

**RECONNAISSANCE GEOLOGICAL REPORT OF PROPOSED SITE OF SHRI  
KAMAL SINGH S/O SHRI JITWAR SINGH FOR THE CONSTRUCTION OF  
OWNER DRIVEN CONSTRUCTION HOUSING (ODCH)  
TOK LUNTHRU, VILLAGE BAYANA, TEHSIL- BHATWARI- DISTRICT  
UTTARKASHI, UTTARAKHAND  
KHASARA NO – 3034 & AREA – 0.016 ha.**

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

**INTRODUCTION:**

In a 'World Bank' funded programme, Government of Uttarakhand has consummate teams of undersigned for geological studies in proposed site 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.

In the above mentioned questioned area, the reconnaissance geological investigation was carried out in the presence and co-operation of Shri Subodh Singh Rana, Revenue Sub-Inspector, Maneri for proposed site of Shri. Kamal Singh S/o Shri. Jitwar Singh falling in Village Lunthru, Tehsil- Bhatwari, Khasara no.- 3034 and area 0.016 ha and is 19Km approx from District Headquarter Uttarkashi, Uttarakhand. At the proposed site there is habitation of people on the downhill side of the proposed site. There is no plot boundary.

It falls on coordinate –N 30<sup>0</sup> 44.539' E 78<sup>0</sup> 33.483' elevation 5443feet. The site is 5Km approx from NH-108 (Gangotri-Dharasu National Highway) through bridle path on the left bank of river Bhagirathi and is about 700-800m approx distance from the Bhagirathi river bank. The Bhagirathi river is in N 285° direction with respect to the site. The vertical height of the proposed site with respect river bank is 1168feet.

**GEOMORPHOLOGICAL OBSERVATION OF THE AREA:**

The uphill slope at the proposed site is 47<sup>0</sup> in NE direction and the downhill slope is 32<sup>0</sup> in SW direction. The site is situated on overburden of about 100m approx. thickness having boulders embedded in the soil of 1-3m approx dimension. Brahmanda Gad, is passing from about 500m approx distance flowing in East to West direction. The terraces are man-made. At the proposed site, location is covered with thick alluvial soil. The land is consolidated. At about 250-300m approx there is Deodar vegetation in NE direction.

**GEOLOGY OF OBSERVATION OF THE AREA:**

**Regional Geological Details**

Uttarkashi valley exhibits characteristic rugged topography of the Lesser Himalayan terrain. The ground elevations generally vary between 1150 to 2000meters 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°- 35°) to steep (36°- 45°) while few escarpments or cliffs (> 50°) 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 Netala Formation of Lesser Himalayan terrain. Quartzite with bands of limestone, phyllite and slate is fine grained, compact, massive in general, but jointed and fractured at places. The slope of the hill ranges between 25°-30° towards eastern direction. At few places insitu rocks are exposed in the plot whereas maximum plot area is covered with overburden. This overburden material comprising soil, hillwash and debris of varying size consisting of brown colored, fine to medium grained silty to gravelly matrix with angular fragments of dolomitic limestone and a few brown fine grained shale etc., in which percentage of the angular fragments is more than the matrix. The major joint trends 240°/30° NW (Oblique to foliation plane) whereas minor joint trends 265°/40° NW.

### **Local Geological Observation**

At the proposed site there was no insitu rock exposed but the small angular fragments of quartzite are found mixed in the soil matrix. The boulders were also of quartzite and also fragments of meta-basic rocks were found.

### **GEOTECHNICAL OBSERVATION OF THE AREA:**

At the site there is thick alluvial soil cover of 20-30m approx thickness which is consolidated with little moisture content. In the uphill and downhill side terraces of the proposed site there are temporary retaining walls already constructed to provide stability to the slopes. The proposed site the soil is consolidated, the rate of infiltration is high making the soil water saturation high as the area receive high rainfall. At the present time the site looks stable and unaffected by any type of mass movement but as there is heavy vegetation of Deodar at uphill side on a steep gradient then the possibility of slumping and other type of mass movement increases.



**Side view of the proposed site for construction**



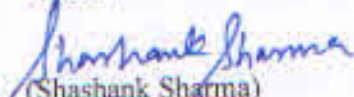
**Deodar tree above the proposed site**

### CONDITIONS AND RECOMMENDATIONS:

1. At the proposed site proper embankment at the toe is strongly recommended.
2. The foundation depth need to be estimated depending on the compactness of the overburden to stabilize the site and also a retaining wall at the backside is recommended.
3. Proper drainage for surface and sub-surface water discharge is strongly recommended.
4. Framed structure must be used as the area falls in the earthquake zone IV, and it is essential that the house must be constructed with latest earthquake resistive techniques.

### CONCLUSION:

Prima-facie, the proposed site of Shri. Kamal Singh S/o Shri. Jitwar Singh is geologically feasible for the construction of house, only if the above mentioned recommendations will be followed strictly, otherwise, in its contravention; geologically suitability will be deemed voided.

  
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Date: 18/12/2013  
Place: Uttarkashi

  
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Assistant Geologist

1874-1880  
Bitter Lake Station  
Sole - 1st 10/16-12/15

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