

Damage of RC Wall Buildings  
due to Past Damaged Earthquake

Table 1.2-1 Damage of Superstructure of RC Wall buildings in Niigata Earthquake

Story \ Damage Level	5	4	3	2	1	[Buildings] Sum
No Damage*	0	16	13	6	0	35
Slight Damage**	0	5	10	3	2	20
Light Damage***	0	0	0	1	0	1

\* No apparent damage

\*\* Crack can be observed on the part of wall girders or bearing walls.

\*\*\* Crack can be observed on wall girders or bearing walls. Large crack can be observed on some members.

Table 1.2-2 Damage of Superstructure of RC Wall buildings in Tokachi-oki Earthquake

Story \ Damage Level	5	4	3	2	1	[Buildings] Sum
No Damage	0	2	2	0	0	4
Heavy Damage	0	0	0	1*	0	1

\* Under Construction

Table 1.2-3 Damage of Superstructure of RC Wall buildings in Miyagi-ken Oki Earthquake

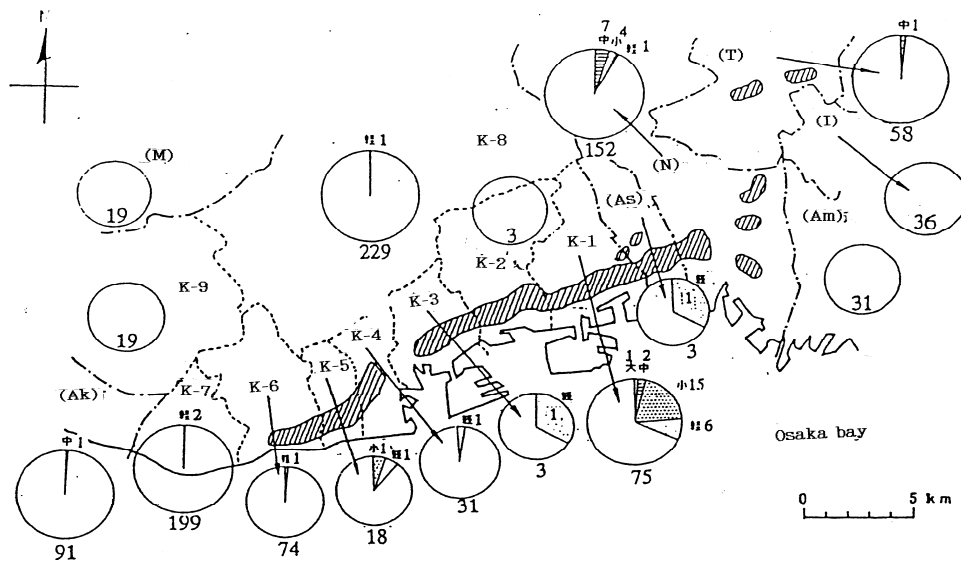
Story \ Damage Level	5	4	3	2	1	[Buildings] Sum
No Damage	80	40	18	11	6	155
Slight Damage	8	2	3	0	0	13
Light Damage*	1	0	0	0	0	1

\*Local destruction of the construction joint on the traverse wall

Table 1.2-4 The list of Damaged RC Wall buildings in Miyagi-ken Oki Earthquake

Name of the housing estate	Building No.	Longitudinal direction	Damaged Buildings' Condition	Damaged Level
Minami-Kaji Cho	South	E-W	Horizontal distortion of the construction joint on the traverse wall(1 <sup>st</sup> , 2 <sup>nd</sup> floor)	slight
Shiroumaru Higashi	4-4	E-W	One directional S.C of partition walls (the upper stories)	Slight
Tsurugaoka No.2	5A-17	N-S	One directional S.C of partition walls (the lower stories)	Slight
”	5A-18	E-W	One directional S.C. of gable walls (East side)	Slight
”	5A-19	E-W	One directional S.C. of partition walls (the upper stories)	Slight
”	5A-28	E-W	One directional S.C. of partition walls (the upper stories)	Slight
”	5A-29	E-W	One directional S.C. of partition walls the upper stories)	Slight
Tsurugaya	2	E-W	One directional S.C. of partition walls (the lower stories) Unilateral S.C. of exterior walls in longitudinal direction	Slight
”	5	E-W	Horizontal distortion of the construction joint on the traverse wall(1 <sup>st</sup> floor)	Light
Tsurugaya Go-chome	8	E-W	Both directional S.C. of partition walls (the lower stories)	Slight
”	11	E-W	Both directional S.C. of partition walls (the lower stories)	Slight
Kimachi Apartment		E-W	Shear crack (hair cracking) in bearing walls	Slight
Odakyu Apartment		E-W	Shear crack (hair cracking) in bearing walls	Slight
Uesugi Apartment		E-W	Shear crack (hair cracking) in bearing walls	Slight

\*S.C = Shear Crack



(Figures mean the number of investigated and damaged buildings)

Area of JMA seismic intensity scale VII

Figure 1.2-1 Regional numbers of investigated and damaged RC wall buildings in Hyogo-Ken Nanbu Earthquake

Table 1.2-5 Regional numbers of investigated and damaged RC wall buildings in Hyogo-Ken Nanbu Earthquake

Area		Public housing	Rental houses by HUD	Others	[Buildings]Sum
Miki City (M)		—	19(0)	—	19(0)
Akashi City (Ak)		—	91(1)	—	91(1)
Kobe City (K)	Nishi ward (K-9)	—	19(0)	—	19(0)
	Kita ward (K-8)	—	229(1)	—	229(1)
	Tarumi ward (K-7)	112(1)	87(1)	—	199(2)
	Suma ward (K-6)	15	46(0)	13(1)	74(1)
	Nagata ward (K-5)	18(2)	—	—	18(2)
	Hyogo ward (K-4)	26(1)	—	5(0)	31(1)
	Chuo ward (K-3)	0	—	3(1)	3(1)
	Nada ward (K-2)	0	3(0)	0	3(0)
	Higashi Nada ward (K-1)	63(21)	2(0)	10(3)	75(24)
Total number of investigated buildings in Kobe city		234(25)	386(2)	31(5)	652(32)
Ashiya City (As)		3(1)	—	—	3(1)
Nishinomiya City (N)		47(8)	70(4)	35(0)	152(12)
Takarazuka City (T)		35(0)	23(1)	—	58(1)
Amagasaki City (Am)		—	31(0)	—	31(0)
Itami City (I)		17(0)	19(0)	—	36(0)
Hokutan Town		—	—	1(0)	1(0)
[Buildings]Sum		336(34)	639(8)	67(5)	1,042(47)

\*based on the report from HUD(Hyogo Prefecture only.)

\*\*including houses for public employees, private apartment houses and condominium

[remarks]the number of damaged buildings are shown in parentheses. Slight damaged included.

— means “not investigated” or “area with no RC wall buildings owned by HUD

Table 1.2-6 Damage Itemization (the number of buildings) of RC wall buildings in Hyogo-ken Nanbu Earthquake

Area	Tilt	Sink	Tilt and Sink	Crack/Damage of wall	Sum(damage level)
Akashi City (Ak)	1				1(Medium)
Kobe City (K)	7	6	6	13	32(Heavy1,Medium2, Light 16 and others)
Ashiya City (As)	1				1(Light)
Nishinomiya City (N)	6		3	3	12(Medium7,Light4, Slight 2)
Takarazuka City (T)	1				1(Medium)
[Buildings]Sum	16	6	9	16	47(Heavy1,Medium 11, Light 21 and others)

1.Damage level is based on RC damage criteria by Association on Japan Disaster Prevention

2.Heavy : Tilt of structure

Medium : Tilt and Sink excluding 2buildings with cracks on their bearing wall

Slight: 14 buildings with cracks on bearing walls or wall girders

3.When the building tilts, a slight sink always accompanies it, however, ones with apparent sink observed are categorized in Tilt and Sink.

Table 1.2-7 The numbers of investigated and damaged Wall PCa buildings and Damage Itemization in Hyogo-Ken Nanbu Earthquake

Area	Investigated buildings	Damaged buildings	Heavy	Medium	Light	Slight
Miki City (M)	20	—				
Akashi City (Ak)	28	—				
Kobe city (K)	Nishi ward (K-9)	16	—			
	Kita ward (K-8)	2	—			
	Tarumi ward (K-7)	111	3		1	2
	Suma ward (K-6)	44	2			2
	Higashi Nada ward(K-1)	2	1			1
Total number of investigated buildings in Kobe city	175	6		1	3	2
Nishinomiya City (N)	2	—				
Takarazuka City (T)	22	—				
Itami City (I)	18	2				2
[Buildings]Sum	265	8	0	1	3	4