TUNNEL SUPPORT SYSTEM FOR SAFE EXCAVATION OF TUNNEL, NEELUM JHELUM HYDRO POWER PROJECT

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ABSTRACT

The objective of this thesis is to evaluate excavation process used in Neelum Jhelum Hydro Power Project and also the support used in the project with more emphasis on the initial support along with a brief introduction of grouting. The project is in Majhoi and it is located to the southeast of Hazara Kashmir Syntaxis. The tunnel starts from Nauseri Dam which is towards the northeast of Majhoi while the tail race tunnel ends in Chattar Kalas power plant towards the south of Majhoi. Twin tunnel entrance is located in Majhoi which is below Muzzafarabad Fault and Jhelum River Fault Zone. Total length of the tunnel is 48 km and the overall project is of 964 MW and it carries Neelum River from below the Jhelum River. The objective described above was attained through field study of the area by assessing the Q value of few faces exposed in the area. After assessment the rock quality was found out to be highly heterogeneous, so the Q value assessed are between Q1 to Q5. At first Drill and Blast technique was used for tunnel excavation but due to its slow progress and the upcoming deadline of the project the technique has been switched to Tunnel Boring Machine (TBM) at the expense of being costly. The initial supports being used included rock bolts, wire mesh, spiling, lattice girders, pipe canopies, shotcrete and reinforced shotcrete ribs. As the project area is located in the vicinity of two rivers so the area has high water content because of which some initial supports are customized for the project only. These supports included grouted rock bolts, lattice girders, project specific reinforced shotcrete, tunnel plug and concrete gallery.

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