Guideline for

Rapid Visual Screening of Buildings

For Potential Seismic Hazards

Prepared By:

Expert Group from Myanmar Engineering Society, Myanmar Earthquake Committee, and Myanmar Geoscience Society in collaboration with UN-Habitat and Relief and Resettlement Department

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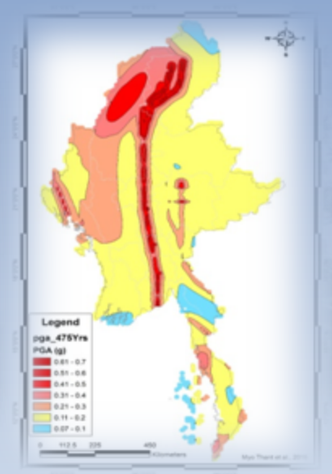

NORWEGIAN MINISTRY OF FOREIGN AFFAIRS

Humanitarian Aid and Civil Protection

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I. INTROCDUCTION

1.1 Background

Myanmar lies in one of the two main earthquake belts of the world with a complex seismo-tectonic process. At least nineteen earthquakes of Magnitude, Ms > 7 have occurred in the region and historical records demonstrate that great and destructive earthquakes have occurred throughout much of the region (Wang Yu, 2014). The Sagaing fault is the most prominent active fault in Myanmar which extends from north of Lake Indawgyi, southward along the Ayeyarwaddy River, north of Mandalay and along the eastern margin of the BagoYoma to the Andaman Sea in addition to the Red River fault, Papun – Wang Chao fault, Three Pagodas fault and other minor faults which crisscross the country.

While Myanmar has experienced destructive earthquake in the past, recent earthquakes in Tarlay Earthquake (2011) and Thabeikkyin Earthquake (2012) highlighted the vulnerability of building stocks. However, very limited work has been undertaken in assessing structural vulnerability of the building stock and the risk to the built environment both in urban and rural areas. Furthermore, the risk knowledge on the earthquake among stakeholders across country is low. Given the high degree of exposure and vulnerability to earthquake and the need to address risk through structural and non-structural mitigation measures, there is a need to develop / adapt and standardize tools which can be used by interested stakeholders in Myanmar.

Tarlay Earthquake

Tarlay Earthquake

Thabeikkyin Earthquake

Figure (1) Building Damages in Tarlay Eathquake and Thabeikkyin Earthquake

Myanmar Engineering Society, Myanmar Geo-Sciences Society, Myanmar Earthquake Committee and UN-Habitat in collaboration with Relief and Resettlement Department are currently working to develop /adapting tools (HAZUS) for assessing earthquake risk at City level and undertook Knowledge Attitude and Practice (KAP) on earthquake risk in 3 cities with the funding support from ECHO through MCCR[1] and Ministry of Foreign Affairs (Norway). As a first step within the framework of broader risk reduction initiatives as part of Myanmar Comprehensive Disaster Risk Reduction Programme (MCDRRP) and Earthquake Risk Reduction Programme of UN-Habitat, an Expert Group meeting is convened to discuss the development of tools to assess structural vulnerability of building stock and the Development of Risk Communication strategy and tools for earthquake. Rapid Visual Screening of Building is part of the development of tools to assess structural vulnerability of building stock.

1.2 Rapid Visual Screening of Buildings for Potential Seismic Hazards (RVS Procedure)

Vulnerability of the buildings is a critical determinant for earthquake risk. Experts say "Earthquakes don't kill people, but unsafe buildings do". Structural vulnerability is a measure of the damage; a building is likely to experience when subjected to ground shaking of a specific intensity. In general dynamic response of a structure during ground shaking is a very complex behavior. It depends on a number of inter-related parameters that are often very difficult to predict precisely. These include ground shaking that the building will experience; the extent to which the structure will be excited by and response to the ground shaking; the strength of the materials in the structure; the quality of construction and condition of individual structural elements; the interaction of the structural and non-structural elements of the building; furnishings and contents present in the building at the time. Most of these factors can be estimated, but never precisely known.

[1]Myanmar Consortium for Community Resilience (MCCR) is part of the DIPECHO IX Action Plan for South East Asia in Myanmar. MCCR is comprised of five INGOs and one UN Agency namely Action Aid, Plan International, Oxfam, Help Age International, Action Contre la Faim and UN-Habitat

Seismic evaluation of existing Buildings demands a three-tiered process Screening Phase (Tier 1), Evaluation Phase (Tier 2), and Detailed Evaluation Phase (Tier 3) to assess either the Life Safety or Immediate Occupancy Performance Level of the building[2]. Screening Phase (Tier 1) uses a Rapid Visual Screening (RVS) methodology, while the Tier 2 and Tier 3 needs more detailed and sophisticated analysis. Since Myanmar is adopting Myanmar National Building Code that is following International Building Code for design as a first step, FEMA 154 is considered relevant for adaption.

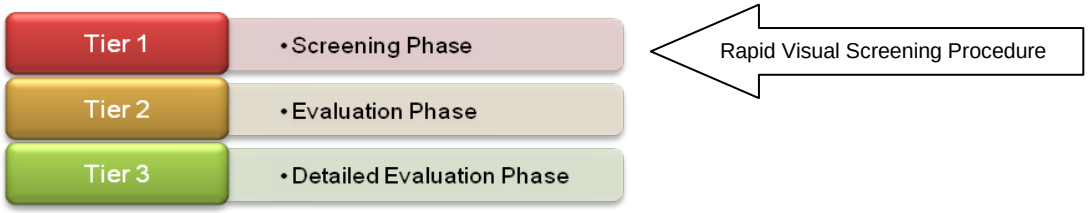


Figure (2) Three-tiered Process of Seismic Evaluation for Existing Buildings

Rapid Visual Screening (RVS) is a quick way of assessing the building vulnerability based on visual inspection[3]. Once identified as potentially hazardous, such buildings should be further evaluated by a design professional experienced in seismic design to determine if, in fact, they are seismically hazardous. The RVS procedure uses a methodology based on a sidewalk survey of a building and a data collection form, which the person conducting the survey completes, based on visual observation of the building from the exterior, and if possible, the interior. If large number of buildings needed to be evaluated, carrying out RVS of buildings minimizes the number of building that requires detailed assessment. Therefore, Rapid Visual Screening will be useful for all buildings except lifeline structures where detailed vulnerability assessment is always necessary. RVS procedure can be implemented relatively quickly and inexpensively to develop a list of potentially hazardous buildings without the high cost of a detailed seismic analysis of individual buildings. FEMA has updated the Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook (Third Edition) FEMA P-154 / January 2015.

This guideline will briefly explain the detailed procedures for RVS building survey. Bridges, large towers, and other non-building structure types are not covered by this procedure. According to recent seismic vulnerability assessment works in Bago, Taungoo, Sagaing and Pyay cities, the major building stocks in Myanmar are - Bamboo, Timber, Brick, Brick Noggin, Concrete and Steel Building. RVS Forms in this guideline cover total 18 buildings type as shown in Table (7).

1.3 Uses of Rapid Visual Screening Results

The main purpose of RVS results is to know the current situation of existing buildings in relation to seismic hazard and other related hazards so that the building owner can know his/ her building requires strengthening or retrofitting measures. The buildings can be identified according to RVS scores. The scoring system provided in each building with a numerical score can be used as a prioritization tool in vulnerability assessment. (FEMA 155, Third Edition)

1.4 Expert Group

Professional engineers and geological experts from Myanmar Engineering Society, Myanmar Earthquake Committee and Myanmar Geo-science Society are invited and prepare the Rapid Visual Screening Data Collection Form in collaboration with UN-Habitat professional engineers. The followings are the lists of the experts from MES, MGS and MEC.

1. U Nyun Maung San (Chairman, Special Project Committee, MES)
2. U Saw Htwe Zaw (Secretary, Special Project Committee, MES)
3. U Ko Ko Gyi (CEC Member, MES)
4. U Nyan Myint Kyaw (Member, Special Project Committee, MES)
5. U Myint Oo (Member, Special Project Committee, MES)
6. Daw Kyi Kyi Khaing (Member, Special Project Committee, MES)
7. U Soe Thura Tun (Secretary, MEC)
8. Dr. Myo Thant (Secretary, MGS)

[2]Seismic Evaluation of Existing Buildings (ASCE/SEI 31-03)

[3]The Applied Technology Council (ATC), with funding from the Federal Emergency Management Agency (FEMA) in the US, developed the FEMA 154 Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook in 1998 and updated in 2002 and more recently in 2015.

II. INSTRUCTIONS OF FILLING DATA COLLECTION FORM LEVEL I

Level 1 Data Collection Form can be seen in Appendix A. This form can be performed by a wide range of individuals, including civil engineers, structural engineers, architects, design professionals, building officials, construction contractors, facility mangers, firefighters, or other individuals with a general background in building design or construction. The screeners fill out the forms and determine the scores to get seismic performance of the building. The collected data/ information have to be put in respective table format. There are five different types of Level 1 Data Collection Form, representing different seismicity regions; *Very High, High, Moderately High, Moderate and Low*. The basis scores and score modifiers vary with seismicity regions. Refer to Table (1) below to choose respective Seismicity Region of the Surveyed Area. For S_s Value, refer to Figure (4) and Figure (5) for S_1 Value. In Table (2), S_s and S_1 for selected cities and towns in Myanmar are described with numeric value. After the respected Seismicity Region has chosen, the screener can start the process by following the instructions described in later sections.

Table (1) Seismicity Region Determination from MCER Spectral Acceleration Response

Seismicity Region	Spectral Acceleration Response, S_s (Short-period or 0.2 seconds)	Spectral Acceleration Response, S_1 (Long-period or 1.0 second)
Low	$S_s < 0.25$ g	$S_1 < 0.10$ g
Moderate	$0.25 \text{ g} \le S_s < 0.50$ g	$0.10 \text{ g} \le S_1 < 0.20$ g
Moderately High	$0.50 \text{ g} \le S_s < 1.00$ g	$0.20 \text{ g} \le S_1 < 0.40$ g
High	$1.00 \text{ g} \le S_s < 1.50$ g	$0.40 \text{ g} \le S_1 < 0.60$ g
Very High	$S_s \ge 1.50$ g	$S_1 \ge 0.60$ g
Note: g = acceleration of gravity in horizontal direction		

In level 1 screening form, it includes six parts; *(1) Building Identification, (2) Building Information, (3) Comments, (4) Photographs and Sketch parts, (5) Basic Score, Modifiers and Final Score parts, and (6) Extent of Review, Other Hazards and Action Required parts*. The following steps will help you completing Level 1 Data Collection Form.

2.1 Building Identification

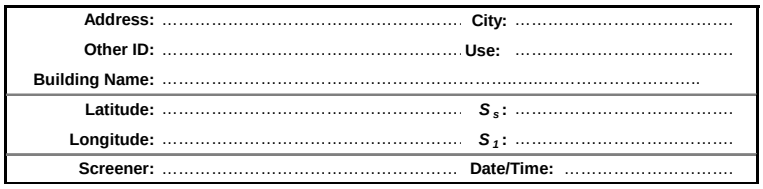


Figure (3) "Building Identification" Portion of Level 1 Data Collection Form

Level 1 Data Collection Form starts with Building Identification part. Building Identification is primarily important for this survey as the later information will be utilized in hazard assessment and mitigation measures for this building, broadly for this region where the building is located.

Address: Specify where the building is located including the street name and block name. It is suggested to include the full range of address numbers for the building, for example "No 1~5".

City: Fill in the city name where the building is situated.

Other ID: This information can be filled in by the house owner. The ID can be Block ID or House ID.

Use: Fill in the occupancy types of the building.

Building Name: Mention the name of the building so that it can be easily known. In some cases, the building has its own name describing the occupancy type.

Latitude: Describe the location of the building in latitude.

Longitude: Mention the longitude of the building.

S_s: Mention the site-specific ground motion S_s value. Refer to Table (2) for detailed values.

S_1: Specify the S_1 value as per table (5) where the building is located. Refer to Figure (2) and (3) for detailed values of S_s and S_1.

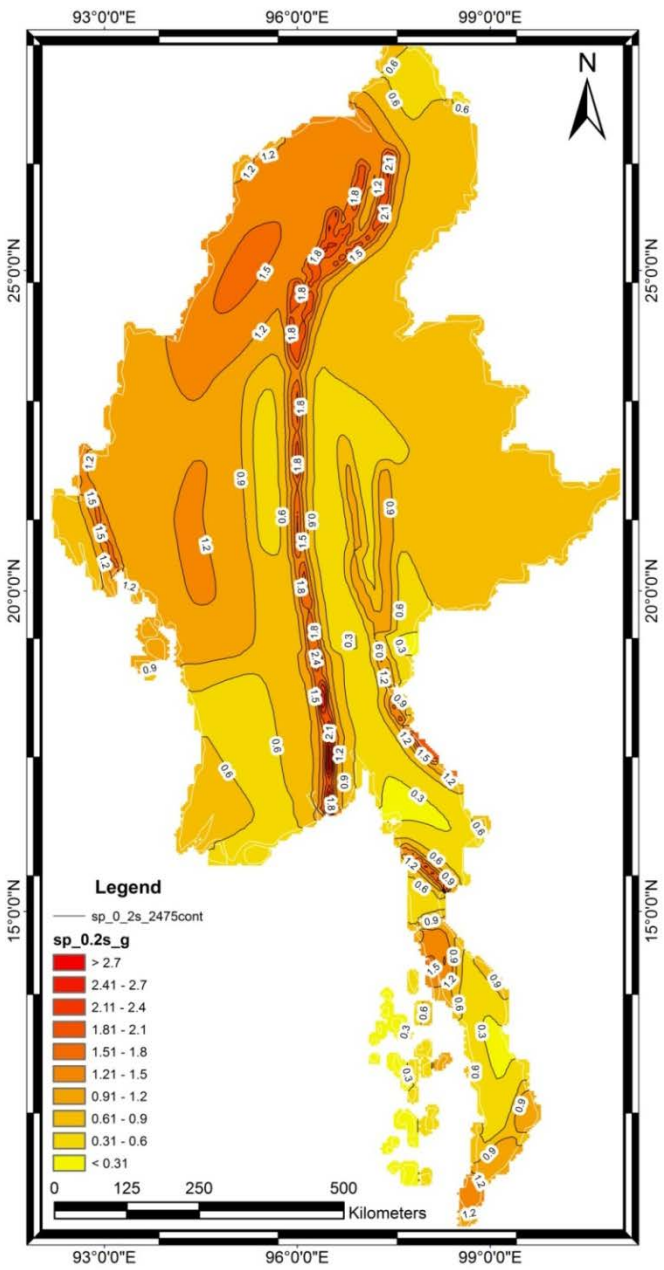


Figure (4) Maximum Considered Earthquake Ground Motion for 0.2 Sec Spectral Response Acceleration at 2% Probability in 50 Years with 5% Critical Damping, Site Class B

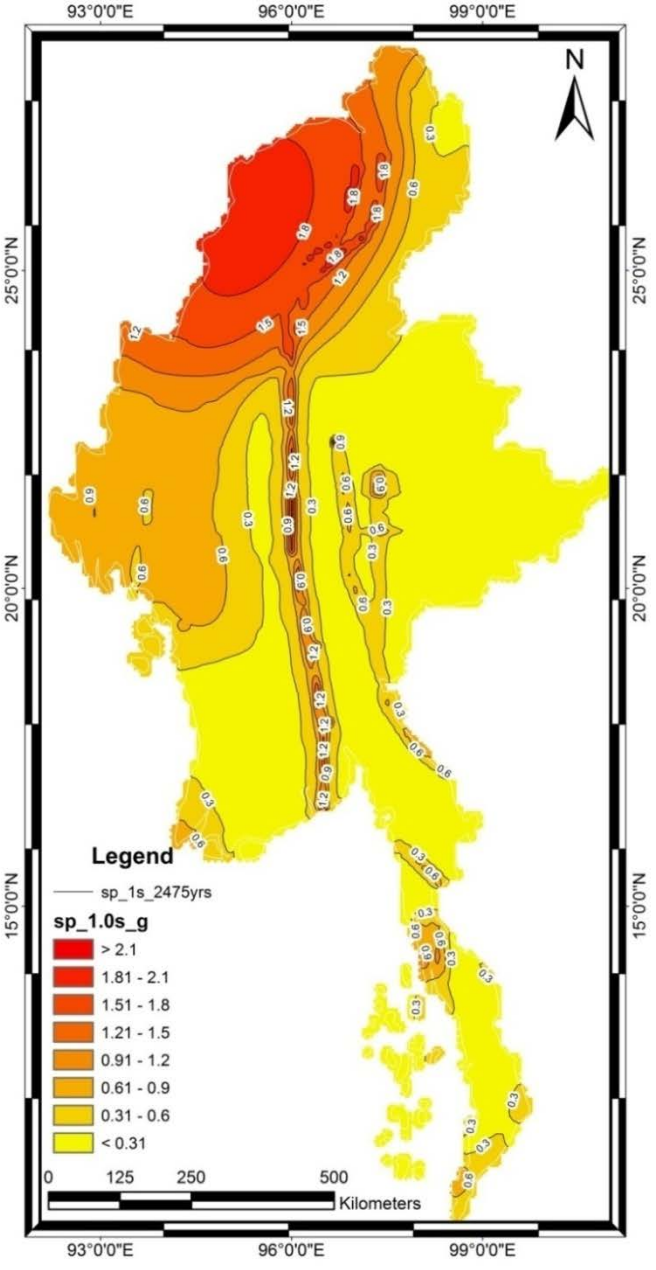


Figure (5) Maximum Considered Earthquake Ground Motion for 1 Sec Spectral Response Acceleration at 2% Probability in 50 Years with 5% Critical Damping, Site Class B

Screener: Name of the person who did survey and fill in the form. This information is also important that the person can have more information of the surveyed building. We can recall memory for some uncertain things in the form later.

Date/ Time: Mention the date and time at which the building is inspected and surveyed.

Table (2) S_s and S_1 Value for City/ Town

Sr. No.	City/ Town	S_s	S_1	Remarks
1	Bagan	1.55	0.62	
2	Bago (Pegu)	1.07	0.43	
3	Bhamo	0.66	0.26	
4	Coco Islands (Great Coco Island)	1.18	0.47	
5	Dawei (Tavoy)	0.25	0.10	
6	Hakha	1.87	0.75	
7	Hpa-An (Pa-An)	0.74	0.30	
8	Kengtung	1.32	0.52	
9	Kyaukpyu (Kyaukphyu)	0.84	0.33	
10	Labutta	0.64	0.26	
11	Lashio	0.48	0.19	
12	Loikaw	1.41	0.56	
13	Magwe	1.45	0.58	
14	Mandalay	2.01	0.80	
15	Mawlamyine (Mawlamyaing)	0.74	0.30	
16	Meiktila	2.07	0.83	
17	Monywa	1.72	0.69	
18	Myitkyina	1.70	0.68	
19	Naypyitaw	1.32	0.53	
20	Pakokku	1.54	0.61	
21	Pathein (Bassein)	0.87	0.35	
22	Putao	2.05	0.82	
23	Pyay (prome)	0.80	0.32	
24	Pyinmana	1.32	0.53	
25	Sagaing	2.12	0.85	
26	Shwebo	2.25	0.90	
27	Sittwe (Akyab)	1.26	0.50	
28	Taungoo	1.20	0.48	
29	Taunggyi	1.69	0.68	
30	Thandwe (Sandoway)	0.88	0.35	
31	Yangon (Rangoon)	0.77	0.31	

2.2 Building Information

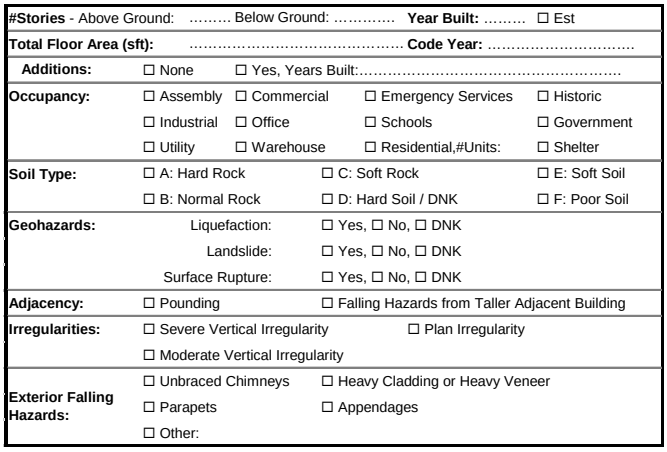


Figure (6) "Building Information" Portion of Level 1 Data Collection Form

Stories - Above Ground: Mention the number of floors above the natural ground level. The number of stories is a good measure for the height of the building.

Stories - Below Ground: Mention the number of floors below the natural ground level. Information on number of story below grade can be used later if the authority or stakeholder considers the flooding issue in their development plan.

Year Built: Mention the year in which the building was completed. If the "year built" cannot be available in some cases. At this case, the screeners can make estimation of building's year built by looking at the architectural and built styles from the street. If the screener fills that year built by approximation basic, check the EST box beside so that the data can be known as estimated.

Total Floor Area (sqft): Mention the total floor area of the building in square feet unit. If the building is multi-storeyed, total floor area can be estimated by multiplying floor area of one story by the number of floor. The purpose of this data is to estimate the building cost or value and to estimate the occupancy load. If the building total floor area is on approximate basic, please put "EST" behind the data.

Code Year: Describe the year of the building code that was used to design the building. "Code Year" can be checked on the drawings of the building. Some buildings may be constructed without following any Building Code or may be constructed before the Building Code was adopted. If the "Building Code" is not known, leave it blank.

Additions: This information is related to the separate portions of the main building. Some extra or extended buildings are constructed attached to the main building. Extended building may be constructed as independent structures with separate joints or may be integrally attached to the main building. If additional buildings are present, the "YES" box should be checked and the built year for that additional building should be enumerated. If the year the addition was on the estimate basic, "EST" should be added beside the year data.

Occupancy: Check the relevant use or occupancy of the building. In RVS Form, there are 9 general occupancy classes and 3 occupancy designations, Table (3). These occupancy types can be correlated with the "Use" of the building. For example, the restaurant building is surveyed, screener may fill the "Use" as "Restaurant" and he or she can choose the "Occupancy" as "Commercial". If the building doesn't not fall on these mentioned occupancy classes, detailed explanations should be included in the "Comments" section. For occupancy designation, screener can check the relevant block; Historic, Government, or Shelter. Some school occupancies are used as shelters in delta region of Myanmar.

Table (3) Occupancy Classes and Occupancy Designations

Occupancy Classes	
Assembly	Public assembly where 300 or more people gather. Examples include theaters, auditoriums, community centers, performance halls, and churches.
Commercial	Retail and wholesale businesses, financial institutions, restaurants, parking structure, and light warehouses.
Emergency Services	Critical facilities including police, fire stations, hospitals, and communication centers.
Industrial	Large facilities including factories, assembly plants, and heavy manufacturing facilities.
Office	Typical office buildings that house clerical and management functions.
Residential	Houses, townhouses, dormitories, motels, hotels, apartments and condominiums, and residences for the aged or disabled.
School	All public and private educational facilities from nursery school to university level.
Warehouse	Large warehouses used for product and commercial warehouses. (In FEMA - 154 Second Edition "Industrial" class included large warehouses).
Utility	Water, wastewater, power, gas, and electric facilities. (Captured as "Industrial" class facilities in FEMA - 154 Second Edition).
Occupancy Designations	
Government	Local, state, and federal non-emergency related buildings.

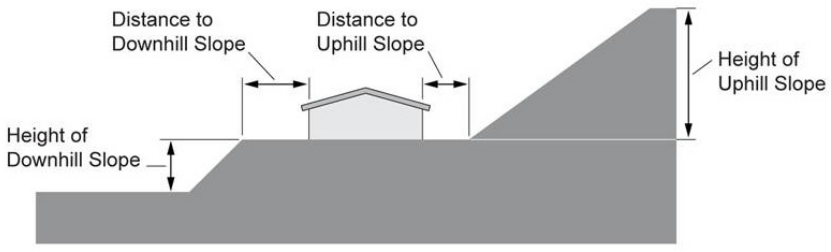
Historic	Many variations from community to community.
Shelter	Designated shelters or buildings specifically identified as shelters for post-event occupancy ("Emergency Services")

Soil Type: Mention soil information or site class where the building is located. There are various data sources for the soil type of a building. If soil map of the surveyed region is not available, the following Soil Type Definition ranging from A to F can be referred for estimation.

Table (4) Soil Type Definitions

Soil Type/ Site Class	Shear Wave Velocity in the Top 30 meters of Soil, V_s^{30}	Standard Blow Count, N	Un-drained Shear Strength of the Upper 100ft, s_u
A. Hard Rock	V_s^{30} > 5000 ft/s		
B. Normal Rock	2500 ft/s < V_s^{30} < 5000 ft/s		
C. Soft Rock	1200 ft/s < V_s^{30} < 2500 ft/s	N > 50	s_u > 2000 psf
D. Hard Soil/ DNK	600 ft/s < V_s^{30} < 1200 ft/s	15 < N < 50	1000 psf < s_u < 2000 psf
E. Soft Soil	V_s^{30} ≤ 600 ft/s	N < 15	s_u < 1000 psf
	More than 10 feet of soft soil with plasiticity index PI > 20, water content w > 40 %, and s_u < 500 psf		
F. Poor Soil	Soil requiring site-specific evaluations. - Soils vulnerable to potential failure or collapse under seismic loading, such as liquefiable soils, quick and high-sensitive clays, collapsible weakly-cemented soils. - Thicker than 10 feet of peat or highly organic clay. - Very high plasticity clays (25 feet with PI > 75) - More than 120 feet of soft or medium stiff clays.		

Geohazards: Check the relevant block of the geo-hazards that can cause damages to the building. Liquefaction, landslide potential and surface fault rupture are the three main types of geologic hazards in this form. If the screener is not sure on whether the geo-hazards exist at the building site, check the "DNK" (Do not know). ***Liquefaction*** is a process by which sediments below the water table temporarily lose stiffness and strength and behave as a viscous liquid rather than a solid. These areas may be along or reclaimed from the river basin where there is higher water table. If the height of the slope is greater than the distance from the nearest side of the building to the slope, a ***potential landslide hazard*** block should be checked on the Data Collection Form. Refer to figure below for landslide hazard potential.



As a rule of thumb, if the height of the slope is greater than the distance from the nearest side of the building to the slope, a potential landslide hazard should be marked on the form.

Figure (7) Building with Potential Landslide Hazard (Source; FEMA 154 Third Edition)

Adjacency: Check the relevant block "Pounding" and "Falling Hazards from Taller Adjacent Building" of the building. 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 ½ " times number of stories in shorter building (in High seismicity region)
- 1" times number of stories in shorter building (in Moderately High seismicity region)
- ½ " times number of stories in shorter building (in Moderate and Low seismicity region)

Refer to the following figure (8) for Pounding Calculation and Consideration example.

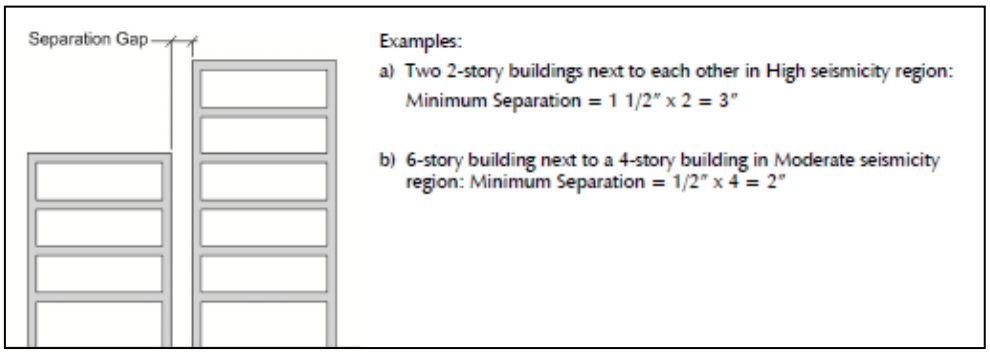


Figure (8) Separation Gap Calculation Example (Source; FEMA 154 Third Edition)

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.

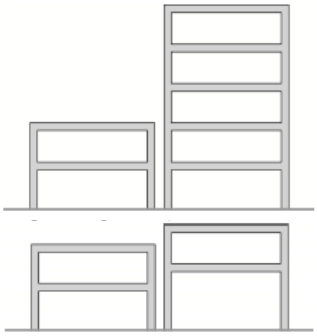
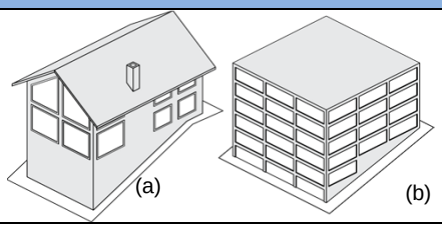
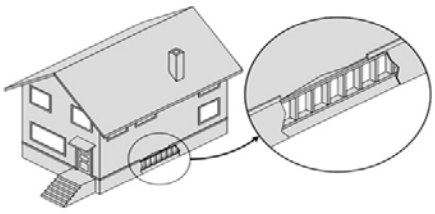
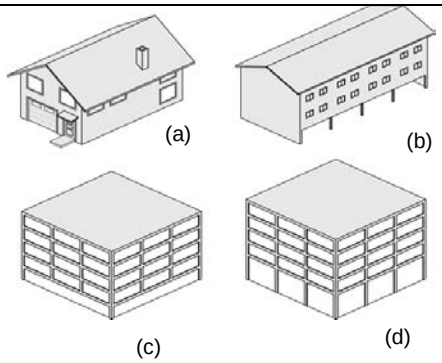


Figure (9) Pounding Considerations (Source; FEMA 154 Third Edition)

Irregularities: Check the relevant block of "Severe Vertical Irregularities", "Moderate Vertical Irregularities" and "Plan Irregularities". See the tables below for detailed explanations of each irregularity case, Table (5) and Table (6).

Table (5) Vertical Irregularity Reference Guide (FEMA 154, Third Edition)

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	Apply: 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. Figure (b): For a W1A building with an open front at the ground story (such as for parking). Figure (c): When one of the stories has less wall or fewer columns than the others (usually the bottom story). Figure (d): When one of the stories is taller than the others (usually the bottom story).

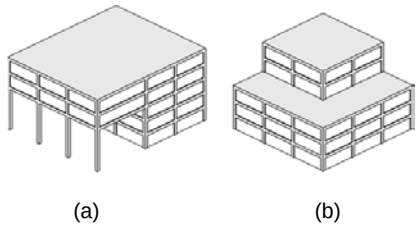
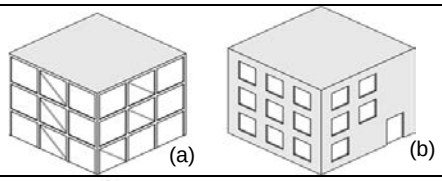
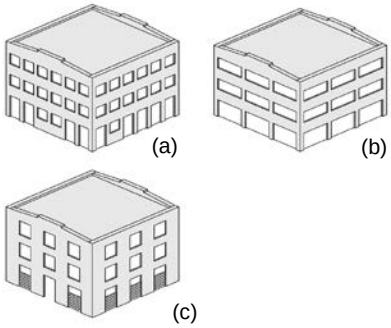
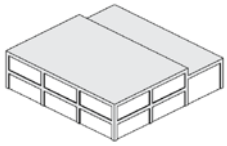
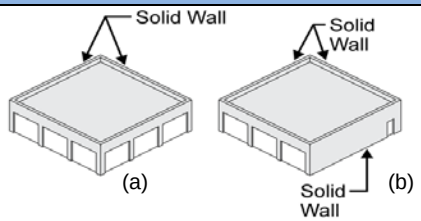
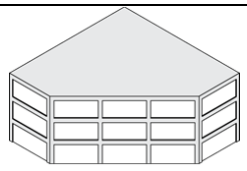
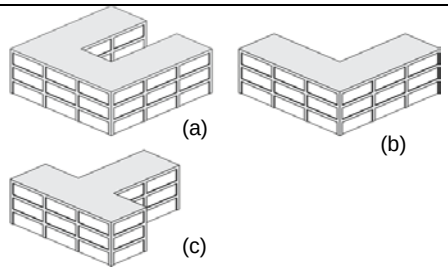
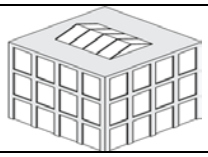
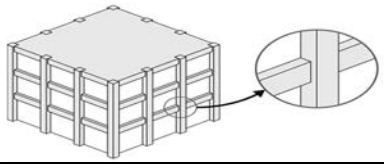
Out-of-plane Setback	 (a) (b)	Severe	Apply if the walls of the building do not stack vertically in plan. This irregularity is most severe when the vertical elements of the lateral system at the upper levels are outboard of those at the lower levels as shown in Figure (a). The condition in Figure (b) also triggers this irregularity. If non stacking walls are known to be nonstructural, this irregularity does not apply. Apply the setback if greater than or equal to 2 feet.
In-plane Setback	 (a) (b)	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	 (a) (b) (c)	Severe	Apply if: Figure (a): Some columns/ piers are much shorter than the typical columns/ piers in the same line. Figure (b): The columns/ piers are narrow compared to the depth of the beams. Figure (c): There are infill walls that shorten the clear height of the column. Note this deficiency is typically seen in older concrete and steel building types.
Split Levels		Moderate	Apply if the floors of the building do not align or if there is a step in the roof level.

Table (6) Plan Irregularity Reference Guide (FEMA 154, Third Edition)

Plan Irregularity		Level 1 Instructions
Torsion		Apply if there is good lateral resistance in one direction, but not the other, of if there is eccentric stiffness in plan (as shown in Figure (a) and (b); solid walls on two or three sides with walls with lots of openings on the remaining sides).
Non-Parallel Systems		Apply if the sides of the building do not form 90-degree angles.
Reentrant Corner	 (a) (b) (c)	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.

Diaphragm Openings		Apply if there is a opening that has a width of over 50 %of the width of the diaphragm at any level.
Beams do not align with Columns		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.

Exterior Falling Hazards: Check the relevant exterior falling hazards in the form. Un-braced chimneys are common falling hazards for masonry and wood frame building as they are unreinforced and not adequately tied the main building. Parapets, Heavy cladding or heavy veneer, and appendages or canopies or architectural elements are in the same problem with chimneys. If these are not properly anchored or properly unreinforced, the appropriate box should be checked. Detailed explanations can be put in the "Comments" section checking "Other" box in this part.

2.3 Comments

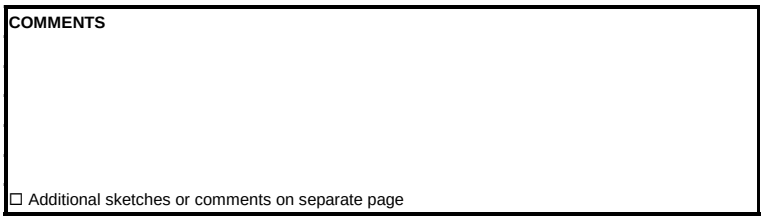


Figure (10) "Comments" Portion of Level 1 Data Collection Form

In "Comments" space, write down the detailed explanations of the building describing important structural features.

2.4 Photographs and Sketch Part

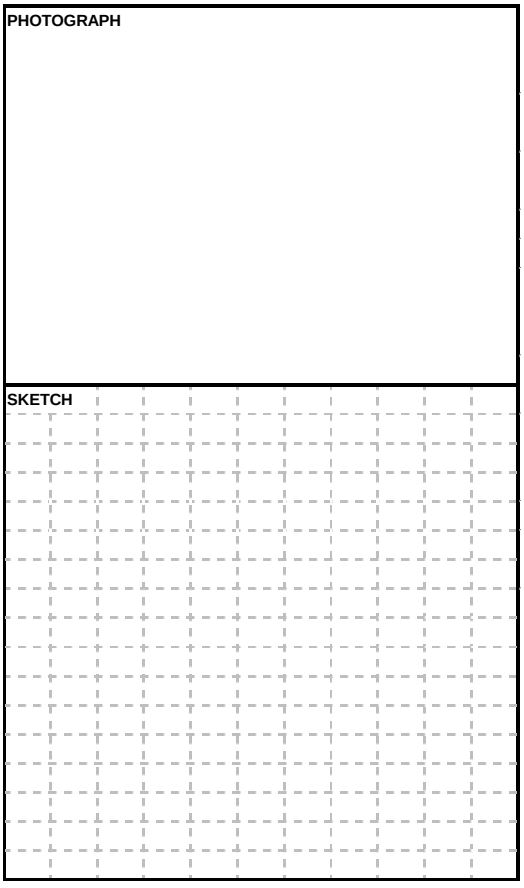


Figure (11) "Photograph and Sketch" Portion of Level 1 Data Collection Form

Photographs: There is the space on Level 1 Data Collection Form for attaching photos. Put the recorded photos of the building in that space. If possible, the screener should take the photos of the building targeting each side of the building and any important features such as observing adjacency, pounding, exterior falling hazards for the identification purposes. Screener can take one or more photos of the building, but have to sure that the other photos are also attached with the Form (either electronic format or hard copy format).

Sketch: Draw a sketch of the surveyed building in that area. The screener can draw a plan sketch or elevation sketch indicating the significant features of the building as per preferences. At least the screener should draw the plan of the building. More detailed information or important features can be recorded on the sketch. Refer to the following figures for the sketch example.

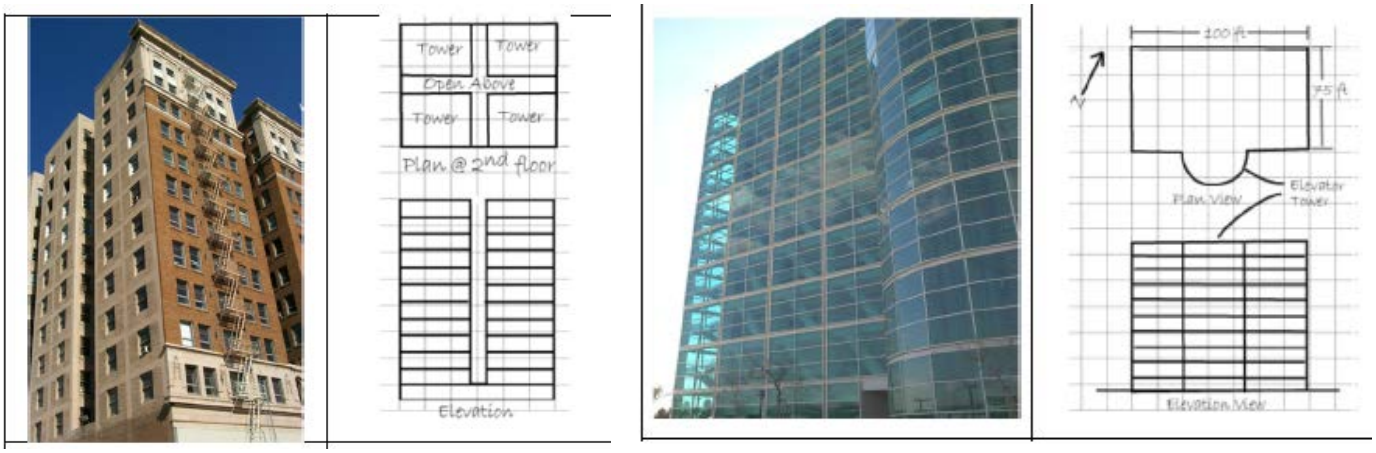


Figure (12) Sketch Examples (Source; FEMA 154 Third Edition)

2.5 Basic Score, Modifiers and Final Score

BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE, S_{L1}																				
BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
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**	**0.9**	**0.8**
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	-0.6	-0.6
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	-0.3	-0.3
Plan Irregularity, P_{L1}		-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	-0.3	0.0
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	NA	NA
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	1.7	1.6	NA	0.5	NA	NA
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	0.2	0.3	0.1	0.1	0.1	0.2
Soil Type E (1-3 stories)		0.0	-0.2	-0.4	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.1	-0.2	0.0	-0.1	0.0	0.0
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	-0.1	-0.2	0.0	NA	NA	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	0.2	0.2
FINAL LEVEL 1 SCORE, $S_{L1} \geq S_{MIN}$																				

Figure (13) "Basic Score, Modifiers and Final Score" Portion of Level 1 Data Collection Form

The structural scoring system consists of a matrix of Basic Scores (one for each FEMA Building Type and its associated seismic force-resisting system) and Score Modifiers to account for observed attributes that modify seismic performance. The five forms vary from each other only in the values of these Basic Scores and Score Modifiers and the Level 2 pounding criteria. The Basic Scores and Score Modifiers are based on (1) time-dependent seismic design and construction practices in the region; (2) attributes known to decrease or increase seismic resistance capacity; and (3) maximum considered ground motions for the seismicity region under consideration. The Basic Score, Score Modifiers, and Final Score all relate to the probability of building collapse, should the maximum ground motions considered by the RVS procedure occur at the site. Final Scores typically range from 0 to 7. For choosing Basic Score, Modifiers and Final Score, building type must be known. Refer to table (7) below for Building Type. Circle the relevant score according to building type and sum them. After that, balance with S_{MIN}. Final Level Score, S_{L1} must be greater than S_{MIN} in all building type. A higher score means that the building has smaller probability of collapse.

Table (7) Building Types

Building Type	
DNK	If the building type cannot significantly identified, or engineer is not sure the building type
W1	Light wood frame single- or multiple-family dwellings of one or more stories in height
W1A	Light wood frame multi-unit, multi-story residential buildings with plan areas on each floor of greater than 3,000 ft^2
W2	Wood frame commercial and industrial buildings with a floor area larger than 5,000 square feet. For commercial and industrial buildings with less than 5,000 square feet, the W2 type can be used as well.
S1	Steel moment-resisting frame buildings
S2	Braced steel frame buildings
S3	Light metal buildings
S4	Steel frame buildings with cast-in-place concrete shear walls
S5	Steel frame buildings with unreinforced masonry infill walls
C1	Concrete moment-resisting frame buildings
C2	Concrete shear wall buildings
C3	Concrete frame buildings with unreinforced masonry infill walls
PC1	Tilt-up buildings
PC2	Precast concrete frame buildings
RM1	Reinforced masonry buildings with flexible floor and roof diaphragms
RM2	Reinforced masonry buildings with rigid floor and roof diaphragms
URM	Unreinforced masonry bearing wall buildings
MH	Manufactured Housing
BN1	Good Brick Nogging Building
BN2	Poor constructed Brick Nogging Building

Pre-Code: One of the key issues that must be addressed in the planning process is the determination of the year in which seismic codes were initially adopted and enforced by the local jurisdiction; and the year in which significantly improved seismic codes were adopted and enforced (this latter year is known as the benchmark year). On the Very High, High, Moderately High, and Moderate seismicity forms, Basic Scores are provided for buildings built after the initial adoption of seismic codes, but before substantially improved codes were adopted (benchmark year). This generally corresponds to buildings designed based on the Uniform Building Code (UBC) in the period between 1941 and 1975. Score Modifiers designated as "Pre-Code" and "Post-Benchmark" are provided, respectively, for buildings built before the adoption of codes and for buildings built after the adoption of substantially improved codes. In Low seismicity regions, the Basic Scores have been calculated assuming the buildings were built without consideration of seismic codes. For buildings in these regions, the Score Modifier designated as "Pre-Code" is not applicable (N/A), and the Score Modifier designated as "Post-Benchmark" is applicable for buildings built after the adoption of seismic codes.

2.6 Extent of Review, Other Hazards, and Action Required

EXTENT OF REVIEW	OTHER HAZARDS	ACTION REQUIRED
Exterior:	Are There Hazards That Trigger A Detailed	Detailed Structural Evaluation Required?
Interior:	Structural Evaluation?	☐ Yes, unknown building type or other building
Drawing Reviewd:	☐ Pounding potential (Unless S_{L1} > Cut-off, if	☐ Yes, score less than cut-off
Soil Type Source:	known)	☐ Yes, other hazards present ☐ No
Geohazards Source:	☐ Falling hazards from taller adjacent building	Detailed Nonstructural Evaluation Recommended?
Contact Person:		☐ Yes, nonstructural hazard identified, should be evaluated
LEVEL 2 SCREENING PERFORMED?	☐ Geologic hazards or Soil Type F	☐ No, nonstructural hazards exist that may require mitigation, but
☐ Yes, Final Level 2 Score, S_{L2}: ☐ No	☐ Significant damage/deterioration to the	a detailed evaluation is not necessary
Nonstructural Hazards? ☐ Yes ☐ No	structural system	☐ 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		

Figure (14) "Extent of Review, Other hazards, and Action Required" Portion of Level 1 Data Collection Form

Extent of Review: This section cover the whole screening process identifying whether the screener had access the Exterior and Interior sides of the building, Drawing, Soil Type and Geohazards Source, and Contact Person. If the level 1 score is less than

cut-off point or if the screener thinks that the building requires further investigation, it is checked “Yes” in “Level 2 Screening Performed?” A score of 2.0 is suggested as a cut-off point for standard occupancy buildings, based on present seismic design criteria.

Other Hazards: Check the relevant box concerning “Pounding potential”, Falling Hazards”, “Geologic Hazards of Soil Type” and “Significant Damage/ Deterioration to the structural system”. These hazards are not considered in the score system of the Level 1 form, but they can cause damage to the building. If one of these hazards conditions exists in the building, a “Detailed Structural Evaluation” is required even though the Level 1 score is less than the cut-off point.

Action Required: As per consequences of above hazards conditions and overall screening process, tick the appropriate box in the form for further process. It is the final part of Level 1 Data Collection Form. There are two parts in the “Action Required” section; structural and non-structural evaluation parts. Check the relevant box in each part. See the following sections for choosing criteria of each option. “DNK” (Do not know) option is also presented in the form.

For Detailed Structural Evaluation,

Tick **“*Yes, unknown FEMA Building Type or other building*”** if the screener has little or no confidence about any choice for the structural system, or if the building does not conform to any of the (17) FEMA Building Types considered on the form, the screening cannot be used to conclude that the building is not potentially hazardous. Therefore, a Detailed Structural Evaluation of the building should be conducted by an experienced design professional. In some cases, the Supervising Engineer or another more experienced screener may be able to determine the FEMA Building Type and complete the screening.

Tick **“*Yes, score less than cut-off*”** if the building receives a score that is less than the cut-off, it may be seismically hazardous and should receive a Detailed Structural Evaluation by an experienced design professional.

Tick **“Yes, other hazards present”** if other hazards are present, as indicated in the “Other Hazards” section of the form, the building may be seismically hazardous and should receive a Detailed Structural Evaluation by an experienced design professional.

Tick **“No”** if the building receives a score greater than the cut-off, and no other hazards are present, then a Detailed Structural Evaluation is not required.

For Detailed Nonstructural Evaluation,

Tick **“*Yes, nonstructural hazards identified that should be evaluated*”** if a nonstructural hazard has been observed and further nonstructural evaluation is recommended to determine whether the identified potential falling hazard is actually a threat. For example, a detailed evaluation would be necessary to determine whether a building’s heavy cladding is properly anchored. If the detailed evaluation reveals that it is properly anchored, the heavy cladding is no longer considered a falling hazard.

“*No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary*” This box is checked if a nonstructural hazard that is a known threat has been observed; eg; an unreinforced brick chimney. In these cases, additional evaluation is not necessary, although mitigation will be necessary if the threat is to be reduced. The jurisdiction may decide to make mitigation of these falling hazards mandatory.

“*No, no nonstructural hazards identified*” If no exterior falling hazards have been observed during the screening, further nonstructural evaluation is not necessary.

III. INSTRUCTIONS OF FILLING DATA COLLECTION FORM LEVEL II (OPTIONAL)

Level 2 Data Collection Form is optional type and it should be filled by a civil or structural engineering professional, architect, or graduate student who has experiences and background knowledge on seismic evaluation of design of buildings. It should be noted that the screener applies same type of seismicity region to both Level 1 and Level 2 Form. If possible, Level 1 and Level 2 should be screened by same person. In Level 2 Data Collection Form, it includes four main sections;

(1) Building Information and Adjusted Base Line Score,
(2) Structural Modifiers to Add to Adjusted Baseline Score,
(3) Observable Nonstructural Hazards, and
(4) Comments.

3.1 Building Information and Adjusted Base Line Score

Building 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***	S' = (S_{L1} - V_{L1} - P_{L1}) =

Figure (15) "Building Information and Adjusted Base Line Score" Portion of Level 2 Data Collection Form

Building Name: Mention the name of the building so that it can be easily known and identify.

Screener: Fill in the name of the screener. It is important as the screener can have more information on the building that he or she did survey. This information can be useful at a later stage.

Date/ Time: Describe the date and time at which the building is screened/ surveyed.

Final Level 1 Score: Take the S_{L1} value from Level 1 Data Collection Form.

Level 1 Irregularities Modifiers; Vertical Irregularity: Fill in the Level 1 Vertical Irregularity Score.

Level 1 Irregularities Modifiers; Plan Irregularity: Fill in the Level 1 Plan Irregularity Score.

Adjusted Baseline Score: Fill in the S' value by calculating with the following equation. V_{L1} and P_{L1} values are taken from the above Vertical Irregularity Modifier and Plan Irregularity Modifier.

$$S' = S_{L1} - V_{L1} - P_{L1}$$

3.2 Structural Modifiers to Add to Adjusted Baseline Score

In this part, there are three main modifiers that can give different score modifiers.

- Vertical Irregularity, V_{L2}
- Plan Irregularity, P_{L2}
- Miscellaneous, M (Comprising of Redundancy, Pounding, S2, C1, PC1, RM1, URM, MH Building, and Retrofit features)

Circle the relevant score modifiers for each section, and then sum all and get the V_{L2}, P_{L2}, and M Score Modifiers respectively. Final Level 2 Score, S_{L2} is the summing of Adjusted Baseline Score, (S' value from *Building Information and Adjusted Base Line Score for Level 2* section), Vertical Irregularity (V_{L2} Score Modifier), Plan Irregularity (P_{L2} Score Modifier), and M Score Modifiers. See the equation below for Final Level 2 Score. S_{L2} score can be transfer to Level 1 Form so that it can be judged with S_{MIN}.

$$\text{Final Level 2 Score, } S_{L2} = S' + V_{L2} + P_{L2} + M \geq S_{MIN}$$

$$S' + V_{L2} + P_{L2} + M \geq S_{MIN}$$

In the last part of Final Level 2 Score, there is a "Yes" / "No" question stating that the building has observable damage or deterioration or another condition that negatively affects the building's seismic performance. If the screener checks the "Yes" box, more detailed explanations can be filled out in the "Comments" section al the last part of Level 2 Data Collection Form.

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE					
Topic	**Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.		-0.4	*(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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.			-0.2	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.			-0.5	*(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 pounding modifiers at -0.9)	-0.7	
		One building is 2 or more stories taller than the other.		-0.7	
		The building is at the end of the block.		-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 Building	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	
	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) ≥ 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.					

Figure (16) "Structural Modifiers to Add to Adjusted Baseline Score" Portion of Level 2 Data Collection Form

Level 2 Form

3.3 Observable Nonstructural Hazards

OBSERVABLE NONSTRUCTURAL HAZARDS				
Location	**Statement (Check "Yes" or "No")**	***Yes***	***No***	**Comments**
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 buidling 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 conslusions)*				
☐ 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.				

Figure (17) "Observable Nonstructural Hazards" Portion of Level 2 Data Collection Form

Check the relevant statement stating "Yes" or "No". The main non-structural hazards are exterior and interior location of the building. In both exterior and interior non structural hazard parts, it is required that the screener read each and every statement

and checks the relevant box. If the screener chooses “Yes” box, there is comments section at the right side of the statement. Describe the important features or characteristics on this comments section. There are seven statements concerning with Exterior Observable Non Structural Hazards and two statements stating Interior Observable Non Structural Hazards.

After reviewing each of the statements, the screener uses judgment to estimate the nonstructural seismic performance of the building. There are three boxes in this part;

- ☐ *Potential Nonstructural Hazards with significant threat to occupant life safety.*
- ☐ *Nonstructural hazards identified with significant threat to occupant life safety.*
- ☐ *Low or no nonstructural hazard threat to occupant life safety.*

If the screener chooses first option, then the relevant measures will be “Detailed Non structural Evaluation Recommended.” For second option, the relevant option will be *“Detailed Nonstructural Evaluation is recommended But not required”.* For the third option, the measure is *“No Detailed Nonstructural Evaluation is required”.*

3.4 Comments

Figure (18) “Comments” Portion of Level 2 Data Collection Form

Describe the special conditions or important features in the “Comments” space. The screener should fill in the detailed information of what he or she found out. If required, the screener can use extra sheet of paper to note down the information ensuring that this sheet is attached to the Data Collection Form.

IV. APPENDIX – DATA COLLECTION FORMS

VERY HIGH Seismicity	**-**	**Level I**
	-	**Level II (Optional)**
HIGH Seismicity	**-**	**Level I**
	-	**Level II (Optional)**
MODERATELY HIGH Seismicity	**-**	**Level I**
	-	**Level II (Optional)**
MODERATE Seismicity	**-**	**Level I**
	-	**Level II (Optional)**
LOW Seismicity	**-**	**Level I**
	-	**Level II (Optional)**

Rapid Visual Screening of Buildings for Potential Seismic Hazards — LEVEL 1

(Adopted from FEMA P-154 Data Collection Form) — **VERY HIGH Seismicity**

PHOTOGRAPH

SKETCH

Address: ..... **City:** .....

Other ID: ..... **Use:** .....

Building Name: .....

Latitude: ..... **S_s:** .....

Longitude: ..... **S_1:** .....

Screener: ..... **Date/Time:** .....

#Stories - Above Ground: ..... Below Ground: ..... **Year Built:** ..... ☐ Est

Total Floor Area (sft): ..... **Code Year:** .....

Additions: ☐ None ☐ Yes, Years Built:.....

Occupancy: ☐ Assembly ☐ Commercial ☐ Emergency Services ☐ Historic ☐ Industrial ☐ Office ☐ Schools ☐ Government ☐ Utility ☐ Warehouse ☐ Residential,#Units: ☐ Shelter

Soil Type: ☐ A: Hard Rock ☐ C: Soft Rock ☐ E: Soft Soil ☐ B: Normal Rock ☐ D: Hard Soil / DNK ☐ F: Poor Soil

Geohazards: Liquefaction: ☐ Yes, ☐ No, ☐ DNK; Landslide: ☐ Yes, ☐ No, ☐ DNK; Surface Rupture: ☐ Yes, ☐ No, ☐ DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Severe Vertical Irregularity ☐ Plan Irregularity ☐ Moderate Vertical Irregularity

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}

BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
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**	**0.9**	**0.8**
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	-0.6	-0.6
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	-0.3	-0.3
Plan Irregularity, P_{L1}		-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	-0.3	0.0
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	NA	NA
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	NA	NA
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	0.1	0.2
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	0.0	0.0
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	NA	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	0.2	0.2

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

EXTENT OF REVIEW

Exterior: ☐ Partial ☐ All Sides ☐ Aerial

Interior: ☐ None ☐ Visible ☐ Entered

Drawing Reviewd: ☐ Yes ☐ No

Soil Type Source:.....

Geohazards 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_{L1} > 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 building type or other building

☐ Yes, score less than cut-off

☐ Yes, other hazards present ☐ No

Detailed Nonstructural Evaluation Recommended?

☐ Yes, nonstructural hazard identified, 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

LEVEL 2 (Optional)

(Adopted from FEMA P-154 Data Collection Form)

VERY HIGH Seismicity

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.

Building 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*** S' = (S_{L1} - V_{L1} - P_{L1}) =		

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic		Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.4	*(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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.		-0.2	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-0.5	*(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.	-0.7	
		One building is 2 or more stories taller than the other.	-0.7	
		The building is at the end of the block.	-0.4	
		(Cap total pounding modifiers at -0.9)		
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 Building	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	
	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) ≥ 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	Comments
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 buidling 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 conslusions)*

☐ 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

LEVEL 1

(Adopted from FEMA P-154 Data Collection Form)

HIGH Seismicity

PHOTOGRAPH

SKETCH

Address: ..... **City:** .....

Other ID: ..... **Use:** .....

Building Name: .....

Latitude: ..... S_s: .....

Longitude: ..... S_1: .....

Screener: ..... **Date/Time:** .....

#Stories - Above Ground: ..... Below Ground: ..... **Year Built:** ..... ☐ Est

Total Floor Area (sft): ..... **Code Year:** .....

Additions: ☐ None ☐ Yes, Years Built:.....

Occupancy: ☐ Assembly ☐ Commercial ☐ Emergency Services ☐ Historic
☐ Industrial ☐ Office ☐ Schools ☐ Government
☐ Utility ☐ Warehouse ☐ Residential,#Units: ☐ Shelter

Soil Type: ☐ A: Hard Rock ☐ C: Soft Rock ☐ E: Soft Soil
☐ B: Normal Rock ☐ D: Hard Soil / DNK ☐ F: Poor Soil

Geohazards: Liquefaction: ☐ Yes, ☐ No, ☐ DNK
Landslide: ☐ Yes, ☐ No, ☐ DNK
Surface Rupture: ☐ Yes, ☐ No, ☐ DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Severe Vertical Irregularity ☐ Plan Irregularity
☐ Moderate Vertical Irregularity

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}

BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
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**	**1.0**	**1.4**
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	-0.7	-0.8
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	-0.4	-0.5
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	-0.4	-0.5
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	NA	NA
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	NA	NA
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	0.3	0.9
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	-0.2	-0.6
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	NA	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	0.2	0.2

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

EXTENT OF REVIEW

Exterior: ☐ Partial ☐ All Sides ☐ Aerial

Interior: ☐ None ☐ Visible ☐ Entered

Drawing Reviewd: ☐ Yes ☐ No

Soil Type Source:.....

Geohazards 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_{L1} > 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 building type or other building

☐ Yes, score less than cut-off

☐ Yes, other hazards present ☐ No

Detailed Nonstructural Evaluation Recommended?

☐ Yes, nonstructural hazard identified, 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

LEVEL 2 (Optional)

(Adopted from FEMA P-154 Data Collection Form)

HIGH Seismicity

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.

Building 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*** $S' = (S_{L1} - V_{L1} - P_{L1})$ =		

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic		Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.5	*(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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.		-0.4	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-0.7	*(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 1.5 % of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	-1	
		One building is 2 or more stories taller than the other.	-1	
		The building is at the end of the block.	-0.5	
		(Cap total pounding modifiers at -0.9)		
S2 Building	"K" bracing geometry is visible.		-1	
C1 Building	Flat plate serves as the beam in the moment frame.		-0.4	
PC1/ RM1 Building	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	
	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	Comments
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 buidling 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 conslusions)*

☐ 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 — LEVEL 1

(Adopted from FEMA P-154 Data Collection Form) — **MODERATELY HIGH Seismicity**

PHOTOGRAPH

SKETCH

Address: …… **City:** ……

Other ID: …… **Use:** ……

Building Name: ……

Latitude: …… **S_s:** ……

Longitude: …… **S_1:** ……

Screener: …… **Date/Time:** ……

#Stories - Above Ground: …… Below Ground: …… **Year Built:** …… ☐ Est

Total Floor Area (sft): …… **Code Year:** ……

Additions: ☐ None ☐ Yes, Years Built:……

Occupancy: ☐ Assembly ☐ Commercial ☐ Emergency Services ☐ Historic ☐ Industrial ☐ Office ☐ Schools ☐ Government ☐ Utility ☐ Warehouse ☐ Residential,#Units: ☐ Shelter

Soil Type: ☐ A: Hard Rock ☐ C: Soft Rock ☐ E: Soft Soil ☐ B: Normal Rock ☐ D: Hard Soil / DNK ☐ F: Poor Soil

Geohazards: Liquefaction: ☐ Yes, ☐ No, ☐ DNK; Landslide: ☐ Yes, ☐ No, ☐ DNK; Surface Rupture: ☐ Yes, ☐ No, ☐ DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Severe Vertical Irregularity ☐ Plan Irregularity ☐ Moderate Vertical Irregularity

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}

BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
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**	**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	-0.8	-0.9
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	-0.5	-0.6
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	-0.5	-0.8
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	NA	NA
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	NA	NA
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	0.6	1.0
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	-0.3	-1.2
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	NA	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	0.2	0.5

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

EXTENT OF REVIEW

Exterior: ☐ Partial ☐ All Sides ☐ Aerial

Interior: ☐ None ☐ Visible ☐ Entered

Drawing Reviewd: ☐ Yes ☐ No

Soil Type Source:……

Geohazards 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_{L1} > 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 building type or other building

☐ Yes, score less than cut-off

☐ Yes, other hazards present ☐ No

Detailed Nonstructural Evaluation Recommended?

☐ Yes, nonstructural hazard identified, 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

LEVEL 2 (Optional)

(Adopted from FEMA P-154 Data Collection Form)

MODERATELY HIGH Seismicity

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.

Building 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*** S' = (S_{L1} - V_{L1} - P_{L1}) =		

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic		Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	
		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	
		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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.5	*(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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.		-0.4	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-0.8	*(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 1.5 % of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	-1	
		One building is 2 or more stories taller than the other.	-1	
		The building is at the end of the block.	-0.5	
		(Cap total pounding modifiers at -0.9)		
S2 Building	"K" bracing geometry is visible.		-1	
C1 Building	Flat plate serves as the beam in the moment frame.		-0.5	
PC1/ RM1 Building	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	
	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) ≥ 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	Comments
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 buidling 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 conslusions)*

☐ 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 — LEVEL 1

(Adopted from FEMA P-154 Data Collection Form) — **MODERATE Seismicity**

PHOTOGRAPH

SKETCH

Address: ..... **City:** .....

Other ID: ..... **Use:** .....

Building Name: .....

Latitude: ..... **S_s:** .....

Longitude: ..... **S_1:** .....

Screener: ..... **Date/Time:** .....

#Stories - Above Ground: ..... Below Ground: ..... **Year Built:** ..... ☐ Est

Total Floor Area (sft): ..... **Code Year:** .....

Additions: ☐ None ☐ Yes, Years Built:.....

Occupancy: ☐ Assembly ☐ Commercial ☐ Emergency Services ☐ Historic
☐ Industrial ☐ Office ☐ Schools ☐ Government
☐ Utility ☐ Warehouse ☐ Residential,#Units: ☐ Shelter

Soil Type: ☐ A: Hard Rock ☐ C: Soft Rock ☐ E: Soft Soil
☐ B: Normal Rock ☐ D: Hard Soil / DNK ☐ F: Poor Soil

Geohazards: Liquefaction: ☐ Yes, ☐ No, ☐ DNK
Landslide: ☐ Yes, ☐ No, ☐ DNK
Surface Rupture: ☐ Yes, ☐ No, ☐ DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Severe Vertical Irregularity ☐ Plan Irregularity
☐ Moderate Vertical Irregularity

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}

BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
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**	**1.7**	**3.2**
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	-1.0	-0.9
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	-0.6	-0.6
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	-0.7	-0.8
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	NA	NA
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	NA	NA
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	1.3	0.8
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	-0.6	-1.1
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	NA	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	0.2	0.8

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

EXTENT OF REVIEW

Exterior: ☐ Partial ☐ All Sides ☐ Aerial

Interior: ☐ None ☐ Visible ☐ Entered

Drawing Reviewd: ☐ Yes ☐ No

Soil Type Source:.....

Geohazards 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_{L1} > 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 building type or other building

☐ Yes, score less than cut-off

☐ Yes, other hazards present ☐ No

Detailed Nonstructural Evaluation Recommended?

☐ Yes, nonstructural hazard identified, 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

LEVEL 2 (Optional)

(Adopted from FEMA P-154 Data Collection Form)

MODERATE Seismicity

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.

Building 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*** $S' = (S_{L1} - V_{L1} - P_{L1})$ =		

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic		Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.6	*(Cap at -1.4)*
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	
	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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.		-0.4	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-1	*(Cap at -1.4)*
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 1.5 % 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	
		(Cap total pounding modifiers at -0.9)		
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 Building	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	
	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	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	Comments
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 buidling 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 conslusions)*

☐ 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 — LEVEL 1

(Adopted from FEMA P-154 Data Collection Form) — **LOW Seismicity**

PHOTOGRAPH

SKETCH

Address: ..... **City:** .....

Other ID: ..... **Use:** .....

Building Name: .....

Latitude: ..... S_s: .....

Longitude: ..... S_1: .....

Screener: ..... **Date/Time:** .....

#Stories - Above Ground: ..... Below Ground: ..... **Year Built:** ..... ☐ Est

Total Floor Area (sft): ..... **Code Year:** .....

Additions: ☐ None ☐ Yes, Years Built:.....

Occupancy: ☐ Assembly ☐ Commercial ☐ Emergency Services ☐ Historic ☐ Industrial ☐ Office ☐ Schools ☐ Government ☐ Utility ☐ Warehouse ☐ Residential,#Units: ☐ Shelter

Soil Type: ☐ A: Hard Rock ☐ C: Soft Rock ☐ E: Soft Soil ☐ B: Normal Rock ☐ D: Hard Soil / DNK ☐ F: Poor Soil

Geohazards: Liquefaction: ☐ Yes, ☐ No, ☐ DNK; Landslide: ☐ Yes, ☐ No, ☐ DNK; Surface Rupture: ☐ Yes, ☐ No, ☐ DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Severe Vertical Irregularity ☐ Plan Irregularity ☐ Moderate Vertical Irregularity

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}

BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
Basic Score		**6.2**	**5.9**	**5.7**	**3.8**	**3.9**	**4.4**	**4.1**	**4.5**	**3.3**	**4.2**	**3.5**	**3.8**	**3.3**	**3.7**	**3.7**	**3.2**	**4.6**	**3.2**	**3.9**
Severe Vertical Irregularity, V_{L1}		-1.5	-1.5	-1.5	-1.4	-1.3	-1.6	-1.2	-1.3	-1.3	-1.2	-1.1	-1.3	-1.1	-1.1	-1.1	-1.2	NA	-1.2	-1.0
Moderate Vertical Irregularity, V_{L1}		-1.0	-0.9	-0.9	-0.9	-0.8	-1.0	-0.7	-0.7	-0.7	-0.7	-0.6	-0.8	-0.6	-0.6	-0.6	-0.7	NA	-0.7	-0.7
Plan Irregularity, P_{L1}		-1.6	-1.4	-1.3	-1.2	-1.1	-1.4	-1.0	-1.1	-1.0	-1.0	-0.9	-1.2	-0.9	-0.9	-0.9	-1.0	NA	-1.0	-1.1
Pre-Code		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Post-Benchmark		2.2	2.4	2.5	2.0	1.6	1.4	2.1	NA	2.3	2.2	NA	1.9	2.6	2.3	2.3	NA	1.8	NA	NA
Soil Type A or B		0.9	1.1	1.3	1.0	1.2	0.8	1.3	1.4	0.9	1.2	1.2	1.3	1.3	1.4	1.4	1.3	0.9	1.3	0.5
Soil Type E (1-3 stories)		-1.2	-1.7	-2.3	-1.2	-1.4	-1.0	-1.7	-2.0	-1.4	-2.0	-1.6	-1.7	-1.6	-1.7	-1.7	-1.5	-2.1	-1.5	-0.6
Soil Type E (>3 stories)		-1.7	-2.0	-2.2	-1.2	-1.4	NA	-1.7	-1.9	-1.3	-1.9	-1.6	NA	-1.6	-1.6	-1.7	-1.4	NA	NA	NA
Minimum Score, S_{MIN}		2.7	2.1	1.5	0.9	0.8	1.2	0.8	0.9	0.5	0.6	0.5	0.6	0.4	0.6	0.5	0.4	2.5	0.2	0.9

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

EXTENT OF REVIEW

Exterior: ☐ Partial ☐ All Sides ☐ Aerial

Interior: ☐ None ☐ Visible ☐ Entered

Drawing Reviewd: ☐ Yes ☐ No

Soil Type Source:.....

Geohazards 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_{L1} > 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 building type or other building

☐ Yes, score less than cut-off

☐ Yes, other hazards present ☐ No

Detailed Nonstructural Evaluation Recommended?

☐ Yes, nonstructural hazard identified, 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

LEVEL 2 (Optional)

(Adopted from FEMA P-154 Data Collection Form)

LOW Seismicity

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.

Building 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*** S' = (S_{L1} - V_{L1} - P_{L1}) =		

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic		Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.6	*(Cap at -1.5)*
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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.		-0.5	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-1.1	*(Cap at -1.6)*
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 1.5 % 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	
		(Cap total pounding modifiers at -0.9)		
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 Building	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	
	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	M =

FINAL LEVEL 2 SCORE, S_{L2} = (S' + V_{L2} + P_{L2} + M) ≥ 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	Comments
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 buidling 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 conslusions)*

☐ 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 — LEVEL 1

(Adopted from FEMA P-154 Data Collection Form) — **VERY HIGH Seismicity**

PHOTOGRAPH

SKETCH

Address: ..... **City:** .....

Other ID: ..... **Use:** .....

Building Name: .....

Latitude: ..... S_s: .....

Longitude: ..... S_1: .....

Screener: ..... **Date/Time:** .....

#Stories - Above Ground: ..... Below Ground: ..... **Year Built:** ..... ☐ Est

Total Floor Area (sft): ..... **Code Year:** .....

Additions: ☐ None ☐ Yes, Years Built:.....

Occupancy: ☐ Assembly ☐ Commercial ☐ Emergency Services ☐ Historic
☐ Industrial ☐ Office ☐ Schools ☐ Government
☐ Utility ☐ Warehouse ☐ Residential,#Units: ☐ Shelter

Soil Type: ☐ A: Hard Rock ☐ C: Soft Rock ☐ E: Soft Soil
☐ B: Normal Rock ☐ D: Hard Soil / DNK ☐ F: Poor Soil

Geohazards: Liquefaction: ☐ Yes, ☐ No, ☐ DNK
Landslide: ☐ Yes, ☐ No, ☐ DNK
Surface Rupture: ☐ Yes, ☐ No, ☐ DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Severe Vertical Irregularity ☐ Plan Irregularity
☐ Moderate Vertical Irregularity

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}

BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
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**	**0.9**	**0.8**
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	-0.6	-0.6
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	-0.3	-0.3
Plan Irregularity, P_{L1}		-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	-0.3	0.0
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	NA	NA
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	NA	NA
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	0.1	0.2
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	0.0	0.0
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	NA	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	0.2	0.2

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

EXTENT OF REVIEW

Exterior: ☐ Partial ☐ All Sides ☐ Aerial

Interior: ☐ None ☐ Visible ☐ Entered

Drawing Reviewd: ☐ Yes ☐ No

Soil Type Source:.....

Geohazards 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_{L1} > 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 building type or other building

☐ Yes, score less than cut-off

☐ Yes, other hazards present ☐ No

Detailed Nonstructural Evaluation Recommended?

☐ Yes, nonstructural hazard identified, 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

LEVEL 2 (Optional)

(Adopted from FEMA P-154 Data Collection Form)

VERY HIGH Seismicity

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.

Building 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*** S' = (S_{L1} - V_{L1} - P_{L1}) =		

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic		Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.4	*(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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.		-0.2	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-0.5	*(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.	-0.7	
		One building is 2 or more stories taller than the other.	-0.7	
		The building is at the end of the block.	-0.4	
		(Cap total pounding modifiers at -0.9)		
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 Building	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	
	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) ≥ 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	Comments
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 buidling 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 conslusions)*

☐ 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

LEVEL 1

(Adopted from FEMA P-154 Data Collection Form)

HIGH Seismicity

PHOTOGRAPH

SKETCH

Address: ..... **City:** .....

Other ID: ..... **Use:** .....

Building Name: .....

Latitude: ..... S_s: .....

Longitude: ..... S_1: .....

Screener: ..... **Date/Time:** .....

#Stories - Above Ground: ..... Below Ground: ..... **Year Built:** ..... ☐ Est

Total Floor Area (sft): ..... **Code Year:** .....

Additions: ☐ None ☐ Yes, Years Built:.....

Occupancy: ☐ Assembly ☐ Commercial ☐ Emergency Services ☐ Historic
☐ Industrial ☐ Office ☐ Schools ☐ Government
☐ Utility ☐ Warehouse ☐ Residential,#Units: ☐ Shelter

Soil Type: ☐ A: Hard Rock ☐ C: Soft Rock ☐ E: Soft Soil
☐ B: Normal Rock ☐ D: Hard Soil / DNK ☐ F: Poor Soil

Geohazards: Liquefaction: ☐ Yes, ☐ No, ☐ DNK
Landslide: ☐ Yes, ☐ No, ☐ DNK
Surface Rupture: ☐ Yes, ☐ No, ☐ DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Severe Vertical Irregularity ☐ Plan Irregularity
☐ Moderate Vertical Irregularity

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}

BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
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**	**1.0**	**1.4**
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	-0.7	-0.8
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	-0.4	-0.5
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	-0.4	-0.5
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	NA	NA
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	NA	NA
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	0.3	0.9
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	-0.2	-0.6
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	NA	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	0.2	0.2

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

EXTENT OF REVIEW

Exterior: ☐ Partial ☐ All Sides ☐ Aerial

Interior: ☐ None ☐ Visible ☐ Entered

Drawing Reviewd: ☐ Yes ☐ No

Soil Type Source:.....

Geohazards 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_{L1} > 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 building type or other building

☐ Yes, score less than cut-off

☐ Yes, other hazards present ☐ No

Detailed Nonstructural Evaluation Recommended?

☐ Yes, nonstructural hazard identified, 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

LEVEL 2 (Optional)
HIGH Seismicity

(Adopted from 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.

Building 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*** S' = (S_{L1} - V_{L1} - P_{L1}) =		

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic		Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.5	*(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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.		-0.4	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-0.7	*(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 1.5 % of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	-1	
		One building is 2 or more stories taller than the other.	-1	
		The building is at the end of the block.	-0.5	
		(Cap total pounding modifiers at -0.9)		
S2 Building	"K" bracing geometry is visible.		-1	
C1 Building	Flat plate serves as the beam in the moment frame.		-0.4	
PC1/ RM1 Building	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	
	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) ≥ 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	Comments
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 buidling 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 conslusions)*

☐ 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

LEVEL 1

(Adopted from FEMA P-154 Data Collection Form)

MODERATELY HIGH Seismicity

PHOTOGRAPH

SKETCH

Address: ..... **City:** .....

Other ID: ..... **Use:** .....

Building Name: .....

Latitude: ..... **S_s:** .....

Longitude: ..... **S_1:** .....

Screener: ..... **Date/Time:** .....

#Stories - Above Ground: ..... Below Ground: ..... **Year Built:** ..... ☐ Est

Total Floor Area (sft): ..... **Code Year:** .....

Additions: ☐ None ☐ Yes, Years Built:.....

Occupancy: ☐ Assembly ☐ Commercial ☐ Emergency Services ☐ Historic
☐ Industrial ☐ Office ☐ Schools ☐ Government
☐ Utility ☐ Warehouse ☐ Residential,#Units: ☐ Shelter

Soil Type: ☐ A: Hard Rock ☐ C: Soft Rock ☐ E: Soft Soil
☐ B: Normal Rock ☐ D: Hard Soil / DNK ☐ F: Poor Soil

Geohazards: Liquefaction: ☐ Yes, ☐ No, ☐ DNK
Landslide: ☐ Yes, ☐ No, ☐ DNK
Surface Rupture: ☐ Yes, ☐ No, ☐ DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Severe Vertical Irregularity ☐ Plan Irregularity
☐ Moderate Vertical Irregularity

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}

BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
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**	**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	-0.8	-0.9
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	-0.5	-0.6
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	-0.5	-0.8
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	NA	NA
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	NA	NA
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	0.6	1.0
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	-0.3	-1.2
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	NA	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	0.2	0.5

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

EXTENT OF REVIEW

Exterior: ☐ Partial ☐ All Sides ☐ Aerial

Interior: ☐ None ☐ Visible ☐ Entered

Drawing Reviewd: ☐ Yes ☐ No

Soil Type Source:.....

Geohazards 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_{L1} > 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 building type or other building

☐ Yes, score less than cut-off

☐ Yes, other hazards present ☐ No

Detailed Nonstructural Evaluation Recommended?

☐ Yes, nonstructural hazard identified, 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

LEVEL 2 (Optional)

(Adopted from FEMA P-154 Data Collection Form)

MODERATELY HIGH Seismicity

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.

Building 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*** S' = (S_{L1} - V_{L1} - P_{L1}) =		

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic		Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	
		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	
		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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.5	*(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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.		-0.4	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-0.8	*(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 1.5 % of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	-1	
		One building is 2 or more stories taller than the other.	-1	
		The building is at the end of the block.	-0.5	
		(Cap total pounding modifiers at -0.9)		
S2 Building	"K" bracing geometry is visible.		-1	
C1 Building	Flat plate serves as the beam in the moment frame.		-0.5	
PC1/ RM1 Building	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	
	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) ≥ 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*	Comments
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 buidling 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 conslusions)*

☐ 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

LEVEL 1

(Adopted from FEMA P-154 Data Collection Form)

MODERATE Seismicity

PHOTOGRAPH

SKETCH

Address: ..... **City:** .....

Other ID: ..... **Use:** .....

Building Name: .....

Latitude: ..... S_s: .....

Longitude: ..... S_1: .....

Screener: ..... **Date/Time:** .....

#Stories - Above Ground: ..... Below Ground: ..... **Year Built:** ..... ☐ Est

Total Floor Area (sft): ..... **Code Year:** .....

Additions: ☐ None ☐ Yes, Years Built:.....

Occupancy: ☐ Assembly ☐ Commercial ☐ Emergency Services ☐ Historic
☐ Industrial ☐ Office ☐ Schools ☐ Government
☐ Utility ☐ Warehouse ☐ Residential,#Units: ☐ Shelter

Soil Type: ☐ A: Hard Rock ☐ C: Soft Rock ☐ E: Soft Soil
☐ B: Normal Rock ☐ D: Hard Soil / DNK ☐ F: Poor Soil

Geohazards: Liquefaction: ☐ Yes, ☐ No, ☐ DNK
Landslide: ☐ Yes, ☐ No, ☐ DNK
Surface Rupture: ☐ Yes, ☐ No, ☐ DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Severe Vertical Irregularity ☐ Plan Irregularity
☐ Moderate Vertical Irregularity

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}

BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
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**	**1.7**	**3.2**
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	-1.0	-0.9
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	-0.6	-0.6
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	-0.7	-0.8
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	NA	NA
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	NA	NA
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	1.3	0.8
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	-0.6	-1.1
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	NA	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	0.2	0.8

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

EXTENT OF REVIEW

Exterior: ☐ Partial ☐ All Sides ☐ Aerial

Interior: ☐ None ☐ Visible ☐ Entered

Drawing Reviewd: ☐ Yes ☐ No

Soil Type Source:.....

Geohazards 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_{L1} > 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 building type or other building

☐ Yes, score less than cut-off

☐ Yes, other hazards present ☐ No

Detailed Nonstructural Evaluation Recommended?

☐ Yes, nonstructural hazard identified, 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

LEVEL 2 (Optional)

(Adopted from FEMA P-154 Data Collection Form)

MODERATE Seismicity

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.

Building 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*** S' = (S_{L1} - V_{L1} - P_{L1}) =		

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic		Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.6	*(Cap at -1.4)*
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	
	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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.		-0.4	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-1	*(Cap at -1.4)*
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 1.5 % 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	
		(Cap total pounding modifiers at -0.9)		
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 Building	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	
	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	M =

FINAL LEVEL 2 SCORE, S_{L2} = (S' + V_{L2} + P_{L2} + M) ≥ 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*	Comments
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 buidling 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 conslusions)*

☐ 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

LEVEL 1

(Adopted from FEMA P-154 Data Collection Form)

LOW Seismicity

PHOTOGRAPH

SKETCH

Address: ..... **City:** .....

Other ID: ..... **Use:** .....

Building Name: .....

Latitude: ..... **S_s:** .....

Longitude: ..... **S_1:** .....

Screener: ..... **Date/Time:** .....

#Stories - Above Ground: ..... Below Ground: ..... **Year Built:** ..... ☐ Est

Total Floor Area (sft): ..... **Code Year:** .....

Additions: ☐ None ☐ Yes, Years Built:.....

Occupancy: ☐ Assembly ☐ Commercial ☐ Emergency Services ☐ Historic
☐ Industrial ☐ Office ☐ Schools ☐ Government
☐ Utility ☐ Warehouse ☐ Residential,#Units: ☐ Shelter

Soil Type: ☐ A: Hard Rock ☐ C: Soft Rock ☐ E: Soft Soil
☐ B: Normal Rock ☐ D: Hard Soil / DNK ☐ F: Poor Soil

Geohazards: Liquefaction: ☐ Yes, ☐ No, ☐ DNK
Landslide: ☐ Yes, ☐ No, ☐ DNK
Surface Rupture: ☐ Yes, ☐ No, ☐ DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Severe Vertical Irregularity ☐ Plan Irregularity
☐ Moderate Vertical Irregularity

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}

BUILDING TYPE	DNK	W1	W1A	W2	S1	S2	S3	S4	S5	C1	C2	C3	PC1	PC2	RM1	RM2	URM	MH	BN1	BN2
Basic Score		**6.2**	**5.9**	**5.7**	**3.8**	**3.9**	**4.4**	**4.1**	**4.5**	**3.3**	**4.2**	**3.5**	**3.8**	**3.3**	**3.7**	**3.7**	**3.2**	**4.6**	**3.2**	**3.9**
Severe Vertical Irregularity, V_{L1}		-1.5	-1.5	-1.5	-1.4	-1.3	-1.6	-1.2	-1.3	-1.3	-1.2	-1.1	-1.3	-1.1	-1.1	-1.1	-1.2	NA	-1.2	-1.0
Moderate Vertical Irregularity, V_{L1}		-1.0	-0.9	-0.9	-0.9	-0.8	-1.0	-0.7	-0.7	-0.7	-0.7	-0.6	-0.8	-0.6	-0.6	-0.6	-0.7	NA	-0.7	-0.7
Plan Irregularity, P_{L1}		-1.6	-1.4	-1.3	-1.2	-1.1	-1.4	-1.0	-1.1	-1.0	-1.0	-0.9	-1.2	-0.9	-0.9	-0.9	-1.0	NA	-1.0	-1.1
Pre-Code		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Post-Benchmark		2.2	2.4	2.5	2.0	1.6	1.4	2.1	NA	2.3	2.2	NA	1.9	2.6	2.3	2.3	NA	1.8	NA	NA
Soil Type A or B		0.9	1.1	1.3	1.0	1.2	0.8	1.3	1.4	0.9	1.2	1.2	1.3	1.3	1.4	1.4	1.3	0.9	1.3	0.5
Soil Type E (1-3 stories)		-1.2	-1.7	-2.3	-1.2	-1.4	-1.0	-1.7	-2.0	-1.4	-2.0	-1.6	-1.7	-1.6	-1.7	-1.7	-1.5	-2.1	-1.5	-0.6
Soil Type E (>3 stories)		-1.7	-2.0	-2.2	-1.2	-1.4	NA	-1.7	-1.9	-1.3	-1.9	-1.6	NA	-1.6	-1.6	-1.7	-1.4	NA	NA	NA
Minimum Score, S_{MIN}		2.7	2.1	1.5	0.9	0.8	1.2	0.8	0.9	0.5	0.6	0.5	0.6	0.4	0.6	0.5	0.4	2.5	0.2	0.9

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

EXTENT OF REVIEW

Exterior: ☐ Partial ☐ All Sides ☐ Aerial

Interior: ☐ None ☐ Visible ☐ Entered

Drawing Reviewd: ☐ Yes ☐ No

Soil Type Source:.....

Geohazards 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_{L1} > 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 building type or other building

☐ Yes, score less than cut-off

☐ Yes, other hazards present ☐ No

Detailed Nonstructural Evaluation Recommended?

☐ Yes, nonstructural hazard identified, 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

LEVEL 2 (Optional)

(Adopted from FEMA P-154 Data Collection Form)

LOW Seismicity

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.

Building 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*** S' = (S_{L1} - V_{L1} - P_{L1}) =		

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic		Statement (If statement is true, circle "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 : Ther 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 ft of wall on the same line (for multiple occupied floors above, use 16 ft 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	V_{L2} =
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.6	*(Cap at -1.5)*
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 dimensions 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 Buildings Out-of-plane Offset: The exterior beams do not align with the columns in plan.		-0.5	P_{L2} =
	Other Irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-1.1	*(Cap at -1.6)*
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 1.5 % 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	
		(Cap total pounding modifiers at -0.9)		
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 Building	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	
	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	M =

FINAL LEVEL 2 SCORE, S_{L2} = (S' + V_{L2} + P_{L2} + M) ≥ 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	Comments
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 buidling 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 conslusions)*

☐ 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 :