

**Geological Assessment of the 2 km long alignment corridor proposed for
Jal Bend to Chilond motor road, Distt. Rudraprayag.**

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1- Introduction:- The Construction Division, PWD Ukhimath has been entrusted for the construction of 2 km long motor road namely Jal Bend to Chilond motor road, located in Ukhimath Block, Distt. Rudraprayag. On the request made by Er. Manoj Das, Executive Engineer I carried out the geological assessment of the proposed alignment on 28.02.2016. Er. Sandeep Semwal, Asst. Engineer also accompanied the site visit.

2- Location:- The alignment corridor of the above said motor road originates from Jal Bend located on Kalimath-Kotma Jal Chaumasi motor road and it passes on the right bank slope of river Kali for half km length and thereafter 1.5 km on the left bank. This area is located in Ukhimath Block, Distt. Rudraprayag.

3- Geological Assessment:- Geologically, the alignment corridor proposed for the construction of the above said motor road lies in a part of Higher Himalaya close towards north of the Main Central Thrust (MCT). The terrain containing it is characterised by the rugged and dissected topographical features having lofty mountains, steeply inclined drains and deeply dissected river gorges. This area is exposed by the varieties of schists and gneisses grouped under the Central Crystallines. The cross slopes of the alignment between cross section 00/00 to cross section 00/20 are inclined at steep angle between 60° to 65° oriented towards N 050 direction and thereafter becomes very steep upto 70° towards N 240 direction. River Kali dissects these opposite oriented slope facets and it has generated a large slide zone on the right bank which is continuously progressing headwards and its crown it has been shifted upto 150 m from the river bed level. The half km long alignment of the proposed road passes across the slope affected by this massive landslides which was generated in 2013 direction. The slope face across this slide affected alignment corridor are exposed by the large scanty angular rock fragments which are slightly embedded in the silty clay matrix. As reported by the villagers these boulders moves down the slope during rainy season at various rates. The left bank slopes of river Kali across which the alignment passes are comprised of massive, hard, compact and slightly weathered rock mass. These rock masses are dissected by four prominent joint sets. All the joint sets dissecting these rock masses are widely spaced to one another and the surfaces of these joints are moderately rough to moderately smooth in nature. The material exposed between cross section 00/20 to 01/40 is physically quiet competent. As per the estimation made at the site the "Uniaxial Compressive Strength" of these rock masses was found ranging between 200 M Pa to 250 M Pa. This part of the alignment slopes are stale and free from any mass wasting activity.

As the starting half km part of this alignment corridor passes across the chronic landslide zone. In order to avoid this section the entire area was investigated to re-align the alignment but no ground was found suitable. Considering the various probability for the road construction it

was advised to construct a temporary road all along this half km landslide affected area with the help of wire crates right upto the right bank of river Kali.

By and large the left bank alignment slopes are stable, whereas the right bank slopes are vulnerable from the stability point of view. It was found that if the landslide zones is treated by placing wall which can resists flexible deformation like wire crates it will help to bring the slope in natural stability with the time.

On the basis of the geological inspection and the study of the site and the facts given above, the following recommendations are being made for the construction of the proposed motor road failing to these recommendations this report will be automatically treated as cancelled.

4- Recommendations:

- 1- Form the road by wire crate only between CH. 00/00/20 and do not excavate the hill slope. Place 3 layers of wire crates on the either side no slopes of the road.
- 2- Do not throw the excavated waste on the lower slope otherwise it will threat the stability of the Joshimath-Malai motor road and its lower slopes.
- 3- In order to maintain the overall stability of the hill slopes and the road construct suitably designed retaining walls/ brest walls all along the road.
- 4- Construct large hill side lined/concrete drain all along the road and make adequate cross drainage arrangements.
- 5- Make adequate arrangements to dispose the waste water on the safe/ stable ground, free flow of accumulated rain water may damage the hill slope and the road.
- 6- The drainage work must be taken up immediately after the excavation of the hill slopes.
- 7- All the construction activity must be carried out as per the standards and norms following the BIS 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 proposed alignment corridor was found suitable for the construction of 2 km long motor road namely Jal Bend to Chilond motor road, located in Ukhimath Block, Distt. Rudraprayag.

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