प्रारुप– 33

परियोजना का नाम :– राज्य योजना के अन्तर्गत जनपद टिहरी गढ़वाल के विकास खण्ड भिलंगना में घनसाली– घुत्तू मोटर मार्ग के कि0मी0–2 (0–2) व घनसाली–कोटी– अखोड़ी मोटर मार्ग के कि0मी0–3 (6–8) को जोड़ने हेतु अर्द्वगी में भिलंगना नदी पर स्टील गर्डर मोटर सेतु का निर्माण एवं मोटर मार्ग का नव निर्माण कार्य।(मार्ग के नव निर्माण हेतु वन भूमि हस्तानान्तरण प्रस्ताव। (लम्बाई– 3.00 कि0मी0 + 76.00 मी0 स्पान सेतु)

भू–वैज्ञानिक की आख्या

(प्रस्तावित स्थल की भू–वैज्ञानिक द्वारा निर्गत अद्यतन निरीक्षण आख्या प्राप्त कर संलग्न की जाय।)

संलग्न है

1/Gb

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

भू – गर्भीय निरीक्षण आख्या एस0जी0– 584/सड़क/पुल समरेखण/गढ़वाल/2014

Geological /Geotechnical Assessment of the site proposed for 76 m span bridge over Bhilangana Nadi, Ardangi, Ghansali, Distt. Tehri Garhwal.

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Geological /Geotechnical Assessment of the site proposed for 76 m span bridge over Bhilangana Nadi, Ardangi, Ghansali, Distt. Tehri Garhwal.

Vijay Dangwal
23.09.2014

1- Introduction:- In the fulfillment of request made by Er. Madan Mohan Kala, Executive Engineer, Temporary Division, PWD, Ghansali I carried out the geological/geotechnical assessment of the site proposed for 76 m span bridge at Andargi for connecting km 3.00 of Ghansali-Koti Akhori motor road. Er. Satya Prakash, Astt. Engineer and Er. Deepak Semwal, Jr. Engineer, Temporary Division, PWD, Ghansali was present during the site visit.

2- Location:- The proposed site lies at short distance for Ghansali town and its right abutment over Bhilanagan is located at Ardangi Tok, while the left abutment will be constructed on the lower slopes of km 3.00 of Ghansali-Koti-Akhori motor road, located in Distt. Tehri Garhwal.

3- Geological Assessment:-- The site proposed for the above said bridge geologically falls in the northern margin of Garhwal Lesser Himalayan Belt located closely to south direction of the Main Central Thrust (MCT). Another major tectonic lineament named Srinagar Thrust (ST) runs close to southward direction of the proposed site.

The area in and around the proposed sites is occupied by the quartzites of Garhwal Group which are massive, hard, fresh, and compact and occasionally thinly foliated in nature.

The site proposed for the bridge is located about 400-500 m upstream of the confluence of river Bhilangana and Nailchami gad. The bridge at this site is oriented in N 120- N 300 direction and river Bhilangana flows with a moderate gradient in the S-W direction. In the down stream direction the river bears a zig-zag pattern of flow which is largely controlled by the joints of the hard rock. The massive and blocky bands of quartzites are well exposed on the either side river banks and upslopes and these rock masses are slightly weathered and oxidized in nature. These quartzites exposed at the site are dissected by four prominent joint sets which are

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almost linear and widely spaced in nature. The joints/rock defects are tight and infilled by secondary inclusions. Huge boulders of Granites gneisses and augen gneisses are exposed on the river bed and these dissipates the current at this site

The right bank up slope at the site is comprised of in-situ quartzite rocks and it bears a steep angle while the left bank up slope in inclined at low to moderate angle.

The various geological parameters of the rock mass recorded at the site are as follows:-

1. Rock , Quartzites:- :Fresh, hard, compact ,blockyand open jointed.
2. Weathering Grade (W_0,) : slightly weathered.
3. Uniaxial Compressive Strength (UCS) : 200-250 M M Pa (ISRM Manual Index)
4. RQD : 60-80% (After Deere and Miller)

The details of Joint set (Rock Defects) recorded at the site are give in the following table:-

TABLE

S. No.	*Feature*	*Dip Amount*	*Dip Direction*
1	J_1(bedding)	74^0	N 230
2	J_2 (joint)	35^0	N 045
3	J_3 (joint)	60^0	N 110
4	J_4 (joint)	65^0	N 320

By and large the up slopes of the abutments are stable and free from any mass wasting activity.

4- Seismicity and Seismotechtonics of the area:- As per the BIS Seismic Zonation Map of India the area containing this site falls in Zone V which corresponds to IX intensity on MM scale.

On the basis of the geological/geotechnical studies carried at the site and the facts mentioned above the following suggestions are being made for the construction of the proposed bridge failing to these report will be automatically treated as cancelled.

5- Recommendations:-

1. Place the foundation of either side abutments on fresh, hard and compact in-situ rock mass. The rock excavation in order to site development must be carried out manually as any type of blasting at this site is restricted.
2. All the opening and fractures in the rock mass must be properly grouted at gravity flow pressure and if any cavity depression encounters during the site development it must be backfilled by the concrete of M=15 strength.
3. In order to site development stripping works should be done manually.
4. The proposed bridge is being constructed in the seismically active geodynamic block of Himalaya, therefore the entire bridge and its appurtenant structures must have earthquake resistant design.
5. All the construction activities should be carried out as per the guidelines and standard codes of practice recommended by MORTH/IRC for the construction similar structures.

6- 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 76 m span bridge at Andargi for connecting km 3.00 of Ghansali-Koti Akhori motor road.

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