

**RECONNAISSANCE GEOLOGICAL REPORT OF PROPOSED SITE OF SHRI BACHAN LAL S/O SHRI SUMAN LAL FOR THE CONSTRUCTION OF OWNER DRIVEN CONSTRUCTION FOR HOUSING (ODCH) VILLAGE-KURDA, TEHSIL- PUROLA DISTRICT- UTTARKASHI KHASARA NO –4316 & AREA –0.014 ha**

**Date of Inspection: 30/12/13**

In a 'World Bank' funded programme, Government of Uttarakhand has provided teams of Consultant Geologists and Consultant Associate Geologist to Director, Geology and Mining Unit, Uttarakhand for geological studies in proposed site for Owner Driven Construction For Housing (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 10<sup>th</sup> 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 R. S. Rana, Revenue Sub-Inspector, Kurda. The proposed site is 4Km approx from Tehsil Headquarter Purola, District Uttarkashi, Uttarakhand and 200m hill side form Purola-Dhaka-Kurona motor road. It falls on coordinate – N 30<sup>0</sup> 53' 11.3" E 78<sup>0</sup> 04' 33.4" El. 1560m. At 200m horizontal distance Khala nala in south direction is present.

The site is located on colluvial deposit and man-made cultivated step terraces are present. The thickness of overburden is varying at places in between 1-1.5m approx with boulders of quartzite and gneisses embedded in the soil. The general slope is 20<sup>0</sup> – 25<sup>0</sup> towards valley side. The downhill slope is 25<sup>0</sup>-30<sup>0</sup> and uphill slope is 30<sup>0</sup> -35<sup>0</sup> slopping in S 40<sup>0</sup> E direction. Very thin soil cover of 2-5cm approx with less vegetation is present.

At the proposed site in-situ rock phyllite with quartz vein is exposed at about 30-40m approx on the foot way. The orientation of the bed is as- Dip amount 15<sup>0</sup> dipping in W direction. The rocks are jointed and weathered and orientation of the joints is as- J1 –Dip amount 90<sup>0</sup>, J2 dip amount 60<sup>0</sup> dipping in N 40<sup>0</sup> E direction. The dip of the bed is towards the hill.



**Close view of the proposed site**

At the proposed site, thin and consolidated soil cover with rock fragments of phyllite varying in size from 5-10cm, with fined grained light brownish silty soil matrix are found. Boulders were embedded in the soil of varying size from 60cm to 80cm approx at and around the proposed site. The soil water saturation is moderate to high in the western side of the proposed site due to Khala-Nala, there is no active movement in the area. Some construction work is already under progress at the proposed site.

### 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 2-3feet 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. The foundation of the houses must be kept on in-situ rock, if found at accessible depth.
4. 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 at the uphill side and in southern side must be done to protect the soil erosion and minimize the surface erosion of the subsurface rocks.
5. 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.
6. The premises of house must be made 'pukka' to prevent excessive subsurface seepage and downward percolation of water and differential settlement.
7. 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 favourable principles of soil mechanics.


### CONCLUSION:

Prima-facie, presently, the proposed site of Shri. Bachan Lal S/o Shri Sohan Lal is geologically feasible for the proposed construction, only if, the above mentioned recommendations will be followed strictly, otherwise, in their contravention; geological suitability will be deemed annulled.

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