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Geological Assessment of the Alignment Corridor Proposed From Shivnandi to Simtoli-Kanda Motor Road in Distt. Rudraprayag

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Introduction :- The Irrigation Division, PMGSY, Rudraprayag, has proposed the construction of 10.07 Km. long motor road named From Shivnandi to Simtoli Motor Road under PMGSY Project on the request of the Executive Engineer, Irrigation Division, PMGSY, Rudraprayag. I carried out the geological assessment of the proposed alignment of the road

1. **Location:-** The proposed alignment originates from the ShivnandiM/R Existing Simtoli-Kanda motor road as a Branch Road. H.P. Bends has been proposed for the said road.

2. **Geological Assessment:-** Geologically the area of the proposed road is located in the inner lands of Garhwal Lesser Himalaya Belt which is bounded by MCT in north and MBT in South Nagthat group quartzite which are sercitic in nature and schist is exposed along the alignment. These rocks are massive to thinly bedded, soft to very hard, compact and partially weathered in nature.

   Four prominent and one random joints set in addition to minor shear zone traverse these rocks and control the stability of the various slope facets of the alignment passes are inclined at moderate to steep angle and these are partially covered with the overburden material of varying thickness ranging from 0.5 m to 1.5 m thick. The rock mass exposed along the alignment corridor is mostly hard and its "Uniaxial Compressive Strength" has been estimated ranging between 70 M Pa to 90 M Pa (ISRM Manual Index). By and large the joints traversing the rock masses are widely spaced through except at places where the rocks is sheared and shattered. The values of the Rock Quality Designation (RQD) calculated at the site ranging between 71 percent to 90 percent suggests that the slope forming rock masses are less distressed in nature and decrease the risks of instability. All the joints planes of the rocks are rough to moderately smooth, tight and sometimes sealed with the secondary inclusion.

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Table

S. No.	Feature	Dip angle	Azimuth
1	2	3	4
J_1	(S_0 Bedding Joint)	30^0	N155
J_2	(S_1 Foliation Joint)	55^0	N185
J_3	(Random Joint Set)	65^0	N135
J_4	(Sealed with Quartzite's)	35^0	N120
J_5	Joint	60^0	N310

The overburden material exposed along the alignment corridor is comprise the scanty rock fragments of various shapes and sizes embedded in the clay matrix. This overburden material is naturally well compacted and dense in na

The slope forming overburden materials do not contain any soft/dispersive so

By and large the alignment slopes are stable and do not bear any signatur mass wasting/land sliding.

On the basis of the geological / geotechnical studies carried at the site and facts mentioned above the following recommendations are being made for construction of the proposed road.

3. Recommendation:-

(i) The alignment some time traverses along/across minor fault zone wh is geologically fragile and special attention needs to be given stability of road where alignment crossing the Nalas or Gads or L streams.

(ii) The hill slope is another factor responsible for geological hazards; road basically traverses the slope class 34^0 to 55^0 special attention ne to be given for stability where it is 48^0 to 60^0 in some parts.

(iii) Special attention must be give at the point of H.P. Bend at the tim construction of road.

(iv) Do not dispose the waste in hill side, dispose it in a safe

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(v) Do not blast heavily on the rocks and blasting is restricte human settlement / public property.

(vi) The road must have extra wide lined long drain with adequate cross drainage arrangement.

(vii) The road must be formed shoulder to shoulder paved, this is so to check the water ingress into the sub surface material.

(viii) Construct suitably designed retaining walls / Brest wall all alon road, it is essential for the overall stability of the hill slope.

(ix) All the construction activity must be carried out as per the stanc and norms following the IS codes prescribed for the similar c construction in Himalayan Zone.

(x) This report is prefeasibility report. At the time of construction it need separate geological concern.

4. Conclusion:- On the basis of the geological / geotechnical studies carried at the site and with the above recommendations, the site was found geologically suitable for the construction of 10.07 Km. long motor road named From Shivnan to Simtoli-Kanda Motor Road, Distt. Rudraprayag, Uttrakhand.

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