

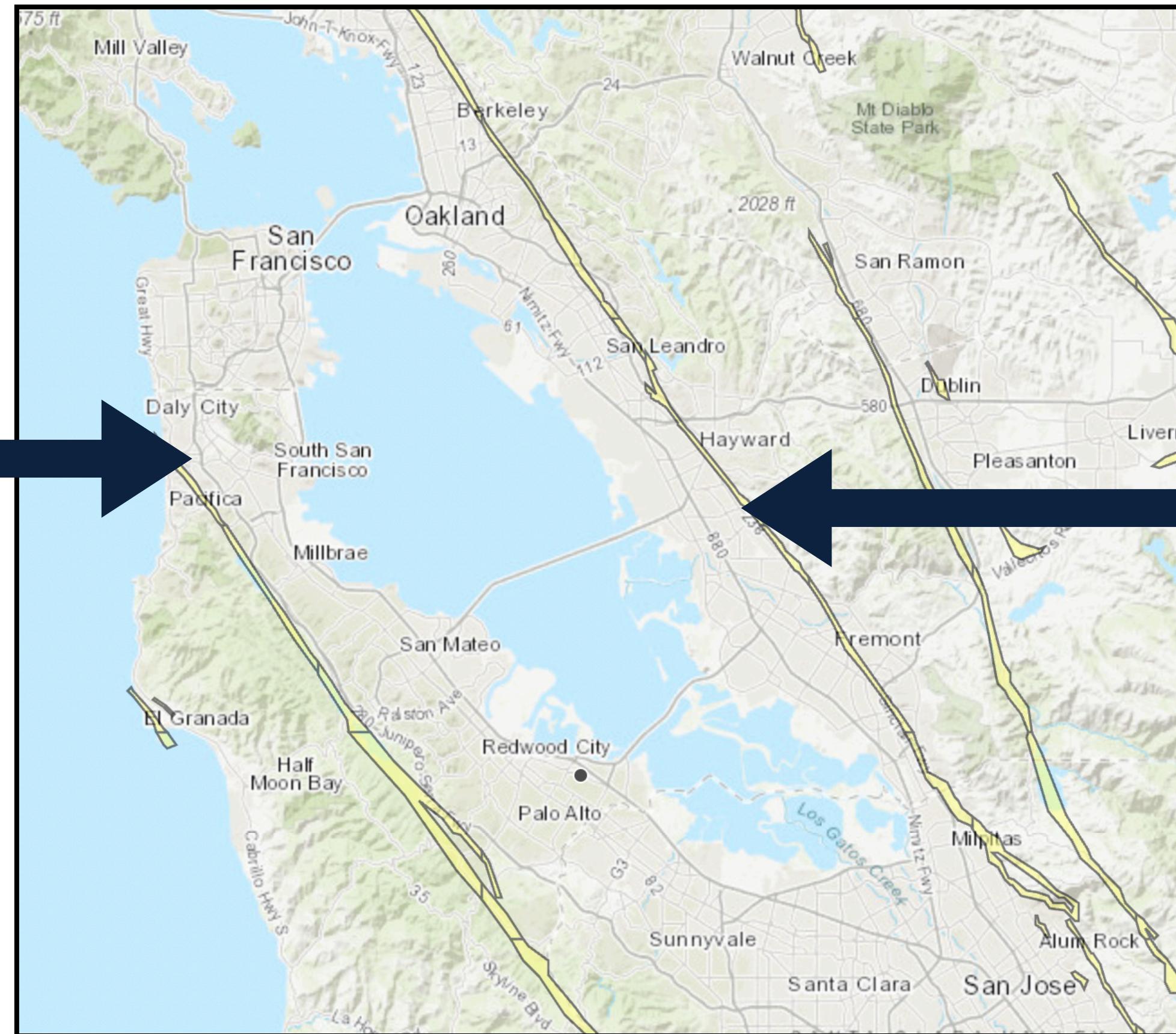
Educational Training For Real Estate Agents

SEISMIC / EARTHQUAKES 101



MAJOR BAY AREA FAULT LOCATIONS

**SAN
ANDREAS
FAULT**



**HAYWARD
FAULT**

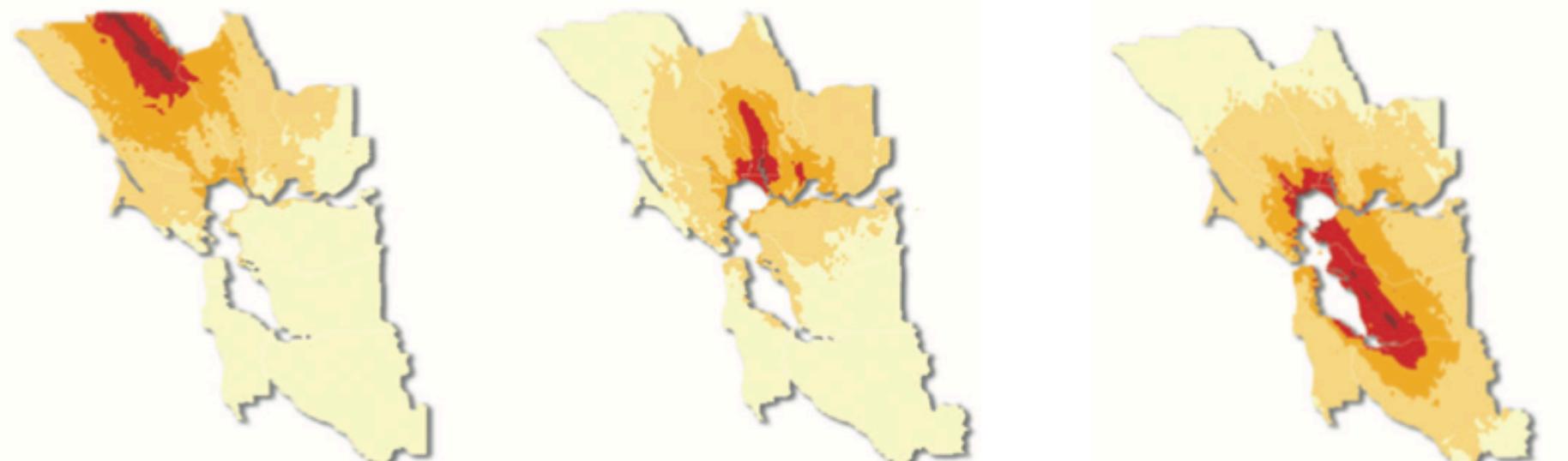


VARIOUS FAULTS & SIZES



Shaking Intensity

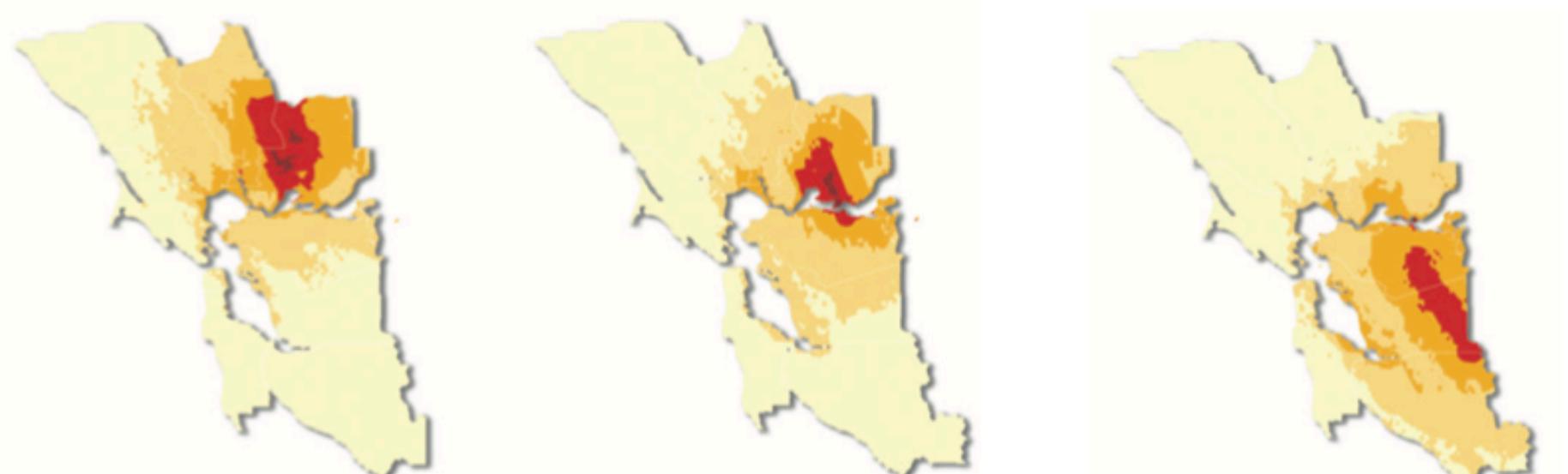
- MMI 9 - Violent
- MMI 8 - Very Strong
- MMI 7 - Strong
- MMI 6 - Moderate
- MMI <5 - Light



Maacama (7.4)

West Napa (6.7)

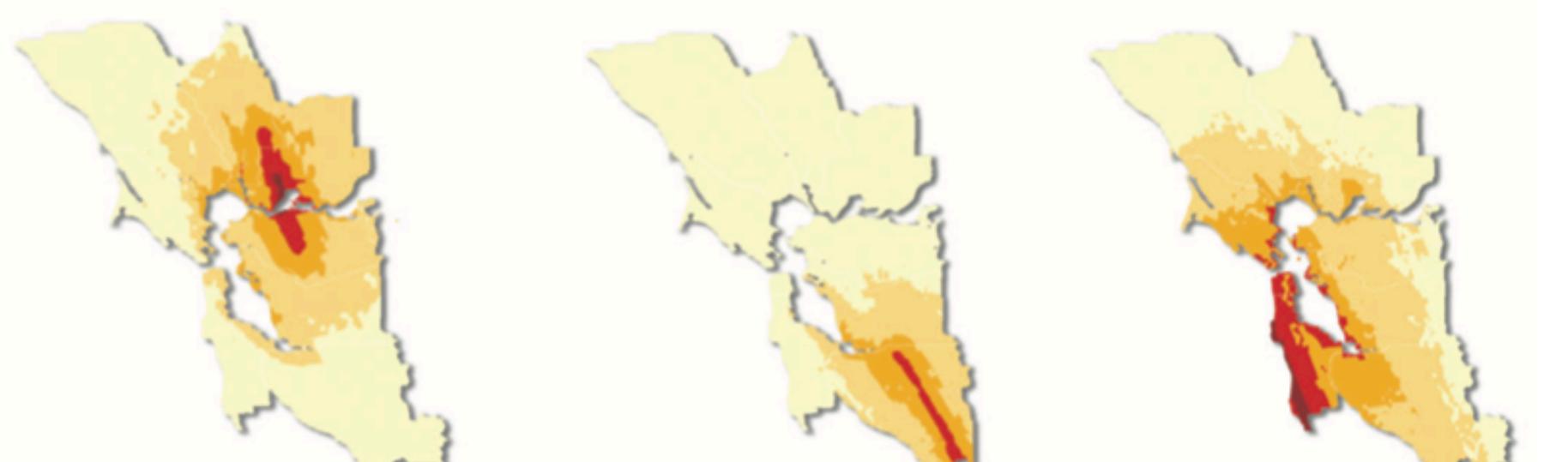
Hayward (7.0)



Great Valley (6.8)

Great Valley (6.7)

Greenville (7.0)



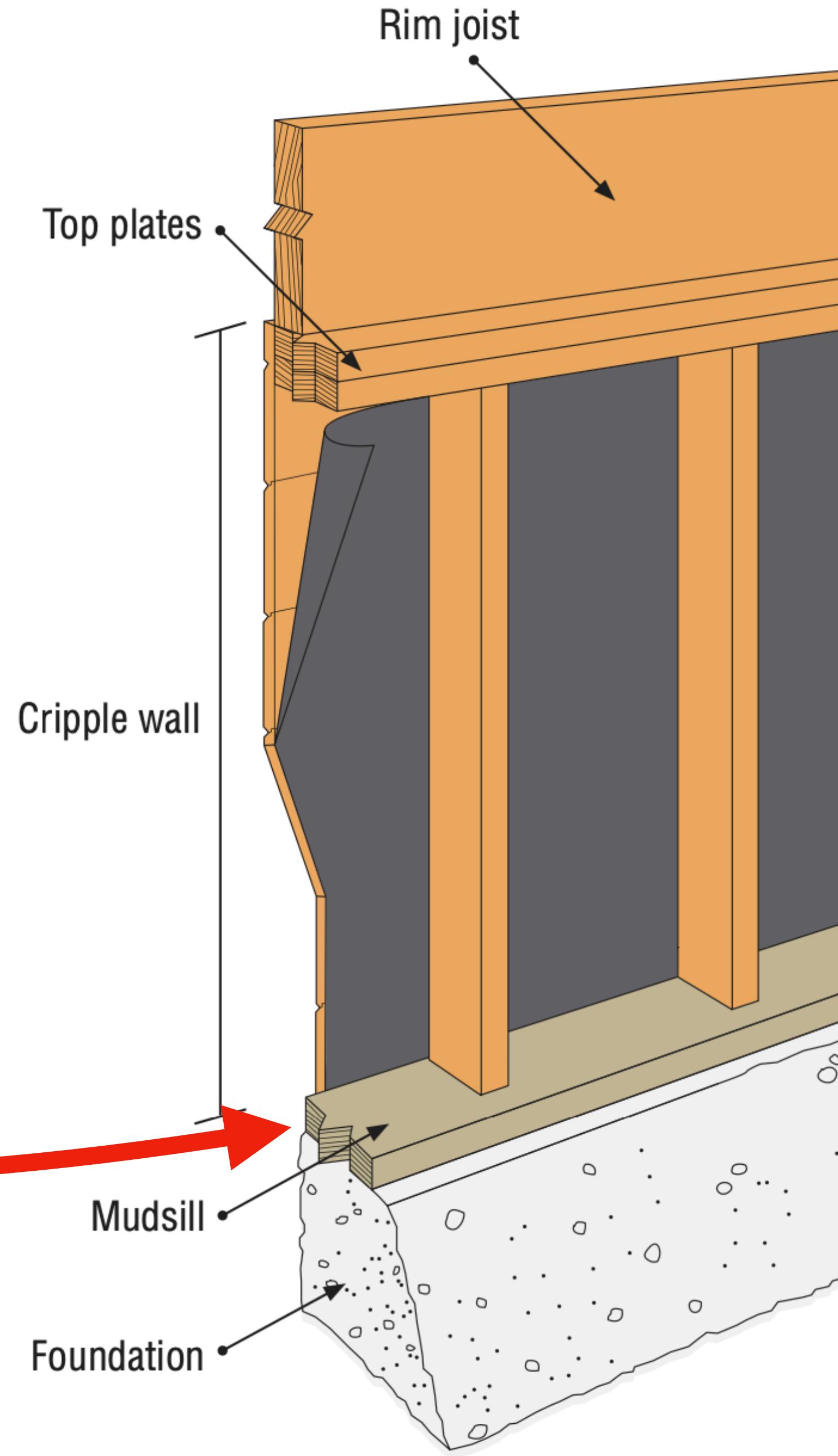
Concord (6.8)

Calaveras (6.4)

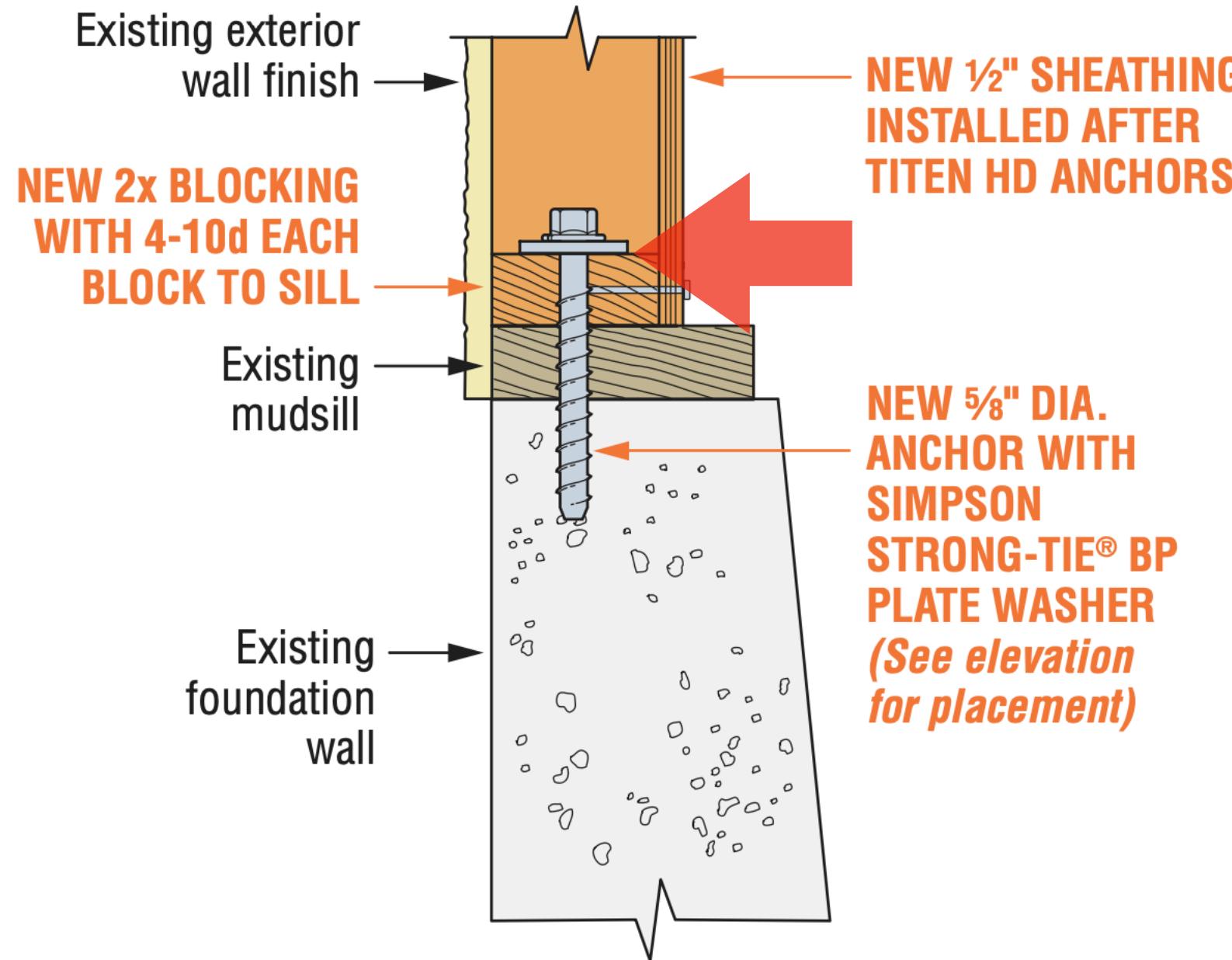
San Gregorio (7.5)



WOOD TO CONCRETE INTERFACE

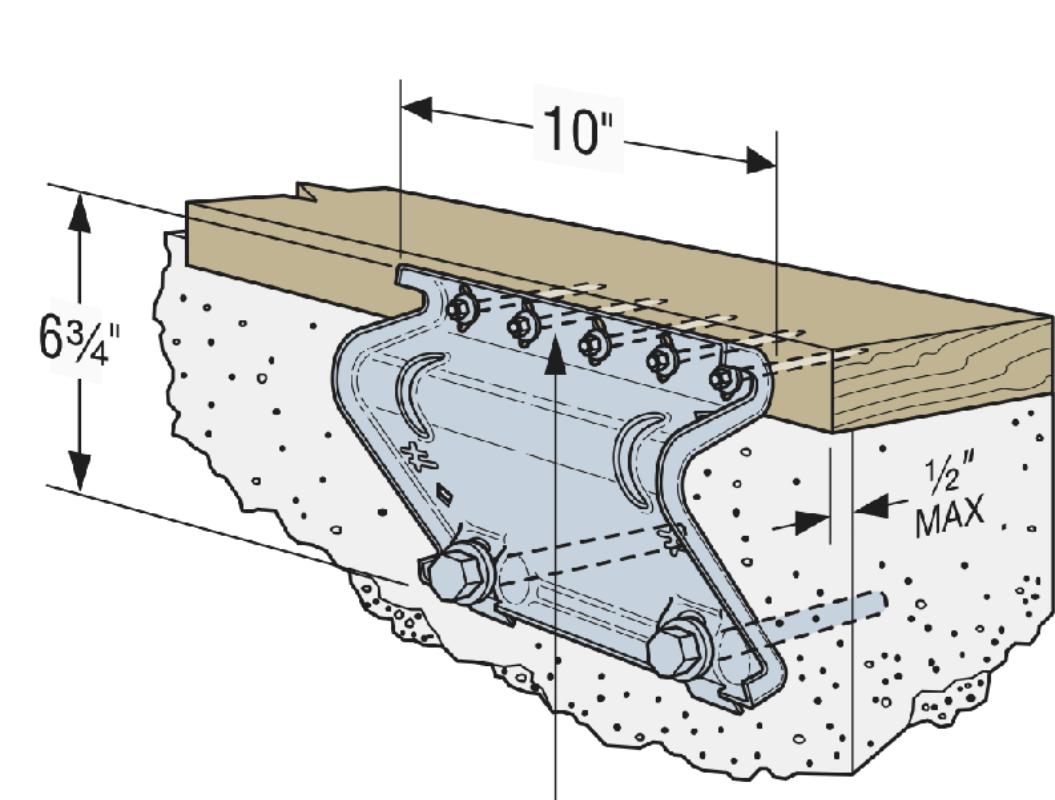


BOLTING RETROFIT



Anchoring Mudsill to Foundation
with Titen HD Anchor

NEW BOLTS ARE ADDED WHEN
THERE IS SPACE TO DRIL



UFP'S ARE USED
WHEN THERE ISN'T
SPACE TO DRILL
NEW BOLTS



CRIPPLE WALLS



House is supported on cripple walls

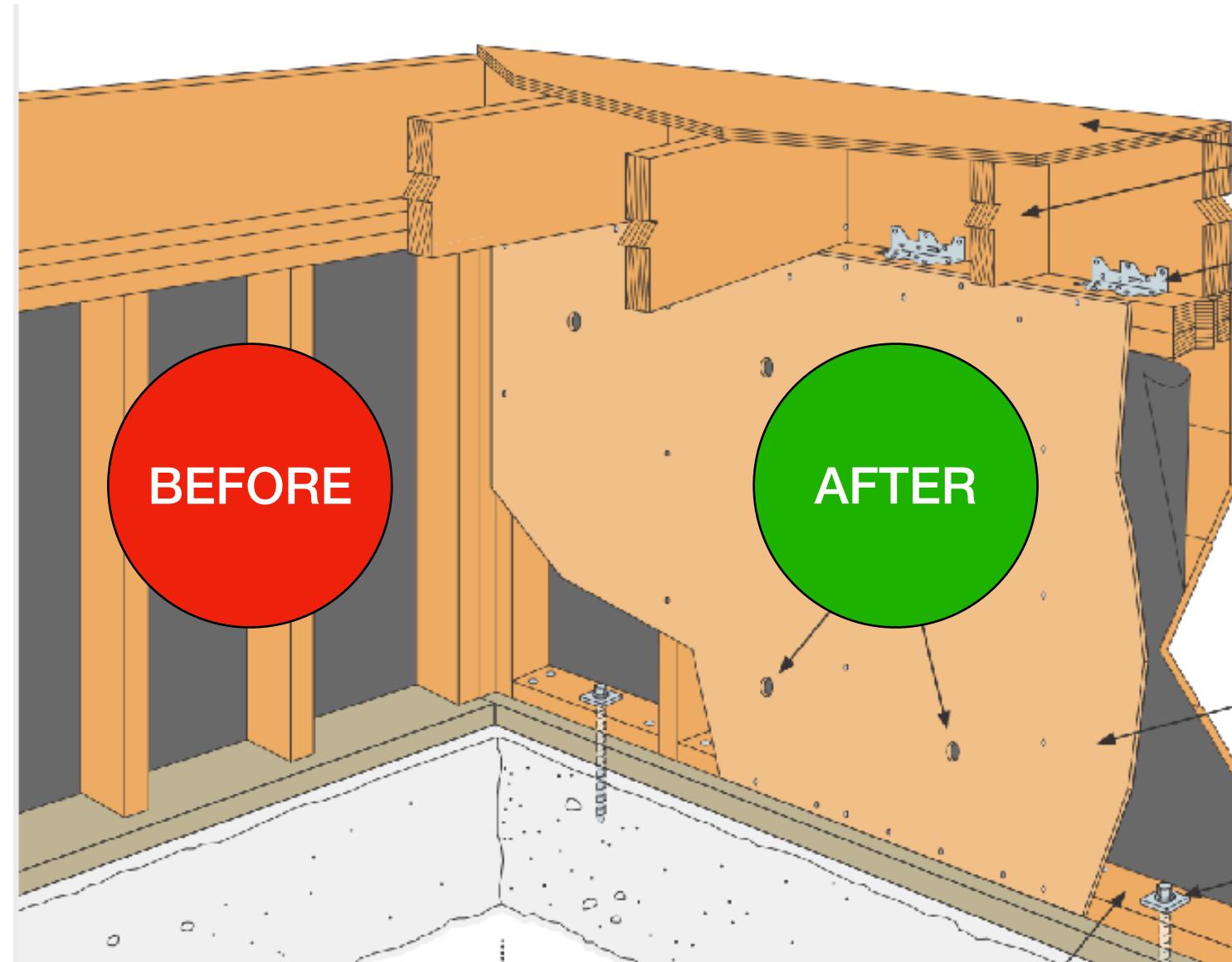
Earthquake moves the foundation

House rocks on the cripple wall

House falls when the cripple wall collapses



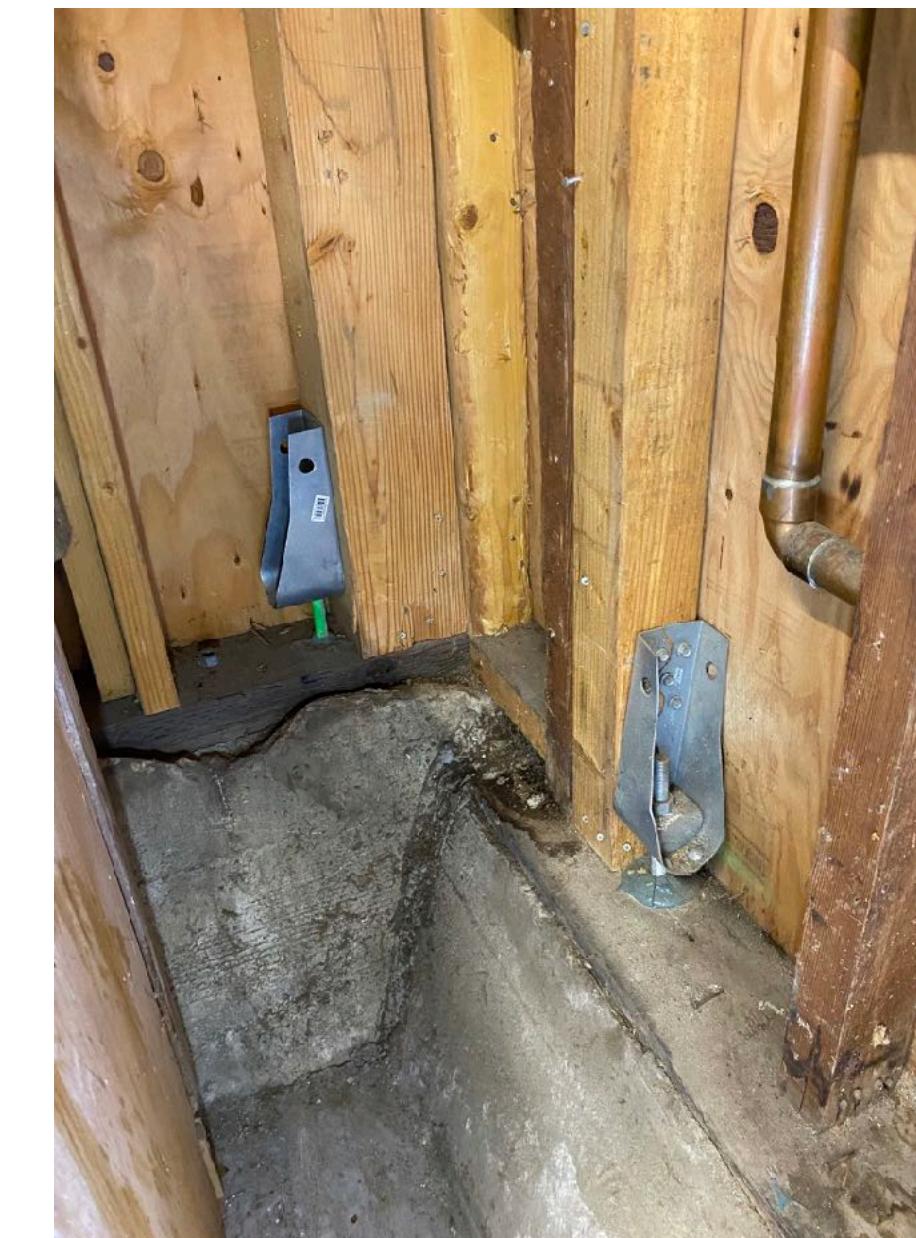
CRIPPLE WALL RETROFIT



OVERVIEW

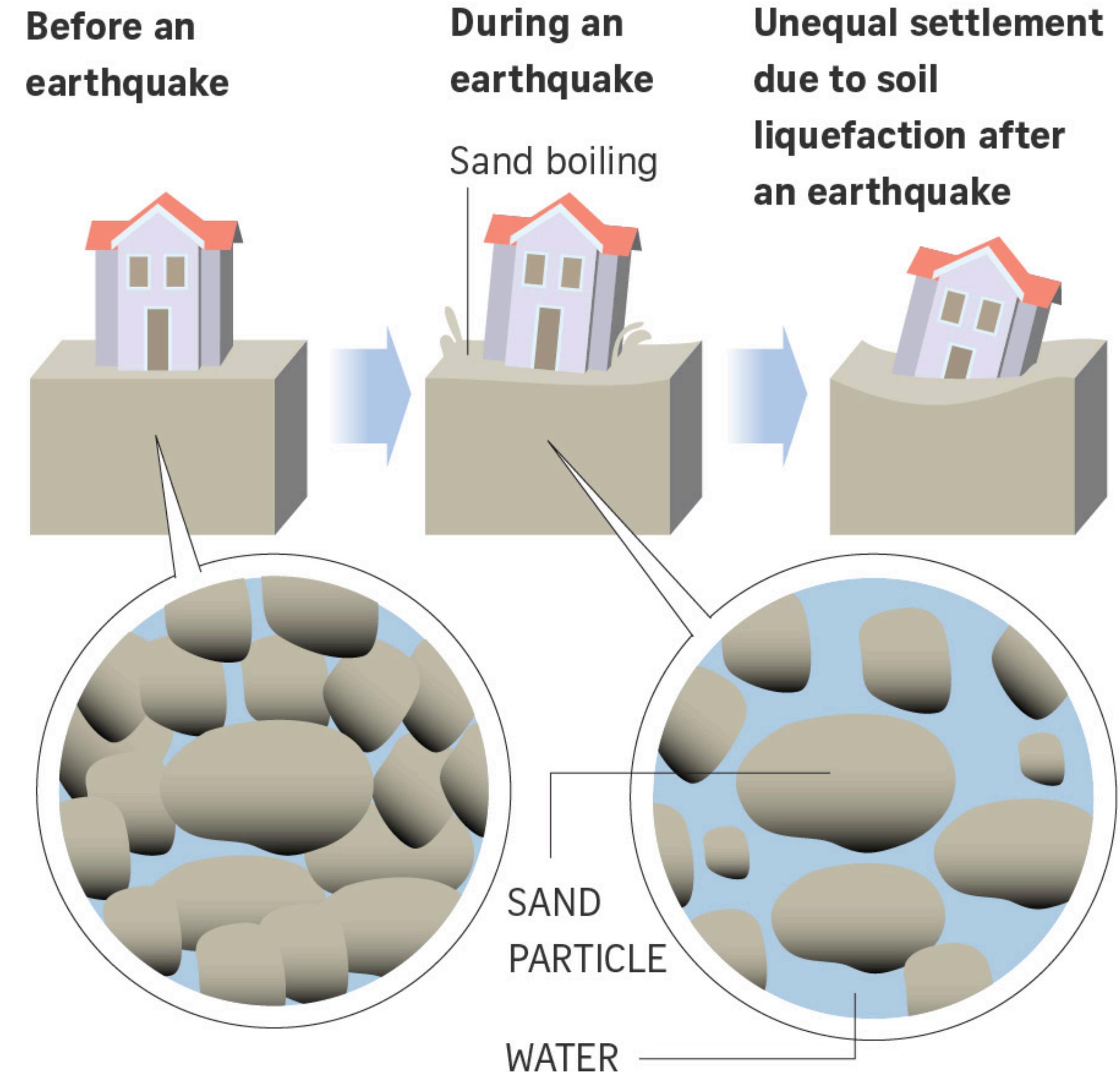
- 'Sheer Panels' are installed over the studs
- Consists of plywood of a specified type and thickness
- Nailed in a specified spacing pattern
- Walls 4' and under are 'pre-engineered' over 4' requires design

REAL WORLD EXAMPLES



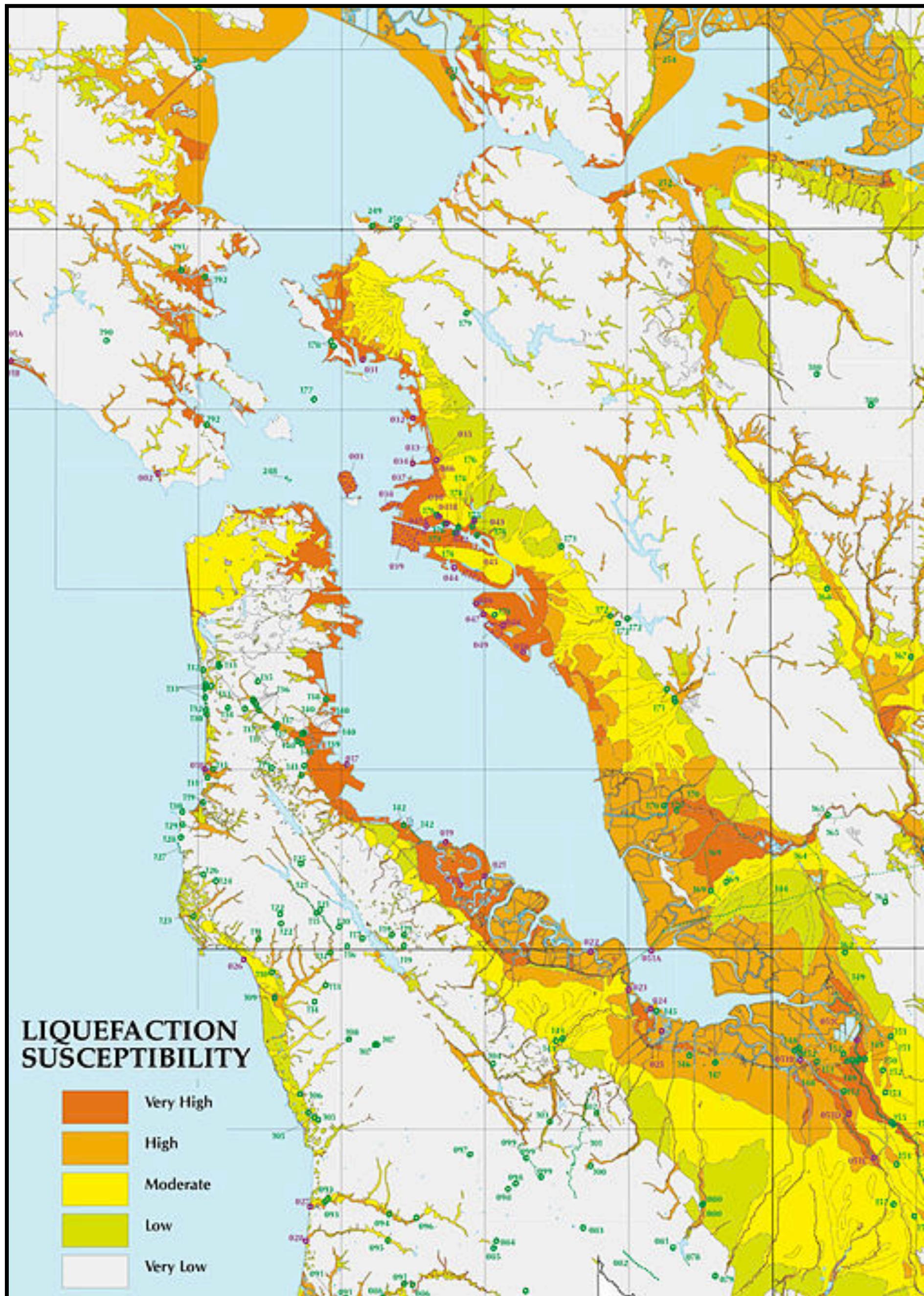
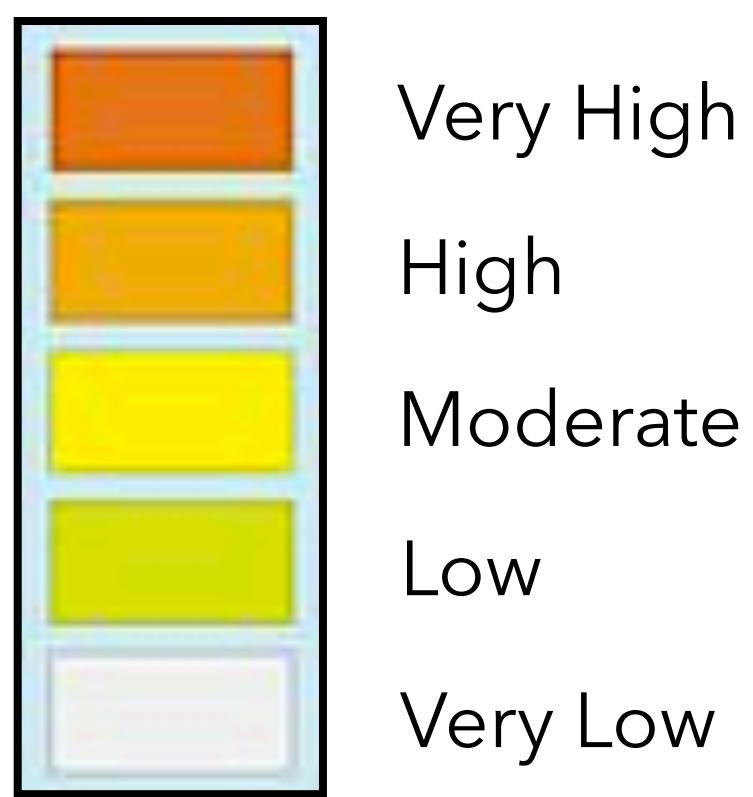
LIQUEFACTION

Phenomenon in which water-saturated sandy layers of earth act like liquids due to the pressure created by earthquakes.

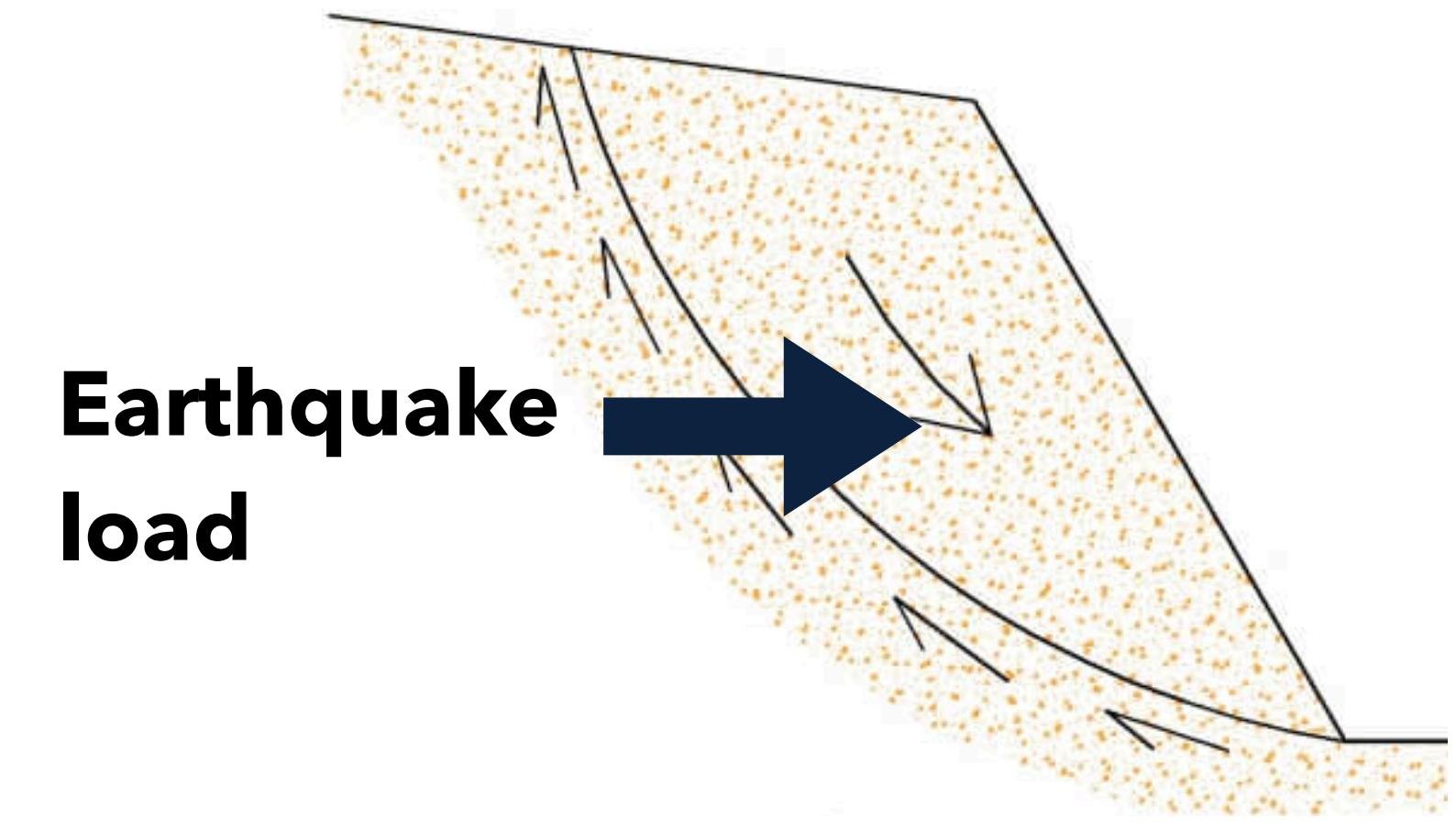


LIQUEFACTION REGION MAP

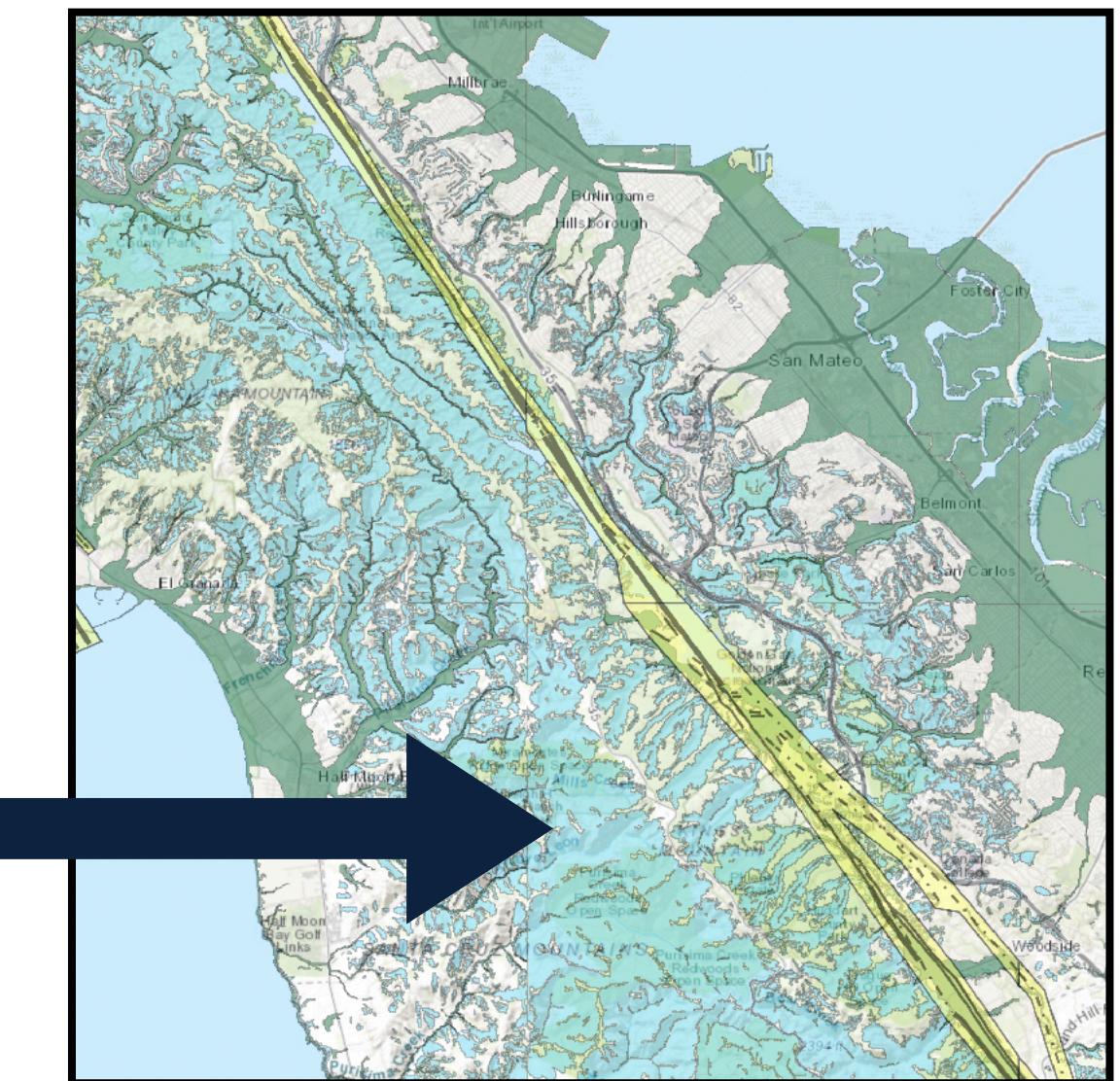
LIQUEFACTION SUSCEPTIBILITY



SEISMIC INDUCED LANDSLIDE



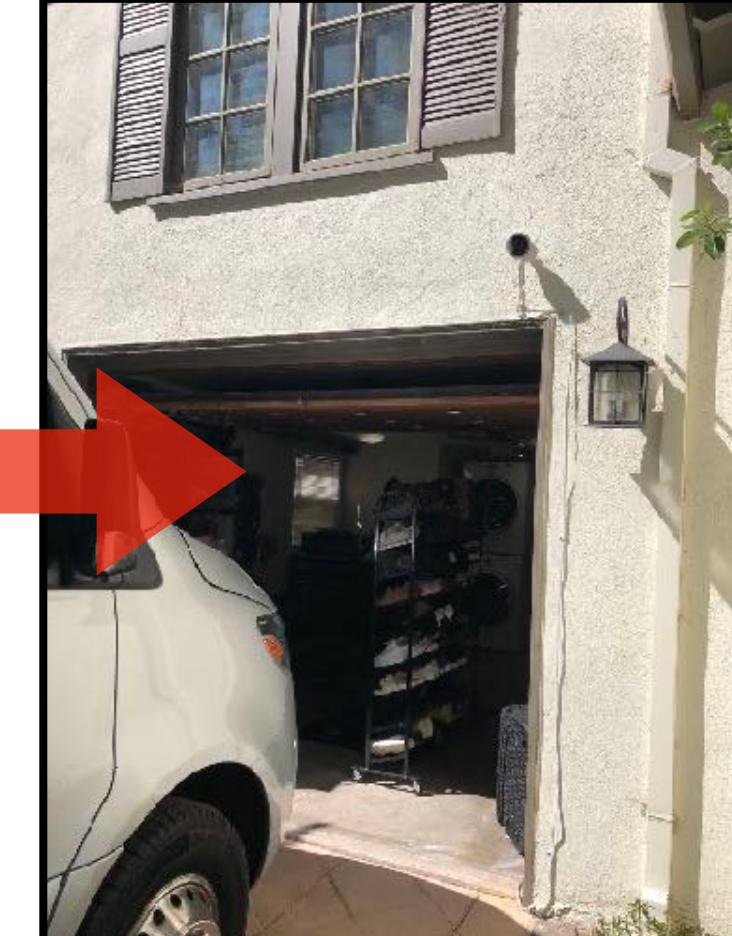
**Mapped
Areas**



WEAK / SOFT STORY



**FAILURE
POTENTIAL**



**GARAGE
OPENINGS**



**MOMENT FRAME
RETROFIT**

RETROFIT OPTIONS

- Option 1: Steel 'Moment Frame' is installed around the perimeter of the opening.
- Option 2: Shear walls can be added on either side of the opening if there is enough space

WEAK STORY



Single Family Failure

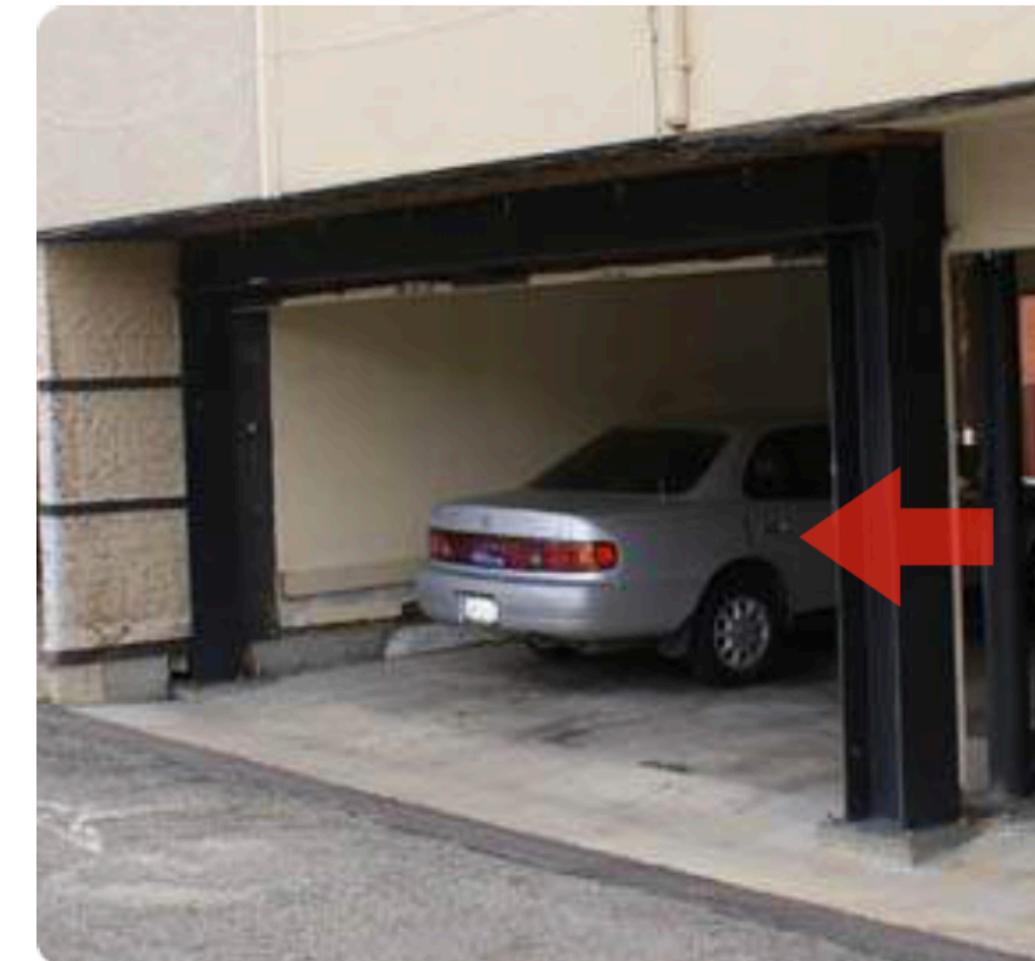


Apartment Bldg Failure



What It Looks Like

Large opening with a living space(s) above it



How It's Retrofitted

A 'Moment Frame' is installed around the perimeter of the opening.

In some instances shear walls can be added on either side of the opening if there is enough space for shear walls

Other options could be closing up the opening with shear walls but this blocks the parking access.

THANKS!



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