प्रारुप–33

परियोजना का नाम :– माननीय मुख्यमंत्री जी की घोषणा के सन्दर्भ में जनपद टिहरी गढ़वाल के विकास खण्ड भिलंगना में मैगाधार– भेटी –जमोलना – पोखार मोटर मार्ग का नव निर्माण कार्य। (मार्ग के नव निर्माण हेतु वन भूमि हस्तानान्तरण प्रस्ताव। (लम्बाई–6.300 कि0मी0 + 48.00 मी0 स्पान सेतु)

भू–वैज्ञानिक की आख्या

(प्रस्तावित स्थल की भू–वैज्ञानिक द्वारा निर्गत अद्यतन निरीक्षण आख्या प्राप्त कर संलग्न की जाय।)

संलग्न है

Geological Assessment of the Alignment Corridor Proposed For – Construction of Pokhar to Jamolna - Bheti motor road, Distt. Tehri Garhwal

30/12/2016

Introduction: - The Temp. Div. P.W.D., Ghansali, Tehri Garhwal has proposed the construction of 6.300 Km. long motor road named Pokhar to Jamolna - Bheti motor road under P.W.D. Project on the request of the Executive Engineer, Temp. Div. P.W.D., Ghansali, Tehri Garhwal I carried out the geological assessment of the proposed alignment of the road in presence of the concerned J.E. and a person of MAGOT Engineering Consultants Pvt.Ltd., D.Dun on Dated 20/12/2016.

1. **Location:** - The proposed alignment originates from Ghansali to Ghuttu motor road at Km. 10 (Pokhar) as a Village Road. Nine H.P. bends are proposed in this alignment.

2. **Geological Assessment:** -
Rocks of Central Crystallines and Garhwal Group are exposed in this region. The region is occupied mainly by Parana and Proterozoic rocks. The Garhwal Group and Central Crystalline are dominated by metamorphic, igneous and sedimentary rocks. Mainly, gneiss, granite, quartz-felspar schist, chlorite sc quartzite, metabasic hist, limestone, phyllite etc. are found in these groups.The Bhilangna Formation is divided into lower and upper units. The lower unit comprises of low to medium grade metamorphites. These are perphyroblastic biotite streaky gneiss, quartzite, quartzs – felspathic schist, chlorite schist, imperented by medium to high grade metamorphites like garnetiferous quartzschist, biotite schist, graphite schist, carbonaceous phyllite, porphyroblastic gneiss, granulites, marble and amphilbolite. Following lithotechtonic unit found in this region.

Tectonic Units	Lothology	
Central Himalayan Crystalline Group	Bhilangana Formation	**Ghuttu member:** Quartzite schist, carbonaceous phyllite, crystalline limestone.
	----------Thayeli Thrust----------	
Deoban/ Garhwal Group	Ghansali Formation	Quartzite and slate sequence with gritty quartzite and limestone lenses in the upper horizons and basic and granitic intrusive rocks.

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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 50 M Pa to 100 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 60 percent to 75 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.

The details of the joints noted at the site are given in the following table:-

Table

S. No.	Feature	Dip angle	Azimuth
1	2	3	4
J_1	(S_0 Bedding Joint)	20^0-60^0	N130-N190
J_2	(Prominent Joint Set)	40^0-80^0	N230-N270
J_3	Joint	35^0-55^0	N280-N310

A few more random joints are present in the area. The overburden material exposed along the alignment corridor is comprised of the scanty rock fragments of various shapes and sizes embedded in the clay- silt matrix. This overburden material is naturally well compacted and dense in nature.

The slope forming overburden materials do not contain any soft/dispersive soils. By and large the alignment slopes are stable and do not bear any signature of mass wasting/land sliding.

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

3. **Recommendation:-**
   (i) The alignment some time traverses along/across minor fault zone which is geologically fragile and special attention needs to be given for stability of road where alignment crossing the Nalas or Gads or Local streams.
   (ii) The hill slope is another factor responsible for geological hazards; the road basically traverses the slope class 30^0 to 45^0 special attention needs to be given for stability where it is 45^0 to 55^0 in some parts. Probable wedge and planar failures need to be addressed effectively.
   (iii) Special attention must be give at the point of H.P. Bend at the time of construction of road.
   (iv) Do not dispose the debris in hill side, dispose it in a safe zone.

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(v) Do not blast heavily on the rocks and blasting is restricted near the 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 along the road, it is essential for the overall stability of the hill slope.

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

4. **Conclusion:-** On the basis of the preliminary geological / geotechnical studies carried at the site and with the above recommendations, the site was found geologically suitable for the construction of 6.300 Km. long motor road named Pokhar to Jamolna - Bheti motor road, Distt. Tehri Garhwal, Uttrakhand.

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