1 General Information

1.1 Building Type (Indigenous name for the housing type): _____

1.2 Country: _____

1.3 Region(s) Where Found: (Provide the name(s) of the region(s) where this housing type exists; the region might indicate state, province or a similar political entity; if possible, indicate percentage this housing type as a fraction of the entire housing stock in the region)

1.4 Summary: provide a brief summary of the housing type; the summary should include the description of building function, structural strengths and deficiencies, and expected seismic performance.

1.5 How long has this construction type been practiced?

- Less than 25 years
- 25-60 years
- 51-75 years
- 76-100 years
- 101-200 years
- More than 200 years

1.6 Is this construction type still being practiced? ◯ YES ◯ NO (as of _____)

1.7 Building Occupancy: Select all that apply

- Residential, unknown type
- Single dwelling
- Multi-unit, unknown type
- Residential, 2 units
- Residential, 3-4 units
- Residential, 5-9 units
- Residential, 10-19 units
- Residential, 20-49 units
- Residential, 50+ units
- Temporary lodging
- Institutional housing
- Mobile home
- Informal housing
- Mixed residential/commercial
- Other

1.8 Typical Number of Stories: _____

1.9 Indicate how often this construction type in the given terrain?

	Typically	Occasionally	Never
Flat	◯	◯	◯
Sloped (hilly)	◯	◯	◯

1.9 Additional Comments on Section 1

2 Features

2.1 Plan Shape: (Select the typical shape of a building plan for this construction type)

Unknown plan shape
Square, solid
Square, with an opening in plan
Rectangular, solid
Rectangular, with an opening in plan
L-shape
Curved, solid (e.g. circular, elliptical, ovoid)
Curved, with opening in plan
Triangular, solid
Triangular, with an opening in plan
Polygonal, solid (e.g. trapezoid, pentagon, hexagon)
Polygonal, with an opening in plan
E-shape
H-shape
S-shape
T-shape
U- or C-shape
X-shape
Y-shape
Irregular plan shape
Other

Additional comments on plan shape: (If Other selected above, please describe.)

2.2 Plan Dimensions

2.2.1 Typical Plan Length (meters)**:** _____

2.2.2 Typical Plan Width (meters)**:** _____

2.2.3 Typical Story Height (meters)**:** _____

2.3 Type of Structural System: Select all that apply

Material	Type of Load-Bearing Structure	Subtypes
Masonry: Stone Masonry Walls: Rubble stone (field stone) in mud/lime mortar or without mortar (u		
Masonry: Stone Masonry Walls: Massive stone masonry (in lime/cement mortar)		
Masonry: Earthen/Mud/Adobe/Rammed Earth Walls: Mud walls		
Masonry: Earthen/Mud/Adobe/Rammed Earth Walls: Mud walls with horizontal wood elements		
Masonry: Earthen/Mud/Adobe/Rammed Earth Walls: Adobe block walls		
Masonry: Earthen/Mud/Adobe/Rammed Earth Walls: Rammed earth/pile construction		
Masonry: Unreinforced Masonry Walls: Brick masonry in mud/lime mortar		
Masonry: Unreinforced Masonry Walls: Brick masonry in mud mortar with vertical posts		
Masonry: Unreinforced Masonry Walls: Brick masonry in lime/cement mortar		
Masonry: Unreinforced Masonry Walls: Concrete block masonry in cement mortar		
Masonry: Confined Masonry: Clay brick/tile masonry with wooden posts and beams		
Masonry: Confined Masonry: Clay brick masonry with concrete posts/tie columns and beams		
Masonry: Confined Masonry: Concrete blocks, tie columns and beams		
Masonry: Reinforced Masonry: Stone masonry in cement mortar		
Masonry: Reinforced Masonry: Clay brick masonry in cement mortar		
Masonry: Reinforced Masonry: Concrete block masonry in cement mortar		
Structural Concrete: Moment Resisting Frame: Flat slab structure		
Structural Concrete: Moment Resisting Frame: Designed for gravity loads only, with URM infill wa		
Structural Concrete: Moment Resisting Frame: Designed with seismic effects, with URM infill walls		
Structural Concrete: Moment Resisting Frame: Designed with seismic effects, with structural infill		
Structural Concrete: Moment Resisting Frame: Dual system Frame with shear wall		
Structural Concrete: Structural Wall: Moment frame with in-situ shear walls		
Structural Concrete: Structural Wall: Moment frame with precast shear walls		
Structural Concrete: Precast Concrete: Moment frame		
Structural Concrete: Precast Concrete: Prestressed moment frame with shear walls		
Structural Concrete: Precast Concrete: Large panel precast walls		
Structural Concrete: Precast Concrete: Shear wall structure with walls cast in-situ		
Structural Concrete: Precast Concrete: Shear wall structure with precast wall panel structure		
Steel: Moment Resisting Frame: With brick masonry partitions		
Steel: Moment Resisting Frame: With cast in-situ concrete walls		
Steel: Moment Resisting Frame: With lightweight partitions		
Steel: Braced Frame: Concentric connections in all panels		
Steel: Braced Frame: Eccentric connections in a few panels		
Steel: Structural Wall: Bolted plate		
Steel: Structural Wall: Welded plate		
Wooden structure: Load-bearing Timber Frame: Thatch		
Wooden structure: Load-bearing Timber Frame: Walls with bamboo/reed mesh and post (Wattle a		
Wooden Structure: Load-bearing timber frame: Masonry with horizontal beams/planks at intermed		
Wooden Structure: Load-bearing Timber Frame: Post and beam frame (no special connections)		
Wooden Structure: Load-bearing Timber Frame: Wood frame (with special connections)		
Wooden structure: Load-bearing Timber Frame: Stud wall frame with plywood/gypsum board shea		
Wooden Structure: Load-bearing Timber Frame: Wooden panel walls		
Other: Seismic Protection Systems: Building protected with base-isolation		
Other: Seismic Protection Systems: Building protected with seismic dampers		
Other: Hybrid Systems: Other		
Other		

Additional comments on structural system: (If Other selected, please explain. If there is more than one type of structural system, please explain.)

2.4 Gravity load-bearing & lateral load-resisting systems: (Describe the key elements)

2.5 Typical Wall Densities (total wall area (excluding openings)/plan area (for each floor)):

Use the area of all walls in one direction divided by the area of the plan, and then do it for the walls going in the other direction (also divided by the area of the plan). Give a number for each direction if they are different.

0-1%	0-1%
1-2%	1-2%
3-4%	3-4%
2-3%	2-3%
4-5%	4-5%
5-10%	5-10%
10-15%	10-15%
15-20%	15-20%
>20%	>20%

Additional comments on typical wall densities:

2.6 Wall Openings: Housing vulnerability is significantly affected by openings in the walls (e.g. doors and windows), and especially their number, size and position; this statement is particularly valid for loadbearing masonry and concrete wall structures. Provide the number, size and position of openings for a typical floor in a building. If possible, provide an estimate (expressed in %) for the overall window and door areas as a fraction of the overall wall surface area.

2.7 Is it typical for buildings of this type to have common walls with adjacent buildings?
◯ YES ◯ NO

2.8 Modification of Buildings: (Describe typical patterns of modification observed (i.e. infill balconies, demolishing interior walls or columns, extensions to buildings, new stairs, etc.))

2.9 Type of Foundation: (Select all that apply)

- Shallow Foundation: Wall or column embedded in soil, without footing
- Shallow Foundation: Rubble stone, fieldstone isolated footing
- Shallow Foundation: Rubble stone, fieldstone strip footing
- Shallow Foundation: Reinforced concrete isolated footing
- Shallow Foundation: Reinforced concrete strip footing
- Shallow Foundation: Mat foundation
- Shallow Foundation: No foundation
- Deep Foundation: Reinforced concrete bearing piles
- Deep Foundation: Reinforced concrete skin friction piles
- Deep Foundation: Steel bearing piles
- Deep Foundation: Wood piles
- Deep Foundation: Steel skin friction piles
- Deep Foundation: Cast-in-place concrete piers
- Deep Foundation: Caissons
- Other Foundation

Additional comments on foundation: (If other selected, please explain. If there is more than one foundation type, please explain)

2.10 Type of Floor System: (Select all that apply)

No elevated or suspended floor system (single-story building)
Masonry floor, unknown
Vaulted masonry floor
Shallow-arched masonry floor
Composite cast-in-place reinforced concrete and masonry floor system
Earthen floor, unknown
Concrete floor, unknown
Cast-in-place beamless reinforced concrete floor
Precast concrete floor with reinforced concrete topping
Precast concrete floor without reinforced concrete topping
Metal floor, unknown
Metal beams, trusses, or joists supporting light flooring
Metal floor beams supporting precast concrete slab
Composite steel deck and concrete slab
Wooden floor, unknown
Wooden beams or trusses and joists supporting light flooring
Wooden beams or trusses and joists supporting heavy flooring
Wood-based sheets on joists or beams
Plywood panels or other light-weight panels for floor
Other floor system

Additional comments on floor system: (e.g. is floor diaphragm rigid or flexible?)

2.11 Type of Roof System: (Select all that apply)

Roof material unknown
Masonry roof, unknown
Vaulted masonry roof
Shallow-arched masonry roof
Composite masonry and concrete roof system
Earthen roof, unknown
Vaulted earthen roof
Concrete roof, unknown
Cast-in-place beamless reinforced concrete roof
Cast-in-place beam-supported reinforced concrete roof
Precast concrete roof with reinforced concrete topping
Precast concrete roof without reinforced concrete topping
Metal roof, unknown
Metal beams or trusses supporting light roofing
Metal roof beams supporting precast concrete slabs
Composite steel roof deck and concrete slab
Wooden roof, unknown
Wooden structure with light roof covering
Wooden beams or trusses with heavy roof covering
Wooden beams or trusses with Wood-based sheets on rafters or purlinsheavy roof covering
Plywood panels or other light-weight panels for roof
Bamboo, straw, or thatch roof
Inflatable or tensile membrance roof
Fabric roof, other
Roof system, other

Additional comments on roof system: (e.g. is roof diaphragm rigid or flexible?)

2.12 Additional Comments on Section 2

3 Building Materials and Construction Process

3.1 Description of Building Materials

Structural element	Building material(s)	Comments (Include Characteristic strength, see Note 1, and Mix Proportion/Dimensions, see Note 2)
Wall/Frame		
Foundations		
Floors		
Roof		
Other:_____		

Notes: 1. Tension/compression/shear strength (e.g. concrete compression strength, steel yield strength, masonry compressive/shear strength; 2. Explain mix of different materials used in the construction e.g. masonry mortar mix (1:6 cement/sand mortar or 1:3 lime/sand mortar); concrete mix 1:2:4 (cement:sand:aggregate) ; dimensions of masonry units e.g. brick size 228mm(9 in.)x 114mm(4.5 in.)x 76mm(3in.)

3.2 Design process

3.2.1 Who is involved in the design process?

- Engineer
- Architect
- Technologist
- Builder
- Owner
- Other
- None of the above

3.2.2 Explain the roles of those selected in the design process

3.2.3 Describe the expertise of those selected

3.3 Construction process

3.3.1 Who typically builds this construction type?

- Owner
- Mason
- Builder
- Contractor
- Other

3.3.2 Explain roles of those selected in the building process (If Other selected, please explain.)

3.3.3 Describe expertise of those selected

3.3.4 Construction Process and Phasing (e.g. Briefly describe the construction process; and what tools and/or equipment are typically used.)

3.3.5 Construction issues (describe any problems encountered during construction that relate to seismic vulnerability)

3.6 Building Codes and Standards

3.6.1 Is this construction type addressed by codes/standards? ◯ YES ◯ NO

3.6.2 If yes, provide the title of the code or standard and the year when the first code/standard addressing this type of construction had been issued? Include any applicable codes.

3.6.3 Process for Building Code Enforcement (explain, if appropriate)

3.7 Building Permits and Development Control Rules

3.7.1 Are building permits required? ◯ YES ◉ NO

3.7.2 Is this typically informal construction? (without permits, plans, inspection-explain)
◯ YES ◉ NO

3.7.3 Is this construction typically authorized as per development control rules?
◯ YES ◉ NO

Additional comments on building permits and development control rules:

3.8 Typical Problems Associated with this Type of Construction (e.g. environmental, water ingress)

3.9 Who typically maintains buildings of this type? (Select all that apply)

- Builder
- Owner(s)
- Renter(s)
- No one
- Other

Additional comments regarding both maintenance and building condition:
(If other above, please explain)

3.10 Construction Economics

3.10.1 Explain unit construction cost: per m2 of built-up area expressed using a currency used in the region, and, if possible, an equivalent amount in $US in the brackets e.g. 200 Rs/m2 (5 $US/m2) (When calculating the conversion between local currency and U.S. dollars, please use the market rate if it is different from the official rate))

3.10.2 Explain labor requirements (number of effort days required to complete the construction):

3.11 Additional Comments on Section 3

4 Socio-Economic Issues

4.1 Patterns of Occupancy:

4.2 Typical number of inhabitants

4.2.1 How many inhabitants reside in a typical building of this construction type during the day? (i.e. during business hours) (select all that apply)

- <5
- 5-10
- 10-20
- >20
- Other

4.2.2 How many inhabitants reside in a typical building of this construction type in the evening/night? (select all that apply)

- <5
- 5-10
- 10-20
- >20
- Other

Additional comments on number of inhabitants: (if Other selected, specify number)

4.3 Economic Level of Inhabitants*: (Select all that apply)

- [ ] Very low-income class (very poor)
- [ ] Low-income class (poor)
- [ ] Middle-income class
- [x] High-income class (rich)

**Below are the general guidelines related to the economic status of the inhabitants*

Very Poor = lowest 10% of the population (per GDP)
Poor = lowest 30% of the population
Middle Class = from the lowest 30% up to the top 20% of the population
Rich = top 20% of the population

Additional comments on economic level of inhabitants:

4.4 What is the typical source of financing for buildings of this type?
(Select all that apply)

- [ ] Owner financed
- [ ] Personal savings
- [ ] Informal network: friends or relatives
- [ ] Small lending institutions/microfinance institutions
- [ ] Commercial banks/mortgages
- [ ] Investment pools
- [ ] Combination
- [ ] Government-owned housing
- [x] Other

Additional comments on financing: (If Combination or Other selected, please explain)

4.5 Type of ownership for buildings of this type? (Select all that apply)

Rent
Own outright
Own with debt (mortgage or other)
Units owned individually (condominium)
Owned by group or pool
Long-term lease
Other

Additional comments on ownership: (if Other selected, please explain)

4.6 Insurance

4.6.1 Is earthquake insurance for this construction type typically available?

◯ YES ◯ NO

4.6.2 If earthquake insurance is available, what does this insurance typically cover/cost?

4.6.3 Are premium discounts or higher coverages available for seismically strengthened buildings or new buildings built to incorporate seismically resistant features?

◯ YES ◯ NO

Additional comments on premium discounts:

4.7 Additional Comments on Section 4

5 Earthquake

5.1 Past earthquakes in the country which affected buildings of this type:

Year	**Earthquake Epicenter** (nearest city, state for ex: Izmit, Turkey, or Killari, Maharashtra)	**Richter Magnitude** (M)	**Maximum Intensity** (Indicate scale e.g. MMI, MSK)

5.2 Damage patterns observed in past earthquakes for this construction type:

Additional comments on earthquake damage patterns:

5.3 Structural and Architectural Features for Seismic Resistance:

(Note that this table should be filled out based on educated judgment-- no design checks or calculations need to be performed.)

Structural/ Architectural Feature	**Statement**[1]	**Select True** (indicating good seismic resistance)**, False** (indicating poor seismic resistance)**, or N/A**
Lateral load path	The structure contains a complete load path for seismic force effects from any horizontal direction that serves to transfer inertial forces from the building to the foundation.	N/A
Building Configuration-Vertical	The building is regular with regards to the elevation. (Specify in 5.4.1)	N/A
Building Configuration-Horizontal	The building is regular with regards to the plan. (Specify in 5.4.2)	N/A
Roof construction	The roof diaphragm is considered to be rigid and it is expected that the roof structure will maintain its integrity, i.e. shape and form, during an earthquake of intensity expected in this area.	N/A
Floor construction	The floor diaphragm(s) are considered to be rigid and it is expected that the floor structure(s) will maintain its integrity during an earthquake of intensity expected in this area.	N/A
Foundation performance	There is no evidence of excessive foundation movement (e.g. settlement) that would affect the integrity or performance of the structure in an earthquake.	N/A
Wall and frame structures-redundancy	The number of lines of walls or frames in each principal direction is greater than or equal to 2.	N/A
Wall proportions	Height-to-thickness ratio of the shear walls at each floor level is: Less than 25 (concrete walls); Less than 30 (reinforced masonry walls); Less than 13 (unreinforced masonry walls);	N/A
Foundation-wall connection	Vertical load-bearing elements (columns, walls) are attached to the foundations; concrete columns and walls are doweled into the foundation.	N/A

[1] The main reference publication used in developing the statements used in this table is FEMA310 "Handbook for the Seismic Evaluation of Buildings-A Prestandard", Federal Emergency Management Agency, Washington, D.C., 1998.

Wall-roof connections	Exterior walls are anchored for out-of-plane seismic effects at each diaphragm level with metal anchors or straps	N/A
Wall openings	The total width of door and window openings in a wall is: For brick masonry construction in cement mortar : less than ½ of the distance between the adjacent cross walls; For adobe masonry, stone masonry and brick masonry in mud mortar: less than 1/3 of the distance between the adjacent cross walls; For precast concrete wall structures: less than 3/4 of the length of a perimeter wall.	N/A
Quality of building materials	Quality of building materials is considered to be adequate per the requirements of national codes and standards (an estimate).	N/A
Quality of workmanship	Quality of workmanship (based on visual inspection of a few typical buildings) is considered to be good (per local construction standards).	N/A
Maintenance	Buildings of this type are generally well maintained and there are no visible signs of deterioration of building elements (concrete, steel, timber)	N/A

Additional comments on Structural and Architectural Features for Seismic Resistance:

5.4 Building Irregularities

5.4.1 Select vertical irregularities typically found in this construction type:

No irregularities
Torsion eccentricity
Re-entrant corner
Other

5.4.2 Select horizontal irregularities typically found in this construction type:

- No irregularities
- Soft/weak story
- Cripple wall
- Short column
- Pounding potential
- Setback
- Change in vertical structure
- Other

5.5 Seismic Features

5.5.1 Walls

5.5.1.1 Seismic Deficiency

5.5.1.2 Earthquake –Resilient Features (Describe positive structural features that contribute to the good seismic performance)

5.5.2 Frame (columns, beams)

5.5.2.1 Seismic Deficiency

5.5.2.2 Earthquake –Resilient Features (Describe positive structural features that contribute to the good seismic performance)

5.5.3 Roof and floors

5.5.3.1 Seismic Deficiency

5.5.3.2 Earthquake –Resilient Features (Describe positive structural features that contribute to the good seismic performance)

5.5.4 Foundation

5.5.4.1 Seismic Deficiency

5.5.4.2 Earthquake –Resilient Features (Describe positive structural features that contribute to the good seismic performance)

5.5.5 Other (e.g. chimneys, masonry veneers, parapets)

5.5.5.1 Seismic Deficiency

5.5.5.2 Earthquake –Resilient Features (Describe positive structural features that contribute to the good seismic performance)

5.6 Seismic Vulnerability Rating: Prior to filling out the information required in the table below, please read the Guidelines here: URL

(Select one- use symbols listed in the Notes below the table)

	High Vulnerability (Very Poor Seismic Performance) A	B	Medium Vulnerability C	D	E	Low Vulnerability (Excellent Seismic Performance) F
Seismic Vulnerability Class						

Notes:
o = Expected seismic vulnerability class
|- =Probable vulnerability range –lower bound
-| =Probable vulnerability range-upper bound
Once you have determined the seismic vulnerability class for this construction type, copy the above symbols: o, |-, and -| as appropriate and place them into the table.

5.7 Additional Comments on Section 5

Seismic Vulnerability Rating – A Guideline

"The term vulnerability is used in this document to express differences in the way that buildings respond to earthquake shaking. If two groups of buildings are subjected to exactly the same earthquake shaking, and one group performs better than the other, then it can be said that the buildings that were less damaged had lower earthquake vulnerability than the ones that were more damaged, or it can be stated that the buildings that were less damaged are more earthquake-resistant, and vice versa." (an excerpt from the publication European Macroseismic Scale 1998 (EMS1998), prepared by the European Seismological Commission, Cahiers du Centre Europeen de Geodynamique et de Seismologie, Vol.15, Luxembourg 1998). Note, therefore, that the use of word vulnerability in this document is not necessarily the same as other uses and definitions of the same word.

Classification of all structural types included in this document into six (6) classes of decreasing vulnerability (A, B, C, D, E, and F) is largely based on a similar classification presented in the EMS1998.
The first three classes A, B, and C, represent the most vulnerable (i.e. least earthquake-resistant) building types; e.g. Class A- adobe masonry (Types 3 and 5 in the table below) or rubble stone masonry (Type 1 in the table below); class B- typical brick masonry building (Type 7); Class C- reinforced concrete frame structure without seismic provisions (Type 13);
Classes D and E are intended to represent building types characterized with the reduced vulnerability (i.e. increased earthquake-resistance) as a result of inherent structural features and also special seismic design provisions; well-built timber, reinforced concrete and steel structures, as well as confined and reinforced masonry structures generally fall into vulnerability classes D and E.
Class F is intended to represent the vulnerability of a structure with a high level of earthquake-resistant design.

Guidelines for Seismic Vulnerability of Construction Types
(based on European Macroseismic Scale 1998)

Participants should use their judgment in assigning the seismic vulnerability class to their building type. The table on the following page has been prepared as a guide in the selection of a seismic vulnerability class, and in the absence of other information can be used by the participant for the appropriate structural type. The vulnerability rating is subjective, and is intended to give a general estimation of the seismic vulnerability of the building type. It should not be used as a basis for statistical loss estimation or for evaluation of an individual building without additional information.

Material	Type of Load-Bearing Structure	No	Subtypes	Vulnerability Class					
				A	B	C	D	E	F
Masonry	Stone Masonry Walls	1	Rubble stone (field stone) in mud/lime mortar or without mortar (usually with timber roof)	λ					
		2	Massive stone masonry (in lime/cement mortar)		|-	λ	-|		
	Earthen/Mud/ Adobe/Rammed Earthen Walls	3	Mud walls	λ					
		4	Mud walls with horizontal wood elements	|-	λ	-|			
		5	Adobe block walls	λ					
		6	Rammed earth/Pile construction						
	Clay brick/block masonry walls	7	Unreinforced brick masonry in mud mortar	|-	λ	-|			
		8	Unreinforced brick masonry in mud mortar with vertical posts						
		9	Unreinforced brick masonry in cement mortar with reinforced concrete floor/roof slabs		|-	λ	-|		
		10	Confined brick/block masonry with concrete posts/tie columns and beams			|-	λ	-|	
	Concrete block masonry	11	Unreinforced in lime/cement mortar (various floor/roof systems)						
		12	Reinforced, in cement mortar (various floor/roof systems)			|-	λ	-|	
Structural concrete	Moment resisting frame	13	Designed for gravity loads only (predating seismic codes i.e. no seismic features)	|-	-	λ	-|		
		14	Designed with seismic features (various ages)			|-	-	λ	-|
		15	Frame with unreinforced masonry infill walls						
		16	Flat slab structure		|-	λ	-|		
		17	Precast frame structure						
		18	Frame with concrete shear walls-dual system						
	Shear wall structure	19	Walls cast in-situ				|-	λ	-|
		20	Precast wall panel structure		|-	λ	-|		
Steel	Moment-resisting frame	21	With brick masonry partitions						
		22	With cast in-situ concrete walls						
		23	With lightweight partitions						
	Braced frame	24					|-	λ	-|
Wooden structures	Load-bearing timber frame	25	Thatch		|-	λ	-|		
		26	Post and beam frame			|-	λ	-|	
		27	Walls with bamboo/reed mesh and post (Wattle and Daub)						
		28	Frame with (stone/brick) masonry infill						
		29	Frame with plywood/gypsum board sheathing						
		30	Frame with stud walls				|-	λ	-|

6 Retrofit

6.1 Description of seismic strengthening provisions

Structural Deficiency	**Description of a typical seismic strengthening provision used** (describe how it needs to be constructed, building materials used, its expected effectiveness, and the level of complexity in terms of construction)

Additional comments: Provide additional information about the strengthening techniques to the extent they are available to you.

6.2 Seismic Strengthening Adopted

6.2.1 Has seismic strengthening described in the above table been performed? If so, to what extent?

6.2.2 Was the work done as a mitigation effort on an undamaged building, or as repair following earthquake damage?

6.3 Construction and Performance of Seismic Strengthening

6.3.1 Was the construction inspected in the same manner as new construction?

6.3.2 Who performed the construction: a contractor, or owner/user? Was an architect or engineer involved?

6.3.3 What has been the performance of retrofitted buildings of this type in subsequent earthquakes?

6.4 Additional Comments on Section 6

Appendix 1: General Information Images

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Appendix 1: General Information Images

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Appendix 1: General Information Images

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Appendix 2: Features Images

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Appendix 2: Features Images

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Appendix 2: Features Images

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Appendix 3: Building Materials Images

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Appendix 3: Building Materials Images

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Appendix 3: Building Materials Images

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Appendix 4: Socio-economic Issues

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Appendix 4: Socio-economic Issues

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Appendix 4: Socio-economic Issues

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Appendix 5: Earthquake Images

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Appendix 5: Earthquake Images

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Appendix 5: Earthquake Images

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Appendix 6: Retrofit Images

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Appendix 6: Retrofit Images

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Appendix 6: Retrofit Images

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Appendix 7: References

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Appendix 8: Authors

Author 1 Name	
Author 1 Title	
Author 1 Affiliation	
Author 1 Location	
Author 1 Email	
Author 2 Name	
Author 2 Title	
Author 2 Affiliation	
Author 2 Location	
Author 2 Email	
Author 3 Name	
Author 3 Title	
Author 3 Affiliation	
Author 3 Location	
Author 3 Email	
Author 4 Name	
Author 4 Title	
Author 4 Affiliation	
Author 4 Location	
Author 4 Email	
Author 5 Name	
Author 5 Title	
Author 5 Affiliation	
Author 5 Location	
Author 5 Email	

Appendix 8: Authors

Author 6 Name	
Author 6 Title	
Author 6 Affiliation	
Author 6 Location	
Author 6 Email	
Author 7 Name	
Author 7 Title	
Author 7 Affiliation	
Author 7 Location	
Author 7 Email	
Author 8 Name	
Author 8 Title	
Author 8 Affiliation	
Author 8 Location	
Author 8 Email	
Author 9 Name	
Author 9 Title	
Author 9 Affiliation	
Author 9 Location	
Author 9 Email	
Author 10 Name	
Author 10 Title	
Author 10 Affiliation	
Author 10 Location	
Author 10 Email	

Appendix 9: Reviewer

Reviewer 1 Name	
Reviewer 1 Title	
Reviewer 1 Affiliation	
Reviewer 1 Location	
Reviewer 1 Email	
Reviewer 2 Name	
Reviewer 2 Title	
Reviewer 2 Affiliation	
Reviewer 2 Location	
Reviewer 2 Email	
Reviewer 3 Name	
Reviewer 3 Title	
Reviewer 3 Affiliation	
Reviewer 3 Location	
Reviewer 3 Email	
Reviewer 4 Name	
Reviewer 4 Title	
Reviewer 4 Affiliation	
Reviewer 4 Location	
Reviewer 4 Email	
Reviewer 5 Name	
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