

**Geotechnical studies for tunnel alignment in Dr. B. R. Ambedkar  
Pranahita -Chevella Sujala Sravanthi Lift Irrigation Scheme,  
Package-14, Medak District, A.P.**

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**Abstract**

Dr. B. R. Ambedkar Pranahita Chevella Sujala Sravanthi Lift Irrigation Scheme (PCSSLIS) envisages diverting of 160 TMC of water from Pranahita River (RL±150m) to Chevella Reservoir. In order to facilitate construction, the entire project is divided into 28 packages for simultaneous execution and effective operational purpose. Out of the total 28 packages of the mammoth scheme, Package- 14 forms a vital part to divert 24.6cumecs of water from Tipparam Tank by constructing an approach channel, gravity channel and a 5.95km long, 5m dia tunnel to Pamulaparthi tank. This package will irrigate 90,000 acres of land in parts of Medak district.

Detailed geotechnical studies of the proposed tunnel between Ch.2.640km and Ch.9.065km revealed that major part of the tunnel is occupied by overburden soil. Sporadic outcrops of granite and its variants belonging to Peninsular Gneissic Complex (PGC) are also exposed all along its length. In general, the granite strata are intersected by two sets of joints dipping vertical to sub-vertical. The surface geology and poor to nil core recovery in the boreholes drilled along the proposed tunnel alignment revealed poor rock strata and insufficient vertical cover at tunnel grade. Based on the deeply weathered nature of subsurface strata the proposed tunnel alignment was not considered suitable for tunneling, hence a new tunnel alignment south of proposed alignment has been investigated.

Detailed surface and borehole studies along alternative tunnel alignment were carried out between Ch. 2.9km to 8.850km, for a length 5.95 L km. The alternative tunnel alignment is relatively at higher level and is occupied by overburden soil and isolated sporadic outcrops of granite and its variants of PGC all along its length. Granite is grey to pink, hard, medium to coarse grained with occasional pegmatite

veins and enclaves of older metamorphics. Geological logging of boreholes drilled along alternative alignment indicated that the rock mass conditions (Fair to Good class) are much better than the originally proposed alignment. Adequate rock cover at tunnel grade will be available all along the alternative tunnel alignment and therefore was prima facie considered feasible.