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P.W.D. Uttrakhand

Geological Investigation Report
E.G. – Road / Bridge / Alignment
Sahiya – 8 / 2013

Geological Assessment of the Alignment Corridor Proposed For –
New Construction of from Km. 18 of Samarjance Road to Mahsasa in
District. Dehradun

29 January 2014

photocopy Attached

(सो जी.पी. मधवाल)
सहायक अभियन्ता
राज्यीय राजमार्ग विकास विभाग
देहरादून जिला-देहरादून

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**Geological Assessment of the Alignment Corridor Proposed For –
New Construction of from Km. 18 of Samarjance Road
to Mahsasa in District. Dehradun**

J.P. Madhwal
29/01/2014

1. **Introduction :-** The Temporary Division, Public Works Department, Sahiya has proposed the construction of 4.00 Km. long motor road named **From Km. 18 of Samarjance Road to Mahsasa** on the request of the Executive Engineer, T.D. P.W.D. Sahiya, I carried out the geological assessment of the proposed alignment in presence of Er. B.D. Bhatt the concerned A.E. on 25/01/2014.
2. **Location:-** The proposed alignment originates from the Km. 18 of the existing Samarjance road connecting the village Mahsasa.
3. **Geological Assessment:-** The alignment corridor of the proposed motor road is located in the inner lands of Garhwal Lesser Himalayan Belt, tectonically bounded by the Main Central Thrust (MCT) in the north and the Main Boundary Thrust (MBT) in the south. Which is mostly occupied by the rocks of Chandpur formation of Jaunsar group. Consists of meta-greywackes, meta siltstone, slates, phyllites and locally carbonaceous grayish phyllite. The upper part of the succession contains well preserved load casts, graded bedding and other structures typical of flyschoidal succession. These rocks are sheared, shattered tectonized and traversed by four sets of joints (rock – defects). It has been observed at the site that most of the joint sets are tight and sealed by the secondary inclusions. The details of the joints recorded at the site are provided in the following table:-.

Table

S. No.	Feature	Dip angle	Azimuth
1	2	3	4
J ₁	(S ₀ Bedding Joint)	45 ⁰	N150
J ₂	Joint	65 ⁰	N90
J ₃	Joint	55 ⁰	N125
J ₄	Joint	35 ⁰	N200

photocopy Attached

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The alignment slopes are inclined at moderate angle and are covered with the overburden material having thickness 1.0 m to 5.0 m order. The over burden material is comprised of rock fragment and chips embedded in clay-silt matrix. The slope forming overburden material (composite soil) is naturally well compacted and dense in nature and it do not contain any soft/ dispersive soil. The "Undrained Shear Strength" of the slope forming soil has been assessed ranging between 250 k Pa to 400 k Pa, which corresponds to "Very Stiff Soil" consistency. The "Uniaxial Compressive Strength" of the lime stone exposed on the alignment corridor has been assessed ranging between 50 k Pa to 100 k Pa which corresponds to the strength "Good" rock.

By and large the alignment slopes are low to moderately steep and free from any landslide/mass wasting.

Most of the alignment slopes are covered with the envelope of overburden material of 1.0 m to 1.5 m thick.

The slope forming overburden material is comprised of hill wash/ slope wash material of composite soil, embedded in clay matrix and it do not contain / soft / dispersive soil.

The alignment having the Five no. of Hair Pin Bends, mostly lies on the gentle slope and in the farm fields of the village farmers and safe.

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.

4. 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 36° to 50° special attention needs to be given for stability where it is 50° to 65° in some parts.
- (iii) Form the road by half cut – half fill techniques and ensure the proper compaction of the fill material.
- (iv) Do not dispose the debris in hill side, dispose it in a safe zone.


Geological Attestation
 (इं० सी०डी० भट्ट)
 महासक अभियन्ता
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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) 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.

5. **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 4.00 Km. long motor road named **From Km. 18 of Samarjance Road to Mahsasa** in Distt. Dehradun, Uttarakhand.

Photo copy Attached

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