

कार्यालय प्रमुख अभियन्ता एवं विभागाध्यक्ष
उत्तराखण्ड लोक निर्माण विभाग,
देहरादून।

भू - गर्भीय निरीक्षण आख्या एस0जी0- 599/सड़क/पुल समरेखण/ गढ़वाल/2014

**Geological Assessment of the Alignment corridor
proposed for the extension of Gairsain-Pajiyana-
Ghandiyal motor road, Distt. Chamoli.**

30-अक्टूबर-2014

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Vijay Dangwal

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1. **Introduction:-** The Constructin Division, Public Works Department Gairsain has proposed the 6.00 km extension of Gairsain-Pajiyana-Ghandiyal motor road located in sub Division Gairsain, District Chamoli. On the request of the Er. K.L. Arya, Executive Engineer, C.D, PWD Gairsain I carried out the geological assessment of the proposed alignment of above said road on 11.10.2014 in presence of Er. Prem Pant , the concerned Jr. Engineer.
2. **Location:-** The proposed 6km extension of Gairsain-Pajiyana-Ghandiyal motor road is located in Gairsain Sub Division, Distt. Chamoli.
3. **Geological Assessment:-** The area of the proposed alignment of extension of Gairsain-Pajiyana-Ghandiyal motor road, geologically falls in the inner Lesser Himalayan belt. This tectonic Block of the Main Himalayan Belt is bounded by the Main Boundary Thrust (MBT) in the south and Main Central Thrust (MCT) in the north. The entire gamut is occupied by the varieties of meta sedimentaries rocks i.e. quartzites, phyllites, dolomites. These rocks are intruded by the metabasic sills and dykes. Most of the alignment corridor is occupied by the quartzites, phyllities and metabasic rocks, which are dissected by numerous linear discontinuities like joint shears and faults in nature. These rocks are weathered and oxidized, and the constituents mineral of these have been partially decomposed which resulted in the formation of residual soils. The rocks are dissected by four prominent joint sets which are described in the following table.

Table

S.No	Feature	Dip angle	Azimuth
1	2	3	4
J ₁	(So bedding joint)	25°	N240°
J ₂	joint (foliation)	52°	N045°
J ₃	joint	38°	N160
J ₄	joint	55°	N320

The phyllites exposed along the alignment corridor contain clay minerals in abundance and they are thinly bedded and foliated on contrary to the quartzites which are massive, blocky and widely spaced jointed in nature.

The slopes of the proposed alignment are inclined at 28° to 37° in N 030 to N 150 direction. Mostly these slopes are covered with the envelope of overburden material comprised of angular rock fragments embedded in clay- silt matrix. The "Uniaxial Compressive Strength" of the rocks exposed on the alignment slopes have been estimated ranging between 50 M Pa to 100 M Pa where as the "Undrained Shear Strength" of the overburden material has assessed ranging between 200 k Pa to 350 k Pa.

By and large the alignment slopes are stable and do not manifest any signature of mass wasting like landsliding/ground subsidence.

On the basis of the geological inspection, studies carried at the site and the facts given above, the following recommendations are being made for the proposed construction failing to these this report will be considered as cancelled automatically.

4. Recommendation:-

- (i) Form the road by half cut-half fill method and compact the fill by dynamic compaction.
- (ii) Do not disposed the cut/excavated material into the valley side slopes otherwise disposed the waste on topographically suitable pre-identified dump yards.
- (iii) Excavate the hill side slope from top to bottom in order to maintain overall stability of the slope.
- (iv) Construct suitably designed retaining/ breast wall all along the road.
- (v) Design standards and specification laid down by IRC/MORTH for the similar construction should be strictly followed.
- (vi) Heavy rock blasting should be avoided and blasting holes should be remained low explosive charge with alternative dummy holes this is to dissipate the energy and to avoid large scale of disturbance to the rock face.
- (vii) The road must have adequate long and cross drainage patter arrangements.

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5. **Conclusion:-** On the basis of the geological / geotechnical studies carried at the site and with the above recommendations, the proposed alignment was found geologically suitable for the 6.00 km extension of Gairsain-Pajiyana-Ghandiyal motor road located in sub Division Gairsain, District Chamoli.

V. Dangwal
30/10/14
(Vijay Dangwal)

Sr. Geologist
Office of the Engineer in Chief,
PWD Dehradun