

**Distribution of Houses by Predominant Materials of Roof and Wall
and Level of Damage Risk**

Table No. : UK 13

State : UTTARAKHAND

HARDWAR

Wall / Roof		Census Houses		Level of Risk under								
		No. of Houses	%	EQ Zone				Wind Velocity m/s				Flood Prone Area in %
				V	IV	III	II	55 & 50	47	44 & 39	33	
				Area in %				Area in %				
				100				67.1		32.9		9.3
WALL												
A1 - Mud & Unburnt Brick Wall	Rural	21,331	4.7									
	Urban	4,569	1.0									
	Total	25,900	5.7		<i>H</i>				<i>VH</i>		<i>M</i>	<i>VH</i>
A2 - Stone Wall not packed with mortar	Rural	2,956	0.7									
	Urban	2,850	0.6									
	Total	5,806	1.3		<i>H</i>				<i>H</i>		<i>L</i>	<i>VH</i>
Total - Category - A		31,706	7.0									
B - Burnt Bricks Wall & Stone wall packed with mortar	Rural	243,815	53.9									
	Urban	156,709	34.7									
	Total	400,524	88.6		<i>M</i>				<i>H</i>		<i>L</i>	<i>H/M</i>
Total - Category - B		400,524	88.6									
C1 - Concrete Wall	Rural	3,918	0.9									
	Urban	3,105	0.7									
	Total	7,023	1.6		<i>L</i>				<i>L</i>		<i>VL</i>	<i>L/VL</i>
C2 - Wood wall	Rural	432	0.1									
	Urban	176	-									
	Total	608	0.1		<i>L</i>				<i>VH</i>		<i>M</i>	<i>H</i>
Total - Category - C		7,631	1.7									
X - Other Materials	Rural	10,079	2.2									
	Urban	2,184	0.5									
	Total	12,263	2.7		<i>VL</i>				<i>VH</i>		<i>M</i>	<i>VH</i>
Total - Category - X		12,263	2.7									
TOTAL HOUSES*		452,124										

ROOF												
R1 - Light Weight Sloping Roof	Rural	44,177	9.8									
	Urban	13,461	3.0									
	Total	57,638	12.8		<i>M</i>				<i>VH</i>		<i>H</i>	<i>VH</i>
R2 - Heavy Weight Sloping Roof	Rural	5,522	1.2									
	Urban	3,321	0.7									
	Total	8,843	1.9		<i>M</i>				<i>H</i>		<i>L</i>	<i>H</i>
R3 - Flat Roof	Rural	232,832	51.5									
	Urban	152,811	33.8									
	Total	385,643	85.3		Damage Risk as per that for the Wall supporting it							
TOTAL HOUSES*		452,124										

Probable Maximum Precipitation at a Station of the district in one day for arial extent of 1000 sqm. 680 mm

Housing Category : Wall Types

Category - A : Buildings in field-stone, rural structures, unburnt brick houses, clay houses

Category - B : Ordinary brick building; buildings of the large block & prefabricated type, half-timbered structures, building in natural hewn stone

Category - C : Reinforced building, well built wooden structures

Category - X : Other materials not covered in A,B,C. These are generally light.

Notes : 1. Flood prone area includes that protected area which may have more severe damage under failure of protection works. In some other areas the local damage may be severe under heavy rains and choked drainage.

2. Damage Risk for wall types is indicated assuming heavy flat roof in categories A, B and C (Reinforced Concrete) building

3. Source of Housing Data : Census of Housing, GOI, 2011

Housing Category : Roof Type

Category - R1 - Light Weight (Grass, Thatch,

Bamboo, Wood, Mud, Plastic, Polythene,

GI Metal, Asbestos Sheets, Other Materials)

Category - R2 - Heavy Weight (Tiles, Stone/Slate)

Category - R3 - Flat Roof (Brick, Concrete)

EQ Zone V : Very High Damage Risk Zone (MSK > IX)

EQ Zone IV : High Damage Risk Zone (MSK VIII)

EQ Zone III : Moderate Damage Risk Zone (MSK VII)

EQ Zone II : Low Damage Risk Zone (MSK < VI)

Level of Risk : VH = Very High; H = High;

M = Moderate; L = Low; VL = Very Low

* Total No.of Houses excluding Vacant/Locked Houses