

कार्यालय प्रमुख अभियन्ता,
लोक निर्माण विभाग, देहरादून।

भू - गर्भीय निरीक्षण आख्या एस0जी0 -114/सड़क समरेखण/कुमाऊँ/2013

Geological Assessment of the alignment
Proposed for Pothing to Sobhakund motor
road, District- Bageshwar.

27-फरवरी 2013

Pothing - Sobhakund Motor road, District
Bageshwar.

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1. Introduction:- The Construction Division, Public Works Department Kapkot has proposed the construction of 5.00 km long motor-road from Pothing to Sobhakund in District Bageshwar Uttarakhand. On the request of Er. G.C. Arya, the Executive Engineer, C.D. Kapkot, I carried out the geological/geotechnical assessment of the proposed site on 27-11-2012 in presence of Er. N.S. Majhila Asst. Engineer and Er. D.S. Badhani, Jr. Engineer, Construction Division, P.W.D., Kapkot.

2. Location:- The alignment proposed for the Pothing - Sobhakund road originates from km 6.00 of Kapkot- Karmi motor road in Kapkot Tehsil, District- Bageshwar.

3. Geological Assessment:- The alignment corridor of the Pothing- Sobhakund motor road lies in the Inner Lands of Lesser Himalayan Belt, and mostly thinly foliated shales/ slates are exposed in and around the alignment corridor. These rocks are almost partially weathered and oxidized and are traversed by numerous discontinuities. The alignment in its starting 50 m length passes through the cultivated fields which are comprised of enormous deposit of loose and dispersive clays. The insitu rock encountered at CH 00/12 where a small gadhera crosses the alignment a 6.00 m span RCC bridge is proposed to be constructed over it. At this Site the "Uniaxial Compressive Strength" of these shales was estimated between 30 M Pa to 50 M Pa. It has been noticed at the site that these rocks are weathered upto the depth of 2.00 m. After CH. 00/12 thereafter, the alignment slopes passes through the opposite facets which are relatively more stable and almost 80 percent of the alignment length passes through it.

The alignment slopes become steeper after CH 00/12 till the end and the geotechnical properties of the rock mass increased abruptly with the advancement of the alignment. Four sets of joints (rock defect) has been recorded at the site and two among those i.e. (i) $J = 80^{\circ}/N060$ and (ii) $J = 60^{\circ}/N220$ were found having strike length and persistence greater than 8 m order. It has been observed that the joint set dipping in the eastward direction controls the slope face and at places where the

nature of dip measures low angle compared to the slope face planar failure may occur. The details of the joints recorded at the site are given in the following table.

Table-1

S.No	Feature	Dip angle	Azimuth
1	2	3	4
J ₁	(So bedding joint)	35°-50°	N170-N190
J ₂	joint	65°-80°	N 058-N080
J ₃	joint	60°-71°	N170
J ₄	joint	41°	N340

Thin cover of slope wash/ overburden material is deposited partially on the alignment slopes. This material is comprised of angular to sub angular rock fragments which are embedded in the clay matrix. The consistency of this material has been assessed "Very Stiff".

The alignment slope faces in opposite direction upto CH. 00/12 it faces towards west and after crossing the pothing gadhera at 00/08 it faces in the eastward direction.

By and large the alignment slopes looks stable and are free from mass wasting.

It is essential to make proper lined drainage arrangements from CH 00/00 to CH 00/02, contemporarily to the excavation of the slope, so as to check the erosion of the loose soils.

On the basis of the walk over survey, the geological studies carried out at the site and the facts given above, the following suggestive measures are being made for the construction of the proposed road.

4. Recommendation:-

- (i) Do not blast heavily on the rocks and near the villages and near public properties.
- (ii) At places where the joint planes are dipping outwards to the slope face with a low angle form the road by manual excavation. These planes can be stitched with the rock bolts.
- (iii) Form the road with half cut- half fill techniques and the fill material needs proper compaction till the required density is achieved.
- (iv) Construct extra large lined hill side long drain with the adequate

- (v) Ensure the disposal of excavated waste on the suitable dump yards and the drained water on the safe ground, it is necessary to maintain check the stability of the slopes.
- (vi) The road must have properly designed retaining / bress walls. It is preferable to construct retaining wall all along the length of the road.
- (vii) Design standards and specification laid down by IRC for similar category roads should be strictly followed.

5. Conclusion:- On the basis of the geological studies carried at the site and with the above recommendations, the proposed site was found geologically suitable for the construction 5.00 km long motor road from Pothing to Sobhakund in District Bageshwar Uttarakhand.

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