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

<table>
<thead>
<tr>
<th>July 2022</th>
<th>August 2022</th>
<th>September 2022</th>
<th>October 2022</th>
<th>November 2022</th>
<th>December 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder Interviews</td>
<td></td>
<td></td>
<td>Working Group Meeting #1</td>
<td>Working Group Meeting #2</td>
<td></td>
</tr>
<tr>
<td><strong>January 2023</strong></td>
<td><strong>February 2023</strong></td>
<td>March 2023</td>
<td>April 2023</td>
<td>May 2023</td>
<td>June 2023</td>
</tr>
<tr>
<td>Working Group Meeting #3</td>
<td>Working Group Meeting #4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>July 2023</strong></td>
<td>August 2023</td>
<td>September 2023</td>
<td>October 2023</td>
<td>November 2023</td>
<td>December 2023</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Present recommendations</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Legislation (exact date TBD)</td>
</tr>
<tr>
<td><strong>January 2024</strong></td>
<td>February 2024</td>
<td>March 2024</td>
<td>April 2024</td>
<td>May 2024</td>
<td>June 2024</td>
</tr>
</tbody>
</table>
Overview of Feedback: Building Information Reporting Form

<table>
<thead>
<tr>
<th>What is a reasonable timeline for owners to complete?</th>
<th>How should we determine schedule categories (tilt-ups)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 years</td>
<td>Group gravitated towards strategies that did not feel random:</td>
</tr>
<tr>
<td></td>
<td>Ideas raised:</td>
</tr>
<tr>
<td></td>
<td>• By soil class</td>
</tr>
<tr>
<td></td>
<td>• By life safety</td>
</tr>
<tr>
<td></td>
<td>• By year of construction</td>
</tr>
<tr>
<td></td>
<td>• By occupancy</td>
</tr>
</tbody>
</table>
**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
## Overview of Feedback: Non-ductile Concrete

<table>
<thead>
<tr>
<th><strong>Zoom Polls</strong></th>
<th><strong>Comments and Questions</strong></th>
</tr>
</thead>
</table>
| **“In” vs Exempt (14/34 responded):** | **Concerns:**  
- 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):** | **Comments:**  
- 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.”  |
| | **Questions:**  
- How will we prevent permanent or prolonged displacement of renters?  |

- 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.

- Exempt from additional building code triggers where possible. Americans with Disabilities Act upgrades will be triggered because it is Federal.
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*)

Wall Anchorage Improper
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

- RWFD roof area [sf]
  - 20,000
  - 10,000
  - 3000
  - 0

- Original permit date
  - 7/1/99
  - 1/1/92
  - 1/1/80
  - 1/1/75

- 0
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

Original permit date: 1/1/75, 1/1/80, 1/1/92, 7/1/99

Max: 345 buildings
(31 PDR)

82 (70 PDR) | 6 (6 PDR) | 20 (16 PDR) | 5 (3 PDR)

116 (63 PDR) | 2 (2 PDR) | 25 (25 PDR) | 1 (1 PDR)

55 (41 PDR) | 6 (0 PDR) | 30 (30 PDR) | 1 (1 PDR)

115 (25 PDR) | 0 (0 PDR) | 10 (10 PDR) | 2 (2 PDR)

30 (7 PDR) | 1 (1 PDR) | 1 (1 PDR) | 1 (1 PDR)

Max: 345 buildings
(31 PDR)
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

(ESIP, 2011)
Possible criteria for what tilt-up buildings are IN the program

- Retrofit (or show compliance by evaluation)
- Exempt

![Graph showing possible criteria for tilt-up buildings]

- Original permit date:
  - 1/1/75
  - 1/1/80
  - 1/1/92
  - 7/1/99

- RWFD roof area [sf]:
  - 0
  - 3000
  - 10,000
  - 20,000

- Permits:
  - 82
  - 116
  - 55
  - 115
  - 30
  - 26
  - 6
  - 0
  - 20
  - 25
  - 30
  - 10
  - 1
  - 5
  - 1
  - 2
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

<table>
<thead>
<tr>
<th>Schedule Category</th>
<th>Buildings included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Constructed 1951 to 1975</td>
</tr>
<tr>
<td>2</td>
<td>Constructed 1976 to 1999</td>
</tr>
<tr>
<td>3</td>
<td>Buildings providing public accommodation OR constructed pre-1950</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
</table>
| 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                                                 |
Retrofit timeline and schedule categories for Non-Ductile Concrete
Exempt buildings are finished. Non-exempt buildings are assigned to a Schedule Category.

Buildings for which evaluation demonstrates compliance are finished (pending review and approval by DBI). Other buildings proceed to retrofit.
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

Tilt-up
- Schedule Category 1
- Schedule Category 2
- Schedule Category 3
- Exempt

Non-ductile concrete
- Schedule Category 1
- Schedule Category 2
- Schedule Category 3
- Schedule Category 4
- Exempt

Submit data form
Submit seismic evaluation or “intent to retrofit”
Submit permit application for retrofit
Complete retrofit construction

Operative date of ordinance
Years after effective date of ordinance
Examples from other ordinances
Example: San Francisco soft story

<table>
<thead>
<tr>
<th>Compliance Tier</th>
<th>Buildings included</th>
<th>Screening due</th>
<th>Permit due</th>
<th>Constr. complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier I</td>
<td>Group A, E, R-2.1, R-3.1, R-4 occupancy</td>
<td>1 year</td>
<td>2 years</td>
<td>4 years</td>
</tr>
<tr>
<td>Tier II</td>
<td>15 or more dwelling units, except Tier I or IV</td>
<td>1 year</td>
<td>3 years</td>
<td>5 years</td>
</tr>
<tr>
<td>Tier III</td>
<td>Buildings not in other tiers</td>
<td>1 year</td>
<td>4 years</td>
<td>6 years</td>
</tr>
<tr>
<td>Tier IV</td>
<td>Group B or M occupancy 1(^{st}) Story or liquefaction</td>
<td>1 year</td>
<td>5 years</td>
<td>7 years</td>
</tr>
</tbody>
</table>

* Due dates are measured from 90 days after the operative date of SFEBBC Chapter 5E
Example: San Francisco façade inspection

<table>
<thead>
<tr>
<th>Compliance Tier</th>
<th>Buildings included</th>
<th>Inspection report due date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Constructed prior to 1910</td>
<td>2021</td>
</tr>
<tr>
<td>2</td>
<td>1910 to 1925</td>
<td>2023</td>
</tr>
<tr>
<td>3</td>
<td>1926 to 1970</td>
<td>2025</td>
</tr>
<tr>
<td>4</td>
<td>after 1970</td>
<td>2027</td>
</tr>
</tbody>
</table>
Examples from Southern California

LOS ANGELES

Same deadlines for all buildings (no schedule categories)

WEST HOLLYWOOD

<table>
<thead>
<tr>
<th>Priority</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority I.</td>
<td>Buildings with 8 or more stories</td>
</tr>
<tr>
<td>Priority II.</td>
<td>Buildings with 3 to 7 stories</td>
</tr>
<tr>
<td>Priority III.</td>
<td>Buildings with 2 or less Stories</td>
</tr>
</tbody>
</table>
Examples from Southern California

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Expected No. Buildings</th>
<th>Submit “Evaluation” or “Screening” Report</th>
<th>Submit Retrofit Plans</th>
<th>Obtain Building Permit</th>
<th>Complete Construction</th>
<th>Total Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles</td>
<td>1,326</td>
<td>3 Years From Notice to the Owner</td>
<td>10 Years From Notice to the Owner</td>
<td>N/A</td>
<td>25 Years From Notice to the Owner</td>
<td>25 Years for Total Retrofit</td>
</tr>
<tr>
<td>Santa Monica</td>
<td>66</td>
<td>3 Years From Notice to the Owner</td>
<td>4 Yrs</td>
<td>N/A</td>
<td>10 Yrs</td>
<td>10 Years NDC</td>
</tr>
<tr>
<td>West Hollywood</td>
<td>55 non-ductile concrete &amp; 60 undefined</td>
<td>3 Years From Notice to the Owner</td>
<td>10 Yrs Phase 1 &amp; 20 Yrs Phase 2 From Notice to the Owner</td>
<td>7 Yrs Phase 1 &amp; 15 Yrs Phase 2 From Notice to the Owner</td>
<td>10 Yrs Phase 1 &amp; 20 Yrs Phase 20 From Notice to the Owner</td>
<td>10 Years Major Deficiencies 20 Years Full Retrofit</td>
</tr>
</tbody>
</table>
## Draft Schedule Categories

### San Francisco Non-Ductile Concrete

<table>
<thead>
<tr>
<th>Schedule Category</th>
<th>Buildings included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Non-residential; Constructed 1948* or later</td>
</tr>
<tr>
<td>2</td>
<td>Non-residential; before 1948</td>
</tr>
<tr>
<td>3</td>
<td>Residential; 1948 or later</td>
</tr>
<tr>
<td>4</td>
<td>Residential; before 1948</td>
</tr>
</tbody>
</table>

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)

Buildings in the Concrete Database by Year of Construction (greater than 1 story)

- Schedule Category 4
- Schedule Category 3
- Schedule Category 2
- Schedule Category 1
- Exempt

Legend:
- Use not specified
- Residential
- Non-residential

Year of Construction:
- Pre 1910
- 1910-1919
- 1920-1929
- 1930-1939
- 1940-1949
- 1950-1959
- 1960-1969
- 1970-1979
- 1980-1992
- Post 1999
- Year not specified
Discussion #2: Break-out groups
Wrap-up
Meeting format update

- 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.
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

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