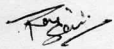


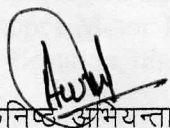
परियोजना का नाम:-

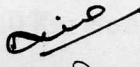
राज्य योजना के अन्तर्गत जनपद चमोली में राज्य योजना के अन्तर्गत जनपद चमोली में उडामाण्डा से तल्ला बिनगढ खूनी गाड कुमेडा का समरेखण का नव निर्माण। मार्ग के नव निर्माण हेतु 1.68 है० सिविल, 0.35 वन पंचायत भूमि, एवं मक डिस्पोजल हेतु 0.48 है० ~~कुल~~ भूमि 2.51 है० भूमि का लो०नि०वि० को हस्तान्तरण प्रस्ताव।


भू-वैज्ञानिक की आख्या

भू-वैज्ञानिक की आख्या संलग्न है।


अमीन


कनिष्ठा अभियन्ता
नि० खण्ड लो०नि०वि०
पोखरी


सहायक अभियन्ता
नि० खण्ड लो०नि०वि०
पोखरी


अधिशारी अभियन्ता
नि० खण्ड लो०नि०वि०
पोखरी

Geological Assessment of 10.0 Km long Udamanda-Talla Bingarh-Khooni Gad-Kumeda Motor Road Alignment corridor between Chainage 0.0 to 10.0 Km,

District Chamoli

Tushar Sharma

19/03/2016

- 1- **Introduction:** The Construction Division, Pokhri, has been entrusted for the construction of 10.0 Km long Udamanda-Talla Bingarh-Khooni Gad-Kumeda Motor Road. In order to assess the geological conditions of the road construction site for its feasibility, Er. Navin Lal Verma (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 site was made on 25/02/2016; Er. Kuldeep Singh Rawat (Junior Engineer) camp CD PWD, Pokhri was present during the site visit.
- 2- **Topographical Information/Location:** The site proposed for the construction of 10.0 Km long Udamanda-Talla Bingarh-Khooni Gad-Kumeda Motor Road diverts from CH 2.025 Km of Udamanda-Sinau-Chopra Motor Road, Pokhri Division in district Chamoli (Garhwal). The co-ordinates along with elevation, masl of the site at CH 0.0 Km are as follows-

Latitude	:	30° 19' 09.80"
Longitude	:	79° 11' 30.10"
Approximate Elevation	:	1661 M



Broader Satellite View of the Site



Closer Satellite View of the Road Alignment Site with approximate Hair Pin Bends

3- Geological Assessment: Geologically, the rocks around road alignment site area belong to Lesser Himalayan sequences which consist of Quartzite, Phyllite, Chlorite Schist and Talc-Serisite Schist which belong to Bhatwari-Barkot units of Ramgarh Group which at places are covered under thin to thick veneers of overburden. The approximate strength of exposed rock mass ranges between 50-150 MPa and has undergone W_1 to W_3 weathering grade. At one or two places the road alignment passes through creep, slide prone zone and loose rock patches which are to be taken care of. The hill slope of the site area is moderate to steep which declines at $\sim 40^\circ$ - 50° . The road alignment passes through cultivation land, vegetation (Pine trees and shrubs) along with patches of jointed/weathered bed rock.



CH 0.0 Km of the road alignment

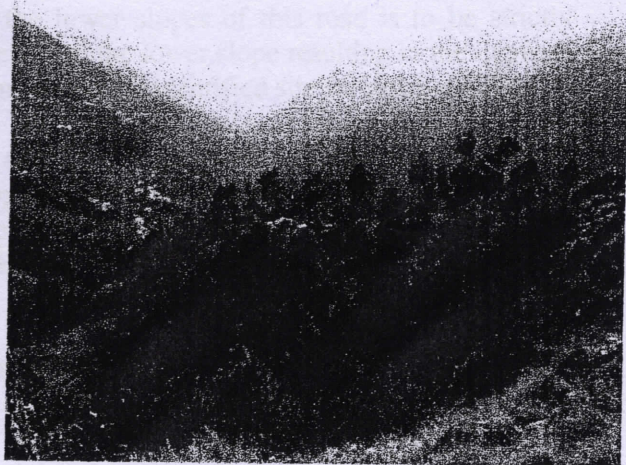


View of road alignment near HP Bend -1

There are total eight hairpin bends on the road alignment which are at CH 0.50, 1.175, 1.675, 3.725, 5.65, 5.975, 6.275 and 6.525 Km Overall the alignment passes through 50% rock and 50% Overburden and Slope wash material.



View of steep slope with tilting trees showing little creep



Another view of slope covered with vegetation

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 more 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.

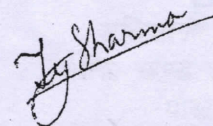
Recommendations:

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 highly jointed/fractured rock and slope wash material.
2. Rock excavation must be carried out by the skilled manual workers as the rock slopes are prone to slide down in case of rapid disturbance especially in the creep, slide prone and loose rock areas (between CH 0.3 & 1.1 Km).
3. The slopes on either sides of entire 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. This is very important for the stability of the hill side slopes.
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 as the rocks are prone to get weathered and eroded easily while in contact with water.

- 30
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. It is observed that overall the slopes in around the alignment are comprised jointed incompetent rocks which are covered by slope wash material and debris/muck with one or two sliding and loose rock patches which at places are not covered by vegetation therefore it is advised to plant soil binding vegetation like Didonia, Lemon grass or Ram Baans on the those patches.
 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 site proposed for 10.0 Km long Udamanda-Talla Bingarh-Khuni Gad-Kumeda Motor road alignment was found geologically suitable for road construction.

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Date: 19/03/2016



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