

कार्यालय प्रमुख अभियन्ता एवं विभागाध्यक्ष
लोक निर्माण विभाग, देहरादून।

मू - गर्मीय निरीक्षण आख्या एस0जी0-147 / सड़क संरक्षण / कुमाऊँ / 2013

Geological Assessment of the alignment proposed for
Pindari Glacier motor road to Kafli Kameda motor
road in Kapkot Block, Distt. Bageshwar.

अनुमति

दिनांक

स्थान

13-दिसम्बर-2013

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18-12-2013

1-Introduction:- The R.E.S. Division Public Works Department PIU-II PMGSY, Kapkot has proposed the construction of 11.250 km long motor road namely Pindari Glacier motor road to Kafli Kameda motor road under Pradhan Mantri Gram Sadak Yojna (PMGSY) in Kapkot Block, Distt. Bageshwar. On the request of Er. P.C Joshi, Executive Engineer, PIU-II, PMGSY, Kapkot I carried out the geological assessment of the proposed alignment of the road on 23.11.2013 in presence of Er. N.S Rawat, Asst. Engineer and Er. S.K Kandpal, Jr. Engineer, PMGSY, Kapkot.

2-Location:- The alignment proposed for the above said road originates from km 9 of Kapkot Pindar motor road and It ends in Kameda village with 11.250 km length.

3-Geological Assessment:- Geologically the alignment corridor of the proposed Pindari Glacier motor road to Kafli-Kameda motor road lies in the inner lands of Kumaon Lesser Himalayan Belt and the rocks of Tejam Group are exposed in this area. Mostly the slopes of the proposed alignment are inclined at moderate to steep angle but at places they bear very low inclination. The relief of the alignment slope facets also varies with the advancement of the alignment which decreases gradually towards the higher elevations. Most of the alignment slopes are occupied by the dolomitic limestones, purple shales and slates which are occasionally carbonaceous in nature. These rocks are exposed as partially weathered and oxidized and have attained the weathering upto Grade-III and due to it it has been observed that the rock mass along the alignment corridor contains few cavities of varying orders and sizes which are at places inter connected to one another. In case of heavy blasts the stability of the rock pillars may breach resulting in the slope failure. Therefore these rocks needs to be trim blasted in case of the excavation of the proposed road. Beside the exposure of in-situ rock masses the proposed alignment slopes are partially covered with the overburden material comprised of hill wash/slope wash material containing rock fragments of varying shape and sizes embedded in the granular sand-silt and clay matrix. The dolomites and dolomitic limestone exposed on the hill slopes

are thickly bedded and widely jointed in nature. Largely these rocks are massive to thinly foliated highly jointed, sheared and shattered in nature and according to the manual tests performed on these the "Uniaxial Compressive Strength" of these rocks has been estimated ranging between 20 M Pa to 50 M Pa which according to the nomenclature description falls in 'soft' and 'hard' rock categories. The rock mass exposed along the alignment corridor exhibits low percentage of "Rock Quality Designation" which is calculated ranging between 35 percent to 40 percent.

The rockmass exposed along the alignment corridor are highly weathered and oxidized in nature and are dissecting four prominent joint sets. According to the study carried on the exposed rocks the details of the dip amount and dip directions of joints sets traversing these rocks are listed in the following table:-

Table

S.No	Feature	Dip angle	Azimuth
1	2	3	4
J ₁	(So bedding joint)	45°	N355
J ₂	joint	58°	N 180
J ₃	joint	41°	N048
J ₄	Joint	76°	N105

The overburden (hill wash) material deposited on the alignment slopes contains granular material in abundance through it is naturally well compacted and dense in nature but its stiffness may be breach so if excavated unscientifically.

The slopes of the alignment in question are inclined at moderate to steep angle and are covered with the thin forest. Few prominent joints dissecting the rock mass dips outwards to the slope facets.

On the basis of the geological / geotechnical studies carried at the site and the facts mentioned above the following recommendation are being made which strictly needs to be incorporated in the construction of the proposed motor road.

4- Recommendations:-

1. Do not blast heavily on the rocks otherwise, excavate the hill slopes by controlled/ trim blast only. Blasts near public properties and human settlements are restricted.
2. In order to form the road bench avoid deep box cuts on the hill slope, otherwise excavate the hill side slope maintaining the angle of repose.
3. Protect the entire hill side slope by constructing the suitable designed retaining wall designed with the consideration of various geotechnical parameters.

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4. Construct extra wide lined drain all along the hill side of the proposed road and make adequate cross drainage arrangements.
5. Do not dispose the drained water on the loose/dispersive/soft ground.
6. Do not dispose the excavated waste on the lower slopes.
7. In order to check the infiltration of waters in the slope forming material see the entire carriage way by black top and shoulders by cement concrete.
8. All the construction activities should be carried out as per the norms and Standard laid by the MORTH/ BIS codes for the Construction similar Structures.

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 11.250 km long motor road namely Pindari Glacier motor road to Kafli Kameda motor road under Pradhan Mantri Gram Sadak Yojna (PMGSY) in Kapkot Block, Distt. Bageshwar.

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Photo copy
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A.E