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P.W.D. Uttarakhand

Geological Investigation Report  
E.G. – Road / Bridge / Alignment  
R.E.S., PIU –II, PMGSY, Didihat (Pithoragarh) – 7 / 2013

Geological Assessment of the Alignment Corridor Proposed For –Didihat  
to Jamtari Motor Road, Distt. Pithoragarh

24 Dec. 2013

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## Geological Assessment of the Alignment Proposed For -- Didihat to Jamtari Mot Distt. Pithoragarh

J.P. Madhwal  
24/12/2013

**Introduction :-** The R.E.S., P.I.U.- II, PMGSY, Pithoragarh is carrying out the construction of 10.525 Km. long motor road named Didihat to Jamtari Mot road under PMGSY Project on the request of the Executive Engineer, P.I.U.- II, PMGSY, Pithoragarh. I carried out the geological assessment of the proposed alignment of the road in presence of the Executive Engineer, P.I.U.- II, PMGSY, Pithoragarh on Dated 15/12/2013.

**1. Location:-** The proposed alignment originates from D.D. Road, Km. 12.000 as a Branch Road. Seven H.P. Bend has been provided on the road.

**2. Geological Assessment:-** Geologically the area is located in the inner lands of Kumaon Lesser Himalaya. The area is occupied by the granite and grano diorite are exposed. These rocks are having minor sills & dykes. These rocks are soft to very hard, compact and partially weathered in nature.

Three prominent and one random joints set in addition to the bedding planes traverse these rocks and control the stability of the alignment. The alignment passes are inclined at moderate to steep and are covered with the overburden material of varying thickness. The rock mass exposed along the alignment is 1.5 m thick. The rock mass exposed along the alignment and its "Uniaxial Compressive Strength" has been found to be in the range of 150 M Pa to 200 M Pa (ISRM Manual Index). By and large the rock masses are widely spaced through except a few places where they are sheared and shattered. The values of the Rock Compressive Strength calculated at the site ranging between 81 percent to 100 percent. The slope forming rock masses are less distressed in nature. The joints are tight and sometimes sealed with the secondary inclusions.

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Asst. Engineer  
R.E.S. P.M.G.S.Y.  
Didihat



## Table

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

Table

S. No.	Feature	Dip angle	Azimuth
1	2	3	4
J <sub>1</sub>	(S <sub>0</sub> Bedding Joint)	65 <sup>0</sup>	N170
J <sub>2</sub>	(S <sub>1</sub> Foliation Joint)	35 <sup>0</sup>	N130
J <sub>3</sub>	(Random Joint Set)	70 <sup>0</sup>	N115

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.

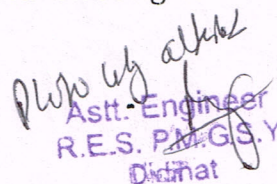
By and large the alignment slopes are stable and do not bear any signature of mass wasting/land sliding.

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 37<sup>0</sup> to 48<sup>0</sup> special attention needs to be given for stability where it is 47<sup>0</sup> to 55<sup>0</sup> in some parts.
- (iii) There are seven H.P. Bends in the alignment special attention must be give during the construction about the stability of slope.
- (iv) Do not dispose the debris in hill side, dispose it in a safe zone.

- (i) Do not blast heavily on the rocks and blasting is restricted near the human settlement / public property.

  
 Astt. Engineer  
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 District



- (ii) The road must have extra wide lined long drain with adequate cross drainage arrangement.
- (iii) The road must be formed shoulder to shoulder paved, this is so to check the water ingress into the sub surface material.
- (iv) Construct suitably designed retaining walls / Breast wall all along the road, it is essential for the overall stability of the hill slope.
- (v) Construct Steel Girder Bridge Length 65.00 m., 30.00 m. and 24.00 m. at Km. 0.050, 2.000 and 2.750.
- (vi) Construct Causeways at Km. 1.000, 2.000 and 4.000.
- (vii) All the construction activity must be carried out as per the standard and norms following the IS codes prescribed for the similar civil construction in Himalayan Zone.

**2. 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 4.200 Km. long motor road named Munsiyari - Madkot motor marg to Kauli Kanyal motor road, Distt. Pithoragarh, Uttarakhand.

- (i) Construct Causeways at Km. 2.000 to 4.000, 6.000, 8.000, 13.000, 14.000 and 21.000.
- (ii) Construct R.C.C. Bridge length 10.00 m. at Km. 2.325.
- (iii) Construct Steel Girder Bridge length 24.00 m., 18.00 m., 24.00 m., 48.00 m., 36.00 m., 24.00 m. at Km. 0.775, 0.850, 1.825, 3.075, 8.175, 19.150.
- (iv) Construct Culvert length 6.00 m. at Km. 19.300.
- (v) All the construction activity must be carried out as per the standard and norms following the IS codes prescribed for the similar civil construction in Himalayan Zone.

**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 20.500 Km. long motor road named Dev Vichona – Khetar Kanyal – Garal motor road, Distt. Pithoragarh, Uttarakhand.

*Photo by abhishek*  
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