

## **EXCAVATION AND SUPPORTED SOLUTIONS FOR THE UNEXPECTED FAILURE CONDITIONS AT SYMVOLO MOUNTAIN TUNNEL CONSTRUCTION**

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### **ABSTRACT**

The tunnel of Symvolo Mountain, which is 1160m long, is placed on South-west of Kavala City at Northern Greece. The tunnel consists of two bores with NW-SE direction, which are connected by two small tunnels. The variety of rock mass quality, the presence of opened faults, and the aquifer's location above the excavation, minimize the stability of rock mass during the excavation and temporary support works.

The aim of the present paper is the description of the dangerous geological status of Symvolo Mountain and the proposed excavation solutions for managing the unexpected failure conditions.

For the above reasons, the sudden changes of the rock mass quality along the tunnel excavation are described. The causes of the geological failures are investigated and the failures are classified. Furthermore, the efficacy of support measures is tested and a relationship between the apparent face of wedges and the shotcrete thickness is proposed.

**KEYWORDS:** Anchors, Bolts, Shotcrete, Support Measures, Swellex, Tunnels