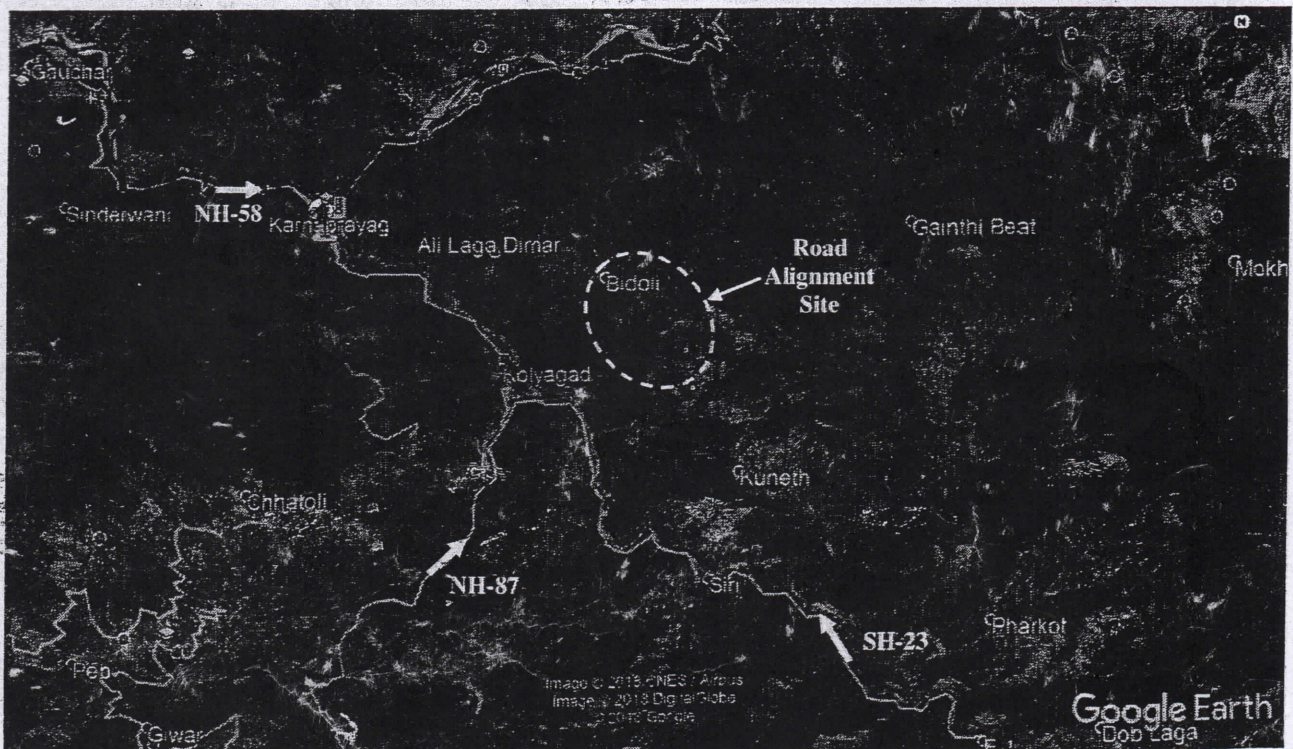


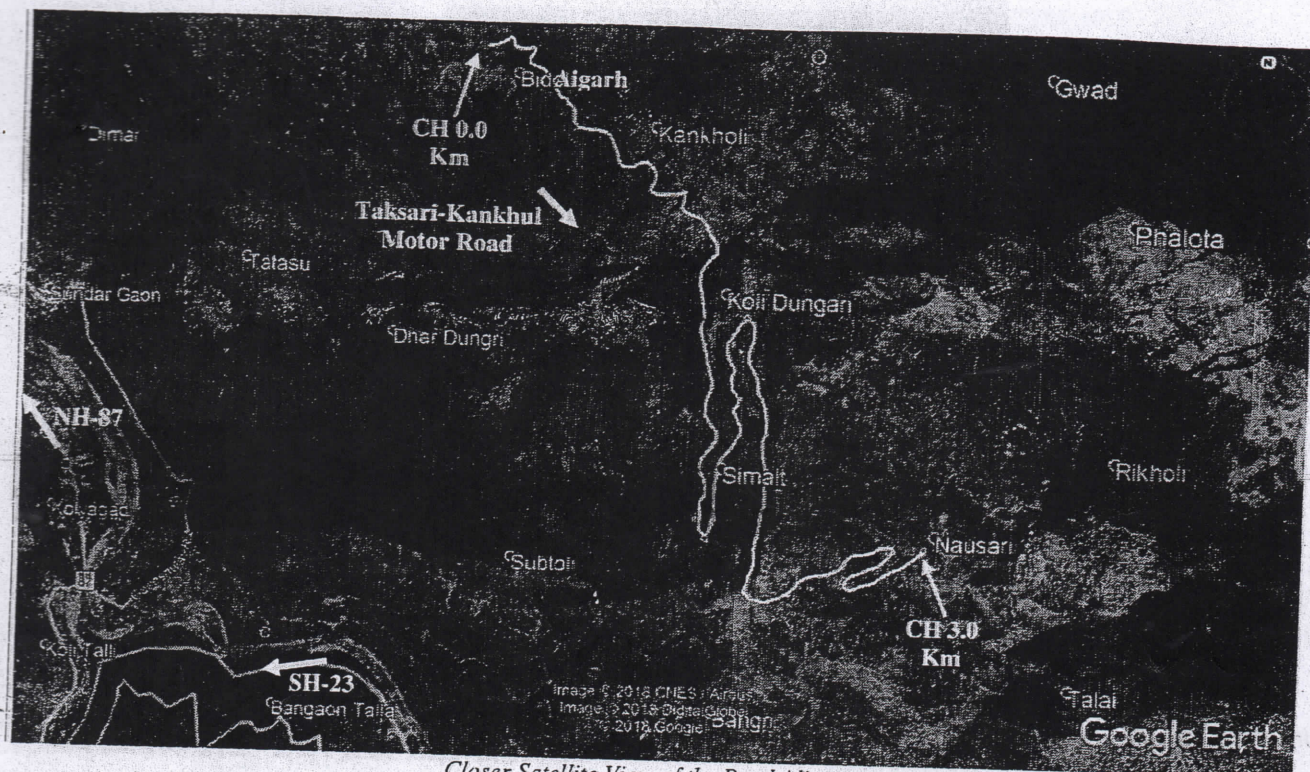
Geological Assessment of 7.0 Km long Gwad-Didoli-Riktoli-Partoli-Kimoli Motor Road
Alignment corridor between Chainage 0.0 to 7.0 Km, Gauchar Division,
District Chamoli (Garhwal)
Tushar Sharma
20/09/2018

- 1- **Introduction:** The Temporary Division, Gauchar, has been entrusted for the construction of 7.0 Km long Gwad-Didoli-Riktoli-Partoli-Kimoli motor road between CH 0.0 to 7.0 Km. In order to assess the geological conditions of the road alignment site for its feasibility, Er. Karan Singh Rana (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 02/07/2018; Er. Prateek Aggarwal (Junior Engineer) PWD, Gauchar was present during the site visit.
- 2- **Topographical Information/Location:** The above mentioned road alignment diverts from CH 2.0 Km of Talsari-Kankhul motor road which itself diverts from CH 10.0 Km of Karanprayag-Nainisain motor road connecting Gwaad, Riktoli, Paatyu, Didoli, Ritholi, Naula, Gair, Tolyu, Partoli and Kimoli villages in Gauchar Division, district Chamoli (Garhwal). The co-ordinates along with elevation, masl of the site at CH 0.0 Km are as follows-

Latitude : 30°15'01.10"
Longitude : 79°16'34.80"
Approximate Elevation : 1545 M



Broader Satellite View of the Site



Closer Satellite View of the Road Alignment Site

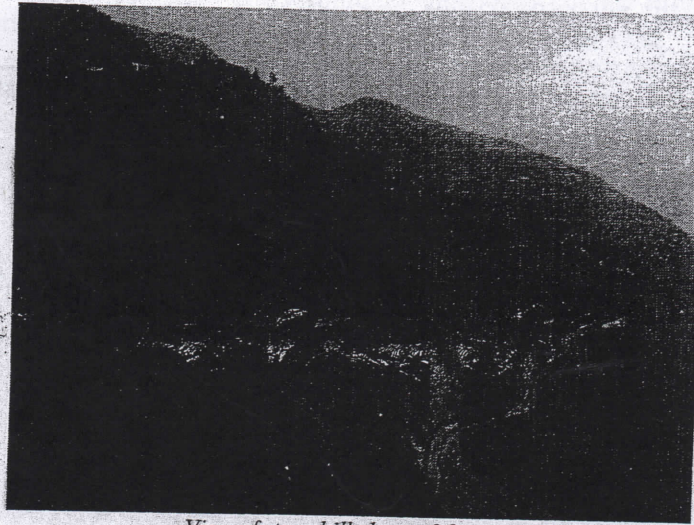
- 3- **Geological Assessment:** Geologically, the road alignment site area falls under the Meta-Sedimentaries of Lesser Himalaya in the vicinity of thrust junction between Berinag & Rautgara Formations of Jaunsar & Damtha Group. The rocks exposed around the site area consist of highly weathered and fractured dark mica schist with quartzitic bands possessing boudinage structures. The hill slope of the site area is moderately steep to steep which declines at $\sim 40^\circ$ - 60° towards West to South-West direction. The road alignment passes through cultivation land (Naap Khet and Civil Land) along with patches of jointed schistose bed rock.



View of site at CH 0.0 Km



View of steep hill slope at the site



View of steep hill slope of the site

The approximate strength of exposed rock mass is around ~50-100 MPa and has undergone W_0 to W_3 weathering grade. There are four hairpin bends on the road alignment which are at CH 3.150, 4.275, 6.175 and 6.500 Km respectively.

The road alignment overall has 1:20-1:40 of both rising and falling gradient with 1:60 gradient at the hairpin bends.

- 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 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.

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.

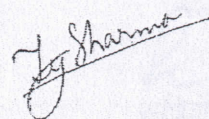
5. Construct the road by half cut and half fill techniques and compact the fill material properly by dynamic compaction.
6. Disposal of muck and excavated waste on the lower slopes of this road is to be strictly avoided; failing to which will increase the weight of the lower slope resulting in the increase 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 site proposed for 7.0 Km long Gwad-Didoli-Riktoli-Partoli-Kimoli motor road alignment between CH 0.0 to 7.0 Km was found geologically suitable for construction.

Note: On the basis of the geological studies carried at the site with limited accessibility to the hill slopes this is a generalized report. The conditions of the site are subject to change during/after the construction work, in case any opinion is required during or post construction then the geologist should be separately communicated.

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Date: 20/09/2018



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