

## ABSTRACT

*Tanju Dam is located on the Tanju River and is administratively located in Dompu Regency, West Nusa Tenggara. This dam was built in the area of the Rababaka Irrigation Network. To overcome the lack of water supply from Tanju River, the Tanju Dam is planned to get additional water supply from the Rababaka River. Based on the consideration of topography and geological conditions, the interbasin supplementation system in Rababaka Complex is not only an open channel, but also a tunnel. Tanju Tunnel is an interbasin supplementary system tunnel in the Rababaka Complex. In this research, geological mapping and engineering geology were carried out. Observation and analysis of rock mass using the GSI method above and below the surface, and RMR (Rock Mass Rating), as well as slope stability analysis using the CFC, Limit Equilibrium Method (LEM) and Finite Element Method (FEM) method. In this study also conducted a cost-benefit analysis (Benefit Cost Ratio). Conditions in the study area are hills and ridges that extend in a relatively northeast-southwest direction, with a ridge length of about 2.2 km and a peak elevation of 325 m. The morphology around the location is quite steep with an angle of  $35^{\circ}$  –  $55^{\circ}$ . The Tanju Tunnel is composed of three rock units, namely andesite, tuff breccia and colluvial deposits. The appropriate excavation method for both the Inlet and Outlet sections with andesite rock condition is the drill and blast method, excavating the entire face of the plane. Considering the small diameter of the tunnel, drilling work using jumbo drill machines, scaling work using Twin Header machines, hauling work using schaeff loaders and dump trucks with a capacity of  $4 \text{ m}^3$ . So that the production time is obtained 95 days faster than the initial plan. The RMR value of Tanju Tunnel is 65 which can be classified as good rock as shown in the RMR classification table, included in the Tunneling Support System Type II using rock bolting with a diameter of 25 mm,  $L = 3 \text{ m}$ , spacing = 2 m, shotcrete 5.0 cm. Slope stability analysis was carried out at the inlet and outlet sections of the tunnel. Based on the results of the slope stability analysis, it is obtained that the critical SF is above the allowed, which means that all the design plans can be implemented. The results of the cost-benefit analysis of Tanju Tunnel excavation using drill and blast method, the cost-benefit value  $(B/C) = 1.22$  where the value  $(B/C) > 1$ .*

**Keywords:** *Andesite, GSI, RMR, drill and blast method, cost-benefit*