

**RECONNAISSANCE GEOLOGICAL REPORT OF SHRI BHAGWATI PRASAD S/O**  
**SHRI BADRI PRASAD FOR THE PROPOSED CONSTRUCTION OF OWNER**  
**DRIVEN CONSTRUCTION HOUSING (ODCH)**  
**VILLAGE-BHATWARI, TEHSIL- BHATWARI, DIST.- UTTARKASHI**  
**KHASRA NO.-3516&AREA-0.026 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 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 Dinesh Chandra Nautiyal, Revenue Sub-Inspector, Bhatwari. The proposed construction site is located 35km away from district headquarter Uttarkashi, nearby Gangotri highway. The proposed site situated on bed rock phyllite which is manmade flat land at 300m horizontal distance in the south-west direction on the right bank of Bhagirathi river. The proposed site is dense populated, population is about 2500. That proposed site falls on the coordinates N 30°48'21.2" E 78°37'8.8" and El. 1623m from msl.



**North view of the site**



**Phyllite outcrop in proposed site**

The proposed site situated about 300m horizontal distance in the south-west direction on the right bank of Bhagirathi River on the bed rock phyllite which is manmade sloppy land. Overburden thickness is about 1-1.5m, in overburden phyllite fragment varying 1-5cm with coarse to fine grain blackish grey soil matrix. There is no cultivated land and low vegetation surrounding area. There are densely populated area, About 200m hill side from proposed site gentle slope trending 15°-20° in south-west direction and valley side slope is moderate

trending  $30^{\circ}$ - $35^{\circ}$  in north-east direction. The perennial Navla Nala about 250-300m North direction is present from the site.

The proposed area is thinly covered overburden on phyllite rock. The angular and sub-angular fragment of Phyllite varying 1-3cm with brownish coarse to fine grain silty soil matrix made up of the land. The site is rest on gentle hill slope towards eastern direction. On the site slightly weathered, minor folded and thinly to thickly foliated Phyllite bedrock seen hill side on the land and Pahi-Gorsali road in behind the site. The exposed rock dipping  $10^{\circ}$ - $20^{\circ}$  towards N  $30^{\circ}$  E, joint J1 trending is  $70^{\circ}$  towards S  $80^{\circ}$  E and J2 is  $80^{\circ}$  towards S  $50^{\circ}$  W direction. There is no water seepage; landslide and weak zone seen around the site.


### RECOMMENDATIONS:


Based on above surface geological observations of the proposed area, geologically suitable for building construction and the following remedial measures are recommended:

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 soak pits 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. 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. Bhagwati Prasad S/o Shri Badr 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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Consultant Associate  
Geologist

  
(Kailash Chandra Sati)  
Consultant Geologist

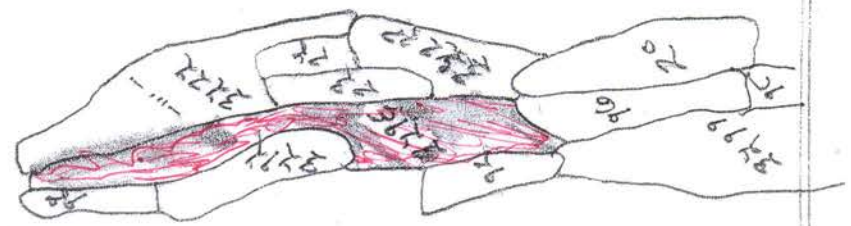
**Date:**  
**Place: Uttarkashi**

  
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no ribs present  
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 o/s distal radius joint go - least 1/4" fracture line narrow

51275 P/B

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