




परियोजना का नाम :- जनपद चमोली के विधानसभा क्षेत्र बद्रीनाथ के विकासखण्ड पोखरी के अन्तर्गत थलगाढ़-डाडौं मोटर मार्ग के नव निर्माण हेतु 1.8235 है० वन भूमि हस्तान्तरण प्रस्ताव।

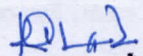
भू-वैज्ञानिक की आख्या

भू-वैज्ञानिक की आख्या संलग्न है।

  
अमीन  
नि०ख०,लो०नि०वि०  
पोखरी

  
कनिष्ठ अभियन्ता  
निर्माण खण्ड लो०नि०वि०  
पोखरी

  
सहायक अभियन्ता  
निर्माण खण्ड लो०नि०वि०  
पोखरी

  
अधिशाली अभियन्ता  
निर्माण खण्ड लो०नि०वि०  
पोखरी



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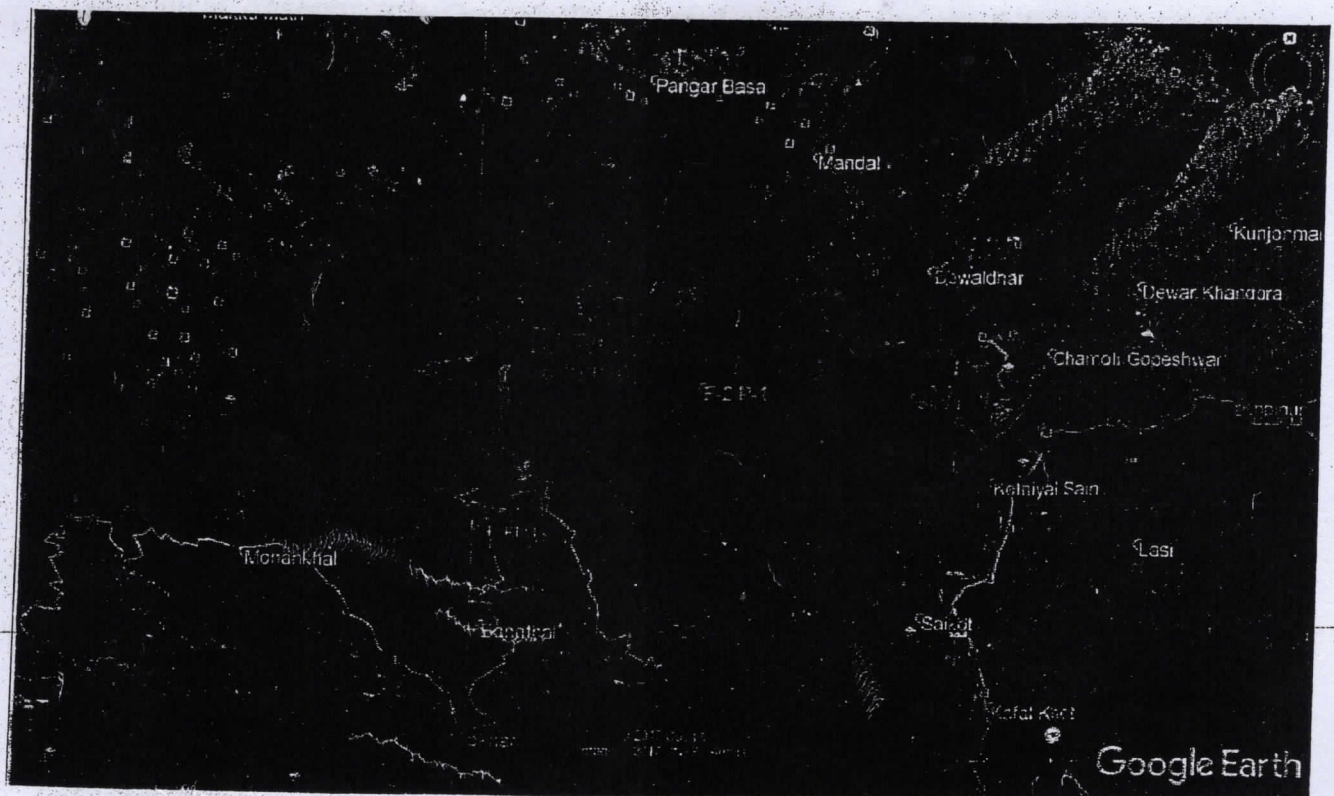
Geological Assessment of 4.0 Km long Thalgarh-Daado Motor Road Alignment  
Corridor between Chainage 0.0 to 4.0 Km, Pokhri Division,  
District Chamoli (Garhwal)

Tushar Sharma

16/10/2017

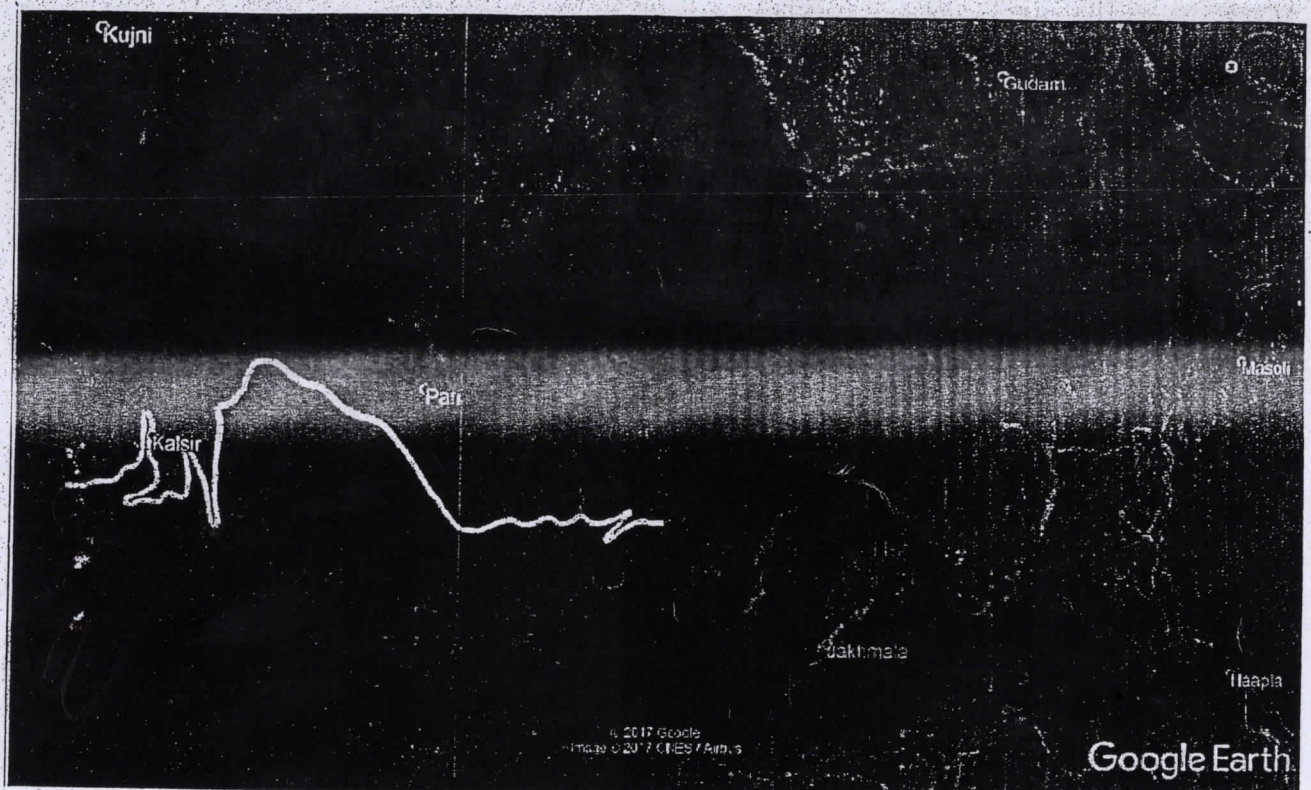
- 1- **Introduction:** The Construction Division, Pokhri, has been entrusted for the construction of 4.0 Km long Thalgarh-Daado Motor Road between CH 0.0 to 4.0 Km. In order to assess the geological conditions of the road alignment site for its feasibility, Er. Rajesh Chandra (Executive Engineer) Construction Division, PWD, Pokhri asked for a geologist to make a site visit. Consequent to his request a visit to the proposed road alignment site was made on 12/10/2017; Er. Kuldeep Singh Rawat and Er. Neeraj Bhandari (Assistant Engineers) CD PWD, Pokhri were present during the site visit.
- 2- **Topographical Information/Location:** The alignment site proposed for the construction of 5.0 Km long Hapla-Gudam-Nail-Nauli Motor Road diverts from CH 8.0 Km Hapla-Kalsir-Dhotidhar Motor Road, Pokhri Division, district Chamoli (Garhwal). The co-ordinates along with elevation, masl of the site at CH 0.0 Km are as follows-

Latitude : 30°25'54.37"  
Longitude : 79°12'43.14"  
Approximate Elevation : 1838 M



*Broader Satellite View of the Site*





*Closer Satellite View of the Road Alignment Site with approximate HP Bends*

**Geological Assessment:** Geologically, the road alignment site area falls in the vicinity of MCT (Main Central Thrust) which separates proterozoic meta-sedimentary sequences of lesser Himalaya with Crystalline rocks of higher Himalaya. The rocks exposed in the area consist of Quartzite and Chlorite/Mica Schist, which belong to Nagthat/Berinag formations of Jaunsar group and crystallines of higher Himalaya respectively. The hill slope of the site area is moderate to steep which declines at  $\sim 30^{\circ}$ - $50^{\circ}$ . The road alignment passes through cultivation land (Naap Khet and Civil Land), vegetation along with patches of hard/jointed quartzitic bed rock. The approximate strength of exposed rock mass is around  $\sim 100$  MPa and has undergone  $W_0$  to  $W_2$  weathering grade. There total six hairpin bends on the road alignment which are at CH 0.225, 0.300, 2.125, 2.450, 3.200 and 3.775 Km respectively. The distance between 1<sup>st</sup> & 2<sup>nd</sup> Hair Pin bends is 75 m which is not in accordance with Hill Road Manual but as the slope appears to be stable therefore construction of Hair Pin Bends proposed at CH 0.225 and 0.300 Km will not affect the stability of the hill slope provided that utmost care is taken with proper support/protection measures for the construction of Hair Pin Bends. The road alignment has 1:20 of both rising and falling gradient with 1:40 grade at hairpin bends.

- 3- **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 and above on 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.



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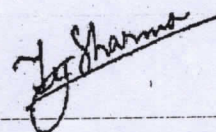
#### 4- Recommendations:

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 especially between CH 0.200 & 0.325 Km where there are two Hair Pin Bends.
3. 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.
4. Construct the road by half cut and half fill techniques and compact the fill material properly by dynamic compaction.
5. 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.
6. All the construction activities ought to be carried out as per the standard codes of practice laid by the BIS and MORTH.

5- Conclusion: On the basis of the geological/geotechnical studies carried at the site and with the above recommendations, the site proposed for of 4.0 Km long Thalgarh-Daado Motor Road alignment between CH 0.0 to 4.0 Km was found geologically suitable for construction.

Letter No: 2132/मु. वै.-7-पौड़ी/2017

Date: 16/10/2017



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