

परियोजना का नाम : जनपद रुद्रप्रयाग के विकासखण्ड जखोली में राज्य योजना (मु0मं0घो0) के अन्तर्गत सुमाडी विराणगांव जाखाल मोटर मार्ग के निर्माण हेतु लोक निर्माण विभाग को वनभूमि हस्तान्तरण प्रस्ताव, लम्बाई 10 किमी0 (वास्तविक लम्बाई 8.075 किमी0)

### भू-वैज्ञानिक की आख्या

----- संलग्न है। -----

कार्यालय प्रमुख अभियन्ता एवं विभागाध्यक्ष  
उत्तराखण्ड लोक निर्माण विभाग,  
देहरादून

भू-गर्भीय निरीक्षण आख्या ए0जी0- 125 / सड़क / पुल / सम्प्रेषण / उत्तराखण्ड / गढ़वाल-2018

**Geological assessment of the alignment corridor proposed for the  
construction of 8.075 km (10.00 km sanctioned length) long  
Sumadi-Virangaon-Jakhal motor road, in Jakholi block, distt.  
Rudraprayag.**

09 फरवरी 2018

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- प्रांतीय खण्ड लोक निर्माण विभाग  
रुद्रप्रयाग



**Geological assessment of the alignment corridor proposed for the construction of 8.075 km (10.00 km sanctioned length) long Sumadi-Virangaon-Jakhal motor road, in Jakholi block, distt.**

**Rudraprayag.**

**Shiv Kumar Rai**

**09.02.2018**

**1- Introduction:-** The Provincial Division, PWD, Rudraprayag vide G.O. No 5157/III (2)/10-05 (सुनवसो)/10 dated 09.11.2010 has been instructed for the construction of 10.00 km Sumadi-Virangaon-Jakhal motor road, in Augustyamuni block, distt. Rudraprayag. After carrying out the work of survey, two alignment named Alignment 1 and Alignment 2 has been proposed. The Alignment 1 originates from km 95 hm 24 of Tehri-Ghansali-Tilwara motor road in the upslope direction comprising 6 HP bends whole along its length of 8.075 km and each HP bends are away from each other where it covers less forest land and agreed by local villagers. In Alignment 2, it originates from km 1 of Sema bend to upper Sumadi motor road which passes from the back of the village Syalsu comprising 7 HP bend whole along its length of 9.20 km covering larger forest land and also not agreed by the local villagers of Syalsu village. Therefore Alignment 1 has been recommended for the geological assessment. On the request made by Er. Indrajeet Bose, Executive Engineer, Provincial Division, PWD, Rudraprayag I carried out the geological assessment of the above mentioned alignment 1 on 11.01.2018 in the presence of Er. V.S Khatri, Jr. Engineer, P.D, PWD, Rudraprayag.

**2- Location:-** The proposed alignment corridor of the above said motor road originates from km 95 h.m 2-4 of Tehri Ghansali-Tilwara motor road in the upslope direction comprising 6 HP bend (at cross section 0/28, 1/7, 1/34, 2/7, 2/33 and 7/32) whole along its length of 8.075 km on the cross slope joining village Sama-Ladiyasu Sumandi-Virangaon-Jakhal, in Jakholi block, distt. Rudraprayag.

**3-Geological Assessment:-**The area of the proposed alignment and its environs lies in the lesser Himalayan zone bounded by major tectonic lineament named Main Central Thrust (MCT) and Srinagar Thrust (ST) from North and South direction respectively. The Quartzites and dolomite of Jaunsar Group are exposed all along and around the area of the alignment. These rocks are folded, faulted and dissected by multiple linear discontinuities. Two of these joints (linear discontinuity) intersect each other and form structural wedges dipping outward to the slope face at lower angle than the slope face. Heavy and uncontrolled blasting may lead these structural wedge to fail the slope. The insitu quartzites exposed along the alignment corridor are hard and massive. Their weathering grade has been assessed almost  $W_1$ - $W_2$  and occasionally  $W_3$  (slightly weathered and oxidized). All the joint planes are tight, widely spaced and the north easterly dipping joint is sealed by secondary quartz inclusion. The slopes across which alignment passes are inclined at  $30^\circ$  to  $70^\circ$  in N  $030^\circ$  to N  $100^\circ$  direction and these are covered with overburden material of varying thickness. This overburden material is comprised of composite soil of angular boulders embedded in clay- sand- silt matrix. This composite soil exposed along the alignment corridor is naturally well compacted and have attained high density. Along the

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alignment intermittently small gadera is cross cutting it which should be bypassed by the small cross culvert.

The slope forming material especially the composite soil do not contain soft soil clay minerals in abundance and which may cause the slope to move down in varied climatic conditions.

The "Undrained Compressive Strength" of the composite soil has been assessed at the site around 320-400 K Pa, this value corresponds to "very stiff soil".

The Uniaxial Compressive Strength (UCS) of the quartzites has been estimated ranging between 180-220 M Pa which corresponds to very strong rock category. By and large the slopes across which the alignment passes are stable and free from landslides/ ground subsidence.

On the basis of above geological inspection, study carried at the site following recommendations are being made for the construction of the proposed motor road failing to these recommendations this report will be treated automatically as cancelled.

#### 4- Recommendations:-

- 1- Form the road by full excavation method across the cross slope.
- 2- Do not throw the excavated waste on the lower slope otherwise it will damage the houses and the cultivated land of local villagers located lower slope and lead hill slope instability.
- 3- In order to maintain the overall stability of the hill slopes and the road construct suitably designed retaining walls/ breast walls along the road where required with basement of competent rock or dynamically compacted soil.
- 4- Construct large hill side lined/concrete drain all along the road and make adequate cross drainage arrangements.
- 5- Make adequate arrangements to dispose the waste water on the safe/ stable ground.
- 6- All the construction activity must be carried out as per the Indian standards codes of practice and norms prescribed by the BIS.

**5- Conclusion:-** On the basis of the geological / geotechnical studies carried at the site and with the above recommendations, the proposed alignment of 8.075 km (10.00 km sanctioned) long on the cross slope comprising 6 HP bend was found geologically suitable for the Sumadi-Virangaon-Jakhal motor road, in Jakholi block, in district- Rudraprayag.

*Photo Copy of the slope*

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