

Geological Assessment of 3.0 Km long Alignment Corridor proposed for the Construction of Kakola- Sleson-Amartola- Jaikandi-Bagadhar-Kanda- Ganeshnagar Motor Road, Distt. Rudraprayag.

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1-Introduction:- The Construction Division Public Works Department, Ukhimath has been entrusted for the construction of 3.00 km long motor road vide G.O. No. -737/ Misc./2013-14 Dated 26/11/2013. On the request made by Shri Manoj Das, Executive Engineer, PWD Ukhimath, I carried out the geological assessment of the proposed alignment corridor of this road on 25/04/2015. Shri Andeep Rana, Asstt. Engineer and Shri Ashok Kumar, Jr. Engineer, also accompanied the site visit.

2- Location :- The alignment corridor of this proposed motor road originates from Km. 3.50 of Chandrapuri -Guli - Ganeshnagar motor road.

3-Geological Assessment:- Geologically the alignment corridor of this proposed road falls in a part of Garhwal Lesser Himalayan Belt which is bounded by the Main Central Thrust (MCT) in the north and the Main Boundary Thrust (MBT) in the south. The rockmasses belonging to the Garhwal Group are exposed in this area and these are represented by the quartzites, chlorite schists, amphibolites and spillites. The terrain containing this alignment is characterized by the rugged and dissected topography containing the steep hill slopes and deeply dissected valleys. Fresh to moderate, fine to coarse grained, thinly to massive, hard and compact quartzites interbedded by the thin partings of phyllites/ chlorite schists and amphibolites are exposed along the alignment corridor. These rock masses are dissected by four prominent joint sets and most of these are marked by the long persistence. The facets of slopes are largely controlled by the bedding/ foliation joints oriented in the north- east direction and the joint set oriented in the southwest direction. The details of the joint sets recorded at the sites are given in the following table.

Table

| Sl. No. | Feature | Dip Angle | Azimuth |
|----------------|---------------------|-----------|---------|
| 1 | 2 | 3 | 4 |
| J ₁ | Bedding joint (So) | 35° | N090 |
| J ₂ | Joint | 40° | N055 |
| J ₃ | Joint | 55° | N270 |
| J ₄ | Joint | 45° | N350 |

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The rocks exposed along the alignment corridor are largely overlain by the thick cover of overburden materials comprised of the composite soils. The rocks exposed to the ground exhibits high values of physical competency based on the manual tests performed at the site. The observed values of "Uniaxial Compressive Strength" of the ground forming rocks were ranging between 100 M Pa to 200 M Pa.

Most of this alignment corridor is occupied by the overburden material composed of the hill/ slope wash material. This overburden material contains angular rock fragments embedded in the silty- clayey matrix. The soils deposited on the alignment slopes exhibits high values of physical competency especially under dry state. According to the assessment made at the site the " Undrained Shear Strength " of the ground forming soils was found ranging between 400 K Pa to 500 K Pa. And these are " Stiff " to " Very Stiff " soils in nature.

By and Large the alignment slopes are stable and free from any mass wasting activities. Nowhere land sliding/ ground subsidence /rock falls and ground deformation were noticed at the time of field survey.

On the basis of the study carried at the site and the facts given above the following recommendations are being made for the construction of the proposed road in question, which must be incorporated at the time of road construction and failing to these this report will be treated as cancelled.


4- Recommendations:-

1. To the possible extent of technology form the road bench by partial excavation of the hill slopes and partial filling on the valley side part, i. e. half cut half fill method.
2. Avoid deep box cuts and full excavation of the hill slope this is so as to maintain the overall stability of the hill slopes.
3. Protect the entire road by constructing hill and valley side properly designed retaining walls.
4. Make proper arrangements for the drainage of surface waters. The hill side long drains must have adequate cross section to accommodate the waters from the catchment and the surface of the road. The cross drainage arrangements shall be made such that the waters are disposed preferably on the natural drainages otherwise on the stable grounds.
5. The entire surface of the road shall be sealed by the black top immediately.
6. The excavated waste shall be used for the construction of road and walls based on its suitability.

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All the construction activities shall be carried as per the standard codes of practice and the guidelines of MoRH.

Recommendations:- Geologically the 3.00 km long alignment corridor proposed for the construction of Kakola- Sieson-Amartola- Jaikandi-Bagadhar- Kanda-Ganeshnagar motor road located in Distt. Rudraprayag was found suitable for the construction.



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