

आलेखिका संख्या 2.28

कार्यालय प्रमुख अभियन्ता एवं विभागाध्यक्ष
उत्तराखण्ड लोक निर्माण विभाग,
देहरादून।

भू – गर्भीय निरीक्षण आख्या एस0जी0- 641/सड़क/पुल समरेखण/ गढ़वाल/2014

**Geological assessment of the alignment
corridor proposed for Thangdhar-
Tholdhar motor road, Distt. Tehri
Garhwal.**

15-दिसम्बर-2014

Geological assessment of the alignment corridor proposed for Thangdhar-Tholdhar motor road, Distt. Tehri.

Garhwal.

Vijay Dangwal

15.12.2014

1- Introduction:- The Construction Division, Public works Department Chamba has been entrusted for the preparation of preliminary estimate of 10.00 km (Actual length 7.775 km) long motor road namely Thangdhar-Tholdhar motor road in Tehri Constituency, Distt. Tehri Garhwal vide G.O No. 89/लो०नि०-1/2004-06 (प्रा०आ०)/2004. The PWD Division has prepared two alternative alignments No.1 & No. 2 for preparing the estimate for the construction of this road and on the basis of the merits the Alignment No. 2 was referred to me by Shri Vipul Kumar Saini the Executive Engineer, for carrying out the geological assessment. On the request made by him I carried out the geological assessment of the alignment on 14.12.2014 in presence of Er. S.S. Rawat,, Astt.Engineer and Er. Shailendra Pande, Jr. Engineer.

2- Location:- The alignment corridor proposed for the above said road originates from km 15.00 of Chamba-Mussoorie motor road (SH-8) located in Chamba Block Distt.Tehri Garhwal.

3- Geological Assessment:- Geologically the alignment corridor proposed for the construction of Thangdhar-Tholdhar motor road lies in the Garhwal Lesser Himalayan geotectonic block bounded by the Main Central Thrust (MCT) to north and Main Boundary Thrust (MBT) to south direction. Mostly the quartzites belonging to Nagthat formation are exposed in this area. The cross slopes of the alignment are inclined at steep (45°) and these are oriented in N 010 to N 270 directions The quartzites exposed on the alignment slopes are almost fresh, hard, compact in nature and are dissected by numerous discontinuities. The strike and dip orientation of the joint sets dissecting rock masses are almost fair and at places these become unfavourable for short stretches. The stretches between CH. 0/16 to 0/31 manifests creep movement and it is comprised for the overburden material comprised of angular rock fragments embedded in the clay-silt matrix. It has been observed that this part of the road is oriented towards north direction and remains almost moist throughout the year. In case of the road construction adequate arrangements for the surface drainage must be made. Further the road in this section needs to be formed by cement concrete.

The quartzites exposed along the alignment corridor are sheared/shattered and deformed at places and these are marked by the intense crushing along the minor fault planes. Some part of this alignment passes across the stepped like cultivated fields which are comprised of the rock chips embedded in sandy-silty clayey matrix. The soils comprising the grounds are almost residual soils which contains a good percentage of silty and plastic clays. It has been observed that the soils deposited on the alignment slopes are stiff and hard in dry state and these became dense by spontaneous natural compaction. As the slope forming soils contain high percentage of humous and clays which are highly susceptible for water absorption adequate arrangements for rainwater runoff along and across the proposed road must be made otherwise the slopes will get saturated and may fail. Though the large part of the alignment is exposed with the thick envelope of the overburden material but scanty outcrops of in situ quartzites which are fresh, hard and compact and widely jointed have seen along it. The details of these joints traversing the rock mass are given in the following table.

Table

S. No	Dip Amount	Dip Azimuth
J ₁	65 ⁰	N 210
J ₂	85 ⁰	N 120
J ₃	78 ⁰	N 080
J ₄	65 ⁰	N 340

By and large the alignment slopes are stable except the stretch at Thangdhar.

The cross slopes of the alignment bears moderate to steep relief and these are largely covered by the forests.

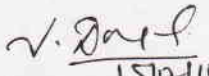
On the basis of the geological/geotechnical studies carried at the site and the facts mentioned above the following recommendations are being made for the construction of the proposed road, failing to these this report will be automatically treated as cancelled.

4- Recommendations:-

1. Construct the road by full excavation of hill slope except the reach between CH 0/17 to CH. 0/31, where the road must be formed by walling on the hill slope.
2. The excavated part of the hill slope must be stabilized by construction suitably designed retaining walls/ breast walls.

3. The entire surface of the road from outer edge to inner edge must be sealed immediately after the excavation of hill slope this is so as to check the water infiltration into the sub soil, otherwise the slope will fail and threat the stability of the road.
4. Construct extra large lined drain all along the hill side of the road and make adequate cross drainage arrangements. The rain water run-off from the upslope catchment should not allow to percolate into the weak strata, otherwise it must be disposed on the safe/ stable ground.
5. The road stretch between CH. 0/17 to CH. 0/31 must be made by cement concrete.
6. Do not blast the rocks by explosives otherwise the fragile system of hill slopes will collapse.
7. Do not dispose the excavated waste on the down hill slopes.
8. Protect the either side slopes of the road by bio-engineering methods especially by plantation of eco-friendly plants.
9. All the construction activity must be carried out as per the standard codes of practice laid by the BIS and MORTH.

5- Conclusion:- On the basis of the geological / geotechnical studies carried at the site and with the above recommendations, the site was found geologically suitable for the construction of 7.775 Km long motor road namely Thangdhar-Tholdhar motor road in Tehri Constituency, Distt. Tehri Garhwal.


15/12/14
(Vijay Dangwal)

Sr. Geologist
Office of the Engineer in Chief,
PWD, Dehradun.