

कार्यालय प्रमुख अभियन्ता
लोक निर्माण विभाग, देहरादून।

भू - गर्भीय निरीक्षण आख्या एस0जी0 -280/सड़क/पुल समरेखण/गढ़वाल/2012

**Geological Assessment of the proposed Alignment
corridore of Maikholi to Nalgaon, Lakheri, Vasisem to
Rohida Motor Road(stage-1) District- Chamoli,
Uttarakhand.**

23-जनवरी-2012

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Maikholi to Nalgaon, Lakheri, Vasisem to Rohida Motor Road (stage-1) District- Chamoli, Uttarakhand.

1. **Introduction:-** The Provincial Division, Public Works Department Karanprayag has proposed 6.00 km extension of Maikholi- Nalgaon- Lakheri- Vasisem to Rohida motor road in Gairsain a sub Division, District Chamoli. On the request of the Executive Engineer, P.D, PWD Karanprayag the undersigned carried out the geological assessment of the proposed alignment corridore No. 1 on 02-12-2011 in presence of Er. Ram Singh , the concerned Jr. Engineer.

Two alternative alignments were suggested for the above said construction but the Alignment No. 2 was geologically not found suitable and therefore dropped for further study.

2. **Location:-** The proposed alignment No.1 originates from the last point km 3.0 Maikholi- Khinsar motor road, under Gairsain sub Division, District- Chamoli.

3. **Geological Assessment:-** The Alignment corridore No.1 of Maikholi- Nalgaon- Lakheri- Vasisem to Rohida motor road geologically falls in the uplands of Lesser Himalayan Zone located in Western Himalayan Division of Main Himalayan Belt. Mostly the schistose phyllites, spillites and schists constitute the bulk of the formation exposed in and around the area. These rocks have been subjected to five phases of deformation and hence they are folded, faulted and jointed in nature. The joints are occasionally tight otherwise they are open upto 2.0 cm and infilled with the clay and crushed rock chips and powder.

These rocks are partially weathered and oxidized (W1-W0 grade) and about 25 percent of the mineral constituent have been altered/ decomposed. Due to the severe alteration, the shear strength of these rocks have been decreased substantially and hence the entire gamut is lithologically characterized by the existance of squeezing and swelling rocks at shallow depth. This typical

characteristic of the rock is attributed to the presence of clay minerals in abundance.

The slopes across the alignment passes are inclined at 20° to 45° in N 100 to N 180 direction and these are cultivated and forested. About 50 percent of the area is covered with the overburden, hill wash material, which at places comprised of angular boulders embedded in clay- silt matrix otherwise, most of this is formed of residual clay enriched with mica-flakes. The soil forming the landmass is semi cohesive in nature and it becomes muddy- slushy in saturated condition.

The slopes of the alignment corridor are facing towards east, south - east and southward, therefore, remains almost dry in fair weather condition an important condition supporting the hill slope stability.

Presently the either side i.e. the up and down hill slopes of the alignment corridor are free from land slide/ mass waisting.

The Uniaxial Compressive Strength (UCS) of the rock masses exposed along the alignment has been estimated between 25 M Pa to 50 M Pa. The value corresponds to average strong stratified and schistose rock having fair physical strength.

The joint sets slicing the rock masses are moderately wide (0.2 m to 2.0 m) in nature and non of them bear adverse orientation which facilitate the planner, wedge, toppling and translational failure. The details of the joint set recorded along the alignment are as follows:-

Table

| S.No | Feature | Dip angle | Azimuth |
|----------------|--------------------|-----------|------------|
| 1 | 2 | 3 | 4 |
| J ₁ | (So bedding joint) | 30-48 | N330-345 |
| J ₂ | joint | 25-42 | N015-N045 |
| J ₃ | joint | 32-35 | N 160-N190 |
| J ₄ | joint | 60-78 | N200-N250 |

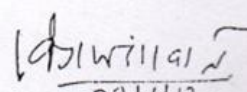
alignment this section requires the construction of a bridge.

On the basis of the visual inspection the studies carried out at the site and the facts given above, the following remedial measures are being suggested for the safe and stable construction.

4. Recommendation:-

- (i) Do not dispose the cut/ excavated material into valley side otherwise dispose the waste on topographically suitable dump yards.
- (ii) Reinforce the rock slopes by installing of 25cm \varnothing 2.5 m long rock bolts.
- (iii) Excavate the hill side slope from top to bottom in order to maintain overall stability of the slope. Cut slope should be rendered stable throughout the designed life of the road.
- (iv) Design standards and specification laid down by IRC for similar category roads should be strictly followed.
- (v) Way out for cut and fill wherever it is possible this is so as to decrease the damages and disturbances.
- (vi) Heavy rock blasting should be avoided and blasting holes should be remained low explosive charge with alternative dummy holes this is avoid large scale of disturbance to the rock face.
- (vii) The road must have adequate road side/ cross drainage pattern.

5. Conclusion:- On the basis of the geological / geotechnical studies carried at the site and with the above recommendations, the proposed alignment was found geologically suitable for the construction of Maikholi to Nalgaon, Lakheri, Vasisem to Rohida motor road (stage-1).


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