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Investigation and Analysis of Damage to Buildings during the 2003 Bam Earthquake

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Abstract

A brief statistical assessment of the seismic vulnerability of buildings in Iran is carried out. Based on the results, Iran is concluded to be one of the most vulnerable countries in the world to earthquake. A post-earthquake building damage survey was performed in Bam city, Iran, after the catastrophic earthquake of Dec. 26, 2003. Subsequently, studies were carried out on the building damage data collected. Based on the results, adobe and masonry buildings, which are the major types of structure in Bam city, were found to have suffered the highest level of damage. Reinforced concrete buildings infilled with masonry walls and masonry buildings with reinforced concrete ties, however, were structures with very low levels of damage. 624 buildings were evaluated using the European Macroseismic Scale (EMS). The results show that the low earthquake resistance of buildings in Bam city is the main reason for the high level of damage. Furthermore, macroseismic intensities are estimated for the Bam region based on the MSK scale for vulnerability class B.

Key words: Bam earthquake, adobe building, post-earthquake damage evaluation, seismic vulnerability, macroseismic intensity

1. Introduction

Iran, as one of the world's most earthquake-prone countries, has been exposed to many devastating earthquakes in past years. The 3 regions of Zagros, Alborz, and Khorasan are exposed to high seismicities. According to a tectonic hypothesis, the movement of the African plate towards the Asian plate, pushing the Arabian plateau and southwest Asia, leads to the creation of faults and ruptures in the earth's crust in a region that includes Iran. On the other hand, previous post-earthquake reconnaissance and statistical results reveal that the seismic vulnerability of residential buildings in Iran is significantly high. These 2 characteristics of Iran make it one of the most vulnerable countries to earthquakes in the world. Building damage evaluation results for the recent Iran-Bam earthquake emphasize that the low lateral resistance of existing structures, mostly masonry, is the major cause of the high level of structural damage due to earthquakes. The main goal of this paper is to present the results of a building damage inspection of the Bam-Iran earthquake, after a brief review of the seismic vulnerability of buildings in Iran.

2. Seismic vulnerability of buildings in Iran

Populated areas, primarily the major cities of Iran, are mostly located on mountains slopes or plains. The distances between mountains peaks and the centers of these cities range from about 15 to 20 kilometers. A population of 60,055,488, based on the 1996 Iran-census, inhabits Iran, which has an area of 1,648,195 km^2. Considering the different climatic and geographical conditions, a distribution map of population shows mountainous regions with high population densities and south and central deserts with low population densities. Figure 1 is a distribution and density map of population in various parts of the country.

Comparing the population distribution map in Fig. 1 and the seismic macrozonation hazard map in Fig. 2, for different seismic zones, reveals that the

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majority of the country's population inhabits high and very high seismic hazard zones. Based on the survey, the populations in the different zones are distributed with 800,240 inhabitants in the low hazard zone, 9,716,184 inhabitants in the moderate hazard zone, 32,979,909 inhabitants in the high hazard zone, and 16,559,155 inhabitants in the very high hazard zone, as shown in Fig. 3. In other words, 83% of the country's population inhabit regions with high and very high earthquake relative hazards.

Based on the building and housing section of Iran's statistical calendar and the 1996 census of Iran, there are 10,770,112 ordinary residential units in Iran, of which 1,594,043 units are wood, concrete, and steel structures, and 9,176,069 units are built of brick, wood, stone, cement block, tile, and clay, as shown in Fig. 4. The first group of structural systems, that is, 15 percent of existing residential units, is estimated to be designed for a seismic load. However, 85 percent of the residential units, the majority of building structures in Iran, have been constructed with brittle materials and have relatively low lateral resistance against seismic loads. Consequently, due to the very high population density in the high and very high seismic hazard zones, as well as the low lateral resistant capacity of the majority of residential buildings,

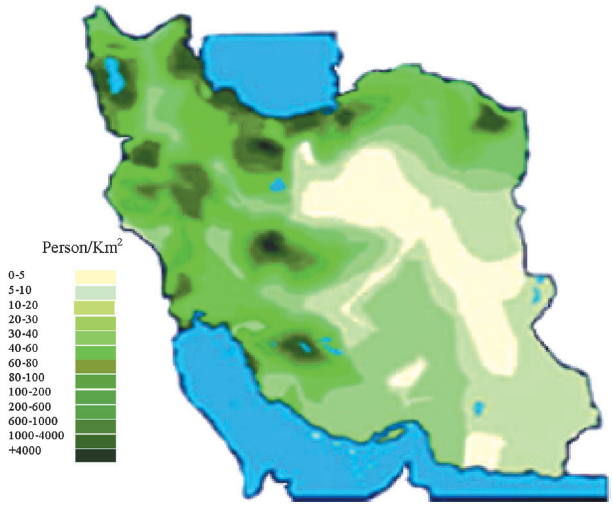

Fig. 1. Distribution map of population in Iran (1996).

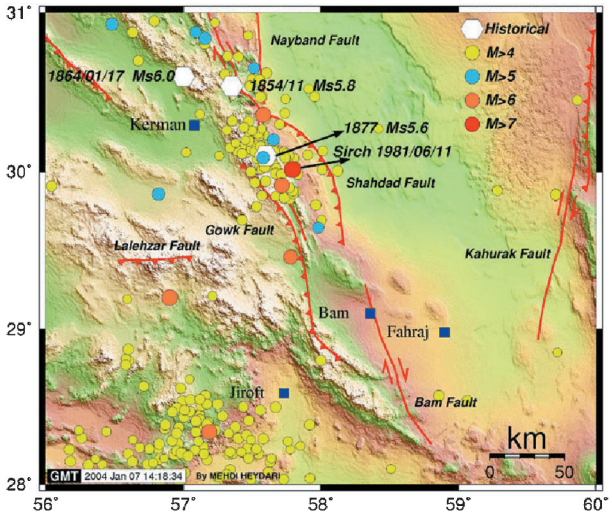

Fig. 6. Historic and instrumental seismicity of the area (IIEES, 2004).

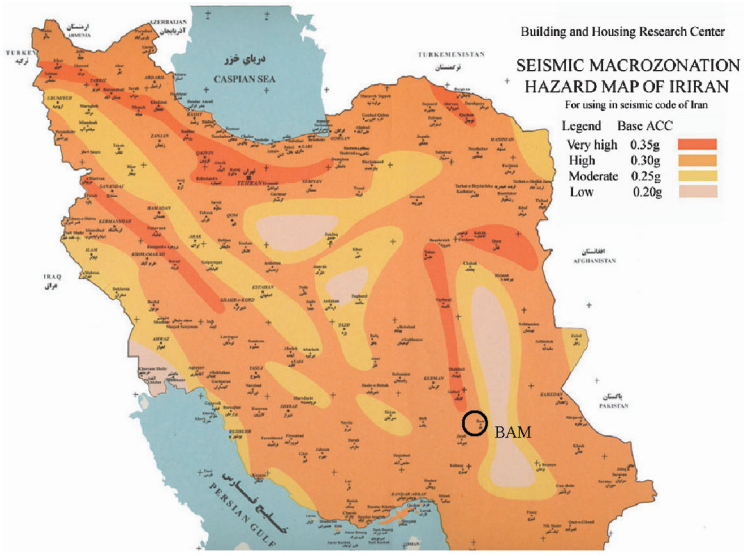

Fig. 2. Seismic macrozonation hazard map of Iran.

Iran is one of the most vulnerable countries in the world to earthquake. This conclusion is supported by the comparison illustrated in Fig. 5. The chart shows the results of a statistical study based on the USGS database of earthquakes with 1,000 or more deaths, since 1900. The vertical axis shows the number of earthquakes that have occurred in the corresponding country in each with fatalities numbering more than 1000. Based on the results, Iran has the highest seismic vulnerability in the world (Tasnimi and Mostafaei, 2001).

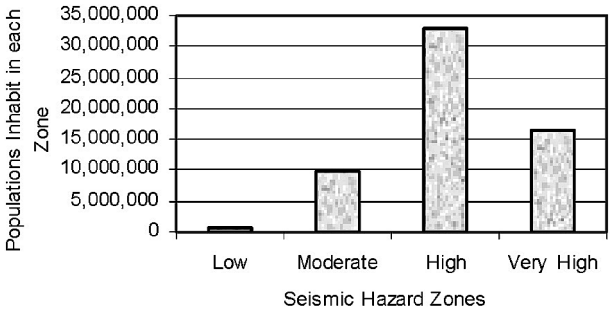

Fig. 3. Population Distribution in Different Seismic Hazard Zones of Iran.

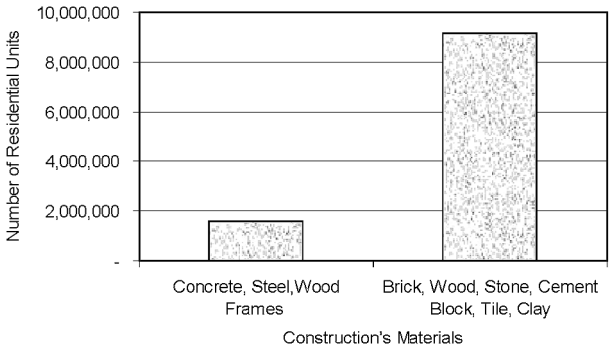

Fig. 4. Structural Types of Buildings in Iran (1996 countrywide statistical results).

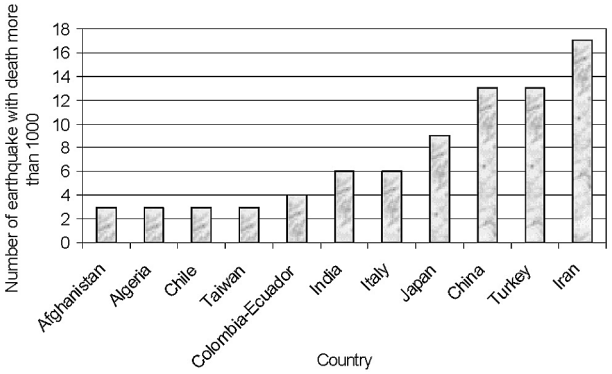

Fig. 5. Seismic vulnerability of countries worldwide based on number of earthquakes in each country, each with 1,000 deaths or more (USGS, 2004).

3. Seismicity of Bam area

Bam city is located in a high seismic hazard zone of Iran, as shown in Fig. 2. Many earthquakes have been recorded around the Bam area, but Bam city itself had no reports of great historical earthquakes before the Dec. 26, 2003 earthquake. Figure 6 shows the historic and instrumental seismicity of the area. According to the seismicity map, most major earthquakes occurred in the northwest region of Bam.

4. Strong motion record

The strong ground motions of the Bam Earthquake were recorded at 18 stations by the Building and Housing Research Center of Iran (BHRC). At Bam station, which was located in the central part of city, maximum horizontal and vertical peak ground accelerations were reported as 799 gals in EW direction and 988 gals, respectively. All 3 components of the ground accelerations are plotted in Fig. 7 as uncorrected data. Fig. 9 shows the 3 acceleration response spectra with a damping ratio coefficient of 0.05 to the critical. Among the surveyed buildings, 25 units had clear residual displacements in 1 direction. According to the results shown in Fig. 8, larger residual displacements and damage in the E-W direction are observed in 77% of the buildings, which indicate the directivity effects on ground motion.

Figures 7 and 9 show larger peak ground acceleration and response in the E-W direction compared to those in the N-S direction, which is consistent with the directions of heavy damage observed as shown in Fig. 8.

5. Structural types of building in Bam

Bam is located 193 km southeast of Kerman city on a plain between the Jebalbarez and Kabudi Mountains, and at approximately 1,100 meters above sea level. In ancient times, people lived in a citadel, which is now known as Arg-e-Bam, the gem of Iranian historical sites and one of the most beautiful buildings of the Ashkanian era. Adobe structures, with clay and straw as the main material components, comprised the major type of construction adopted in the city. The current city of Bam is located southwest of Arg-e-Bam. Based on the statisti-

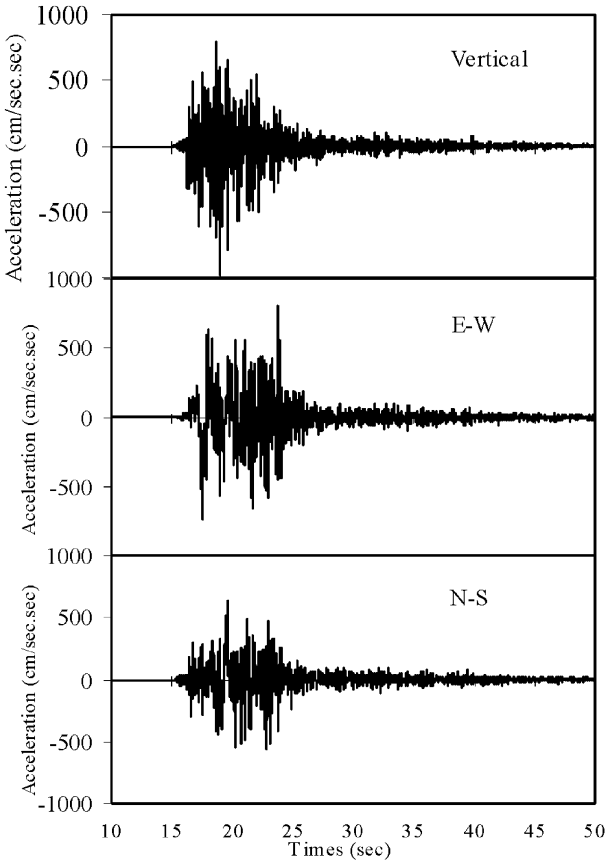

Fig. 7. Three components of strong ground motion in Bam recorded by The Building and Housing Research Center (BHRC, 2004).

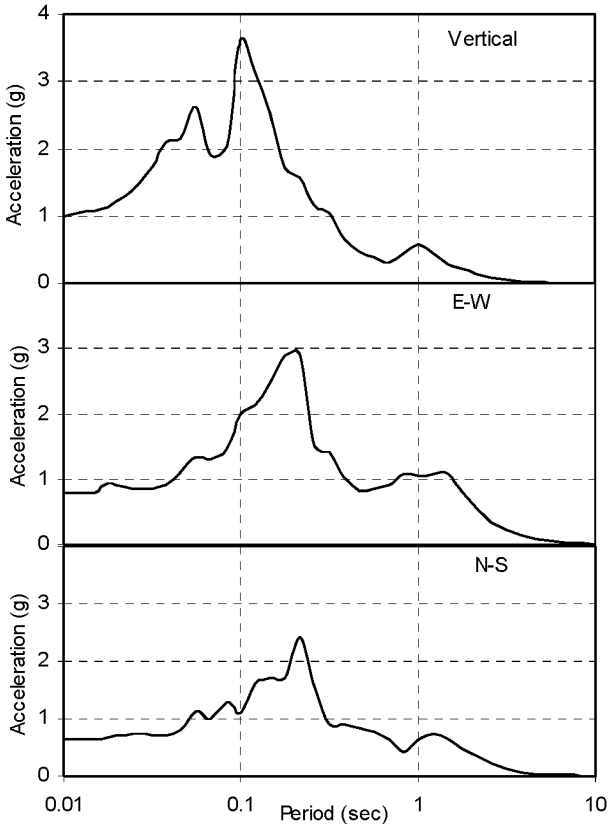

Fig. 9. Acceleration response spectra of Bam earthquake (Damping ratio: 0.05).

Research Center (BHRC, 2004)

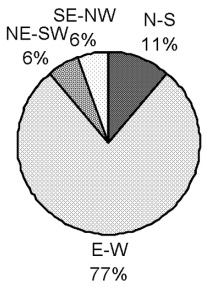

Fig. 8. Damage rates based on the direction in which a structure suffered more damage and experienced greater residual deformation in comparison to those of perpendiculars.

cal study, constructions in Bam can be divided into 8 types of structure. The majority of old buildings were adobe, categorized as Ad in this study, which now accounts for 8% of the all structures in the city, as shown in Fig. 10.

Almost 68% of the buildings were masonry, M type or M-Ad type. The difference between M and M-Ad is the use of masonry mortar, which is cement for type M and mud-lime for type M-Ad. Figure 11 shows a masonry building in the center of the city, almost 1 km from the site where the strong ground motion accelerogram was recorded.

Reinforced masonry buildings, which are divided into 2 types, masonry with reinforced concrete ties, or M-C, and masonry with steel frame ties, or M-S, account for 14% of the structures.

Figure 12 shows a reinforced masonry building with reinforced concrete horizontal and vertical elements as ties. Type M-S also refers to a steel frame building with masonry brick walls, as shown in Fig. 13. In this type of structural system, the masonry walls give supplemental lateral resistance to the structural system and work as confined infill walls.

Steel-frame with bracing as S-B type, and steel-frame, assumed with moment resistant connections, or S-F type, comprise 7% of the buildings. The S-B type is one of the most popular structural types in Iran, especially since applying the first Iranian seis-

Fig. 10. Arg-e-Bam, example of adobe structure (Ad type).

Fig. 11. Masonry Buildings in Bam, M Type.

Fig. 12. Reinforced Masonry Buildings in Bam, M-C Type.

Fig. 13. Masonry with steel frame buildings, M-S type.

mic code in 1990. It is preferred by owners of conventional buildings, due to the fast and convenient construction process and economic benefits in comparison to a reinforced concrete structure (Fig. 14).

Reinforced concrete frame, the RC type shown in Fig. 15, and special steel frame with masonry walls, M-S-F type shown in Fig. 16, occupy the remaining 3% of structures in the city of Bam. The proportions of the different structural types in Bam city are illustrated in Fig. 17. It can be inferred from the figure that 24% of the surveyed buildings (M-C & M-S, S-B & S-F, and RC & M-S-F) in the city have structural systems that are defined in the Iranian seismic code as systems with a seismic resistant design.

6. Damage evaluation

In this survey, building samples were selected in Bam city and 4 nearby villages (Esfikan, PoshtRood, KhajeAskar, and Baravat), by applying a simple random sampling method to have an equal chance of building selection in the population. Bam area was divided into 9 zones according to their overall average of estimated building age, population density, and overall damage grade. All data collected are listed in Table 1. The overall damage grades and the density of population in each zone were estimated from aerial photos taken soon after the earthquake, and the corresponding damage evaluation results, published by National Cartographic Center of Iran (NCCI, 2003). Figure 18 illustrates the 9 zones selected and the number of buildings surveyed in the corresponding zones. Zone 1 is the oldest part of Bam city, in which 70% of the buildings are more than 30 years old. Although some RC and steel frame structures were observed in zone 1, adobe and masonry buildings were the most common structures in this zone. The numbers of buildings surveyed in each zone were selected according to the population density in the corresponding zone. Zones 1, 2, and 3 had very high population densities compared to that of the zone 4, which is mostly covered with palm and citrus trees. Therefore, the number of building samples in zone 4 is less than the other zones, as shown in Fig. 18. In the figure, zone i (e.g. zone 1), refers to the zone number and the number at the right side (e.g. 116 for zone 1) regarding the number of buildings surveyed in that zone. The epicenter location in the figure was

Fig. 14. Steel frame structures with bracing, S-B type.

Fig. 15. Two-story RC structure, RC type.

Fig. 16. Special steel frame-masonry structures, M-S-F type.

derived from aftershock observations reported by Suzuki, *et al.* (2004). In this study, 624 buildings listed in Table 1 were evaluated according to the European Macro-seismic Scale (EMS) by Grunthal G., (1998). Damage grades on the EMS scale are classified as grade 1: negligible to slight damage, grade 2: moderate damage, grade 3: substantial to heavy damage, grade 4: very heavy damage, and grade 5: destruction. Figure 19 illustrates the survey results of total structural damage grades for the different types of building. The figure indicates that almost 70% of the buildings in Bam city suffered very heavy damage or complete destruction, with grade 4 or grade 5, and only 10% of the buildings in the city were observed with slight damage or grade 1.

A further estimation was made to obtain damage grades for different types of structure. Figure 20 shows the outcomes of the study. As indicated by the figure, masonry buildings, types M and M-Ad, and also adobe constructions, type Ad have the highest rates of damage among the different types of structure. The main reason for such a high level of destruction is the very low lateral load-bearing capacity of their structural systems against seismic loads. On the other hand, reinforced masonry buildings such as type M-C and M-S had considerably lower damage rates compared to those of masonry or adobe buildings. These results emphasize the importance of reinforcing masonry buildings, which is also outlined in the seismic code of Iran.

Steel frame with bracing, S-B type, is the other type of structure that has in low damage rates. This type of structure is very popular in Iran. The 2 main problems observed for S-B type structures might be imperfect connections welding or insufficient lateral bracing system for earthquake resistance, which results from less attention being given to quality control for construction process and structural design. The reinforced concrete structure, RC type, was the structural system used in approximately 2% of construction in Bam. The damaged RC buildings, observed in Bam, had low rates of transfer reinforcement in the columns, and low quality control in the construction process and structural element design. In some of the new and quite well designed buildings, no major cracks or damage were observed in the structural elements. Which might imply that the buildings had almost linear performance during the earthquake. However, based on the minimum design base shear coefficients obtained from the Iranian code, nonlinear performance is expected of such buildings due to the earthquake. Examples of structures with this kind of response are the RC buildings

of telephone centers in Bam city (in Zone 1 of Fig. 18, the same zone as the strong motion station's zone) and Baravat village (in Zone 8), as shown in Figs. 21 and 22, respectively. The steel structure of Bam Azadi hotel (in Zone 4) also performed without significant structural damage, as shown in Fig. 23. Based on these observations, it is estimated that the effects of infill masonry walls might be an important factor for the almost linear response of this kind of frame structure. To find the answer, in addition to the statistical damage evaluation presented, a case study of a 3D nonlinear time history analysis for the RC building of the Telephone Center in Bam city,

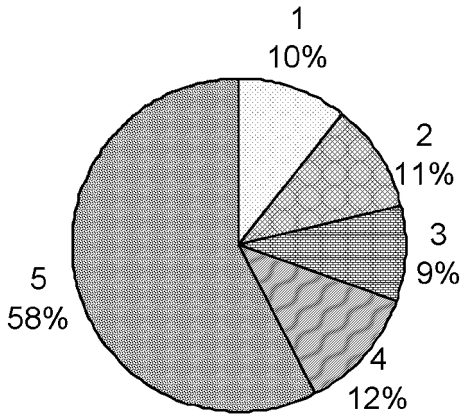

Fig. 19. Damage grades for all types of building in Bam.

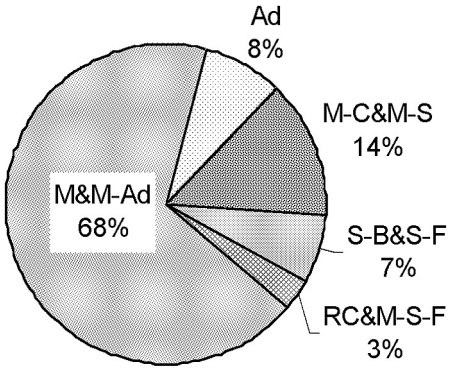

Fig. 17. Proportions of Structural Types of Buildings Surveyed.

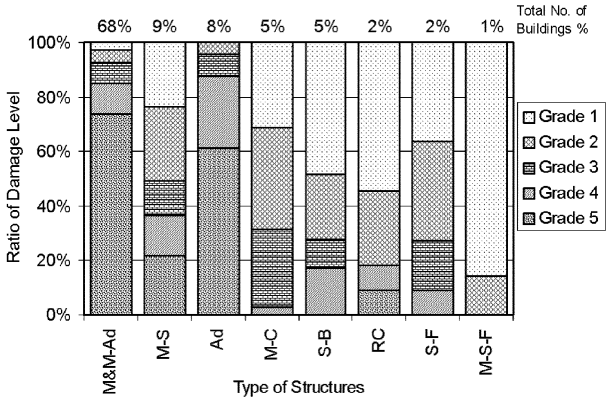

Fig. 20. Building damage grades for different types of structure.

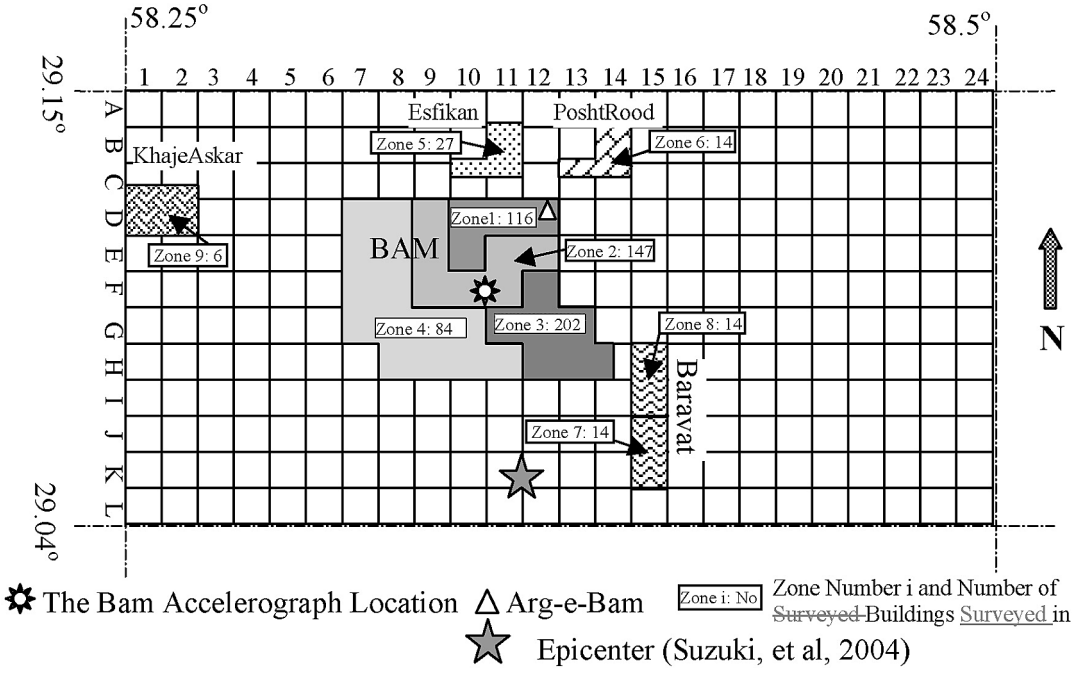

Fig. 18. Zoning map and number of buildings in each zone of Bam city and nearby villages.

Fig. 21. A beam-column connection on the first floor of the Bam telephone center, which had no damage (about 1,000 m north of the strong motion station).

Fig. 22. Baravat village telephone center, which had no structural damage.

Fig. 23. Bam Azadi hotel which had no structural damage (about 2000 m SW of the strong motion station).

which was subjected to the strong motion record, was carried out. This results are presented in a separate paper.

The first Iranian code of practice for seismic resistant designs of buildings was applied in 1990 as a mandatory code, and the second edition was published in 1999. Therefore, the buildings surveyed were also sorted by year of construction to identify the effects of code practicing.

Figure 24 shows damage rates for buildings sorted by construction date. As the statistical results indicate, 77% of the buildings in the city were constructed before 1990, the mandatory year of the seismic code, and suffered very high rates of damage. However, among buildings built from 1990 and after the second edition of the seismic code was published in 1999, the damage rates were significantly reduced, which shows efficient results of applying the seismic code.

7. Damage distribution in Bam city

The 4 zones of Bam city, zones 1 to 4 in Fig. 18, are shown magnified in Fig. 25. This map shows the zoning map of building damage distribution, as well as overall damage ratios in each zone based on data collected only in Bam city. By comparing Figs. 18, 25, and 26-a, it can be inferred that the damage rates decreased significantly in zones 4, 8, and 9, although they are not far from the epicenter. According to the results, zone 3 followed by zone 1 show the highest damage rates in the area. However, zone 2, which is located between zones 1 and 3, shows lower damage ratios. Figure 26-b illustrates damage ratios in Zones 1 to 4 for only one type of structure, masonry buildings. Based on the figure, zone 2 again has lower rates of damage than zone 1 and zone 3. Therefore, the different damage rates might be due to other factors such as fault mechanism. Further study is recommended on this outcome.

8. Estimation of macroseismic intensity

A MSK intensity contours map was drawn from building damage grades, based on EMS98 definitions (Grunthal, 1998). EMS98 is a macroseismic scale proposed by the European Seismological Commission of International Association of Seismology and Physics of Earth's Interior (IASPEI) in 1998, which was based on a modification of the MSK scale (1964). Building

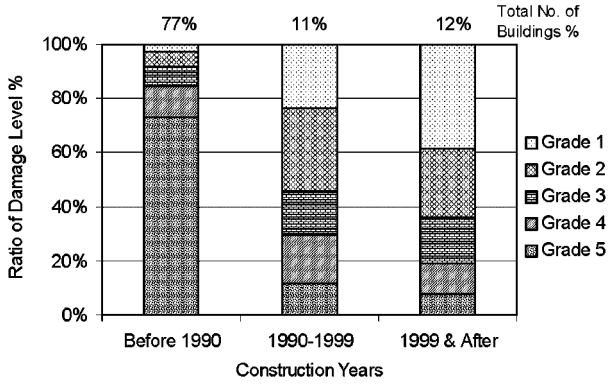

Fig. 24. Damage rates based on year of construction.

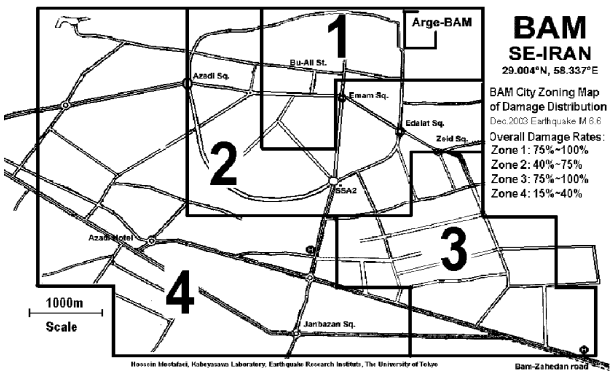

Fig. 25. Zoning map of building damage distribution in Bam city.

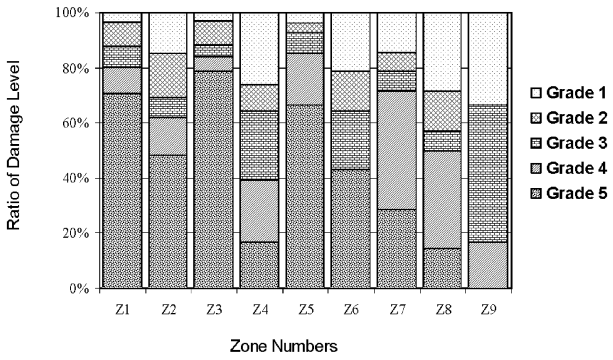

Fig. 26-a. Ratio of damage grades in different zones.

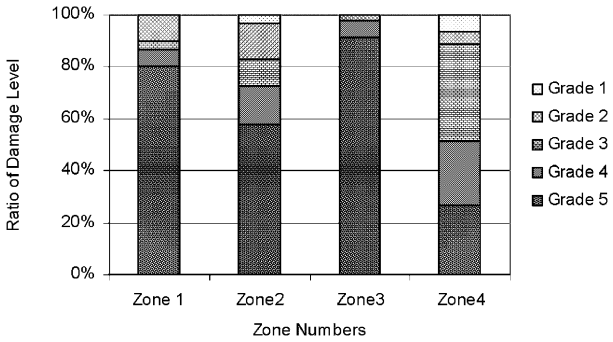

Fig. 26-b. Damage rates in zones 1 to 4 based on damage ratios of masonry buildings.

vulnerability classes are defined on the improved scale of EMS98 in a similar way to those of the MSK scale from A to F shown in Fig. 27.

Damage definitions in EMS98 were applied to obtain macroseismic intensities for the Bam region. To estimate macroseismic intensities, first the evaluated buildings are sorted according to type, A to F, and their damage rates, 1 to 5, based on the EMS98 scale. Then, in each selected area, corresponding to each type of building, the damage rates are computed for each damage grade. Damage rate, for damage grade i of the selected structural type, is defined as the number of buildings with damage i, divided by the total number of buildings in the selected area. Table 2 shows the relation between MSK intensity and damage rates for the various vulnerability classes and damage grades (EMS98).

Because the masonry structure was the most common type of building in Bam city and the nearby villages, almost 70% of the surveyed buildings, it was selected as the structural type of vulnerability class B for the intensity estimation. Therefore, the third column of Table 2 is applied for this study. The other structural types were not chosen for the macroseismic estimation, because the number of buildings surveyed of each type was not sufficient to achieve an acceptable result under the assessment method. Both masonry type M and type M-Ad were assumed to have the same class of vulnerability as class B in EMS98 scale (Table 2). The results of the macroseismic intensity estimations, using the above approach, are illustrated in Fig. 28.

To estimate the intensities, Bam city and nearby villages were divided into bins with the network shown in Fig. 28. For the surveyed buildings located in each bin, damage rates corresponding to the each damage grade were computed and correlated with MSK intensity, according to Table 2. The correlated MSK intensity was selected as the estimated intensity for the corresponding bin. Finally, the contours were drawn using an interpolation method. The outcomes were modified considering the location of

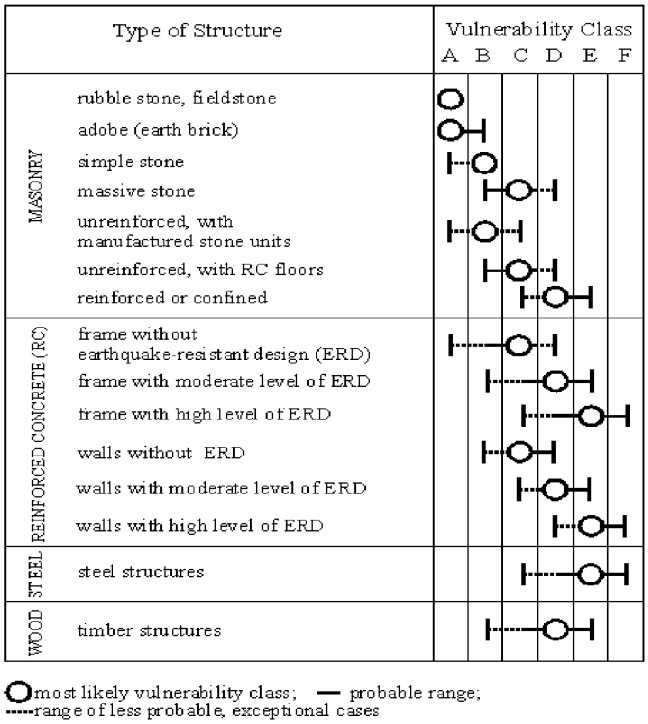

Fig. 27. Structural Types and Vulnerability Classes.

Table 2. Relation between the MSK intensity and the damage rates for various vulnerability classes and damage grades (EMS98).

Intensity	Damage	Class A	Class B	Class C	Class D	Class E
VI	Grad 1	20-60%	20-60%	0-20%	-	-
	Grad 2	0-20%	0-20%	-	-	-
VII	Grad 1	-	-	20-60%	0-20%	-
	Grad 2	-	20-60%	0-20%	-	-
	Grad 3	20-60%	0-20%	-	-	-
	Grad 4	0-20%	-	-	-	-
VIII	Grad 2	-	-	20-60%	0-20%	-
	Grad 3	-	20-60%	0-20%	-	-
	Grad 4	20-60%	0-20%	-	-	-
	Grad 5	0-20%	-	-	-	-
IX	Grad 2	-	-	-	20-60%	0-20%
	Grad 3	-	-	20-60%	0-20%	-
	Grad 4	-	20-60%	0-20%	-	-
	Grad 5	20-60%	0-20%	-	-	-
X	Grad 2					20-60%
	Grad 3				20-60%	0-20%
	Grad 4			20-60%	0-20%	
	Grad 5	60-100%	20-60%	0-20%		
XI	Grad 2					
	Grad 3					20-60%
	Grad 4			60-100%	20-60%	0-20%
	Grad 5		60-100%	20-60%	0-20%	
XII	Grad 5	100%	100%	100%	60-100%	60-100%

epicenter determined of the main shock and after-shock distribution (Suzuki, *et al.*, 2004).

Comparing the population distribution map in Bam in the preliminary report of BHRC (2004), it can be inferred that most of the buildings in Bam are located in the area with an intensity of XI on the

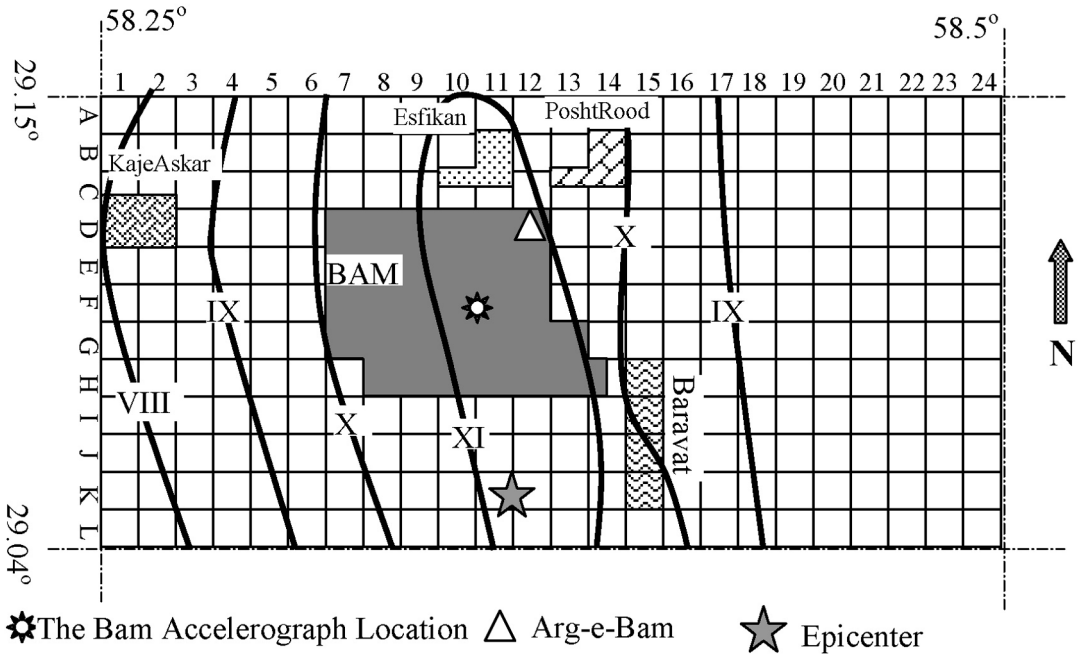

Fig. 28. MSK intensity contours for Bam earthquake applying vulnerability class B.

MSK scale, which is about X on the Modified Mercalli Scale. The conversion can be applied using Fig. 29. According to the figure, the maximum acceleration for intensity X may be estimated at between 800 cm/s^2 and 1,000 cm/s^2, which are almost in the same ranges as those recorded.

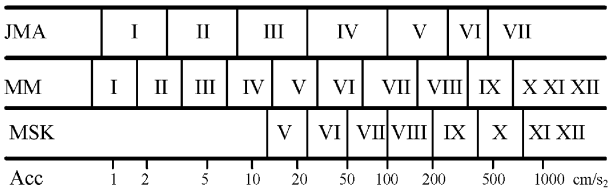

Fig. 29. Relation between different intensities scale and maximum acceleration (cm/s2) (Hisada and Meguro, 2001).

Conclusions

Based on the brief statistical analysis of historical earthquake damage and building types, Iran is ranked as one of the most seismically vulnerable countries in the world. A post-earthquake evaluation of damage to 624 buildings after the Iran-Bam earthquake was carried out in this study. The majority of the demolished buildings in the city were masonry and adobe structures without a seismic design. On the other hand, masonry buildings with reinforcements or ties, even if they were not well designed, experienced significantly low rates of damage due to the effects of infill walls and confinement. Input directivity was observed from the damage direction of buildings surveyed, with larger residual displacements and damage in the east-west direction. Low damage rates for buildings constructed after applying the seismic code show progress in reducing the seismic vulnerability of buildings in the area. A number of newly constructed RC and steel frame structures with seismically resistant designs, were observed to have significantly low rates of damage in the high-intensity zones, which might be due to the effects of masonry infill walls. To find answers for the observed responses, a further study is being carried out. The results will be presented in another paper. Macroseismic intensities were estimated for the Bam area on the MSK scale using EMS98 and the damage rates of the surveyed masonry structures. The macroseismic intensity estimation results for the Bam region revealed almost the same range of converted accelerations as that of the recorded strong ground motion.

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Table 1-1. Information on buildings evaluated in Bam city and four nearby villages.

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
1	1	B-11	Takhti	1970	1	1	A	M	5	_
2	2	B-11	Takhti	1970	1	1	A	M	4	_
3	3	B-11	Takhti	1980	1	3	A	M	5	_
4	4	B-11	Takhti	1970	1	1	A	M	5	_
5	5	C-14	PoshtRood	1970	1	4	C	M	1	P1010002
6	6	C-14	PoshtRood	1970	1	4	A	M	5	_
7	7	C-14	PoshtRood	1970	1	4	A	M	5	_
8	8	C-14	PoshtRood	1970	1	4	A	M	5	_
9	9	C-13	PoshtRood	1970	2	4	C	M	3	P1010004
10	10	C-13	PoshtRood	1970	1	4	A	M	5	_
11	11	C-13	PoshtRood	1970	1	4	A	M	5	_
12	12	B-14	PoshtRood	1970	1	3	C	M	1	P1010003
13	16	C-13	PoshtRood	1970	1	3	A	M	2	_
14	17	C-13	PoshtRood	1970	1	3	A	M	3	_
15	18	C-13	PoshtRood	1970	1	3	A	M	5	_
16	19	C-13	PoshtRood	1970	1	3	A	M	1	_
17	20	C-13	PoshtRood	1970	1	3	A	M	2	_
18	21	C-13	PoshtRood	2002	1	3	A	M	3	P1010005
19	22	C-11	Esfikan	1980	1	3	A	M	3	_
20	23	C-11	Esfikan	1980	1	3	A	M	5	_
21	24	C-11	Esfikan	1980	1	4	A	M	5	_
22	25	C-11	Esfikan	1980	1	4	O-Msq	M	4	_
23	26	C-11	Esfikan	1980	1	4	A	M	5	_
24	27	C-10	Esfikan	1980	1	4	O-Msq	M	5	P1010006
25	28	C-10	Esfikan	1980	1	4	A	M	5	_
26	29	C-10	Esfikan	1980	1	3	A	M	5	_
27	29	C-10	Esfikan	1970	1	4	A	Ad	4	P1010007
28	30	C-10	Esfikan	1970	1	3	C	M	4	_
29	31	C-10	Esfikan	2000	1	4	A	M-C	1	P1010008
30	32	C-10	Esfikan	1970	1	4	O-Trad.-Jim	M	2	P1010009
31	33	C-10	Esfikan	1970	1	3	A	M	5	_
32	34	C-10	Esfikan	1970	1	3	A	M	5	_
33	35	C-11	Esfikan	1970	1	1	A	M	4	_
34	36	C-11	Esfikan	1970	1	2	A	M	5	_
35	37	C-11	Takhti	1970	1	1	A	M	5	_
36	38	C-11	Takhti	1970	1	1	A	M	5	_
37	39	C-11	Takhti	1970	1	1	A	M	5	_
38	40	C-11	Takhti	1970	1	2	A	M	5	_
39	41	C-11	Takhti	1970	1	2	A	M	5	_
40	42	C-11	Takhti	1970	1	2	A	M	5	_
41	43	C-11	Takhti	1980	1	1	C	M-S	3	P1010010
42	44	D-11	East-ValiAsr	1960	1	3	A	M-Ad	5	_
43	45	D-11	East-ValiAsr	1960	1	3	A	M-Ad	5	_
44	46	D-11	East-ValiAsr	1960	1	3	A	M-Ad	5	_
45	47	D-11	East-ValiAsr	1960	1	4	A	M-Ad	5	_
46	48	D-11	East-ValiAsr	1960	1	4	A	M-Ad	5	_
47	49	D-11	East-ValiAsr	1960	1	4	A	M-Ad	5	_
48	50	D-11	East-ValiAsr	1960	1	4	A	M-Ad	5	_
49	51	D-10	ValiAsr	1970	1	3	A	M	5	IMG-0009
50	52	D-10	ValiAsr	1970	1	4	O-stadium	M	5	IMG-0010
51	53	D-10	ValiAsr	1970	1	3	C	M	2	IMG-0011
52	54	D-10	ValiAsr	1970	1	3	A	M-Ad	5	IMG-0012&15
53	55	D-10	ValiAsr	1970	1	3	A	M-Ad	5	IMG-0013
54	56	D-10	ValiAsr	1970	1	3	A	M-Ad	5	IMG-0013
55	57	D-10	ValiAsr	1970	1	3	A	M-Ad	5	IMG-0014
56	58	D-10	ValiAsr	1970	1	3	A	M-Ad	5	IMG-0016
57	59	D-10	ValiAsr	1995	3	3	A	S-B	1	IMG-0017
58	60	D-10	ValiAsr	1970	1	3	A	M-Ad	5	IMG-0018&19
59	61	D-10	ValiAsr	1990	2	4	A	M-C	2	IMG-0020
60	62	D-10	ValiAsr	1990	2	2	E-School	M-C	2	IMG-0021-24

Table 1-2. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
61	63	D-10	ValiAsr	1980	3	2	O-public health	M	5	IMG-0025&26
62	64	D-10	ValiAsr	1970	1	3	A	Ad	5	IMG-0027
63	65	D-10	ValiAsr	1970	1	3	A	Ad	5	IMG-0028
64	66	D-10	ValiAsr	1970	1	3	A	Ad	5	_
65	67	D-9	End-ValiAsr	1990	2	3	A-S	S-B	2	IMG-0029
66	68	D-9	End-ValiAsr	1970	1	3	A	M	5	_
67	69	D-9	End-ValiAsr	1990	1	4	A	M	2	_
68	70	D-9	End-ValiAsr	1980	1	4	A	M	3	_
69	71	D-8	BuAliSina	1990	1	4	A	M-S	2	IMG-0030
70	72	D-8	BuAliSina	1990	1	4	A	M-S	2	_
71	73	D-8	BuAliSina	1970	1	4	A	M-Ad	5	IMG-0031
72	74	D-8	BuAliSina	1970	1	4	A	M-Ad	4	IMG-0032
73	75	D-8	BuAliSina	1970	1	4	A	M	3	IMG-0033
74	76	D-8	BuAliSina	1970	1	3	A	M-Ad	3	_
75	77	D-8	BuAliSina	1970	1	3	A	M	5	_
76	78	D-8	BuAliSina	1970	1	3	A	M	3	_
77	79	D-8	BuAliSina	1980	1	3	A	M	3	_
78	80	D-8	BuAliSina	1980	1	3	A	M	2	_
79	81	D-9	BuAliSina	1990	1	4	A-S	M	2	_
80	82	D-9	BuAliSina	1990	1	4	A	M	3	_
81	83	D-9	BuAliSina	1990	1	3	A-S	M	2	_
82	84	D-9	BuAliSina	1990	1	3	A	M	5	_
83	85	D-10	BuAliSina	2000	2	4	A-S	M-S	4	IMG-0034
84	86	D-10	BuAliSina	1990	1	4	A	M	2	IMG-0035
85	87	D-10	BuAliSina	1970	1	4	A	M	5	_
86	88	D-10	BuAliSina	1970	1	4	A	M-Ad	5	IMG-0037
87	89	D-10	BuAliSina	1970	1	4	A	M-Ad	5	IMG-0038
88	90	D-10	BuAliSina	1970	1	3	A	M	5	_
89	91	D-10	BuAliSina	1990	1	3	A	M	5	_
90	92	D-10	BuAliSina	1970	1	3	A	M	4	_
91	93	D-10	BuAliSina	1970	1	3	A	M	5	_
92	94	D-10	BuAliSina	1970	2	3	A	M-S	5	IMG-0036
93	95	D-10	BuAliSina	1995	2	3	A	M-S	2	IMG-0039
94	96	D-10	BuAliSina	1970	1	4	A	M	5	IMG-0040&41
95	97	D-10	BuAliSina	2003	3	4	A-S	S-B	1	IMG-0042
96	98	D-10	BuAliSina	1970	1	4	A	M	5	IMG-0043
97	99	D-10	BuAliSina	1970	1	3	A	M	5	-
98	100	D-10	BuAliSina	1970	1	2	A	M	5	IMG-0044
99	101	D-11	Takhti	2000	3	1	A-S	S-B	1	IMG-0045
100	102	D-11	Takhti	1970	1	1	A	Ad	5	IMG-0046
101	103	D-11	Takhti	1980	1	1	C	M-S	3	_
102	104	D-11	Takhti	1970	1	1	A	Ad	5	_
103	105	D-11	Takhti	1970	1	2	A	M-Ad	5	_
104	106	D-11	Takhti	1970	1	2	C	S-B	3	IMG-0048
105	107	D-11	Takhti	1970	1	2	C	M	5	IMG-0047
106	108	D-11	Takhti	1990	1	1	C	M-S	4	_
107	109	D-11	Takhti	1990	1	2	C	S-B	3	IMG-0049&50
108	110	D-11	Takhti	1990	1	1	C	M-S	3	_
109	111	D-11	TabaTabaei	1980	2	3	O-Store	M-S-F	1	IMG-0052
110	112	D-11	TabaTabaei	1970	1	3	A	M	5	IMG-0053
111	113	D-11	TabaTabaei	1990	1	2	E-School	M-C	2	IMG-0054&6
112	114	D-11	East-AbualiSina	1970	1	3	C	M-S	5	IMG-0057
113	115	D-11	East-AbualiSina	1970	1	3	C	M	5	_
114	116	D-11	East-AbualiSina	1970	1	3	A	M	5	_

Table 1-3. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
115	117	D-11	East-AbualiSina	1970	1	4	A-S	M	5	_
116	118	D-11	East-AbualiSina	1970	1	4	A-S	M	5	_
117	119	D-11	East-AbualiSina	1970	1	4	A	M	5	_
118	120	D-11	East-AbualiSina	1990	2	4	A-S	S-B	4	IMG-0058
119	122	D-12	Abuzar	1970	1	1	A	M	4	IMG-0059
120	123	D-12	Abuzar	1970	1	2	A	M-Ad	5	IMG-0060
121	124	D-12	Abuzar	1970	1	1	A	M-Ad	5	_
122	125	D-12	Abuzar	1970	1	2	A	M-Ad	5	_
123	126	D-12	Abuzar	1970	1	1	A	Ad	3	IMG-0061
124	127	D-12	Abuzar	1970	1	2	A	M-Ad	5	_
125	128	D-12	Abuzar	1970	1	1	A	M-Ad	5	_
126	129	E-12	S.TaherOddin	1980	1	3	A	M	2	IMG-0062
127	130	E-12	S.TaherOddin	1980	1	3	C	M	1	IMG-0063
128	131	E-12	S.TaherOddin	1970	1	3	A	M	3	_
129	132	E-12	S.TaherOddin	1970	1	3	A	M	3	_
130	133	E-12	S.TaherOddin	1980	1	4	A	M	5	_
131	134	E-12	S.TaherOddin	1980	1	4	A	M-Ad	5	IMG-0064
132	135	E-12	S.TaherOddin	1980	1	4	A	M	2	_
133	136	E-12	S.TaherOddin	1980	1	4	A	M	1	_
134	137	E-12	S.TaherOddin	1980	1	4	A	M	2	_
135	138	E-11	Abuzar	1980	2	2	A-S	M-S	2	IMG-0065
136	139	E-11	Abuzar	1970	1	2	A	M	5	_
137	140	E-11	Abuzar	1970	1	1	A-S	M	5	_
138	141	E-11	Abuzar	1970	1	1	A	M	5	_
139	142	E-12	Pasdaran	1980	_	3	O-Shrine	M-S	3	IMG-0066&IMG-0079&80
140	143	E-12	Pasdaran	2002	3	3	Ad-Tel-Center	RC	1	IMG-0067toIMG-78
141	144	E-12	Pasdaran	1970	1	3	A	M	4	IMG-0081
142	147	E-12	Pasdaran	2000	2	4	A-S	M-S	2	IMG-0082
143	148	E-12	Pasdaran	1990	2	4	A-S	M-S	3	_
144	149	E-11	Pasdaran	2000	1	3	Ad-Bank	M-S	1	IMG-0083
145	150	E-11	Pasdaran	1980	1	4	C	M-S	1	IMG-0084
146	151	E-11	Pasdaran	1970	1	3	A	Ad	4	IMG-0085
147	152	E-11	Pasdaran	1970	2	3	A	M	5	IMG-0086
148	153	E-11	Pasdaran	2000	2	4	A-S	S-B	1	IMG-0087
149	154	E-11	Pasdaran	2000	2	3	Ad-Bank	M-S	1	IMG-0088
150	155	E-11	Pasdaran	2000	3	4	A-S	M-S	1	_
151	156	E-11	Pasdaran	1980	1	3	A	M	5	IMG-0089
152	157	E-11	Pasdaran	1980	1	4	E-School	M-Ad	4	IMG-0090
153	158	E-11	Sadughi	2000	3	3	C	M	4	IMG-0091&92
154	159	E-10	Sadughi	1970	1	4	A-S	M-S	5	IMG-0093to98
155	159	E-10	Sadughi	1980	1	4	A-S	M-S	5	IMG-0093to98
156	159	E-10	Sadughi	1970	1	4	A-S	M-S	5	IMG-0093to98
157	159	E-10	Sadughi	1970	1	4	A-S	M-S	5	IMG-0093to98
158	159	E-10	Sadughi	1980	1	4	A-S	M-S	5	IMG-0093to98
159	159	E-10	Sadughi	1970	1	4	A-S	M-S	5	IMG-0093to98
160	159	E-10	Sadughi	1980	1	4	A-S	M-S	5	IMG-0093to98

Table 1-4. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
161	161	E-10	Sadughi	1990	2	3	Ad-Bank	S-B	4	IMG-0099to102
162	200	E-10	Madani	1970	1	1,2	A-S	M	5	IMG-0103-111
163	200	E-10	Madani	1970	1	1,2	A-S	M	5	IMG-0103-111
164	200	E-10	Madani	1970	2	1,2	A-S	M	5	IMG-0103-111
165	200	E-10	Madani	1970	2	1,2	A-S	M	5	IMG-0103-111
166	200	E-10	Madani	1970	1	1,2	A-S	M	5	IMG-0103-111
167	200	E-10	Madani	2000	3	2	A-S	S-B	3	IMG-112-113
168	160	E-10	Madani	1970	_	4	O-Water-Sup.	RC	2	IMG-114-119
169	161	E-10	Sadughi	1990	2	3	A-S	M-S	4	IMG-0120
170	210	E-10	Sadughi	1970	1	3	A-S	M-S	5	IMG-0122
171	210	E-10	Sadughi	1970	1	3	A-S	M-S	5	IMG-0122
172	211	E-10	Sadughi	2000	1	4	Ad-Bank	M-S	2	IMG-0121
173	212	E-10	Sadughi	1970	1	4	A-S	M-Ad	5	IMG-0123
174	212	E-10	Sadughi	1970	1	4	A-S	M-Ad	5	IMG-0123
175	212	E-10	Sadughi	1970	1	4	A-S	M-Ad	5	IMG-0123
176	213	E-10	Sadughi	2000	3	3	C	S-F	3	IMG-0124
177	214	E-9	Beheshti	1990	2	4	A-S	M-S	1	IMG-0125
178	215	E-9	Beheshti	1970	1	3	A	M-Ad	5	IMG-0126
179	215	E-9	Beheshti	1970	1	3	A	M-Ad	5	IMG-0126
180	215	E-9	Beheshti	1970	1	3	A	M-Ad	5	IMG-0126
181	216	E-9	Beheshti	1985	2	3	Ad-Tel-Center	M-S-F	2	IMG-127
182	216	E-9	Beheshti	1980	1	3	A-S	M	5	IMG-128to131
183	216	E-9	Beheshti	1980	1	3	A-S	M	5	IMG-128to131
184	216	E-9	Beheshti	1970	1	3	A-S	M	5	IMG-128to131
185	217	E-9	Beheshti	2000	1	3	Ad-Office	M-S	4	IMG-132&135
186	218	E-9	Beheshti	1970	1	4	A	M-Ad	5	IMG-133to134
187	218	E-9	Beheshti	1970	1	4	A	M	5	IMG-133to134
188	217	E-9	Beheshti	2003	2	3	A-S	S-B	2	IMG-136-137
189	217	E-9	Beheshti	2003	_	3	O-Mosqe	RC	2	IMG-138
190	219	D-9	ValiAsr	1980	2	2	A-S	M-S	2	IMG-139
191	219	D-9	ValiAsr	1980	1	2	E-School	M-S	2	IMG-140&141
192	220	D-9	Delgosha	1970	1	2	A	M	5	IMG-0143
193	220	D-9	Delgosha	1970	1	2	A	M	5	IMG-0143
194	220	D-9	Delgosha	1970	1	2	A	M	5	IMG-0143
195	220	D-9	Delgosha	1980	1	1	C	M-S	2	IMG-0144
196	220	D-9	Delgosha	1970	1	1	A	M	5	_
197	220	D-9	Delgosha	1970	1	1	A	M	5	_
198	221	E-8	Jomhuri	1970	1	3	C	M	4	IMG-0145
199	222	E-8	Jomhuri	2003	3	3	A-S	S-B	1	IMG-0146
200	223	E-8	Jomhuri	1980	1	3	A	M	5	IMG-0147
201	224	E-8	Jomhuri	1990	2	4	Ad-Office	M-S	1	IMG-0148
202	225	E-8	Jomhuri	1970	1	3	A	M	5	IMG-0149
203	226	E-8	Jomhuri	2003	2	4	A-S	S-F	2	IMG-0150
204	227	E-7	Jomhuri	2003	1	3	A	M-C	1	IMG-0151
205	228	E-7	Shahriyar	2003	2	1	A	M	1	IMG-0152
206	229	E-7	Shahriyar	1980	1	1	A	M	3	IMG-0153

Table 1-5. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
207	230	E-7	Shahriyar	1990	1	2	A	M	2	IMG-0154
208	231	E-7	AmirKabir	2003	2	1	A-S	RC	1	IMG-0155
209	232	E-7	AmirKabir	2002	2	2	A-S	S-B	1	IMG-0156
210	233	E-7	AmirKabir	2003	1	2	A	RC	1	IMG-0157&158
211	234	E-7	AmirKabir	1950	1	1	E-School	Ad	2	IMG-0159&160
212	235	F-7	EmamReza	1970	1	3	A	M	5	IMG-0161
213	236	F-7	EmamReza	1960	1	4	A	Ad	4	IMG-0162
214	237	F-8	22Bahman	1970	2	1	A	M	4	IMG-0163
215	238	F-8	22Bahman	1970	1	1	A	M	3	IMG-0164
216	239	F-8	22Bahman	2000	2	1	A-S	M-S	1	IMG-0165
217	240	F-8	22Bahman	2000	2	1	A-S	S-B	1	IMG-0166
218	241	F-8	22Bahman	1990	2	2	A-S	S-F	1	IMG-0167
219	242	F-8	22Bahman	1970	1	1	A	Ad	4	IMG-0168
220	243	F-8	22Bahman	1970	1	2	A	Ad	4	IMG-0169
221	244	E-8	22Bahman	1960	1	2	A	Ad	4	IMG-0170
222	245	E-8	22Bahman	1960	1	1	A	Ad	5	IMG-0171
223	246	E-9	Taleghani	2002	1	3	A-S	M-S	1	IMG-0172
224	247	E-9	Taleghani	1990	1	3	A	M	5	IMG-0173
225	248	E-9	Taleghani	2000	2	4	A	M-S	1	IMG-0174
226	249	E-9	Taleghani	1970	1	4	A-S	M	4	IMG-0175
227	250	E-9	22Bahman	1960	1	2	A	Ad	5	IMG-0176
228	251	E-9	22Bahman	1960	1	1	A	Ad	4	IMG-0177
229	252	E-9	22Bahman	1960	1	1	A	Ad	4	IMG-0178
230	252	E-9	22Bahman	1960	1	1	A	Ad	5	IMG-0178
231	253	E-9	22Bahman	1960	1	1	A	Ad	5	IMG-0179
232	254	E-9	22Bahman	1990	2	1	A-S	M-S	3	IMG-0180
233	255	E-9	Taleghani	1960	1	3	A	Ad	5	IMG-0181
234	256	F-9	Taleghani	1970	2	4	A-S	M	4	IMG-0182
235	257	F-9	Taleghani	2000	2	3	A-S	S-B	1	IMG-0183&184
236	258	F-9	Taleghani	1960	1	4	A	M-Ad	5	IMG-0185
237	259	F-9	Taleghani	1995	2	4	A	S-F	2	IMG-0186
238	260	G-8	MohamadAbad	1990	1	4	A	M	4	IMG-0187
239	261	G-8	MohamadAbad	1990	2	3	A	M	4	IMG-0188
240	1	G-9	Bahonar	2000	2	3	A-S	S-F	3	IMG-0189
241	2	G-9	Bahonar	1930	1	3	O-Mill	Ad	4	IMG-0191to193
242	3	G-9	Bahonar	2004	4	4	Ad-Office	S-F	2	IMG-194to195
243	4	H-10	Rajaei	1990	2	4	A	M-C	3	IMG-196
244	5	H-11	Rajaei	1980	1	3	A	M	4	IMG-197to199
245	5	H-11	Rajaei	1980	1	3	A	M	4	IMG-197to199
246	5	H-11	Rajaei	1980	1	3	A	M	4	IMG-197to199
247	6	H-11	Rajaei	1980	1	4	A	M	5	IMG-200
248	6	H-11	Rajaei	1980	4	4	A-S	S-B	1	IMG-201
249	6	H-11	Rajaei	1970	1	4	A	M	5	IMG-202to204
250	6	H-11	Rajaei	1970	1	4	A	M	5	IMG-202to204
251	6	H-11	Rajaei	1970	1	4	A	M	5	IMG-202to204
252	7	H-11	Rajaei	1970	1	4	A	M	5	IMG-205to207
253	7	H-11	Rajaei	1970	1	4	A	M	5	IMG-205to207

Table 1-6. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
254	7	H-11	Rajaei	1970	1	4	A	M	5	IMG-205to207
255	9	H-14	Rajaei	2003	2	3	A	M-C	3	IMG-208to213&IMG-215to216
256	9	H-14	Rajaei	2003	2	3	A	M-C	3	IMG-208to213&IMG-215to216
257	9	H-14	Rajaei	2003	2	3	A	M-C	3	IMG-208to213&IMG-215to216
258	9	H-14	Rajaei	2003	2	3	A	M-C	3	IMG-208to213&IMG-215to216
259	9	H-14	Rajaei	2003	2	3	A	M-C	3	IMG-208to213&IMG-215to216
260	9	H-14	Rajaei	2003	2	3	A	M-C	3	IMG-208to213&IMG-215to216
261	9	H-14	Rajaei	2003	2	3	A	M-C	3	IMG-208to213&IMG-215to216
262	9	H-14	Rajaei	2003	2	3	A	M-C	3	IMG-208to213&IMG-215to216
263	8	H-13	Rajaei	2003	2	3	A	M-C	2	IMG-214&217
264	8	H-13	Rajaei	2003	2	3	A	M-C	2	IMG-214&217
265	8	H-13	Rajaei	2003	2	3	A	M-C	2	IMG-214&217
266	8	H-13	Rajaei	2003	2	3	A	M-C	2	IMG-214&217
267	8	H-13	Rajaei	2003	2	3	A	M-C	2	IMG-214&217
268	8	H-13	Rajaei	2003	2	3	A	M-C	2	IMG-214&217
269	8	H-13	Rajaei	2003	2	3	A	M-C	2	IMG-214&217
270	8	H-13	Rajaei	2003	2	3	A	M-C	2	IMG-214&217
271	10	H-13	Rajaei	1980	1	1	A	M	5	IMG-218to220
272	10	H-13	Rajaei	1980	1	1	A	M	5	IMG-218to220
273	10	H-13	Rajaei	1980	1	1	A	M	5	IMG-218to220
274	10	H-13	Rajaei	1980	1	1	A	M	5	IMG-218to220
275	10	H-13	Rajaei	1980	1	1	A	M	5	IMG-218to220
276	10	H-13	Rajaei	1980	1	1	A	M	5	IMG-218to220

Table 1-7. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
277	10	H-13	Rajaei	1980	1	1	A	M	4	IMG-218to220
278	10	H-13	Rajaei	1980	1	1	A	M	4	IMG-218to220
279	11	H-13	Rajaei	1980	1	2	A	M	4	IMG-221-223
280	11	H-13	Rajaei	1980	1	2	A	M	4	IMG-221-223
281	11	H-13	Rajaei	1980	1	2	A	M	4	IMG-221-223
282	11	H-13	Rajaei	1980	1	2	A	M	5	IMG-221-223
283	11	H-13	Rajaei	1980	1	2	A	M	5	IMG-221-223
284	11	H-13	Rajaei	1980	1	2	A	M	5	IMG-221-223
285	11	H-13	Rajaei	1980	1	2	A	M	5	IMG-221-223
286	12	H-13	Rajaei	1980	1	3	A	M	5	IMG-224-226
287	12	H-13	Rajaei	1980	1	3	A	M	5	IMG-224-226
288	12	H-13	Rajaei	1980	1	3	A	M	5	IMG-224-226
289	12	H-13	Rajaei	1980	1	3	A	M	5	IMG-224-226
290	12	H-13	Rajaei	1980	1	3	A	M	5	IMG-224-226
291	12	H-13	Rajaei	1980	1	3	A	M	5	IMG-224-226
292	12	H-13	Rajaei	1980	1	3	A	M	5	IMG-224-226
293	12	H-13	Rajaei	1980	1	3	A	M	5	IMG-224-226
294	12	H-13	Rajaei	1980	1	3	A	M	5	IMG-224-226
295	13	H-13	Rajaei	1980	1	3	A	M	5	IMG-227-229
296	13	H-13	Rajaei	1980	1	3	A	M	5	IMG-227-229
297	13	H-13	Rajaei	1980	2	3	A	M	5	IMG-227-229
298	13	H-13	Rajaei	1980	2	3	A	M	5	IMG-227-229
299	13	H-13	Rajaei	1980	2	3	A	M	5	IMG-227-229
300	13	H-13	Rajaei	1980	2	3	A	M	5	IMG-227-229
301	13	H-13	Rajaei	1980	2	3	A	M	5	IMG-227-229
302	14	H-13	Rajaei	1980	1	1	A	M	5	IMG-230to232
303	14	H-13	Rajaei	1980	1	1	A	M	5	IMG-230to232
304	14	H-13	Rajaei	1980	1	1	A	M	5	IMG-230to232
305	14	H-13	Rajaei	1980	1	1	A	M	2	IMG-230to232
306	14	H-13	Rajaei	1980	1	1	A	M	2	IMG-230to232
307	15	H-13	Rajaei	1980	1	2	A	M	5	IMG-233-234
308	15	H-13	Rajaei	1980	1	2	A	M	5	IMG-233-234
309	14	H-13	Rajaei	1990	1	1	A	S-B	2	–
310	15	H-13	Rajaei	1980	1	2	A	M	5	IMG-235
311	15	H-13	Rajaei	1980	1	2	A	M	5	IMG-235
312	15	H-13	Rajaei	1980	1	2	A	M	5	IMG-235
313	15	H-13	Rajaei	1980	1	2	A	M	5	IMG-235
314	15	H-13	Rajaei	1980	1	2	A	M	5	IMG-235
315	15	H-13	Rajaei	1980	2	2	A	M	5	IMG-235
316	15	H-13	Rajaei	1980	2	2	A	M	5	IMG-235
317	16	H-13	Rajaei	1980	1	1	A	M	5	IMG-236to238
318	16	H-13	Rajaei	1980	1	1	A	M	5	IMG-236to238
319	16	H-13	Rajaei	1980	1	1	A	M	5	IMG-236to238
320	16	H-13	Rajaei	1980	1	1	A	M	5	IMG-236to238
321	16	H-13	Rajaei	1980	1	1	A	M	5	IMG-236to238
322	16	H-13	Rajaei	1980	1	1	A	M	5	IMG-236to238
323	16	H-13	Rajaei	1980	1	1	A	M	5	IMG-236to238

Table 1-8. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
324	17	H-13	Rajaei	1980	2	1	A	M	5	IMG-239&240
325	17	H-13	Rajaei	1980	1	1	A	M	5	IMG-239&240
326	17	H-13	Rajaei	1980	1	1	A	M	5	IMG-239&240
327	17	H-13	Rajaei	1980	1	1	A	M	5	IMG-239&240
328	17	H-13	Rajaei	1980	1	1	A	M	5	IMG-239&240
329	17	H-13	Rajaei	1980	1	1	A	M	5	IMG-239&240
330	17	H-13	Rajaei	1980	1	1	A	M	5	IMG-239&240
331	17	H-13	Rajaei	1990	1	1	A	M-C	2	–
332	18	G-13	Rajaei	1980	2	2	A	M	5	IMG-241&242
333	18	G-13	Rajaei	1980	2	2	A	M	5	IMG-241&242
334	19	F-13	Rajaei	1990	1	1	A	M-C	1	IMG-243
335	20	F-12	Rajaei	1980	1	2	A	M	5	–
336	21	F-12	Rajaei	1980	1	2	A	M-C	1	IMG-0244
337	22	F-12	Rajaei	1990	3	2	Ad-Office	RC	1	IMG-245to249
338	23	F-12	Janbazan	1970	2	4	A	M	5	IMG-250
339	23	F-12	Janbazan	1970	1	4	A	M	5	IMG-251
340	23	F-12	Janbazan	1970	1	4	A	M	5	IMG-251
341	24	F-12	Janbazan	1970	1	3	A	M	5	IMG-252
342	24	F-12	Janbazan	1970	1	3	A	M	5	IMG-252
343	25	F-12	Janbazan	1970	1	4	A	M	5	IMG-253
344	25	F-12	Janbazan	1970	1	4	A	M	5	IMG-253
345	25	F-12	Janbazan	1970	1	4	A	M	5	IMG-253
346	25	F-12	Janbazan	1970	1	4	A	M	5	IMG-253
347	25	F-12	Janbazan	1970	2	4	A	M	5	IMG-253
348	25	F-12	Janbazan	2003	1	4	A	M-C	1	IMG-254
349	24	F-12	Janbazan	1970	1	3	A	M	5	IMG-255
350	25	F-12	Janbazan	1970	1	4	A	M	5	IMG-256
351	26	F-11	Janbazan	1970	1	4	A	Ad	5	IMG-257
352	26	F-11	Janbazan	1970	1	4	A	Ad	5	IMG-257
353	27	F-11	Janbazan	1970	1	3	A	M	5	–
354	27	F-11	Janbazan	1970	1	3	A	M	5	–
355	28	F-11	Janbazan	1970	3	3	A	M-S	4	IMG-258
356	29	F-11	Motahari	1970	1	3	A	M	5	IMG-259
357	30	F-11	Motahari	1970	1	4	A	Ad	5	IMG-260
358	30	F-11	Motahari	1970	1	4	A	Ad	5	IMG-261
359	31	F-11	Motahari	2000	2	4	A-S	S-B	2	IMG-262
360	32	F-11	Motahari	2000	2	3	Ad-Bank	M-S	2	IMG-263
361	33	F-11	Motahari	1980	2	3	A-S	M	4	IMG-264
362	34	F-11	Motahari	1980	1	4	C	M	2	IMG-265
363	35	F-11	SeyedJamal	1970	1	2	A	Ad	5	IMG-266
364	36	F-11	SeyedJamal	1970	1	1	A	M	5	IMG-267
365	37	F-11	SeyedJamal	1980	1	2	A	M	5	IMG-268
366	38	F-11	SeyedJamal	1980	1	1	A	M	5	IMG-269
367	39	F-11	SeyedJamal	1980	1	2	A	M-Ad	5	IMG-270&271
368	39	F-11	SeyedJamal	1980	1	2	A	M-Ad	5	IMG-270&271
369	39	F-11	SeyedJamal	1980	2	2	A	M-Ad	5	IMG-270&271
370	40	F-11	SeyedJamal	1980	1	1	A	M-Ad	5	IMG-272
371	39	F-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-273
372	39	F-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-273

Table 1-9. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
373	39	F-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-273
374	39	F-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-273
375	41	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-274
376	41	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-274
377	41	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-274
378	41	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-274
379	41	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-275
380	41	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-275
381	41	G-11	SeyedJamal	1970	2	2	A	M-Ad	5	IMG-275
382	41	G-11	SeyedJamal	1970	2	2	A	M-Ad	5	IMG-275
383	41	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-275
384	42	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-276
385	42	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-276
386	42	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-276
387	42	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-276
388	42	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-276
389	43	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-277
390	44	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-278
391	44	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-278
392	44	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-278
393	44	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-278
394	44	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-278
395	44	G-11	SeyedJamal	1970	1	1	A	M-Ad	5	IMG-278
396	43	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-279
397	43	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-279
398	43	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-279
399	43	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-279
400	43	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-279
401	43	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-279
402	43	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-280
403	43	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-280
404	43	G-11	SeyedJamal	1970	1	2	A	M-Ad	5	IMG-280
405	43	G-11	SeyedJamal	2000	2	2	A	RC	2	IMG-281to285
406	45	H-11	SeyedJamal	1980	1	2	A	M	3	IMG-0287
407	45	H-11	SeyedJamal	1980	1	2	A	M	3	IMG-0287
408	45	H-11	SeyedJamal	1980	1	2	A	M	3	IMG-0287
409	45	H-11	SeyedJamal	1980	1	2	A	M	3	IMG-0287
410	45	H-11	SeyedJamal	1980	1	2	A	M	3	IMG-0287
411	45	H-11	SeyedJamal	1980	1	2	A	M	3	IMG-0287
412	46	H-11	SeyedJamal	1980	1	1	A	M	3	IMG-0286
413	46	H-11	SeyedJamal	1980	1	1	A	M	3	IMG-0286
414	46	H-11	SeyedJamal	1980	1	1	A	M	3	IMG-0286
415	46	H-11	SeyedJamal	1980	1	1	A	M	3	IMG-0286
416	46	H-11	SeyedJamal	1980	1	1	A	M	3	IMG-0286
417	47	G-12	Keshavarz	1970	1	4	A	Ad	2	IMG-0288
418	48	G-12	Keshavarz	2000	4	3	A-S	S-B	4	IMG-289to298
419	49	G-12	Keshavarz	1970	1	3	A	M	5	IMG-299
420	49	G-12	Keshavarz	1970	1	3	A	M	5	IMG-299
421	49	G-12	Keshavarz	1970	1	3	A	M	5	IMG-299
422	50	G-12	Keshavarz	1970	1	4	A	M	5	IMG-300
423	50	G-12	Keshavarz	1970	1	4	A	M	5	IMG-300
424	50	G-12	Keshavarz	1970	1	4	A	M	5	IMG-300
425	50	G-12	Keshavarz	1970	1	4	A	M	5	IMG-300
426	50	G-12	Keshavarz	1970	1	4	A	M	5	IMG-300
427	51	G-13	Keshavarz	1970	1	4	A	M	5	IMG-301&302
428	51	G-13	Keshavarz	1970	1	4	A	M	5	IMG-301&302
429	51	G-13	Keshavarz	1970	1	4	A	M	5	IMG-301&302

Table 1-10. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
430	51	G-13	Keshavarz	1970	1	4	A	M	4	IMG-301&302
431	52	G-12	Toavon	1970	1	4	A	M	5	IMG-303
432	53	G-12	Toavon	1990	1	3	A	M	5	IMG-304
433	53	G-12	Toavon	1990	1	3	A	M	5	IMG-304
434	54	G-12	Toavon	1980	1	3	A	M	5	IMG-305&306
435	54	G-12	Toavon	1980	1	3	A	M	5	IMG-305&306
436	54	G-12	Toavon	1980	1	3	A	M	5	IMG-305&306
437	55	G-12	Toavon	1980	1	3	A	M	5	IMG-307
438	55	G-12	Toavon	1980	1	3	A	M	5	IMG-307
439	55	G-12	Toavon	1980	1	3	A	M	4	IMG-307
440	56	G-13	Toavon	2003	2	4	A	RC	1	IMG-308&310
441	56	G-13	Toavon	1980	1	4	A	M	5	IMG-311
442	55	G-13	Toavon	2000	1	3	A	RC	5	IMG-312to317
443	57	G-11	Toavon	1980	1	3	A	M	5	IMG-318
444	58	G-12	Toavon	1970	1	4	A	M	5	IMG-319&320
445	59	G-12	Toavon	1970	1	3	A	M	5	IMG-321
446	60	G-12	Toavon	2003	2	4	A	RC	4	IMG-322to331
447	61	G-11	Moalem	1970	1	3	A	M	5	IMG-332
448	62	G-11	Moalem	1970	2	4	A	M	5	IMG-333
449	63	F-10	Ferdosy	1960	1	3	A	Ad	5	IMG-334
450	64	F-10	Ferdosy	1960	1	4	A	Ad	5	IMG-335
451	64	F-10	Ferdosy	1960	1	4	A	Ad	5	IMG-336
452	64	F-10	Ferdosy	1960	1	4	A	Ad	5	IMG-336
453	63	F-10	Ferdosy	1990	1	3	A	M-S	2	IMG-337
454	65	F-10	Ferdosy	1970	1	3	A	M	5	IMG-338
455	65	F-10	Ferdosy	1970	1	3	A	M	5	IMG-338
456	65	F-11	Ferdosy	2000	_	3	O-Stadium	M-S-F	1	IMG-339
457	66	F-11	Ferdosy	2000	2	4	Ad-Office	M-C	1	IMG-340&341
458	67	F-10	Ferdosy	1980	1	3	A	M	5	IMG-344
459	68	F-10	Ferdosy	1980	1	4	A	M	4	IMG-345
460	69	F-9	Taleghani	1970	1	3	A	Ad	5	IMG-346&347
461	70	F-9	Taleghani	1970	1	4	A	Ad	5	IMG-348
462	71	F-9	Taleghani	1960	1	3	E-School	Ad	4	IMG-349
463	72	F-9	Taleghani	1980	1	4	A	M-S	5	IMG-350
464	73	F-10	Taleghani	1970	1	4	A	M	5	IMG-351
465	74	F-10	Taleghani	1990	1	3	C	M-S	1	IMG-352&353
466	75	F-10	Taleghani	2003	3	4	C	S-F	1	IMG-354&355
467	76	F-10	Taleghani	1970	1	3	E-School	M	5	IMG-356
468	77	F-10	Taleghani	1960	1	4	A	M-Ad	5	IMG-357
469	78	E-10	Modares	1960	1	1	A	Ad	5	IMG-358
470	79	E-10	Modares	1960	1	2	A	Ad	5	IMG-359
471	80	E-10	Modares	1960	1	2	A	M	5	IMG-360
472	81	E-10	Modares	2000	2	1	A	M-C	4	IMG-361to363
473	82	E-10	Modares	1980	1	2	A	M	2	IMG-364
474	83	E-10	Modares	2003	3	1	A	M-S	4	IMG-365
475	84	E-10	Modares	1970	1	1	A	M-Ad	4	IMG-366
476	84	E-10	Modares	1970	1	1	A	M-Ad	4	IMG-366
477	85	E-9	Modares	1990	1	2	A	M	4	IMG-367
478	86	E-9	Modares	1990	1	2	A	M-C	1	IMG-368

Table 1-11. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
479	87	E-9	Modares	1970	1	2	A	Ad	4	IMG-369
480	88	F-9	Modares	1980	1	2	A	Ad	5	IMG-370
481	89	F-9	Modares	1980	1	1	A	M	3	IMG-371
482	90	F-8	Modares	1980	1	2	A	M	4	IMG-372
483	91	F-8	Chamran	2003	2	3	A	S-B	1	IMG-373
484	92	F-8	Chamran	1990	1	4	O-publichealth	M-C	1	IMG-374
485	93	F-8	Chamran	1980	1	3	A	M	3	IMG-376
486	94	F-11	Emam	2000	4	1	A-S	S-B	4	IMG-377to382&IMG-410to415
487	95	H-10	Emam	1980	1	1	Ad-Office	M-S-F	1	IMG-389
488	96	H-10	Emam	1990	2	1	Ad-Office	M-C	3	IMG-392to397
489	97	G-10	Emam	1990	_	1	O-Stadium	M-S-F	1	IMG-398toIMG-402
490	98	G-10	Emam	1980	2	1	A-S	S-B	2	IMG-403
491	99	G-10	Emam	2000	4	1	A-S	S-B	1	IMG-404
492	100	F-10	Emam	1970	1	1	A	Ad	5	IMG-405
493	101	F-10	Emam	1990	1	1	A-S	M-S	3	IMG-406
494	102	F-11	Emam	1980	2	1	O-Inn	M	2	IMG-407&408
495	103	F-11	Emam	1960	1	1	A	Ad	5	IMG-409
496	104	F-11	Emam	2000	2	1	A-S	S-F	1	IMG-416
497	105	E-11	Emam	2000	2	1	A-S	M-S	1	IMG-417&418
498	105	E-11	Emam	2000	2	1	A-S	M-S	2	IMG-419
499	106	E-11	Emam	1970	2	1	A-S	M-S	4	IMG-420
500	107	E-11	Emam	2003	_	1	O-Mosqe	M-C	1	IMG-421to428
501	108	E-11	Emam	1970	1	1	Ad-Office	M-Ad	5	IMG-429to430
502	109	E-10	Kashani	1970	1	2	A	M-Ad	5	IMG-431
503	109	E-10	Kashani	1970	1	2	A	M-Ad	5	IMG-431
504	110	E-10	Kashani	1970	1	2	A	M-Ad	5	IMG-432
505	110	E-10	Kashani	1970	1	2	A	M-Ad	5	IMG-432
506	111	E-10	Kashani	1970	1	1	A	M-Ad	5	IMG-433
507	111	E-10	Kashani	1970	1	1	A	M-Ad	5	IMG-433
508	112	E-10	Kashani	1970	1	1	A	M-Ad	5	IMG-434to436
509	112	E-10	Kashani	1970	1	1	A	M-Ad	5	IMG-434to436
510	112	E-10	Kashani	1970	1	1	A	M-Ad	5	IMG-434to436
511	112	E-10	Kashani	1970	2	1	A	M-Ad	5	IMG-434to436
512	112	E-10	Kashani	1970	2	1	A	M-Ad	5	IMG-434to436
513	112	E-10	Kashani	1970	1	1	A	M-Ad	5	IMG-434to436
514	113	E-10	Kashani	1970	1	2	A	M-Ad	5	IMG-437
515	113	E-10	Kashani	1970	1	2	A	M-Ad	5	IMG-437
516	113	E-10	Kashani	1970	1	2	A	M-Ad	5	IMG-437
517	114	E-10	Emam	1970	1	2	A	Ad	5	IMG-438
518	115	E-10	Emam	1980	2	2	A	M-S	2	IMG-439to440
519	116	E-10	Emam	1960	1	2	A-S	Ad	3	IMG-441to442
520	117	E-10	Emam	1980	1	2	O-Hospital	M	3	IMG-443
521	118	F-10	Emam	1960	2	2	A	Ad	5	IMG-444

Table 1-12. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
522	119	F-10	Emam	2000	2	2	A-S	S-B	1	IMG-445
523	120	F-10	Emam	2000	3	2	A-S	S-B	4	IMG-446to448
524	121	F-10	Emam	1990	2	2	A	M	5	IMG-449
525	122	F-10	Emam	1990	3	2	A-S	M-S	1	IMG-450
526	123	G-10	Emam	1980	1	2	A	M-Ad	4	IMG-451
527	124	G-10	Emam	1960	1	2	A	M	5	IMG-452to455
528	125	G-10	Emam	1980	1	2	O-Hospital	M	4	IMG-456to459
529	126	G-10	Emam	1980	_	2	O-Tel.Tower	Truss	1	IMG-462to464
530	1	I-15	Baravat-Rajaei	2000	3	1	Ad-Tel.Center	RC	1	IMG-467to472
531	2	I-15	Baravat-Rajaei	1990	1	1	C	M	2	IMG-473
532	3	I-15	Baravat-Rajaei	1960	1	1	A	Ad	3	IMG-474
533	4	H-15	Baravat-Rajaei	1970	1	1	C	M	2	IMG-475
534	5	H-15	Baravat-Rajaei	1980	1	1	C	M-Ad	1	IMG-476
535	6	H-15	Baravat-Rajaei	1970	2	2	A	M	4	IMG-477
536	7	H-15	Baravat-Rajaei	1980	2	2	A	M	4	IMG-478
537	8	H-15	Baravat-Rajaei	1960	1	2	A	Ad	5	IMG-479
538	9	H-15	Baravat-Rajaei	1980	2	2	A	M	5	IMG-480&481
539	10	I-15	Baravat-Rajaei	1980	1	2	A	M	5	IMG-482
540	11	I-15	Baravat-Rajaei	1980	2	2	O-FireDept.	M-S	1	IMG-483to484
541	12	I-15	Baravat-Rajaei	1970	1	2	A	M	4	IMG-485to486
542	12	I-15	Baravat-Rajaei	1970	1	2	A	M	5	IMG-487
543	13	I-15	Baravat-Rajaei	1990	3	2	Ad-Bank	S-F	2	IMG-488
544	14	J-15	Baravat-Rajaei	1980	2	2	A-S	S-F	4	IMG-489
545	15	J-15	Baravat-Rajaei	1970	1	2	A	M	4	IMG-490
546	16	J-15	Baravat-Rajaei	1970	1	2	A	M	4	IMG-491
547	17	J-15	Baravat-Rajaei	1970	1	2	A	M	4	IMG-492
548	18	K-15	Baravat-Rajaei	2000	1	1	A	M	3	IMG-494
549	19	K-15	Baravat-Rajaei	1970	1	1	A	M	5	IMG-495
550	20	K-15	Baravat-Rajaei	1970	1	1	A	M	5	IMG-496
551	21	K-15	Baravat-Rajaei	1970	1	1	A	M	5	IMG-497to499
552	21	K-15	Baravat-Rajaei	1970	1	1	A	M	5	IMG-497to499
553	22	J-15	Baravat-Rajaei	1960	1	1	A	Ad	4	IMG-500
554	22	J-15	Baravat-Rajaei	1960	1	1	A	Ad	4	IMG-501
555	23	J-15	Baravat-Rajaei	1990	2	1	A	S-B	1	IMG-502
556	24	J-15	Baravat-Rajaei	1980	1	1	A	M	2	IMG-503to504
557	25	J-15	Baravat-Rajaei	1990	1	1	A	M-C	3	IMG-505to507
558	1	C-1	KajeAskarVillage	1970	1	4	E-School	M	1	IMG-508
559	2	C-1	KajeAskarVillage	1960	1	3	A	Ad	3	IMG-509
560	3	C-1	KajeAskarVillage	1960	1	3	A	M	4	IMG-510
561	4	D-1	KajeAskarVillage	1990	1	4	A	M	1	IMG-511
562	5	D-2	KajeAskarVillage	1990	1	4	C	M	3	IMG-512
563	6	C-2	KajeAskarVillage	1995	1	3	A	M	3	IMG-513
564	1	G-7	Bam Industrial City	1990	1	4	O-Factory	M-S-F	1	IMG-515

Table 1-13. (continued)

Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
565	2	H-8	Bam Industrial City	2003	1	4	O-Factory	M-S-F	1	IMG-516&517
566	3	H-8	Bam Industrial City	2000	1	4	Ad-Office	M	1	IMG-518
567	4	H-8	Bam Industrial City	1990	1	4	A	M	1	IMG-519
568	5	H-9	Bam	1990	2	4	O-Car Company	M-S	4	IMG-520
569	6	H-9	Bam	1990	2	4	C-Restaurant	M	4	IMG-521
570	1	H-11	HashemiNejad	1990	1	1	A	M	4	IMG-0522
571	2	H-11	HashemiNejad	2000	1	2	E-School	M-C	1	IMG-0523
572	3	G-11	HashemiNejad	1970	1	1	A	M	5	IMG-0524
573	4	G-11	HashemiNejad	1980	1	2	A	M	5	IMG-0525
574	3	G-11	HashemiNejad	1980	1	1	A	M	4	IMG-0526
575	5	G-11	HashemiNejad	1970	1	1	A	M	5	IMG-0527
576	6	G-11	HashemiNejad	1970	1	2	A	M	5	IMG-0528-529
577	7	G-11	Almahdi	1970	1	4	A	M	5	IMG-0530-531
578	7	G-11	Almahdi	1970	1	4	A	M	5	IMG-0530-531
579	7	G-11	Almahdi	1970	1	4	A	M	5	IMG-0530-531
580	7	G-11	Almahdi	1970	1	4	A	M	5	IMG-0530-531
581	7	G-11	Almahdi	1970	1	4	A	M	5	IMG-0530-531
582	8	G-11	Almahdi	1990	1	3	A	M	5	IMG-532-533
583	8	G-11	Almahdi	1980	1	3	A	M	5	IMG-532-533
584	8	G-11	Almahdi	1980	1	3	A	M	5	IMG-532-533
585	9	G-11	Almahdi	1980	1	4	A	M	5	IMG-534-535
586	9	G-11	Almahdi	1980	1	4	A	M	5	IMG-534-535
587	9	G-11	Almahdi	1980	1	4	A	M	5	IMG-534-535
588	9	G-11	Almahdi	1980	1	4	A	M	5	IMG-534-535
589	9	G-11	Almahdi	1980	1	4	A	M	5	IMG-534-535
590	10	G-11	Almahdi	1970	1	3	A	M	5	IMG-536
591	10	G-11	Almahdi	1970	1	3	A	M	5	IMG-536
592	10	G-11	Almahdi	1970	1	3	A	M	5	IMG-536
593	10	G-11	Almahdi	1970	1	3	A	M	5	IMG-536
594	10	G-11	Almahdi	1970	1	3	A	M	5	IMG-536
595	11	G-11	Almahdi	1970	1	4	A	M	5	IMG-537
596	11	G-11	Almahdi	1970	1	4	A	M	5	IMG-537
597	11	G-11	Almahdi	1970	1	4	A	M	5	IMG-537
598	12	G-11	Almahdi	1970	1	3	A	M	5	IMG-538
599	13	G-12	Almahdi	1970	1	4	A	M	5	IMG-539to541
600	13	G-12	Almahdi	1970	1	4	A	M	5	IMG-539to541
601	13	G-12	Almahdi	1970	1	4	A	M	5	IMG-539to541
602	13	G-12	Almahdi	1970	1	4	A	M	5	IMG-539to541
603	13	G-12	Almahdi	1970	1	4	A	M	5	IMG-539to541
604	14	G-12	Almahdi	1970	1	4	A	M	5	IMG-0542
605	15	G-12	Almahdi	1990	1	3	E-School	M-C	2	IMG-0543
606	15	G-12	Almahdi	1990	1	3	E-School	M-S	2	IMG-0544
607	15	G-12	Almahdi	2003	2	3	A	S-B	2	IMG-0545
608	16	G-12	Almahdi	2003	2	4	A	S-B	2	IMG-0546
609	17	G-12	Almahdi	2002	2	4	A	S-B	1	IMG-0547
610	18	G-12	Almahdi	1980	1	4	A	M	5	IMG-0548

Table 1-14. (continued)

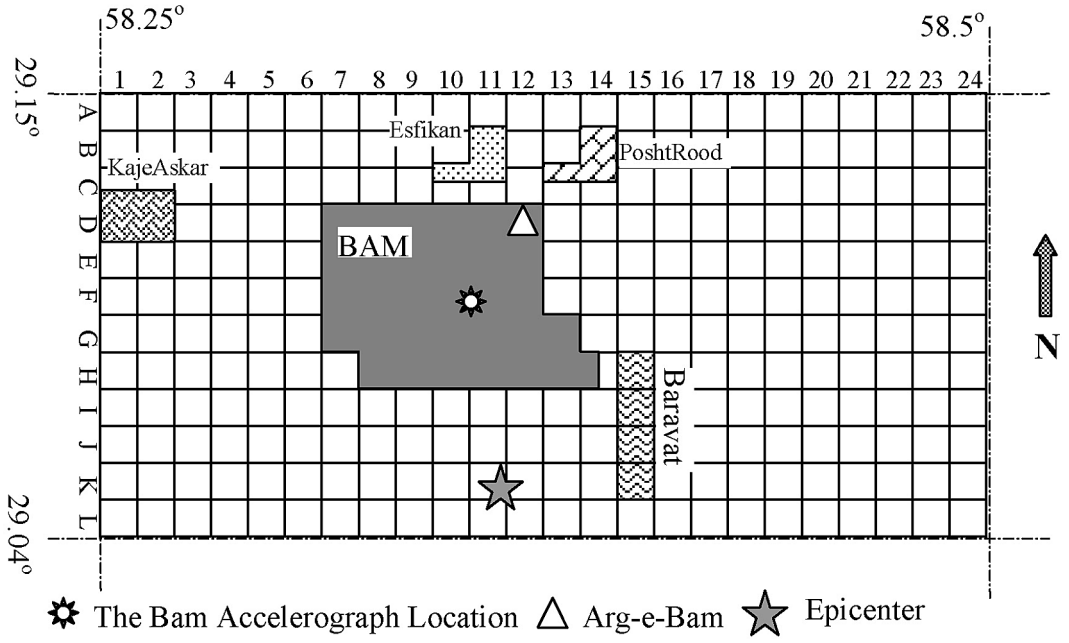
Total No.	No.	Area	Location Street	Built Year	No.of Story	Direction	Use of Structure	Structure	Damage Rate	Photos No.
611	19	F-12	12Metri-Zeinabiye	1970	1	1	A	M	5	IMG-0549
612	20	F-12	12Metri-Zeinabiye	1970	1	2	A	M	5	IMG-0550
613	21	F-12	12Metri-Zeinabiye	1990	1	1	A	M	4	IMG-0551
614	22	F-11	12Metri-Zeinabiye	1980	1	2	A	M	3	IMG-0552
615	23	F-11	12Metri-Zeinabiye	1970	1	2	A	M	4	IMG-0553
616	24	F-11	12Metri-Zeinabiye	1990	1	1	A	M	4	IMG-0554
617	23	F-11	12Metri-Zeinabiye	1970	1	2	A	Ad	5	IMG-0555
618	25	F-11	Abolfazl	1970	1	2	A	M	5	IMG-0556
619	26	F-11	Abolfazl	1970	2	1	A	M	5	IMG-0557
620	27	F-11	Abolfazl	1980	2	1	A	M	5	IMG-0558
621	28	F-11	Abolfazl	1990	2	2	A	M-S	2	IMG-0559
622	28	F-11	Abolfazl	1990	2	2	A	M	3	IMG-0560
623	29	F-11	Abolfazl	1970	1	2	A	M	5	IMG-0561
624	30	F-12	Abolfazl	1990	2	1	A	M	5	IMG-0562

Total No.: Total number of buildings, No.: Local number of buildings for observation, Area: Location of Building based on the below Map, Location Street: Name of Street, Year Built: Year constructed as estimated by the investigator, No. of Stories: Number of stories of the building, Direction: definitions: 1=Entrance of the Building faces west, 2=Entrance of the Building faces East, 3=Entrance of the Building faces south, 4 Entrance of the Building faces North, Use of Structure: The Building is used as: A-Apartment Building, Ad-Administrative Building, AS-Apartment-Shop Building, C-Commercial Building, E-Educative Facility, O-Others.

Structure: Type of Structure: Ad=adobe structure, M=Masonry, M-Ad Masonry with adobe mortar, M-C=Masonry with RC ties, M-S=Masonry with steel ties, S-B=Steel frame structures with bracing, RC=Reinforced Concrete, M-S-F=steel frame-masonry structure.

Damage Rate: Damage grades in the EMS scales; grade 1: negligible to slight damage, grade 2: moderate damage, grade 3: substantial to heavy damage, grade 4: very heavy damage, and grade 5: destruction.

Photo No.: Number of related digital photo file. The photos can be provided by the authors on request.



Buildings Locator Map: A networked map of Bam city and four nearby villages.