

**TUNNEL SUPPORT SYSTEM FOR THE SAFE EXCAVATION
OF TUNNEL KARAKORAM HIGHWAY PHASE II HAZARA
MOTORWAY**



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ABSTRACT

This thesis is based on the tunnel excavation process used in Abbottabad tunnel no.1 located at MalikPura having coordinates (34°09'59.2"N 73°11'31.5"E) along with the initial support system methodology used in the tunnel construction. The major tectonic of the area is Hazara syntaxis which is located at the north east of the Abbottabad tunnel no.1. Most of the area compromised of Hazara formation in which the specifically tunnel area contain phyllite in tunnel one and quartzite and slate in tunnel two. The tunnel face has been completed while the excavation process on the rest of the tunnel is ongoing. In the first tunnel the excavation process was being done by excavator machine and during the excavation a water spring was found. The Q value of rock that we found were Q4 and Q5 according to the Q value system. In the first tunnel supporting was weld mesh, rock bolts and shotcrete pipe canopies were installed for stiffer support while the shotcrete was sprayed and rock bolts were already installed.

In the second lane where excavation was being processed by drill and blast technique but due to the mistake in drill and blast schematics the cavity was formed at the excavation face and tunnel started to collapse because of which further excavation was held and the engineering and geologist provided a solution of tunnel collapse. As the cavity was six meter in height so muck buttressing along with shotcrete support was favored as a temporary solution.

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