

Geological Assessment of 8.675 Km long Dhotigad-Pachgaon-Syura link motor road District- Almora.

Priya Joshi

18/11/2016

- 1- **Introduction-** Provincial Division, Public Works Department Almora entrusted in construction of 8.675 Km long Dhotigad-Pachgaon-Syura link motor road Almora District. On the request of Shri Harish Pandey, Executive Engineer, Provincial Division, Almora I carried out geological assessment of the above said motor road on dated 17/11/2016. Additional Assistant Engineer Shri D. P. Verma accompanied during the site visit.
- 2- **Location-** The Dhotigad-Pachgaon-Syura link motor road starts from km 14 of Almora-Someswar-Gwaldam-Karnprayag motor road. 12 HP bends are proposed which falls at 0.725-0.775, 1.200-1.250, 1.400-1.45, 1.675-1.725, 1.775-1.825, 5.950-6.0, 6.825-6.875, 8.050-8.1, 8.125-8.175, 8.225-8.275, 8.325-8.375, 8.475-8.525 chainage respectively. Total length of the motor road is 8.675 Km while the sanctioned length of the road is 6.00 km. Syura, Pachgaon and Barsimi village will falls along the proposed alignment.
- 3- **Geological Assessment-** The alignment corridor proposed for the above said motor road lies in part of Kumaun Lesser Himalayan. Geologically the site in question lies in Almora Nappe of Kumaun Lesser Himalaya. Almora Nappe is bounded by South Almora Thrust (SAT) in South and by North Almora Thrust (NAT) in the North. It comprises rocks of Almora Group. Almora Group comprises of two different lithological units which are Biotite Mica Schist, and Micaceous Quartzite of Saryu Formation and Granite-Granodiorite plutonic bodies.

Topography of the area overall is gentle to moderately steep. Area is covered with forest. Some manmade terraces were also observed which are mostly cultivated. Starting portion of the area is much steeper and is mostly covered with forest than the last few km's which falls on the terraces from where the alignment has been proposed (Fig. 2). Slope angle varies from place to place. Slope angle ranges from 25°-75° and slope direction varies from N70°-280°. Hydrological conditions are mainly dry, except in rainy season. There are no prominent nala's which will fall across the length of the road. Rock type in the area is micaceous quartzite and schist, Quartzite is hard and compact in strength while schist is weak. At some places the schist is highly sheared and weathered. Weathering grade ranges up to W₂-W₃. High grade of deformation is there and near to the starting point phyllitic nature of rock is also observed. In quartzite deformation is less.

Foliation in the schist dips in north direction with the gentle amount of 25° . Three sets of joints have been observed at the site in quartzite.

Table-1

S.No.	Feature	Dip angle	Azimuth
1	Joint J1	25°	N 320°
2	Joint J2	70°	N 140°
3	Joint J3	65°	N 220°
4	Slope	30°	N 130°

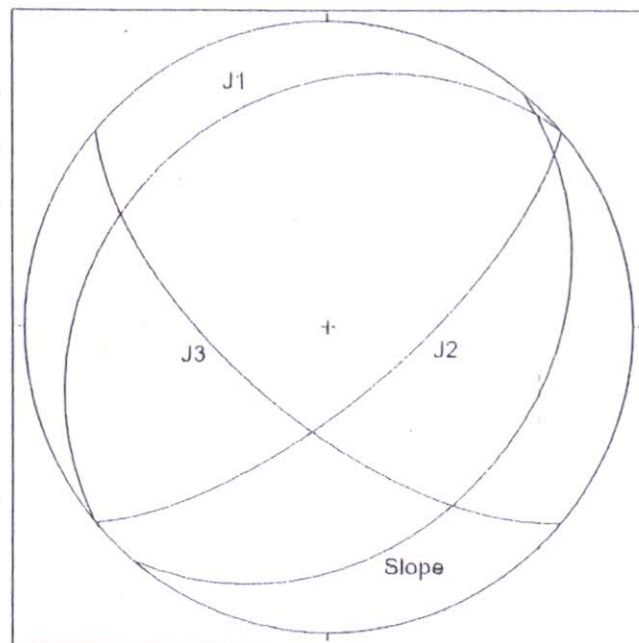


Figure 1 Stereographic projections of joints and slope data in Quartzite

From the above stereographic projections (Fig1) it is clear that none type of translational failure is observed in the quartzite thus joints do not create much impact on the stability of the area.



Figure 2 General topography of the area

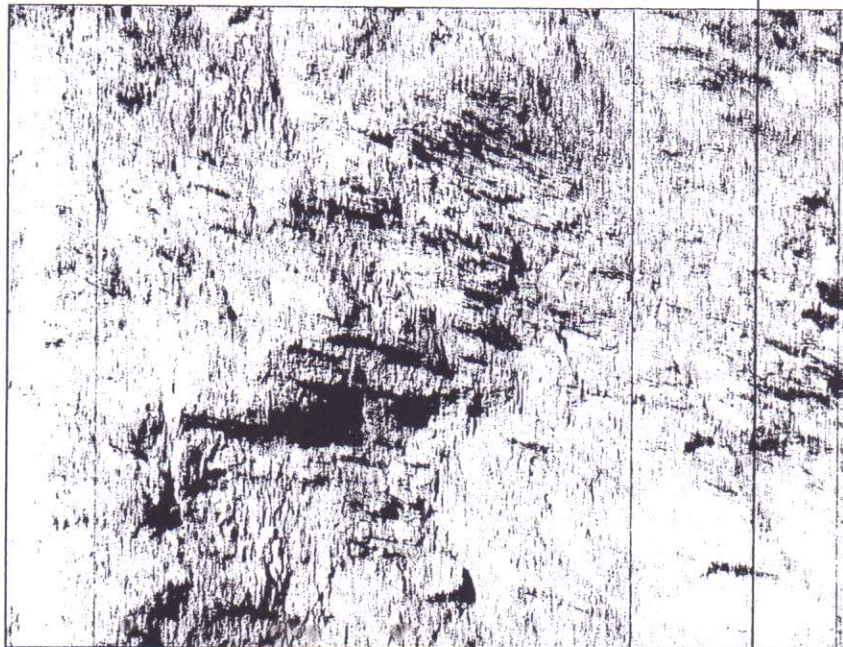


Figure 3 Schist outcrop observed at site

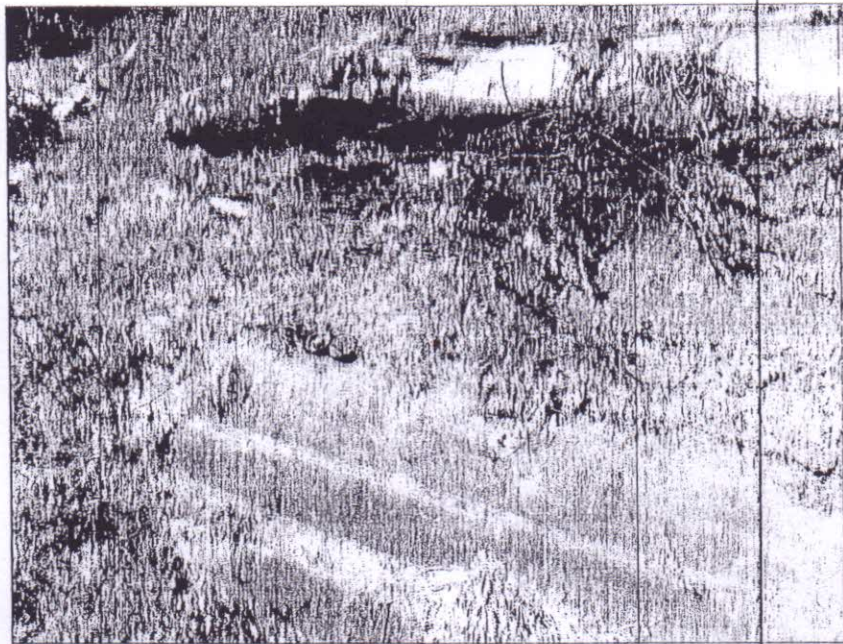


Figure 4 Quartzite rock observed at the site in between thin band of Schist

On the basis of the geological/geotechnical studies carried at the site and the fact mentioned above the following recommendations are being made for the construction of the proposed road, failing to these recommendations this report will be treated as cancelled.

4- Recommendations-

- 1- Do not blast heavily by explosives. It is recommended that the blasting shall be carried out by controlled method i.e. by leaving large volume of dummy holes.
- 2- The entire hill and valley side slope along the whole length of the road must be protected by suitably designed retaining/ breast walls. This work should be done simultaneously with the advancement of the road cutting. It is advised to leave sufficient weep holes in the walls; this is so as to facilitate the subsurface drainage.
- 3- Properly designed culvert/bridges must be constructed over the mala whichever is suitable.
- 4- Construct U shaped lined drain all along the hill side of the road and made adequate cross drainage arrangements. The accumulated rain water from upper reaches of the hill must not allow to flow freely over the road constructed and its lower hill slopes.

- 5- Disposal of muck and excavated waste on the lower slopes of this road is to be strictly avoided. It is advised to dispose the muck on the identified site for muck disposal.
- 6- The portion of the road which passes through the cultivated field where water seepage from the ground is high; RCC should be done.
- 7- All the construction activities must be carried out as per the prescribed norms and the standard codes of the practice laid by BIS and MORTH.

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