Geological Assessment of the alignment corridor proposed for the Construction of 6.25 Km Jhimar-Talla Viral motor road in District-Almora.

Priya Joshi
16/09/16

1- Introduction:-The Provincial Division, Public Works Department, Ranikhet has proposed the construction of 6.25 Km long Jhimar-Talla Viral motor road motor road in Syalde Block, Ranikhet, District Almora. On the request made by Shri. K. L. Verma, Executive Engineer Provincial Division Ranikhet I carried out the geological assessment of the proposed alignment corridor of the above said motor road on 01.06.2016. K.G. Goswami, Additional Assistant Engineer also accompanied during the site visit. The sanctioned length of the road is 6.00Km, while the actual length is 6.25 Km.

2- Location:-The site in question starts from Jhimar village. The total length of the road is 6.25 Km in which 2 HP bands are proposed at 2/29, and at 3/10 chainage respectively. One 10 m span puliya is proposed along a prominent nala.

The co-ordinates of starting and end points taken from hand held GPS are as follows-

Starting Point	**End Point**
Latitude- N 29°44'31.41"	**Latitude**- N 29°43'53.10"
Longitude- E 79°09'13.57"	**Longitude**- E 79°10'20.09"

3- Geological assessment:- Geologically, the proposed location for the above said motor road lies in part of Kumaun Lesser Himalayan Belt. The area lies near to the contact of Ramgarh Thrust (RT) with Nagthat Formation of Jaunsar Group. Ramgarh thrust separates the underlying autochthonous sedimentaries of inner and outer lesser Himalaya from the overlying low grade metamorphic unit of Ramgarh group. Nagthat formation comprises of Quartzite and Ramgarh group is made up of the rocks i.e. Phyllite, Schistose Quartzite, and Carbonaceous Phyllite of Nathuwakhan Formation.

Topography of the area overall is gentle to moderately steep. The lower reaches of hill slope are in N90° direction. Majority of the area is covered with forest. Some manmade terraces were also observed which are mostly cultivated. Overall the area is moderately steep and is mostly covered with forest. Four main nala were falls across the alignment. At one of them bridge is proposed. Soil cover thickness is approximately less than 1 m and has clay content. Weathering condition is moderate to high in the area. Slope angle varies from 25°-50° and slope direction varies from N40°-270°. Three prominent nala is observed along the site. Outcrop of slightly folded quartzite is observed along the nala. Rock type observed in the area is micaceous quartzite (Fig. 2), which is

moderately weak in strength as the rock is highly jointed and moderately deformed. Near to the starting point some outcrop of schist are also observed having foliation in N220° direction. At some places the rock is highly sheared and weathered. High grade of deformation is observed. At the end of second km a debris slide is observed. Highly sheared and weathered overburden is failed along the gravity. Joint sets which were recorded from the rock outcrops of Quartzite exposed at the site are as follows-

Table-1

S.No.	Feature	Dip angle	Azimuth
1	J1	45^0	N 80°
2	J2	40^0	N 240°
3	J3	50^0	N 150^0
4	Slope	25^0	N 50°

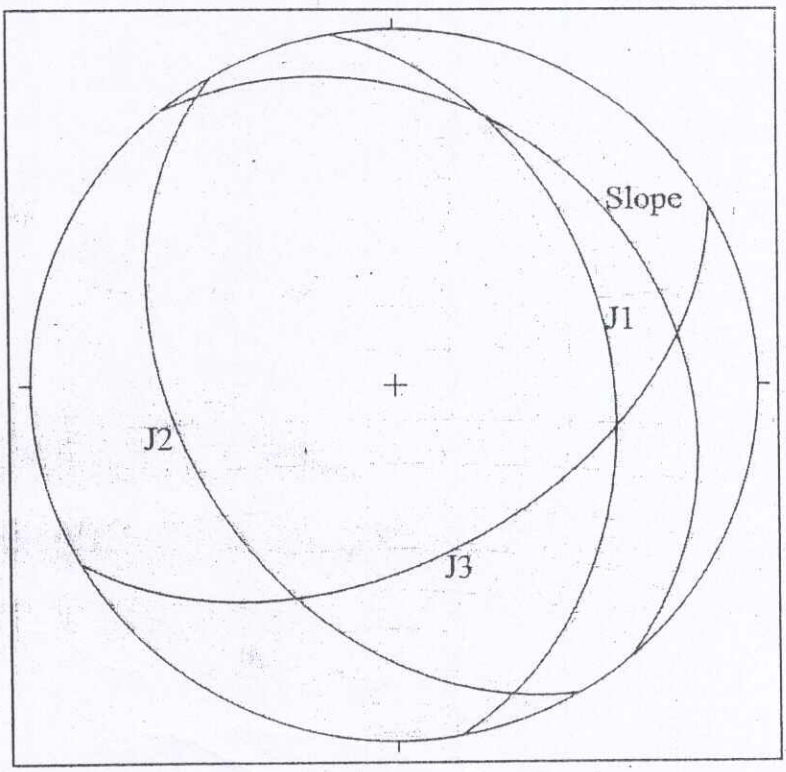

Figure 1 Stereographic projection of Joints and Slope data

From the above stereographic projection (Fig 1) it is clear that the foliation/Joints do not create much impact on the stability of the area.

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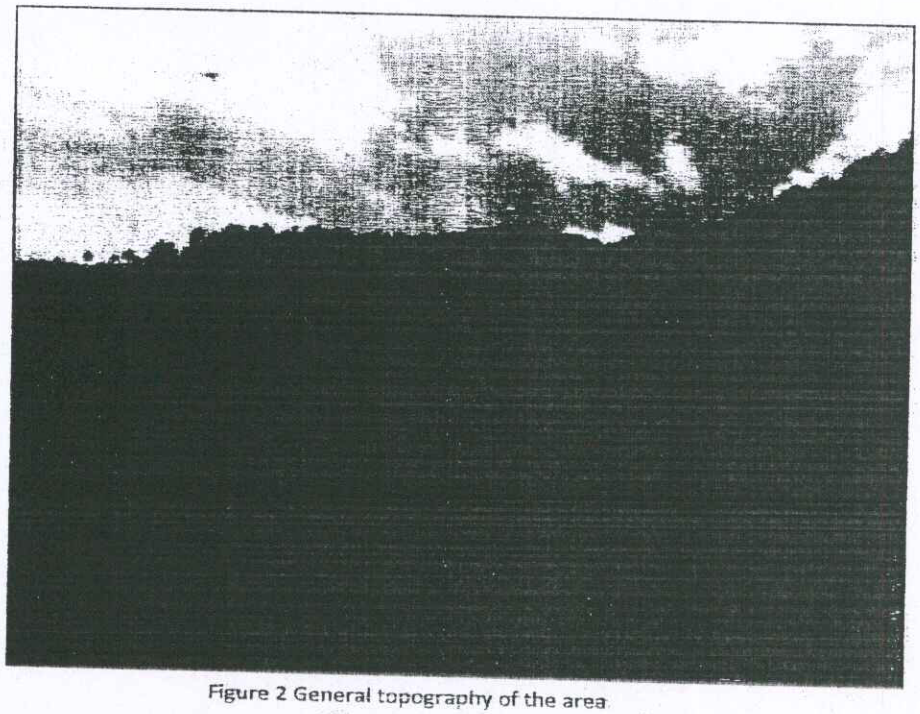

Figure 2 General topography of the area

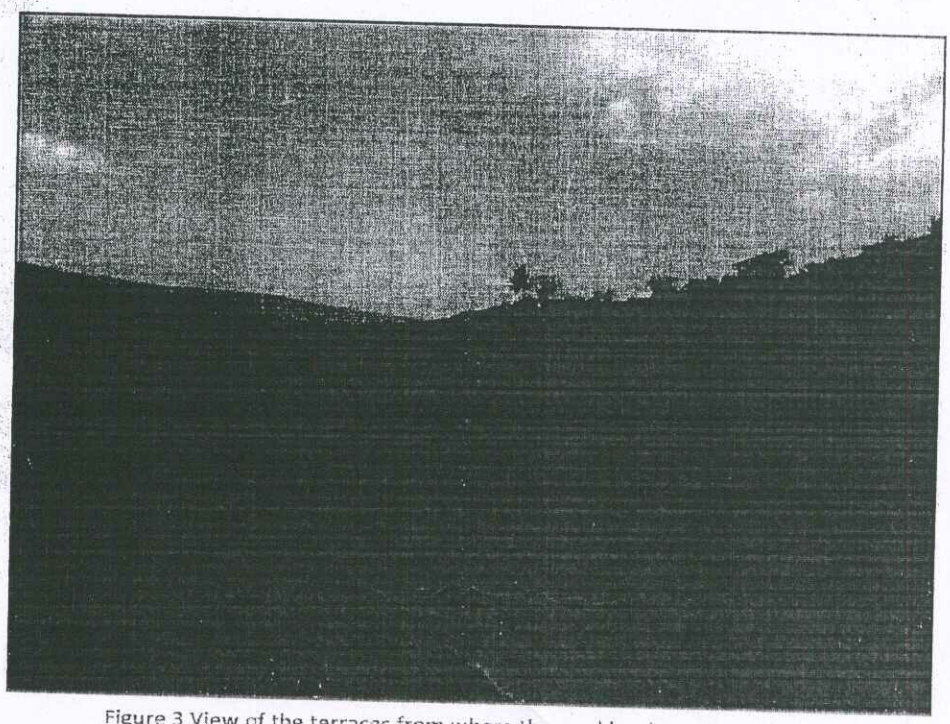

Figure 3 View of the terraces from where the road has been proposed

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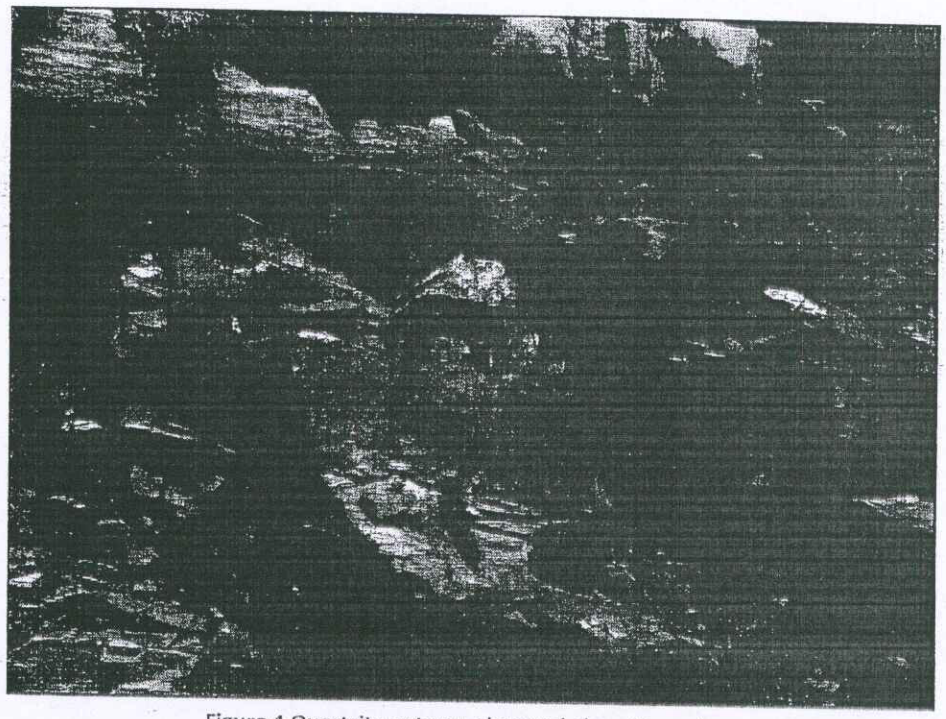

Figure 4 Quartzite outcrop observed along the nala

4- **Conclusion-** 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.

5- **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 nala whichever is suitable.

4- Construct U shaped concrete lined drain all along the hill side of the road and made adequate cross drainage arrangements. The accumulated rain water from upper

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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; failing to which will increase the weight of the lower slope resulting Increase in driving forces. It is advised to dispose the muck on the identified site for muck disposal.

6- Foundation for the bridge if constructed, over nala must be placed wisely on fresh, hard, compact and intact rock mass after removing weathered top portion.

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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