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

भू – गर्भीय निरीक्षण आख्या एस0जी0–742 / सड़क / पुल समरेखण / गढ़वाल / 2015

Geological assessment of the 3 km long alignment corridor proposed for Ringalgad to Dadak motor road in Dhanaulty constituency, Distt. Tehri Garhwal.

28–फरवरी–2015

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Vijay Dangwal
28.02.2015

1- Introduction:- The Temporary Division, Public Works Department Thatyur has proposed has been entrusted for the construction of 3.00 km long motor raod Ringalgad to Dadak motor road in Dhanaulty constituency, Distt. Tehri Garhwal vide G.O No.- 5810 (1) /III(2)/10-18 (प्रा0आ0)/2010 दी0सी0-11 dated 20.09.2010 On the request made by Er. N.S.Kholiya, Executive Engineer, for carrying out the geological assessment of this alignment corridor proposed for it. I visited the site on 12.01.2015 in presence of Er. Vishal Sharma Astt. Engineer and Er.Anurag Tripathi and Er. Ramanand Nautiyal, Jr.Engineer, PWD, Thatyur.

2- Location:- Two alternative alignments i.e Alignment No. 1 with 5 HP Bends and Alignment No. 2 with 7 HP Bends have been prepared for the geological assessment but considering the various geological and geo-technical considerations the alignment no. 2 was not found suitable for the construction of the above said motor road. The present report is being generated for the Alignment No.1.

The 3.00 km long alignment corridor of the above said road origingates from km 46 of Raipur-Kaddukhal-Kumalada motor road, Distt. Tehri Garhwal.

3- Geological Assessment:- Geologically the alignment corridor of the above said road lies in a part of Outer Belt of Garhwal Lesser Himalaya comprised of the shales belonging to Tal Formation of Mussoorie Group. The rock masses exposed on and across the alignment corridor are thinly foliated, partially weathered at the near surface and traversed by many linear discontinuities. The terrain comprising this alignment is characterized by the low inclined hill slopes for about one and half kilometer and thereafter, moderately inclined hill slopes upto the end chainage. Most of the rock masses along the alignment corridor are covered by the thin envelope of overburden material comprised of the residual soils and hill/slope wash material. The slope facets of this alignment are inclined between 15^0 -45^0 oriented in N 130- N180 directions. Large part of this alignemt is covered by the thick forests.

The rocks exposed along the alignment corridor exhibits low to moderate values of physical competencies and generally falls in Class III and Class IV of Rock Mass Rating System (RMR). According to an estimation made at the site the "Uniaxial Compressive Strength" of the rock masses was found ranging between 10 M Pa to 40 M Pa.

The rock masses exposed on and along this alignment corridor have been traversed by the four prominent discontinuities and only one of these plunge towards the

direction of the slope face. All the joint are closely spaced and bears very high frequencies. The following table give a brief description of the joint sets recorded at the site.

Table

S.No	Feature	Dip angle	Azimuth
1	2	3	4
J_1	(So bedding joint)	70^0	N 050
J_2	joint	65^0	N 320
J_3	joint	15^0	N 180
J_4	joint	12^0	N 360

These joints are almost tight and free from infilling.

The overburden material deposited on and across the alignment corridor measures 0.50 to 2.0 m thickness. This material is comprised of the rock fragments embedded in the clayey-matrix. This material is naturally dense, hard in dry state, compact and semi-dispersive in nature. The soils comprising in it are "Stiff" in nature as per the soils consistency classification. The "Undrained Shear Strength" present on and across the alignment slopes has been assessed ranging betweeb 300 K Pa -400 K Pa. It has been observed that most of these soils are generated by the decomposition of terrain rock, therefore these are residula soils and contains plastic clay minerals in abundance. In case of the road construction adequate arrangemensts for the disposal of run-off from the upslopes and range must be made in order to check the water infiltration into these highly succeptible material.

By and large the alignment slopes are stable and presently free form any landslide/ mass wasting activities.

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- Reccomendations:-

1- Construct the road by half cut and half fill techniques and compact the fill material properly by dynamic compaction.
2- The either side slopes of the entire road must be protected by suitably designed retaining walls/ breast walls, this work shall be carried out simultaneously with the advancement of the road cutting. This is very important for the stability of the hill side slopes.
3- The entire surface of the road from outer edge to inner edge must be sealed immediately after the excavation. this is so as to check the water infiltration into the sub soil, otherwise the slope will fail and threat the safety of the village on its lower slopes.
4- Construct extra large lined drain all along the hill side of the road and make adequate cross drainage arrangements. The accumulated rain water run-off from this road and its upslope catchment should not allow to flow freely over the lower hills.

5- Do not dispose the excavated waste on the lower slopes, it will damage the Highway and obstruct the communication.

6- 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 3.00 km long motor raod Ringalgad to Dadak motor road in Dhanaulty constituency, Distt. Tehri Garhwal.

28/2/15

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