भू–वैज्ञानिक की आख्या

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कार्यालय प्रमुख अभियन्ता एवं विभागाध्यक्ष
उत्तराखण्ड लोक निर्माण विभाग,
देहरादून

भू–गर्भीय निरीक्षण आख्या ए0जी0– 10/ सड़क/ पुल/ सम्बन्धी/ उत्तराखण्ड/ गढ़वाल–2016

Geological Assessment of 4.775 km long alignment corridor proposed for the construction of Kanatal - Andhivar garh-Sungaon motor road, Distt. Tehri Garhwal

07 अक्टूबर.2016

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Shiv Kumar Rai

07.10.2016

1. **Introduction:-** The Construction Divison, Public Works Department, Chamba has been entrusted for the construction of 8.00 km (actual length is 4.775 km on ground) long Kanatal-Andhiyar Garhi-Sungaon motor road in down slope direction from village Kanatal on Chamba-Mussoorie road in Chamba block, Distt. New Tehri. On the request made by Er. V.K. Saini, Executive Engineer, I made a site visit on 26.07.2016 and carried out the geological assesment of the proposed alignment corridor. Er. Suresh Bhatt, Jr. Engineer was present during the site visit.

2. **Location:-** The proposed alignment corridor of the above said motor road originates from village Kanatal in Chamba-Mussoorie road via Udhyan Kanatal, Andhiyar Garh and ultimately to Sungaon in Chamba block, Distt. Tehri Garhwal.

3. **Geology Assessment:-** Geologically, the 4.775 km long alignment corridor of this road falls in a part of Outer Lands of Garhwal Lesser Himalayan bounded by the Main Central Thrust (MCT) in the north and Main Boundary Thrust (MBT) in South. The area of the alignment corridor of the above said motor road is exposed by the rock masses belonging to Blaini and Krol formation of Mussoorie. The cross slopes containing this alignment are inclined at moderate to steep angle and are formed by the bed rocks i.e. dolomites, quartzites, intercalated shales and thick over burden material. The 4.775 km stretch is partially exposed by the bed rocks and partially by the hill slope wash material in erratic pattern of varying length and thickness.

The dolomites with subordinate shales exposed on and across this alignment corridor is slightly weathered and oxidized (W0 to W1 Grade) in nature. These are thinly foliated, hard and compact in nature and exhibits fair values of physical competence. According to the estimation made at the site the "Uniaxial Comprasive Strength" of the bed rocks were found ranging between 30 M Pa to 50 M Pa. The Rock Quality Designation (RQD) values of the phyllites exposed along this alignment corridor was calculated and found ranging between 41% to 60%, hence these phyllites rock falls in the Rock Class-III (Fair) as per Rock Mass Rating. These rock masses are jointed in nature and are traversed by five prominent joint sets rock defect sets. All of these defects are liner, tight and occasionally sealed by secondary inclusion of mineral quartz.

Most of this alignment passes across the hill slopes consisting of loose unconsolidated material generated by the decomposition of parent rocks. The soils are "stiff" in nature. Hard and consolidated in the dry state. It has been observed that the soils forming the slopes contain clay minerals in abundance therefore these may exhibit constant values of strength under the dry and wet conditions. According to the assessment made at the site the "Undrained Shear Strength" of the soils exposed along this corridor was found ranging between 300k Pa to 400k Pa.

By and large the hill slopes containing this alignment are stable and do not manifests signatures related to the land sliding/ground subsidence. No where slush like conditions were seen during the walk over survey likewise the entire ground looks free from the formation of tension cracks and sink pot holes.

On the basis of the geological inspection and the study carried at the site and the facts given above, the following recommendations are drawn/made for the construction of the proposed motor road failing to these recommendations this report will be automatically treated as cancelled.

4. Recommendations:

(i) Form the road by half cut-half fill techniques and compact the fill by dynamic compaction.

(ii) Do not dispose the excavated waste on the lower slope otherwise it will threat the stability of the hill slopes and the adjoining villages.

(iii) Constrict suitably designed retaining walls/ breast walls all along the road.

(iv) Make adequate arrangements for long and cross drainage.

(v) The drained water must be disposed on the stable ground.

(vi) The entire surface of the road bench must be sealed by the bituminous painting this is so as to check the water infiltration into the subsoils.

(vii) All the construction activity shall be carried out as per the Indian Standards codes of practice and guidelines issued by the MORTH.

5. Conclusion:- On the basis of above geological/geotechnical studies carried out at the site and with the above recommendations, the site was found suitable for the construction of 4.775 km long Kanatal-Andhiyargarh-Sungaon motor road, located in Chamba block, Distt. Tehri Garhwal.

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