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

On www.menti.com, use code 7586 1618 to tell us, “What are your favorite buildings in San Francisco?”
Welcome!
What are your favorite buildings in San Francisco?
Program Overview
Concrete Building Safety Program

Identify, evaluate, and retrofit the most vulnerable concrete buildings to protect against major structural failure, for the safety of the population and in support of the City’s seismic resilience goals.
Working Group Role

- Help the City understand the concerns of stakeholders, including from vulnerable communities
- Provide useful recommendations for program policy and design that support programmatic goals
- Help ensure program products have a high level of usability among the general public
- Support the program at public meetings or participate in other forms of community education and outreach
Earthquake Safety Implementation Program

- 30-year, 50-task strategy to improve seismic safety of buildings
- Developed out of 10-year CAPSS Program
Concrete Building Safety Program

- Two parallel efforts:
  - Develop Technical Requirements. Technical experts will develop ordinance framework, identify necessary evaluation and retrofit materials, and prepare implementation materials with stakeholder and staff input and final approval from the Executive Steering Committee. *Led by Applied Technology Council (ATC)*
  - Participatory Program Design. Convene a working group of seismic safety experts, community leaders and industry members who will convene regularly to review and provide feedback on program design. *Led by CivicMakers*
Participatory Program Design Timeline

Phase 1
- Discovery Interviews

Phase 2
- Working Group Planning

Phase 3
- Working Group Meetings

2022
- Mar
- Apr
- May
- June
- July
- Aug
- Sept
- Oct
- Nov
- Dec

2023
- Jan
- Feb
- Mar
- Apr
- May
Executive Panel

- Carmen Chu, City Administrator of San Francisco
- Patrick O’Riordan, Director, Department of Building Inspection
- Albert Ko, Director, Public Works
- Brian Strong, Chief Resilience Officer and Director of Capital Planning
- Kate Sofis/Anne Taupier, Office of Economic and Workforce Development
- Mary Ellen Carroll, Director, Department of Emergency Management
- Eric Shaw, Director, Mayor's Office of Housing and Community Development
- Joaquin Torres, Assessor-Recorder of San Francisco
Program Team & Role

Responsible for ensuring that the Concrete Building Safety Program is developed with an understanding and consideration of the concerns, ideas, and recommendations of affected building owners, tenants and employees ("stakeholders")

City of San Francisco
Brian Strong
Melissa Higbee
Laurel Mathews*
Alex Morrison
DBI staff

ATC
Ayse Hortacsu*
Joe Maffei
Dena Belzer
David Bonowitz
Steve Harris
Karl Telleen

CivicMakers
Judi Brown
Mike King*
Brittany Henry
Terri Feeley (LBE subcontractor)

* Primary contacts
San Francisco Office of Resilience & Capital Planning

- Established 2016: Merged Office of Resilience and Recovery with Capital Planning Program
- Promote resilience to shocks and stressors
- Develop Capital Plan and Capital Budget
- Assist other departments in being more effective in these areas (provide analyst expertise, funding, political buy-in for projects in these areas)
Applied Technology Council

Non-profit organization established in 1973 by the Structural Engineers Association of California (SEAOC)

Mission: imagine, develop, and promote advancement of technologies to enhance societal resistance to natural and other hazards

Team: ATC staff project manager working with expert consultants

Scope: Develop technical program materials

2011 Earthquake Safety Implementation Plan
Facilitates and provides staffing for these Working Group meetings.

We believe in the power of inclusive, collaborative design to shape a better world.
## Recap – Program Overview

<table>
<thead>
<tr>
<th>Program goal</th>
<th>Working group timeline</th>
<th>Who is involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify, evaluate, and retrofit the most vulnerable concrete buildings to protect against major structural failure</td>
<td>8 meetings. 1 year.</td>
<td><strong>Project team</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SF Office of Resilience and Capital Planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SF Department of Building Inspection</td>
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<tr>
<td></td>
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<td>• Applied Technology Council</td>
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<tr>
<td></td>
<td></td>
<td>• Civicmakers</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Stakeholder Working Group</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Executive Panel</strong></td>
</tr>
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<td></td>
<td></td>
<td><strong>Board of Supervisors</strong></td>
</tr>
</tbody>
</table>
Q&A Session
Intro to Concrete Buildings
Tilt-up and non-ductile concrete buildings: What are they and why retrofit?

Working Group Meeting #1
October 19, 2022
Outline

Tilt-up and non-ductile concrete buildings
  • Comparison: Tilt-up and Non-ductile concrete buildings
  • Retrofitting Tilt-up buildings
  • Retrofitting Non-ductile concrete buildings

Plan for a retrofit program
  • One ordinance-multiple deadlines
  • Preliminary timeline
  • Communication points

What the technical team needs from the working group
Tilt-up and Non-ductile Concrete Buildings
Building type: Tilt-up

Bonowitz

Bonowitz
Building type: Non-ductile concrete
## Building types

<table>
<thead>
<tr>
<th></th>
<th>Tilt-up (RWFD)</th>
<th>Non-ductile concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key vulnerabilities</td>
<td>Roof-to-wall connections</td>
<td>Numerous: Column shear, punching shear, story mechanism, wall shear…</td>
</tr>
<tr>
<td>Average cost to retrofit</td>
<td>$ Tens per sf</td>
<td>$ Hundreds per sf</td>
</tr>
<tr>
<td>Access to do retrofit work</td>
<td>Typically good</td>
<td>Typically poor</td>
</tr>
<tr>
<td>Retrofit while occupied</td>
<td>Typically yes</td>
<td>Typically no</td>
</tr>
<tr>
<td>Typical uses in SF</td>
<td>Industrial, retail, grocery</td>
<td>Residential, office, public</td>
</tr>
<tr>
<td>Number in SF</td>
<td>700?</td>
<td>4000?</td>
</tr>
<tr>
<td>Average floor area</td>
<td></td>
<td>50,000 sf</td>
</tr>
<tr>
<td>Ease to identify</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Variability of performance</td>
<td>Moderate</td>
<td>High</td>
</tr>
</tbody>
</table>
Why retrofit tilt-up buildings?
Tilt-ups have **Rigid Walls** and **Flexible (roof) Diaphragms (RWFD)**

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

1992 Landers (*CSSC in Lawson, 2017*)
The tilt-up problem

1994 Northridge (Nghiem in Lawson, 2017)

1994 Northridge (Sakkestad)
The tilt-up problem: pilasters

1994 Northridge (EERI in Lawson, 2017)

1994 Northridge (Nghiem in Lawson, 2017)
Requirements for wall-to-roof connection

Koliou et al., 2017
Tilt-up buildings included in the program

- **Retrofit or show compliant**
  - (larger)
  - (older)

- **Depends on use**
  - (smaller)
  - (newer)

- **Excluded**

Year of original construction
Tilt-up Retrofit Solutions
The tilt-up solution: anchorage

FEMA 547

City of Berkeley
The tilt-up solution: crossties
Recovery - Critical Buildings
Grocery stores
<table>
<thead>
<tr>
<th>Major Industry Group</th>
<th>Business Type Desc</th>
<th>Location Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>3270</td>
<td>Food and Drugs</td>
<td>Grocery Stores Liquor</td>
</tr>
<tr>
<td>3271</td>
<td>Food and Drugs</td>
<td>Grocery Stores Liquor</td>
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<td>3272</td>
<td>Food and Drugs</td>
<td>Grocery Stores Liquor</td>
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<td>Grocery Stores Liquor</td>
</tr>
<tr>
<td>3297</td>
<td>Food and Drugs</td>
<td>Grocery Stores Liquor</td>
</tr>
<tr>
<td>3298</td>
<td>Food and Drugs</td>
<td>Grocery-No Alcohol</td>
</tr>
<tr>
<td>3299</td>
<td>Food and Drugs</td>
<td>Grocery-No Alcohol</td>
</tr>
</tbody>
</table>
RWFD inventory

- PDR zones
  - 200-300 RWFD
- Outside PDR zones
  - 400 grocery stores
  - 65 standalone buildings
    - 40 “large”
    - 25 “medium”
- Gregory Hobbs, SF State
Why retrofit non-ductile concrete?
Column shear failure

Western Honshu Japan, 2007
Weak-pier story mechanism
Christchurch, 2010-2011

**Graph:**
- **Spectra Acceleration / S_a (g ms^-2)**
- **Period (sec)**
- **EQ1:CBGS**
- **EQ2:CHHC**
- **EQ3:REHS**
- **EQ4:CCCC**

**Legend:**
- Mean of 4 CBD records
- EQ1:CBGS (NS64E)
- EQ2:CHHC (S89W)
- EQ3:REHS
- EQ4:CCCC (N89W)
- NZS4203 (1976)
Concrete buildings included in the program

- Retrofit or show compliant
  - Depends on structural characteristics
- Excluded

- Year of original construction:
  - (older)
  - (newer)

- Stories:
  - (taller)
  - (shorter)
Concrete Inventory

All concrete buildings pre-1980

~4000 count
Retrofitting Concrete Buildings
Column wrapping
Elliptical column jackets

UC Berkeley Eshleman Hall

Rutherford + Chekene
PG&E Central Services Garage

Rutherford + Chekene
Cost of construction – Non-ductile concrete buildings

- Los Angeles and West Hollywood retrofit, 2017
- Translating to these estimates from LA to San Francisco and 2017 to 2022 gives $75 to $225/sf.

Plan for a retrofit program
Timeline to date

- CAPSS
- ESIP
- LA, WeHo, Santa Monica, Berkeley ordinances
- ATC 151 startup
- Conjunction with civic makers
## Retrofit programs in other jurisdictions

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Year enacted</th>
<th>Scope</th>
<th>Incentive structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkeley</td>
<td>2018</td>
<td>Tilt-up, Non-ductile concrete</td>
<td>Incentives</td>
</tr>
<tr>
<td>Santa Monica</td>
<td>2017</td>
<td>Tilt-up, Non-ductile concrete</td>
<td>Mandatory</td>
</tr>
<tr>
<td>West Hollywood</td>
<td>2017</td>
<td>Non-ductile concrete</td>
<td>Mandatory</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>2015</td>
<td>Non-ductile concrete</td>
<td>Mandatory</td>
</tr>
</tbody>
</table>
## Program development: Timeline to date

<table>
<thead>
<tr>
<th>Technical (ATC)</th>
<th>Q1 2021</th>
<th>Q2 2021</th>
<th>Q3 2021</th>
<th>Q4 2021</th>
<th>Q1 2022</th>
<th>Q2 2022</th>
<th>Q3 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summarize past retrofit programs. Tilt-up and concrete inventory work.</td>
<td>Compare characteristics retrofit programs. Inventory cleanup.</td>
<td>Summarize research on SF inventory and tools for evaluating.</td>
<td>Identify deficiencies to prioritize for retrofit.</td>
<td>Draft data collection form. Options for combining tilt-up and non-ductile.</td>
<td>Draft technical framework</td>
<td>Coordinate with Civic makers. Research cost data</td>
</tr>
</tbody>
</table>
Communication points

• Emphasize safety

• Put tilt up and non-ductile in the same ordinance, with tilt-up having earlier completion dates
Preliminary timeline for compliance
Preliminary timeline for compliance

Example timeline – CBSP timeline not finalized

Tilt-up
- Tier 1
- Tier 2
- Exempt

Non-ductile concrete
- Tier 1
- Tier 2
- Exempt

Effective date of ordinance
Submit data form
Submit seismic evaluation or “intent to retrofit”
Submit permit application for retrofit
Complete retrofit construction
Needed from the working group
Working group

• Bring the broader perspective
• Provide input on implementation options
• Timeline of ordinance compliance
Quick Break
Come back at 12:22pm
Working Group Role

- Help the City understand the concerns of stakeholders, including from vulnerable communities
- Provide useful recommendations for program policy and design that support programmatic goals
- Help ensure program products have a high level of usability among the general public
- Support the program at public meetings or participate in other forms of community education and outreach
Working Group Agreements

- Start and end on time
- Respect the opinions of others
- One person speaks at a time
- Participate (be here now, as much as possible)
- Open and honest communication (as you feel comfortable providing)
- Give space – Take space
- Default is to be on video
Working Group Structure

- Anticipate meeting another 7 times between now and September 2023
- Virtual, fully remote meetings through the end of 2022; will revisit the potential for meeting in person in 2023
- Diverse set of representatives from various stakeholder groups
  - Commercial & Residential Building Owners
  - Tenant Representatives
  - Labor Representatives
  - Business Representatives
  - Builders & Developers
  - Technical Experts
  - City Staff
What this Working Group is, and what it is not

- **Working Group:** "A committee or group appointed to study and report on a particular question and make recommendations based on its findings."

- **IS:**
  - A forum for providing meaningful feedback on programmatic options and materials
  - A representative body for the needs and interests of populations and stakeholders impacted by concrete building retrofits
  - A space where programmatic considerations are centered in equity

- **IS NOT:**
  - For writing policy
  - For becoming experts in retrofitting
  - For being asked to inform any program decisions without adequate information presented
  - An official City commission or voting body
How We Work Together

North
Acting - “Let’s do this!” Likes to act, try things, plunge in.

West
Attention to detail - Likes to know the who, what, when, where, and why before acting.

East
Speculating - Likes to look at the big picture and the possibilities before acting.

South
Caring - Likes to know that everyone’s feelings have been considered and their voices have been heard before acting.

Source: Harmony Education Center
The Four Directions

- What are the strengths of your style? (3-4 adjectives)
- What are the limitations of your style? (3-4 adjectives)
- What style do you find most difficult to work with and why?
- What do people from other "directions" or styles need to know about you so you can work together effectively?
- What's one thing you value about each of the other three styles?
Wrap Up & Next Steps
Major Themes from Discovery Interviews

- Program Messaging
- Program Communications
- Equity and Inclusion
- Financial Incentives and Cost
- Temporary Tenant Relocation
- Compliance Timeline
- Risk Assessment and Screening Process
- Historic Preservation
Future Meeting Topics & Timeline

**October 24, 2022**
3:30 – 5:00 p.m.
- Optional concrete building walking tour

**November 16, 2022**
Afternoon – exact time TBD
- Discuss how we will screen these buildings

**January 2023**
Date and time TBD
Agenda TBD

**February 2023**
Date and time TBD
Agenda TBD

LAUREL.MATHEWS@SFGOV.ORG
What we need from you

1. Fill out the Debrief Deck to give us feedback and share your ideas (Laurel will provide editing access after the meeting)

2. Notify us of major conflicts and scheduling concerns – we will try our best to accommodate everyone's schedule!
Thank you!

Working Group Meeting #1

October 19, 2022