

**RECONNAISSANCE GEOLOGICAL REPORT OF PROPOSED SITE OF SHRI  
KEDAR SINGH S/o SHRI GANGA SINGH FOR THE CONSTRUCTION OF  
OWNER DRIVEN CONSTRUCTION FOR HOUSING (ODCH)  
TOK SURKHIRLA, VILLAGE VARNIGAD MUGARSANTI, TEHSIL- BARKOT-  
DISTRICT UTTARKASHI, UTTARAKHAND  
KHASARA No. – 1037 & AREA – 0.036 ha.**

**Date of Inspection: 24/12/13**

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 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 Bhagat Singh Rawat, Revenue Sub-Inspector, Tiyan. It is 23Km approx from Tehsil Headquarter Barkot, Uttarkashi, Uttarakhand and the site is 17Km approx on Kanakopnal Motarmarg from NH-123 (Delhi-Yamunotri National Highway). It falls on coordinate – N 30° 43.247 E 78° 08.142 El. 4300feet. The proposed site is in Surkhirla Tok of village Varnigad mugarsanti which is least populated.

The proposed site is on consolidated colluvial overburden material varying in thickness from 2.3-3.5m. Man-made cultivated terraces are present. The uphill slope at the proposed site is 43°-46° and the downhill slope is 25°-27° approx sloping in N 350° direction. 'Varnigad' a tributary of Yamuna river is flowing almost 300m vertical distance from the proposed site, flowing in N 280° direction. Around the proposed site location moderate vegetation is present at about 80-100m approx distance.

Near the proposed site Limestone in-situ rock with quartz vein is exposed which is lightly weathered. The orientation of the beds of the in-situ rock is towards the hillside and is as - Dip amount 38° dipping in N 160° direction.



**Far view of the proposed site**


At the proposed site, thick colluvial soil cover is present and with boulders of size 20cm to 1m approx. Small rock fragments are present in the soil matrix. The soil is consolidated the rate of infiltration is low making the soil water saturation low. At and around the proposed site location the water seepage is low. The tree above and around the site are standing straight which shows the site is stable.

### RECOMMENDATIONS:

1. Inclined retaining wall at the south-eastern backside 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.
3. The foundation depth of the houses must be as per the compactness of the overburden material in the proposed site.
4. Inclined retaining wall at the toe of the proposed site with provision of weep holes at specific distance should be constructed.
5. 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.
6. 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.
7. The premises of house must be made 'pukka' to prevent excessive subsurface seepage and downward percolation of water and differential settlement.
8. 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. Kedar Singh S/o Shri. Ganga Singh is geologically feasible for the proposed construction, only if, the above mentioned recommendations will be followed strictly, otherwise, in its contravention; geologically suitability will be deemed annulled.

  
(Shashank Sharma)  
Consultant Associate Geologist

**Date:**

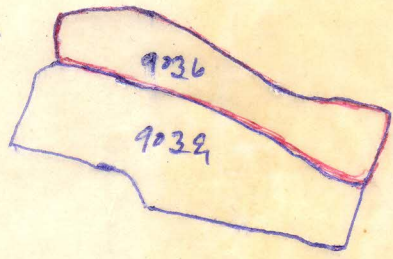
**Place: Camp Uttarkashi**

  
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नक्शा ग्राम - नमिगाड मध्य वंश, पक्ष सुमेलित, वेदील - वजल  
 का अंशरहित, अंशरहित का अंशरहित ग्राम, अंशरहित, पक्ष सुमेलित  
का अंशरहित का अंशरहित ग्राम - वजल

यमाना 64 = 1 मील



य वजल एव 0.5 C.H.

सिद्ध

अंशरहित ग्राम

यमाना 64  
 2034/06/43  
 10/11  
 24/12/13

नक्शा ग्राम - नमिगाड (सुमेलित) पक्ष सुमेलित, वेदील - वजल  
 का अंशरहित अंशरहित का अंशरहित ग्राम - वजल

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