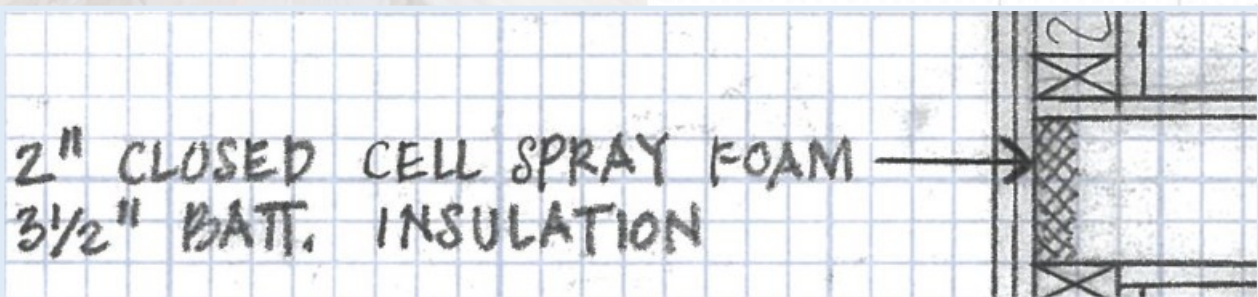


# What to Look for Series Air Barriers for Plan Review

**What are the requirements?**

**How should it be shown on the plans?**

**What should I be looking for?**



# What are the requirements?

## Air Barriers for Plan Review

### Air Leakage / Air Barrier Requirements

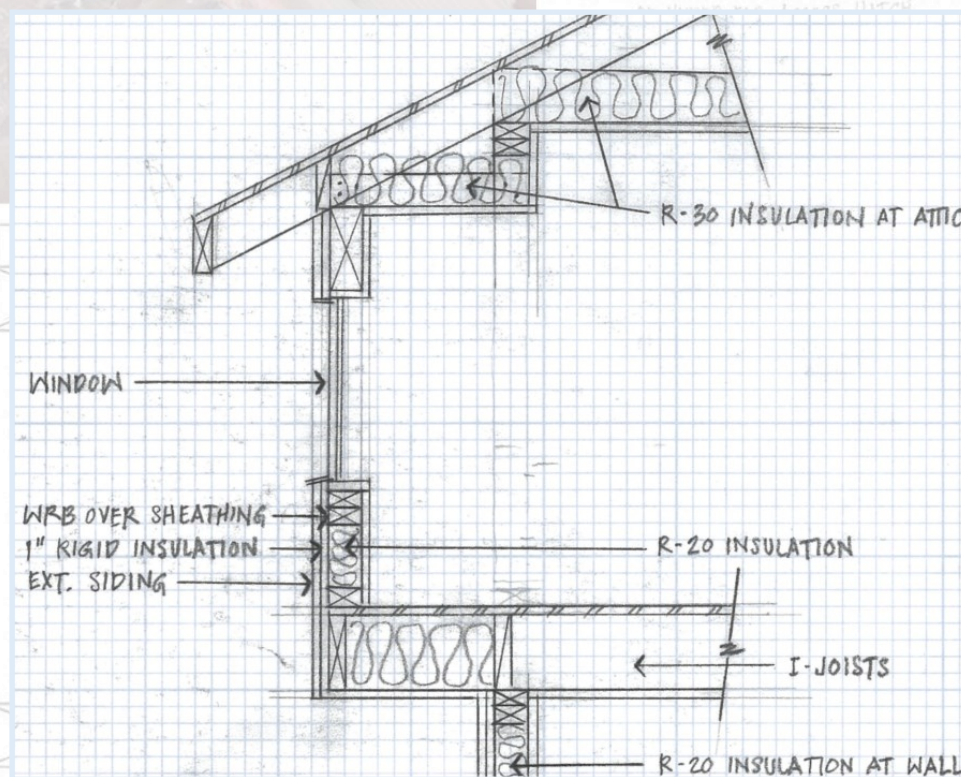
#### R103.2 (2018 & 2021)

##### Required to be placed on the plans

- Air sealing details

#### R402.4 Air Leakage (2018 & 2021)

- Limit air leakage with the thermal envelope assembly, including air barrier
- Sealing methods must account for expansion and contraction
- Components of the thermal envelope must comply with Table R402.4.1.1
- Testing must be performed in accordance with R402.4.1.2
- Testing air leakage rate can not exceed the values in R402.4.1.3





# What to Look for Series

## Air Barriers for Plan Review

### 2018 IECC Table R402.4.1.1

- ♦ General requirements
- ♦ Ceiling/attic
- ♦ Walls
- ♦ Windows, skylights and doors
- ♦ Rim joists
- ♦ Floors, including cantilevered floors and floors above garages
- ♦ Crawl space walls
- ♦ Shafts, penetrations
- ♦ Narrow cavities
- ♦ Garage separation
- ♦ Recessed lighting
- ♦ Plumbing and wiring
- ♦ Shower/tub on exterior wall
- ♦ Electrical/phone box on exterior walls
- ♦ HVAC register boots
- ♦ Concealed sprinklers

### 2021 IECC Table R402.4.1.1

- ♦ General requirements
- ♦ Ceiling/attic
- ♦ Walls
- ♦ Windows, skylights and doors
- ♦ Rim joists
- ♦ Floors, including cantilevered floors and floors above garages
- ♦ Basement crawl space and slab foundations
- ♦ Shafts, penetrations
- ♦ Narrow cavities
- ♦ Garage separation
- ♦ Recessed lighting
- ♦ Plumbing, wiring or other obstructions
- ♦ Shower/tub on exterior wall
- ♦ Electrical/phone box on exterior walls
- ♦ HVAC register boots
- ♦ Concealed sprinklers

# Air Barriers for Plan Review

## General Requirements

2018 & 2021

- A continuous air barrier shall be installed in the building envelope
- Breaks or joints in the air barrier shall be sealed

### Common Materials Used

- Continuous rigid insulation on the exterior
- House wrap installed as tested for air barrier
- Zip Panels
- Drywall

3½" BLOWN-IN INSULATION BLANKET R-11.0  
2" CLOSED CELL SPRAY FOAM INSUL. R-12.5  
1½" EXTERIOR RIGID INSULATION R-7.5  
TOTAL= R-31

STAINLESS STEEL BRICK TIES SCREWED  
TO SHEATHING @ 24" VERT. & 16" HORZ.

FLR. INSULATION  
INSULATION WITH SAME R-VALUE  
AS FLR. ATTACHED TO UNDERSIDE  
OF UNDER-FLR. ACCESS HATCH

TYP. FLR. JOISTS  
DEL. FLR. JOISTS  
AROUND HATCH  
OPENING

HATCH

ELECTRICAL BOX

SEALANT

11473  
11474  
92227  
92272

ZIPsystem  
FLASHING TAPE

ZIP

ZIP

ZIP

ZIP

ZIP

ZIP

ZIP



SHUMS CODA  
ASSOCIATES

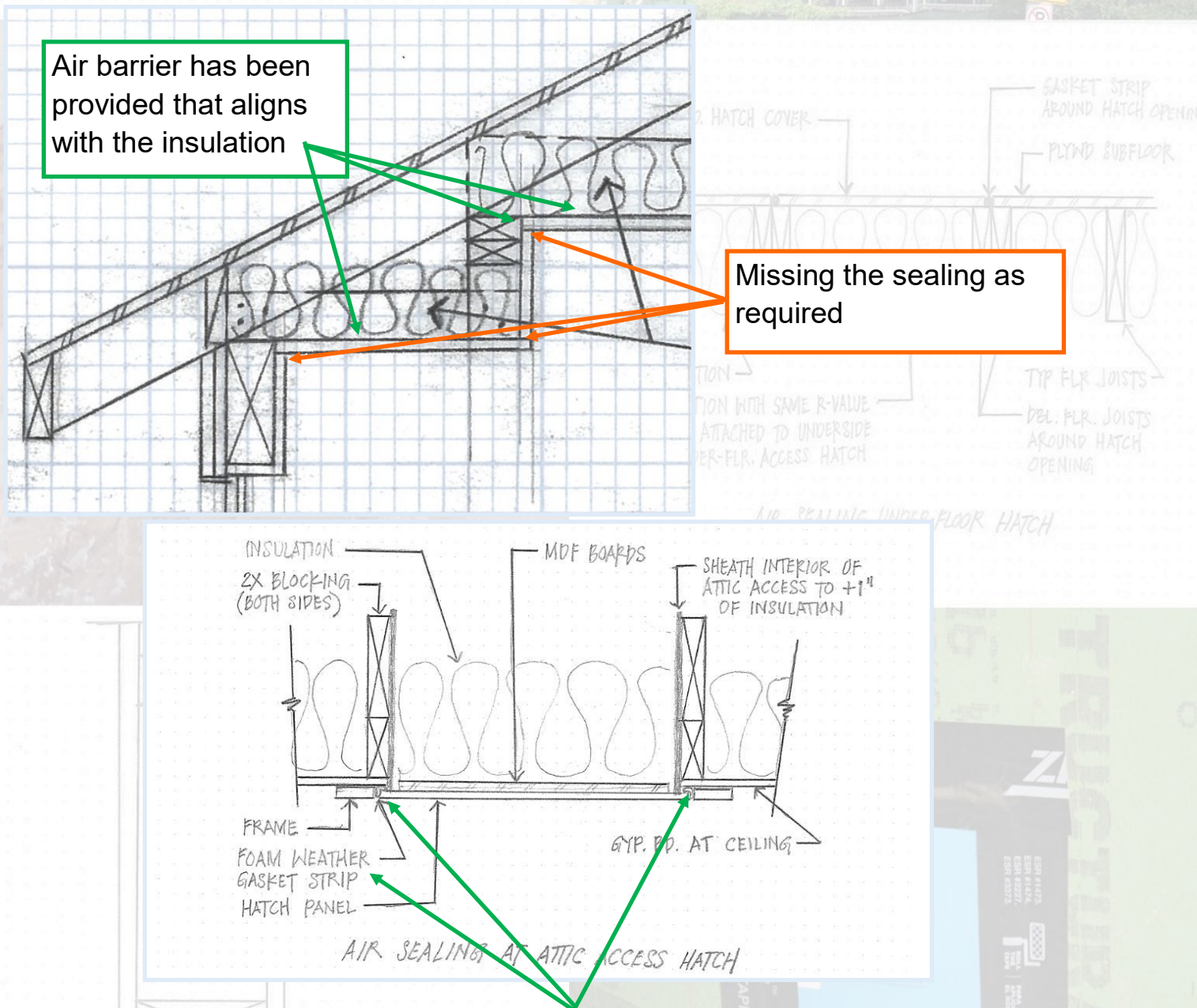
Group 14  
Engineering  
Architects  
Builders

BUILD Tank inc.

# Air Barriers for Plan Review

## Ceiling/Attic

- The air barrier in any dropped ceiling or soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed.
- Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.

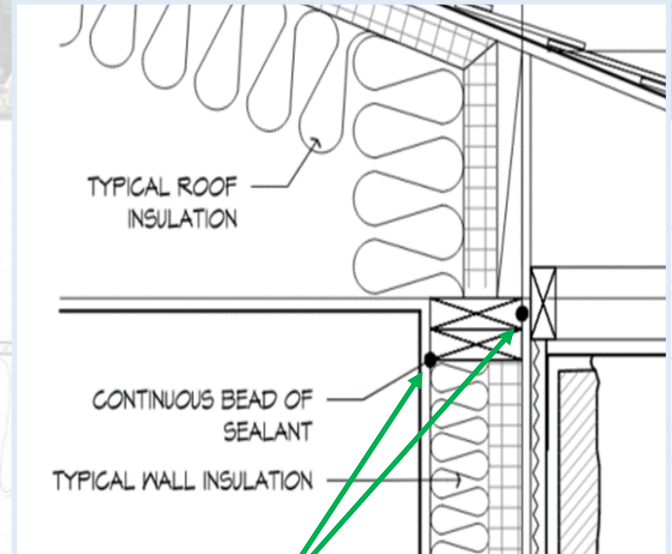
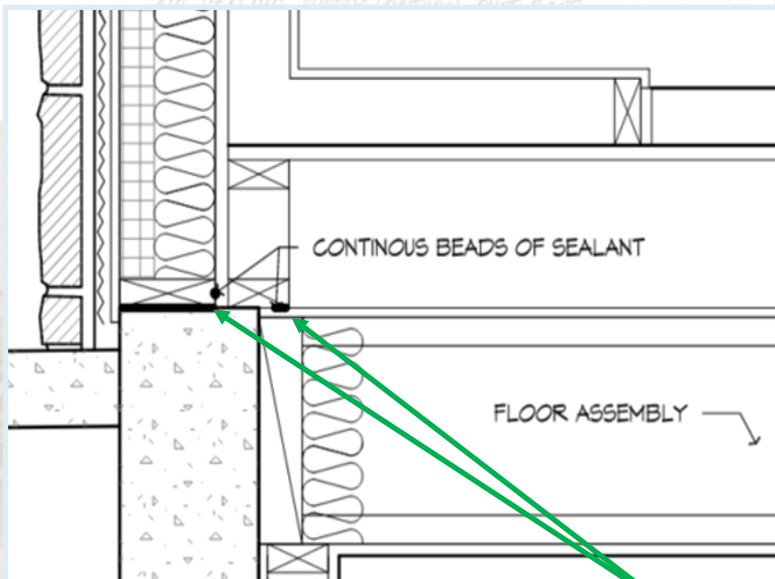


Sealing shown at edges of opening with a gasket

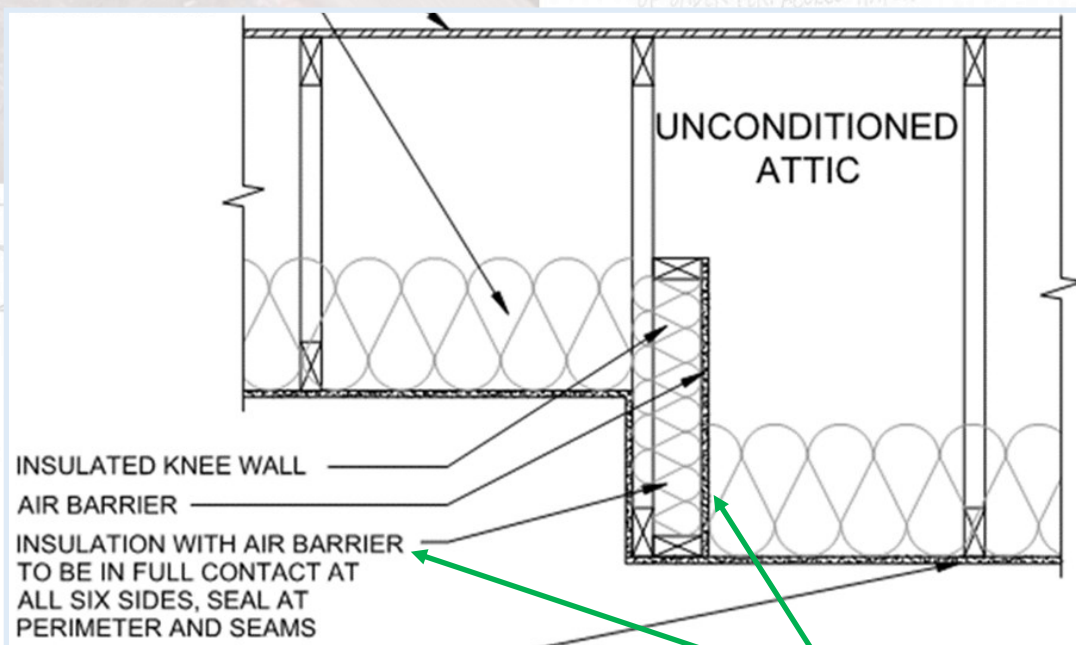


# Air Barriers for Plan Review Walls

- The junction of the foundation and sill plate shall be sealed.
- The junction of the top plate and the top of exterior walls shall be sealed.
- Knee walls shall be sealed.



Sealing provided at bottom (sill) plate and at top plate

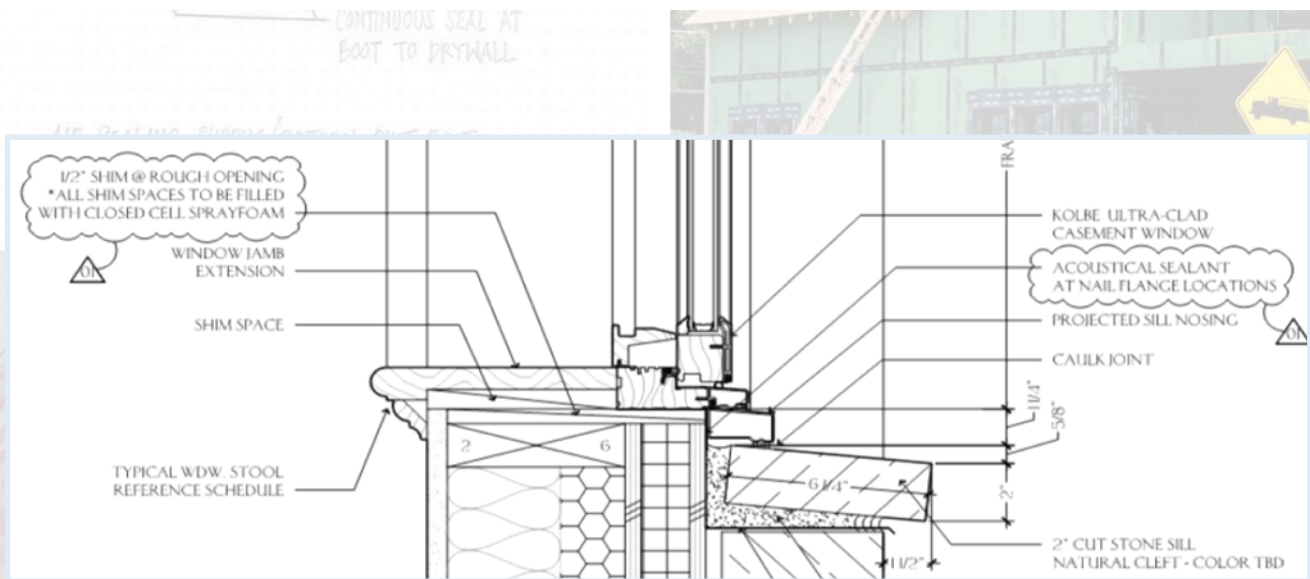


Air sealing is called out and an air barrier is provided and called out

# Air Barriers for Plan Review

## Windows, Skylights, and Doors

- The space between framing and skylights, and the jambs of windows and doors, shall be sealed.



Openings between window and door assemblies and their respective jambs and framing shall be sealed and insulated with sprayed foam with a thermal resistance of R-3 per-inch minimum.

- Can be shown as either part of a window detail
- More likely to be in the form of a note on the plans

FYI - The window and door manufacturers do not want fast expanding foam to be used. Foam can be used, but not fast expanding.

# Air Barriers for Plan Review

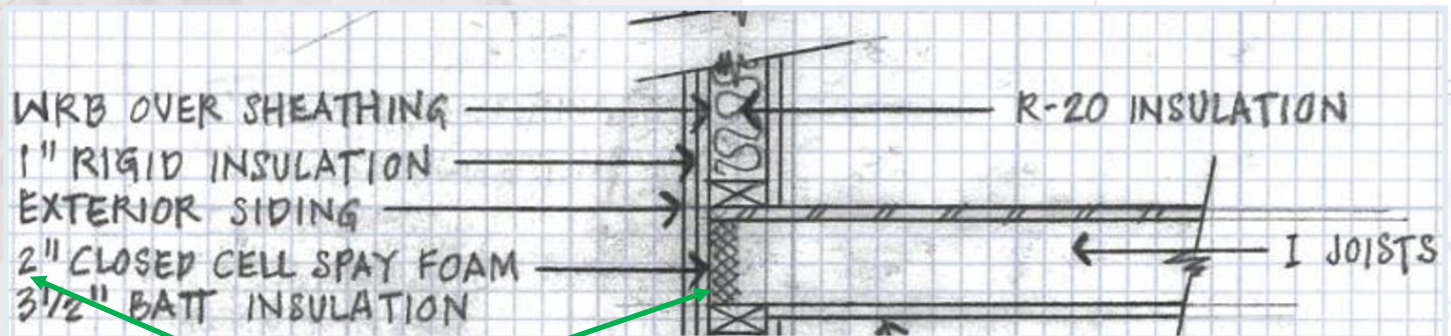
## Rim Joists

### 2018 IECC

- Rim joists shall include the air barrier.

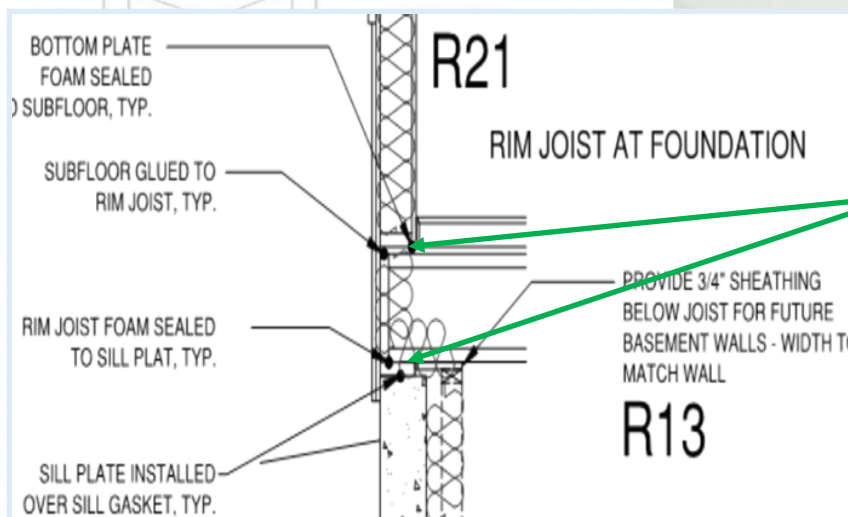
### 2021 IECC

- Rim joists shall include an exterior air barrier.
- The junctions of the rim board to the sill plate and the rim board and the subfloor shall be air sealed.



Closed cell spray foam can be considered an air barrier if installed to a certain thickness.

Closed cell spray foam can be both an air barrier and part of the above grade wall insulation R-value.



Calls out for the sill plate and subfloor to be sealed

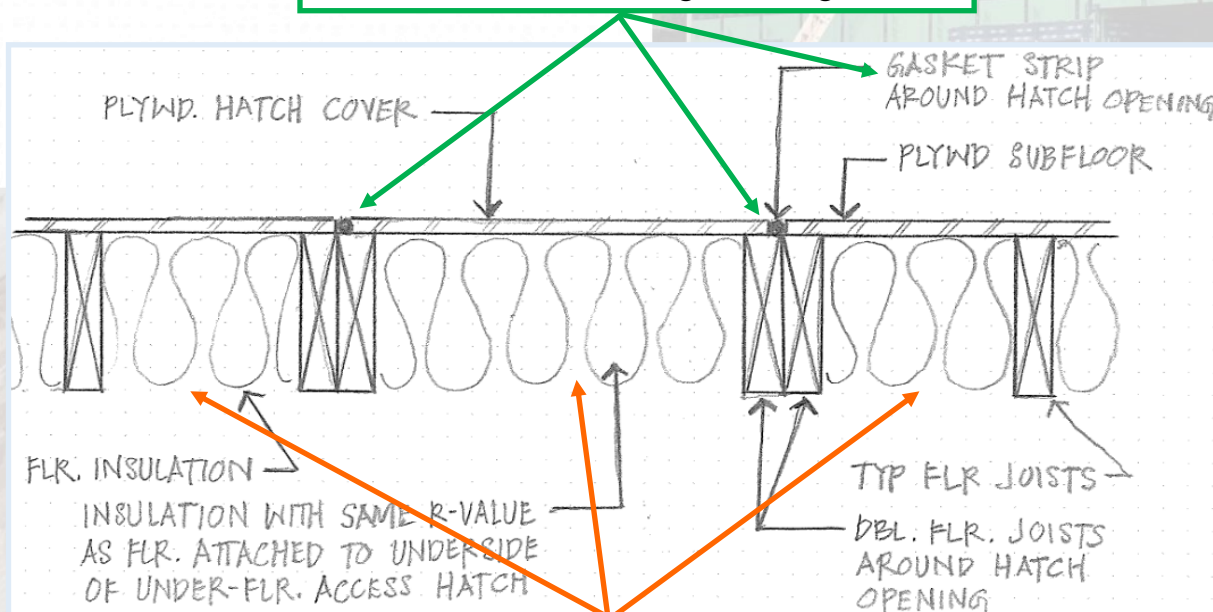


# Air Barriers for Plan Review

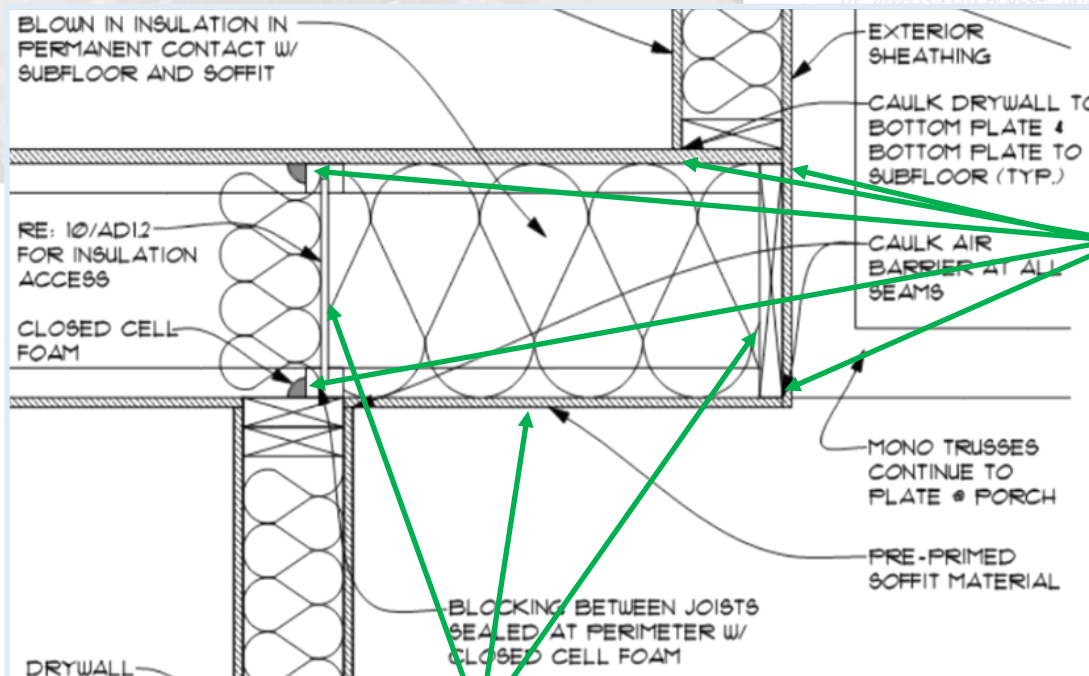
## Floors, including cantilevered floors and floors above garages

- The air barrier shall be installed at any exposed edge of insulation.

Floor hatch has sealing with a gasket



Air barrier is missing to separate the unconditioned space from the conditioned with it in alignment of the insulation.



Air sealing has been provided at the correct locations

Air barrier has been provided in correct locations

# Air Barriers for Plan Review

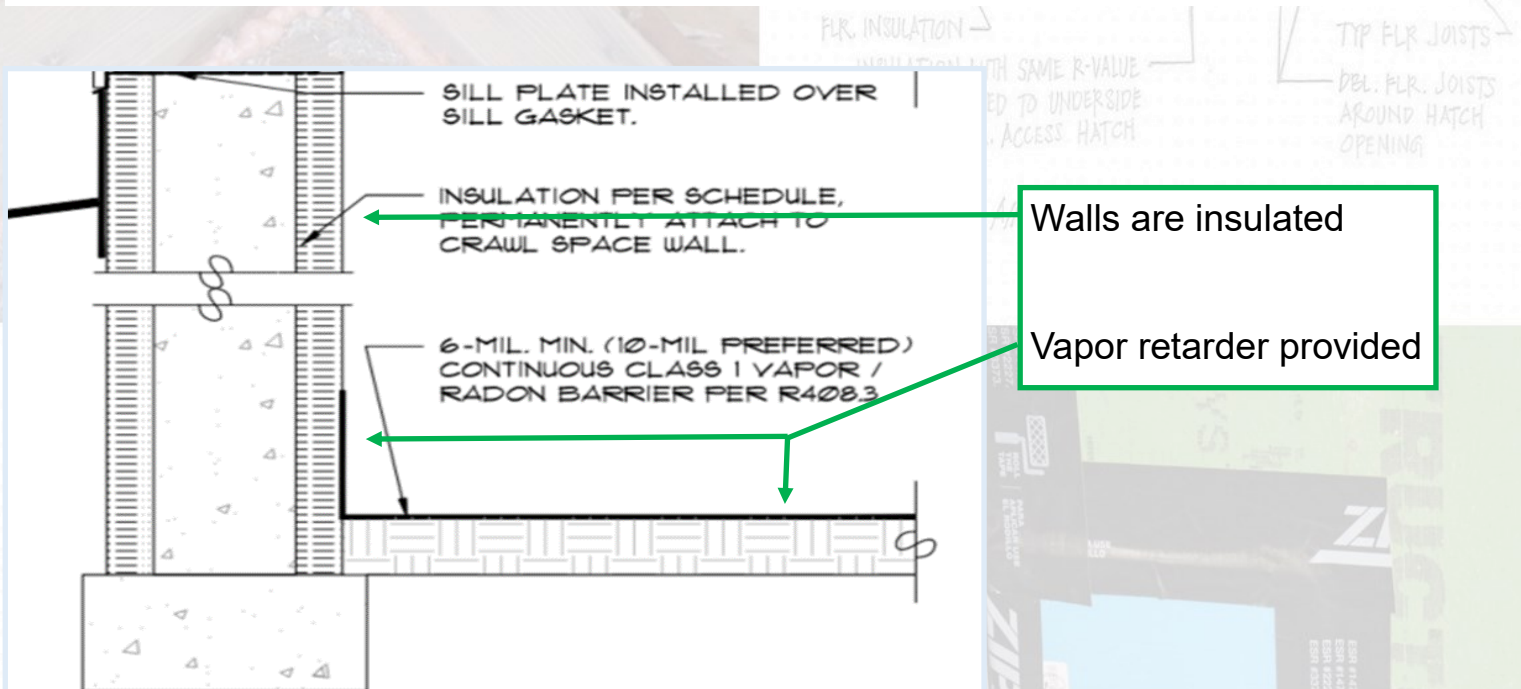
## Basement Crawl Space and Slab Foundations

### 2018 IECC

- Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.

### 2021 IECC

- Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder/air barrier in accordance with Section R402.2.10.
- Penetrations through concrete foundation walls and slabs shall be air sealed.
- Class 1 vapor retarders shall not be used as an air barrier on below-grade walls and shall be installed in accordance with Section R702.7 of the International Residential Code.



Either a note or detail might be provided for the new requirement of sealing of penetrations through slab or foundation wall.



# Air Barriers for Plan Review

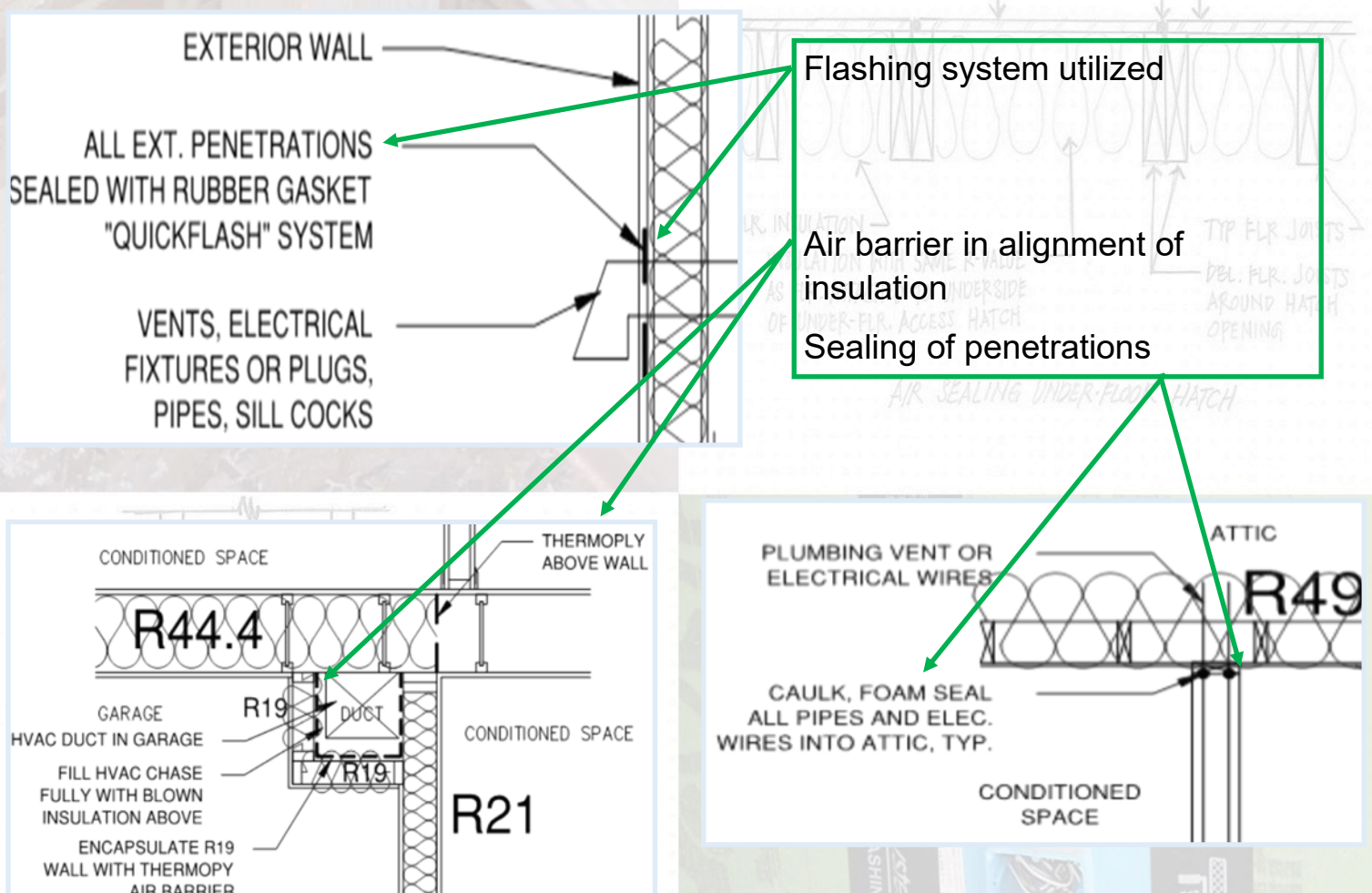
## Shafts, Penetrations

### 2018 IECC

- Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.

### 2021 IECC

- Duct and flue shafts to exterior or unconditioned space shall be sealed.
- Utility penetrations of the air barrier shall be caulked, gasketed or otherwise sealed and shall allow for expansion, contraction of materials and mechanical vibration.



# Air Barriers for Plan Review

## Narrow Cavities

### 2021 IECC

- Narrow cavities of 1 inch or less that are not able to be insulated shall be air sealed.

- This is a new requirement in the 2021 IECC
- This may be demonstrated with a note on the plans
- The image below demonstrates the intent of this requirement to seal those locations

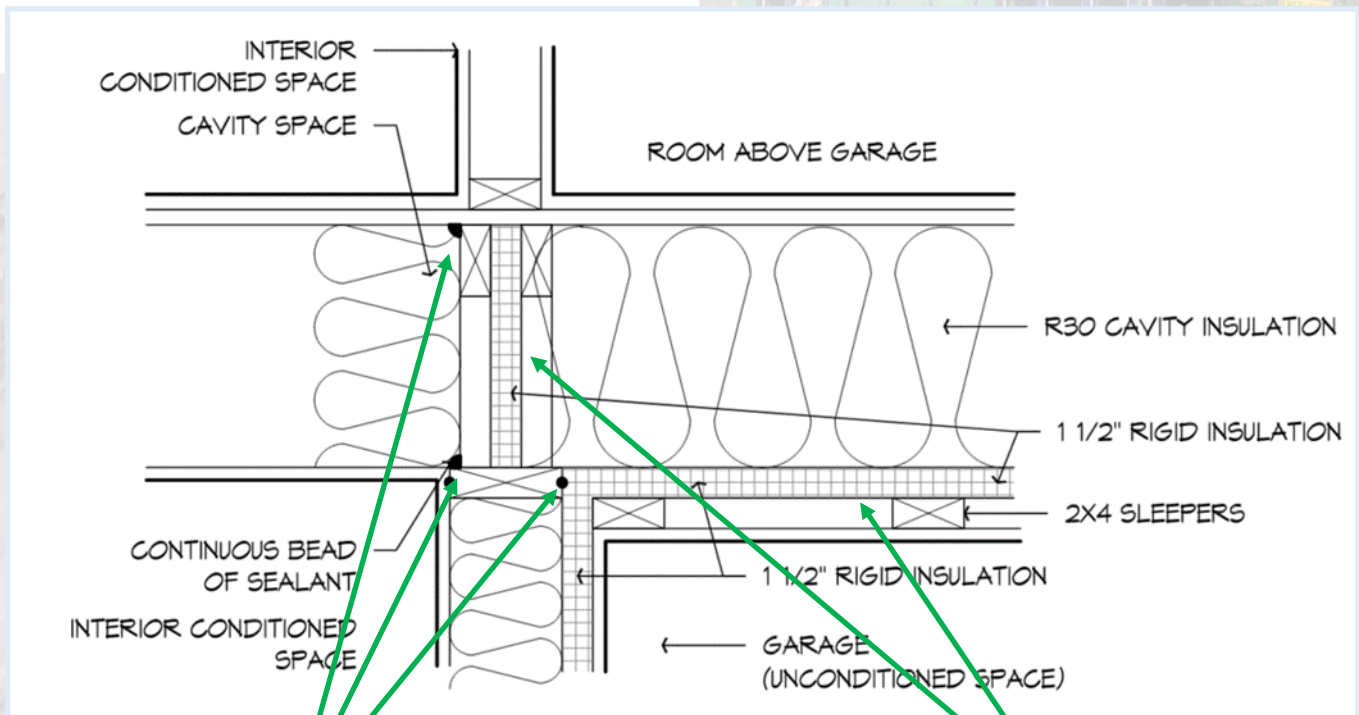




# Air Barriers for Plan Review

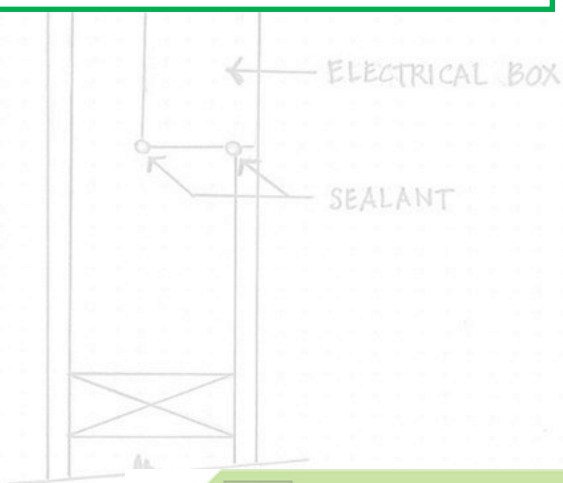
## Garage Separation

- Air sealing shall be provided between the garage and conditioned spaces.



Sealing was called out to separate the garage area from the dwelling units

Air barrier is called out to separate the garage area from the dwelling units



# Air Barriers for Plan Review

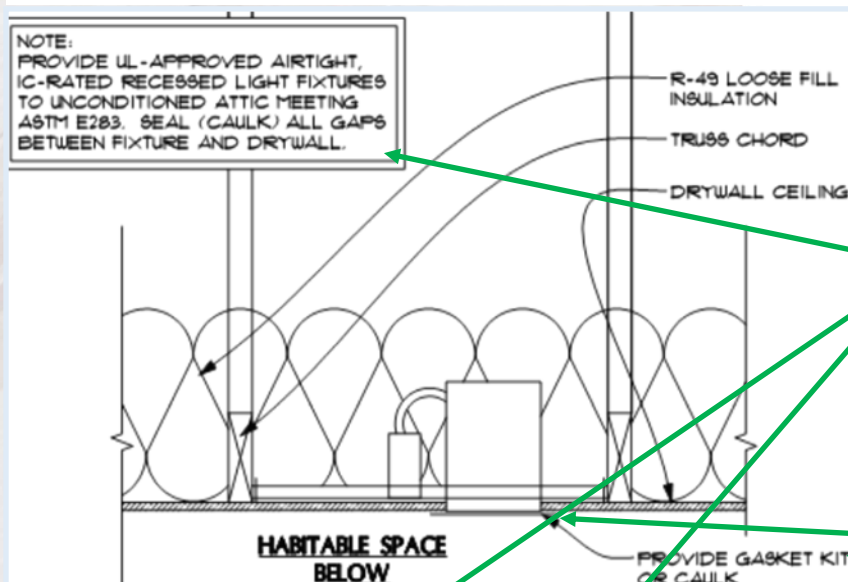
## Recessed Lighting

### 2018 IECC

- Recessed light fixtures installed in the building thermal envelope shall be sealed to the finished surface.

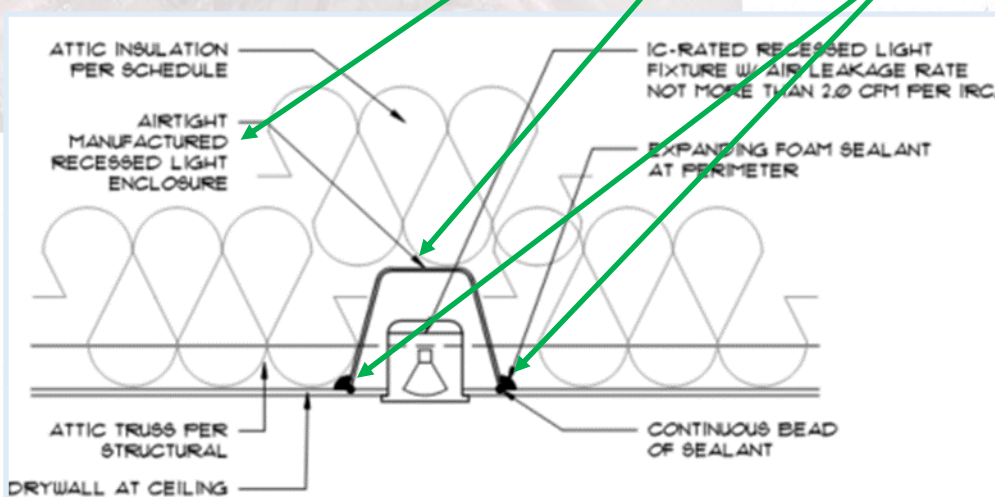
### 2021 IECC

- Recessed light fixtures installed in the building thermal envelope shall be air sealed in accordance with Section R402.4.5.



IC- rated meets the air leakage rating for the enclosure

Recessed lighting sealed, or gasketed at the finished surface



- RECESSED LIGHTING INSTALLED IN THE THERMAL ENVELOPE SHALL BE SEALED WITH A GASKET OR CAULK BETWEEN THE HOUSING AND THE INTERIOR WALL OR CEILING COVERING, BE IC-RATED AND LABELED AS HAVING AN AIR LEAKAGE RATE NOT MORE THAN 2.0 CFM PER IRC.

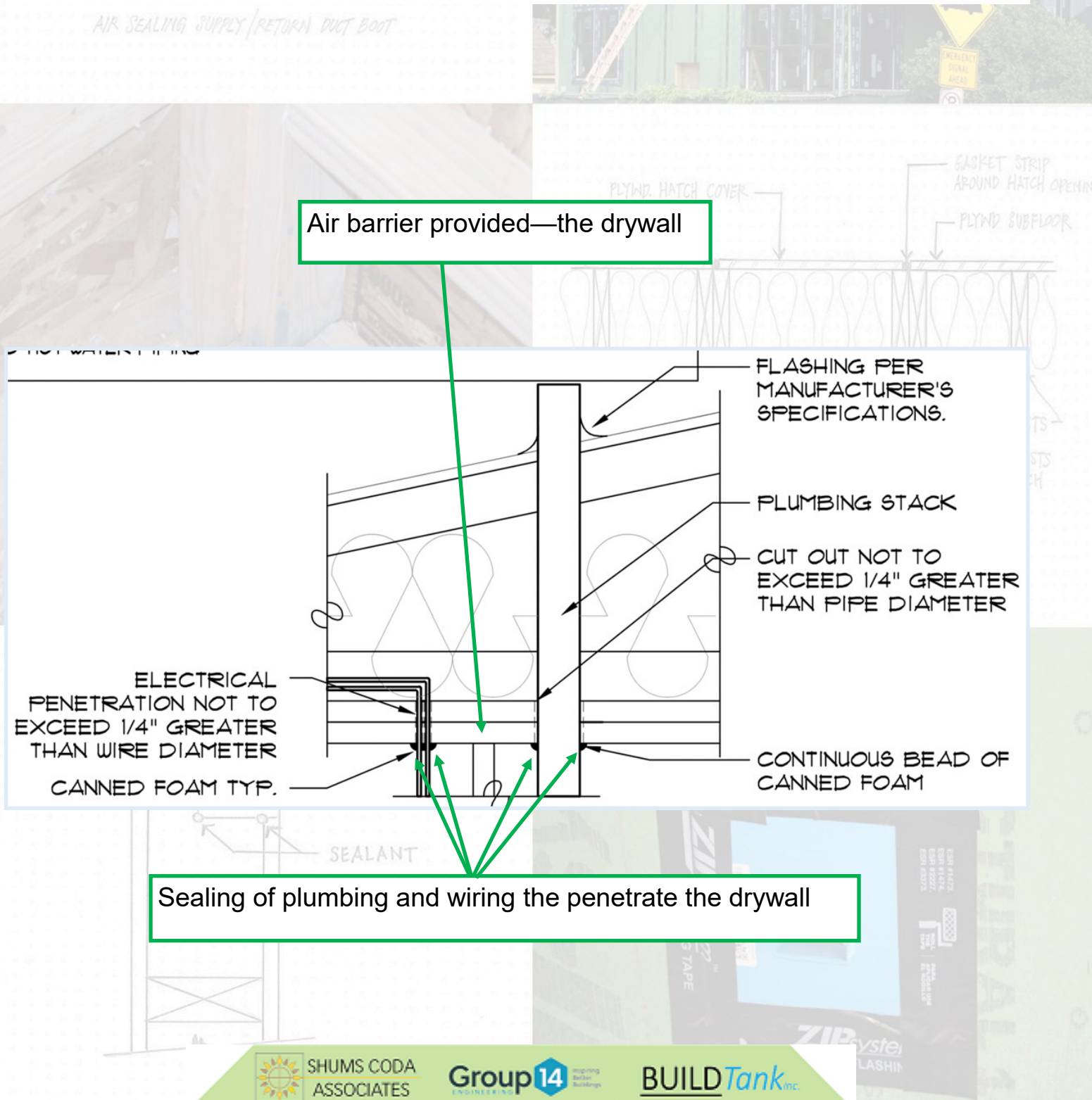


# Air Barriers for Plan Review

## Plumbing, Wiring or other Obstructions

2021 IECC

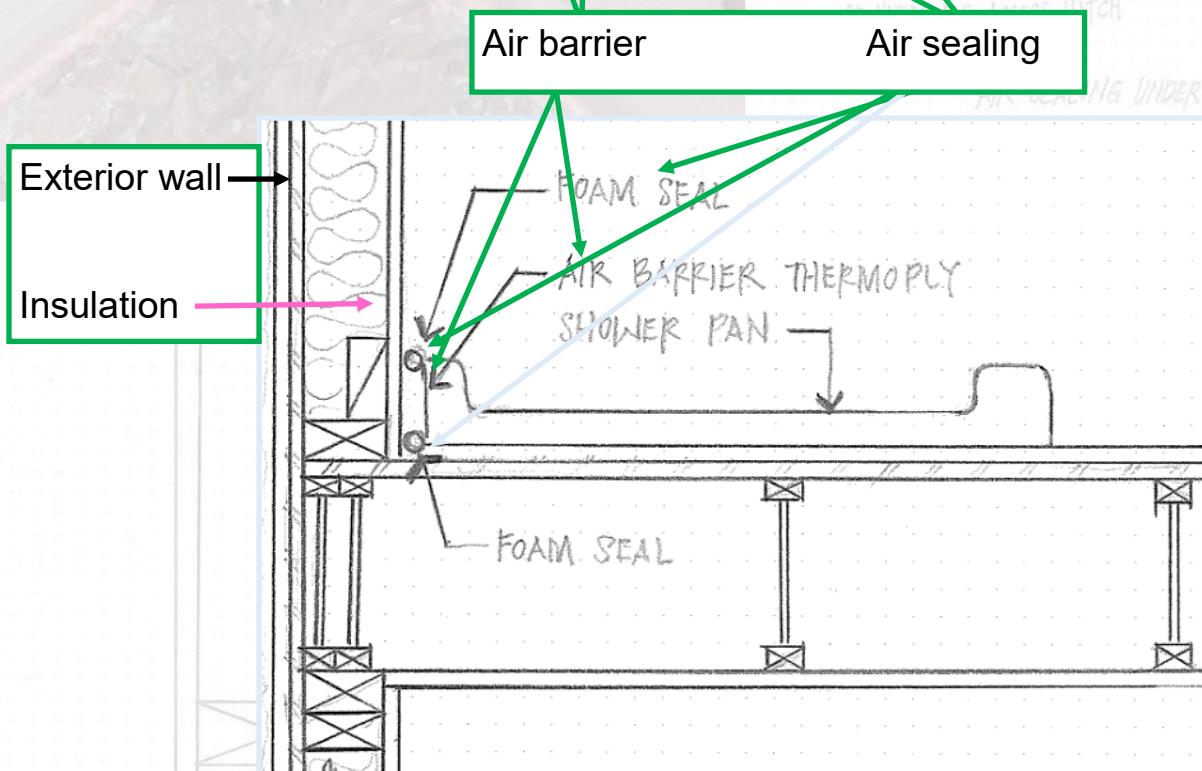
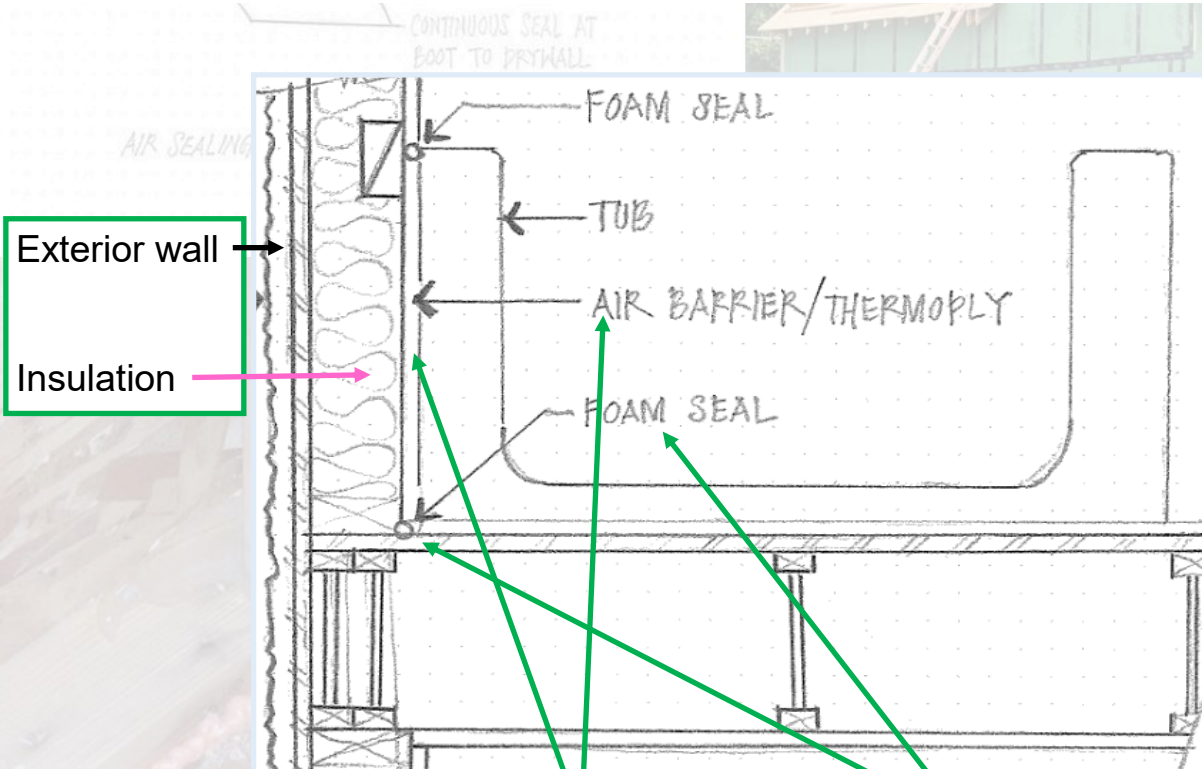
- All holes created by wiring, plumbing or other obstructions in the air barrier assembly shall be air sealed.



# Air Barriers for Plan Review

## Shower/Tub on exterior wall

- The air barrier installed at exterior walls adjacent to showers and tubs shall separate the wall from the shower or tub.

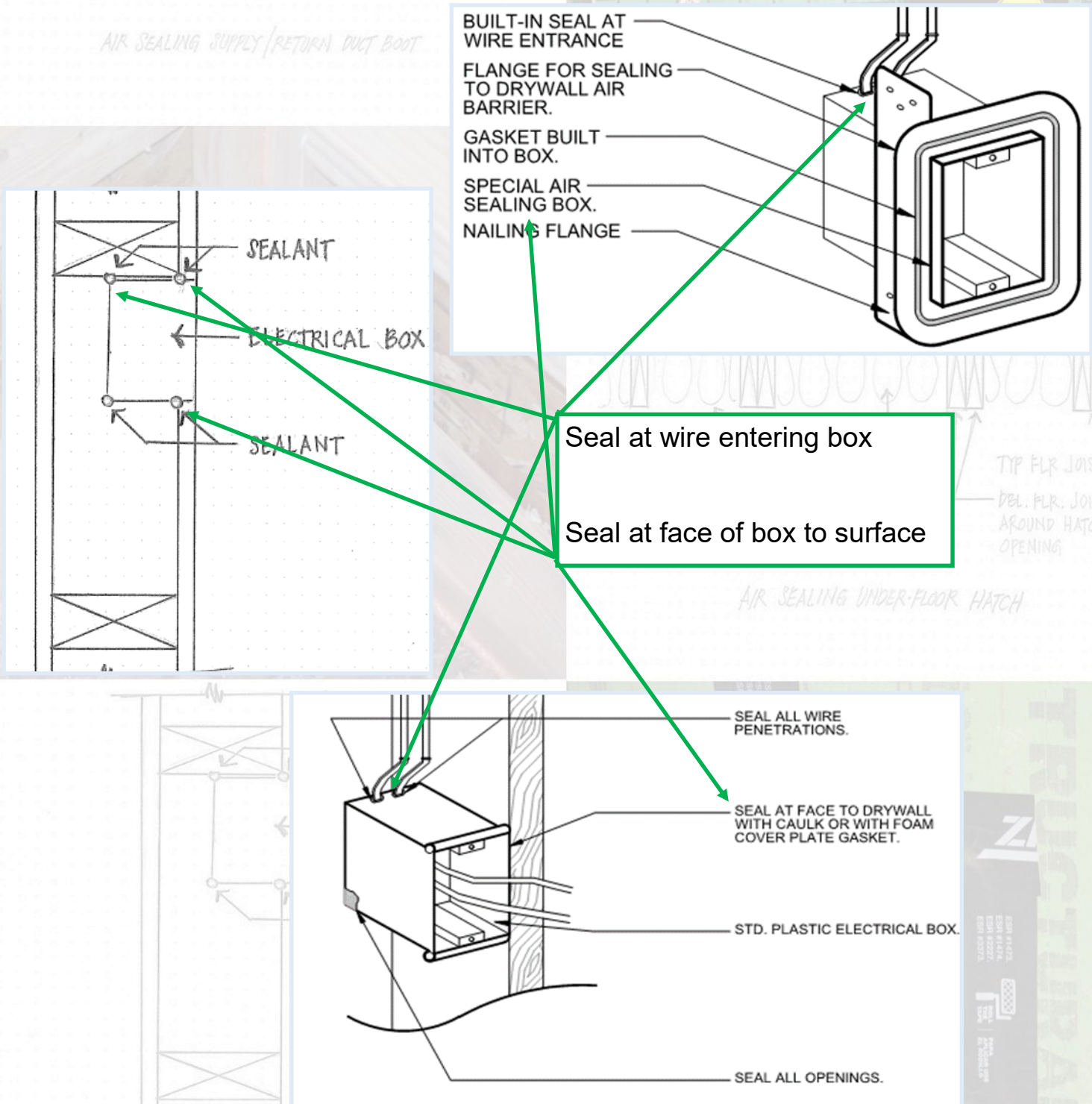




# Air Barriers for Plan Review

## Electrical/phone box on exterior walls

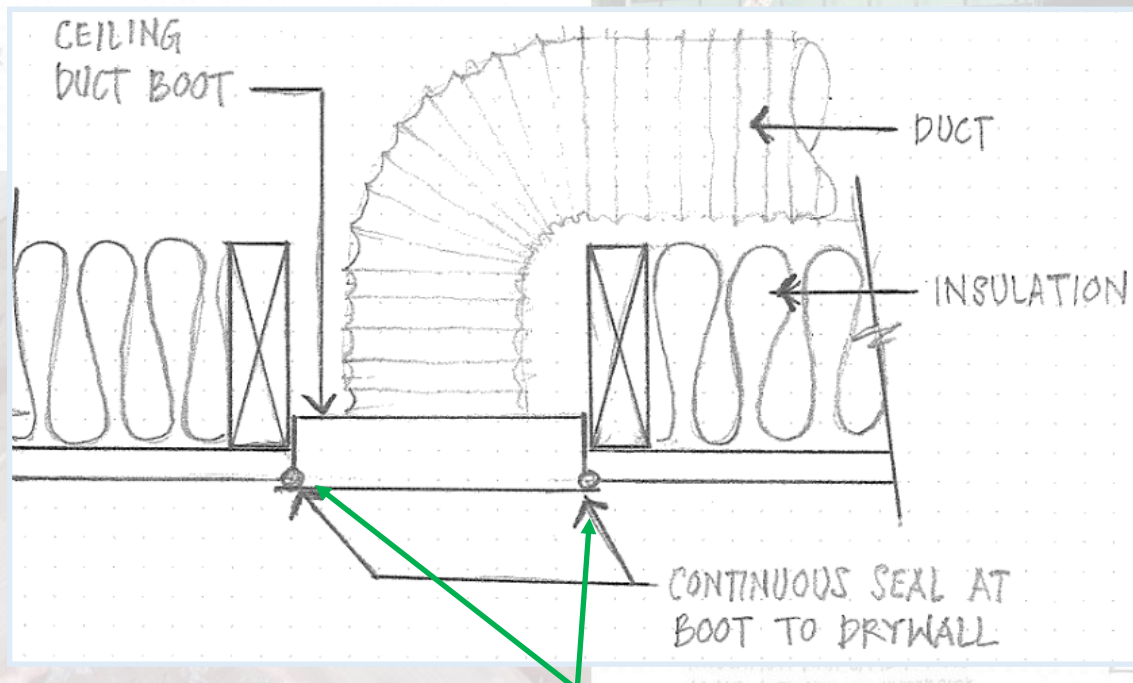
- The air barrier shall be installed behind electrical and communication boxes. Alternatively, air-sealed boxes shall be installed.



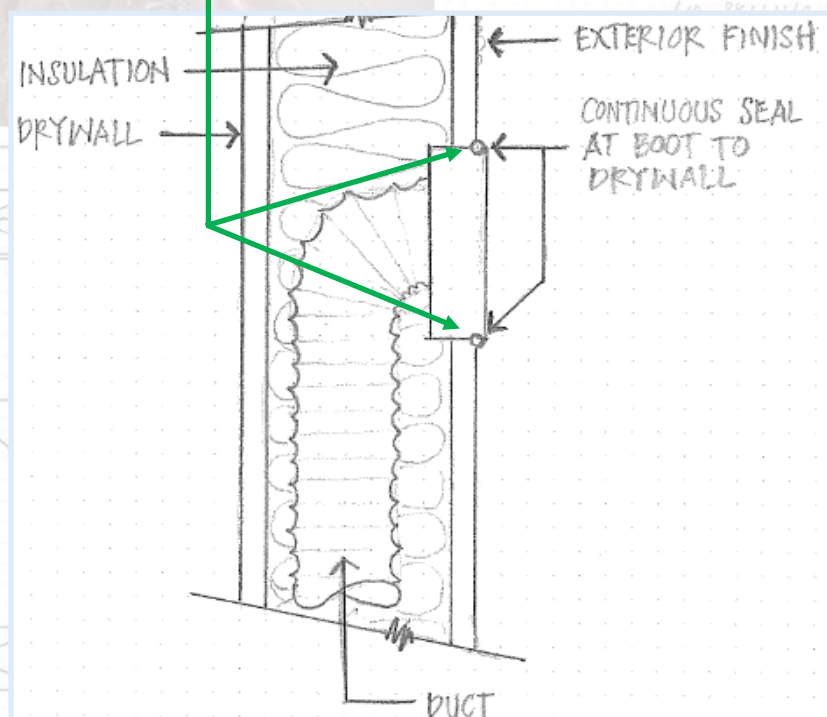
# Air Barriers for Plan Review

## HVAC Register Boots

- HVAC supply and return register boots that penetrate building thermal envelope shall be sealed to the subfloor, wall covering or ceiling penetrated by the boot.



Sealing at register to surface





# Air Barriers for Plan Review

## Concealed Sprinklers

- Where required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.

No standardized detail can be provided by the designer. It must come from the manufacturer of the concealed sprinkler head. As a plans examiner or architect/designer a request should be made to the manufacturer for the correct detail for air sealing

