कार्यालय मुख्य अभियंता (अ0क्षे0)
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पत्रांक– 6566/03स0भू0वै0–2016

दिनांक– 30/12/2016

प्राप्ति सं0 49
फाइल सं0 129 सी
06-01-2017

सेवा में,

अधिशासी अभियन्ता
प्रान्तीय खण्ड लो0नि0वि0
रानीखेत।

विषय :– मोटर मार्ग के भूगर्भीय सर्वेक्षण के सम्बन्ध में।

संदर्भ :– आपके कार्यालय पत्रांक– 3014/36 सी० दिनांक 24/12/2016

महोदय,

उपरोक्त विषयक संदर्भित पत्र के क्रम में अधोहस्ताक्षरी द्वारा जनपद अल्मोड़ा में बिल्लेख–मल्ला गैरा से अम्बेडकर गॉव मोटर मार्ग, 2.50 किमी0 लम्बाई हेतु निर्माण कार्य के भूगर्भीय सर्वेक्षण की आख्या अग्रिम आवश्यक कार्यवाही हेतु संलग्न कर प्रेषित की जा रही है।

संलग्न :– उक्तानुसार।

Priya Joshi 30/12/2016
(प्रिया जोशी)
सहायक भू–वैज्ञानिक
कार्या0 मुख्य अभियन्ता
लो0नि0वि0 अल्मोड़ा

पत्रांक 6/ कैम्प दिनांक 2/1/2017
प्रति अधिशासी अभियन्ता, प्रा० खण्ड लो० नि० वि०, रानीखेत को पत्र आवश्यक कार्यवाही हेतु प्रेषित।

6-1-17

RN-49/129सी/06-01-17
प्रति – सहायक अभियन्ता/ कैम्प प्रा० खण्ड रानीखेत को आवश्यक कार्यवाही हेतु प्रेषित।

अधिशासी अभियन्ता,
प्रान्तीय खण्ड, लो० नि० वि०
अल्मोड़ा

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रानीखेत

Geological Assessment of the alignment corridor proposed for the Construction of 2.5 Km Bilekh-Mall Gaira-Ambedkargaon motor road, Ranikhet District-Almora.

P ya Joshi
30/12/16

1) **Introduction:-**The Provincial Division, Public Works Department, Ranikhet has proposed the construction of 2.5 Km Bilekh-Mall Gaira-Ambedkargaon motor road, Ranikhet, District Almora. On the request made by Mr. 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 26.12.2016. Junior Engineer Mr. Hemant Kumar Pathak, and Miss. Gayatri Kandpal also accompanied the site visit.

2) **Location-** The site in question starts from Km 4.0 of Bilekh link motor road. Total length of the motor road is 2.5 Km which consists of 4 HP Bend at 1/03-1/05, 1/34 -1/36, 2/01 2/03 and at 2/13 - 2/15 chainage respectively. Two small seasonal nala falls across the road.

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

Starting Point
Latitude- 29°34.852'N
Longitude- 79°24.585'E
Altitude- 1927m

End Point
Latitude- 29°35.075'N
Longitude- 79°24.885'E
Altitude- 1752m

3) **Geological Assessment-** Geologically, the alignment corridor proposed for the above said motor road lies in part of Kumaun Lesser Himalayan Belt. The area is bounded by Ramgarh Thrust in the South and by South Almora Thrust in the North. Ramgarh thrust separates the underlying autochthonous sedimentaries of inner and outer lesser Himalaya from the overlying low grade metamorphic unit of Ramgarh group. These autochthonous sedimentaries comprises of Quartzite, which belongs to Jaunsar Group stratigraphically. Ramgarh Group comprises of Phyllite, Schistose Quartzite, and Carbonaceous Phyllite of Nathuwakhan Formation and Porphyroid of Debgura Formation. The rocks i.e Schistose Quartzite of Ramgarh Group occupies this area.

The site in question comprises of Schistose Quartzite (Fig 2). Schistose Quartzite is compact and moderately hard in strength. In-between Quartzite thin bands of Schist are also observed. Comparatively schist bands are more weak and deformed than the Quartzite. The strength of the rock is estimated by manual test. High grade of deformation and weathering is observed on schistose. Largely the rocky strata along this alignment are capped by thin overburden material which varies in thickness from place to

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place. The soil material has micaceous content and the matrix is fine to very fine. The soils are good cohesive, dense and hard in dry conditions but these converts into soft clays under the wet/saturated conditions.

The topography of the area is gentle to moderately steep. Two main nala flows from the area. These nalas are ephemeral and comprises of big boulders of Quartzite bought together from upper reaches during rainy season. Slope angle varies from 35°-60° and Slope direction is N330°. The rocks are slightly- moderately weathered and oxidized up to W_1 –W_2 grade. Hydrological conditions in this area are mainly dry in the fair weather. Two prominent joint sets which were recorded from the rock outcrops exposed at the site are as follows-

Table I

S.No.	Feature	Dip angle	Azimuth
1	J1	3[illegible]	N 350°
2	J2	55°	N 40°
3	Slope	60°	N 330°

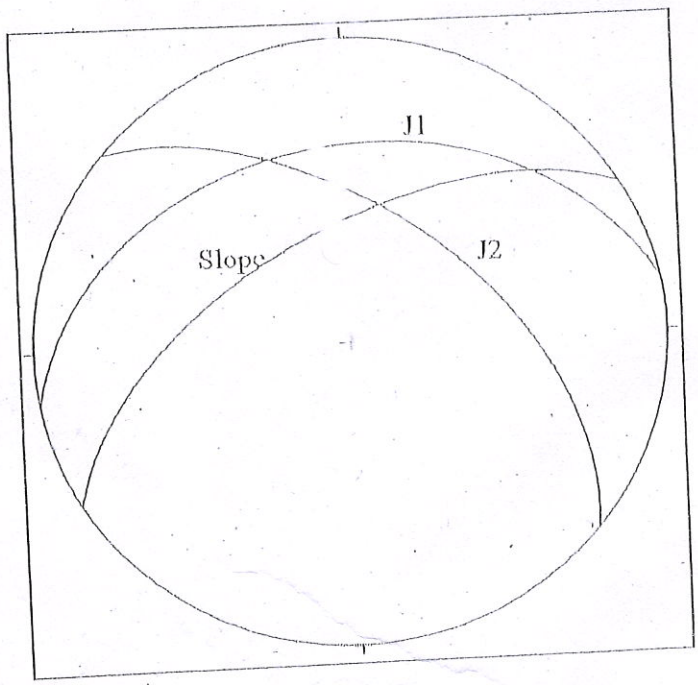

Figure 1 Stereographic projection of Joints and Slope data

From the above stereographic projection Fig 1 it is clear that due to the intersection of joints J1 & J2 a wedge is formed in slope direction also joint J1 fulfill the condition for

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(73)

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 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/causeway must be constructed over the nalas whichever is suitable.
4. Construct extra-large 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. If during the construction any type of failure occurred then proper protection must be given at the same time to stabilize the hill slope.
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.

Letter No: 6566/ 03 स०भू०वै०/16

Date: 30/12/2016

Priya Joshi
30/12/16
Priya Joshi
(Assistant Geologist)
Chief Engineer Office
PWD, Almora.

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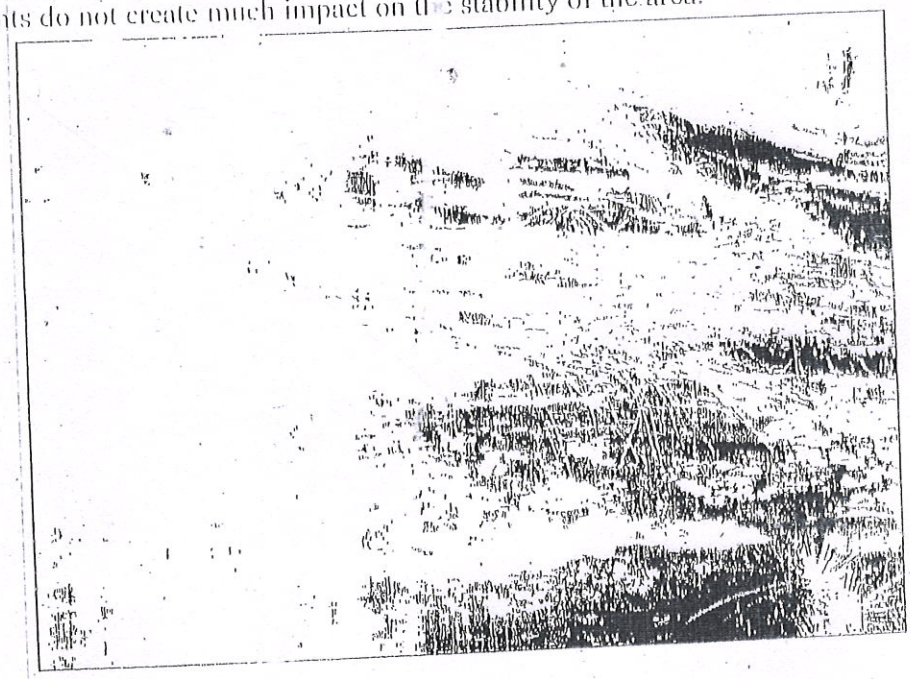
planar failure until unless if there is a releasing surface such as tension crack on the slope. Thus joints do not create much impact on the stability of the area.



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