

RECONNAISSANCE GEOLOGICAL REPORT OF SHRI HARI PRASAD NAUTIYAL S/O SHRI SHANTI PRASAD NAUTIYAL FOR THE PROPOSED CONSTRUCTION OF OWNER DRIVEN CONSTRUCTION HOUSING (ODCH) VILLAGE-BHATWARI, TEHSIL- BHATWARI, DIST.- UTTARKASHI
KHASRA NO.-2218&AREA0.010 ha.

Date of Inspection: 21-12-2013

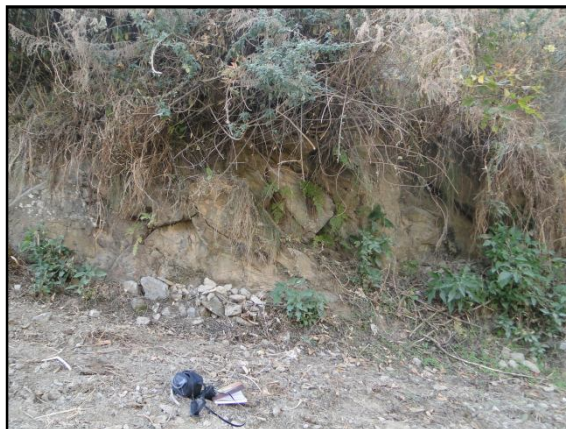
In a 'World Bank' funded programme, Government of Uttarakhand has teams for geological studies in sites proposed for Owner Driven Construction House (ODCH) in disaster affected districts of Uttarakhand.

Director, Geology and Mining Unit, Directorate of Industries, Uttarakhand has issued an office order No. 1612 Aa. Pra./Bhu.Ni./Bhu.Khani.E./2013-14 dated 10th December 2013 regarding geological studies in disaster affected five districts of Uttarakhand, Uttarkashi is one of them. Thus, undersigned have taken geological observation during traverses and collected field geological data under the management of cosignatory departmental 'Assistant Geologist'.

In the above mentioned questioned area, the reconnaissance geological investigation was carried out in the presence and co-operation of Shri Dinesh Chandra Nautiyal, Revenue Sub-Inspector Bhatwari. The proposed construction site is located 35km away from district headquarter Uttarkashi, nearby 200m foot way uphill direction from Gangotri highway and falls on alluvial deposits which is manmade flat terrace, about 400m horizontal distance in the south-west direction on the right bank from Bhagirathi river. The proposed site is dense populated; population is about 2500 in Bhatwari village. That proposed site falls on the coordinates N 30°48'36.1" E 78°37'5.6" and El. 1629m from msl.



A view of the proposed site



Weathered exposed rock in uphill side of the land

The proposed site is situated on a coluvial man-made terrace. The overburden thickness in the proposed site is about 1-1.5m approximately with phyllite fragments of 2-5cm size. Some quartzite boulders of 2-3m size are present on uphill slope. The uphill slope from the site is 35°-40° towards NEE direction for about 35-40m then increases to 45°-50° above that. The downhill slope of the site for about 100m is approximately 15°-20° towards NEE direction and then there is a steep fall of 40°-45° up to the Bhagirathi River towards E direction. The Bhagirathi River is flowing from North to South direction and the site is about

350-400m approximate horizontal distance and 50-70m approximate vertical distance from the Bhagirathi river bank, in East direction. A perennial NavlaNala is present about 300-400m from the site in South direction and Nalais flowing in East direction. The proposed site is low vegetated.

The proposed site is on a cultivated terrace in the Village Bhatwari. There is an active land slide below about 200m SW direction right bank of the Bhagirathi River above the Gangotri national highway from the site. In the proposed site slightly to moderately weathered, moderately jointed and thinly to thickly foliated phyllite with alternate bends quartzite is exposed on hillside of the proposed site. The exposed rock dipping 35° towards N 10° E, joint J1 is 90° , J2 is 65° towards S 20° E and J3 is 80° towards S 70° W direction.

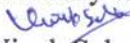
RECOMMENDATIONS:

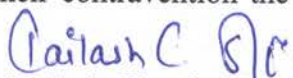
Based on above surface geological observations, the proposed area seems geologically suitable for the proposed building construction. The following remedial measures are recommended for safety:

1. Inclined retaining wall at the uphill and downhill side with depth of foundation more than the foundation depth of the house, with provisions of weep holes and sufficient gap of about 0.5-1.0m in between the backside retaining wall and the proposed construction should be constructed and also, proper drainage system between the retaining wall and the wall of house should be developed.
2. The surface drainage should be properly planned through lined drain/pipe, so both, rainwater from uphill side as well as waste water from the existing houses to be release safe place at down-hill along a channel with more dimensions than that of maximum possible volume of water.
3. Massive plantation of trees, bushes and grasses which can hold the soil mass and retained the debris with dense and long rooted, wide/broad leafed flora must be done to protect the soil erosion and minimize the surface erosion of the subsurface rocks.
4. The soakpits and toilet foundations must be quiet away from the house so that the foundations are not directly affected from subsidence due to excessive seepage.
5. The premises of house must be made 'pukka' to prevent excessive subsurface seepage and downward percolation of water and differential settlement.
6. Framed structure must be used and light roof should be constructed, as the area falls in the earthquake zone IV, so it is essential that the house must be constructed with latest earthquake resistive techniques, scientific and technically sound craftsmanship with logical and favorable principles of soil mechanics.


CONCLUSION:

Prima-facie, presently, the proposed site of Shri. Hari Prasad Nautiyal S/o Shri Shanti Prasad is geologically feasible for the proposed construction, only if, the above mentioned recommendations will be followed strictly, otherwise, in their contravention the geological suitability will be deemed void.


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