

## **Geological report of Proposed widening of Duggada – Satpuli Road**

NH PWD Division Dhumakot proposed 45 km (Km 156+000 to 196+000 Km) widening of NH 534 (Old-119) . As requested by Er . Navneet Panday , Executive Engineer,NH PWD Division, Dhumakot, I carried out Geological investigations of the proposed road on 24 and 25th November, 2018 in the presence of Mr. Vipin Sharma , Consultant .

### **General Geological Condition:**

Geologically the investigated the area comes under the Lesser Himalayan terrain. The proposed alignment falls around 550m to 1700m a MSL. The major ridge present in this area is roughly trending in E-W. While there are 2 Major drainage system present covering the region One is Nayar system draining Towards W to WSW direction while the another is a major snow fed river of upper Ganges system called Alaknanda which is draining almost E-W . Both the major drainage system cover outer lesser Himalayan segment of Ganges system. At right angle to the main ridge, numerous secondary and tertiary spurs intersect the area showing highly dissected topography. The general slope is south facing or north facing

### **Rock types :**

Lithologically , the area is constituted by and Shales/few patches of Quartzite's / and a huge extension of greenish / Khaki coloured phyllites with few intrusive of basic rocks at places . The highly fractured and shattered rocks are testimony of active tectonics in the region. Numerous local faults are also visible in the area . The steep slopes and rugged topography of the region indicate that the area is neotectonically active . Slates are thinly bedded . Four sets of joints are prominent in the rocks . The trend of Phyllites at starting is 35° due SW . Most of the rock types are tightly folded shattered and fractured .

**Detailed investigation of the alignment and suggested corrective measures are As:**

### **D. Duggada – Ghum Khal Sector**

- The alignment starts is continuation of NH 534 ( old 119 ) from Duggada village,lansdown townships at the left bank of Eastern Kho river .
- The Duggada is densely populated historical township situated at the bottom of the valley which is in fact a flood plain of the River Kho .
- Duggada has a history of Catastrophic flash flood related disaster in the past .
- The uphill slope of the Duggada & Ghumkhal village is quite strep and in the condition of road widening, the slope may turn into huge landslide.

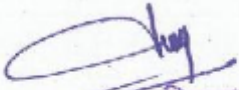
- Considering the above fact it is advisable that best walls should be achieved to achieve the required width of the road .
- After Duggada villages a segment of step slope is encountered just after Kho river bridge . At this segment of road extra care should be taken during the overlay on that particular stretch .
- It should be ensured that no muck is disposed in the down slope side in the river as the river is habitat of rare Himalayan Mahshir fish and dumping of Muck into the river may harm the aquatic life of the river.
- At this segment the slope is gentle with few settlements.
- Road widening at this segment is mostly safer provided proper hill side code of conduct provisioned for road construction is followed properly .
- After crossing bridge on Kho river the slope becomes steeper . At this segment also breast wall from downside of the slope should be ensured to achieve the prescribed width of the road .
- It is further emphasised that muck disposal should be ensured with utmost care with proper dumping sites . And no part of muck should be disposed into the downslope which otherwise will damage vegetation , settlements , cultivated fields and slope stability .
- The muck dumping site should be strictly as per the norms . And dumping of the muck in the down slope side must be strictly prohibited .
- Most of the alignment will pass through scanty forested region . Hence Proper engineering measures should be ensured to minimise the slope failure and minimum damage to the vegetation
- Proper drains and parapet / scrubbers walls at appropriate locations be constructed as per norms of hill side road safety .

### **Ghumkhal-Satpuli Road Sector.**


- The slope is steep and the rocks called Phyllites though hard by enlarge but at places highly crumpled.
- There are few HP bends encountered at this sector .
- At this segment it is advisable to ensure proper breast walls to achieve proper width of the road.
- After crossing this segment, the road enters into gentler slope with few settlements at many places.
- Most of the road here passes either through cultivable fields or gentle slopes with scanty vegetation of chir and its phytosociety .
- Widening of the road through slope cutting may be permitted here but again muck disposal should be ensured following existing norm strictly .
- Proper dumping sites should be identified and prepared for accommodating muck generated during road widening .
- The muck dumping site should be strictly as per the norms . And dumping of the muck in the down slope side must be strictly prohibited.


- Considering the fragility of the rocks at HP bends , breast walling should be preferred to achieve the prescribed width of the road .
- No dumping of muck should be allowed to down slope side along the road .
- Proper drains and parapet / scrubbers walls at appropriate locations be constructed as per norms of hill side road safety .

The proposed section of the road may be geologically safe provided the construction agency NII ( PWD ) take care of the above - mentioned corrective measures . Suggestions may be sought in future if problem arises at some point.

  
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