

परियोजना का नाम :- राज्य योजना के अन्तर्गत जनपद टिहरी गढ़वाल के विकास खण्ड भिलंगना में बाल गंगा नदी एवं भिलंगना नदी के संगम पर बाल गंगा महाविद्यालय को जोड़ने हेतु स्टील गर्डर सेतु एवं एप्रोच मोटर मार्ग का नव निर्माण कार्य। (मार्ग के नव निर्माण हेतु वन भूमि हस्तान्तरण प्रस्ताव। (लम्बाई- 5.00 कि०मी० + 100.00 मी० स्पान सेतु)

भू-वैज्ञानिक की आख्या

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

संलग्न है

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

भू - गर्भीय निरीक्षण आख्या एस0जी0- 643 / सड़क / पुल समरेखण / गढ़वाल / 2014

**Geological Assessment of the site proposed for 100 m
span bridge over Bhilangana for connecting Balganga
Degree College, Distt. Tehri Garhwal.**

16-दिसम्बर-2014



Geological Assessment of the site proposed for 100 m span bridge over Bhilangana for connecting Balganga Degree College, Distt. Tehri Garhwal.

Vijay Dangwal

16-12-2014

1- Introduction:- The Temporary Division, Public Works Department, Ghansali has proposed the construction of 100 m span bridge over Bhilangana for connecting Balganga Degree College, Distt. Distt. Tehri Garhwal under Chief Minister's notification. On the request made by Er. Madan Mohan Kala, Executive Engineer I carried out the geological assessment of the proposed site for this bridge on 04.12.2014 in presence of Er. Ratnesh Kumar Saxena, Astt. Engineer and Er. Sunil Kumar, Jr. Engineer, PWD, Ghansali.

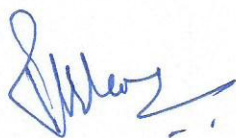
2- Location:- The site proposed for the construction of above said bridge is located over Bhilangana river, about 200 m upstream of its confluence with its right bank tributary river Balganaga.

3- Geological Assessment:- Geologically the site proposed for the bridge is located in the inner Lands of Garhwal Lesser Himalayan Belt bounded by the Main Central Thrust (MCT) in the north and Shrinagar Thrust (ST) in south. Mostly the quartzites belonging to Garhwal Group are exposed in this area. These quartzites exposed on the either banks at this site are comprised of massive bands and these are fresh, hard, and compact and slidghtly weathered in nature. These quartzites have been traversed by four linear discontinuities which are planer, smooth and occasionally infilled by the secondary inclusions. The site proposed for the bridge falls in the close vicinity of Shrinagar Thrust (ST) therefore the affect of thrusting is clearly marked on the rock masses therefore many symapathetic joint planes have been generated on these rock mass exposed on both banks river Bhilangana. The quartzites exhibits very high value of physical competency and their "Uniaxiai, Compressive Strength" has been estimated ranging >250 M Pa and these are "Extremely Strong".

River Bhilanga at the propsed site flows in North 200 direction with a low gradient and its bed is occupied by large sub rounded boulders along with the rock fragments all sizes.

The cross slopes of the river at this are very steep i.e, Cliff and they bears very low relief.

Four prominanat joint sets have been recorded traversing the rock mass exposed on the right and left bank of the site. These joint seets are being given in the following table.



Table

S.No	Feature	Dip angle	Azimuth
1	2	3	4
J ₁	(So bedding joint)	65 ⁰	N180
J ₂	joint ,	80 ⁰	N300
J ₃	joint	35 ⁰	N045
J ₄	joint	78 ⁰	N105

The ground proposed for the construction of either bank abutments is comprised of slightly weathered quartzites which needs removal of the weathered part/stripping.

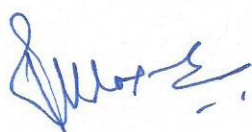
No shear zone has been found traversing these rock masses which needs any special treatment.

4- Seismicity:- According to Indian Standard code the site falls in seismic zone V of seismic zoning Map of India (IS 1893, part 1, 2002) which corresponds to intensity IX on MM scale.

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 construction of the proposed bridge failing to these this report will be treated as cancelled automatically.

5- Recommendations:-

- Place the foundation of the abutments on fresh, hard and compact in-situ rock mass.
- In order to develop the site for the constructions of right abutment, do not blast on the rock, otherwise the site development and stripping works must be done by manual excavation.
- If any cavity encounters during the site development it must be backfilled by the concrete of M=20 strength, likewise if any fracture or opening is encountered it must be grouted properly prior to the construction works of abutments.
- The upstream and downstream banks of the site must be protected by suitably designed structures.
- The bridge must have earthquake resistant design as the proposed construction falls in the geodynamically active Himalayan Belt prone to seismic hazards.
- All the construction activities should be carried out as per the Standard codes of practice laid by the MORTH/ BIS.



6- Conclusion:- On the basis of the geological / geotechnical studies carried at the site and with the above recommendations, the site proposed for the above said bridge was found geologically suitable for the construction of 100 m span bridge over Bhilangana for connecting Balganga Degree College, Distt. Distt. Tehri Garhwal under Chief NMinmistars notification.

V. Dangwal
16/12/2014

(Vijay Dangwal)

Sr. Geologist

Office of the Engineer in Chief,
PWD Dehradun.

[Signature]