कार्यालय मुख्य अभियन्ता, लो0नि0वि0, अल्मोड़ा
Office of the Chief Engineer, P.W.D., Almora
Fax No.05962-230011
E-mail - cepwdkumaon@rediffmail.com

पत्रांक– 999 /01स0भू0वै0/21 दिनांक– 23/02/2021

सेवा में,

अधिशासी अभियन्ता,
प्रान्तीय खण्ड लो0नि0वि0
अल्मोड़ा।

विषयः– मोटर मार्गों के भूगर्भीय निरीक्षण के सम्बन्ध में।
सन्दर्भः– आपका पत्रांक सं0 2306/1सी0 दिनांक 04.12.2020।

महोदय,

उपरोक्त विषय के क्रम में निम्नलिखित मोटर मार्गों का भूगर्भीय सर्वेक्षण कर भूगर्भीय आख्या संलग्न कर प्रेषित की जा रही है।

1. माननीय मुख्यमंत्री घोषणा सं0 156/2020 के अन्तर्गत जनपद अल्मोड़ा, विधानसभा क्षेत्र सोमेश्वर के अन्तर्गत मजखाली मण्डल के मटीला से गैरोली तक मोटर मार्ग के निर्माण कार्य लम्बाई 1.500 किमी0।
2. माननीय मुख्यमंत्री घोषणा सं0 160/2020 के अन्तर्गत जनपद अल्मोड़ा, विधानसभा क्षेत्र सोमेश्वर के अन्तर्गत मजखाली मण्डल के काकड़ीघाट मोटर मार्ग से बेतचार जनखाड़ी तक मोटर मार्ग के निर्माण कार्य लम्बाई 2.00 किमी0।

संलग्नः– उपरोक्तानुसार।

(प्रिया शर्मा)
सहायक अभियन्ता (भूविज्ञान)
कार्यालय मुख्य अभियन्ता
लो0नि0वि0 अल्मोड़ा

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Geological Assessment of the alignment corridor of Matela-Gairoli motor road, length 1.5 km, District-Almora.

Priya Joshi
23.02.2021

Introduction: -The Provincial Division, Public Works Department, Almora has proposed the construction of 1.5 km long alignment namely Matela-Gairoli motor road, District Almora. On the request made by Mr. Vijay Kumar, Executive Engineer Provincial Division Almora (In reference to letter no.2306/1C dated 04/12/2020), I carried out site visit on dated 26.12.2020. Mr. Jagdish Prashad, Junior Engineer accompanied during the site visit.

Location- The site in question starts from Km14 Hectometer 2-4 of PMGSY Suniyakot-Matela motor road. Total length of the motor road is 1.5 Km, no HP Bend is proposed along the alignment. Gradient of road varies as- 0/0-0/4 1:20F, 0/4-0/8 1:18F, 0/9-0/21 1:20F, 0/21-0/30 1:24R, 0/30-1/2 1:20F, 1/2-1/12 1:24F, 1/12-1/20 Level. The co-ordinates of start and end points taken from hand held GPS are as follows-

Start Point	**End Point**
Latitude- 29°35'45.2508"N	Latitude- 29°36'26.7084"N
Longitude- 79°30'52.5636"E	Longitude- 79°31'4.8468"E

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-Granodiorite plutonic bodies.

Topography of the area overall is gentle to moderately steep. Area is mostly barren. Rock type observed on the site is Micaceous Quartzite, and Schist which belongs to Saryu Formation and Gneiss which is of Crystalline Formation. The quartzite is moderately hard and compact in strength while the schist is weak in strength. The strength of the rock is estimated by manual test. Some manmade terraces were also observed near to the villages which are mostly cultivated. Three prominent sets of joints were observed. Joints are closely spaced and the opening between the joint planes is close to open up to 1mm. In-between the opening clayey soil is filled. Largely the rocky strata along this alignment are capped by thin overburden material which varies in thickness from place to place. Gneiss outcrop were also observed in starting portion having phyllitic content. The foliation in the schist dips in 30° direction with gentle amount. The

The topography of the area is gentle to moderately steep. Three main nala flows from the area. All the three nala are perennial and comprises of big boulders of Charnockite and Augen Gneiss (Fig 4), bought together from upper reaches during rainy season. Slope angle varies from 35°-60° and Slope direction is N110°. 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 1

S.No.	Feature	Dip angle	Azimuth
1	J1	70°	N 140°
2	J2	25°	N 10°
3	J3	40°	N 170°
4	Slope	30°	N 35°

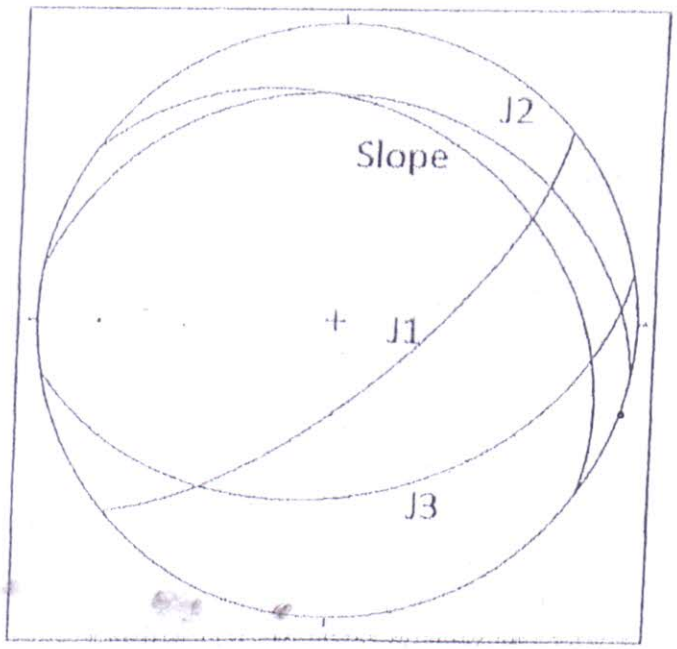

Figure 1 Stereographic projection of Joints and Slope data

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. The plunge direction of the wedge which is forming due to the interaction of the joints J1 and J2 is different from slope direction from which it looks stable and quite competent from the stability point of view.

Figure 2 Rock outcrop observed near the starting point of the road.

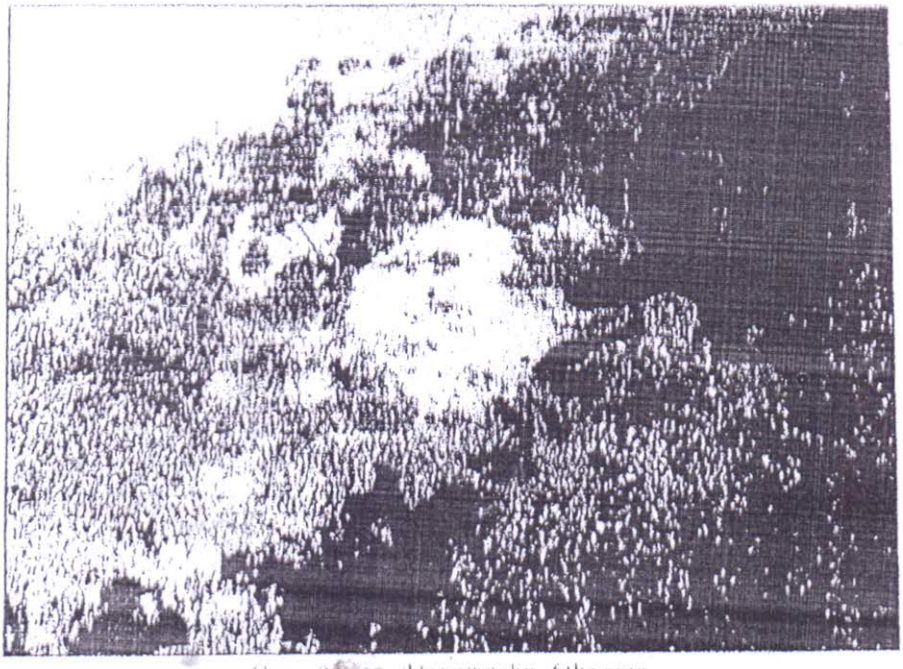

Figure 3 General topography of the area

Figure 3 Google Map photo along the alignment

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

Recommendations :-

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.

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.

Properly designed culvert/bridges must be constructed over the nalas whichever is suitable.

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

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sal of muck and excavated waste on the lower slopes of this road is to be strictly ed. It is advised to dispose the muck on the identified site for muck disposal.

portion of the road which passes through the cultivated field where water seepage n the ground is high: RCC should be done.

tection must be given to prevent failure anywhere along the alignment during and st construction.

ll the construction activities must be carried out as per the prescribed norms and the andard codes of the practice laid by BIS and MORTH.

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Date: 23/02/2021

28/02/2021

Priya Joshi
(Assistant Geologist)
Chief Engineer Office
PWD, Almora.