

## **Tunneling in peridotite lherzolite in Telupid, Sabah, Malaysia**

### **ABSTRACT**

The study area is underlain by the ultrabasic rock of partly Sabah Ophiolite Complex of Cretaceous ages. The objectives of this study are to determine the Q-value and to estimate the permanent support measures for 20m span, 10m high and eastern direction of the proposed tunnel in the study area. Engineering geological mapping (lithological and surface mapping and discontinuity survey), laboratory study (petrographically study) and testing (Unconfined Compressive testing) and data analysis (Q system parameters evaluation and support estimation) was conducted in this study. The results show that the rock mass is classified as lherzolite, strong, excellent quality, more than four joint sets, slightly altered discontinuity wall, dry and favourable discontinuity condition. The equivalence dimension ( $D_e$ ) are 15.4 for the permanent roof. The Q-values are 1.4 (Class D or poor and type 5) and 3.5 (Class D or poor and type 4) for permanent roof and wall, respectively. Temporary roof and wall of the proposed tunnel are 7 (class C or fair and type 3). The permanent supports for the roof and wall are systematic bolting, 9-12 cm and 6-9 cm thick and 700J and 500J energy absorption of fiber reinforce sprayed concrete, respectively. Systematic bolting and 5-6 cm thick fiber reinforce shotcrete are temporary support for both roof and wall of the tunnel.