

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

**Table No. : UP 02**

**State : UTTAR PRADESH**

**MUZAFFARNAGAR**

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				100				16.1	
<b>WALL</b>													
<b>A1 - Mud &amp; Unburnt Brick Wall</b>	Rural	36,921	4.1										
	Urban	9,300	1.0										
	<b>Total</b>	<b>46,221</b>	<b>5.1</b>		<i>H</i>			<i>VH</i>				<i>VH</i>	
<b>A2 - Stone Wall not packed with mortar</b>	Rural	6,619	0.7										
	Urban	4,539	0.5										
	<b>Total</b>	<b>11,158</b>	<b>1.2</b>		<i>H</i>			<i>H</i>				<i>VH</i>	
<b>Total - Category - A</b>		<b>57,379</b>	<b>6.3</b>										
<b>B - Burnt Bricks Wall &amp; Stone wall packed with mortar</b>	Rural	567,152	62.4										
	Urban	248,162	27.3										
	<b>Total</b>	<b>815,314</b>	<b>89.7</b>		<i>M</i>			<i>H</i>				<i>H/M</i>	
<b>Total - Category - B</b>		<b>815,314</b>	<b>89.6</b>										
<b>C1 - Concrete Wall</b>	Rural	3,490	0.4										
	Urban	2,576	0.3										
	<b>Total</b>	<b>6,066</b>	<b>0.7</b>		<i>L</i>			<i>L</i>				<i>L/VL</i>	
<b>C2 - Wood wall</b>	Rural	784	0.1										
	Urban	420	-										
	<b>Total</b>	<b>1,204</b>	<b>0.1</b>		<i>L</i>			<i>VH</i>				<i>H</i>	
<b>Total - Category - C</b>		<b>7,270</b>	<b>0.8</b>										
<b>X - Other Materials</b>	Rural	22,452	2.5										
	Urban	7,105	0.8										
	<b>Total</b>	<b>29,557</b>	<b>3.3</b>		<i>VL</i>			<i>VH</i>				<i>VH</i>	
<b>Total - Category - X</b>		<b>29,557</b>	<b>3.2</b>										
<b>TOTAL HOUSES*</b>		<b>909,520</b>											

<b>ROOF</b>												
<b>R1 - Light Weight Sloping Roof</b>	Rural	231,076	25.4									
	Urban	57,760	6.4									
	<b>Total</b>	<b>288,836</b>	<b>31.8</b>		<i>M</i>			<i>VH</i>				<i>VH</i>
<b>R2 - Heavy Weight Sloping Roof</b>	Rural	51,160	5.6									
	Urban	11,943	1.3									
	<b>Total</b>	<b>63,103</b>	<b>6.9</b>		<i>M</i>			<i>H</i>				<i>H</i>
<b>R3 - Flat Roof</b>	Rural	355,182	39.1									
	Urban	202,399	22.3									
	<b>Total</b>	<b>557,581</b>	<b>61.4</b>	Damage Risk as per that for the Wall supporting it								
<b>TOTAL HOUSES*</b>		<b>909,520</b>										

Probable Maximum Precipitation at a Station of the district in one day for arial extent of 1000 sqm. 523 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