

A panoramic view of the Seattle skyline featuring the Space Needle, various skyscrapers, and Mount Rainier in the background under a clear blue sky. The foreground shows some green trees.

Unreinforced Masonry (URM) Retrofit Recognition Codes

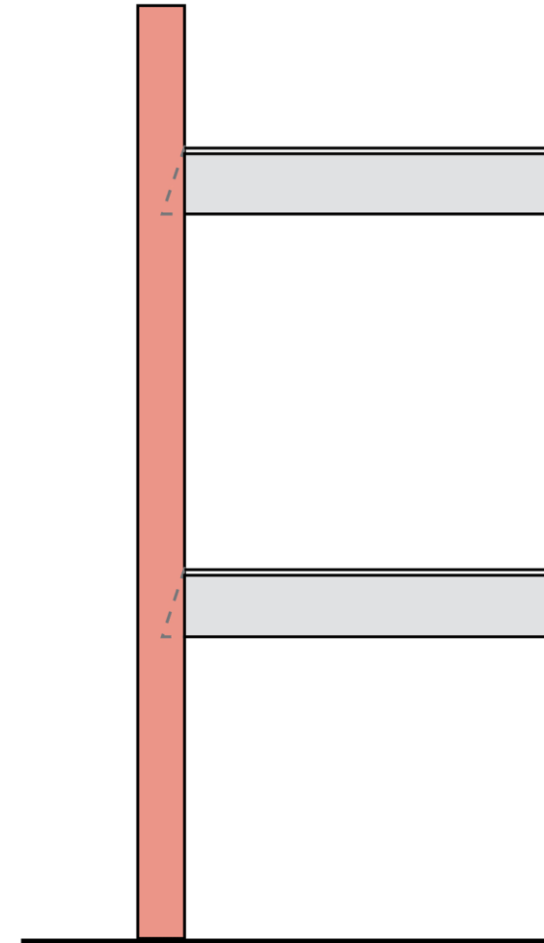
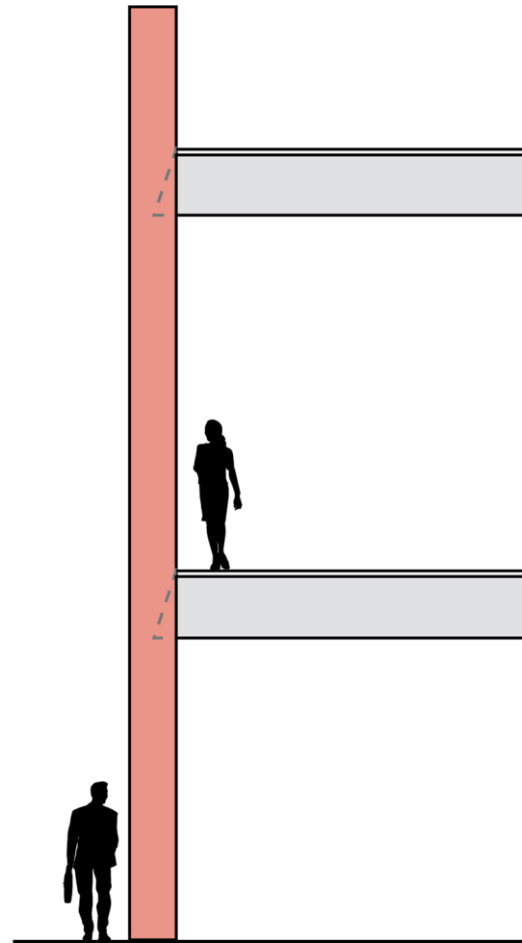
Photo by John Skelton



Seattle Department of
Construction and Inspections

Construction Codes Advisory Board
July 18, 2024

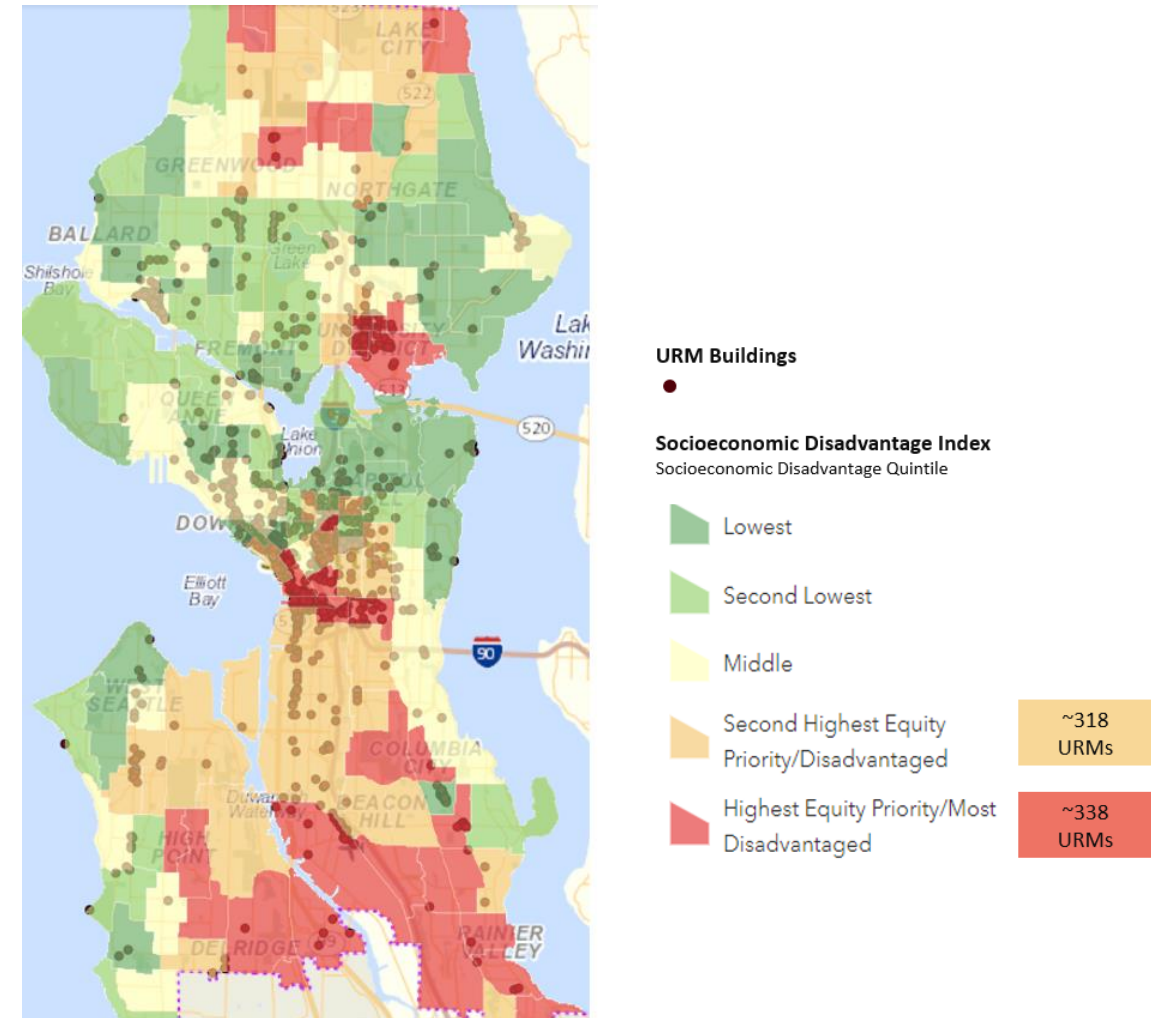
Unreinforced Masonry (URM) Retrofits



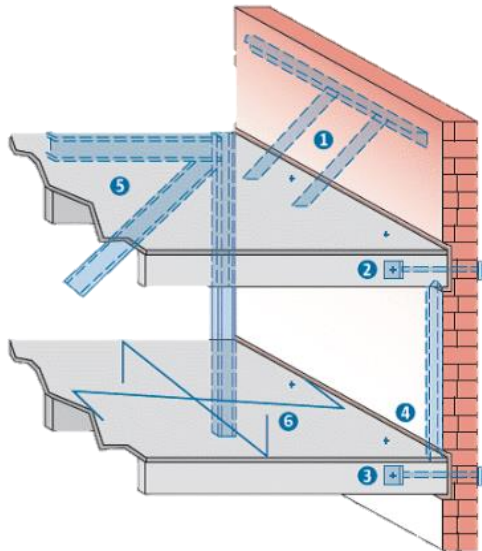
Seattle's URMS

Vulnerability Classification	Number of URMs
Critical vulnerability: emergency service facilities and schools	75
High vulnerability : buildings over three stories in poor soil areas (i.e., liquefaction and slide areas); and buildings containing public assembly spaces with occupancies of more than 100 people	184
Medium vulnerability: all other buildings	883
Total Confirmed URMs	1,142

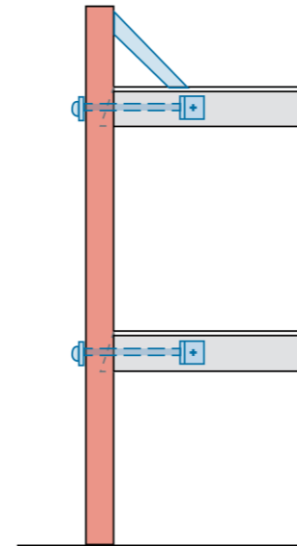
Number of URMs by classification, September 2021



History of Seattle's URM work




Existing Code-Based Method



New Alternate Method

- Contributors**
- University of Washington
 - Geologists
 - Seismologists
 - Structural and Geotechnical Engineers
 - Office of Emergency Management
 - Structural Engineers Association of WA (SEAW)
 - URM Technical Team- Public Private Partnership

URM Technical Standard & Director's Rule (2023)

 **Seattle Department of Construction & Inspections**

URM Retrofit Technical Standard (DRAFT)
(Release Date: June 30, 2023)

- 1. Scope**

The provisions of this Technical Standard shall apply to all existing buildings having one or more *unreinforced bearing walls* as defined in Section 3, generally constructed prior to 1945 and unlawful after adoption of the 1973 Uniform Building Code on May 7, 1977.
- 2. General Requirements**

All work specified in this standard shall comply with the Seattle Building Code and referenced standards, except as modified herein. Construction information provided on plans shall include all existing and new building information necessary to perform the work and be in accordance with Chapter 1 of the Seattle Building Code.
- 3. Definitions**

For the purpose of this section, the applicable definitions in the SBC and SEBC shall also apply.

BED JOINT. The horizontal layer of mortar on which a masonry unit is laid.

CROSSWALL. A new or existing wood-framed wall(s) sheathed with any material with a cumulative length of at least 50 percent of the diaphragm depth between diaphragm chords. Individual walls shall have a maximum height-to-length ratio of 1.5 to be considered a crosswall. The minimum crosswall length may be reduced to 25% of the diaphragm depth if it can be shown that the crosswalls do not consist of unblocked gypsum wall board.

POINTING. The process of removal of deteriorated mortar from between masonry units and placement of new mortar. Also known as repointing or tuckpointing for purposes of this standard.

REPOINTING. See "Pointing."

SUBSTANTIAL ALTERATIONS. See Seattle Existing Building Code for definition and seismic regulations.

TUCKPOINTING. See "Pointing."

UNREINFORCED MASONRY (URM). Includes burned clay, concrete or sand-lime brick, hollow clay block, or hollow clay tile.

UNREINFORCED MASONRY BEARING WALL. A URM wall that provides the primary support for vertical loads from floors or roofs and relies on the tensile strength of masonry units, mortar and grout in resisting design loads.
- 4. Seismic Retrofit Methods**

All URM buildings shall either be shown to be in compliance with or altered to comply with the seismic regulations for buildings undergoing *Substantial Alterations* per the Seattle Existing Building Code. URM buildings retrofitted per Section 6: Alternate Method are deemed to comply with this section provided the building qualifies per Section 5: Alternate Method Qualification Criteria.

SDCI Director's Rule 6-2023 Page 1 of 12

SDCI

Director's Rule 6-2023

Applicant:	Page	Supersedes:
City of Seattle Department of Construction and Inspections	1 of 12	N/A
	Publication:	Effective:
	7/6/2023	9/22/2023
Subject:	Code and Section Reference:	
A Method for the Seismic Improvement of Unreinforced Masonry (URM) Buildings	2018 Seattle Existing Building Code Sections 101.13 and 303.1.7	
	Type of Rule:	
	Code Interpretation	
	Ordinance Authority:	
	SMC 3.06.040	
Index:	Approved	Date
2018 Seattle Existing Building Code	<i>[Signature on file]</i>	signed 9/22/23
	Nathan Torgelson, Director, DCI	

Background

In response to Resolution 32033, which recommends the phasing in of a mandate for seismic retrofits of Unreinforced Masonry (URM) buildings, a task group comprised of SDCI technical staff and practicing engineers was convened in 2022 to update the 2012 Draft URM Retrofit Standard to address: (i) updated codes; (ii) improved understanding of seismic hazards; and (iii) to clarify the technical content of the document. On June 30th 2023, an updated draft of the URM Retrofit Technical Standard was published and is available on SDCI's URM website. This Director's Rule is adopting a component of the Draft URM Retrofit Technical Standard as a method for the seismic retrofit of a URM building. This Director's Rule and the updated 2023 Draft Technical Standard will be used to inform a compliance pathway for a future ordinance requiring the mandatory retrofit of URM buildings.

This Director's Rule provides designers a method for the voluntary seismic improvement of a URM building. This Rule directly addresses testing and quality of the existing masonry construction and

2021 SEBC URM Retrofit Recognition Codes

- Defines minimum voluntary seismic safety requirements to be recognized as “retrofitted”. (Section 202)
 - Establishes pathways for previous retrofits to be eligible for “retrofitted” status. (Section 304.5)
- Establishes the **Alternate Method** for URM retrofits, minimizing cost and collapse hazard. (Appendix A6)
- Encourages voluntary URM retrofits.

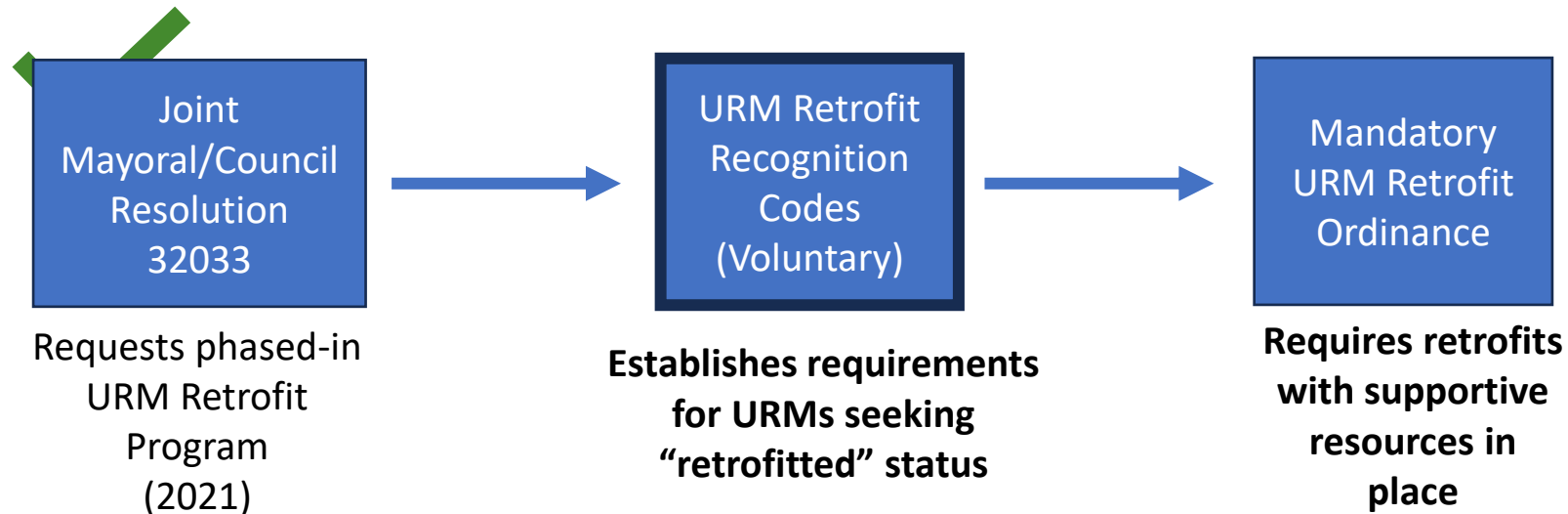
List of URMs Identified by SDCI – June 2024

Address	City	State	Zip Code	Year Built	No. Story	Retrofit Level	Report Occupancy	Occupant load	Confirmation Source
1321 Harbor Ave SW	Seattle	WA	98116	1915	1	no visible retrofit	Commercial	11-100	Photos from Previous Surveys
2124 California Ave SW	Seattle	WA	98116	1928	3	no visible retrofit	Residential	11-100	Google Street View
2306 42nd Ave SW	Seattle	WA	98116	1909	2	visible retrofit	Government	11-100	Photos (Rosettes) from Previous Surveys
4029 Beach Dr SW	Seattle	WA	98116	1928	1	no visible retrofit	Commercial/Residential	1-10	Field Visit
5300 Ballard Ave NW	Seattle	WA	98107	1902	2	no visible retrofit	Residential	11-100	Field Visit
5239 Ballard Ave NW	Seattle	WA	98107	1900	1	substantial Alteration	Commercial	11-100	Permit Drawing Review
5233 Ballard Ave NW	Seattle	WA	98107	1900	1	no visible retrofit	Commercial	1	
5800 15th Ave NW	Seattle	WA	98107	1922	3	permitted retrofit	Schools	1	
5227 Leary Ave NW	Seattle	WA	98107	1911	5	no visible retrofit	Other Mixed Uses	1	
5333 Ballard Ave NW	Seattle	WA	98107	1904	1	permitted Retrofit	Commercial	1	
2021 NW 58th St	Seattle	WA	98107	1900	3	permitted Retrofit	Residential	1	
1903 NW Market St	Seattle	WA	98107	1909	3	no visible retrofit	Commercial/Residential	1	
5205 Ballard Ave NW	Seattle	WA	98107	1915	1	public retrofit	Commercial	1	
5323 Ballard Ave NW	Seattle	WA	98107	1901	3	substantial Alteration	Commercial/Office	1	
2000 NW Market St	Seattle	WA	98107	1924	2	no visible retrofit	Public Assembly	1	
5337 Ballard Ave NW	Seattle	WA	98107	1900	1	no visible retrofit	Commercial	1	
5814 22nd Ave NW	Seattle	WA	98107	1928	4	no visible retrofit	Residential	1	
5313 Ballard Ave NW	Seattle	WA	98107	1900	1	substantial Alteration	Commercial	1	
2056 NW Market St	Seattle	WA	98107	1925	3	no visible retrofit	Commercial/Residential	1	
5403 Ballard Ave NW	Seattle	WA	98107	1901	2	permitted Retrofit	Commercial/Residential	1	
1766 NW Market St	Seattle	WA	98107	1906	2	no visible retrofit	Commercial/Office	1	
5443 Ballard Ave NW	Seattle	WA	98107	1906	2	public retrofit	Other Mixed Uses	1	
4743 Ballard Ave NW	Seattle	WA	98107	1900	2	substantial Alteration	Public Assembly	1	
5425 Russell Ave NW	Seattle	WA	98107	1910	3	visible retrofit	Commercial/Office	1	
5424 Ballard Ave NW	Seattle	WA	98107	1906	2	no visible retrofit	Commercial/Office	1	
2215 NW Market St	Seattle	WA	98107	1903	2	no visible retrofit	Commercial/Office	1	
5200 Ballard Ave NW	Seattle	WA	98107	1900	2	visible retrofit	Public Assembly	1	
1836 NW Market St	Seattle	WA	98107	1926	1	substantial Alteration	Commercial	1	
5419 Ballard Ave NW	Seattle	WA	98107	1913	1	no visible retrofit	Commercial	1	
5201 Ballard Ave NW	Seattle	WA	98107	1915	2	substantial Alteration	Schools	1	
5215 Ballard Ave NW	Seattle	WA	98107	1902	2	no visible retrofit	Public Assembly	1	
5218 20th Ave NW	Seattle	WA	98107	1902	3	public retrofit	Other Mixed Uses	1	
5242 Shilshole Ave NW	Seattle	WA	98107	1926	1	no visible retrofit	Industrial	1	
5463 Leary Ave NW	Seattle	WA	98107	1950	1	no visible retrofit	Commercial	1	
5348 Ballard Ave NW	Seattle	WA	98107	1900	2	no visible retrofit	Commercial/Office	1	
5229 Ballard Ave NW	Seattle	WA	98107	1900	2	substantial Alteration	Public Assembly	1	
5420 Ballard Ave NW	Seattle	WA	98107	1923	1	no visible retrofit	Commercial	1	
5310 Ballard Ave NW	Seattle	WA	98107	1900	2	substantial Alteration	Public Assembly	1	
5425 Ballard Ave NW	Seattle	WA	98107	1926	2	no visible retrofit	Commercial/Residential	1	
5405 Leary Ave NW	Seattle	WA	98107	1904	2	substantial Alteration	Commercial/Office	1	
5109 Ballard Ave NW	Seattle	WA	98107	1900	2	permitted Retrofit	Commercial	1	
5344 Ballard Ave NW	Seattle	WA	98107	1900	1	no visible retrofit	Commercial	1	
2236 NW Market St	Seattle	WA	98107	1927	1	no visible retrofit	Commercial	1	
5100 Ballard Ave NW	Seattle	WA	98107	1905	2	no visible retrofit	Commercial/Residential	1	
5130 Ballard Ave NW	Seattle	WA	98107	1900	1	visible retrofit	Commercial	1	
2244 NW Market St	Seattle	WA	98107	1913	2	no visible retrofit	Commercial/Office	1	
2026 NW Market St	Seattle	WA	98107	1904	2	no visible retrofit	Commercial	1	

Retrofit Level
No visible retrofit
No visible retrofit
Visible retrofit
No visible retrofit
No visible retrofit
Substantial Alteration
No visible retrofit
Retrofitted
No visible retrofit
Permitted Retrofit
Permitted Retrofit
No visible retrofit
Visible retrofit

Pathway to Required URM Retrofits

- Short-term goal: URM Retrofit Recognition Codes
 - Establish the requirements for a compliant retrofit.
 - Encourage and support voluntary URM retrofits.
 - Develop supportive resources (communications, funding, outreach, etc.).
- Long-term goal remains establishing a Mandatory URM Retrofit Ordinance.



Substantial Alteration Triggers for URMs

- **Strike sub-alt definition #5:** *A significant increase in occupant load of a URM building.*
 - Intent: Target URM buildings known for their poor seismic performance.
 - Stricter than definition #3 that applies to all buildings.
- A URM retrofitted to comply with the proposed code changes should no longer be penalized more than other types of structures since the hazard is mitigated.
- If scope of work meets Def's #1 through 4, a sub-alt is still triggered. No change.

311.1.1 Definition: *substantial alteration* or repair means any one of the following:

1. Repair of a building with a damage ratio of 60 percent or more.
2. Remodeling or an addition that substantially extends the useful physical or economic life of the building or a significant portion of the building, other than a typical tenant remodeling.
3. **A change of a significant portion of a building to an occupancy that is more hazardous than the existing occupancy, based on the combined life and fire risk.**
4. Reoccupancy of a building that has been substantially vacant for more than 24 months in occupancies other than Group R-3.
5. ~~A significant increase in the occupant load of an unreinforced masonry building.~~

SECTION 202
GENERAL DEFINITIONS

ADD THESE DEFINITIONS TO SECTION 202:

UNREINFORCED MASONRY (URM). Includes burned clay, concrete or sand-lime brick, hollow clay block, or hollow clay tile.

UNREINFORCED MASONRY (URM) BUILDING. A building where one or more *URM* walls provide the primary support for vertical loads from floors or roofs and the *URM* walls rely on the tensile strength of masonry units, mortar and grout in resisting design loads.

NOTE: URM buildings were generally constructed prior to 1945 and unlawful after adoption of the 1973 Uniform Building Code on May 7, 1977.

RETROFITTED UNREINFORCED MASONRY (URM) BUILDING. A *URM building* that meets a minimally acceptable level of life safety risk from earthquakes by demonstrating compliance with Section 304.5.1.

NOTE: Retrofitted URM buildings are eligible for a status change in the City of Seattle URM database.

SECTION 304

STRUCTURAL REQUIREMENTS FOR ALL COMPLIANCE METHODS

ADD THIS NEW SUB-SECTION 304.5 TO SECTION 304

304.5 Seismic regulations for Unreinforced Masonry Buildings. *URM buildings* meeting any of the following criteria shall comply with 304.5.1:

1. Where there is a significant increase in the occupant load of a *URM building*, as determined by the code official.
2. *URM Buildings* voluntarily seeking to be defined as a *Retrofitted URM Building*.

304.5.1 URM Seismic regulations. *URM buildings* shall comply or be altered to comply with one of the following:

1. Section 304.4.2;
2. Appendix Chapter A6 Alternate Method for the Seismic Improvement of *Unreinforced Masonry (URM) Buildings*;
3. Previously permitted and completed retrofits that comply with one of the following:
 - a. *URM Buildings* that have undergone a seismic retrofit due to a substantial alteration determination, permitted between September 16, 1996 and April 24, 2009 using the 1994 or later edition of the Seattle Building Code. A report confirming the retrofit work was completed shall be prepared by a licensed structural engineer and submitted to the code official.
 - b. *URM Buildings* that have undergone a seismic retrofit due to a substantial alteration determination, permitted after April 24, 2009 using the 2006 or later edition of the Seattle Building Code.
 - c. Other seismic retrofits approved by the code official.

ADD THIS NEW APPENDIX CHAPTER A6:

CHAPTER A6

**ALTERNATE METHOD FOR THE SEISMIC IMPROVEMENT OF UNREINFORCED
MASONRY (URM) BUILDINGS**

SECTION A601
GENERAL

A601.1 Purpose.

The purpose of this Appendix is to establish an alternate method for the seismic retrofit of URM buildings with the goal of improving seismic life safety. This alternate method provides a minimally acceptable level of life safety risk from earthquakes that is a lesser level than the substantial alteration seismic regulations established in section 311.1.2.

A601.2 General Requirements.

Where this Appendix A6 is used, the construction documents shall include a statement on the structural notes demonstrating that the building has been evaluated and/or retrofitted to comply with this Appendix A6.

Questions?