Concrete Building Safety Program

Working Group Meeting #4

February 7, 2023

In the chat, please share your name, organization, and your role or title

ONESF
Building Our Future

Outline

Refresher from previous meetings

Tilt-up draft program

- Information about the tilt-up inventory
- What buildings to include in (or exempt from) SF's program
- What level of retrofit to require
- Timeline and schedule categories

Schedule categories for concrete

Refresher from previous meetings

Working Group Timeline

July 2022	August 2022	September 2022	October 2022	November 2022	December 2022
Stakeholder Interviews			Working Group Meeting #1	Working Group Meeting #2	
January 2023	**February 2023**	**March 2023**	**April 2023**	**May 2023**	**June 2023**
Working Group Meeting #3	Working Group Meeting #4		Working Group Meeting #5		Working Group Meeting #6
July 2023	**August 2023**	**September 2023**	**October 2023**	**November 2023**	**December 2023**
	Working Group Meeting #7		Working Group Meeting #8	**Present recommendations**	
January 2024	**February 2024**	**March 2024**	**April 2024**	**May 2024**	**June 2024**
			Legislation (exact date TBD)		

Building Our Future

Overview of Feedback:
Building Information Reporting Form

What is a reasonable timeline for owners to complete?	**How should we determine schedule categories (tilt-ups)?**
1-3 years	Group gravitated towards strategies that did not feel random: Ideas raised: •By soil class •By life safety •By year of construction •By occupancy

ONESF
Building Our Future

Overview of Feedback: **Tilt-ups**

Should some tilt-up buildings be retrofitted to a higher standard?

Group leaned toward one single retrofit standard, because a building's use can change over time. But the group was not universally against having different retrofit standards or scopes. Important uses identified:

- Buildings important to disaster response and recovery
- Grocery stores and food banks
- Infrastructure (cell towers, BART, ambulance)
- Medical (pharmacies and medical clinics)
- Buildings with high occupancy

ONESF
Building Our Future

Overview of Feedback: **Non-ductile Concrete**

Zoom Polls	Comments and Questions
"In" vs Exempt (14/34 responded): • **60%** "It works for me." or "I can live with it." • **40% "**I have questions or concerns that need to be addressed before I could live with it." **Retrofit Level (15/34 responded)**: • **50%** "It works for me." or "I can live with it." • **50% "**I have questions or concerns that need to be addressed before I could live with it."	**Concerns**: • Loss of space in units – prioritize retrofits that change the outside of the building rather than the inside of units. • Considering full cost of retrofits – construction cost, building value, unit value. • "Pounding" of adjacent buildings. **Comments**: • Exempt from additional building code triggers where possible. Americans with Disabilities Act upgrades will be triggered because it is Federal. **Questions**: • How will we prevent permanent or prolonged displacement of renters?

Tilt-up Buildings

* We use “tilt-up” in this presentation as shorthand for the engineering term **Rigid-Wall Flexible-Diaphragm** buildings.

Reminder: The tilt-up problem

1994 Northridge (*EERI in FEMA P-1026*)

1992 Landers (*CSSC in Lawson, 2017*)

Reminder: The tilt-up problem

Repaired Napa building, 1 story, ~7200 sf

2014 Napa (*Lynn in Lawson, 2017*)

Retrofit priorities → Inventory scope

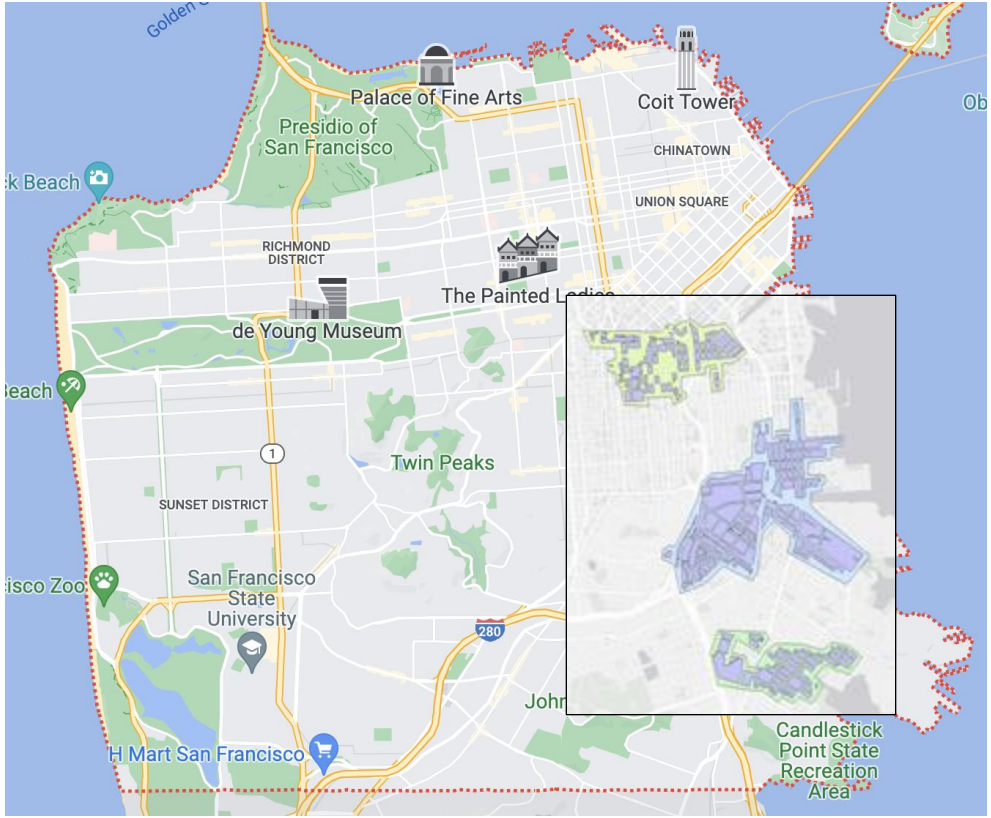
Priorities

- **Safety**
- Recovery
- Neighborhood effects

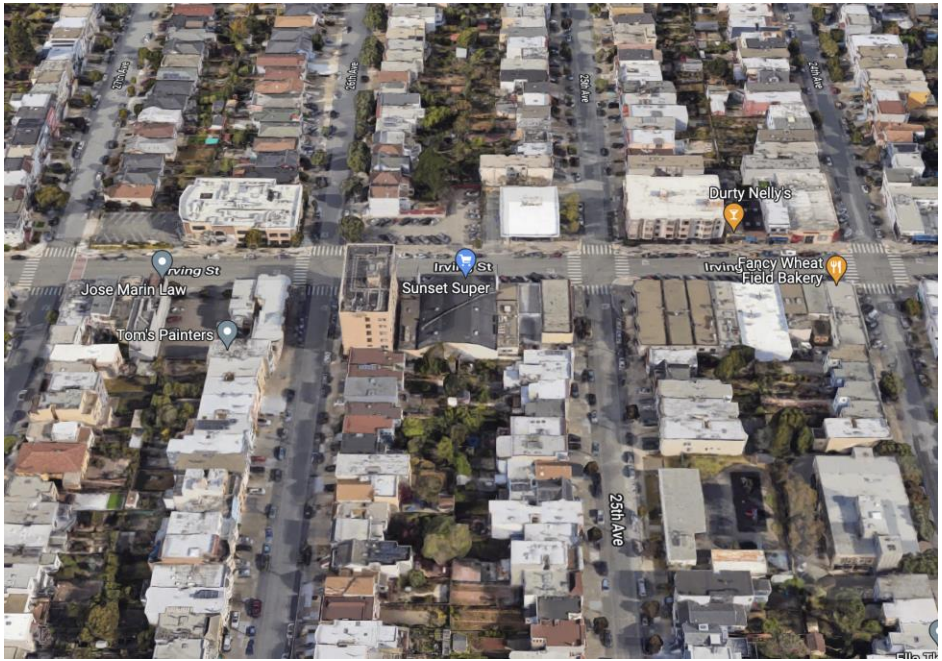
Three levels of inventory

- Citywide
- PDR zones
- Grocery stores

All 3 sources are important



PDR: Production, Distribution, Repair

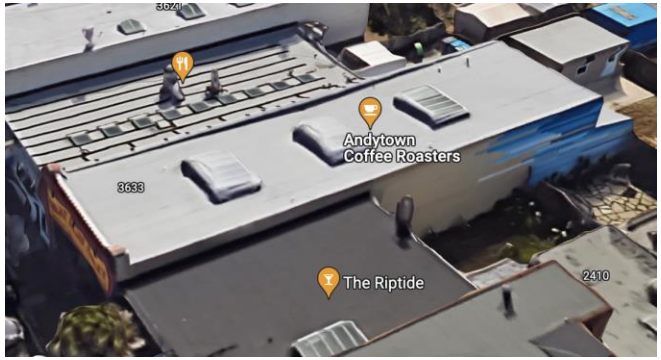


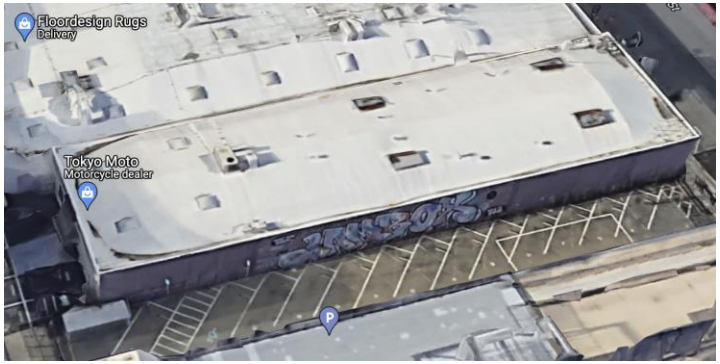
San Francisco neighborhood building stock

San Francisco PDR zone

Building size

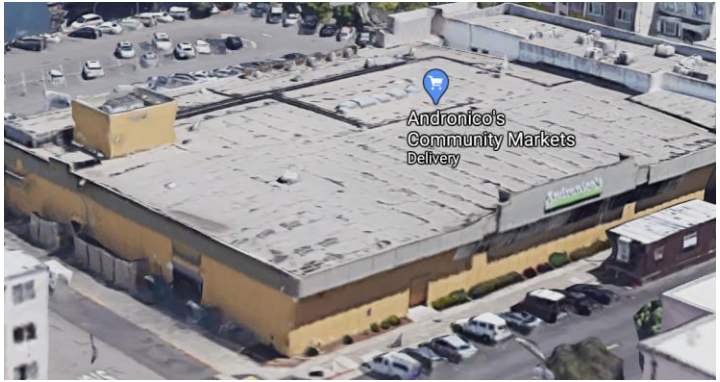
2500 sf





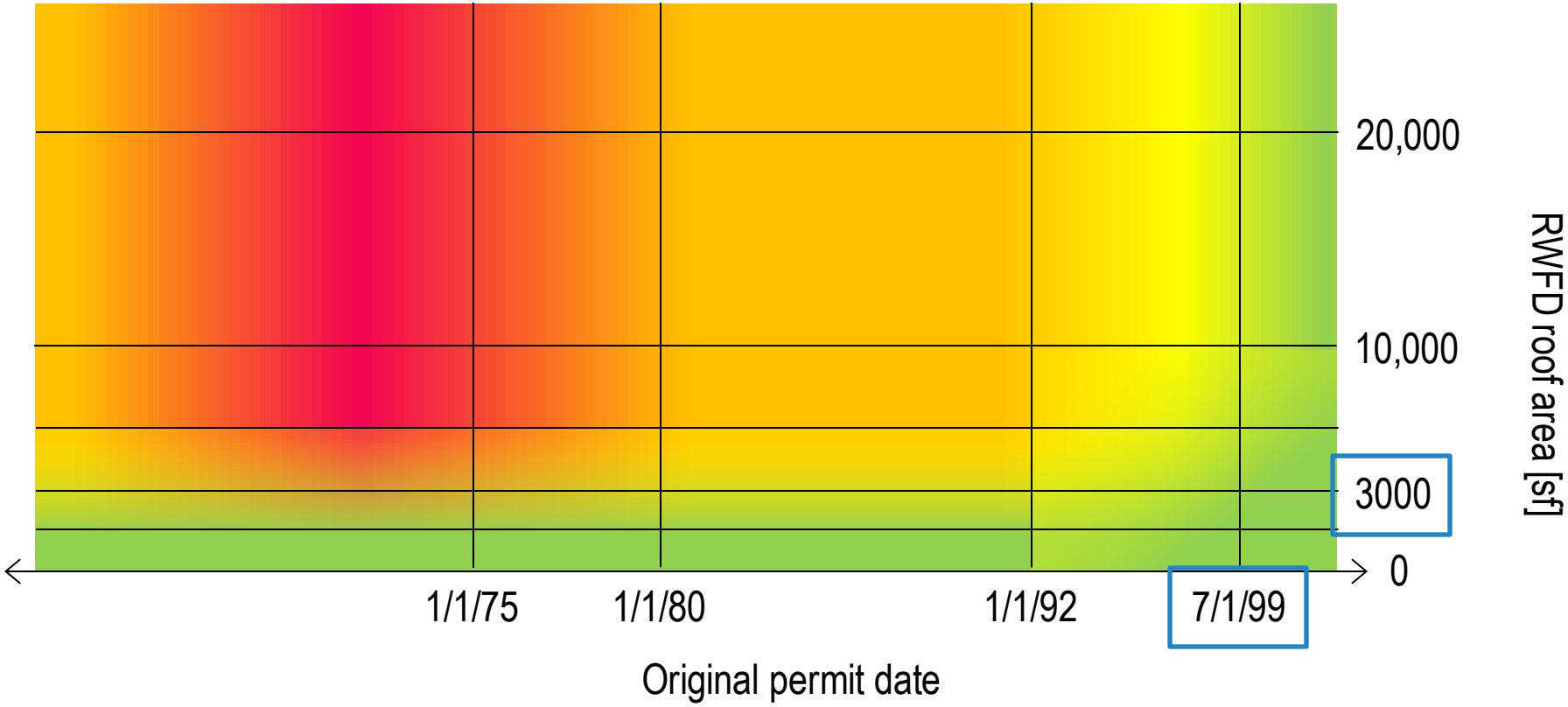
10,000 sf

20,000 sf



40,000 sf

Performance of RWFD buildings



Inventory: Pre-1999, 3000+ sf, RWFD buildings

Grocery stores

40 – 60 citywide

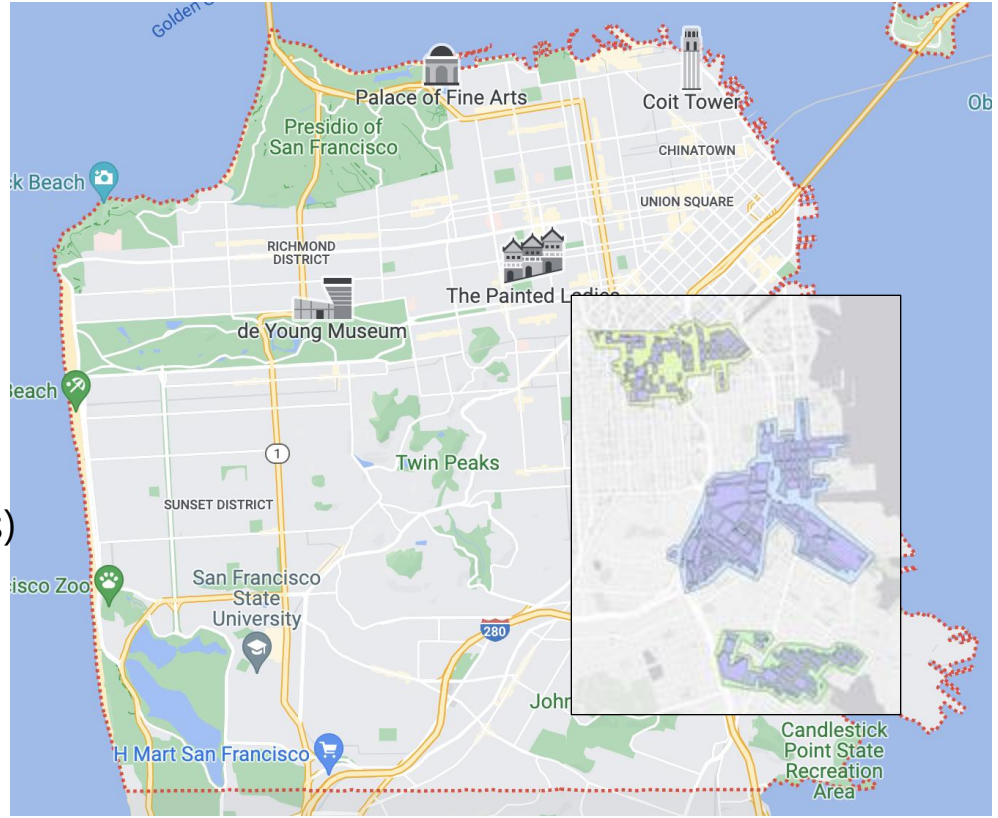
PDR zones

320 – 365 (includes 4 groceries)

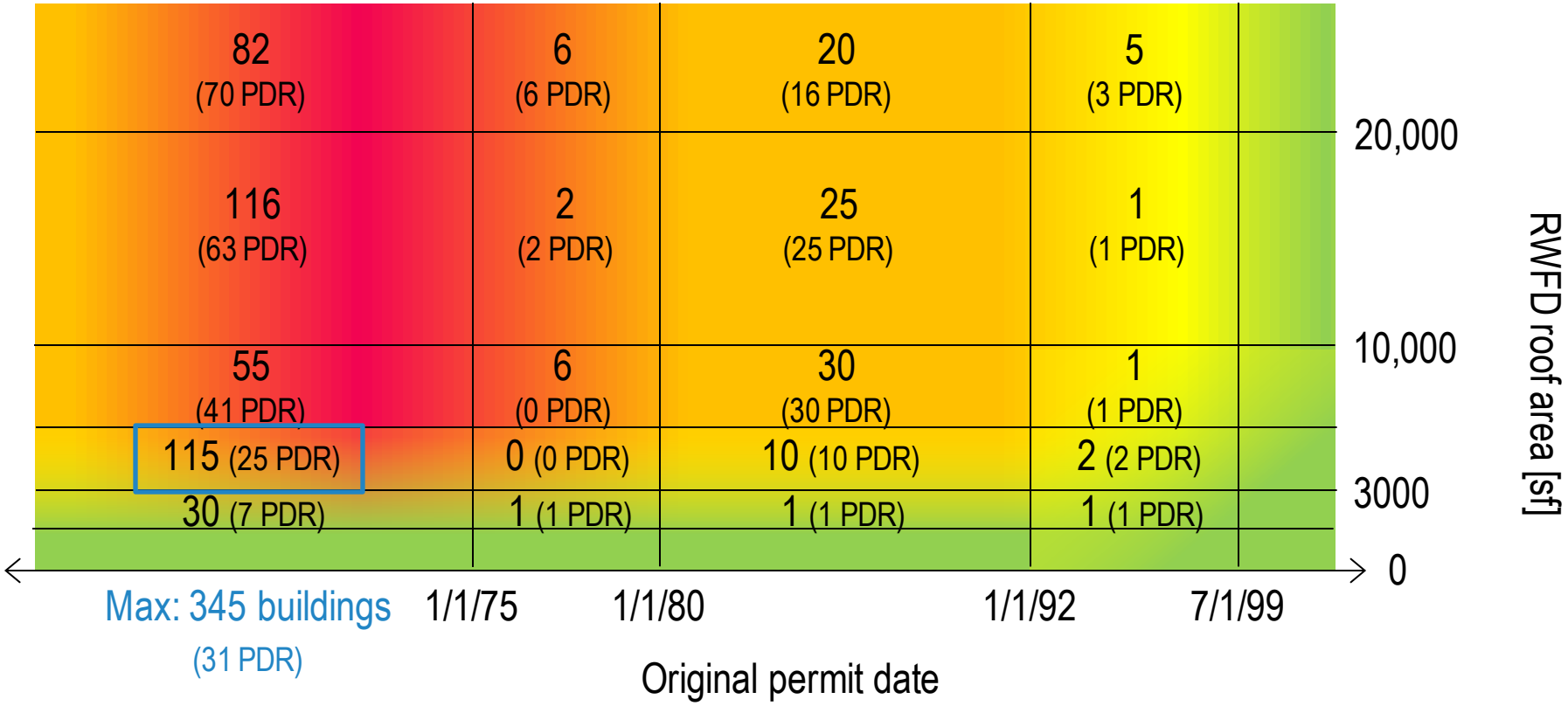
Citywide, non-PDR

160 – 500 (roughly includes groceries)

Total: 480 – 850



RWFD building count: Minimum estimate



Tilt-up Recommended Program

Program development

Inventory

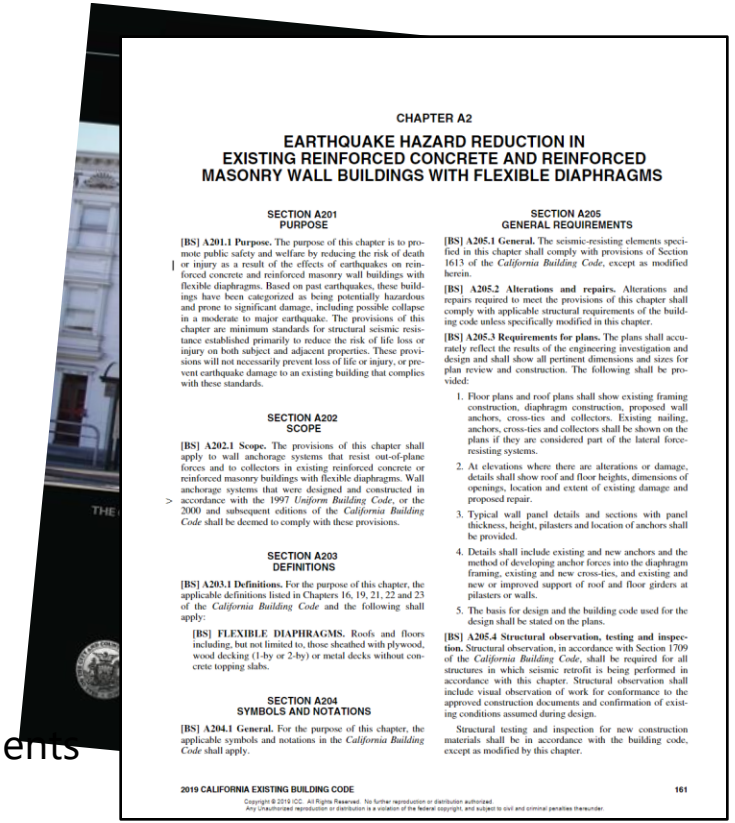
- 480 – 850 buildings
- 40-70% in PDR zones
- 75-85% pre-1975

Planning

- Emphasis on safety
- Recovery and neighborhood effects a bonus

Engineering

- Sufficient to focus on collapse-prone structural elements



CHAPTER A2

EARTHQUAKE HAZARD REDUCTION IN EXISTING REINFORCED CONCRETE AND REINFORCED MASONRY WALL BUILDINGS WITH FLEXIBLE DIAPHRAGMS

SECTION A201
PURPOSE

[BS] A201.1 Purpose. The purpose of this chapter is to promote public safety and welfare by reducing the risk of death or injury as a result of the effects of earthquakes on reinforced concrete and reinforced masonry wall buildings with flexible diaphragms. Based on past earthquakes, these buildings have been categorized as being potentially hazardous and prone to significant damage, including possible collapse in a moderate to major earthquake. The provisions of this chapter are minimum standards for structural seismic resistance established primarily to reduce the risk of life loss or injury on both subject and adjacent properties. These provisions will not necessarily prevent loss of life or injury, or prevent earthquake damage to an existing building that complies with these standards.

SECTION A202
SCOPE

[BS] A202.1 Scope. The provisions of this chapter shall apply to wall anchorage systems that resist out-of-plane forces and to collectors in existing reinforced concrete or reinforced masonry buildings with flexible diaphragms. Wall anchorage systems that were designed and constructed in accordance with the 1997 *Uniform Building Code*, or the 2000 and subsequent editions of the *California Building Code* shall be deemed to comply with these provisions.

SECTION A203
DEFINITIONS

[BS] A203.1 Definitions. For the purpose of this chapter, the applicable definitions listed in Chapters 16, 19, 21, 22 and 23 of the *California Building Code* and the following shall apply:

[BS] FLEXIBLE DIAPHRAGMS. Roofs and floors including, but not limited to, those sheathed with plywood, wood decking (1-by or 2-by) or metal decks without concrete topping slabs.

SECTION A204
SYMBOLS AND NOTATIONS

[BS] A204.1 General. For the purpose of this chapter, the applicable symbols and notations in the *California Building Code* shall apply.

SECTION A205
GENERAL REQUIREMENTS

[BS] A205.1 General. The seismic-resisting elements specified in this chapter shall comply with provisions of Section 1613 of the *California Building Code*, except as modified herein.

[BS] A205.2 Alterations and repairs. Alterations and repairs required to meet the provisions of this chapter shall comply with applicable structural requirements of the building code unless specifically modified in this chapter.

[BS] A205.3 Requirements for plans. The plans shall accurately reflect the results of the engineering investigation and design and shall show all pertinent dimensions and sizes for plan review and construction. The following shall be provided:

1. Floor plans and roof plans shall show existing framing construction, diaphragm construction, proposed wall anchors, cross-ties and collectors. Existing nailing, anchors, cross-ties and collectors shall be shown on the plans if they are considered part of the lateral force-resisting systems.
2. At elevations where there are alterations or damage, details shall show roof and floor heights, dimensions of openings, location and extent of existing damage and proposed repair.
3. Typical wall panel details and sections with panel thickness, height, pilasters and location of anchors shall be provided.
4. Details shall include existing and new anchors and the method of developing anchor forces into the diaphragm framing, existing and new cross-ties, and existing and new or improved support of roof and floor girders at pilasters or walls.
5. The basis for design and the building code used for the design shall be stated on the plans.

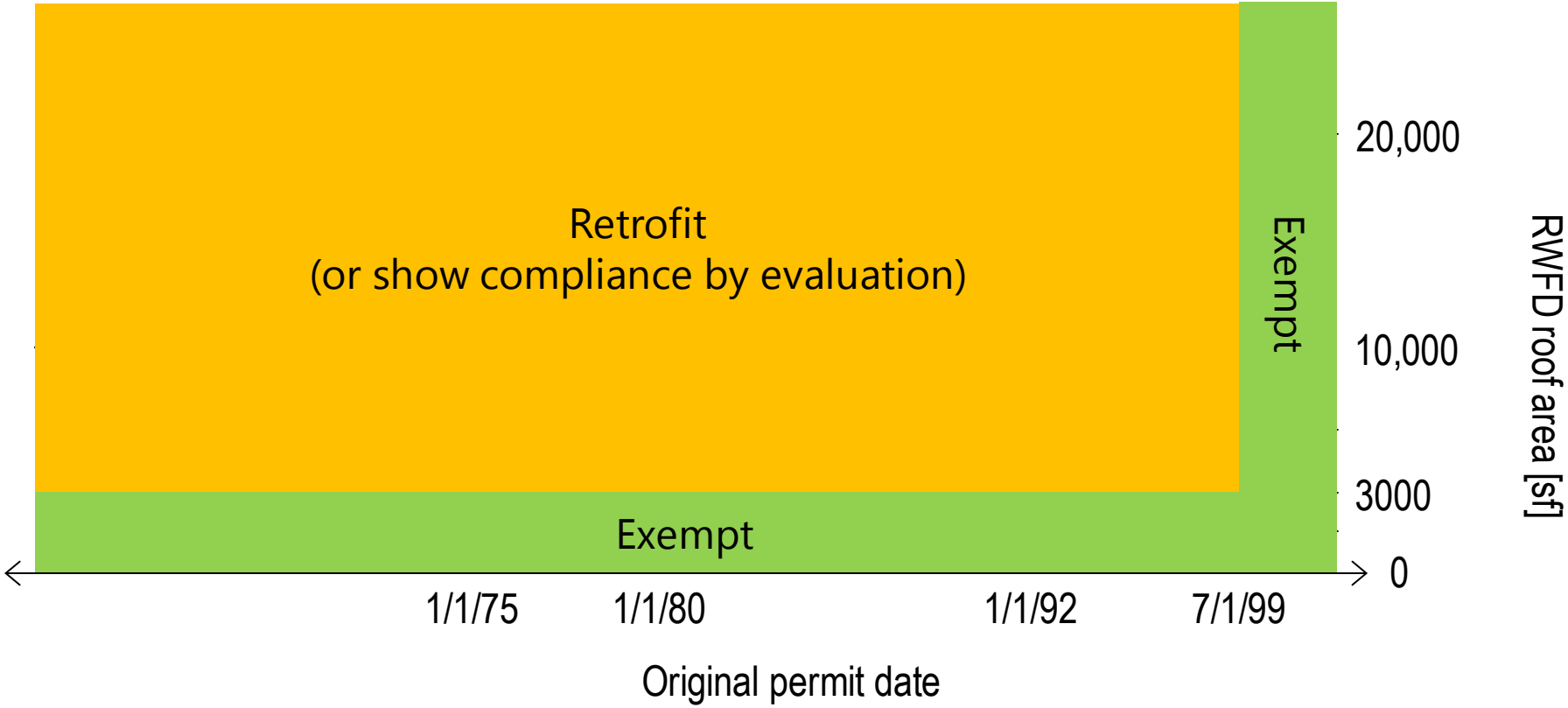
[BS] A205.4 Structural observation, testing and inspection. Structural observation, in accordance with Section 1709 of the *California Building Code*, shall be required for all structures in which seismic retrofit is being performed in accordance with this chapter. Structural observation shall include visual observation of work for conformance to the approved construction documents and confirmation of existing conditions assumed during design.

Structural testing and inspection for new construction materials shall be in accordance with the building code, except as modified by this chapter.

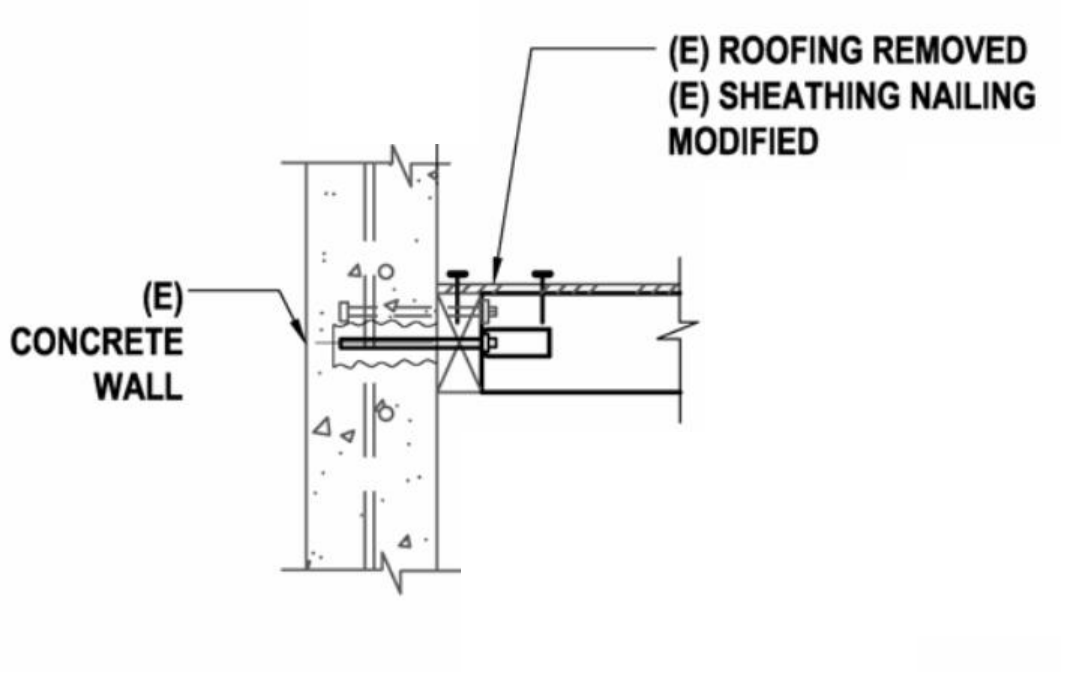
Copyright © 2019 ICC. All Rights Reserved. No further reproduction or distribution authorized.
Any unauthorized reproduction or distribution is a violation of the federal copyright, and subject to civil and criminal penalties thereunder.

(ESIP, 2011)

Possible criteria for what tilt-up buildings are IN the program



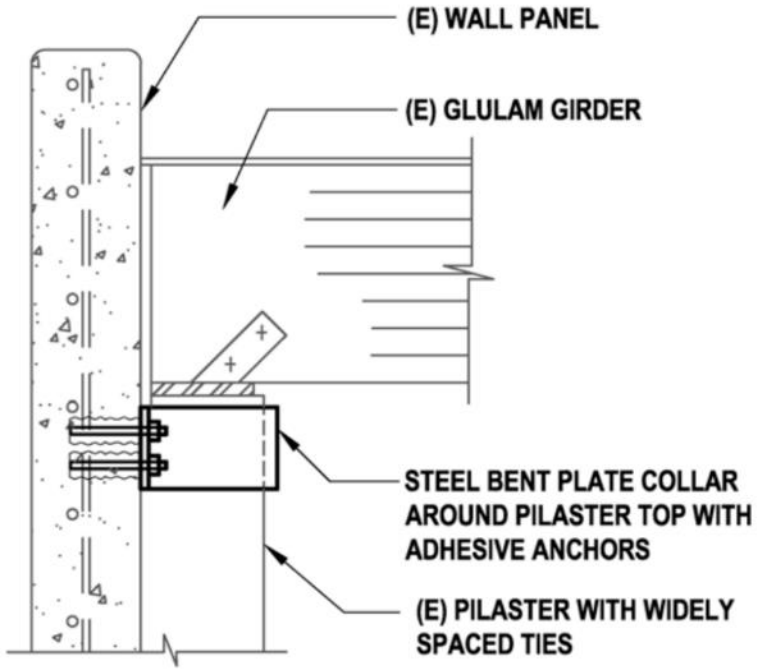
The tilt-up solution: anchorage



FEMA 547

City of Berkeley

The tilt-up solution: pilasters



FEMA 547

2010 Humboldt Co. (*Bonowitz*)

The tilt-up solution: crossties

Saunders Construction

Saunders Construction

Possible levels of retrofit scope

Option 1 – Minimum for safety

- SF Existing Building Code Appendix A2
- Roof-to-wall connections + cross-ties (75% of current code)

Option 2 – Possible higher standard

- Design for 100% of current code instead of 75%
- Address hazardous non-structural components: light fixtures, ceiling grids, storage racks.

Schedule Categories recommended

Schedule Category	Buildings included
1	Constructed 1951 to 1975
2	Constructed 1976 to 1999
3	Buildings providing public accommodation OR constructed pre-1950

Objectives:
(a) Divide the inventory approximately equally to spread out the work
(b) Give more time for more complicated projects
(c) Put similar buildings in the same Schedule Category

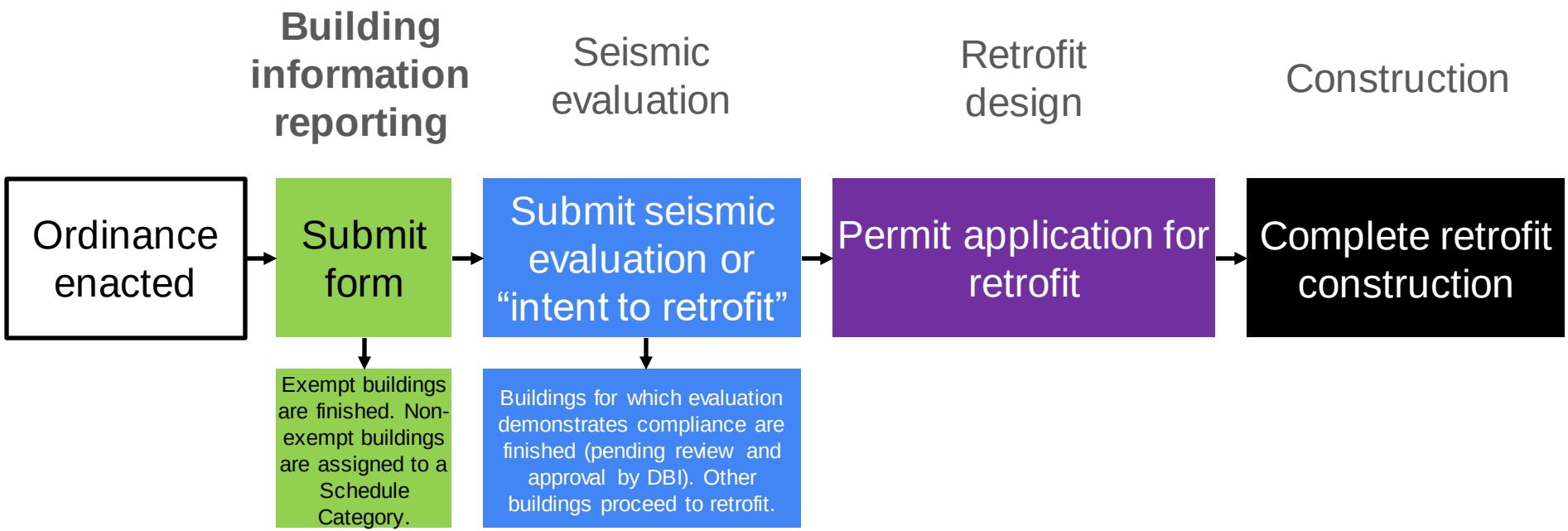
Tilt-up Recommended Program: Summary

	Tilt-up Recommended Program
What buildings are in the program vs exempt?	**In the program**: • Constructed before 1999 (1997 UBC) • **and** larger than 3,000 square feet roof area
What level of retrofit?	(**Appendix A2 Standard**) 75% of code, no requirement to address non-structural elements
How will we define schedule categories?	**First deadline**: Constructed 1951-1975 **Second deadline**: Constructed 1975-1999 **Third deadline**: Public accommodation (of any age) **or** constructed pre-1950

Discussion #1

Retrofit timeline and schedule categories for Non-Ductile Concrete

Stages of retrofit program

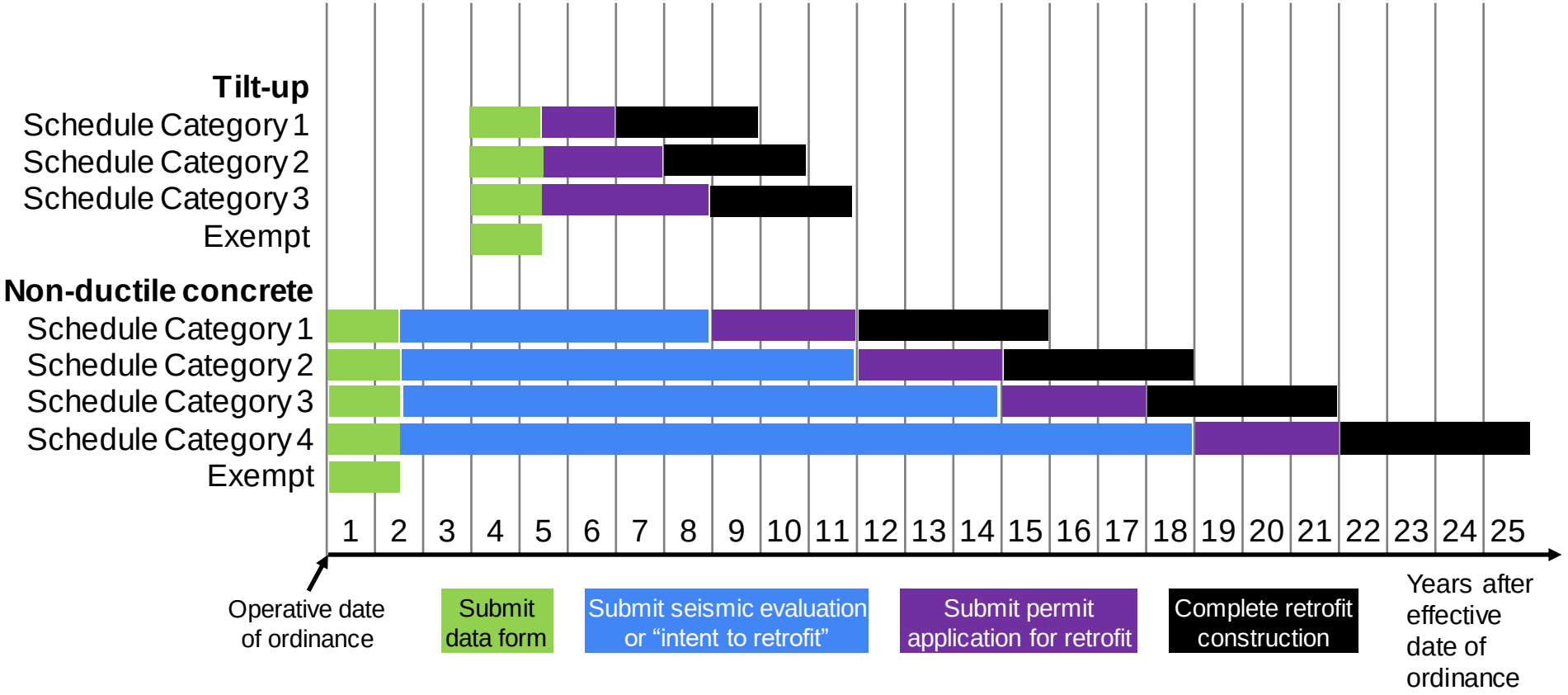


Schedule for compliance

Separate buildings into "**Schedule Categories**" for complying with requirements. A few potential objectives are to:

- Spread out the review work for SFDBI
- Spread out the demand for engineering and construction work
- Provide sufficient time for those who need it, e.g., buildings with tenants who require temporary relocation

Example timeline for compliance



Examples from other ordinances

Example: San Francisco soft story

Compliance Tier	Buildings included	Screening due	Permit due	Constr. complete
Tier I	Group A, E, R-2.1, R-3.1, R-4 occupancy	1 year	2 years	4 years
Tier II	15 or more dwelling units, except Tier I or IV	1 year	3 years	5 years
Tier III	Buildings not in other tiers	1 year	4 years	6 years
Tier IV	Group B or M occupancy 1st Story or liquefaction	1 year	5 years	7 years
* Due dates are measured from 90 days after the operative date of SFEBC Chapter 5E				

Example: San Francisco façade inspection

Compliance Tier	Buildings included	Inspection report due date
1	Constructed prior to 1910	2021
2	1910 to 1925	2023
3	1926 to 1970	2025
4	after 1970	2027

Examples from Southern California

LOS ANGELES

Same deadlines for all buildings (no schedule categories)

WEST HOLLYWOOD

PRIORITY DESIGNATION

Priority	Description
Priority I.	Buildings with 8 or more stories
Priority II.	Buildings with 3 to 7 stories
Priority III.	Buildings with 2 or less Stories

Examples from Southern California

Jurisdiction	Expected No. Buildings	Submit "Evaluation" or "Screening" Report	Submit Retrofit Plans	Obtain Building Permit	Complete Construction	Total Time
Los Angeles	1,326	3 Years From Notice to the Owner	10 Years From Notice to the Owner	N/A	25 Years From Notice to the Owner	**25 Years for Total Retrofit**
Santa Monica	66	3 Years From Notice to the Owner	4 Yrs	N/A	10 Yrs	**10 Years NDC**
West Hollywood	55 non-ductile concrete & 60 undefined	3 Years From Notice to the Owner	10 Yrs Phase 1 & 20 Yrs Phase 2 From Notice to the Owner	7 Yrs Phase 1 & 15 Yrs Phase 2 From Notice to the Owner	10 Yrs Phase 1 & 20 Yrs Phase 20 From Notice to the Owner	**10 Years Major Deficiencies 20 Years Full Retrofit**

Draft Schedule Categories

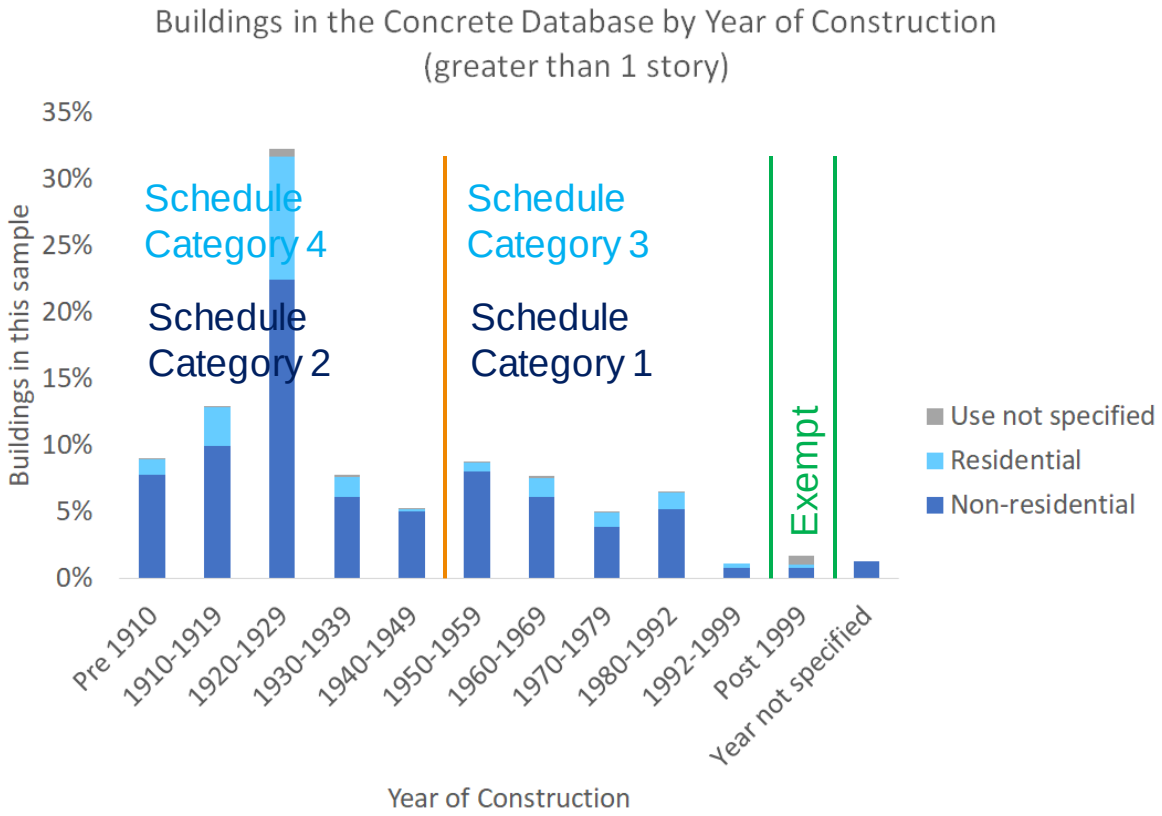
San Francisco Non-Ductile Concrete

Concrete

Schedule Category	Buildings included
1	Non-residential; Constructed 1948* or later
2	Non-residential; before 1948
3	Residential; 1948 or later
4	Residential; before 1948

Objectives:
(a) Divide the inventory approximately equally to spread out the work
(b) Give more time for residential buildings for tenant relocation.
(c) Give more time for older buildings to understand existing conditions
(c) Put similar buildings in the same Schedule Category

From Concrete database (work in progress)



Discussion #2: Break-out groups

Wrap-up

Meeting format update

- Proclamation of local emergency **terminated**, effective February 28, 2023.
- After February 28, we must have an in-person meeting location.
- We plan to continue offering a hybrid/remote option unless we are prevented from doing so by the City Attorney.

LAUREL.MATHEWS@SFGOV.ORG

Refresher: Follow-up survey - We need your help

Let us know on which topics you can offer **resources**, **case studies** and **expertise**:

- **Communications with building owners and tenants**
- Financing information and resources for building owners
- **Temporary tenant relocation**
- **Process streamlining (for example, permitting and design review)**
- Labor and building trades
- Historic preservation requirements

LAUREL.MATHEWS@SFGOV.ORG