

Additional Attachment -2.28

परियोजना का नाम :- जनपद नैनीताल के अन्तर्गत विकास खण्ड रामगढ मे नथुवाखान सुयालबाडी मोटर मार्ग छीमी से मटेला होते हुए तोला भुमियाँ देव मन्दिर तक मोटर मार्ग का नव निर्माण

प्रारूप-33

भू-वैज्ञानिक की आख्या

(प्रस्तावित स्थल की भू-वैज्ञानिक द्वारा निर्गत अद्यतन निरीक्षण आख्या प्राप्त कर भू-वैज्ञानिक हस्ताक्षरयुक्त प्रतियों संलग्न की गयी है।)


अधिसासी अभियन्ता
निर्माण खण्ड, लो0नि0वो
नैनीताल।



कार्यालय मुख्य अभियन्ता
लोक निर्माण विभाग, अल्मोड़ा



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पत्रांक-1021/08 स0भू0वै0/17

सेवा में,

दिनांक 26/04/2017.

अधिकासी अभियन्ता

निर्माण खण्ड, लो0नि0वि0,

नैनीताल।

विषय :-

सन्दर्भ:-

मोटर मार्ग की भूभर्गीय सर्वेक्षण कार्य किये जाने के सम्बन्ध में।
आपका पत्रांक 792/सी 1 सी, दिनांक 25.04.2017

महोदय,

उपरोक्त विषयक संदर्भित पत्र के क्रम में अधोहस्ताक्षरी द्वारा वित्तीय वर्ष 2016-17 में जनपद नैनीताल के विधानसभा क्षेत्र नैनीताल के विकास खण्ड रामगढ़ के अन्तर्गत नथुवाखान-सुयालबाड़ी मोटर मार्ग छीमी से सटेला होते हुये तोला भूमियादेव मंदिर तक मोटर मार्ग का नव निर्माण कार्य पर किये गये भूभर्गीय सर्वेक्षण की आख्या अग्रिम आवश्यक कार्यवाही हेतु प्रेषित की जा रही है।

सलग्न:- उक्तानुसार।

हामा प्रति प्रमाणित

Priya Joshi
(प्रिया जोशी)

सहा0 भू0-वैज्ञानिक
क्षेत्रीय कार्यालय, लो0नि0वि0,
अल्मोड़ा।

15/04/2017
मुख्य अभियन्ता
निर्माण खण्ड, लो0नि0विभाग
नैनीताल

5

Geological Assessment for construction of 4.0 Km long alignment corridor proposed from Km 67 of Nathuakhan-Suvalbari motor road to Chimi-Matela village upto Tola Bhumiya Mandir, District- Nainital.

Priva Joshi
26/04/2017

- 1- **Introduction-** Construction Division, Public Works Department, Nainital entrusted in construction of 4.0 Km long alignment corridor proposed from Km 67 of Nathuakhan-Suvalbari motor road to Chimi-Matela village upto Tola Bhumiya Mandir District- Nainital. On the request of Shri D. S. Kutiya, Executive Engineer, Construction Division, Nainital I carried out geological assessment of the above said motor road on dated 22/04/2017. Junior engineer Shri. Puran Singh Rawat accompanied during the site visit.
- 2- **Location-** The 4.0 km long Chimi Matela motor road starts from Km 67 of Mauna Nathuakhan-Suvalbari motor road. The road consists of 6 HP bends at 0/13, 0/28, 1/2, 1/15, 1/28 and at 3/18 chainage respectively.

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

Starting Point

Latitude- 29°30'27.12"N

Longitude- 79°33'45.27"E

- 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-Granitic Gneiss-Granodiorite plutonic bodies.

Topography of the area overall is gentle to moderately steep. Area is covered with dense 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 rest of the km's which falls on the terraces from where the alignment has been proposed (Fig. 3). Majority of area passes through cultivated terraces. Slope angle varies from place to place. Slope angle ranges from 25°-75° and slope direction varies from N130°-360°. Hydrological conditions are mainly dry, except in rainy season. One prominent nala is observed at the site which constitute of cobble and pebbles. The carrying capacity of nala

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is low. 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. 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. Some query for rock excavation is also observed in the area.

Rock type in the area is quartzite (Fig. 4), which is hard and compact in strength. At some places the rock is highly sheared and weathered. High grade of deformation is there and near to the starting point schist outcrop were also observed. Three sets of joints has been observed in quartzite at the site which are as follows-

Table I

S. No.	Feature	Azimuth	Direction
1	B/J1	20°	N30°
2	J2	30°	N340°
3	J3	75°	N160°
4	J4	50°	N50°
5	Slope	55°	N 100°

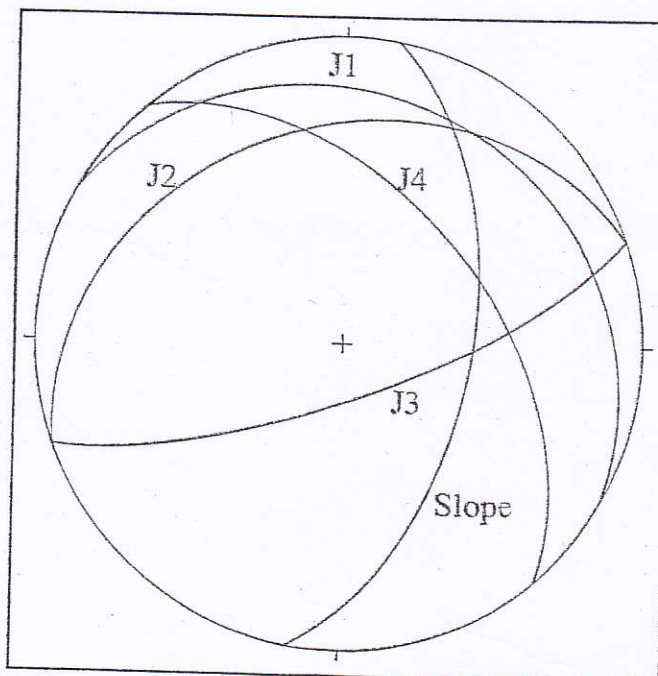


Figure 1 Stereographic projection of joints and slope data observed

From the above stereographic projection (Fig 1) it is clear that a small wedge is forming by the intersection of joints Joint J3 & J4 which can be fail until unless if there is a

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releasing surface such as tension crack on the slope as it is parallel to the slope face. Thus joints do impact on the stability of the area. At the starting point a debris slide is observed other than this site looks stable and quite competent from the stability point of view.



Figure 2 Debris slide observed at the starting point of the road



Figure 3 General topography of the area

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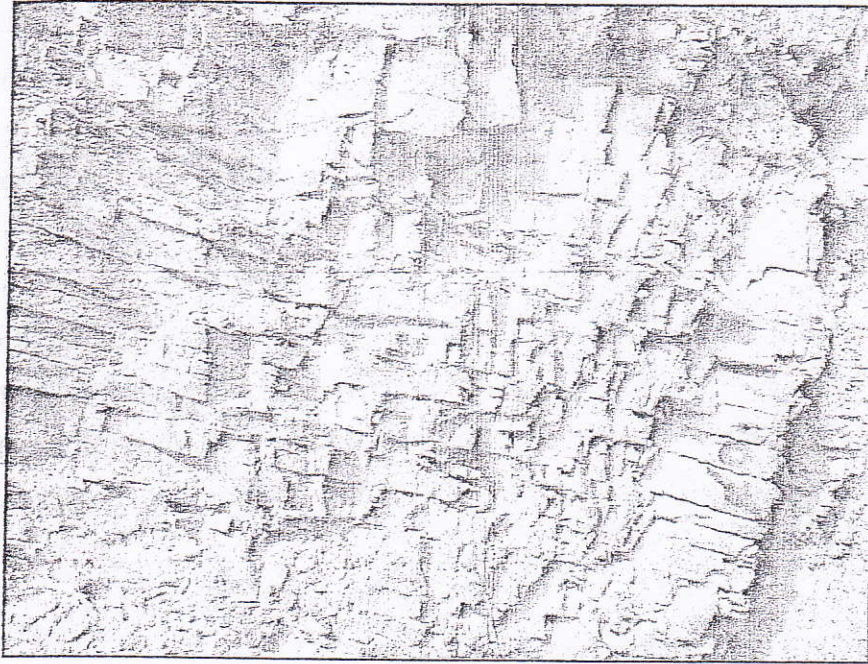


Figure 4 Weathered micaceous Quartzite outcrop along the starting point

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/causeway must be constructed over the nala whichever is suitable.
- 4- 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

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lower hill slopes. Water from the hill slope and surrounding area must be channelized by providing proper drainage system.

- 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- Near to the starting point of the road where debris slide is observed proper protection must be given. Retaining/ wire crate wall must be constructed to withhold the slide.
- 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: 1021 / 08 स०भू०वै०/17

Date: 26/04/2017

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प्रमुख अभियन्ता
निर्माण खण्ड, लोअनि० विभाग
मैनीताल

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26/4/17

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