

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  $35^{\circ}$ - $60^{\circ}$  and slope direction varies from  $N220^{\circ}$ - $340^{\circ}$ . Water seepage is in dry condition. One prominent ephemeral nala is observed along the site. 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. At some places the rock is highly sheared and weathered. High grade of deformation is observed. Joint sets which were recorded from the rock outcrops exposed at the site are as follows-

**Table-1**

S.No.	Feature	Dip angle	Azimuth
1	J1	$40^{\circ}$	$N 0^{\circ}$
2	J2	$30^{\circ}$	$N 180^{\circ}$
3	J3	$65^{\circ}$	$N 270^{\circ}$
4	Slope	$60^{\circ}$	$N 220^{\circ}$

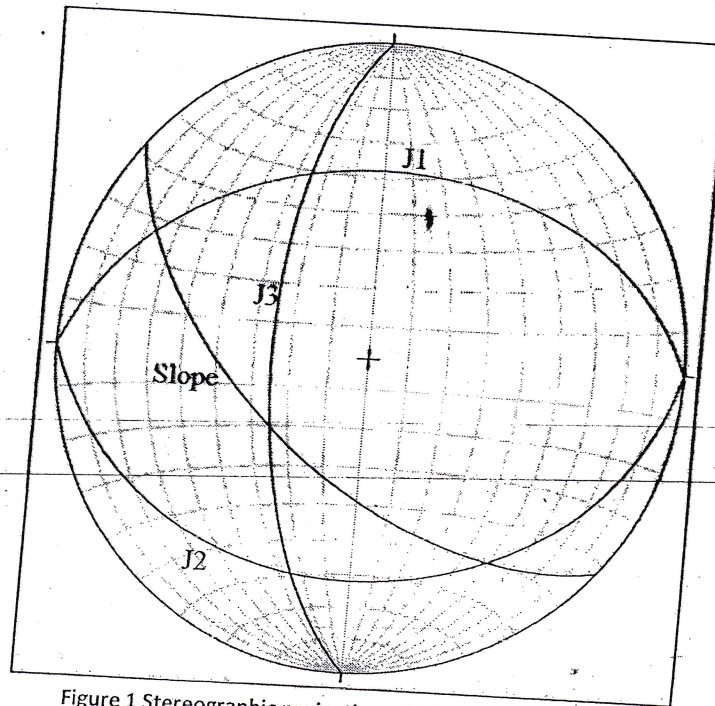


Figure 1 Stereographic projection of joints and slope data

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.



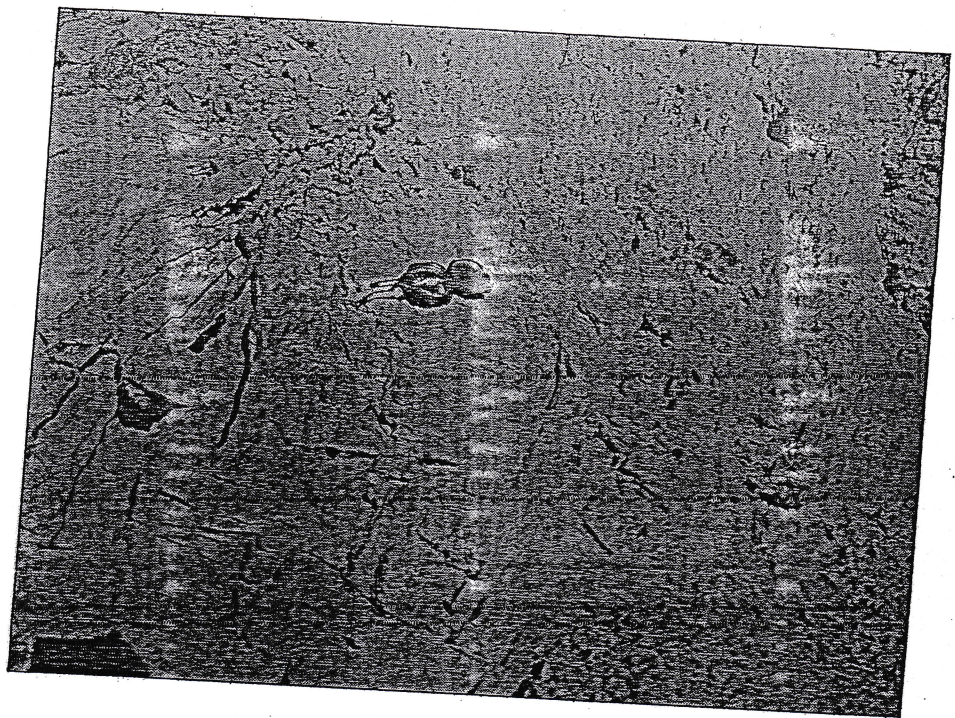


Figure 2 Rock type observed at the site



Figure 3 Starting portion of the proposed road



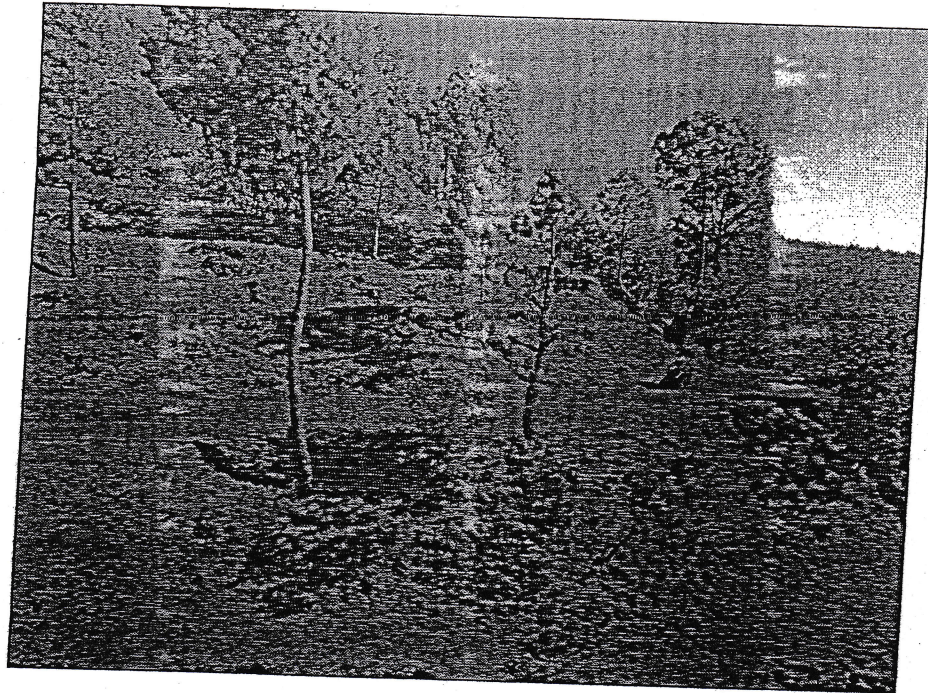


Figure 4 View of manmade terraces from where the alignment has proposed

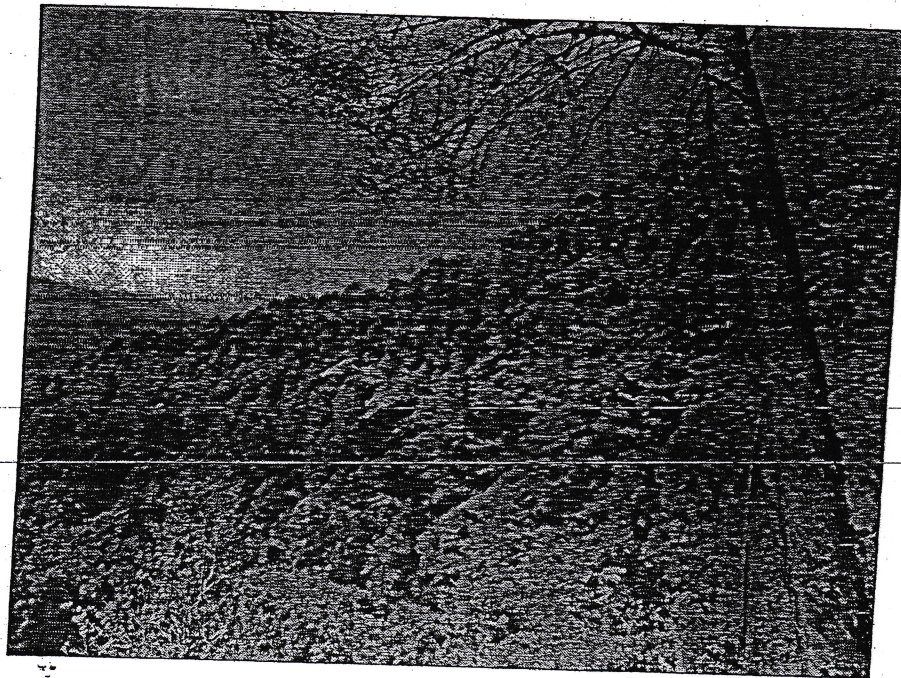


Figure 5 General topography of the area

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.

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5- Recommendations-

- 1- Starting portion of the proposed alignment must be change. As in the starting portion the road is passing through the muck disposal of the above cut road.
- 2- 10m span puliya is proposed over a prominent ephemeral nala.
- 3- 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.
- 4- 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.
- 5- Properly designed culvert/bridges must be constructed over the nala whichever is suitable.
- 6- 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 reaches of the hill must not allow to flow freely over the road constructed and its lower hill slopes.
- 7- 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.
- 8- 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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22/10/16

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