Additional Attachment -2.28

परियोजना का नाम :– जनपद नैनीताल के अन्तर्गत विकास खण्ड रामगढ़ मे लक्ष्मीखान – नथुवाखान – प्यूडा–क्वारव मोटर मार्ग के कि0मी0 11 मे नावली नामक स्थान से लोश्ज्ञानी तक सम्पर्क मोटर मार्ग के निर्माण हेतु।

प्रारुप–33

भू–वैज्ञानिक की आख्या

(प्रस्तावित स्थल की भू–वैज्ञानिक द्वारा निर्गत अद्यतन निरीक्षण आख्या प्राप्त कर भू–वैज्ञानिक हस्ताक्षरयुक्त प्रतियॉ प्रमाणित कर संलग्न की गयी है।)

सहायक अभियन्ता
निर्माण खण्ड, लो0नि0 विभाग
नैनीताल,

अधिशासी अभियन्ता
निर्माण खण्ड, लो0नि0वि0
नैनीताल

(8)

प्राप्ति सं० 4193
दिनांक 08-12-16

कार्यालय मुख्य अभियंता (अ0क्षे0)
लोक निर्माण विभाग, अल्मोड़ा
UTTARAKHAND
Phone : 05962-230294, Fax 05962-230011
email : cepwdkumaon@rediffmail.com

पत्रांक–6237 / 08स0मू0वै0–2016 दिनांक– 2/12/2016

सेवा में,

अधिशासी अभियन्ता
निर्माण खण्ड लो0नि0वि0
नैनीताल।

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

संदर्भ :– आपके कार्यालय पत्रांक–2101 / 1सी0 दिनांक–30 / 08 / 2016

महोदय,

उपरोक्त विषयक संदर्भित पत्र के क्रम में अधोहस्ताक्षरी द्वारा जनपद नैनीताल में राज्य योजना के अन्तर्गत नावली से लोश्यानी मोटर मार्ग (प्रथम चरण) के निर्माण कार्य के भूगर्भीय सर्वेक्षण की आख्या अग्रिम आवश्यक कार्यवाही हेतु संलग्न कर प्रेषित की जा रही है।

संलग्न :– उक्तानुसार।

Priyalbi 2/12/16
(प्रिया जोशी)
सहायक भू–वैज्ञानिक
कार्या0 मुख्य अभियन्ता
लो0नि0वि0 अल्मोड़ा

R.No 4193/1C दि0 13-12-16

सहायक अभियन्ता
निर्माण खण्ड, लो०नि० विभाग
नैनीताल.

Geological Assessment for the construction of 5 Km long motor road from Navli-Loshgyani District- Nainital.

Priya Joshi
02/12/2016

1- **Introduction**- Construction Division, Public Works Department, Nainital entrusted in construction of 5.0 Km long motor road from Navli-Loshgyani District- Nainital. On the request of Shri D. S. Kutiyal, Executive Engineer, Construction Division, Nainital I carried out geological assessment of the above said motor road on dated 05/11/2016. Junior Engineer Shri. Rohit Chandra Dugtal accompanied during the site visit.

2- **Location**- The 5.0 km long Navli-Loshgyani motor road starts from Km 11 of Talla Ramgarh -Nathuwakhan motor road. The road consists of 8 HP bends at 0.125-0.150, 0.350-0.400, 0.875-0.925, 1.350-1.400, 1.500-1.550, 1.600-1.650, 2.000-2.750, and at 2.750-2.850 chainage respectively.

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

Starting Point
Latitude- N29°27'31.8"
Longitude- E79°34'37.6"

3- **Geological assessment:-** Geologically, the alignment corridor proposed for the above said motor road lies in part of Kumaun Lesser Himalayan Belt bounded between Ramgarh Thrust in the south and by South Almora Thrust (SAT)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. Ramgarh Group comprises of Phyllite, Schistose Quartzite, and Carbonaceous Phyllite of Nathuwakhan Formation and Porphyroid of Debguru Formation. The rocks i.e Schistose Quartzite of Ramgarh Group occupies this area. The area lies on close vicinity of Ramgarh Thrust.

Topography of the area overall is gentle to moderately steep. Area is covered with forest (Fig. 2). Some manmade terraces were also observed which are mostly cultivated. Starting portion of the area is comparatively steep and is mostly covered with cultivated land and forest. The rest of the portion falls on cultivated terraces from where the alignment has been proposed. Majority of area passes through forest land. Slope angle varies from place to place. Slope angle ranges from 25°-75°. Hydrological conditions are mainly dry, except in rainy season. 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 silt content and the matrix is fine to very fine.

Photo Copy Attached.

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The soils are good cohesive, dense and hard in dry conditions but these converts into soft clays under the wet/saturated conditions. Weathering grade ranges from W_1-W_2.

Rock type in the area is quartzite (Fig. 3), which is hard and compact in strength. At some places the rock is highly sheared and weathered. High grade of deformation and intense folding is observed at some portion along the alignment. Three sets of joints which were observed in the site are as follows-

Table I

S. No.	Feature	Azimuth	Direction
1	J1	25°	N50°
2	J2	70°	N140°
3	J3	70°	N250°
4	Slope	65°	N200°

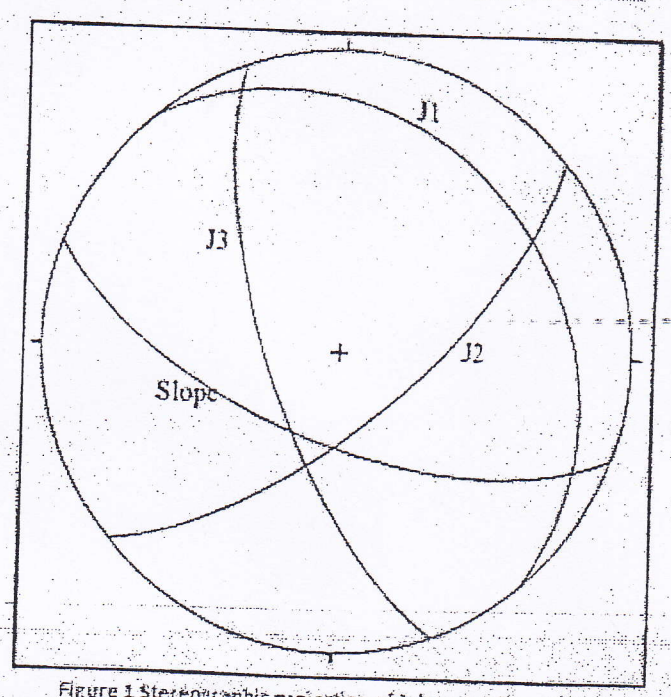

Figure 1 Stereographic projection of Joints and Slope data

From the above stereographic projection (Fig 1) it is clear that Joint J2 and J3 forming a small wedge which is susceptible for wedge failure until unless if there is a releasing surface such as tension crack on the slope as the failure direction of wedge is parallel to the slope direction. Other than this the site looks stable and quite competent from the stability point of view.

Photo Copy Attached

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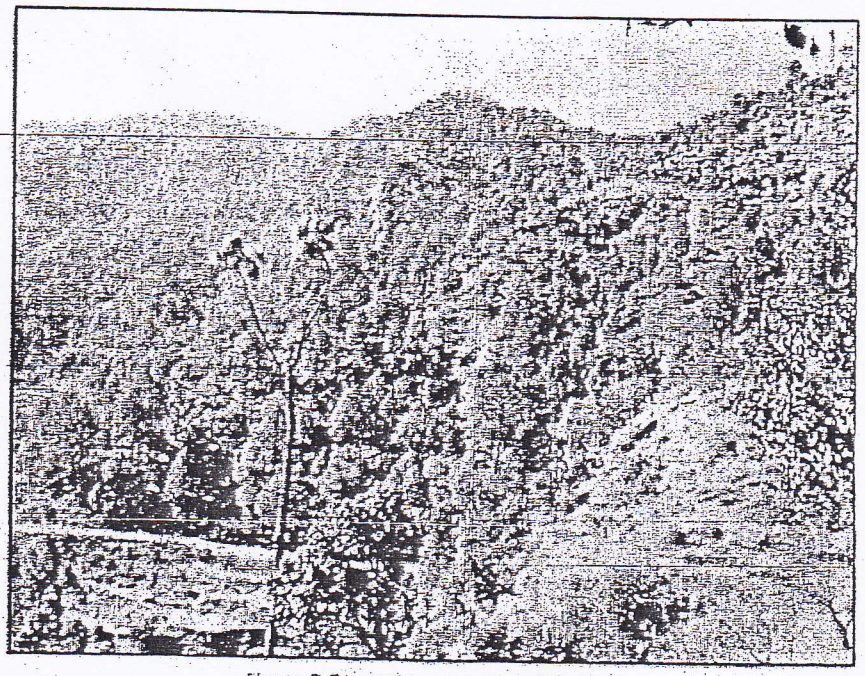

Figure 2 General topography of the area

Figure 3 Quartzite rock outcrop observed at site

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.

Photo copy Attached

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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 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.

5- 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.

6- 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.

7- The portion of the road which passes through the cultivated field where water seepage from the ground is high; RCC should be done.

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: 6237/ 08 स०भू०वै०/16 Date: 02/12/2016

Photo Copy Attested,

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Priya Joshi 2/12/2016
Priya Joshi
(Assistant Geologist)
Chief Engineer Office
PWD, Almora.