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कार्यालय मुख्य अभियन्ता
लोक निर्माण विभाग,अल्मोड़ा

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पत्रांक— 1693/04 स0भू0वै0/17

सेवा में,

अधिशासी अभियन्ता
निर्माण खण्ड,लो0नि0वि0,
रानीखेत।

दिनांक 9/06/2017

विषय :— मोटर मार्ग के भूगर्भीय सर्वेक्षण कार्य किये जाने के सम्बन्ध में।
सन्दर्भ:— आपका पत्रांक 1090/54सी0 दिनांक 25.05.2017

महोदय,

उपरोक्त विषयक संदर्भित पत्र के कम में अधोहस्ताक्षरी द्वारा मा0 मुख्यमंत्री घोषणा सं0 1789/2015 के अन्तर्गत जनपद अल्मोड़ा के विधान सभा क्षेत्र रानीखेत के अन्तर्गत सिनार मोटर मार्ग के बहेड़ा–रहड्वार–चौनिया से दलमोड़ी तक मोटर मार्ग का नव निर्माण कार्य पर किये गये भूगर्भीय सर्वेक्षण की आख्या अग्रिम आवश्यक कार्यवाही हेतु प्रेषित की जा रही है।

संलग्न— उक्तानुसार।

(प्रिया जोशी) 9/6/17
सहा0 भू0–वैज्ञानिक
क्षेत्रीय कार्यालय, लो0नि0वि0,
अल्मोड़ा।

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Geological Assessment of the alignment corridor proposed for Baheda-Rehadhar-Chauniya-Dalmodi 6.0 Km District Almora.

Priya Joshi
09/06/17

1- **Introduction:-**The Construction Division, Public Works Department, Ranikhet has proposed the construction for Baheda-Rehadhar-Chauniya-Dalmodi 6.0 Km District Almora. On the request made by Mr. M. C. Joshi Executive Engineer Construction Division Ranikhet, I carried out the geological assessment of the proposed site of the above said motor road on dated 24.05.2017. Junior Engineer Mr. Khajan Rawat accompanied during the site visit.

2- **Location-** The site in question starts from Km 13.0 of Bhikiyasain-Barikot-Bilti-Binayak motor road. Total length of the road is 6.0 Km. Ten HP bend is proposed along the alignment at 0.250-0.300, 0.500-0.550, 1.200-1.250, 1.350-1.400, 1.500-1.550, 4.500-4.550, 4.950-5.00, 5.200-5.250, 5.450-5.550 and 5.850-5.900 chainage. Dalmodi, Baheda, Rehadhar, Chauniya, and Khobda villages fall along the alignment. The co-ordinates of starting taken from hand held GPS are as follows-

Starting Point
Latitude- 29°44'16.62"N
Longitude- 79°17'33.20"E

3- **Geological Assessment:-** The alignment corridor proposed for the above said motor road lies in part of Kumaun Himalayas. 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-Granitic Gneiss-Granodiorite plutonic bodies.

The site in question comprises of Mica schist and Micaceous Quartzite (Fig 3). In between Schist thin bands of Quartzite are observed. Schist is weak in strength and deformed comparatively Micaceous Quartzite is compact and hard. The strength of the rock is estimated by manual test. High grade of deformation and weathering is observed on schist. Schist are highly sheared and crushed at some portions. Largely the rocky strata along this alignment are capped by thin overburden material which varies in thickness from place to place and overall less than 1m. Joints are closely spaced and the opening between the joint planes is close to open up to 1-2mm. In-between the opening along the joint plane soil-clay is filled. The soil material has micaceous content and the matrix is

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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. Slope direction varies from place to place. Slope angle varies from 25°-50°.

The topography of the area is gentle to moderately steep. Starting 300m portion of the proposed alignment passes through steep hill slope, remaining portion passes through moderately steep forest to gentle cultivated terraces. Gradient of the road is gentle. 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. Slight subsidence is observed towards the end of the first km tilting of trees are also observed. Foliation in the schist is trending in N100° direction with gentle gradient. Four prominent joint sets which were recorded from the quartzite outcrops exposed at the site are as follows-

Table-1

S.No.	Feature	Dip angle	Azimuth
1	Joint J1	21°	N 20°
2	Joint J2	35°	N 250°
3	Joint J3	40°	N180°
4	Slope	35°	N 270°

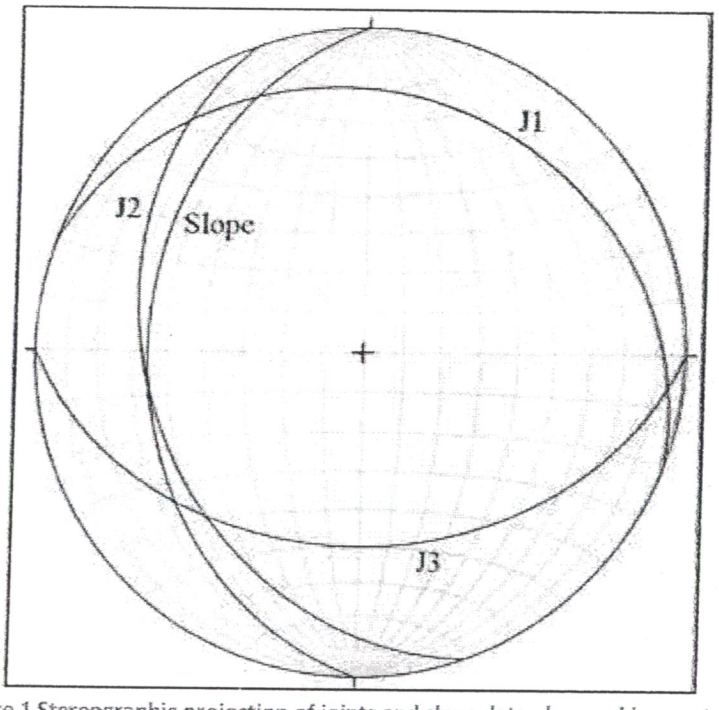

Figure 1 Stereographic projection of joints and slope data observed in quartzite

Figure 2 General topography of the area

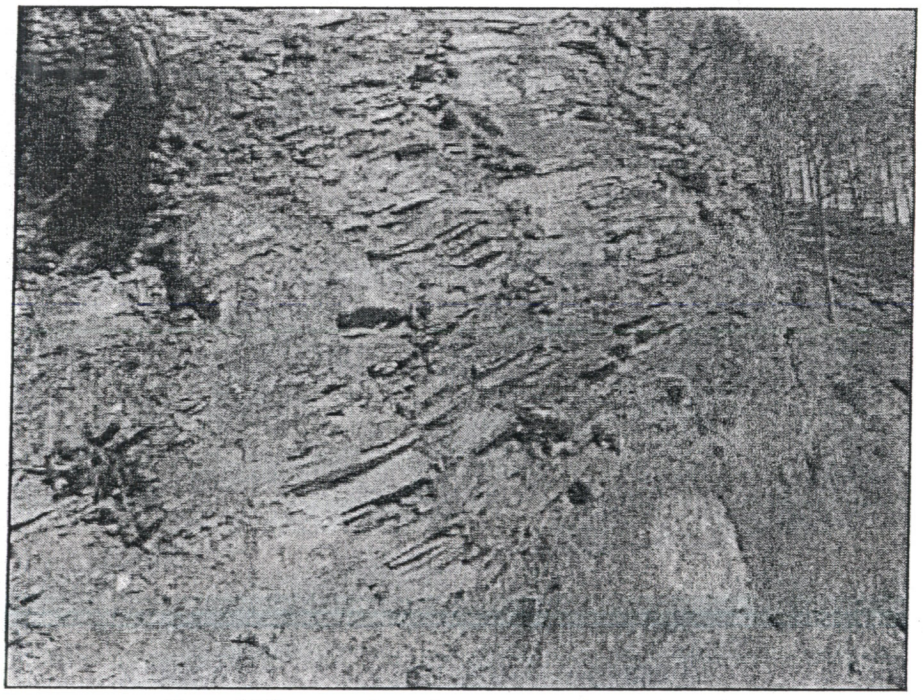

Figure 3 Micaceous Quartzite outcrop at the starting point

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** –

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5-Recommendations –

1- Disposal of Muck/Sliding material of the above existing road on the lower slopes is to be strictly avoided. It is advised to dispose the muck on the identified site for muck disposal.

2- 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.

3- The entire hill and valley side slope along the whole length of the road must be protected by suitably designed retaining and 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.

4- Properly designed culvert/scupper/causeway must be constructed at the proper interval wherever is necessary.

5- Construct large 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. Water from the hill slope and surrounding area must be channelized by providing proper drainage system.

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- Proper protection must be given if anywhere wedge failure occurs.

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.

Letter No: 1693 / 04 स०भू०वै०/17 **Date: 09/06/2017**

Priya Joshi 9/6/17

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