

To,
The Executive Engineer
(Provincial Division)
PWD, Rudraprayag

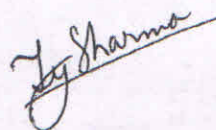
Subject: Submission of Geological Site assessment report of 7.25 Km long Tilwara-Tolab-Maikoti-Malkoti-Dangi-Gunau Light Vehicle Road (LVR) Alignment Site for its Widening/Improvement.

Dear Sir,

In response to your request of making a site visit for the assessment of 7.25 Km long Tilwara-Tolab-Maikoti-Malkoti-Dangi-Gunau Light Vehicle Road (LVR) Alignment Site for its Widening/Improvement between CH 0.0 to 7.25 Km, in Rudraprayag Division, district Chamoli (Garhwal), a site visit was made on 23/06/2017 of which a report has been prepared. Therefore it is requested to please find report of the above mentioned site attached with this letter.

Date: 01/07/2017

Yours Faithfully



Tushar Sharma
(Assistant Geologist)
Office of the Chief Engineer
PWD (Pauri Zone)

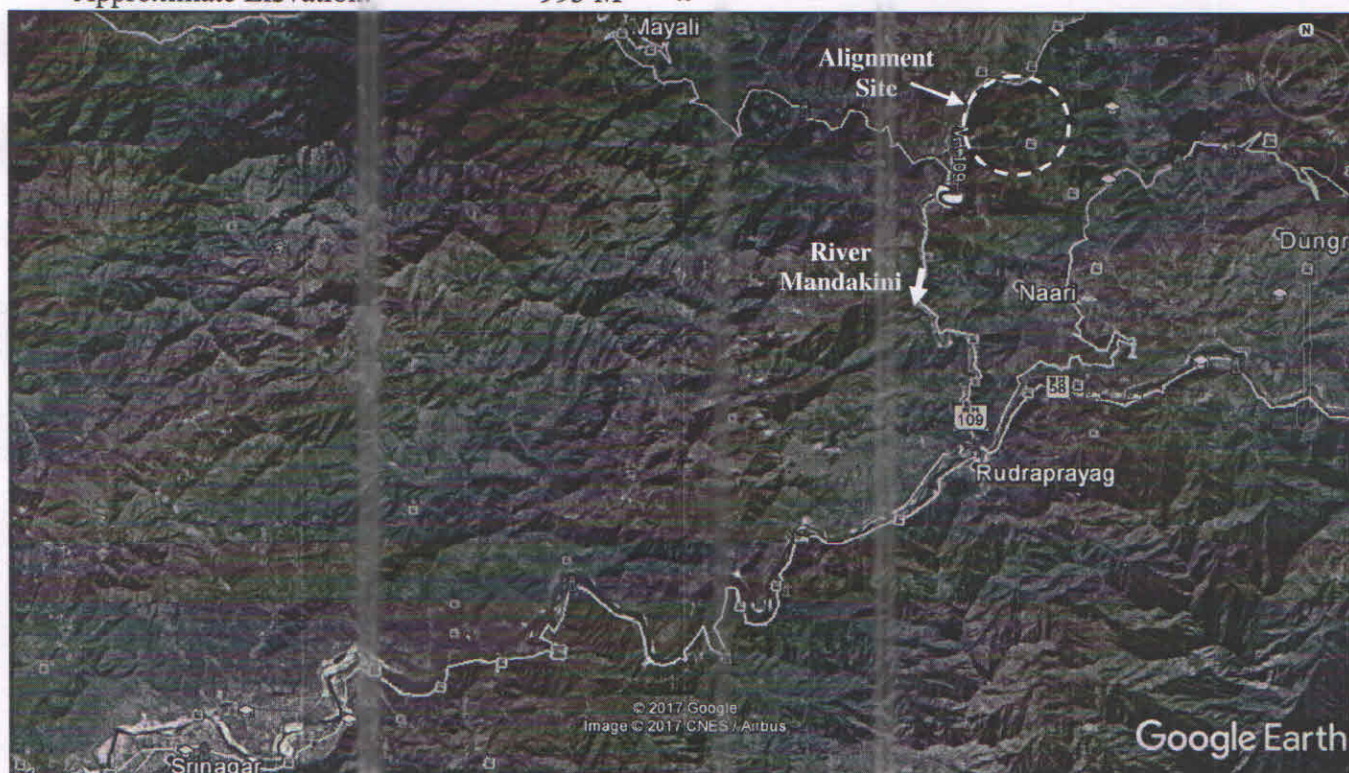
**Geological Assessment of 7.25 Km long Tilwara-Tolab-Maikoti-Malkoti-Dangi-Gunau
Light Vehicle Road (LVR) Alignment Site for its Widening/Improvement
Between CH 0.0 and 7.25 Km, District Rudraprayag**

Tushar Sharma

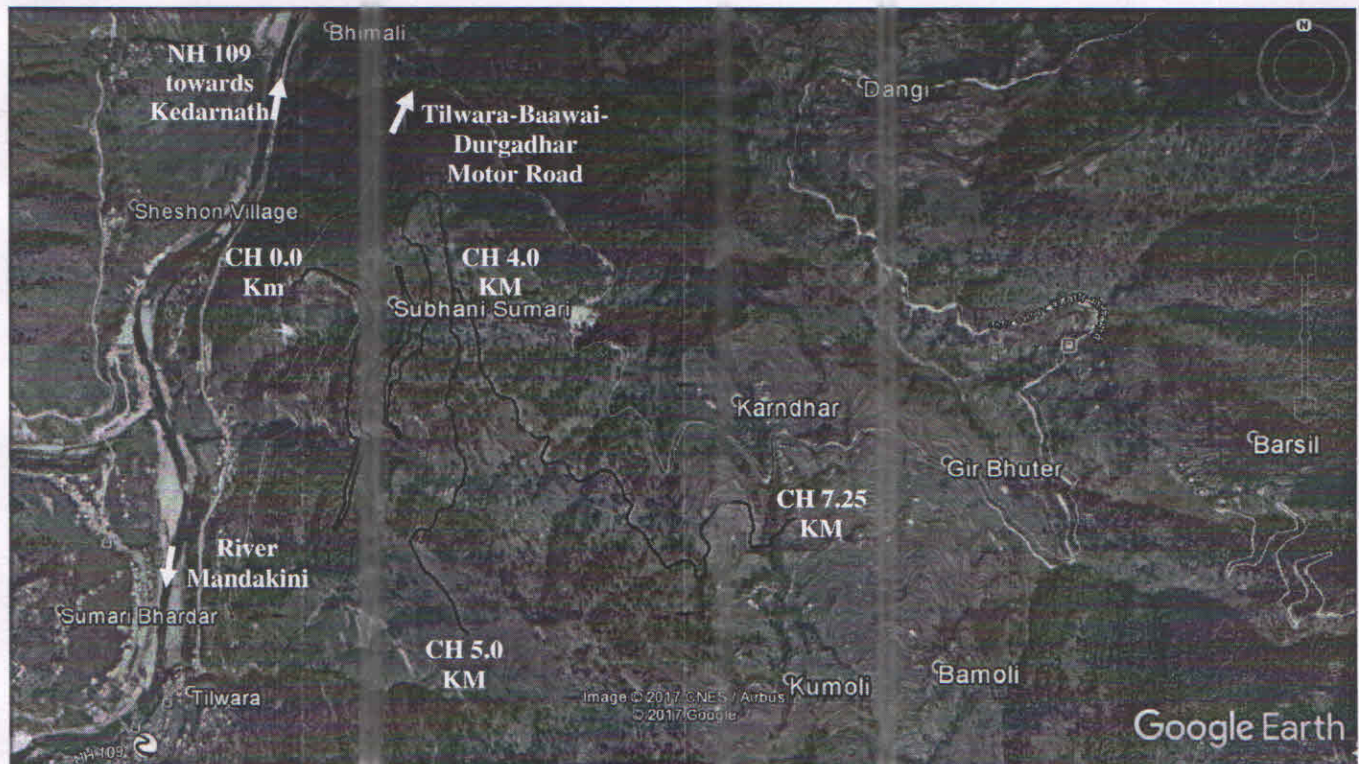
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- 1- **Introduction:** The Provincial Division, Rudraprayag has been entrusted for the widening/improvement of 7.25 Km long Tilwara-Tolab-Maikoti-Malkoti-Dangi-Gunau Light Vehicle Road (LVR) to Motor road, District Rudraprayag. In order to assess the alignment site for construction, Er. M.C. Gupta (Executive Engineer) Provincial Division, Rudraprayag asked for a geologist to make a site visit. Consequent to his request a site visit was made on 23/06/2017; Er. Arun Rana (Junior Engineer) PD, Rudraprayag was present during the site visit.
- 2- **Topographical Information/Location:** The above said stretch of 7.25 Km long Tilwara-Tolab-Maikoti-Malkoti-Dangi-Gunau Light Vehicle Road diverts from Ch 4.0 Km of Tilwara-Baawai-Durgadhar Motor Road. The LVR itself diverts into two parts after CH 4.0 KM of which the right branch goes 1.0 Km further to join Village Tolab while the left branch goes 2.25 Km further to join village Kumoli. The co-ordinates along with elevation, masl of the site at CH 0.0 Km are as follows-

Latitude:	30° 21' 23.25"
Longitude:	78° 58' 49.50"
Approximate Elevation:	995 M



Broader Satellite View of the Site



Closer Satellite View of the Road Alignment Site

- 3- **Geological Assessment:** Geologically, the area falls under Lesser Himalayan zone. The rocks exposed around the site belong to the Ramgarh group/Barkot unit. The area lies in the proximity of a prominent regional tectonic structure Ramgarh Thrust. The rocks exposed in and around the site are quartzite, Mica schist, Chlorite Schist and schistose quartzite. However, the road alignment runs through cultivation land covered with overburden and slope wash material with vegetation with one or two patches of bed rock. The approximate strength of exposed rock mass is around ~80-150 MPa and has undergone W_0 to W_3 weathering grade. The hill slope of the road alignment is moderately steep (~30-40°) which roughly declines towards West to South-West direction except the second branch (joining Kumoli) of the road which declines towards East to North-East direction.
- 4- **Seismicity of the area:** According to Indian Standard code the site falls in seismic zone V of seismic zoning Map of India (IS 1893, part 1, 2002) which corresponds to intensity IX or above MM scale.

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

5- Recommendations:

1. Blasting by explosives for the road construction is to be avoided as far as it is possible. Use of explosives will render the slope highly unstable as the slope consists of jointed/ fractured rock mass and overburden/slope wash material.
2. Excavation work must be carried out by skilled manual workers as the rock slopes are prone to slide down in case of rapid disturbance.
3. The slopes on either sides of the road must be protected by the construction of suitably designed retaining wall/ breast wall with proper weep holes, this work shall be carried out simultaneously with the advancement of the road cutting.
4. Construction of large U-shaped longitudinal concrete lined drain all along the hill side of the road with adequate provision of cross drains is necessary.
5. Construct the road by half cut and half fill techniques and compact the fill material properly by dynamic compaction.
6. Disposal of muck and excavated waste on the lower slopes of this road is to be strictly avoided; failing to which will increase the weight of the lower slope resulting in the increase in driving forces. It is advised to dispose the muck on the identified site for muck disposal.
7. All the construction activities ought to be carried out as per the standard codes of practice laid by the BIS and MORTH.

- 6- Conclusion: On the basis of the geological/geotechnical studies carried at the site and with the above recommendations, the 7.25 Km long Tilwara-Tolab-Maikoti-Malkoti-Dangi-Gunau Light Vehicle Road was found geologically suitable for its widening & improvement.

Letter No: 1229/भू. वै. 07-पौड़ी /2017

Date: 01/07/2017



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