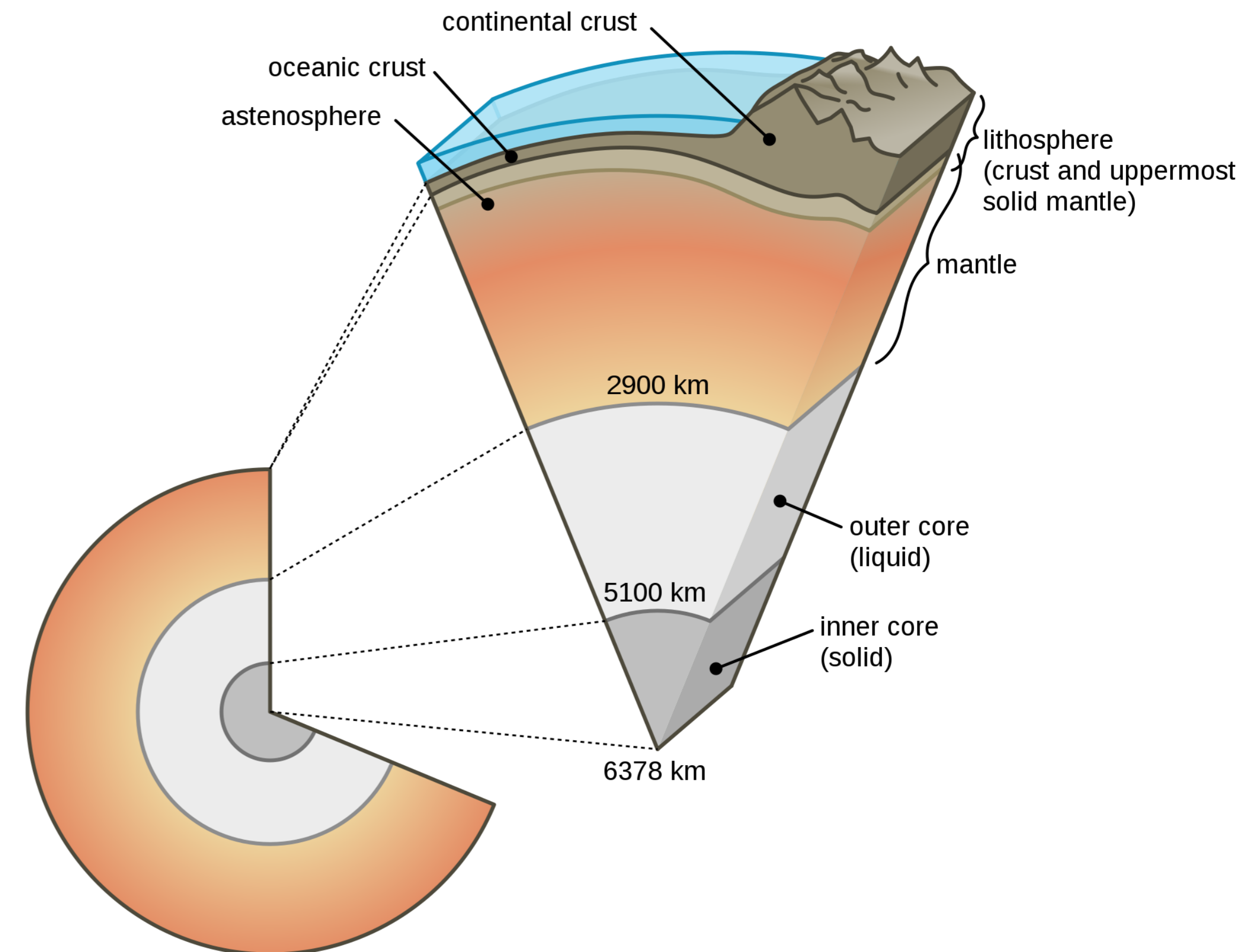


Walk-In Cooler & Freezer  
Anchoring and Seismic Anchoring  
June 20, 2022

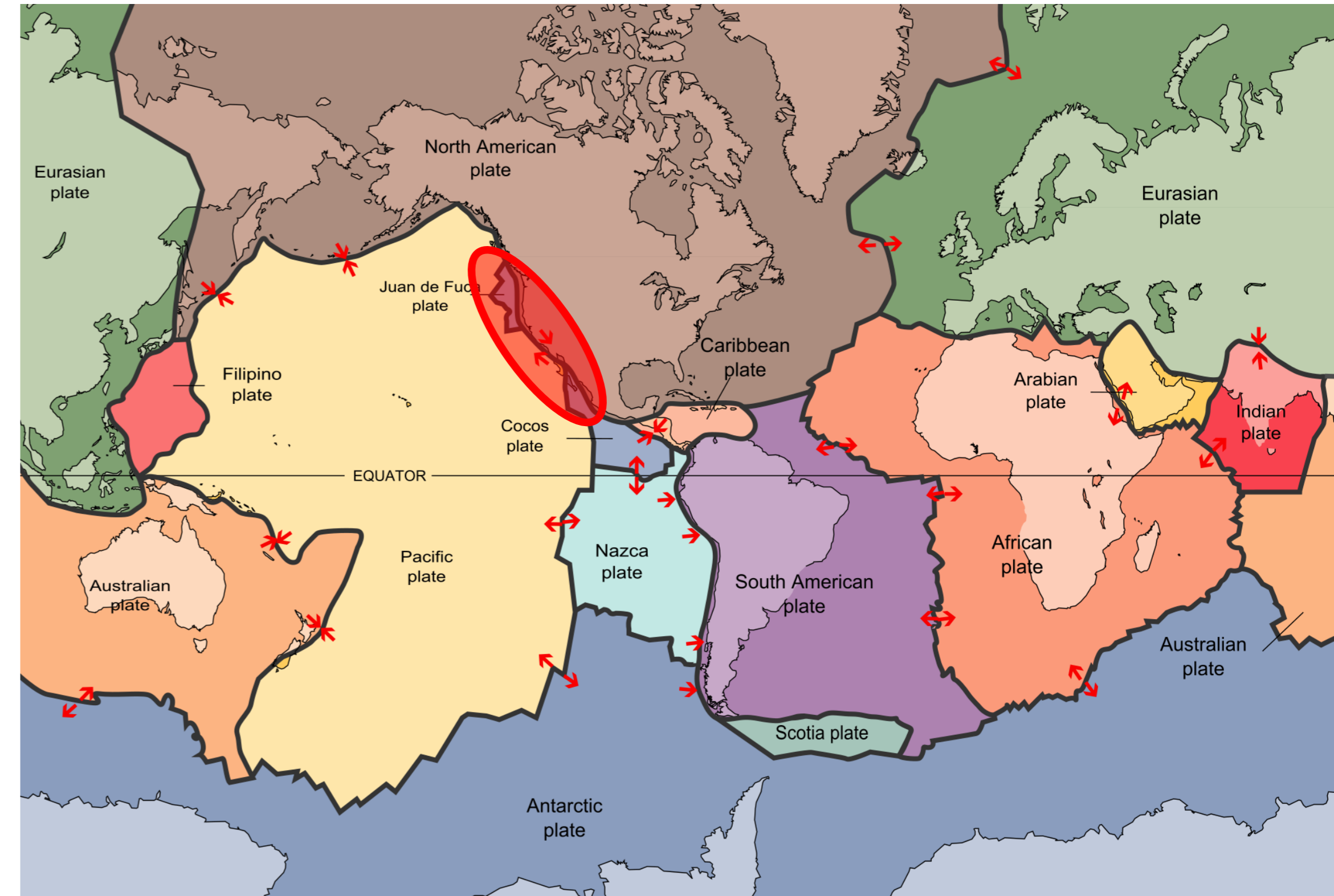
# Internal Layering of the Earth

- The Earth's lithosphere is its rigid outer shell
- The lithosphere is stronger than the lower mantle and able to move (slide) relative to the lower mantle
- It is believed that convection in the mantle and density variations in the crust drive tectonic plate movement



# Tectonic Plates

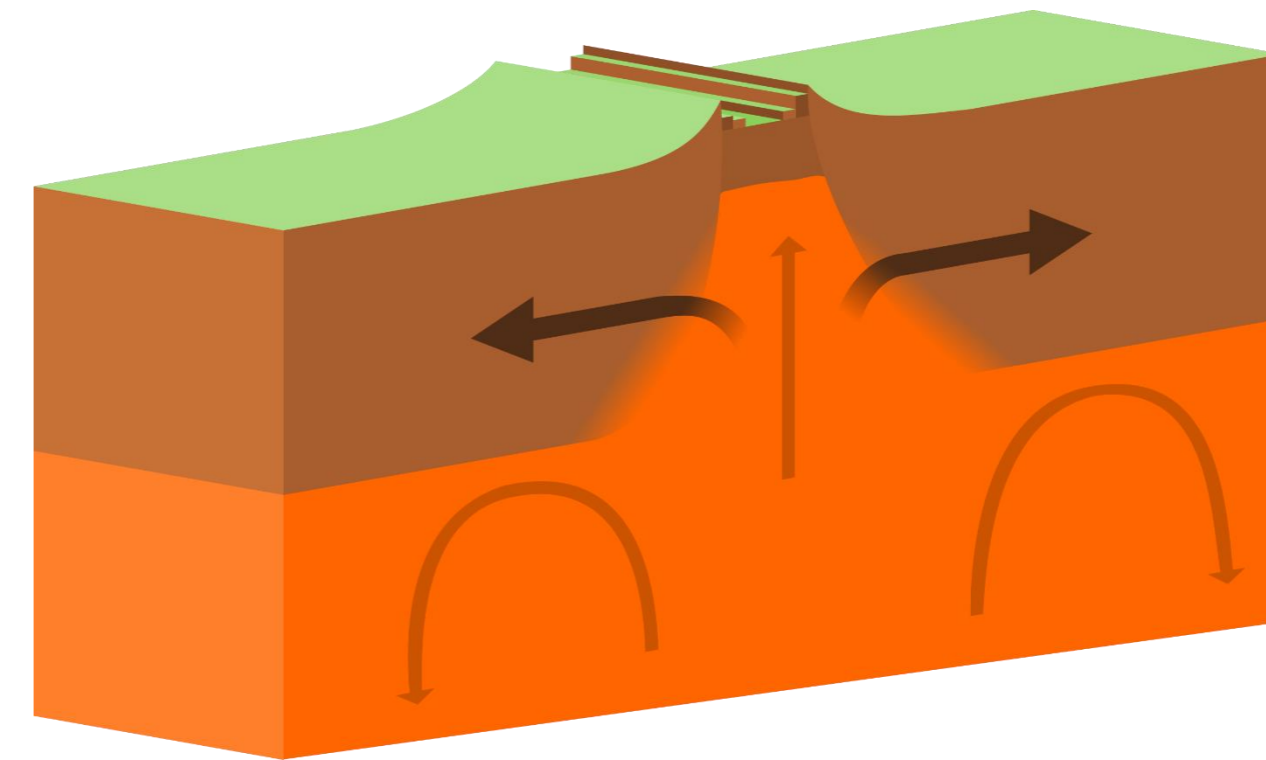
- The Earth has 8 major and several smaller tectonic plates
- Most of the Earth's volcanic and earthquake zones are located at or near plate boundaries



# Plate Boundaries

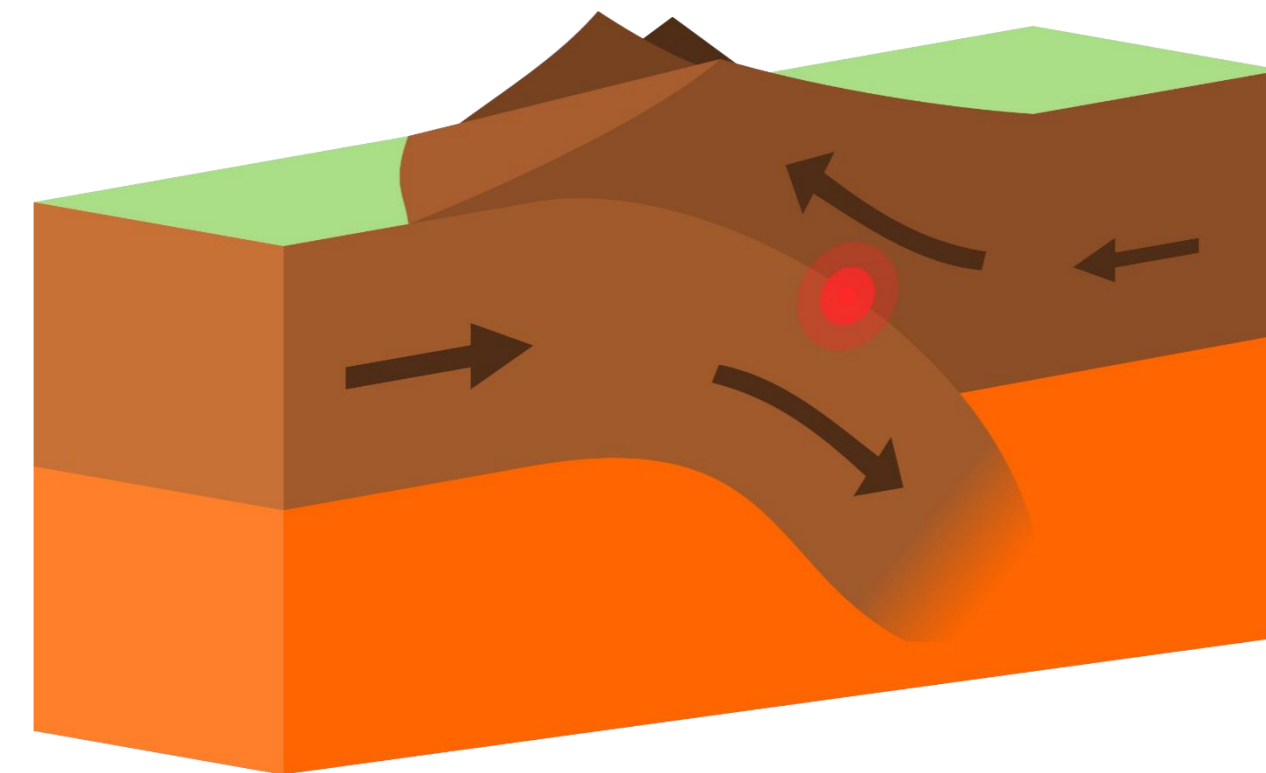
## Divergent Boundaries

- Plates slide away from each other
- Crust thins and swells up creating an ocean ridge
- Plates may collapse creating a large ocean basin



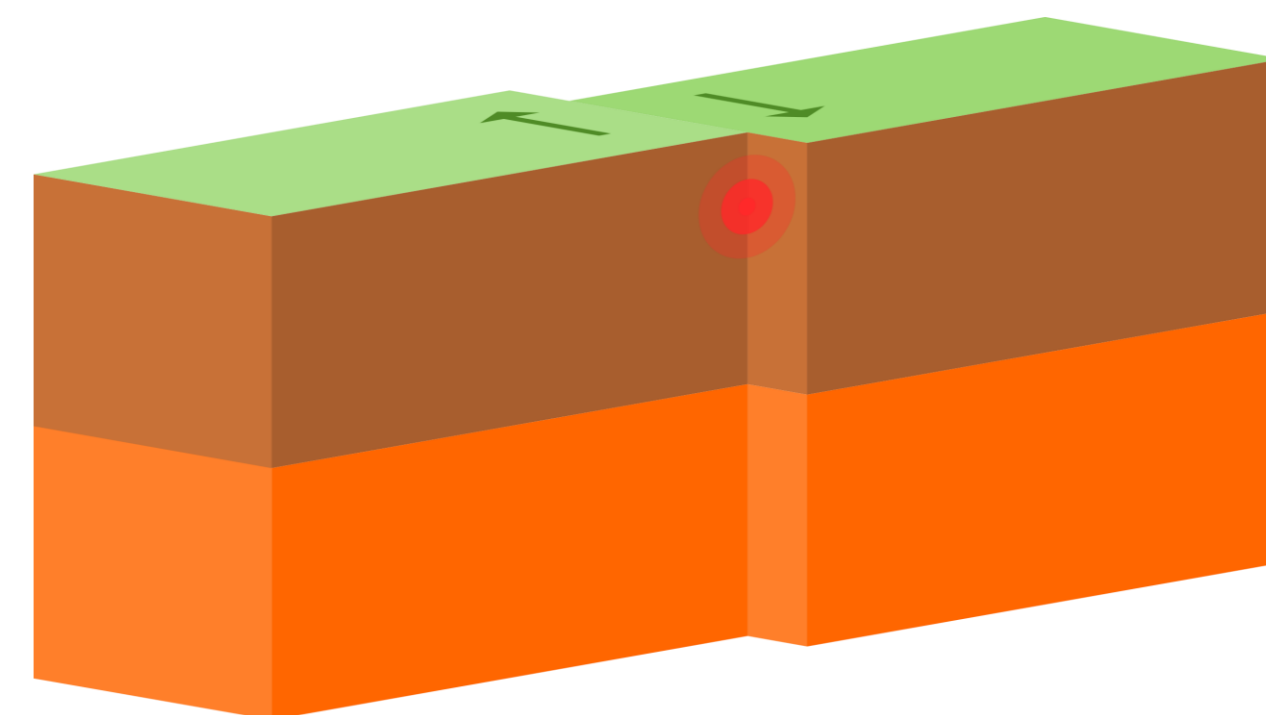
## Convergent Boundaries

- Plates slide towards each other
- One plate moves under the other or a continental collision
- Plate descending under the other plate melts causing volcanoes and earthquakes

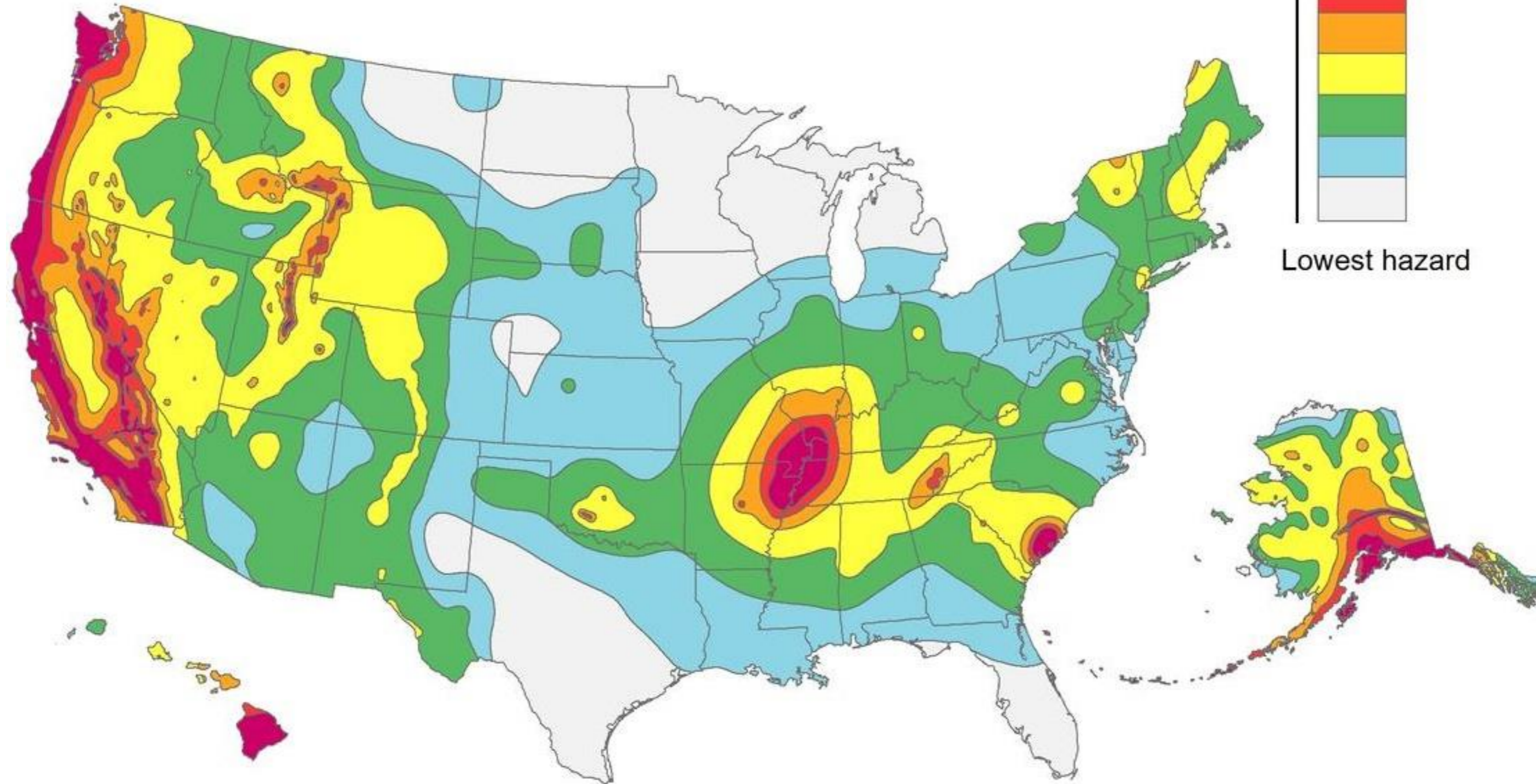


## Transform Boundaries

- Plates slide past each other in geological time
- In real time plates, grab, grind, stick, and lurch past each other
- Strong earthquakes can occur along transform faults



# USGS Earthquake Hazard Map



WALK-IN COOLERS AND FREEZERS

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## Video #1

- 0:04 – 0:16
- 2:30 – 2:40

<https://www.youtube.com/watch?v=7IPbCvwbhOg>

## Video #2

- 1:24 – 1:34
- 2:17 – 2:22
- 2:33 – 2:54

<https://www.youtube.com/watch?v=9uMtkrrNgzQ>



WALK-IN COOLERS AND FREEZERS

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# Walk-In Cooler & Freezer Seismic Anchoring

## Goal

- During a seismic event, eliminate/minimize human injury
- During a seismic event, eliminate/minimize property damage and destruction

## Strategy

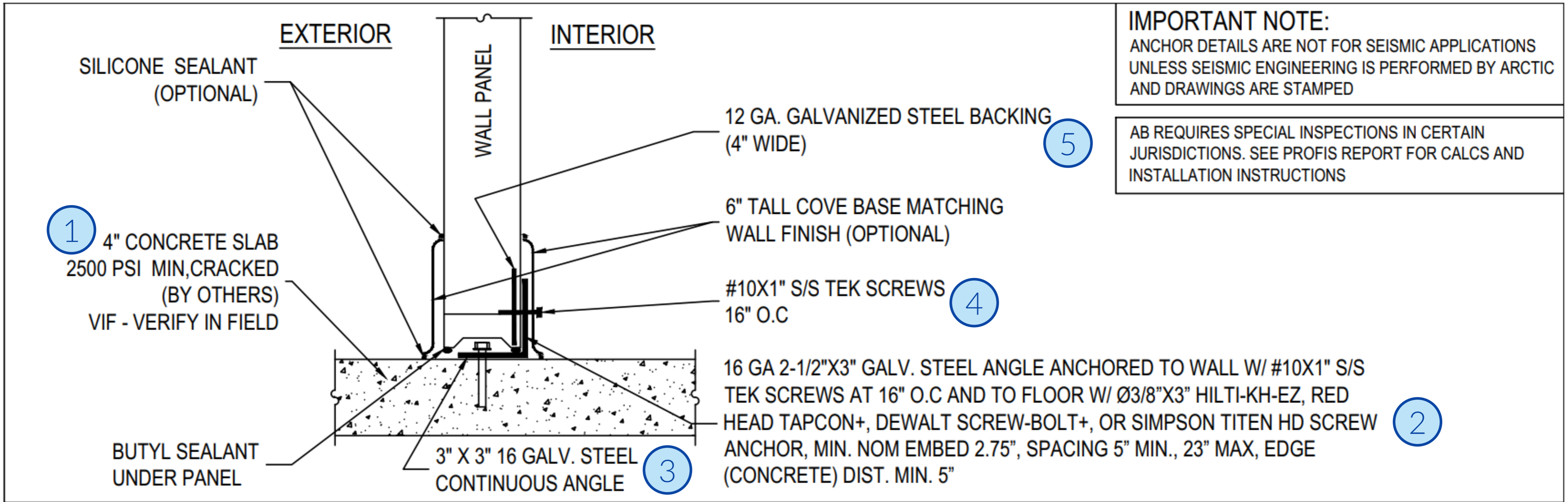
- Prevent/reduce likelihood of walk-in tipping or rolling
- Prevent/reduce likelihood of walk-in collapsing

## Tactic

- Anchor walk-in to the floor
- On occasion anchor walk-in to building walls
- On occasion add structural members such as beams and columns to anchor walk-in to
- On occasion tie walk-in together with strapping and/or a steel skeleton



# Key Components of Seismic Anchoring



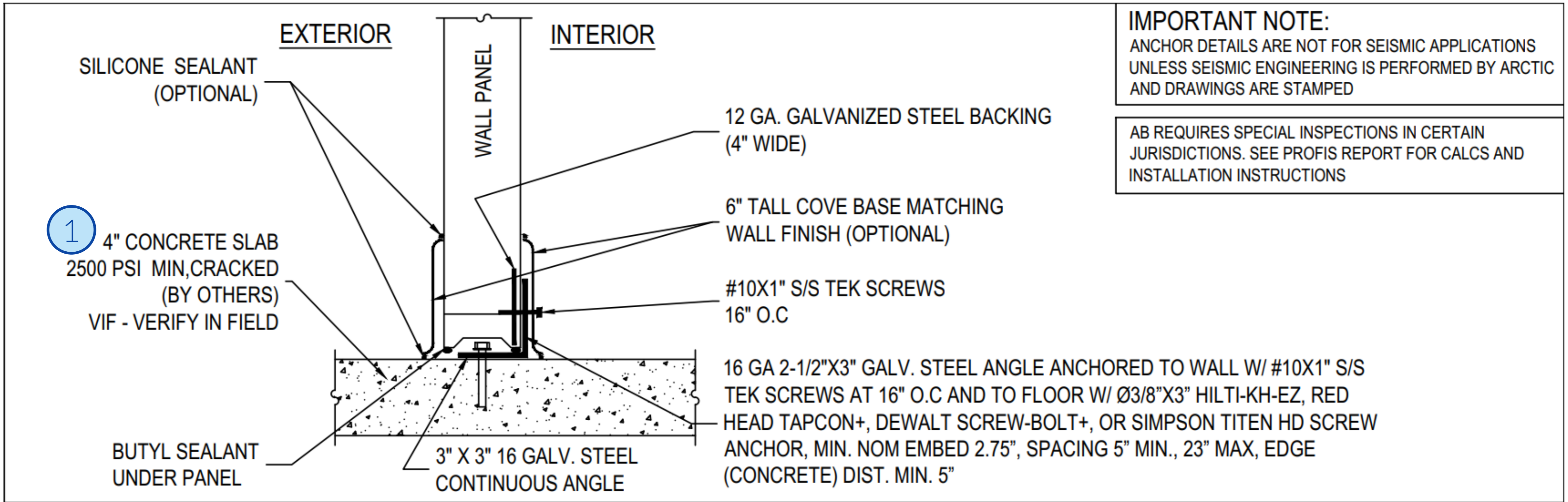
**IMPORTANT NOTE:**  
ANCHOR DETAILS ARE NOT FOR SEISMIC APPLICATIONS UNLESS SEISMIC ENGINEERING IS PERFORMED BY ARCTIC AND DRAWINGS ARE STAMPED

AB REQUIRES SPECIAL INSPECTIONS IN CERTAIN JURISDICTIONS. SEE PROFIS REPORT FOR CALCS AND INSTALLATION INSTRUCTIONS

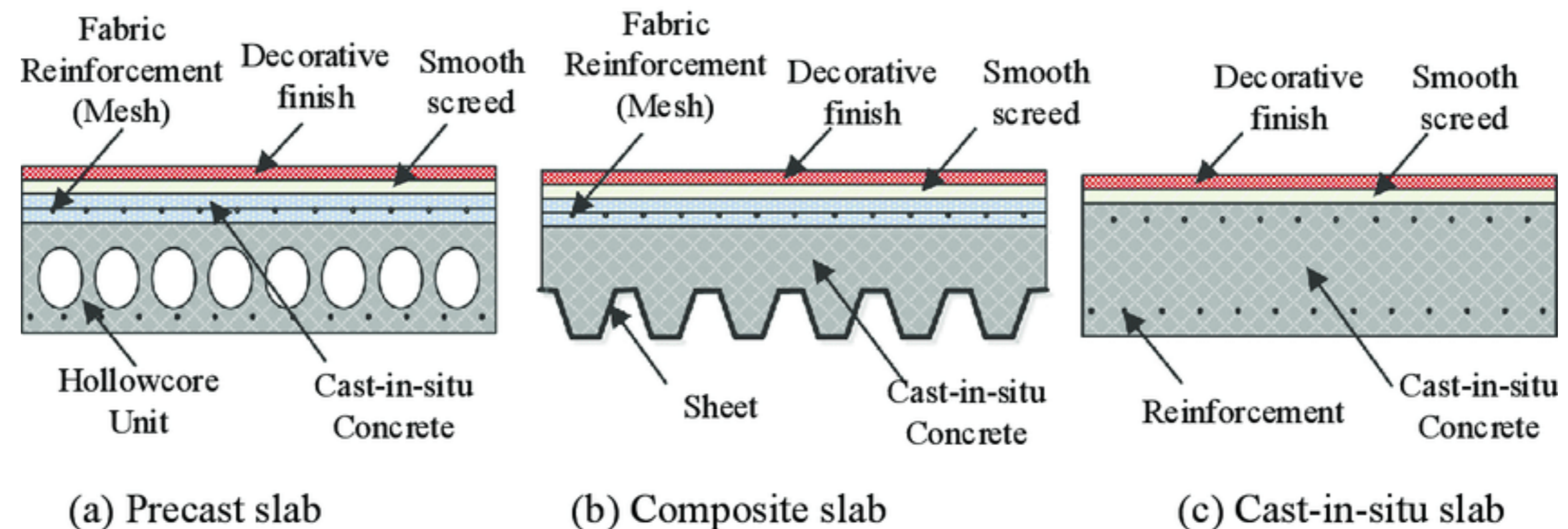
- 1 Floor engineered to hold the anchors from pulling out
- 2 Ø3/8" x 3" Hilti-KH-EZ, Red Head Tapcon+, DeWalt Screw-Bolt+, or Simpson TitenHD screw anchors or Ø3/8" x 3-1/2" lag screws connect the angle to the floor
- 3 18 ga. galvanized steel angle ties the walk-in to the floor
- 4 #10 x 1" TEK screws connect the angle to the walk-in
- 5 12 ga. galvanized steel backing foamed-in-place in walk-in wall provides structure to fasten to



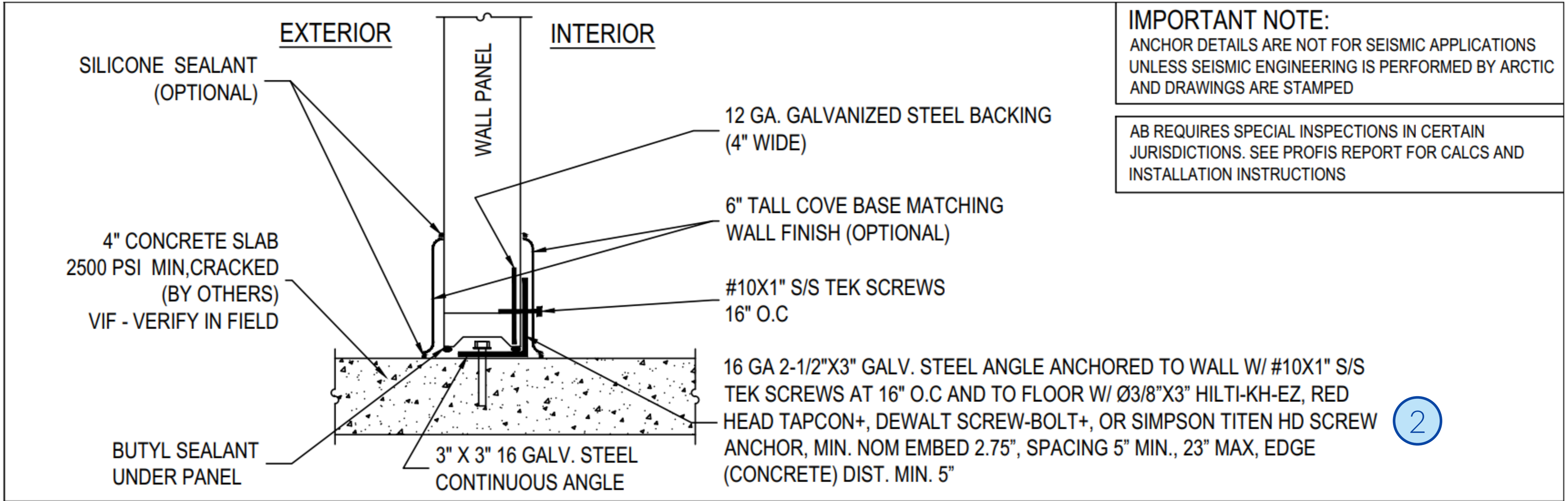
# Key Components of Seismic Anchoring



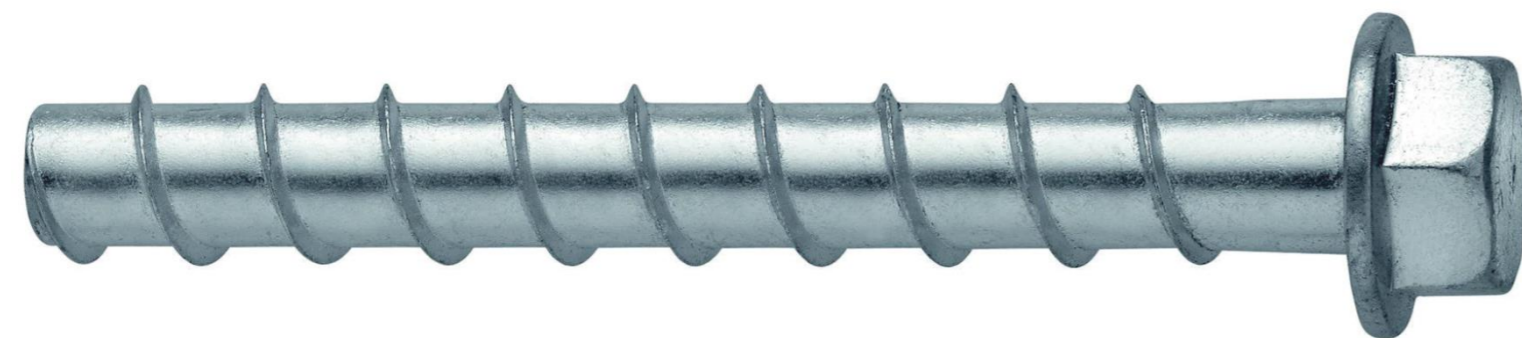
1 Floor engineered to hold the anchors from pulling out



# Key Components of Seismic Anchoring



**2** Ø3/8" x 3" long Hilti-KH-EZ, Red Head Tapcon+, DeWalt Screw-Bolt+, or Simpson TitenHD screw anchors or Ø3/8" x 3-1/2" lag screws connect the angle to the floor



Screw Anchors



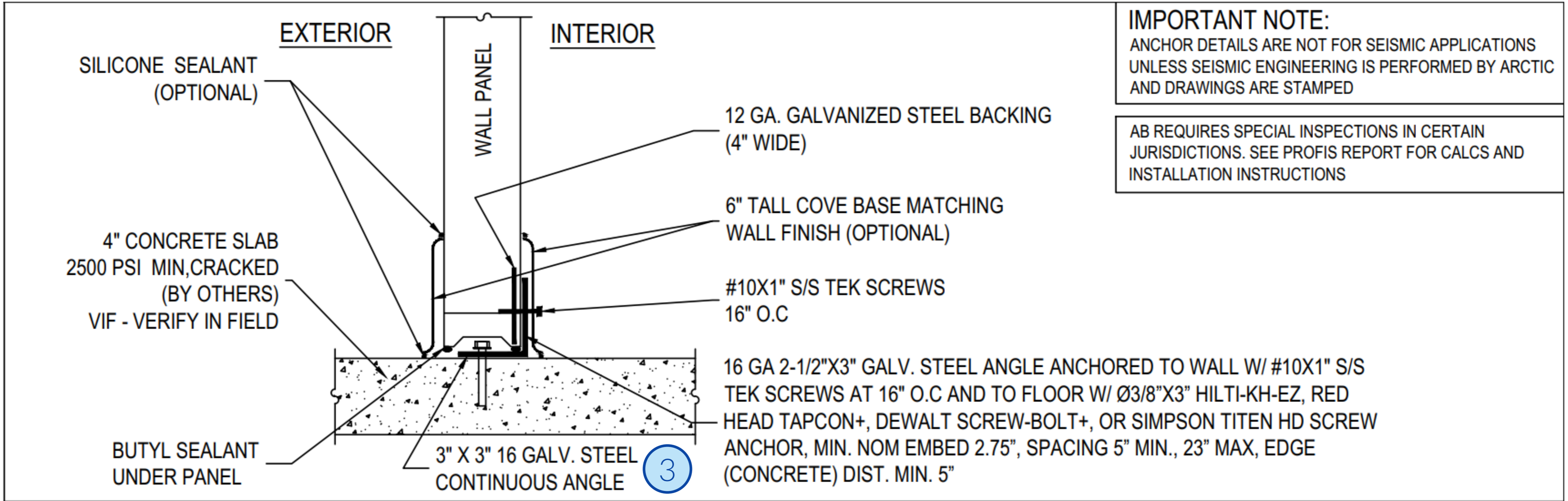
Lag Screws



WALK-IN COOLERS AND FREEZERS

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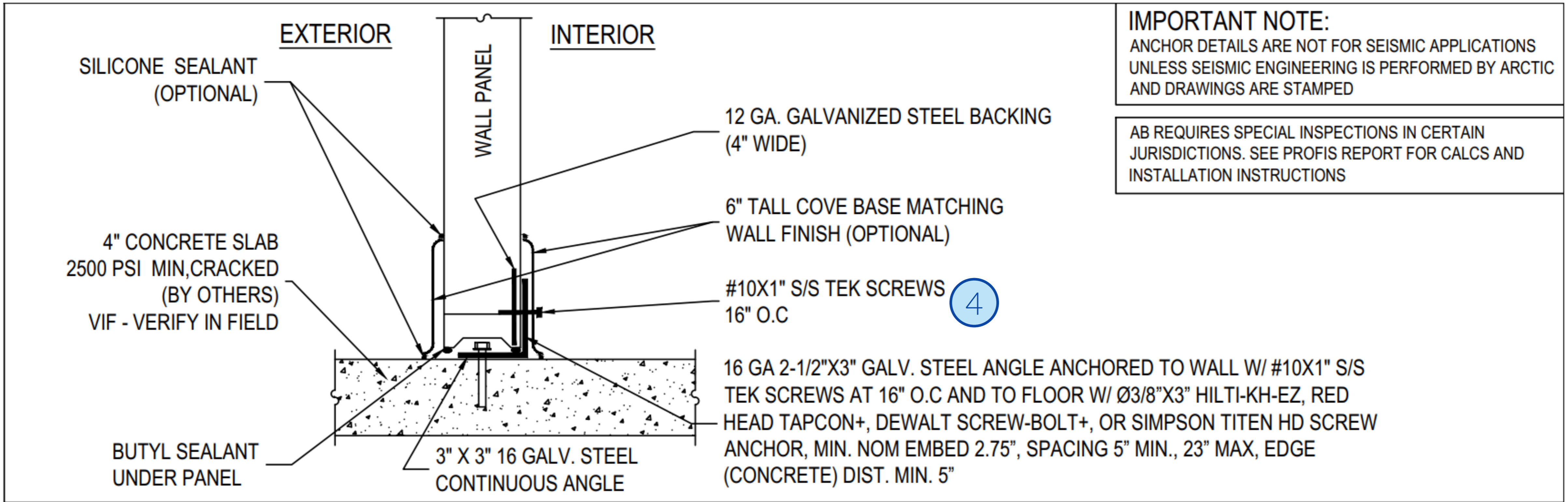
# Key Components of Seismic Anchoring



③ 16 ga. galvanized steel angle ties the walk-in to the floor



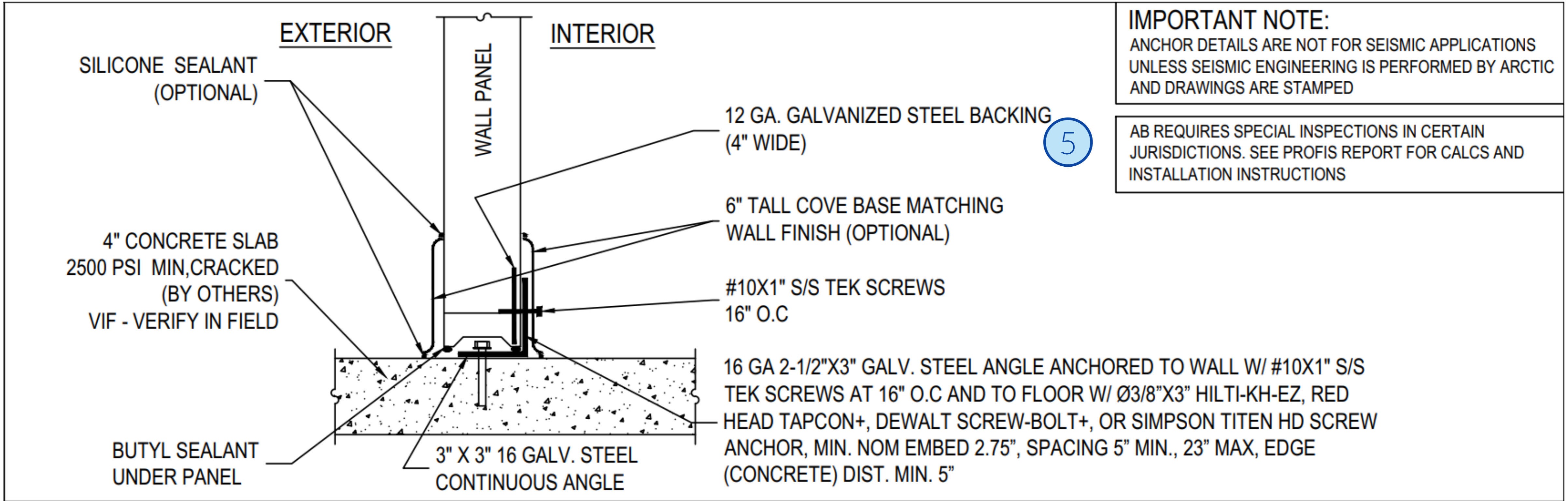
# Key Components of Seismic Anchoring



4 #10 x 1" TEK screws connect the angle to the walk-in

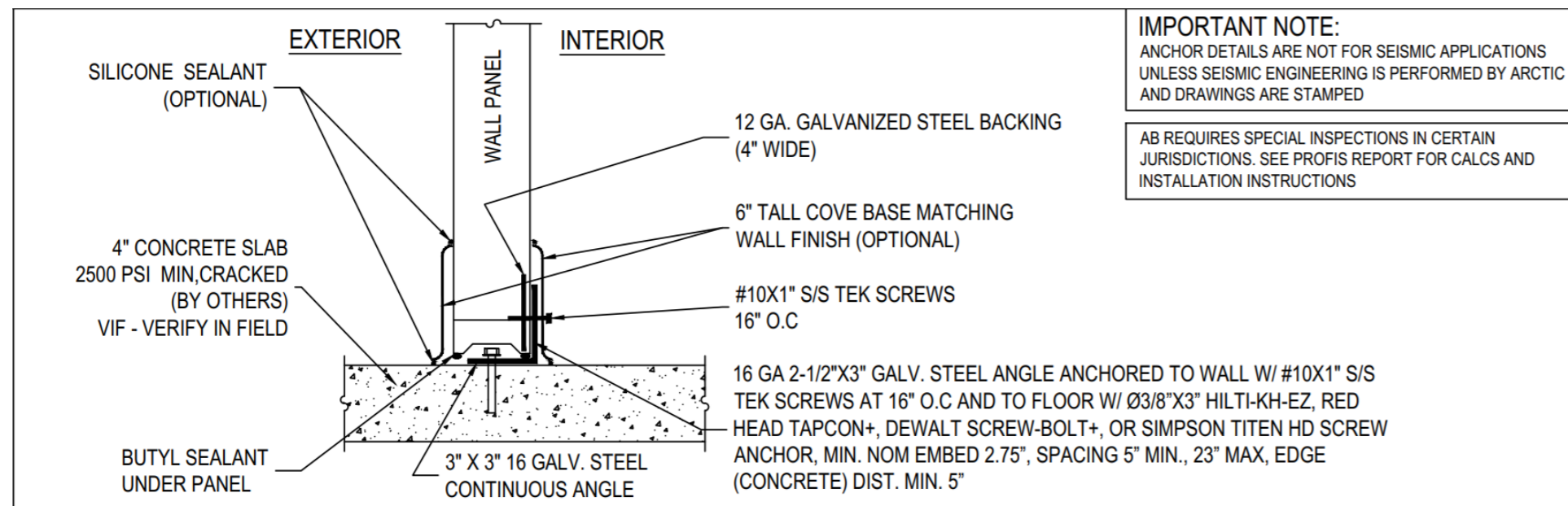


# Key Components of Seismic Anchoring

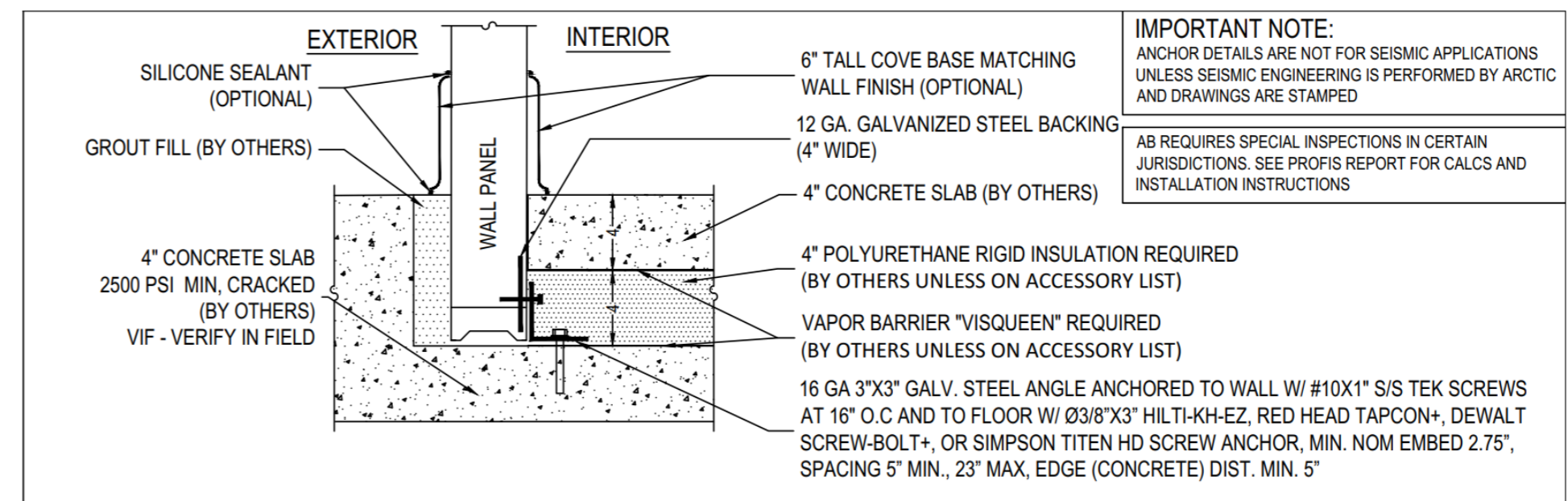


**5** 12 ga. galvanized steel backing foamed-in-place in walk-in wall provides structure to fasten to

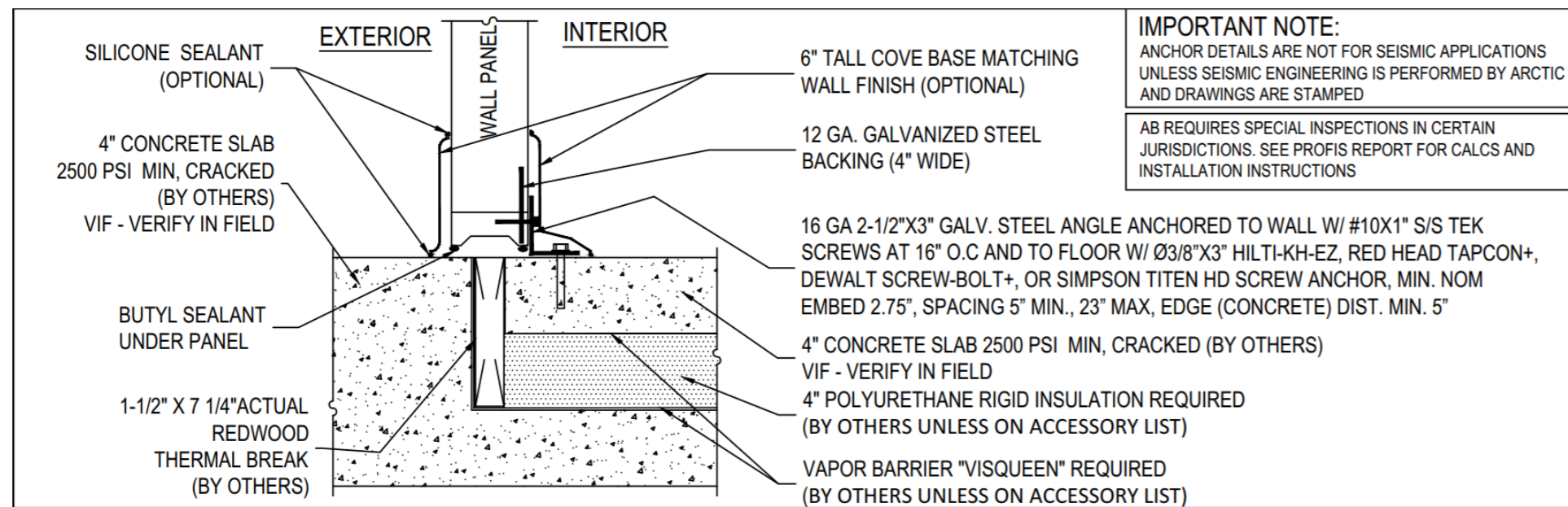
# Arctic Standard Seismic Anchoring Systems



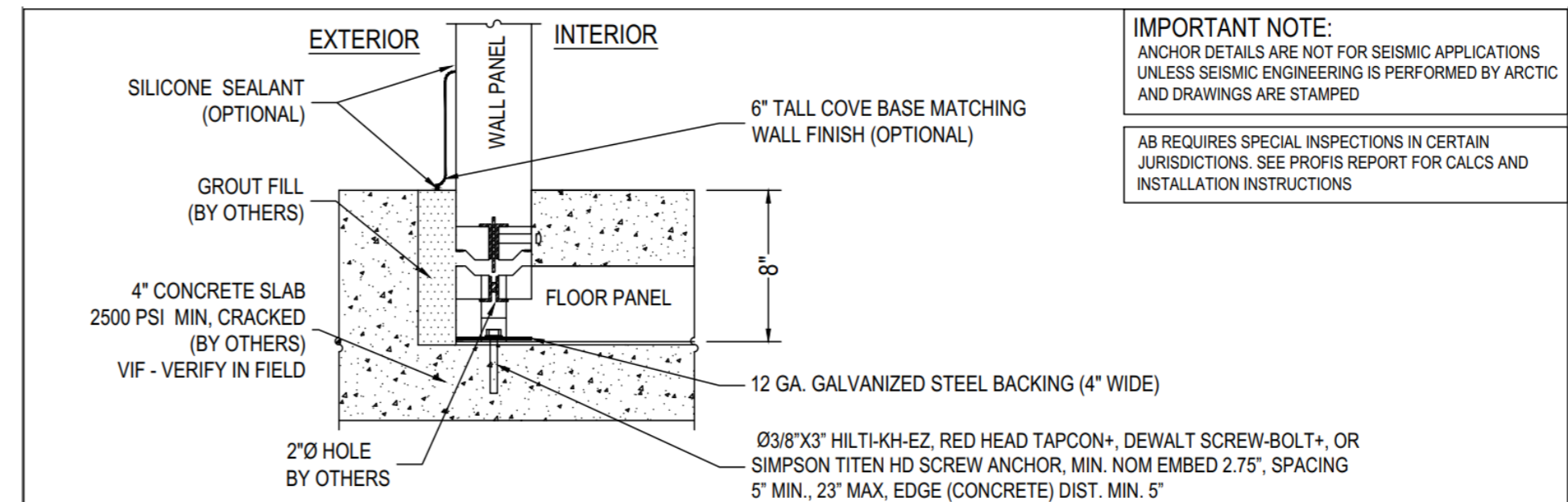
**NO FLOOR: CONCEALED ANGLE BRACKET ANCHOR**



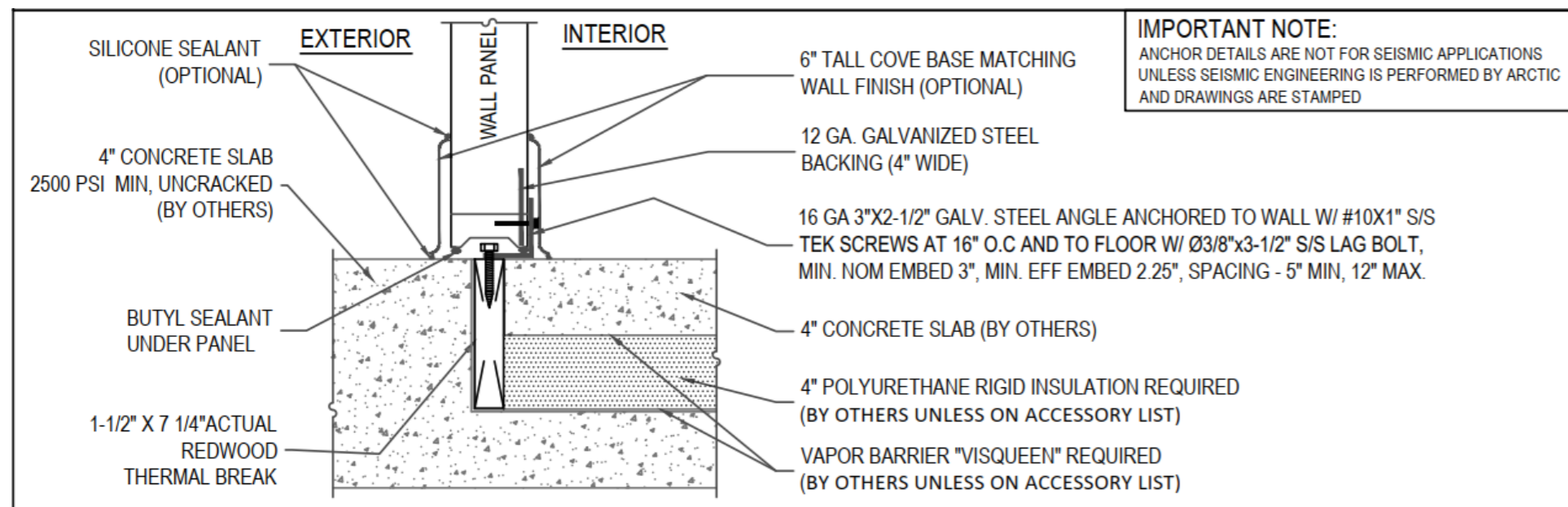
**NO FLOOR: EMBEDDED WALL ANGLE BRACKET ANCHOR**



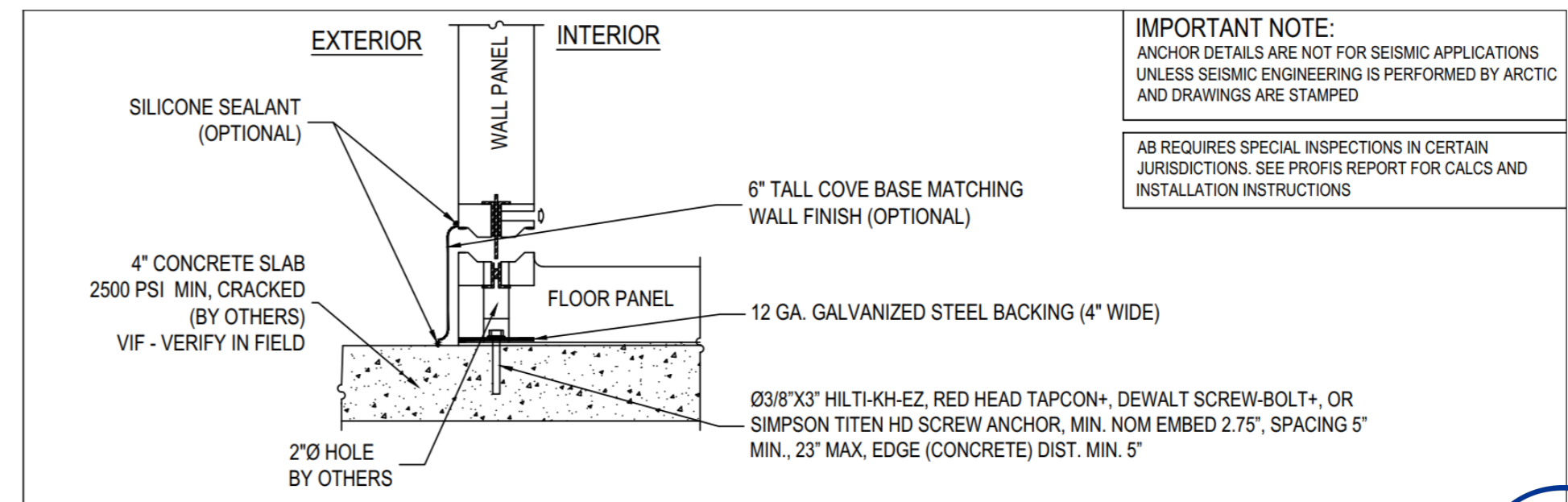
**NO FLOOR: THERMAL BREAK – EXPOSED ANGLE BRACKET ANCHOR**



**WITH FLOOR: EMBEDDED FLOOR – THROUGH FLOOR BOLTING SYSTEM**



**NO FLOOR: THERMAL BREAK – CONCEALED ANGLE BRACKET ANCHOR**



**WITH FLOOR: THROUGH FLOOR BOLTING SYSTEM**

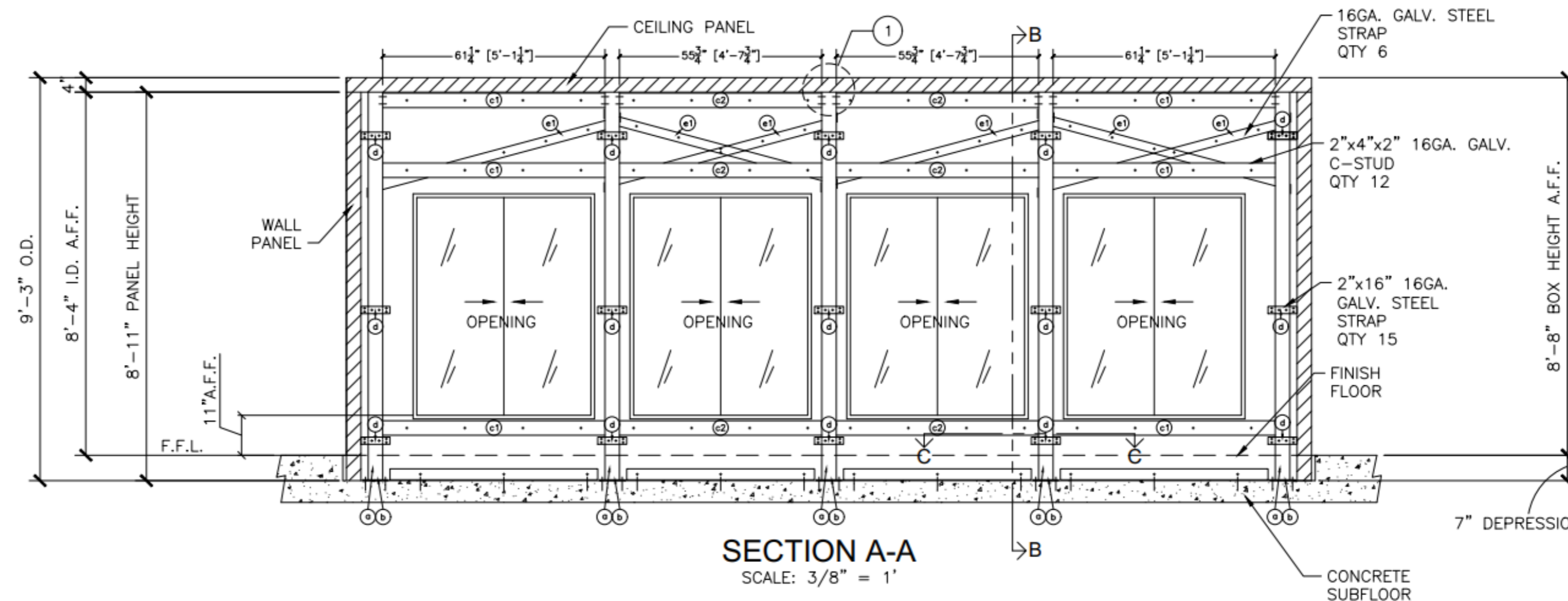
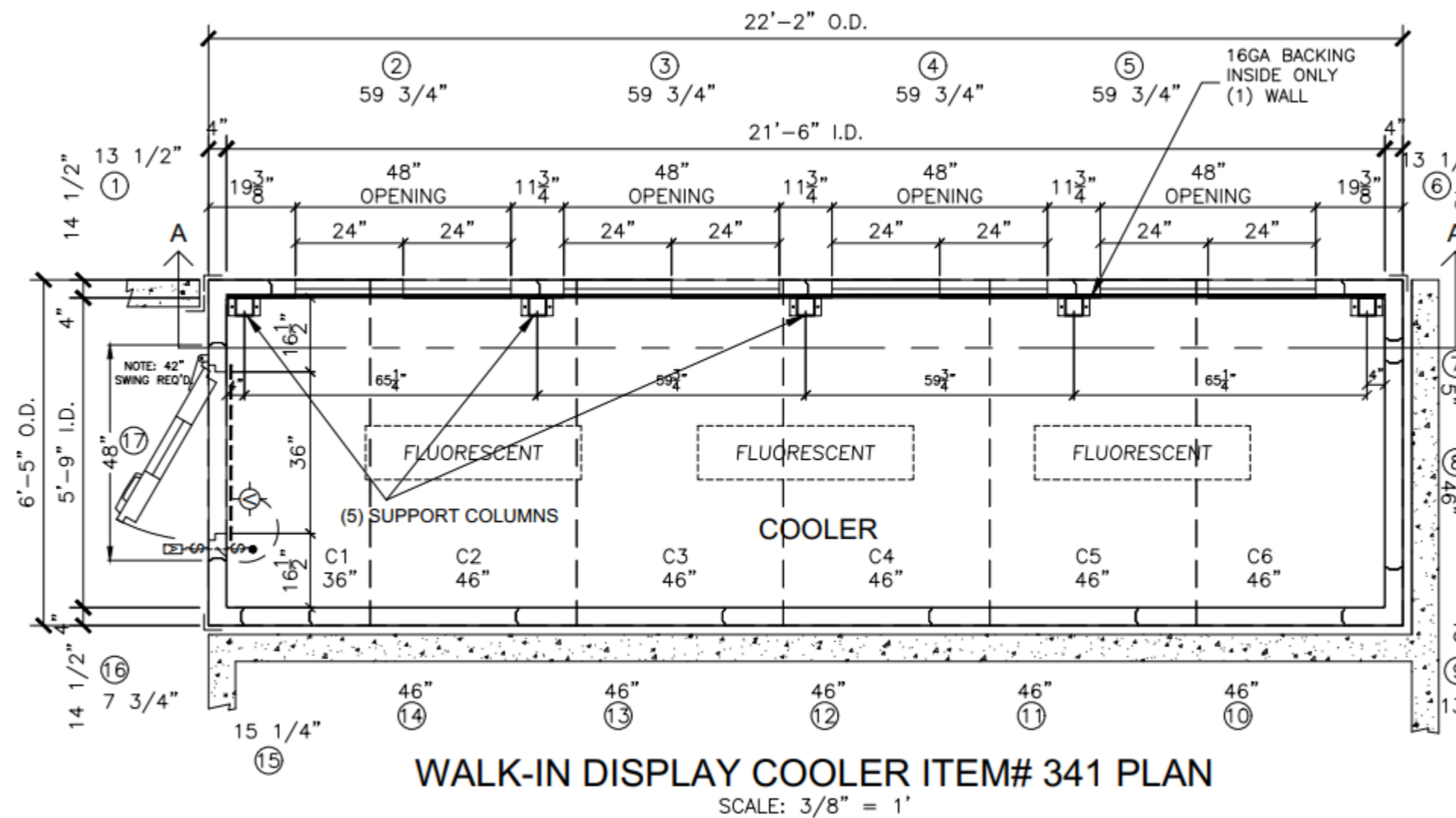


WALK-IN COOLERS AND FREEZERS

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## Complex Features

- Large diameter anchors
- Closer anchor spacing
- Anchoring to building walls
- Structural exoskeleton
- Strapping tying panels together



WALK-IN COOLERS AND FREEZERS

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# Regulating Agencies

- Local building inspector
- Los Angeles Research Reports (LARR) by Los Angeles Department of Building and Safety (LADBS)
- California's Division of State Architect (DSA) school facility seismic mitigation program
- California's Department of Health Care Access and Information (HCAI) (formerly under Office of Statewide Health Planning and Development (OSHPD))



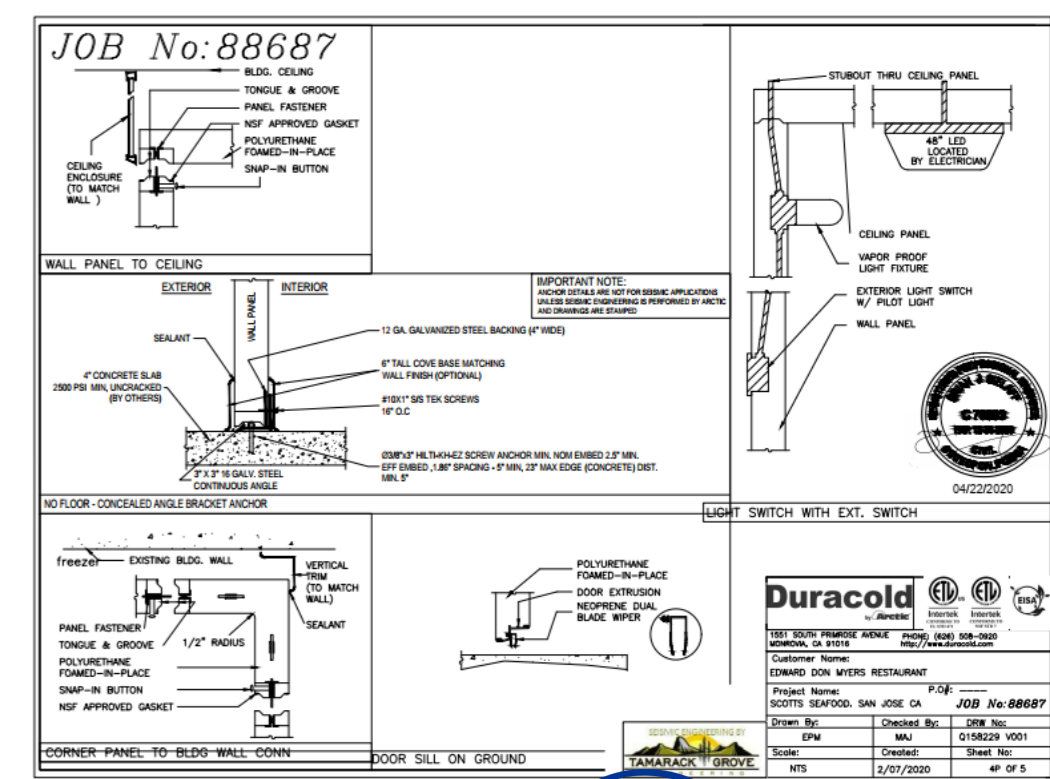
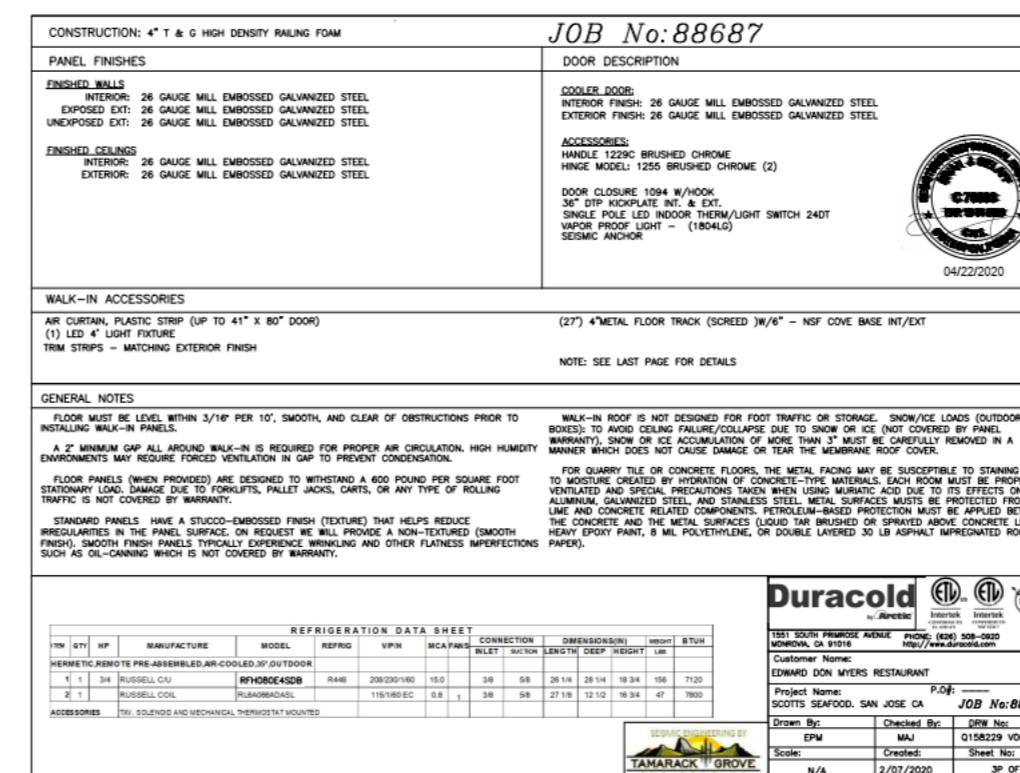
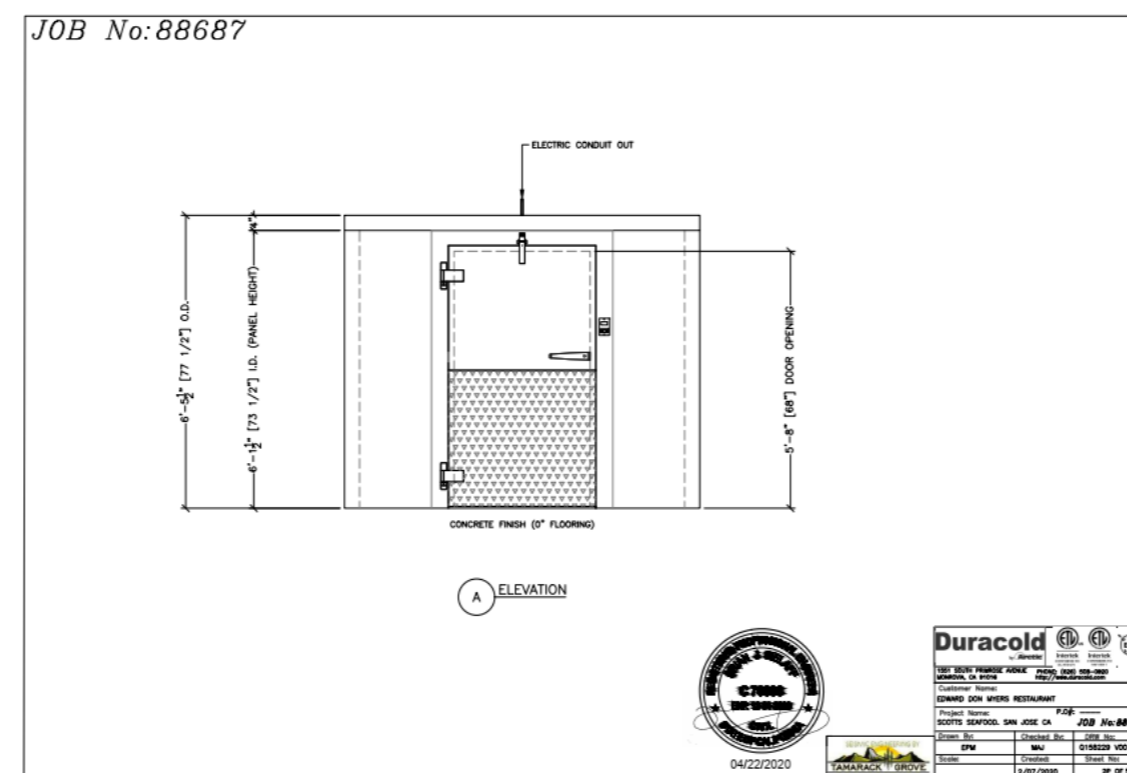
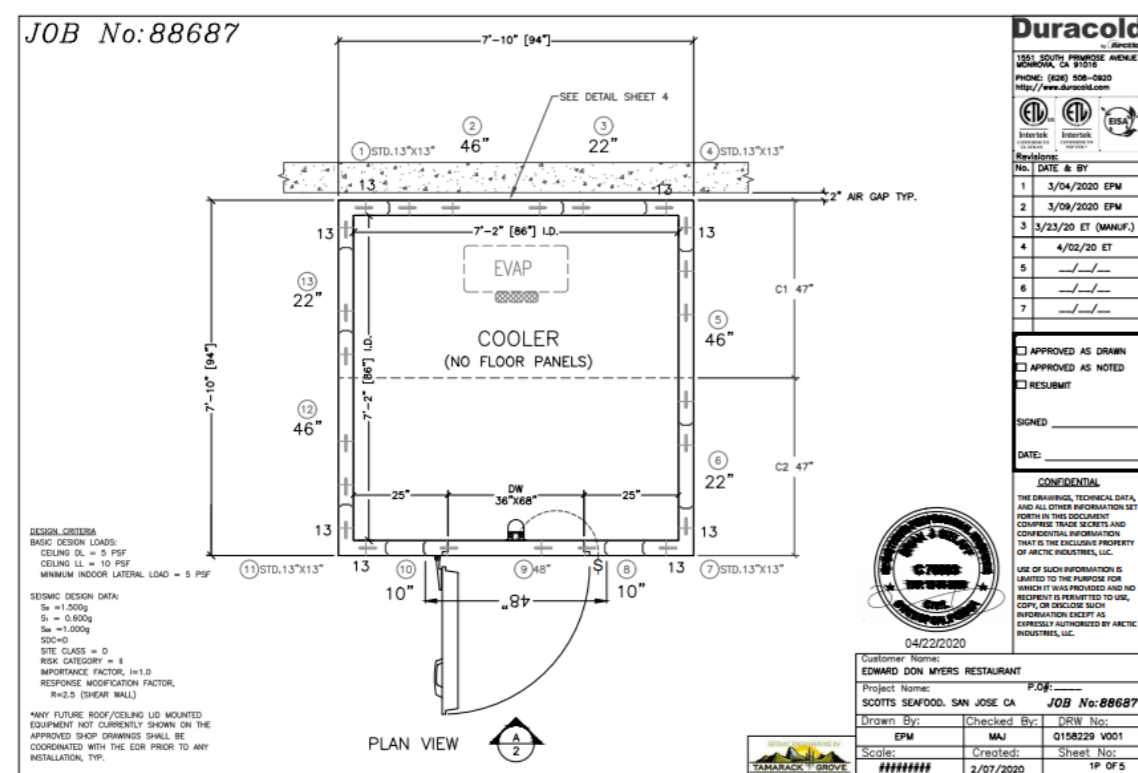


## Customer Provides

- Walk-in dimensions
- Size, weight, and loading of everything attached to walk-in
- Complete address of walk-in → seismic calculations use USGS data for the actual installation address
- Floor material, thickness, and strength
- Adjacent wall construction, materials, and strength

## Arctic Delivers

- An engineering seismic anchoring system for the walk-in at the provided address
- Professional Engineer (PE) stamped and signed drawings
- Anchoring detail drawing(s)
- Foamed-in-place features
- Anchors



## Building Floor

- Concrete <4"
- Low strength or tensioned concrete
- Non-concrete floors

## Walk-In

- Ceilings >12' long
- Ceilings supported to the building
- Long & narrow walk-ins
- Large openings

## Regulatory

- DSA
- HCAI (OSHPD)
- Other agencies
- Structural Engineer (SE) stamp/sign

