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कार्यालय प्रमुख अभियन्ता एवं विभागाध्यक्ष
उत्तरखण्ड लोक निर्माण विभाग,
देहरादून

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Geological Assessment of 7.9 km long alignment corridor proposed for Langasu to Niwadi Khet Silangi motor road, Distt. Chamoli Garhwal

30.अक्टूबर.2015

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Vijay Dangwal

30.10.2015

1. Introduction:- The Temporary Division, Public Works Department, Gauchar vide G.O No 764 / III(2) / 08–65 (प्र0अ0) / 2007 दिनांक 24.03.2008 has been entrusted for the construction of 15 km long (Actural length 7.9) motor road namely Langasu to Niwadi Khet Silangi motor road, Distt. Chamoli Garhwal. On the request made by Er. M.K. Bhatt, Executive Engineer, I carried out the geological assessment of the proposed alignment on 25.07.2015. Er. Amit Kumar Patel, Astt. Engineer and Er. Neha Maindolia PWD, Gauchar, was present during the site visit.

2. Location:- The proposed alignment corridor of the above said motor road originates from the near premise of Baidanu hamlet NH 07 (old 58) and it contains 13 no's of HP Bends. It passes across the upslopes of the National Highway.

3. Geological Assessment:- Geologically, the 7.9 km long alignment corridor of the above said road lies in a part of Inner Lands of Garhwal Lesser Himalaya exposed by the varieties of schists and gneisses. The terrain containing this alignment is rugged and dissected and it is characterized by the steeply inclined hill slopes. Village Niwadi is sitting on top of an old slide zone generated in the geological past. The hill slopes containing this alignment is located on the right bank of river Alaknanda and it is inclined between 60^0 to 70^0 slope oriented towards N 350 – N 010 direction. Presently a small stretch of the National Highway which is located below village Nawadi is under the influence of ground subsidence. The cross slopes of this alignment are largely exposed by the in-situ rock masses comprised of the chlorite schist and overburden material. The rock mass is largely fair in physical competency but at places it is exceptionally poor and its Uniaxial Compressive Strength decreases as low as below 5 M Pa. The gneisses and the chlorite schists belonging to Almora Group are slightly weather and oxidized in nature. These are blocky moderately hard and compact in nature. These rocks contains clayey minerals in abundance therefore these are highly susceptible for the water absorption. As many as four joint sets have been identified traversing these rock mass and the slope facets are controlled by the geometrical interplay of these joints. The details of the joint sets traversing these rock mass exposed on the cross slopes are given in the following table.

Table

S.No	Feature	Dip angle	Azimuth
1	2	3	4
J_1	(S0 bedding Joint)	85°	N 110
J_2	joint	55°	N 260
J_3	joint	40°	N 350
J_4	joint	62°	N 045

Part of this alignment passes across the cross slopes exposed with the thick cover of overburden material. This overburden material is naturally dense, hard and compact in nature. It has been observed that this material contains clay minerals in abundance. The geometrical orientation of the entire slope face is towards N direction and generally such slopes retain

moisture throughout the year. The moist clay content generally undergoes ductile deformation therefore, in case of the road construction the entire surface of the road must be sealed properly by cement concrete from outer edge to inner edge so that the water percolation into the subsurface material cab be checked completely. This

By and large the slopes containing this alignment are stable and do not manifest prominent signatures related to the ground deformation.

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

4. Reccomendations:-

1- Form the road by half cut half fill technique and compact the fill material properly by dynamic compaction.
2- The entire section of the road located above the National Highway must be construction by the cement concrete covered into the hill side. This is so as to check the water infiltration into the subsurface material.
3- Do not dispose the excavated waste on the lower slopes, otherwise it will threat the stability of the stretch National Highway which marks great strategic importance.
4- 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.
5- Construct large size lined long drain all along the hill side of the road and make adequate cross drainage arrangements. The drainage arrangements must be made in such a way so that the water accumulation/accumulated run-off of free water can not take place.
6- Make adequate arrangements to dispose the waste water on the safe/ stable ground.
7- The drainage work must be taken up immediately after the excavation of the hill slopes.
8- The entire hill slope containing this alignment must be protected by the plantation of suitable species.
9- 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 alignment corridor was geologically found suitable for the construction of of 15 km long (Actural length 7.9) motor road namely Langasu to Niwadi Khet Silangi motor road, Distt. Chamoli Garhwal.

30/10/15

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