

Concrete Building Safety Program

Working Group Meeting #1

October 19, 2022

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

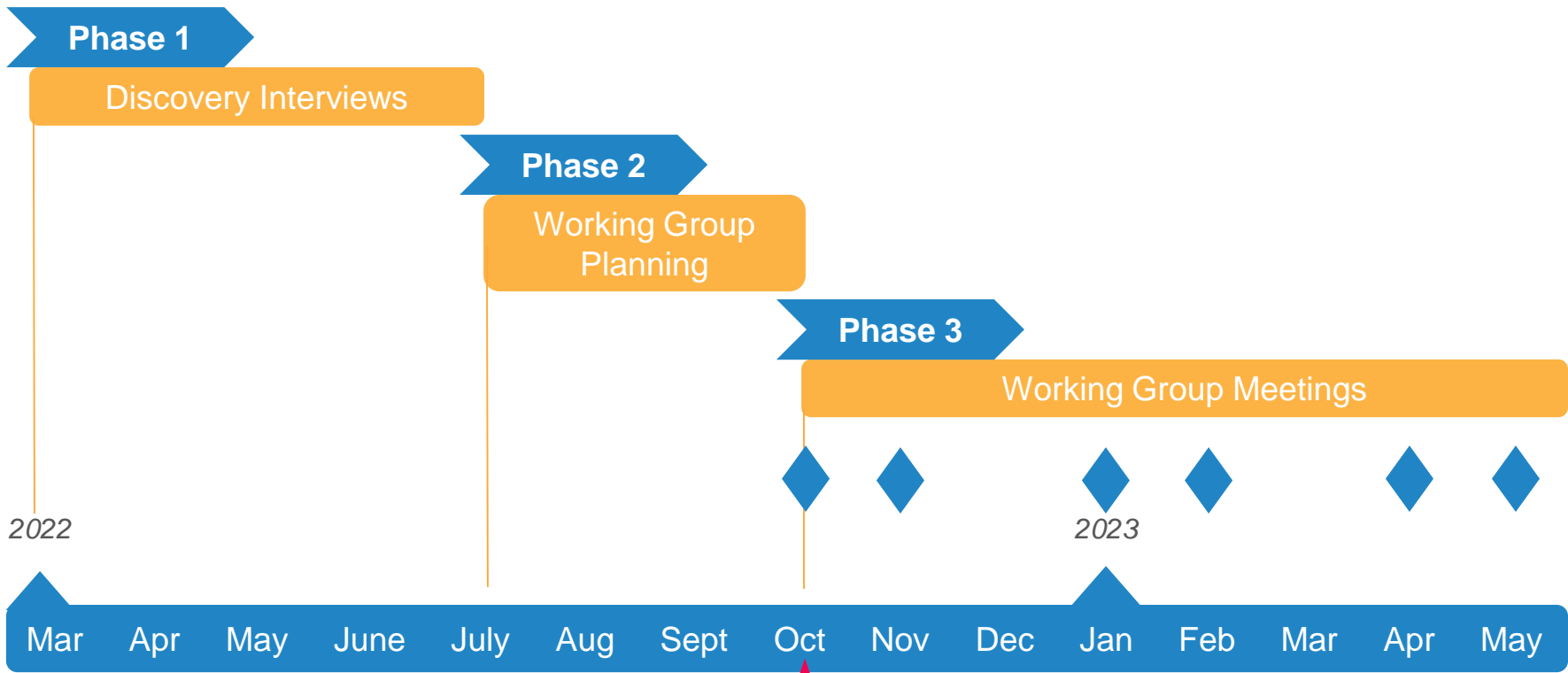
Evaluation and Retrofit Program	1990	1995	2000	2005	2010	2015	2020 and beyond
Unreinforced masonry retrofit	★						
Soft-story retrofit					★		
Private schools evaluation					★		
Façade inspection and maintenance						★	
Concrete retrofit (proposed)							

★ date of ordinance

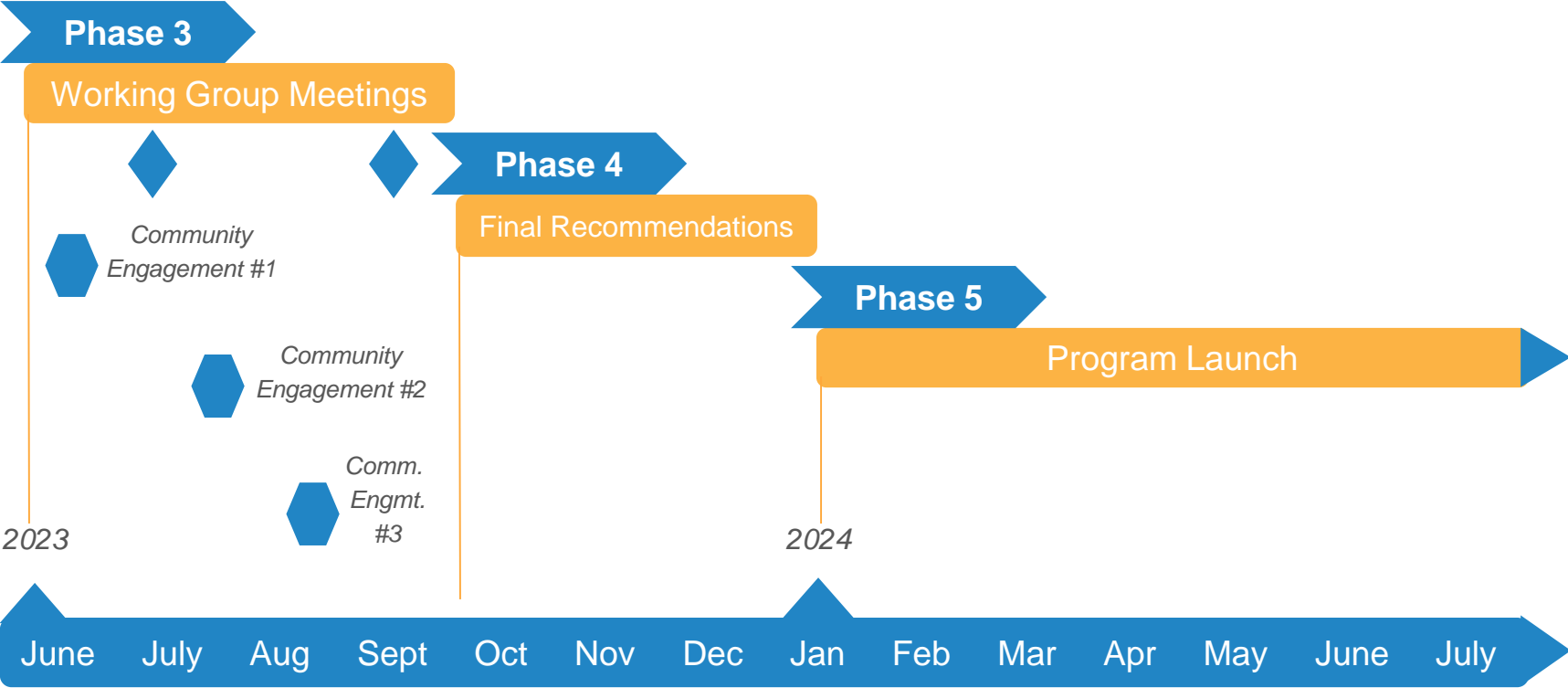
Concrete Building Safety Program

- **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



Participatory Program Design Timeline (cont.)



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

Daniel Zepeda

CivicMakers

Judi Brown

Mike King*

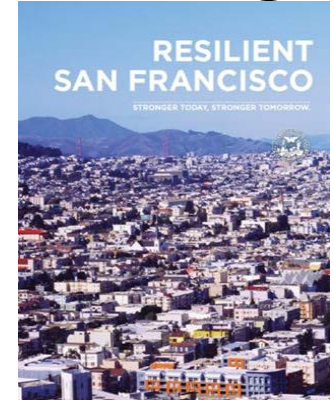
Brittany Henry

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)



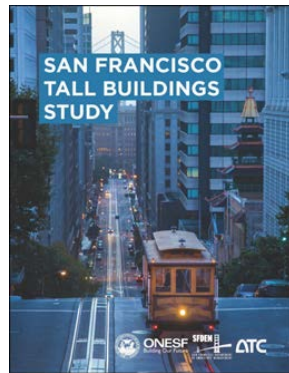
ATC Applied Technology Council

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

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



2019 Study



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

Program goal	Working group timeline	Who is involved
Identify, evaluate, and retrofit the most vulnerable concrete buildings to protect against major structural failure	8 meetings. 1 year.	<p>Project team</p> <ul style="list-style-type: none">• SF Office of Resilience and Capital Planning• SF Department of Building Inspection• Applied Technology Council• Civicmakers <p>Stakeholder Working Group</p> <p>Executive Panel</p> <p>Board of Supervisors</p>



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

	Tilt-up (RWFD)	Non-ductile concrete
Key vulnerabilities	Roof-to-wall connections	Numerous: Column shear, punching shear, story mechanism, wall shear...
Average cost to retrofit	\$ Tens per sf	\$ Hundreds per sf
Access to do retrofit work	Typically good	Typically poor
Retrofit while occupied	Typically yes	Typically no
Code years of interest	1991 UBC, 1997 UBC	1976 UBC, 1997 UBC
Typical uses in SF	Industrial, retail, grocery	Residential, office, public
Number in SF	700?	4000?
Average floor area		50,000 sf
Ease to identify	High	Medium
Variability of performance	Moderate	High



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

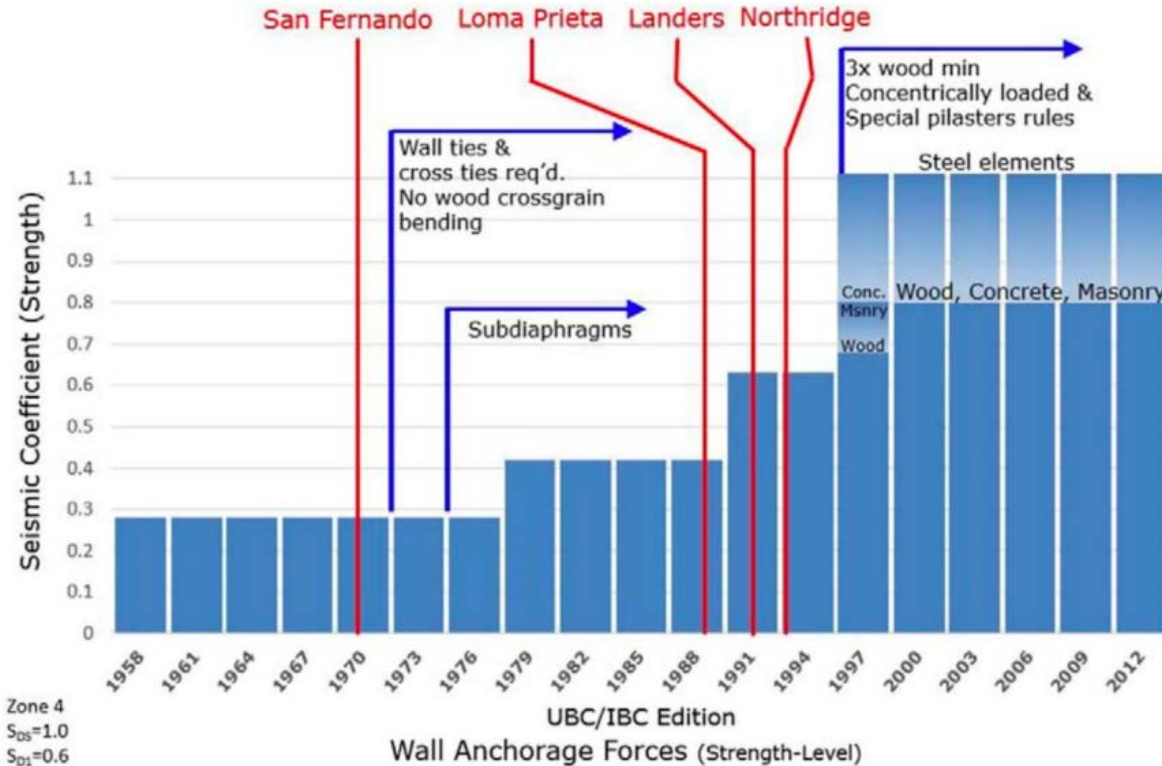


1994 Northridge (*EERI in Lawson, 2017*)



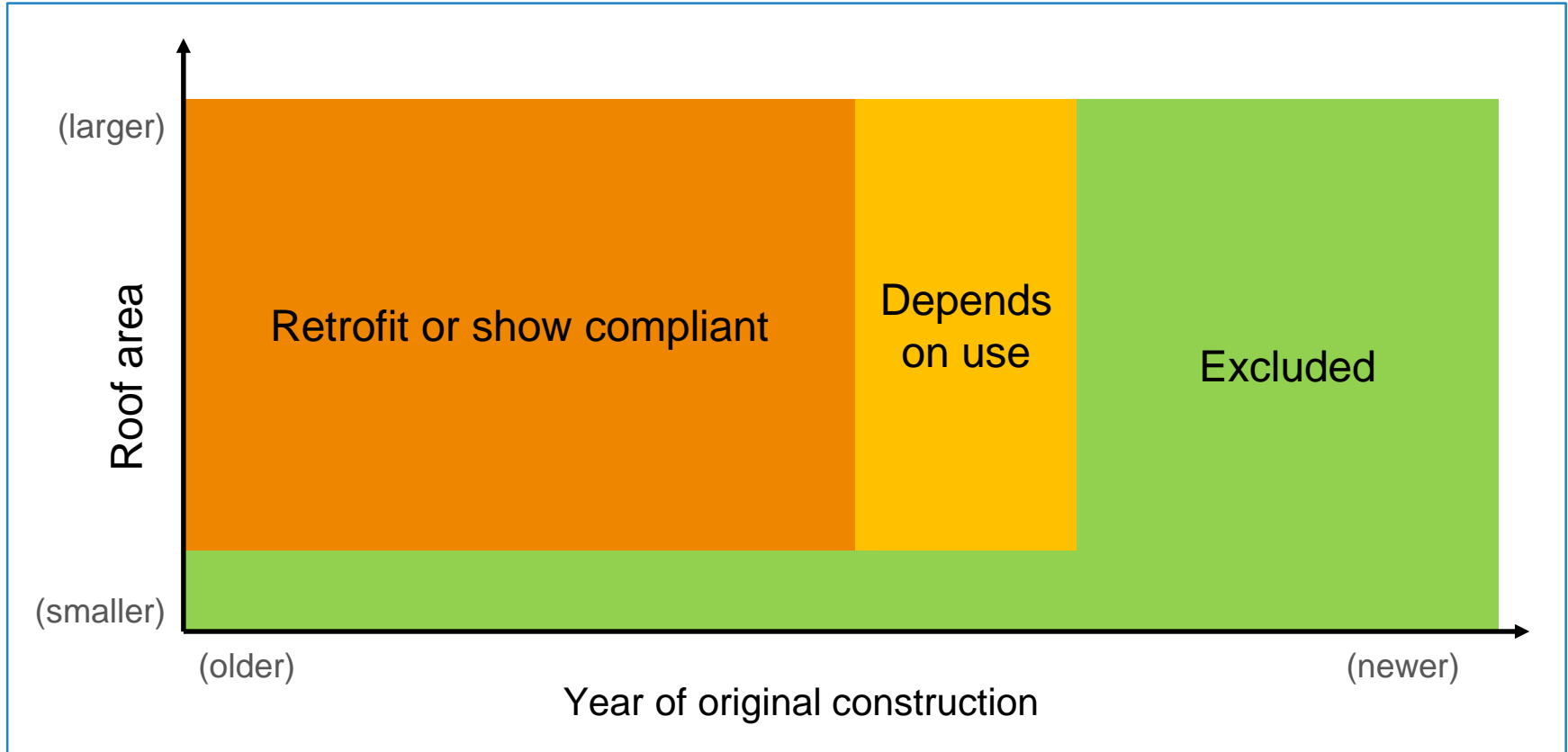
1994 Northridge (*Nghiem in Lawson, 2017*)

Requirements for wall-to-roof connection



Koliou et al., 2017

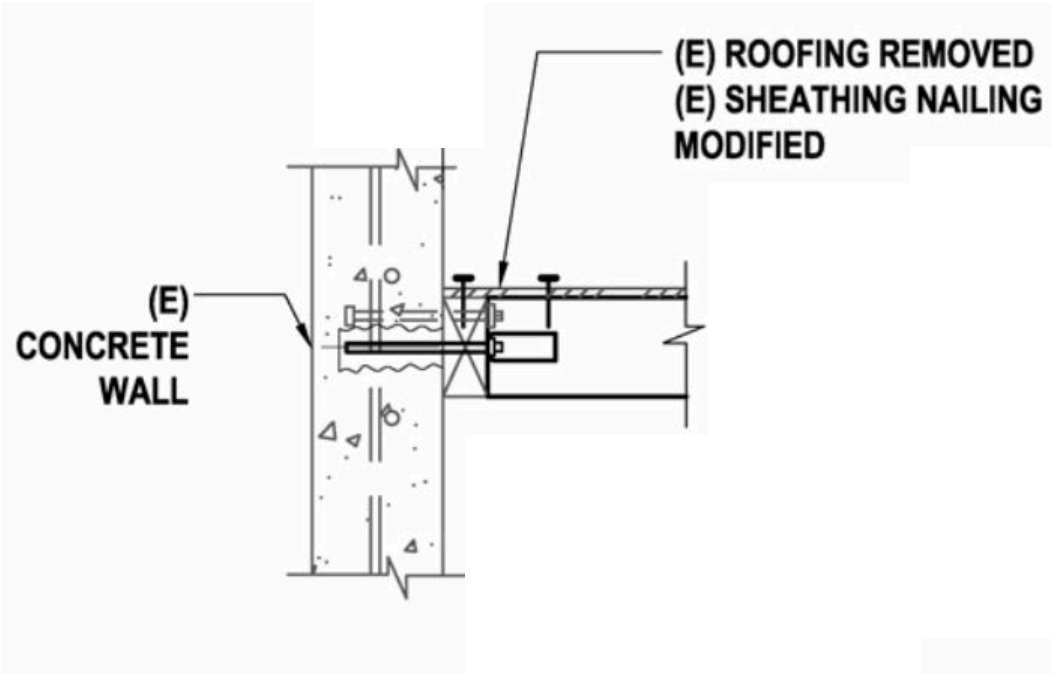
Tilt-up buildings included in the program



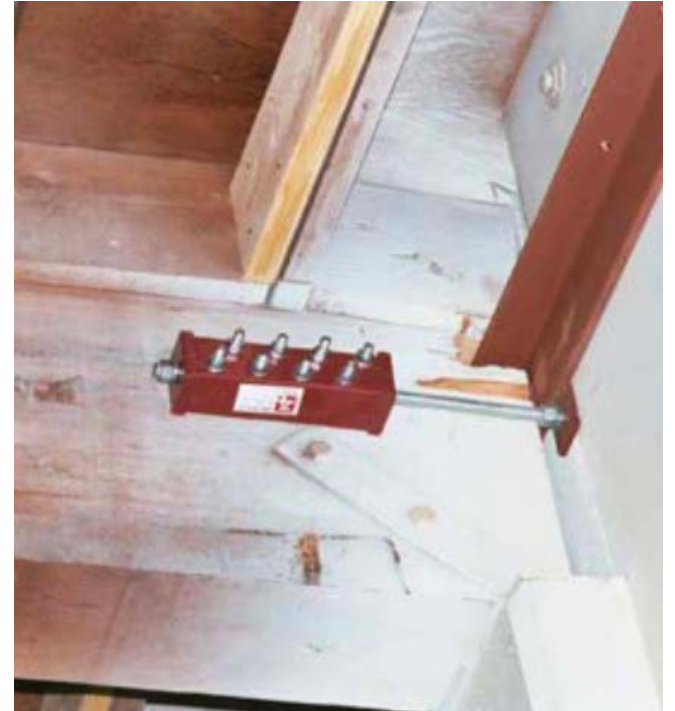


Tilt-up Retrofit Solutions

The tilt-up solution: anchorage



FEMA 547



City of Berkeley

The tilt-up solution: crossties



Saunders Construction

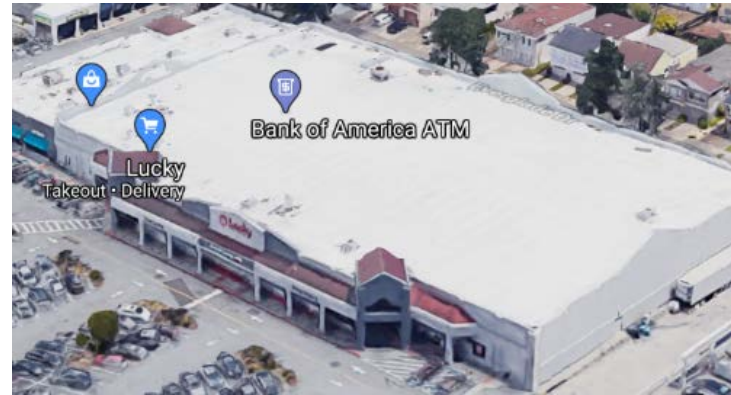
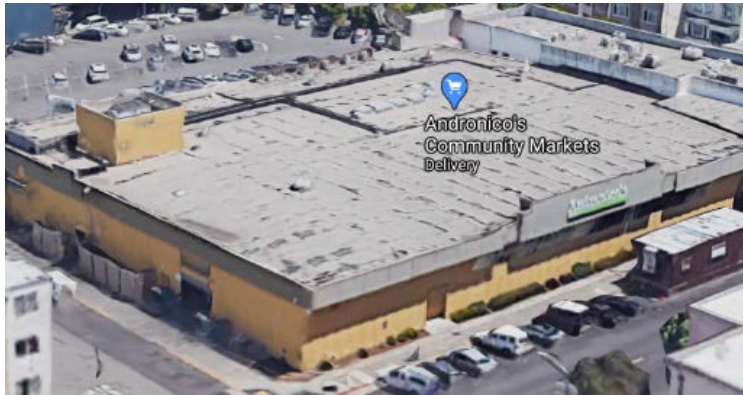


Saunders Construction



Recovery- Critical Buildings

Grocery stores



(Google)

	A	B	C	D	E	F
1	Major Industry Group	Business Type Desc	Location Address			
3270	Food and Drugs	Grocery Stores Liquor	837 Washington St # 839			
3271	Food and Drugs	Grocery Stores Liquor	838 Washington St			
3272	Food and Drugs	Grocery Stores Liquor	84 Turk St # 90			
3273	Food and Drugs	Grocery Stores Liquor	843 Clement St			
3274	Food and Drugs	Grocery Stores Liquor	845 Holloway Ave			
3275	Food and Drugs	Grocery Stores Liquor	845 Market St Ste 10			
3276	Food and Drugs	Grocery Stores Liquor	850 La Playa St			
3277	Food and Drugs	Grocery Stores Liquor	858 Rhode Island St			
3278	Food and Drugs	Grocery Stores Liquor	861 Divisadero St			
3279	Food and Drugs	Grocery Stores Liquor	862 Clay St			
3280	Food and Drugs	Grocery Stores Liquor	868 Geary St			
3281	Food and Drugs	Grocery Stores Liquor	868 Geary St A			
3282	Food and Drugs	Grocery Stores Liquor	868 Jackson St			
3283	Food and Drugs	Grocery Stores Liquor	870 Jackson St			
3284	Food and Drugs	Grocery Stores Liquor	881 Clay St			
3285	Food and Drugs	Grocery Stores Liquor	895 Washington St			
3286	Food and Drugs	Grocery Stores Liquor	898 Stockton St			
3287	Food and Drugs	Grocery Stores Liquor	900 Columbus Ave			
3288	Food and Drugs	Grocery Stores Liquor	900 Irving St			
3289	Food and Drugs	Grocery Stores Liquor	901 Geneva Ave			
3290	Food and Drugs	Grocery Stores Liquor	901 Haight St			
3291	Food and Drugs	Grocery Stores Liquor	904 Eddy St			
3292	Food and Drugs	Grocery Stores Liquor	927 Post St			
3293	Food and Drugs	Grocery Stores Liquor	949 Taraval St			
3294	Food and Drugs	Grocery Stores Liquor	985 Bush St			
3295	Food and Drugs	Grocery Stores Liquor	99 9th St			
3296	Food and Drugs	Grocery Stores Liquor	995 Ellis St			
3297	Food and Drugs	Grocery Stores Liquor	United Nations Plaza			
3298	Food and Drugs	Grocery-No Alcohol	298 Teddy Ave			
3299	Food and Drugs	Grocery-No Alcohol	4992 Mission St			

Business Type Desc

Sort

A Z

Ascending

Z A

Descending

By color: None

Filter

By color: None

Equals

Grocery...

And

Or

Equals

Grocery-...

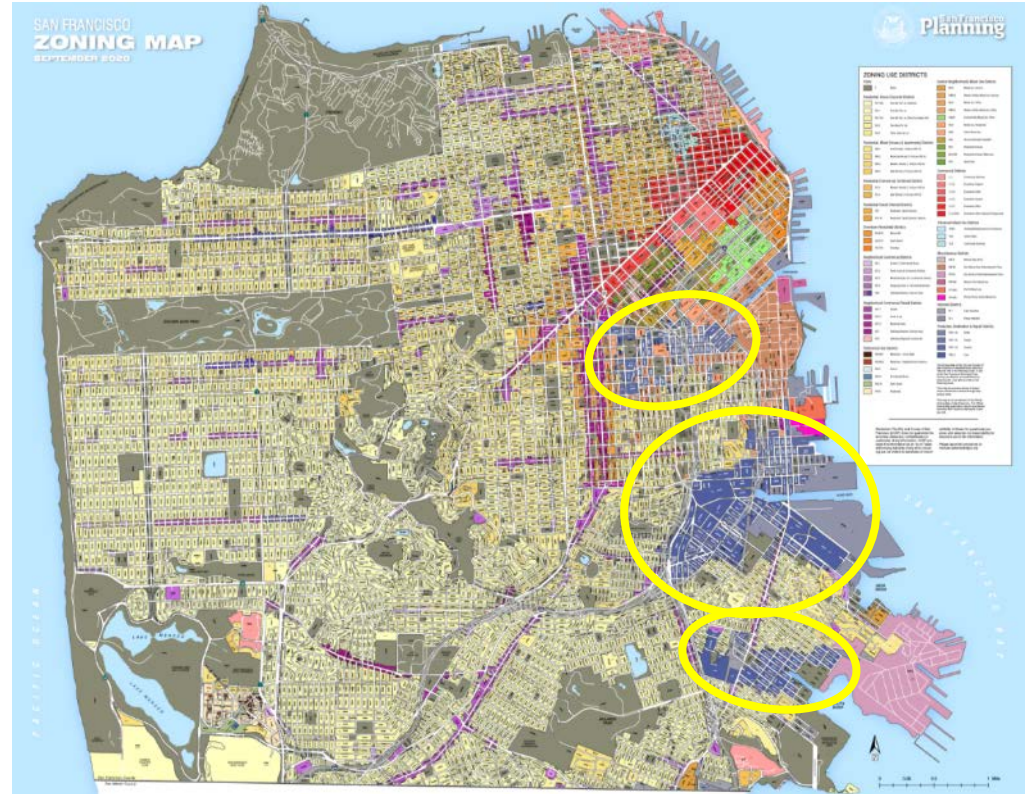
Q Search

☐ Garden/Agricultural Supplies
 ☐ General Merchandise
 ☐ Government/Social Org.
 ☒ Grocery Stores Liquor
 ☒ Grocery-No Alcohol
 ☐ Health/Medical
 ☐ Heavy Industrial
 ☐ Home Furnishings

Clear Filter

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



1995 Kobe
earthquake



(a)



(b)



(c)



(d)



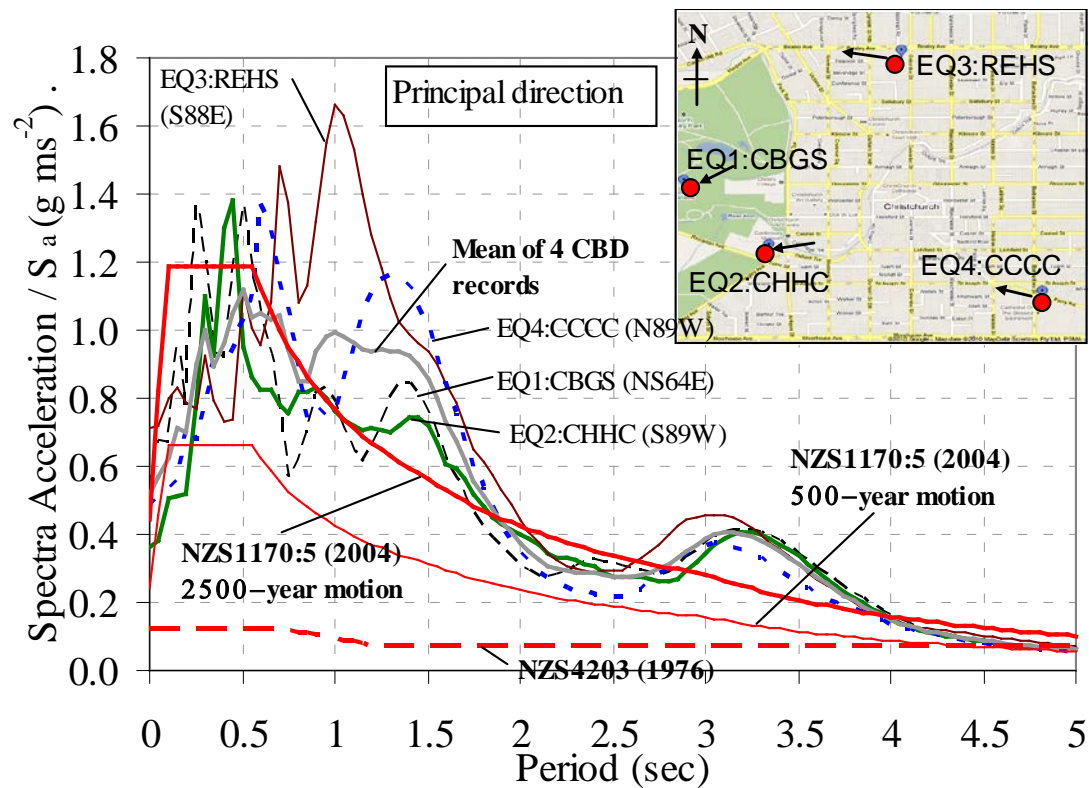
(e)



(f)

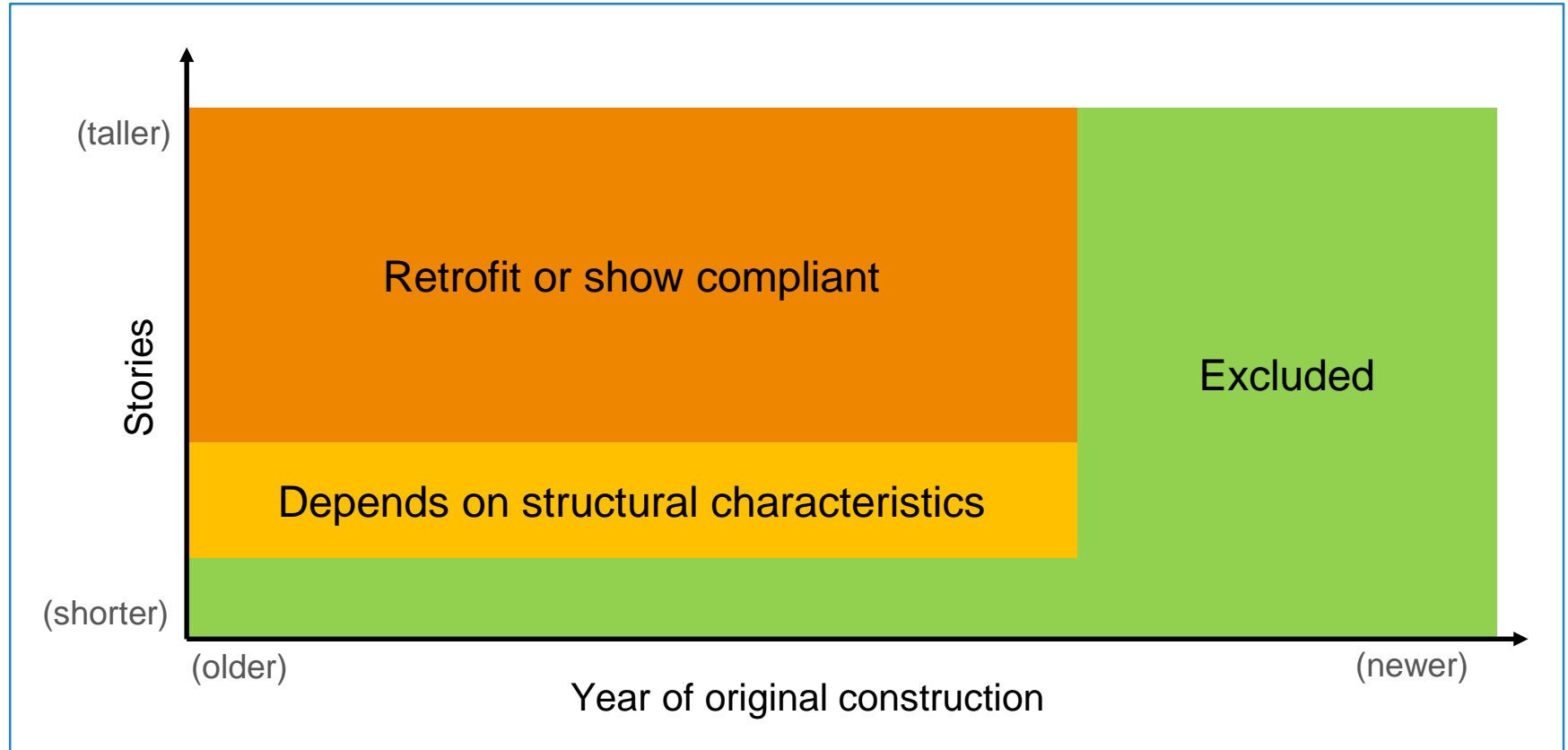


Christchurch, 2010-2011

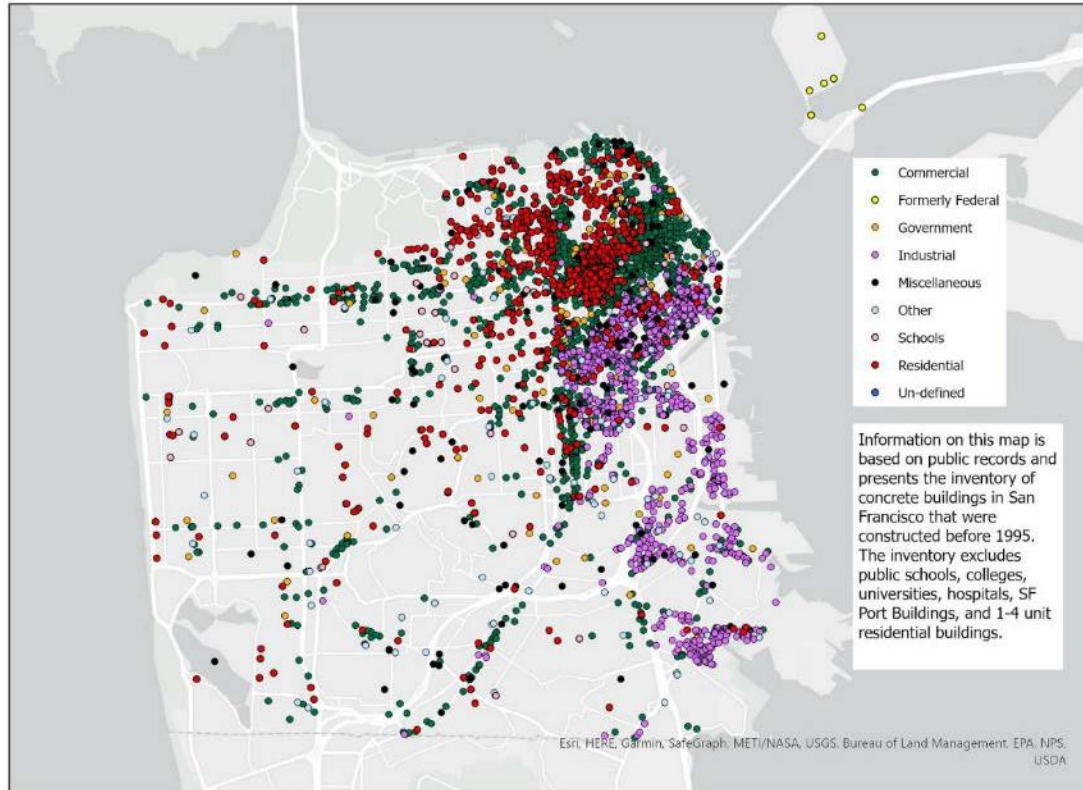




Concrete buildings included in the program



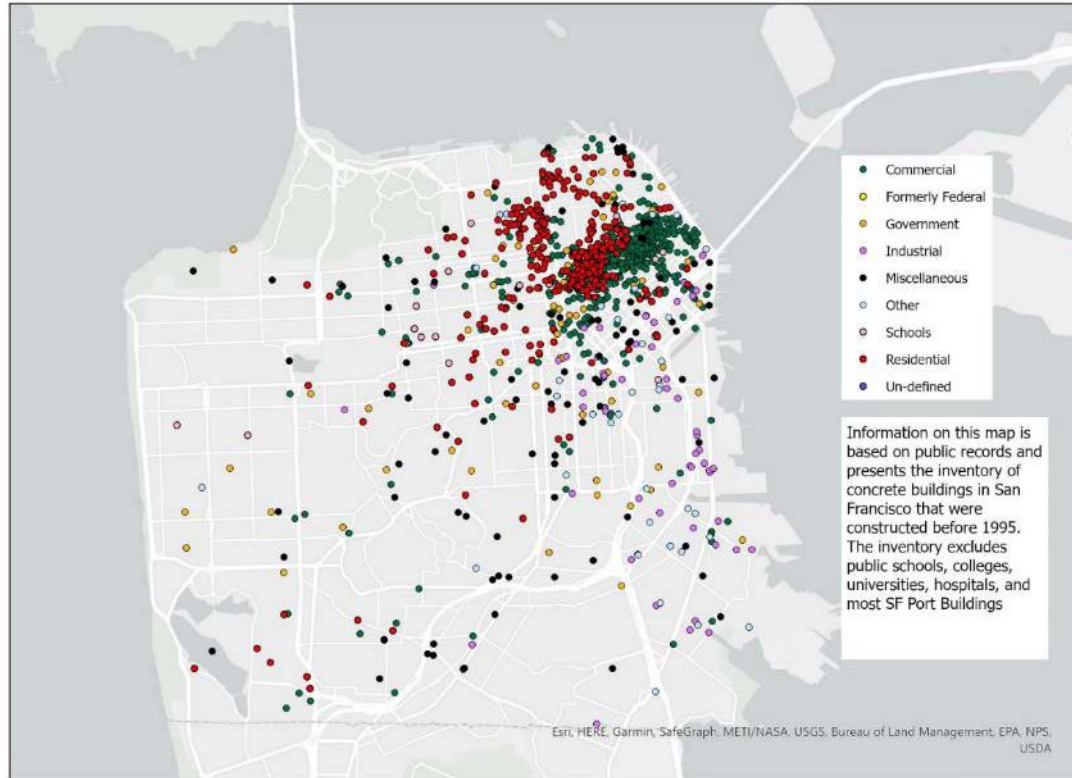
Concrete Inventory



All concrete buildings
pre-1980

~4000 count

Concrete Inventory > 5 story



Concrete buildings
pre-1980
Taller than 5 story

~1000 count



Retrofitting Concrete Buildings

Column wrapping



Elliptical column jackets



UC Berkeley Eshleman Hall



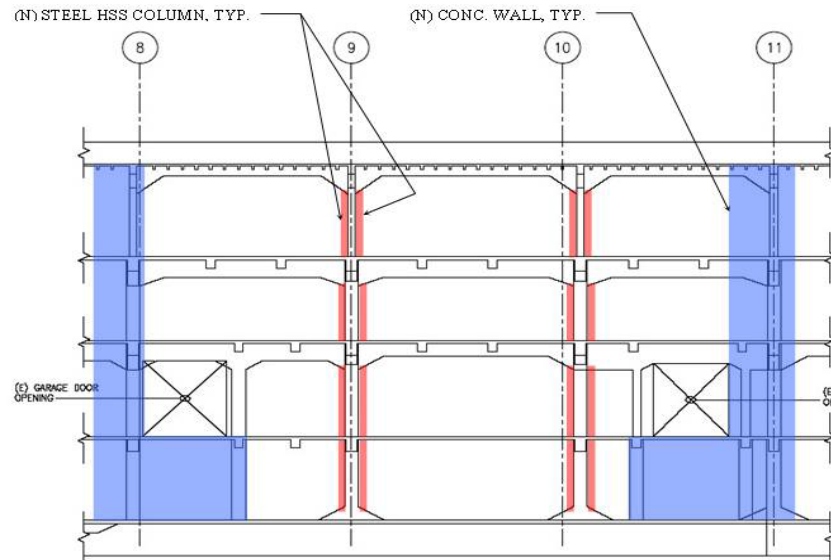
Rutherford + Chekene







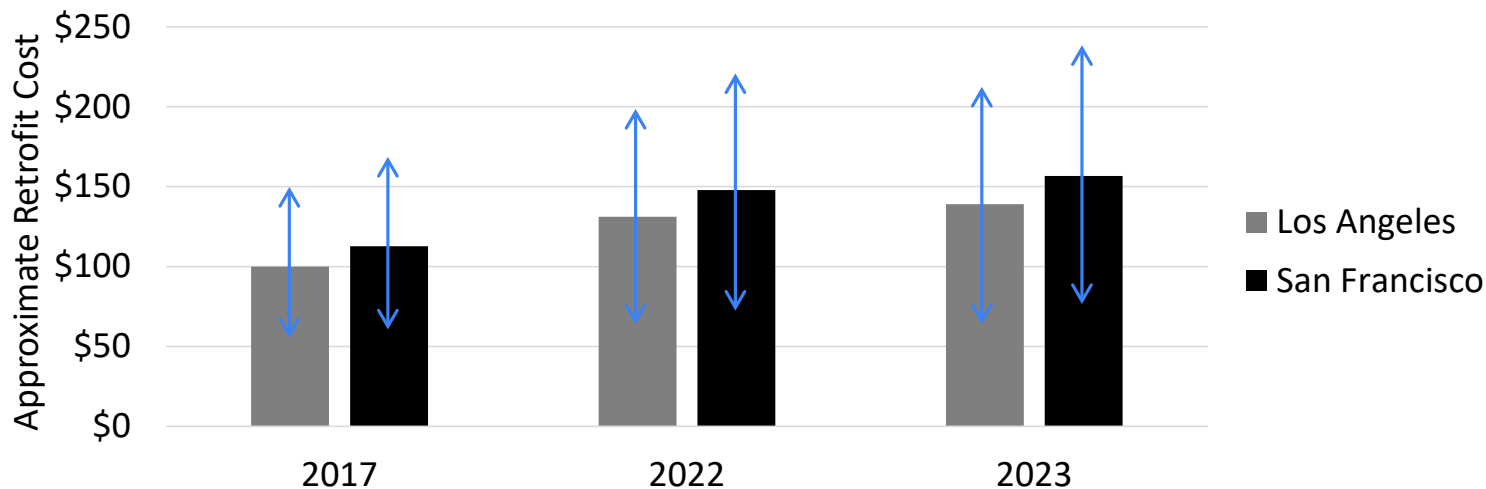
PG&E Central Services Garage





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.



1." from "White Paper: Non-Ductile Concrete Buildings" by Omgivning, October 2021.

https://assets.ctfassets.net/z78475or6i3d/6u5Zb3dJhq1HaWe61VR0E/29fc76a971e03a639b04b0f6fb2ea567/211025_NDC_White_Paper_1_.pdf

2. "Seismic Retrofit Program: Financial Analysis" Keyser Marston Associates to City of West Hollywood, 4 December 2017.

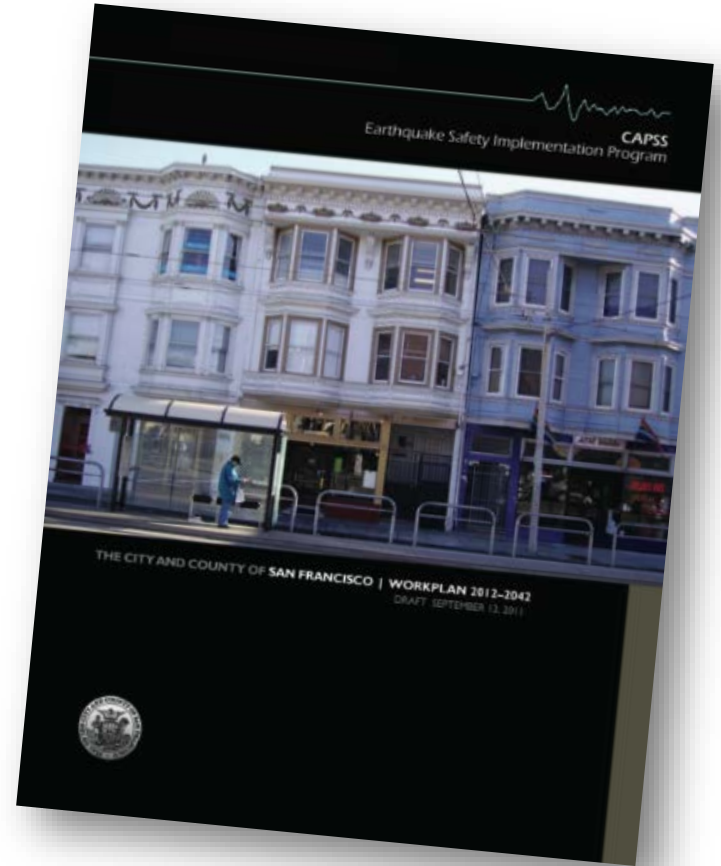
http://weho.granicus.com/MetaViewer.php?view_id=22&clip_id=3201&meta_id=146594



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

Jurisdiction	Year enacted	Scope	Incentive structure
Berkeley	2018	Tilt-up, Non-ductile concrete	Incentives
Santa Monica	2017	Tilt-up, Non-ductile concrete	Mandatory
West Hollywood	2017	Non-ductile concrete	Mandatory
Los Angeles	2015	Non-ductile concrete	Mandatory

Program development: Timeline to date

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

Communication points

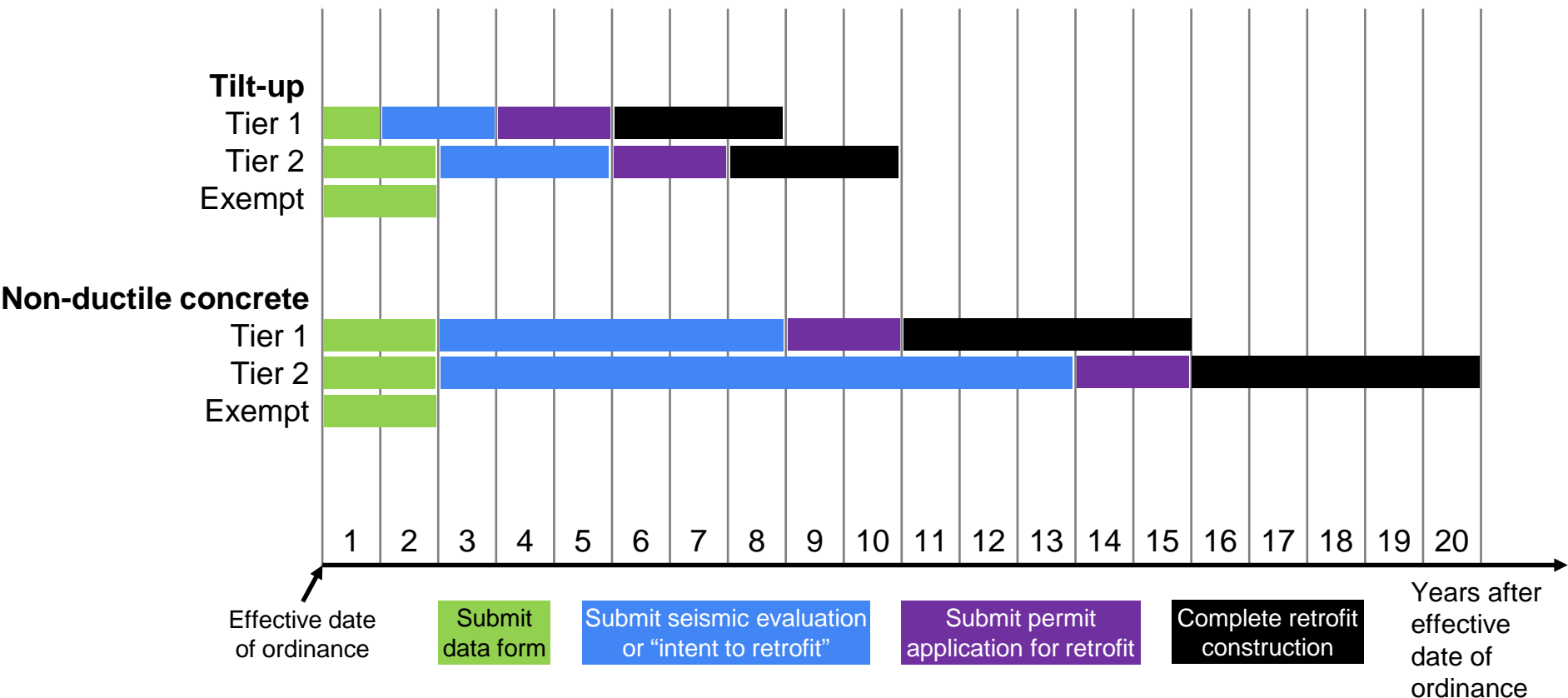
- Emphasize safety
- Put tilt up and non-ductile in the same ordinance, with tilt-up having earlier completion dates



Preliminary timeline for compliance

Preliminary timeline for compliance

Example timeline – CBSP
timeline not finalized





Needed from the working group

Working group

- Bring the broader perspective
- Provide input on implementation options
- Timeline of ordinance compliance



Q&A Session



Quick Break
Come back at 12:22pm



How We Work Together

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.

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?

NORTH

SOUTH

EAST

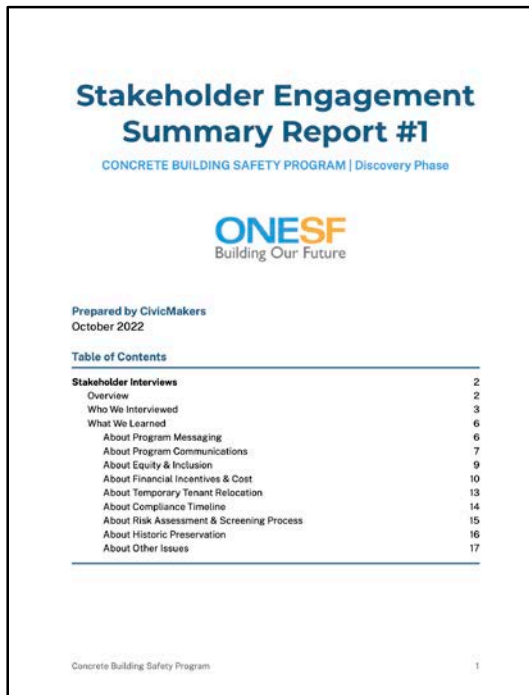
WEST



W rap 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



**Stakeholder Engagement
Summary Report #1**

CONCRETE BUILDING SAFETY PROGRAM | Discovery Phase

ONESF
Building Our Future

Prepared by CivicMakers
October 2022

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Concrete Building Safety Program 1

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

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!

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