

## FYR of Macedonia: Summary of Building Types, Vulnerability to Collapse and Occupancy

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WHE Construction Type or Material <i>(refer to Table 2 for suggested category (ies))</i>	Description of construction type (type of load-bearing structure) <i>(refer to Tables 2 and 3 for suggested categories and sources of data to help answer this question)</i>	Estimate of probability of collapse (%) of the building type when subjected to the specified shaking intensity (expressed as a range) <i>(refer to instructions page 5)</i> (3) <b>MMI / EMS / MSK</b>				Fraction of population who LIVES in this building type <i>(refer to instructions for help in estimating)</i>		Fraction of WORKING population who WORKS in this building type <i>(refer to instructions on page 5 for help in estimating)</i>		Peak average number of occupants per building <i>(refer to instructions on page 5 for help in estimating)</i>
		IX (~0.65-1.24g)	VIII (~0.34-0.65g)	VII (~0.18-0.34g)	VI (~0.092-0.18g)	urban areas (4)	rural areas (5)	urban areas (6)	rural areas (7)	
(1)	(2)									(8)
Masonry	[1] Rubble stone (field stone) in mud/lime mortar or without mortar	75	40	15	5	1	5	0	0	3-5
Masonry	[3, 4] Mud walls, Mud walls with horizontal wood elements	90	70	25	5	1	5	0	0	3-5
Masonry	[7] Unreinforced brick masonry in mud mortar	70	35	12	2	5	15	0	0	3-5
Masonry	[9] Unreinforced brick masonry in lime/cement mortar with reinforcement	50	25	6	1	5	15	1	5	12-15
Masonry	[10] Confined brick/block masonry with concrete posts/tie columns	10	6	1	0	20	30	5	40	20-25
Structural concrete	[14] MRF designed for gravity loads only (predating seismic codes i.e. 1963)	35	10	2	0	15	5	25	2	80-100
Structural concrete	[15] MRF designed with seismic features (various ages)	12	4	1	0.1	25	5	20	10	150-200
Structural concrete	[19] MRF with concrete shear wall-dual system	7	2	0.2	0	25	3	30	5	200-300
Structural concrete	[21] Shear Walls cast in-situ	3	1	0.1	0	5	0	2	0	300-350

Refer to Part 3 (next 3 pages) for tables and links that may help you fill out this form.

If you do not know some of the answers please indicate so with a dash ---- or ?. Use 0 only when you know the number or percent IS 0.

### Other Sources Consulted:

Zoran MILUTINOVIC, Professor, Head, Section for Risk, Disaster Management and Strategic Planning, Institute of Earthquake Engineering and Engineering Seismology (IZIIS-Skopje), P.O. Box 101, Skopje-1000, R. of Macedonia; zoran@pluto.iziis.ukim.edu.mk

State Statistical Office of Republic of Macedonia ([http://www.stat.gov.mk/english/glavna\\_eng.asp](http://www.stat.gov.mk/english/glavna_eng.asp)); Catalog of publications (<http://www.stat.gov.mk/english/katalog.asp>)

IZIIS-Skopje, Damage and loss surveys following 1963 Skopje and 1967 Debar (Macedonia), 1969 Banja Luka (Bosnia and Herzegovina), 1979 Montenegro, 1980 Kopaonik (Serbia), 1986 Knin (Croatia), 1990 Gevgelija and 1994 Bitola (Macedonia) earthquakes