

According to Vulnerability Atlas of India, made by Building Material and Technology Promotion Council, Distribution of Houses by Predominant Materials of Roof and Wall and Level of Damage of Risk in Haryana is shown in below Table:-

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 %				
					54.2	34.3	11 .5		100			30.6
Wall												
A1-Mud &Unburnt Brick wall	Rural	239,519	4.7									
	Urban	64,956	1.3									
	Total	304,475	6.0		H	M	L		H			VH
A2-Stone wall	Rural	168,795	3.3									
	Urban	16,667	0.3									
	Total	185,462	3.6		H	M	L		M			VH
Total Category - A		489,937	9.6									
B- Burnt Bricks Wall	Rural	3,038,990	59.5									
	Urban	1,427,666	28.0									
	Total	4,466,656	87.5		M	L	V L		M			H/M
Total Category - B		4,466,656	87.5									
C1- Concrete Wall	Rural	24,761	0.5									
	Urban	25,753	0.5									
	Total	50,514	1.0		L	VL	V L		VL			L/VL
C2- Wood Wall	Rural	5,115	0.1									
	Urban	4,014	0.1									
	Total	9,129	0.2		L	VL	V L		H			H
Total Category - C		59,643	1.2									
X- Other Materials	Rural	67,304	1.3									
	Urban	22,735	0.4									
	Total	90,039	1.7		VL	VL	V L		H			VH
Total Category - X		90,039	1.7									
Total Buildings		5,106,275										
Roof												
R1-Light Weight Sloping Roof	Rural	1,537,872	30.1									
	Urban	268,491	5.3									
	Total	1,806,363	35.4		M	L	VL		VH			VH
R2-Heavy Weight Sloping Roof	Rural	96,303	1.9									
	Urban	34,564	0.7									
	Total	130,867	2.6		M	L	VL		M			H
R3- Flat Roof	Rural	1,910,309	37.4									
	Urban	1,258,736	24.7									
	Total	3,169,045	62.1	Damage risk as per that for the Wall supporting it								
Total Buildings		5,106,275										

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

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, Slate)

Category -R3- Flat Roof (Brick, Stone, Concrete)

Risk Level	Extent of damage
Damage risk level for earthquake	
High Damage Risk (H)	Gaps in walls; parts of buildings may collapse; separate parts of the building lose their cohesion; and inner walls collapse
Moderate Damage Risk (M)	Large and deep cracks on walls fall of chimneys on roofs.
Low damage Risk (L)	Small Cracks in walls; fall of fairly large pieces of plaster, pantiles slip off; cracks in chimneys, part may fall down.
Damage Risk levels for Wind Storms	
Very High Damage Risk (VH)	Generally similar to: High Risk” but damage is expected to be more widespread as in the case of cyclonic storms.
High Damage Risk (H)	Boundary walls overturn, walls in house and industrial structures fail; roofing sheets, and tiles or whole roofs fly; large scale destruction of life-line structures such as lighting and telephone poles, a few transmission line towers/communication towers <i>may</i> suffer damage; and non engineered/ semi constructions suffer heavy damage.
Moderate Damage Risk (M)	Loose tiles of clay fly, roofs sheets fixed to battens fly; moderate damage to telephone and lighting poles; moderate damage to non-engineered/semi-engineered buildings.
Very Low damage Risk (VL)	Loose metal or fibre cement sheets fly; a few lighting and telephone poles go out of alignment; sign boards hoardings partially damaged; well detailed non-engineered/semi-engineered buildings suffer very little damage.
Damage Risk levels for Flood	
Very High Damage Risk (VH)	Total collapse of buildings; roof and some walls collapse; floating away of sheets, thatch etc; erosion of foundation; severe damage to life line structures and systems.
High Damage Risk (H)	Gaps in wall; punching of holes through wall by flowing water; parts of buildings may collapse; light roofs float away; erosion of foundation, sinking or tilting; undercutting of floors, partial roof collapse.
Moderate Damage Risk (M)	Large and deep cracks in walls; loss of belongings; damage to electric fittings.
Low damage Risk (L)	Small cracks in walls; fall of fairly large pieces of plaster
Very Low damage Risk (VL)	Fine cracks in plaster; fall of small pieces of plaster.

Note: -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, 2001