

**RECONNAISSANCE GEOLOGICAL REPORT OF PROPOSED SITE OF**  
**SHRI BACHAN SINGH S/O SHRI INDER SINGH FOR THE CONSTRUCTION OF**  
**OWNER DRIVEN CONSTRUCTION HOUSING (ODCH)**  
**VILLAGE- NAGANGAON, TOK- TIMRALI, TEHSIL- BARKOT, DISTT.-**  
**UTTARKASHI**  
**KHASARA NO – 5420(a) & AREA – 0.020 ha**

**Date of Inspection: 19-12-2013**

## **1. INTRODUCTION:**

In a 'World Bank' funded programme, Government of Uttarakhand has provided teams of Consultant Geologists and Consultant Associate Geologists to Director, Geology and Mining Unit, Uttarakhand for geological studies in proposed sites 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 traversed and collected field geological observations 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 Bharat Singh Rawat, Revenue Sub-Inspector, Nagangaon, for proposed site of Shri Bachan Singh S/o Shri Inder Singh, Village Nagangaon, Tok Timrali, Tehsil- Barkot, Khasara No- 5420(a), and Area- 0.020 ha. The site is 12km approximately from Tehsil Barkot, District Uttarkashi, Uttarakhand and is approachable 9km by NH-123 (Delhi-Yamunotri National Highway) and then 3km via Nagangaon-Masalgaon Motor road. The site is 100-120m from the road in West direction. It falls on coordinates – N 30°50.559' E 78°15.235' and elevation 1402m. The site is on the right bank of river Yamuna and is about 400-500m approximately distance from the Yamuna river bank, in South direction. The site is highly populated.

## **2. GEOMORPHOLOGY OF THE PROPOSED AREA:**

The proposed site is situated on a flat terrace about 50-55m downhill in West direction from the Nagangaon-Masalgaon Motor road. The uphill slope from the site is 50-55° towards West direction and the downhill slope of the site is very gentle approximately 1°-2° towards West direction. The site is 2-3m above the downhill terrace in West direction. The overburden thickness in the proposed site is about 15-20m approximately and the soil matrix is composed of brown colored silty clay with phyllite fragments of 2-5cm. There is Badiyar River flowing in Southwest direction about 80-100m horizontal distance in

Northwest direction from the site. The proposed site is less vegetated and cultivated terraces are present.

### **3. REGIONAL GEOLOGY AND GEOLOGICAL OBSERVATION AROUND THE CONSTRUCTION SITE:**

Uttarkashi valley exhibits characteristic rugged topography of the Lesser Himalayan terrain. The ground elevations generally vary between 1150m to 2000m above msl. The hill slopes in the area are generally observed to comprise of rocky outcrops, rocky cliffs and mantle of colluviums. The hill slopes in the area is generally moderately steep ( $25^{\circ}$ -  $35^{\circ}$ ) to steep ( $36^{\circ}$ -  $45^{\circ}$ ) while few escarpments or cliffs ( $> 50^{\circ}$ ) are also present. Uttarkashi town is located in the Lesser Himalayan geotectonic block and it is bound by two major Thrust fault i.e. Main Central Thrust (MCT) and Srinagar Thrust (ST). The MCT can be traced to the northeast of Uttarkashi while the Srinagar Thrust lies in the southwest. Phyllite, metabasic and quartzite of Garhwal Group are exposed around the area.

Geologically, the area falls in the region of rocks of Bhatwari-Barkot Formation (= Chail) of Ramgarh Group of Lesser Himalayan terrain, the rocks are mainly phyllites, quartzites with intrusion. It should be emphasized that the quartzites, phyllites and metabasics (= Chail) directly underlying the crystalline are a typical phenomenon for all the Himalayas.

No in-situ rocks found near the proposed site. The site is consolidated and stable.

### **4. GEOTECHNICAL OBSERVATION OF THE PROPOSED CONSTRUCTION SITE:**

The proposed area is on a flat colluvial deposit man made terrace. The soil type here is colluvial and brown colored silty clay material with thickness of 1-2m. The general slope of the site is  $15^{\circ}$ - $20^{\circ}$  towards West direction. The proposed site depending on the geotechnical observations is stable for the construction of the house.



**A far view of the proposed site from West direction.**

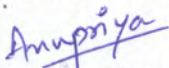
## 5. RECOMMENDATIONS:


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

1. An inclined retaining wall must be constructed in two steps of 2m each in uphill East direction of the proposed site and another retaining wall of 2m in the downhill West direction of the site.
2. The foundation depth of the houses must be as per the compactness of the overburden material in the proposed site.
3. A minimum gap of about 3-4ft must be kept between the backside retaining wall and the backside wall of the proposed house to prevent seepage into the house.
4. The back, sides and premises of the houses must be made cemented to prevent subsurface seepage and a proper drainage system to be developed.
5. Light roof and deep column must be constructed for the proposed houses.
6. The area falls in Lesser Himalayan earthquake zone IV so the houses must be erected with latest earthquakes resistive techniques, and scientific and technically sound craftsmanship.

## 6. CONCLUSION:


Prima-facie, the proposed site of Shri Bachan Singh S/o Shri Inder Singh 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.

  
(Anupriya Shah)  
Consultant Associate Geologist

  
(Deepak Singh)  
Consultant Geologist

**Date:** 25<sup>th</sup> Dec 2013

**Place:** Camp Uttarkashi

  
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नं. 14201 गाँव व 2110 गाँव मध्ये विमपली गाँव होय वरिष्ठ जे पुरी गाँव व प्रभावित  
 वीकल रविसारा भोजी  
 तहसील बसवेट, जिला उत्तरकाशी पर वही आपदा प्रभावित परिवार हेतु  
 प्रीपेडिक्ट भवन निर्माण हेतु भूमि प्रस्तावित की जा रही है।



खसरा नम्बर	वेगफल हे० मी	खसरा संख्या	जमा	भूमि का नाम	का विवरण
5419				प्रस्तावित भूमि	चरवादि, अन्नबि, प्रभावित के हक
5417				वेचनबि, अन्नबि, प्रभावित के हक	व कब्जे
5420				510 कुल के हक	में है।
5422				(2) प्रस्तावित	
			39	(3) अन्नबि	

- (1) उत्तर दिशा में खसरा नं० 5419 अन्नबि 310 कुल के हक
- (2) दक्षिण दिशा में खसरा नं० 5422 चरवादि के हक
- (3) पूर्व दिशा में खसरा नं० 5417 अन्नबि के हक
- (4) पश्चिम दिशा में खसरा नं० 5419 अन्नबि के हक


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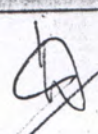
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कल खसरा मौजा ..... मध्ये तोक, पट्टा .....  
 तहसील बडकोट, जिला उत्तरकाशी जहा पर देवी आपदा प्रभावित परिशिष्ट हेतु  
 प्रीफेब्रिकेट भवन निर्माण हेतु भूमि प्रस्तावित की जा रही है।

खसरा नम्बर	क्षेत्रफल हे० में	खतौनी संख्या	खाता	भूमिधर नाम/पिता/पति का नाम	का विवरण
1	2	3		4	5
5420	0.020	39		✓ श्री. प्रदीप, अमनबल श्री. चमनबल, अमनबल श्री. कुचर, बिलगाय	प्रस्तावित भूमि प्रभावित के हक हिस्से व कब्जे कास्त में है।
योग					

  
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