

Appendix B

Data Collection Forms and Reference Guides

B.1 Level 1 and Level 2 Forms for Very High, High, Moderately High, Moderate, and Low Seismicity

Electronic versions of these forms are also available for download at www.atcouncil.org.

PHOTOGRAPH

Address: _____
 _____ Zip: _____

Other Identifiers: _____

Building Name: _____

Use: _____

Latitude: _____ **Longitude:** _____

Ss: _____ **Sr:** _____

Screener(s): _____ **Date/Time:** _____

No. Stories: Above Grade: _____ Below Grade: _____ **Year Built:** _____ EST

Total Floor Area (sq. ft.): _____ **Code Year:** _____

Additions: None Yes, Year(s) Built: _____

Occupancy: Assembly Commercial Emer. Services Historic Shelter
 Industrial Office School Government
 Utility Warehouse Residential, # Units: _____

Soil Type: A B C D E F DNK
 Hard Avg Dense Stiff Soft Poor
 Rock Rock Soil Soil Soil Soil
If DNK, assume Type D.

Geologic Hazards: Liquefaction: Yes/No/DNK Landslide: Yes/No/DNK Surf. Rupt.: Yes/No/DNK

Adjacency: Pounding Falling Hazards from Taller Adjacent Building

Irregularities: Vertical (type/severity) _____
 Plan (type) _____

Exterior Falling Hazards: Unbraced Chimneys Heavy Cladding or Heavy Veneer
 Parapets Appendages
 Other: _____

COMMENTS:

Additional sketches or comments on separate page

SKETCH

Additional sketches or comments on separate page

BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE, S_{L1}

FEMA BUILDING TYPE	Do Not Know	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score		2.1	1.9	1.8	1.5	1.4	1.6	1.4	1.2	1.0	1.2	0.9	1.1	1.0	1.1	1.1	0.9	1.1
Severe Vertical Irregularity, V_{L1}		-0.9	-0.9	-0.9	-0.8	-0.7	-0.8	-0.7	-0.7	-0.7	-0.8	-0.6	-0.7	-0.7	-0.7	-0.7	-0.6	NA
Moderate Vertical Irregularity, V_{L1}		-0.6	-0.5	-0.5	-0.4	-0.4	-0.5	-0.4	-0.3	-0.4	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.3	NA
Plan Irregularity, Pl_1		-0.7	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.4	-0.4	-0.5	-0.3	-0.5	-0.4	-0.4	-0.4	-0.3	NA
Pre-Code		-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	0.0
Post-Benchmark		1.9	1.9	2.0	1.0	1.1	1.1	1.5	NA	1.4	1.7	NA	1.5	1.7	1.6	1.6	NA	0.5
Soil Type A or B		0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.1	0.3	0.2	0.3	0.3	0.1	0.1
Soil Type E (1-3 stories)		0.0	-0.2	-0.4	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	-0.1
Soil Type E (> 3 stories)		-0.4	-0.4	-0.4	-0.3	-0.3	NA	-0.3	-0.1	-0.1	-0.3	-0.1	NA	-0.1	-0.2	-0.2	0.0	NA
Minimum Score, S_{MIN}		0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	1.0

FINAL LEVEL 1 SCORE, $S_{L1} \geq S_{MIN}$:

EXTENT OF REVIEW

Exterior: Partial All Sides Aerial
 None Visible Entered

Interior: None Visible Entered

Drawings Reviewed: Yes No

Soil Type Source: _____

Geologic Hazards Source: _____

Contact Person: _____

LEVEL 2 SCREENING PERFORMED?

Yes, Final Level 2 Score, S_{L2} _____ No

Nonstructural hazards? Yes No

OTHER HAZARDS

Are There Hazards That Trigger A Detailed Structural Evaluation?

Pounding potential (unless $S_{L2} >$ cut-off, if known)

Falling hazards from taller adjacent building

Geologic hazards or Soil Type F

Significant damage/deterioration to the structural system

ACTION REQUIRED

Detailed Structural Evaluation Required?

Yes, unknown FEMA building type or other building

Yes, score less than cut-off

Yes, other hazards present

No

Detailed Nonstructural Evaluation Recommended? (check one)

Yes, nonstructural hazards identified that should be evaluated

No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary

No, no nonstructural hazards identified DNK

Where information cannot be verified, screener shall note the following: EST = Estimated or unreliable data OR DNK = Do Not Know

Rapid Visual Screening of Buildings for Potential Seismic Hazards

FEMA P-154 Data Collection Form

Optional Level 2 data collection to be performed by a civil or structural engineering professional, architect, or graduate student with background in seismic evaluation or design of buildings.

Level 2 (Optional)
VERY HIGH Seismicity

Bldg Name:	Final Level 1 Score: $S_{L1} =$ _____ (do not consider S_{MIN})
Screener:	Level 1 Irregularity Modifiers: Vertical Irregularity, $V_{L1} =$ _____ Plan Irregularity, $P_{L1} =$ _____
Date/Time:	ADJUSTED BASELINE SCORE: $S' = (S_{L1} - V_{L1} - P_{L1}) =$ _____

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic	Statement (If statement is true, circle the "Yes" modifier; otherwise cross out the modifier.)	Yes	Subtotals
Vertical Irregularity, V_{L2}	Sloping Site	W1 building: There is at least a full story grade change from one side of the building to the other.	-0.9
		Non-W1 building: There is at least a full story grade change from one side of the building to the other.	-0.2
	Weak and/or Soft Story (circle one maximum)	W1 building cripple wall: An unbraced cripple wall is visible in the crawl space.	-0.5
		W1 house over garage: Underneath an occupied story, there is a garage opening without a steel moment frame, and there is less than 8' of wall on the same line (for multiple occupied floors above, use 16' of wall minimum).	-0.9
		W1A building open front: There are openings at the ground story (such as for parking) over at least 50% of the length of the building.	-0.9
		Non-W1 building: Length of lateral system at any story is less than 50% of that at story above or height of any story is more than 2.0 times the height of the story above.	-0.7
		Non-W1 building: Length of lateral system at any story is between 50% and 75% of that at story above or height of any story is between 1.3 and 2.0 times the height of the story above.	-0.4
	Setback	Vertical elements of the lateral system at an upper story are outboard of those at the story below causing the diaphragm to cantilever at the offset.	-0.7
		Vertical elements of the lateral system at upper stories are inboard of those at lower stories.	-0.4
		There is an in-plane offset of the lateral elements that is greater than the length of the elements.	-0.2
	Short Column/ Pier	C1,C2,C3,PC1,PC2,RM1,RM2: At least 20% of columns (or piers) along a column line in the lateral system have height/depth ratios less than 50% of the nominal height/depth ratio at that level.	-0.4
		C1,C2,C3,PC1,PC2,RM1,RM2: The column depth (or pier width) is less than one half of the depth of the spandrel, or there are infill walls or adjacent floors that shorten the column.	-0.4
Split Level	There is a split level at one of the floor levels or at the roof.	-0.4	
Other Irregularity	There is another observable severe vertical irregularity that obviously affects the building's seismic performance.	-0.7	
	There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.4	
			$V_{L2} =$ _____ (Cap at -0.9)
Plan Irregularity, P_{L2}	Torsional irregularity: Lateral system does not appear relatively well distributed in plan in either or both directions. (Do not include the W1A open front irregularity listed above.)	-0.5	
	Non-parallel system: There are one or more major vertical elements of the lateral system that are not orthogonal to each other.	-0.2	
	Reentrant corner: Both projections from an interior corner exceed 25% of the overall plan dimension in that direction.	-0.2	
	Diaphragm opening: There is an opening in the diaphragm with a width over 50% of the total diaphragm width at that level.	-0.2	
	C1, C2 building out-of-plane offset: The exterior beams do not align with the columns in plan.	-0.2	
	Other irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.	-0.5	
			$P_{L2} =$ _____ (Cap at -0.7)
Redundancy	The building has at least two bays of lateral elements on each side of the building in each direction.	+0.2	
Pounding	Building is separated from an adjacent structure by less than 1.5% of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	(Cap total) -0.7
		One building is 2 or more stories taller than the other.	pounding -0.7
		The building is at the end of the block.	modifiers at -0.9 -0.4
S2 Building	"K" bracing geometry is visible.	-0.7	
C1 Building	Flat plate serves as the beam in the moment frame.	-0.3	
PC1/RM1 Bldg	There are roof-to-wall ties that are visible or known from drawings that do not rely on cross-grain bending. (Do not combine with post-benchmark or retrofit modifier.)	+0.2	
PC1/RM1 Bldg	The building has closely spaced, full height interior walls (rather than an interior space with few walls such as in a warehouse).	+0.2	
URM	Gable walls are present.	-0.3	
MH	There is a supplemental seismic bracing system provided between the carriage and the ground.	+0.5	
Retrofit	Comprehensive seismic retrofit is visible or known from drawings.	+1.2	
			$M =$ _____

FINAL LEVEL 2 SCORE, $S_{L2} = (S' + V_{L2} + P_{L2} + M) \geq S_{MIN}$. (Transfer to Level 1 form)

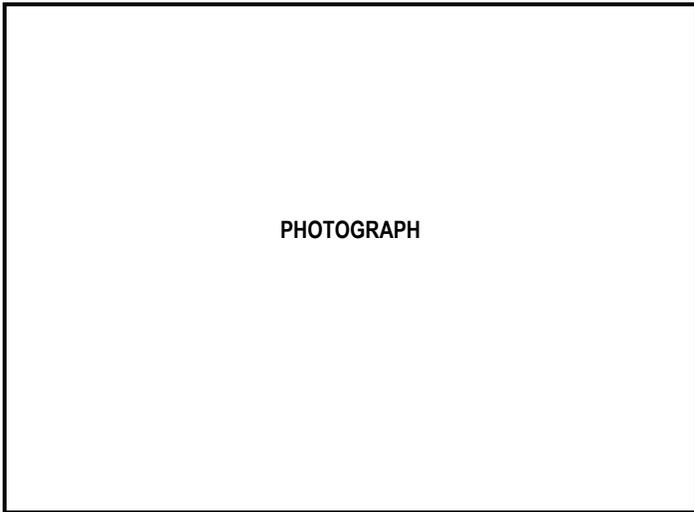
There is observable damage or deterioration or another condition that negatively affects the building's seismic performance: Yes No
If yes, describe the condition in the comment box below and indicate on the Level 1 form that detailed evaluation is required independent of the building's score.

OBSERVABLE NONSTRUCTURAL HAZARDS

Location	Statement (Check "Yes" or "No")	Yes	No	Comment
Exterior	There is an unbraced unreinforced masonry parapet or unbraced unreinforced masonry chimney.			
	There is heavy cladding or heavy veneer.			
	There is a heavy canopy over exit doors or pedestrian walkways that appears inadequately supported.			
	There is an unreinforced masonry appendage over exit doors or pedestrian walkways.			
	There is a sign posted on the building that indicates hazardous materials are present.			
	There is a taller adjacent building with an unanchored URM wall or unbraced URM parapet or chimney.			
	Other observed exterior nonstructural falling hazard:			
Interior	There are hollow clay tile or brick partitions at any stair or exit corridor.			
	Other observed interior nonstructural falling hazard:			

Estimated Nonstructural Seismic Performance (Check appropriate box and transfer to Level 1 form conclusions)
 Potential nonstructural hazards with significant threat to occupant life safety →Detailed Nonstructural Evaluation recommended
 Nonstructural hazards identified with significant threat to occupant life safety →But no Detailed Nonstructural Evaluation required
 Low or no nonstructural hazard threat to occupant life safety →No Detailed Nonstructural Evaluation required

Comments:



Address: _____
 _____ Zip: _____
Other Identifiers: _____
Building Name: _____
Use: _____
Latitude: _____ **Longitude:** _____
Ss: _____ **Sr:** _____
Screeener(s): _____ **Date/Time:** _____

No. Stories: Above Grade: _____ Below Grade: _____ **Year Built:** _____ EST
Total Floor Area (sq. ft.): _____ **Code Year:** _____
Additions: None Yes, Year(s) Built: _____

Occupancy: Assembly Commercial Emer. Services Historic Shelter
 Industrial Office School Government
 Utility Warehouse Residential, # Units: _____

Soil Type: A B C D E F DNK
 Hard Avg Dense Stiff Soft Poor
 Rock Rock Soil Soil Soil Soil
If DNK, assume Type D.

Geologic Hazards: Liquefaction: Yes/No/DNK Landslide: Yes/No/DNK Surf. Rupt.: Yes/No/DNK

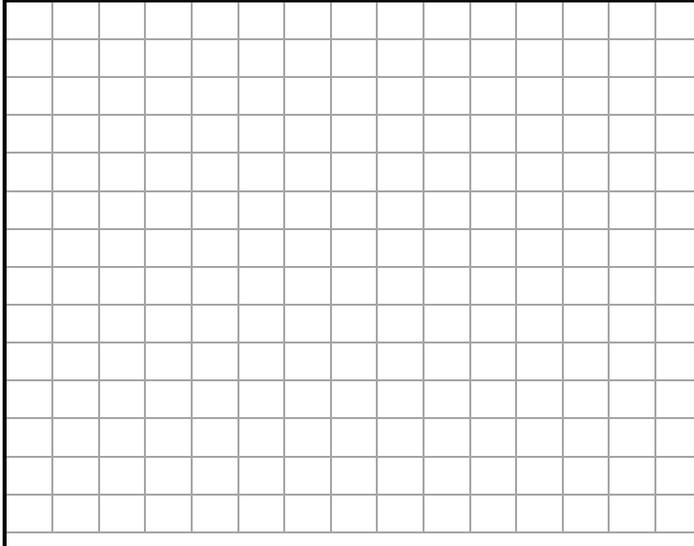
Adjacency: Pounding Falling Hazards from Taller Adjacent Building

Irregularities: Vertical (type/severity) _____
 Plan (type) _____

Exterior Falling Hazards: Unbraced Chimneys Heavy Cladding or Heavy Veneer
 Parapets Appendages
 Other: _____

COMMENTS:

 Additional sketches or comments on separate page



SKETCH

BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE, S_{L1}

FEMA BUILDING TYPE	Do Not Know	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score		3.6	3.2	2.9	2.1	2.0	2.6	2.0	1.7	1.5	2.0	1.2	1.6	1.4	1.7	1.7	1.0	1.5
Severe Vertical Irregularity, V _{L1}		-1.2	-1.2	-1.2	-1.0	-1.0	-1.1	-1.0	-0.8	-0.9	-1.0	-0.7	-1.0	-0.9	-0.9	-0.9	-0.7	NA
Moderate Vertical Irregularity, V _{L1}		-0.7	-0.7	-0.7	-0.6	-0.6	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.6	-0.5	-0.5	-0.5	-0.4	NA
Plan Irregularity, P _{L1}		-1.1	-1.0	-1.0	-0.8	-0.7	-0.9	-0.7	-0.6	-0.6	-0.8	-0.5	-0.7	-0.6	-0.7	-0.7	-0.4	NA
Pre-Code		-1.1	-1.0	-0.9	-0.6	-0.6	-0.8	-0.6	-0.2	-0.4	-0.7	-0.1	-0.5	-0.3	-0.5	-0.5	0.0	-0.1
Post-Benchmark		1.6	1.9	2.2	1.4	1.4	1.1	1.9	NA	1.9	2.1	NA	2.0	2.4	2.1	2.1	NA	1.2
Soil Type A or B		0.1	0.3	0.5	0.4	0.6	0.1	0.6	0.5	0.4	0.5	0.3	0.6	0.4	0.5	0.5	0.3	0.3
Soil Type E (1-3 stories)		0.2	0.2	0.1	-0.2	-0.4	0.2	-0.1	-0.4	0.0	0.0	-0.2	-0.3	-0.1	-0.1	-0.1	-0.2	-0.4
Soil Type E (> 3 stories)		-0.3	-0.6	-0.9	-0.6	-0.6	NA	-0.6	-0.4	-0.5	-0.7	-0.3	NA	-0.4	-0.5	-0.6	-0.2	NA
Minimum Score, S _{MIN}		1.1	0.9	0.7	0.5	0.5	0.6	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	1.0

FINAL LEVEL 1 SCORE, S_{L1} ≥ S_{MIN}:

<p>EXTENT OF REVIEW</p> <p>Exterior: <input type="checkbox"/> Partial <input type="checkbox"/> All Sides <input type="checkbox"/> Aerial Interior: <input type="checkbox"/> None <input type="checkbox"/> Visible <input type="checkbox"/> Entered Drawings Reviewed: <input type="checkbox"/> Yes <input type="checkbox"/> No Soil Type Source: _____ Geologic Hazards Source: _____ Contact Person: _____</p>	<p>OTHER HAZARDS</p> <p>Are There Hazards That Trigger A Detailed Structural Evaluation?</p> <p><input type="checkbox"/> Pounding potential (unless S_{L2} > cut-off, if known) <input type="checkbox"/> Falling hazards from taller adjacent building <input type="checkbox"/> Geologic hazards or Soil Type F <input type="checkbox"/> Significant damage/deterioration to the structural system</p>	<p>ACTION REQUIRED</p> <p>Detailed Structural Evaluation Required?</p> <p><input type="checkbox"/> Yes, unknown FEMA building type or other building <input type="checkbox"/> Yes, score less than cut-off <input type="checkbox"/> Yes, other hazards present <input type="checkbox"/> No</p> <p>Detailed Nonstructural Evaluation Recommended? (check one)</p> <p><input type="checkbox"/> Yes, nonstructural hazards identified that should be evaluated <input type="checkbox"/> No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary <input type="checkbox"/> No, no nonstructural hazards identified <input type="checkbox"/> DNK</p>
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Where information cannot be verified, screener shall note the following: EST = Estimated or unreliable data OR DNK = Do Not Know

Rapid Visual Screening of Buildings for Potential Seismic Hazards

FEMA P-154 Data Collection Form

Optional Level 2 data collection to be performed by a civil or structural engineering professional, architect, or graduate student with background in seismic evaluation or design of buildings.

Level 2 (Optional)
HIGH Seismicity

Bldg Name:	Final Level 1 Score: $S_{L1} =$ _____ (do not consider S_{MIN})
Screener:	Level 1 Irregularity Modifiers: Vertical Irregularity, $V_{L1} =$ _____ Plan Irregularity, $P_{L1} =$ _____
Date/Time:	ADJUSTED BASELINE SCORE: $S' = (S_{L1} - V_{L1} - P_{L1}) =$ _____

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic	Statement (If statement is true, circle the "Yes" modifier; otherwise cross out the modifier.)	Yes	Subtotals
Vertical Irregularity, V_{L2}	Sloping Site	W1 building: There is at least a full story grade change from one side of the building to the other.	-1.2
		Non-W1 building: There is at least a full story grade change from one side of the building to the other.	-0.3
	Weak and/or Soft Story (circle one maximum)	W1 building cripple wall: An unbraced cripple wall is visible in the crawl space.	-0.6
		W1 house over garage: Underneath an occupied story, there is a garage opening without a steel moment frame, and there is less than 8' of wall on the same line (for multiple occupied floors above, use 16' of wall minimum).	-1.2
		W1A building open front: There are openings at the ground story (such as for parking) over at least 50% of the length of the building.	-1.2
		Non-W1 building: Length of lateral system at any story is less than 50% of that at story above or height of any story is more than 2.0 times the height of the story above.	-0.9
		Non-W1 building: Length of lateral system at any story is between 50% and 75% of that at story above or height of any story is between 1.3 and 2.0 times the height of the story above.	-0.5
	Setback	Vertical elements of the lateral system at an upper story are outboard of those at the story below causing the diaphragm to cantilever at the offset.	-1.0
		Vertical elements of the lateral system at upper stories are inboard of those at lower stories.	-0.5
		There is an in-plane offset of the lateral elements that is greater than the length of the elements.	-0.3
	Short Column/ Pier	C1,C2,C3,PC1,PC2,RM1,RM2: At least 20% of columns (or piers) along a column line in the lateral system have height/depth ratios less than 50% of the nominal height/depth ratio at that level.	-0.5
		C1,C2,C3,PC1,PC2,RM1,RM2: The column depth (or pier width) is less than one half of the depth of the spandrel, or there are infill walls or adjacent floors that shorten the column.	-0.5
Split Level	There is a split level at one of the floor levels or at the roof.	-0.5	
Other Irregularity	There is another observable severe vertical irregularity that obviously affects the building's seismic performance.	-1.0	
	There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.5	
			$V_{L2} =$ _____ (Cap at -1.2)
Plan Irregularity, P_{L2}	Torsional irregularity: Lateral system does not appear relatively well distributed in plan in either or both directions. (Do not include the W1A open front irregularity listed above.)		-0.7
	Non-parallel system: There are one or more major vertical elements of the lateral system that are not orthogonal to each other.		-0.4
	Reentrant corner: Both projections from an interior corner exceed 25% of the overall plan dimension in that direction.		-0.4
	Diaphragm opening: There is an opening in the diaphragm with a width over 50% of the total diaphragm width at that level.		-0.2
	C1, C2 building out-of-plane offset: The exterior beams do not align with the columns in plan.		-0.4
Other irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-0.7	
			$P_{L2} =$ _____ (Cap at -1.1)
Redundancy	The building has at least two bays of lateral elements on each side of the building in each direction.		+0.3
Pounding	Building is separated from an adjacent structure by less than 1% of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	-1.0
		One building is 2 or more stories taller than the other.	-1.0
		The building is at the end of the block.	-0.5
			(Cap total pounding modifiers at -1.2)
S2 Building	"K" bracing geometry is visible.		-1.0
C1 Building	Flat plate serves as the beam in the moment frame.		-0.4
PC1/RM1 Bldg	There are roof-to-wall ties that are visible or known from drawings that do not rely on cross-grain bending. (Do not combine with post-benchmark or retrofit modifier.)		+0.3
PC1/RM1 Bldg	The building has closely spaced, full height interior walls (rather than an interior space with few walls such as in a warehouse).		+0.3
URM	Gable walls are present.		-0.4
MH	There is a supplemental seismic bracing system provided between the carriage and the ground.		+1.2
Retrofit	Comprehensive seismic retrofit is visible or known from drawings.		+1.4
			$M =$ _____

FINAL LEVEL 2 SCORE, $S_{L2} = (S' + V_{L2} + P_{L2} + M) \geq S_{MIN}$. (Transfer to Level 1 form)

There is observable damage or deterioration or another condition that negatively affects the building's seismic performance: Yes No
If yes, describe the condition in the comment box below and indicate on the Level 1 form that detailed evaluation is required independent of the building's score.

OBSERVABLE NONSTRUCTURAL HAZARDS

Location	Statement (Check "Yes" or "No")	Yes	No	Comment
Exterior	There is an unbraced unreinforced masonry parapet or unbraced unreinforced masonry chimney.			
	There is heavy cladding or heavy veneer.			
	There is a heavy canopy over exit doors or pedestrian walkways that appears inadequately supported.			
	There is an unreinforced masonry appendage over exit doors or pedestrian walkways.			
	There is a sign posted on the building that indicates hazardous materials are present.			
	There is a taller adjacent building with an unanchored URM wall or unbraced URM parapet or chimney.			
	Other observed exterior nonstructural falling hazard:			
Interior	There are hollow clay tile or brick partitions at any stair or exit corridor.			
	Other observed interior nonstructural falling hazard:			

Estimated Nonstructural Seismic Performance (Check appropriate box and transfer to Level 1 form conclusions)
 Potential nonstructural hazards with significant threat to occupant life safety → Detailed Nonstructural Evaluation recommended
 Nonstructural hazards identified with significant threat to occupant life safety → But no Detailed Nonstructural Evaluation required
 Low or no nonstructural hazard threat to occupant life safety → No Detailed Nonstructural Evaluation required

Comments:

PHOTOGRAPH

Address: _____
 _____ Zip: _____

Other Identifiers: _____

Building Name: _____

Use: _____

Latitude: _____ **Longitude:** _____

Ss: _____ **Sr:** _____

Screener(s): _____ **Date/Time:** _____

No. Stories: Above Grade: _____ Below Grade: _____ **Year Built:** _____ EST

Total Floor Area (sq. ft.): _____ **Code Year:** _____

Additions: None Yes, Year(s) Built: _____

Occupancy: Assembly Commercial Emer. Services Historic Shelter
 Industrial Office School Government
 Utility Warehouse Residential, # Units: _____

Soil Type: A B C D E F DNK
 Hard Avg Dense Stiff Soft Poor DNK
 Rock Rock Soil Soil Soil Soil *If DNK, assume Type D.*

Geologic Hazards: Liquefaction: Yes/No/DNK Landslide: Yes/No/DNK Surf. Rupt.: Yes/No/DNK

Adjacency: Pounding Falling Hazards from Taller Adjacent Building

Irregularities: Vertical (type/severity) _____
 Plan (type) _____

Exterior Falling Hazards: Unbraced Chimneys Heavy Cladding or Heavy Veneer
 Parapets Appendages
 Other: _____

COMMENTS:

Additional sketches or comments on separate page

SKETCH

BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE, S_{L1}

FEMA BUILDING TYPE	Do Not Know	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score		4.1	3.7	3.2	2.3	2.2	2.9	2.2	2.0	1.7	2.1	1.4	1.8	1.5	1.8	1.8	1.2	2.2
Severe Vertical Irregularity, V_{L1}		-1.3	-1.3	-1.3	-1.1	-1.0	-1.2	-1.0	-0.9	-1.0	-1.1	-0.8	-1.0	-0.9	-1.0	-1.0	-0.8	NA
Moderate Vertical Irregularity, V_{L1}		-0.8	-0.8	-0.8	-0.7	-0.6	-0.8	-0.6	-0.6	-0.6	-0.6	-0.5	-0.6	-0.6	-0.6	-0.6	-0.5	NA
Plan Irregularity, P_{L1}		-1.3	-1.2	-1.1	-0.9	-0.8	-1.0	-0.8	-0.7	-0.7	-0.9	-0.6	-0.8	-0.7	-0.7	-0.7	-0.5	NA
Pre-Code		-0.8	-0.9	-0.9	-0.5	-0.5	-0.7	-0.6	-0.2	-0.4	-0.7	-0.1	-0.4	-0.3	-0.5	-0.5	-0.1	-0.3
Post-Benchmark		1.5	1.9	2.3	1.4	1.4	1.0	1.9	NA	1.9	2.1	NA	2.1	2.4	2.1	2.1	NA	1.2
Soil Type A or B		0.3	0.6	0.9	0.6	0.9	0.3	0.9	0.9	0.6	0.8	0.7	0.9	0.7	0.8	0.8	0.6	0.9
Soil Type E (1-3 stories)		0.0	-0.1	-0.3	-0.4	-0.5	0.0	-0.4	-0.5	-0.2	-0.2	-0.4	-0.5	-0.3	-0.4	-0.4	-0.3	-0.5
Soil Type E (> 3 stories)		-0.5	-0.8	-1.2	-0.7	-0.7	NA	-0.7	-0.6	-0.6	-0.8	-0.4	NA	-0.5	-0.6	-0.7	-0.3	NA
Minimum Score, S_{MIN}		1.6	1.2	0.8	0.5	0.5	0.9	0.5	0.5	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	1.4

FINAL LEVEL 1 SCORE, $S_{L1} \geq S_{MIN}$:

<p>EXTENT OF REVIEW</p> <p>Exterior: <input type="checkbox"/> Partial <input type="checkbox"/> All Sides <input type="checkbox"/> Aerial Interior: <input type="checkbox"/> None <input type="checkbox"/> Visible <input type="checkbox"/> Entered Drawings Reviewed: <input type="checkbox"/> Yes <input type="checkbox"/> No Soil Type Source: _____ Geologic Hazards Source: _____ Contact Person: _____</p> <p>LEVEL 2 SCREENING PERFORMED?</p> <p><input type="checkbox"/> Yes, Final Level 2 Score, S_{L2} _____ <input type="checkbox"/> No Nonstructural hazards? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>OTHER HAZARDS</p> <p>Are There Hazards That Trigger A Detailed Structural Evaluation?</p> <p><input type="checkbox"/> Pounding potential (unless $S_{L2} >$ cut-off, if known) <input type="checkbox"/> Falling hazards from taller adjacent building <input type="checkbox"/> Geologic hazards or Soil Type F <input type="checkbox"/> Significant damage/deterioration to the structural system</p>	<p>ACTION REQUIRED</p> <p>Detailed Structural Evaluation Required?</p> <p><input type="checkbox"/> Yes, unknown FEMA building type or other building <input type="checkbox"/> Yes, score less than cut-off <input type="checkbox"/> Yes, other hazards present <input type="checkbox"/> No</p> <p>Detailed Nonstructural Evaluation Recommended? (check one)</p> <p><input type="checkbox"/> Yes, nonstructural hazards identified that should be evaluated <input type="checkbox"/> No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary <input type="checkbox"/> No, no nonstructural hazards identified <input type="checkbox"/> DNK</p>
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Where information cannot be verified, screener shall note the following: EST = Estimated or unreliable data OR DNK = Do Not Know

Legend: MRF = Moment-resisting frame RC = Reinforced concrete URM INF = Unreinforced masonry infill MH = Manufactured Housing FD = Flexible diaphragm
 BR = Braced frame SW = Shear wall TU = Tilt up LM = Light metal RD = Rigid diaphragm

Rapid Visual Screening of Buildings for Potential Seismic Hazards

FEMA P-154 Data Collection Form

Optional Level 2 data collection to be performed by a civil or structural engineering professional, architect, or graduate student with background in seismic evaluation or design of buildings.

Level 2 (Optional)

MODERATELY HIGH Seismicity

Bldg Name:	Final Level 1 Score: $S_{L1} =$ _____ (do not consider S_{MIN})
Screener:	Level 1 Irregularity Modifiers: Vertical Irregularity, $V_{L1} =$ _____ Plan Irregularity, $P_{L1} =$ _____
Date/Time:	ADJUSTED BASELINE SCORE: $S' = (S_{L1} - V_{L1} - P_{L1}) =$ _____

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic	Statement (If statement is true, circle the "Yes" modifier; otherwise cross out the modifier.)	Yes	Subtotals
Vertical Irregularity, V_{L2}	Sloping Site	W1 building: There is at least a full story grade change from one side of the building to the other.	-1.3
		Non-W1 building: There is at least a full story grade change from one side of the building to the other.	-0.3
	Weak and/or Soft Story (circle one maximum)	W1 building cripple wall: An unbraced cripple wall is visible in the crawl space.	-0.6
		W1 house over garage: Underneath an occupied story, there is a garage opening without a steel moment frame, and there is less than 8' of wall on the same line (for multiple occupied floors above, use 16' of wall minimum).	-1.3
		W1A building open front: There are openings at the ground story (such as for parking) over at least 50% of the length of the building.	-1.3
		Non-W1 building: Length of lateral system at any story is less than 50% of that at story above or height of any story is more than 2.0 times the height of the story above.	-1.0
		Non-W1 building: Length of lateral system at any story is between 50% and 75% of that at story above or height of any story is between 1.3 and 2.0 times the height of the story above.	-0.5
	Setback	Vertical elements of the lateral system at an upper story are outboard of those at the story below causing the diaphragm to cantilever at the offset.	-1.0
		Vertical elements of the lateral system at upper stories are inboard of those at lower stories.	-0.5
		There is an in-plane offset of the lateral elements that is greater than the length of the elements.	-0.3
	Short Column/ Pier	C1,C2,C3,PC1,PC2,RM1,RM2: At least 20% of columns (or piers) along a column line in the lateral system have height/depth ratios less than 50% of the nominal height/depth ratio at that level.	-0.5
		C1,C2,C3,PC1,PC2,RM1,RM2: The column depth (or pier width) is less than one half of the depth of the spandrel, or there are infill walls or adjacent floors that shorten the column.	-0.5
Split Level	There is a split level at one of the floor levels or at the roof.	-0.5	
Other Irregularity	There is another observable severe vertical irregularity that obviously affects the building's seismic performance.	-1.0	
	There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.5	
			$V_{L2} =$ _____ (Cap at -1.3)
Plan Irregularity, P_{L2}	Torsional irregularity: Lateral system does not appear relatively well distributed in plan in either or both directions. (Do not include the W1A open front irregularity listed above.)	-0.8	
	Non-parallel system: There are one or more major vertical elements of the lateral system that are not orthogonal to each other.	-0.4	
	Reentrant corner: Both projections from an interior corner exceed 25% of the overall plan dimension in that direction.	-0.4	
	Diaphragm opening: There is an opening in the diaphragm with a width over 50% of the total diaphragm width at that level.	-0.3	
	C1, C2 building out-of-plane offset: The exterior beams do not align with the columns in plan.	-0.4	
Other irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.			-0.8
			$P_{L2} =$ _____ (Cap at -1.3)
Redundancy	The building has at least two bays of lateral elements on each side of the building in each direction.		+0.3
Pounding	Building is separated from an adjacent structure by less than 0.5% of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	-1.0
		One building is 2 or more stories taller than the other.	-1.0
		The building is at the end of the block.	-0.5
			(Cap total pounding modifiers at -1.3)
S2 Building	"K" bracing geometry is visible.		-1.0
C1 Building	Flat plate serves as the beam in the moment frame.		-0.5
PC1/RM1 Bldg	There are roof-to-wall ties that are visible or known from drawings that do not rely on cross-grain bending. (Do not combine with post-benchmark or retrofit modifier.)		+0.3
PC1/RM1 Bldg	The building has closely spaced, full height interior walls (rather than an interior space with few walls such as in a warehouse).		+0.3
URM	Gable walls are present.		-0.4
MH	There is a supplemental seismic bracing system provided between the carriage and the ground.		+1.2
Retrofit	Comprehensive seismic retrofit is visible or known from drawings.		+1.4
			$M =$ _____

FINAL LEVEL 2 SCORE, $S_{L2} = (S' + V_{L2} + P_{L2} + M) \geq S_{MIN}$. (Transfer to Level 1 form)

There is observable damage or deterioration or another condition that negatively affects the building's seismic performance: Yes No
If yes, describe the condition in the comment box below and indicate on the Level 1 form that detailed evaluation is required independent of the building's score.

OBSERVABLE NONSTRUCTURAL HAZARDS

Location	Statement (Check "Yes" or "No")	Yes	No	Comment
Exterior	There is an unbraced unreinforced masonry parapet or unbraced unreinforced masonry chimney.			
	There is heavy cladding or heavy veneer.			
	There is a heavy canopy over exit doors or pedestrian walkways that appears inadequately supported.			
	There is an unreinforced masonry appendage over exit doors or pedestrian walkways.			
	There is a sign posted on the building that indicates hazardous materials are present.			
	There is a taller adjacent building with an unanchored URM wall or unbraced URM parapet or chimney.			
Other observed exterior nonstructural falling hazard:				
Interior	There are hollow clay tile or brick partitions at any stair or exit corridor.			
	Other observed interior nonstructural falling hazard:			

Estimated Nonstructural Seismic Performance (Check appropriate box and transfer to Level 1 form conclusions)
 Potential nonstructural hazards with significant threat to occupant life safety → Detailed Nonstructural Evaluation recommended
 Nonstructural hazards identified with significant threat to occupant life safety → But no Detailed Nonstructural Evaluation required
 Low or no nonstructural hazard threat to occupant life safety → No Detailed Nonstructural Evaluation required

Comments:

PHOTOGRAPH

SKETCH

Address: _____
 _____ Zip: _____

Other Identifiers: _____

Building Name: _____

Use: _____

Latitude: _____ **Longitude:** _____

Ss: _____ **S1:** _____

Screener(s): _____ **Date/Time:** _____

No. Stories: Above Grade: _____ Below Grade: _____ **Year Built:** _____ EST

Total Floor Area (sq. ft.): _____ **Code Year:** _____

Additions: None Yes, Year(s) Built: _____

Occupancy: Assembly Commercial Emer. Services Historic Shelter
 Industrial Office School Government
 Utility Warehouse Residential, # Units: _____

Soil Type: A B C D E F DNK
 Hard Avg Dense Stiff Soft Poor DNK
 Rock Rock Soil Soil Soil Soil *If DNK, assume Type D.*

Geologic Hazards: Liquefaction: Yes/No/DNK Landslide: Yes/No/DNK Surf. Rupt.: Yes/No/DNK

Adjacency: Pounding Falling Hazards from Taller Adjacent Building

Irregularities: Vertical (type/severity) _____
 Plan (type) _____

Exterior Falling Hazards: Unbraced Chimneys Heavy Cladding or Heavy Veneer
 Parapets Appendages
 Other: _____

COMMENTS:

Additional sketches or comments on separate page

BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE, S_{L1}

FEMA BUILDING TYPE	Do Not Know	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score		5.1	4.5	3.8	2.7	2.6	3.5	2.5	2.7	2.1	2.5	2.0	2.1	1.9	2.1	2.1	1.7	2.9
Severe Vertical Irregularity, V _{L1}		-1.4	-1.4	-1.4	-1.2	-1.2	-1.4	-1.1	-1.2	-1.1	-1.2	-1.0	-1.1	-1.0	-1.1	-1.1	-1.0	NA
Moderate Vertical Irregularity, V _{L1}		-0.9	-0.9	-0.9	-0.8	-0.7	-0.9	-0.7	-0.7	-0.7	-0.7	-0.6	-0.7	-0.6	-0.7	-0.7	-0.6	NA
Plan Irregularity, P _{L1}		-1.4	-1.3	-1.2	-1.0	-0.9	-1.2	-0.9	-0.9	-0.8	-1.0	-0.8	-0.9	-0.8	-0.8	-0.8	-0.7	NA
Pre-Code		-0.3	-0.5	-0.6	-0.3	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	-0.5
Post-Benchmark		1.4	2.0	2.5	1.5	1.5	0.8	2.1	NA	2.0	2.3	NA	2.1	2.5	2.3	2.3	NA	1.2
Soil Type A or B		0.7	1.2	1.8	1.1	1.4	0.6	1.5	1.6	1.1	1.5	1.3	1.6	1.3	1.4	1.4	1.3	1.6
Soil Type E (1-3 stories)		-1.2	-1.3	-1.4	-0.9	-0.9	-1.0	-0.9	-0.9	-0.7	-1.0	-0.7	-0.8	-0.7	-0.8	-0.8	-0.6	-0.9
Soil Type E (> 3 stories)		-1.8	-1.6	-1.3	-0.9	-0.9	NA	-0.9	-1.0	-0.8	-1.0	-0.8	NA	-0.7	-0.7	-0.8	-0.6	NA
Minimum Score, S _{MIN}		1.6	1.2	0.9	0.6	0.6	0.8	0.6	0.6	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	1.5

FINAL LEVEL 1 SCORE, S_{L1} ≥ S_{MIN}:

<p>EXTENT OF REVIEW</p> <p>Exterior: <input type="checkbox"/> Partial <input type="checkbox"/> All Sides <input type="checkbox"/> Aerial Interior: <input type="checkbox"/> None <input type="checkbox"/> Visible <input type="checkbox"/> Entered Drawings Reviewed: <input type="checkbox"/> Yes <input type="checkbox"/> No Soil Type Source: _____ Geologic Hazards Source: _____ Contact Person: _____</p> <p>LEVEL 2 SCREENING PERFORMED?</p> <p><input type="checkbox"/> Yes, Final Level 2 Score, S_{L2} _____ <input type="checkbox"/> No Nonstructural hazards? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>OTHER HAZARDS</p> <p>Are There Hazards That Trigger A Detailed Structural Evaluation?</p> <p><input type="checkbox"/> Pounding potential (unless S_{L2} > cut-off, if known) <input type="checkbox"/> Falling hazards from taller adjacent building <input type="checkbox"/> Geologic hazards or Soil Type F <input type="checkbox"/> Significant damage/deterioration to the structural system</p>	<p>ACTION REQUIRED</p> <p>Detailed Structural Evaluation Required?</p> <p><input type="checkbox"/> Yes, unknown FEMA building type or other building <input type="checkbox"/> Yes, score less than cut-off <input type="checkbox"/> Yes, other hazards present <input type="checkbox"/> No</p> <p>Detailed Nonstructural Evaluation Recommended? (check one)</p> <p><input type="checkbox"/> Yes, nonstructural hazards identified that should be evaluated <input type="checkbox"/> No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary <input type="checkbox"/> No, no nonstructural hazards identified <input type="checkbox"/> DNK</p>
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Where information cannot be verified, screener shall note the following: **EST = Estimated or unreliable data** **OR** **DNK = Do Not Know**

Rapid Visual Screening of Buildings for Potential Seismic Hazards

FEMA P-154 Data Collection Form

Optional Level 2 data collection to be performed by a civil or structural engineering professional, architect, or graduate student with background in seismic evaluation or design of buildings.

Level 2 (Optional)
MODERATE Seismicity

Bldg Name:	Final Level 1 Score: $S_{L1} =$ _____ (do not consider S_{MIN})
Screener:	Level 1 Irregularity Modifiers: $V_{L1} =$ _____ $P_{L1} =$ _____
Date/Time:	ADJUSTED BASELINE SCORE: $S' = (S_{L1} - V_{L1} - P_{L1}) =$ _____

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic	Statement (If statement is true, circle the "Yes" modifier; otherwise cross out the modifier.)	Yes	Subtotals
Vertical Irregularity, V_{L2}	Sloping Site	W1 building: There is at least a full story grade change from one side of the building to the other.	-1.4
		Non-W1 building: There is at least a full story grade change from one side of the building to the other.	-0.4
	Weak and/or Soft Story (circle one maximum)	W1 building cripple wall: An unbraced cripple wall is visible in the crawl space.	-0.7
		W1 house over garage: Underneath an occupied story, there is a garage opening without a steel moment frame, and there is less than 8' of wall on the same line (for multiple occupied floors above, use 16' of wall minimum).	-1.4
		W1A building open front: There are openings at the ground story (such as for parking) over at least 50% of the length of the building.	-1.4
		Non-W1 building: Length of lateral system at any story is less than 50% of that at story above or height of any story is more than 2.0 times the height of the story above.	-1.1
		Non-W1 building: Length of lateral system at any story is between 50% and 75% of that at story above or height of any story is between 1.3 and 2.0 times the height of the story above.	-0.6
	Setback	Vertical elements of the lateral system at an upper story are outboard of those at the story below causing the diaphragm to cantilever at the offset.	-1.2
		Vertical elements of the lateral system at upper stories are inboard of those at lower stories.	-0.6
		There is an in-plane offset of the lateral elements that is greater than the length of the elements.	-0.4
	Short Column/Pier	C1,C2,C3,PC1,PC2,RM1,RM2: At least 20% of columns (or piers) along a column line in the lateral system have height/depth ratios less than 50% of the nominal height/depth ratio at that level.	-0.5
		C1,C2,C3,PC1,PC2,RM1,RM2: The column depth (or pier width) is less than one half of the depth of the spandrel, or there are infill walls or adjacent floors that shorten the column.	-0.5
Split Level	There is a split level at one of the floor levels or at the roof.	-0.6	
Other Irregularity	There is another observable severe vertical irregularity that obviously affects the building's seismic performance.	-1.2	
	There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.6	
Plan Irregularity, P_{L2}	Torsional irregularity: Lateral system does not appear relatively well distributed in plan in either or both directions. (Do not include the W1A open front irregularity listed above.)	-1.0	
	Non-parallel system: There are one or more major vertical elements of the lateral system that are not orthogonal to each other.	-0.5	
	Reentrant corner: Both projections from an interior corner exceed 25% of the overall plan dimension in that direction.	-0.5	
	Diaphragm opening: There is an opening in the diaphragm with a width over 50% of the total diaphragm width at that level.	-0.3	
	C1, C2 building out-of-plane offset: The exterior beams do not align with the columns in plan.	-0.4	
	Other irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.	-1.0	
Redundancy	The building has at least two bays of lateral elements on each side of the building in each direction.	+0.4	
Pounding	Building is separated from an adjacent structure by less than 0.25% of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	-1.2
		One building is 2 or more stories taller than the other.	-1.2
		The building is at the end of the block.	-0.6
S2 Building	"K" bracing geometry is visible.	-1.2	
C1 Building	Flat plate serves as the beam in the moment frame.	-0.5	
PC1/RM1 Bldg	There are roof-to-wall ties that are visible or known from drawings that do not rely on cross-grain bending. (Do not combine with post-benchmark or retrofit modifier.)	+0.4	
PC1/RM1 Bldg	The building has closely spaced, full height interior walls (rather than an interior space with few walls such as in a warehouse).	+0.4	
URM	Gable walls are present.	-0.5	
MH	There is a supplemental seismic bracing system provided between the carriage and the ground.	+1.2	
Retrofit	Comprehensive seismic retrofit is visible or known from drawings.	+1.4	

FINAL LEVEL 2 SCORE, $S_{L2} = (S' + V_{L2} + P_{L2} + M) \geq S_{MIN}$: _____ (Transfer to Level 1 form)

There is observable damage or deterioration or another condition that negatively affects the building's seismic performance: Yes No
If yes, describe the condition in the comment box below and indicate on the Level 1 form that detailed evaluation is required independent of the building's score.

OBSERVABLE NONSTRUCTURAL HAZARDS

Location	Statement (Check "Yes" or "No")	Yes	No	Comment
Exterior	There is an unbraced unreinforced masonry parapet or unbraced unreinforced masonry chimney.			
	There is heavy cladding or heavy veneer.			
	There is a heavy canopy over exit doors or pedestrian walkways that appears inadequately supported.			
	There is an unreinforced masonry appendage over exit doors or pedestrian walkways.			
	There is a sign posted on the building that indicates hazardous materials are present.			
	There is a taller adjacent building with an unanchored URM wall or unbraced URM parapet or chimney.			
	Other observed exterior nonstructural falling hazard:			
Interior	There are hollow clay tile or brick partitions at any stair or exit corridor.			
	Other observed interior nonstructural falling hazard:			

Estimated Nonstructural Seismic Performance (Check appropriate box and transfer to Level 1 form conclusions)
 Potential nonstructural hazards with significant threat to occupant life safety → Detailed Nonstructural Evaluation recommended
 Nonstructural hazards identified with significant threat to occupant life safety → But no Detailed Nonstructural Evaluation required
 Low or no nonstructural hazard threat to occupant life safety → No Detailed Nonstructural Evaluation required

Comments:

Rapid Visual Screening of Buildings for Potential Seismic Hazards

FEMA P-154 Data Collection Form

Optional Level 2 data collection to be performed by a civil or structural engineering professional, architect, or graduate student with background in seismic evaluation or design of buildings.

Level 2 (Optional)

LOW Seismicity

Bldg Name:	Final Level 1 Score: $S_{L1} =$ _____ (do not consider S_{MIN})
Screener:	Level 1 Irregularity Modifiers: $V_{L1} =$ _____ $P_{L1} =$ _____
Date/Time:	ADJUSTED BASELINE SCORE: $S' = (S_{L1} - V_{L1} - P_{L1}) =$ _____

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic	Statement (If statement is true, circle the "Yes" modifier; otherwise cross out the modifier.)	Yes	Subtotals
Vertical Irregularity, V_{L2}	Sloping Site	W1 building: There is at least a full story grade change from one side of the building to the other.	-1.5
		Non-W1 building: There is at least a full story grade change from one side of the building to the other.	-0.4
	Weak and/or Soft Story (circle one maximum)	W1 building cripple wall: An unbraced cripple wall is visible in the crawl space.	-0.7
		W1 house over garage: Underneath an occupied story, there is a garage opening without a steel moment frame, and there is less than 8' of wall on the same line (for multiple occupied floors above, use 16' of wall minimum).	-1.5
		W1A building open front: There are openings at the ground story (such as for parking) over at least 50% of the length of the building.	-1.5
		Non-W1 building: Length of lateral system at any story is less than 50% of that at story above or height of any story is more than 2.0 times the height of the story above.	-1.3
		Non-W1 building: Length of lateral system at any story is between 50% and 75% of that at story above or height of any story is between 1.3 and 2.0 times the height of the story above.	-0.6
	Setback	Vertical elements of the lateral system at an upper story are outboard of those at the story below causing the diaphragm to cantilever at the offset.	-1.3
		Vertical elements of the lateral system at upper stories are inboard of those at lower stories.	-0.6
		There is an in-plane offset of the lateral elements that is greater than the length of the elements.	-0.4
	Short Column/Pier	C1,C2,C3,PC1,PC2,RM1,RM2: At least 20% of columns (or piers) along a column line in the lateral system have height/depth ratios less than 50% of the nominal height/depth ratio at that level.	-0.6
		C1,C2,C3,PC1,PC2,RM1,RM2: The column depth (or pier width) is less than one half of the depth of the spandrel, or there are infill walls or adjacent floors that shorten the column.	-0.6
	Split Level	There is a split level at one of the floor levels or at the roof.	-0.6
	Other Irregularity	There is another observable severe vertical irregularity that obviously affects the building's seismic performance.	-1.3
There is another observable moderate vertical irregularity that may affect the building's seismic performance.		-0.6	
Plan Irregularity, P_{L2}	Torsional irregularity: Lateral system does not appear relatively well distributed in plan in either or both directions. (Do not include the W1A open front irregularity listed above.)	-1.1	
	Non-parallel system: There are one or more major vertical elements of the lateral system that are not orthogonal to each other.	-0.6	
	Reentrant corner: Both projections from an interior corner exceed 25% of the overall plan dimension in that direction.	-0.6	
	Diaphragm opening: There is an opening in the diaphragm with a width over 50% of the total diaphragm width at that level.	-0.4	
	C1, C2 building out-of-plane offset: The exterior beams do not align with the columns in plan.	-0.5	
	Other irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.	-1.1	
Redundancy	The building has at least two bays of lateral elements on each side of the building in each direction.	+0.4	
Pounding	Building is separated from an adjacent structure by less than 0.1% of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	-1.3
		One building is 2 or more stories taller than the other.	-1.3
		The building is at the end of the block.	-0.6
S2 Building	"K" bracing geometry is visible.	-1.3	
C1 Building	Flat plate serves as the beam in the moment frame.	-0.6	
PC1/RM1 Bldg	There are roof-to-wall ties that are visible or known from drawings that do not rely on cross-grain bending. (Do not combine with post-benchmark or retrofit modifier.)	+0.4	
PC1/RM1 Bldg	The building has closely spaced, full height interior walls (rather than an interior space with few walls such as in a warehouse).	+0.4	
URM	Gable walls are present.	-0.6	
MH	There is a supplemental seismic bracing system provided between the carriage and the ground.	+1.8	
Retrofit	Comprehensive seismic retrofit is visible or known from drawings.	+1.6	

FINAL LEVEL 2 SCORE, $S_{L2} = (S' + V_{L2} + P_{L2} + M) \geq S_{MIN}$: _____ (Transfer to Level 1 form)

There is observable damage or deterioration or another condition that negatively affects the building's seismic performance: Yes No
 If yes, describe the condition in the comment box below and indicate on the Level 1 form that detailed evaluation is required independent of the building's score.

OBSERVABLE NONSTRUCTURAL HAZARDS

Location	Statement (Check "Yes" or "No")	Yes	No	Comment
Exterior	There is an unbraced unreinforced masonry parapet or unbraced unreinforced masonry chimney.			
	There is heavy cladding or heavy veneer.			
	There is a heavy canopy over exit doors or pedestrian walkways that appears inadequately supported.			
	There is an unreinforced masonry appendage over exit doors or pedestrian walkways.			
	There is a sign posted on the building that indicates hazardous materials are present.			
	There is a taller adjacent building with an unanchored URM wall or unbraced URM parapet or chimney.			
	Other observed exterior nonstructural falling hazard:			
Interior	There are hollow clay tile or brick partitions at any stair or exit corridor.			
	Other observed interior nonstructural falling hazard:			

Estimated Nonstructural Seismic Performance (Check appropriate box and transfer to Level 1 form conclusions)

Potential nonstructural hazards with significant threat to occupant life safety → Detailed Nonstructural Evaluation recommended

Nonstructural hazards identified with significant threat to occupant life safety → But no Detailed Nonstructural Evaluation required

Low or no nonstructural hazard threat to occupant life safety → No Detailed Nonstructural Evaluation required

Comments:

B.2 Quick Reference Guide

Table B-1 FEMA Building Types and Code Adoption and Enforcement Dates

FEMA Building Type		Year Seismic Codes Initially Adopted and Enforced	Benchmark Year when Codes Improved
W1	Light wood frame single- or multiple-family dwellings		
W1A	Light wood frame multi-unit, multi-story residential buildings with plan areas on each floor of greater than 3,000 square feet		
W2	Wood frame commercial and industrial buildings > 5,000 sqft		
S1	Steel moment-resisting frame		
S2	Braced steel frame		
S3	Light metal frame		
S4	Steel frame with cast-in-place concrete shear walls		
S5	Steel frame with unreinforced masonry infill walls		
C1	Concrete moment-resisting frame		
C2	Concrete shear wall		
C3	Concrete frame with unreinforced masonry infill walls		
PC1	Tilt-up construction		
PC2	Precast concrete frame		
RM1	Reinforced masonry with flexible floor and roof diaphragms		
RM2	Reinforced masonry with rigid floor and roof diaphragms		
URM	Unreinforced masonry bearing-wall buildings		
MH	Manufactured housing		
Anchorage of Heavy Cladding Year in which seismic anchorage requirements were adopted:			

Notes:

These tables shall be filled out by the Supervising Engineer. See Section 2.6.3 of the *Handbook* for additional information. If seismic codes have never been adopted and enforced in the jurisdiction, apply the Pre-Code Score Modifier regardless of the building's date of construction.

Pre-Code: Building designed and constructed prior to the year in which seismic codes were initially adopted and enforced in the jurisdiction; pre-code years are not applicable in regions of Low seismicity.

Post-Benchmark: Building designed and constructed after significant improvements in seismic code requirements (e.g., ductile detailing) were adopted and enforced; the benchmark year when codes improved may be different for each building type and jurisdiction.

Heavy Cladding: Heavy cladding on buildings designed and constructed prior to the year noted is considered an exterior falling hazard and should be noted as such on the Level 1 form.

B.3 Level 1 Building Addition Reference Guide

Table B-2 Level 1 Reference Guide for Reviewing Buildings with Horizontal Additions

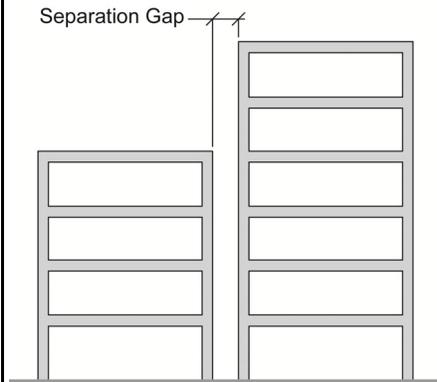
Building Addition Screening Criteria	Response	Screening Guidance
<p><i>Criterion 1:</i> Does the building have visible and aligned joints over the entire height of two exterior walls and across the roof?</p>	Yes	Determine scores for each separate building defined by the joints and consider the potential for pounding using the adjacency guidelines in Section 3.9.
	No	See Criterion 2
<p><i>Criterion 2:</i> Does the building have any of the following characteristics:</p> <p>a) abrupt and noticeable differences in architectural style that occur on two sides of the building over the entire height of the exterior walls?</p> <p>b) visible differences in structural framing between distinct portions of the building?</p> <p>c) differences in floor elevation between portions of the building?</p>	Yes	Screen as separate buildings defined by the differences noted in Criterion 2. Determine score for each portion and record the lower score.
	No	Screen as a single building.

B.4 Level 1 Pounding Reference Guide

Table B-3 Level 1 Pounding Reference Guide

Consider pounding when the separation between adjacent buildings is less than:

- 2" times number of stories in shorter building (in Very High seismicity region)
- 1 1/2" times number of stories in shorter building (in High seismicity region)
- 1" times number of stories in shorter building (in Moderately High seismicity region)
- 1/2" times number of stories in shorter building (in Moderate and Low seismicity regions)

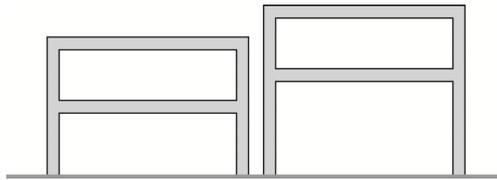


Examples:

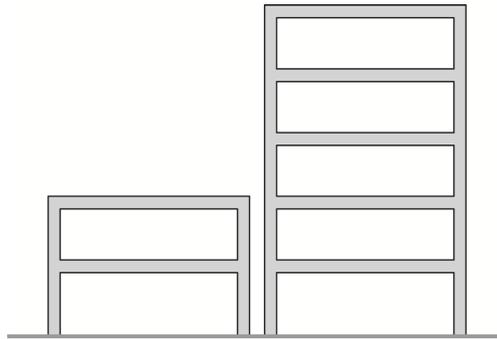
- Two 2-story buildings next to each other in High seismicity region:
Minimum Separation = $1\ 1/2'' \times 2 = 3''$
- 6-story building next to a 4-story building in Moderate seismicity region: Minimum Separation = $1/2'' \times 4 = 2''$

AND one or more of the following conditions apply:

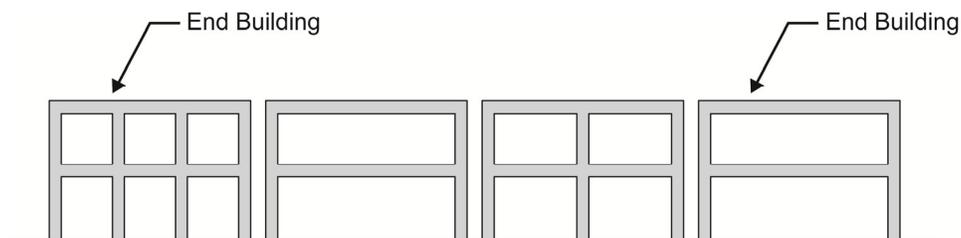
1. Floors of adjacent building do not align vertically within two feet:



2. One building is 2 or more stories taller than the other:



3. Building is at the end of the block:



B.5 Vertical Irregularity Reference Guide

Table B-4 Vertical Irregularity Reference Guide

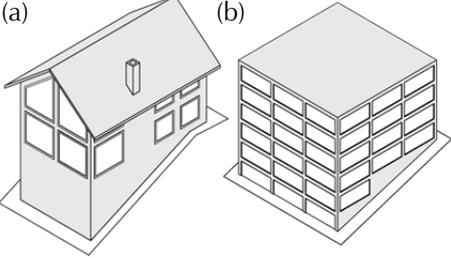
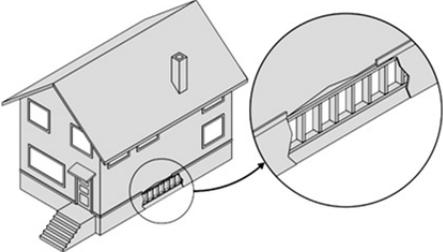
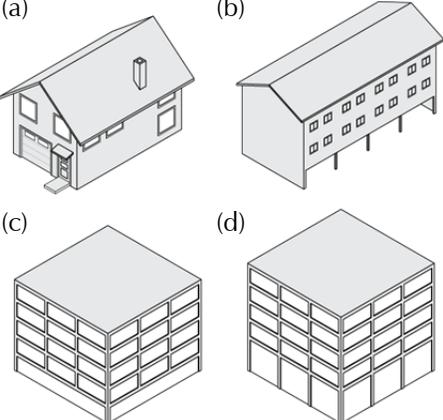
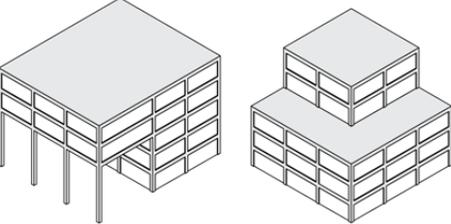
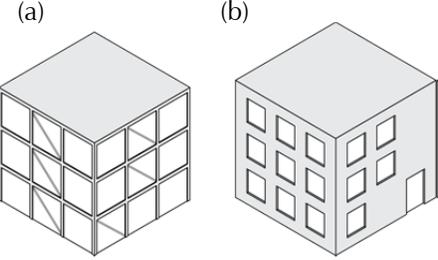
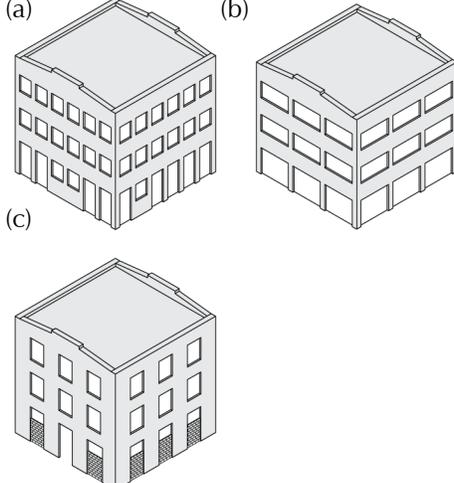
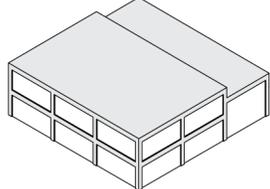
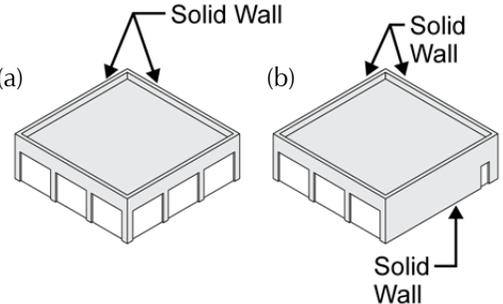
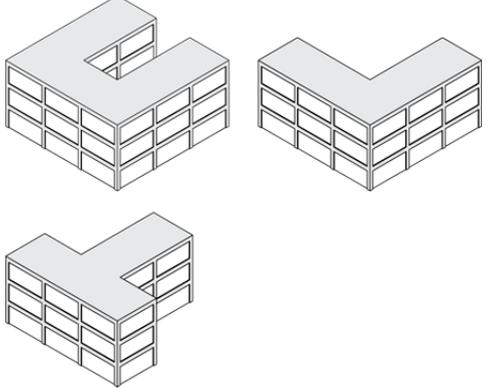
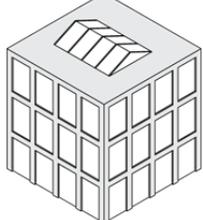
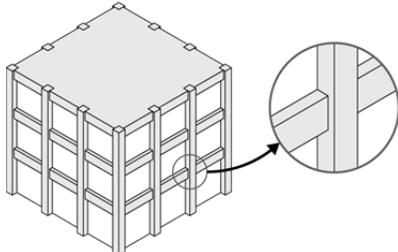
	Vertical Irregularity	Severity	Level 1 Instructions
Sloping Site		Varies	Apply if there is more than a one-story slope from one side of the building to the other. Evaluate as Severe for W1 buildings as shown in Figure (a); evaluate as Moderate for all other building types as shown in Figure (b).
Unbraced Cripple Wall		Moderate	Apply if unbraced cripple walls are observed in the crawlspace of the building. This applies to W1 buildings. If the basement is occupied, consider this condition as a soft story.
Weak and/or Soft Story		Severe	<p>Apply:</p> <p>Figure (a): For a W1 house with occupied space over a garage with limited or short wall lengths on both sides of the garage opening.</p> <p>Figure (b): For a W1A building with an open front at the ground story (such as for parking).</p> <p>Figure (c): When one of the stories has less wall or fewer columns than the others (usually the bottom story).</p> <p>Figure (d): When one of the stories is taller than the others (usually the bottom story).</p>
Out-of-Plane Setback		Severe	<p>Apply if the walls of the building do not stack vertically in plan. This irregularity is most severe when the vertical elements of the lateral system at the upper levels are outboard of those at the lower levels as shown in Figure (a). The condition in Figure (b) also triggers this irregularity. If nonstacking walls are known to be nonstructural, this irregularity does not apply.</p> <p>Apply the setback if greater than or equal to 2 feet.</p>

Table B-4 Vertical Irregularity Reference Guide (continued)

	Vertical Irregularity	Severity	Level 1 Instructions
In-plane Setback	 <p>(a) (b)</p>	Moderate	Apply if there is an in-plane offset of the lateral system. Usually, this is observable in braced frame (Figure (a)) and shear wall buildings (Figure (b)).
Short Column/Pier	 <p>(a) (b) (c)</p>	Severe	<p>Apply if:</p> <p>Figure (a): Some columns/piers are much shorter than the typical columns/piers in the same line.</p> <p>Figure (b): The columns/piers are narrow compared to the depth of the beams.</p> <p>Figure (c): There are infill walls that shorten the clear height of the column.</p> <p>Note this deficiency is typically seen in older concrete and steel building types.</p>
Split Levels		Moderate	Apply if the floors of the building do not align or if there is a step in the roof level.

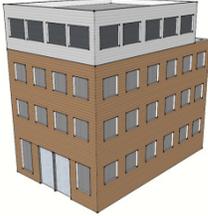
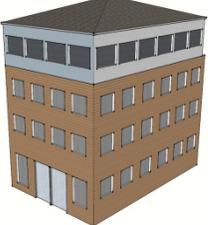
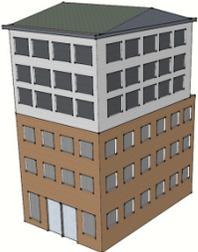
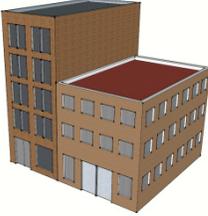
B.6 Plan Irregularity Reference Guide

Table B-5 Plan Irregularity Reference Guide

	Plan Irregularity	Level 1 Instructions
Torsion		<p>Apply if there is good lateral resistance in one direction, but not the other, or if there is eccentric stiffness in plan (as shown in Figures (a) and (b)); solid walls on two or three sides with walls with lots of openings on the remaining sides).</p>
Non-Parallel Systems		<p>Apply if the sides of the building do not form 90-degree angles.</p>
Reentrant Corner		<p>Apply if there is a reentrant corner, i.e., the building is L, U, T, or + shaped, with projections of more than 20 feet. Where possible, check to see if there are seismic separations where the wings meet. If so, evaluate for pounding.</p>
Diaphragm Openings		<p>Apply if there is a opening that has a width of over 50% of the width of the diaphragm at any level.</p>
Beams do not align with columns		<p>Apply if the exterior beams do not align with the columns in plan. Typically, this applies to concrete buildings, where the perimeter columns are outboard of the perimeter beams.</p>

B.7 Level 2 Building Addition Reference Guide

Table B-6 Level 2 Building Addition Reference Guide

Addition Orientation	Type of Addition	Example	RVS Screening Recommendation	Notes and Additional Instructions
Vertical	Single story addition has a smaller footprint than the original building		Evaluate as a single building using the total number of stories of the original building and addition and indicate a setback vertical irregularity.	Vertical setback irregularity applies if the area of the addition is less than 90 percent of the area of the story below or if two or more walls of the addition are not aligned with the walls below.
Vertical	Single or multiple story addition with similar footprint and seismic force-resisting system as the original building		Evaluate as a single building using the total number of stories of the building plus the addition.	If the vertical elements of the seismic force-resisting system of the addition do not align with the vertical elements of the seismic force-resisting system below, apply the setback vertical irregularity.
Vertical	Single or multiple story addition in which the addition has a different seismic force-resisting system		Evaluate as a single building with another observable moderate vertical irregularity.	If the footprint of the addition is less than 90 percent of the story below or if two or more walls of the addition are not aligned with the walls below, a setback vertical irregularity should also be indicated.
Horizontal	Addition with same construction type and number of stories as original and horizontal dimension of the narrower building at the interface is less than or equal to 50% of the length of the wider building		Evaluate as a single building with a torsional irregularity plan irregularity.	If the difference in horizontal dimension is between 50% and 75%, indicate a reentrant corner irregularity. If the floor heights are not aligned within 2 feet, presence of pounding is indicated.
Horizontal	Addition with a different height than the original building		Evaluate as a single building using the height of the taller building and indicate a Pounding Score Modifier if the heights of the buildings differ by more than 2 stories or if the floors do not align with 2 feet.	If the horizontal dimension of the narrower of the two buildings along the interface is less than 75% of the dimension of the wider, the reentrant corner plan irregularity should be indicated.

The above horizontal addition scenarios assume that there is not an obvious separation gap between the addition and the original building.

Table B-6 Level 2 Building Addition Reference Guide (continued)

Addition Orientation	Type of Addition	Example	RVS Screening Recommendation	Notes and Additional Instructions
Horizontal	Addition with different building type than original		Evaluate a single building with torsional irregularity using the building type with the lower basic score.	If the floors do not align within 2 feet or the number of stories differs by more than 2 stories, also indicate the appropriate Pounding Score Modifier.
Horizontal	Small addition where the addition relies on the original building for gravity support		Evaluate as a single building. Evaluate for the presence of a setback irregularity if there is a difference in the number of stories and plan irregularity if there is a difference in horizontal dimension of the original building and addition along the interface.	If the construction type of the addition is different than the original building, evaluate as two buildings with the addition as having an observable severe vertical irregularity.

The above horizontal addition scenarios assume that there is not an obvious separation gap between the addition and the original building.