

# Installing Contractor Insulation Boot Camp

## Lesson 9: Air Sealing & Insulating Basements

# Lesson Topics



## What we will cover:

- The importance of protecting indoor air quality
- Air sealing and insulating rim joists
- Air sealing & insulating basement & crawlspace ceilings

# Working Safely



What might harm you in a basement or crawlspace?

# Stop Work Items



## STOP WORK ITEMS

- No safe entry
- Unsafe conditions, for example, rotten structure
- Standing water
- Mold
- Wildlife
- Asbestos
- Electrical (Knob and Tube, live wires)
- Furnace or water heater not vented to exterior

# Rim Joists

## Air Sealing & Insulating Rim Joists

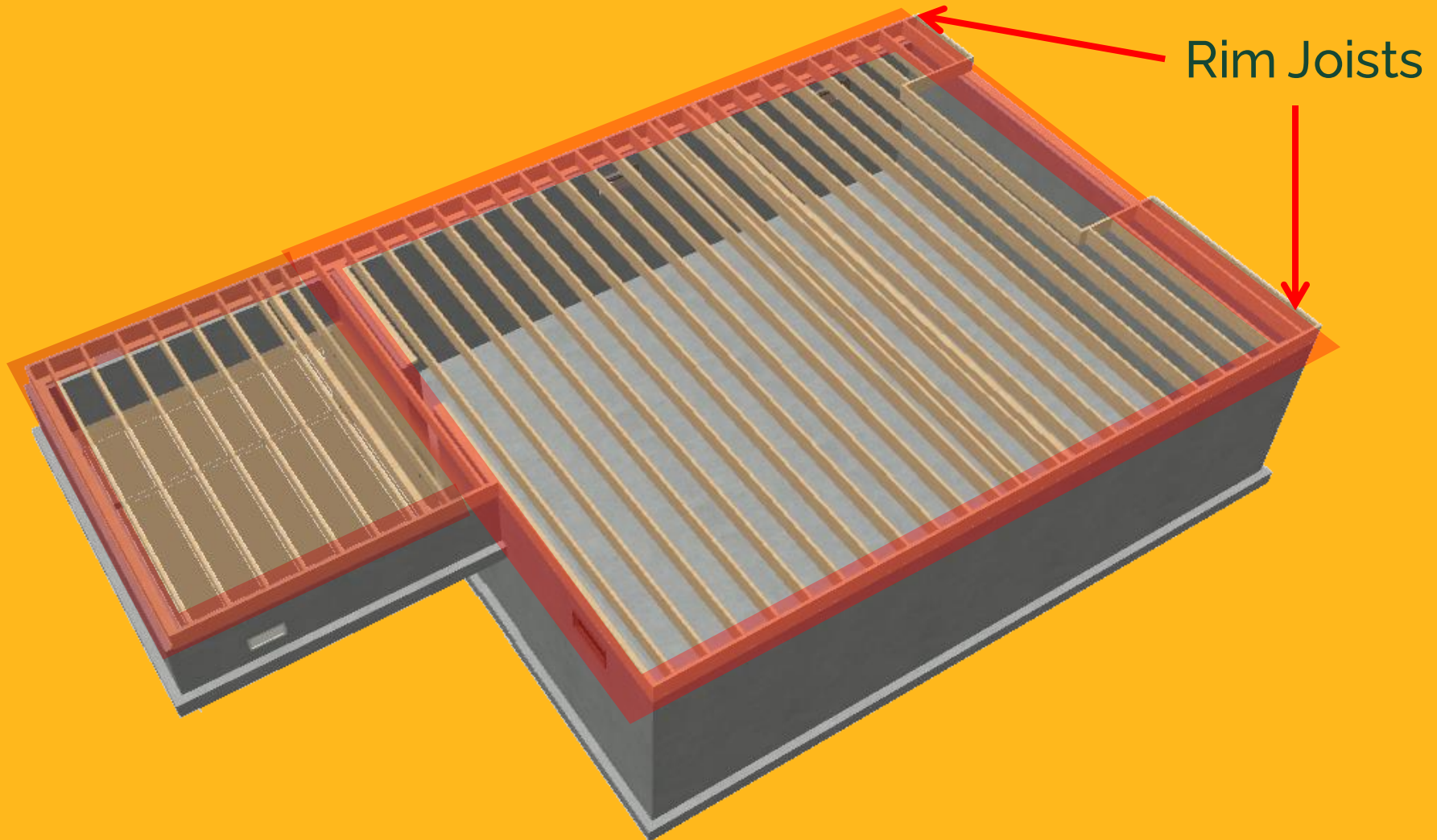


Three typical methods for sealing and insulating rim joists:

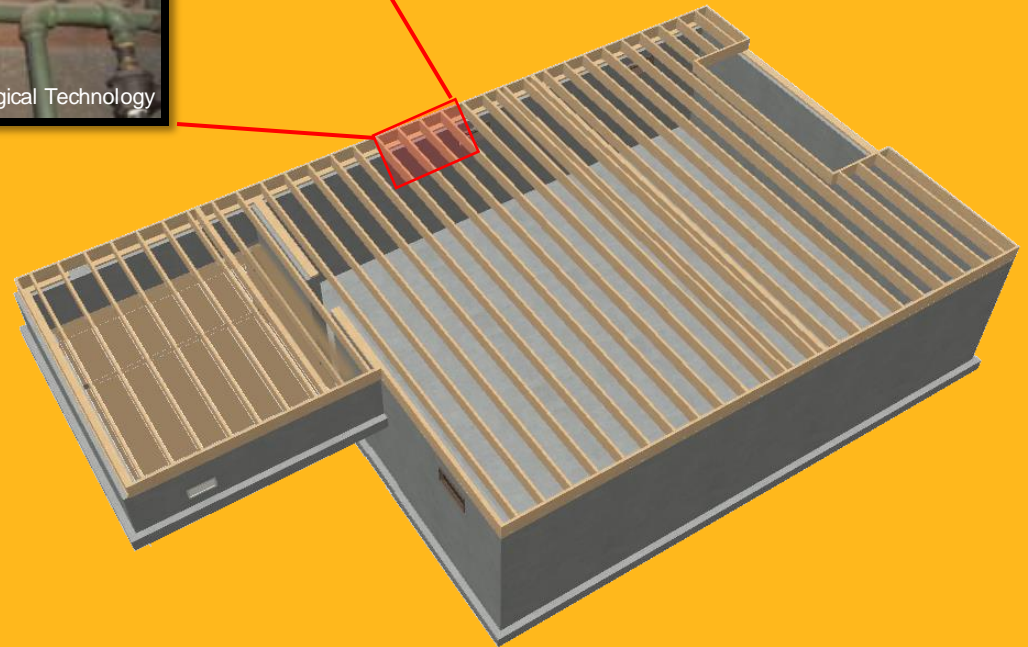
- Two-part foam
- Foam and fiber glass batts
- Foam and rigid foam board



# Rim Joists



# Rim Joist Bays





# Sealing Rim Joists



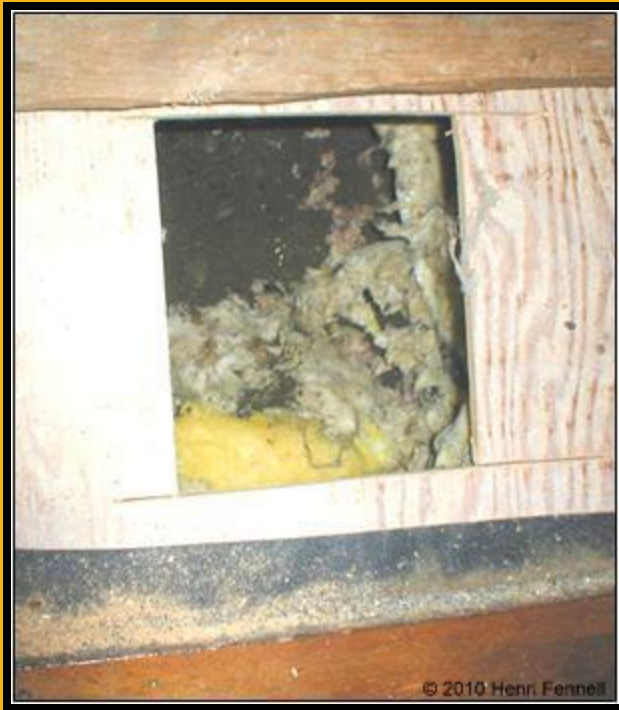
# Sealing Rim Joists



© Center for Ecological Technology

# Difficult Access - Crawlspace

Before



After





# Insulating with Fiberglass



# Balloon Framing



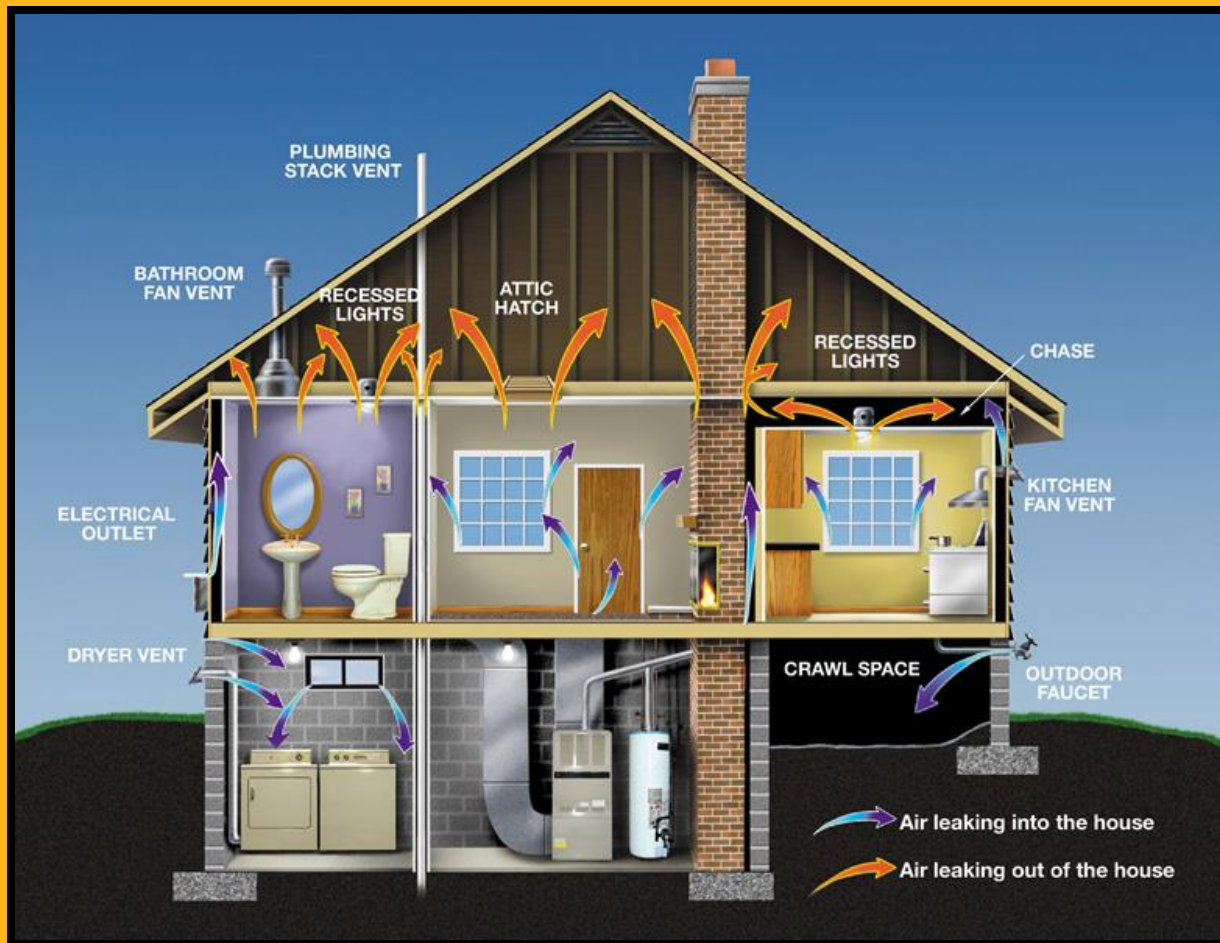


# Air Sealing in Basements

- When to seal basement air leaks
- How to seal basement air leaks
- Which materials to use

# Stack Effect

## Air Sealing an Open Chase



# Open Chase Example



The Center for Ecological Technology



# Open Chase Example



# Beneath Bathtub



© Center for Ecological Technology



# When To Insulate the Ceiling

- The basement is open to the outdoors
- Including the basement in the thermal boundary is difficult



# Cautions

Recall that insulating the ceiling usually lowers the basement or crawlspace temperature:

- Heating equipment and pipes outside the thermal boundary must be heavily insulated
- Freezing pipes are more likely
- Tendency for moisture problems increases

# Program Requirements



- Applicable to any area of a residential building envelope separating conditioned and non-conditioned space
- Basement and Garage Ceilings: Existing R-value cannot exceed R6 - Final R-value must be R19 or greater
- Rim Joist: Existing R-value cannot exceed R6 - Final R-value must be R13 or greater

# Failed Measures



- (Basement Ceiling) The Inspector measured 120 sq. ft. of basement ceiling area with that was insulated from R-0 to R-19. It was found that 6" of R-19 fiberglass batts were installed and secured with steel insulation hanging rods. Basement air sealing was performed. This measure failed inspection due to the treated being 43% less than reported.
- (Rim joist) The Inspector measured 72 sq. ft. of rim joist area that was insulated from R-0 to R-14. 4" of fiberglass batt insulation was added. Basement air sealing was performed. This measure failed inspection due to the treated being 40% less than reported.

# Ceiling Insulation with Fiberglass

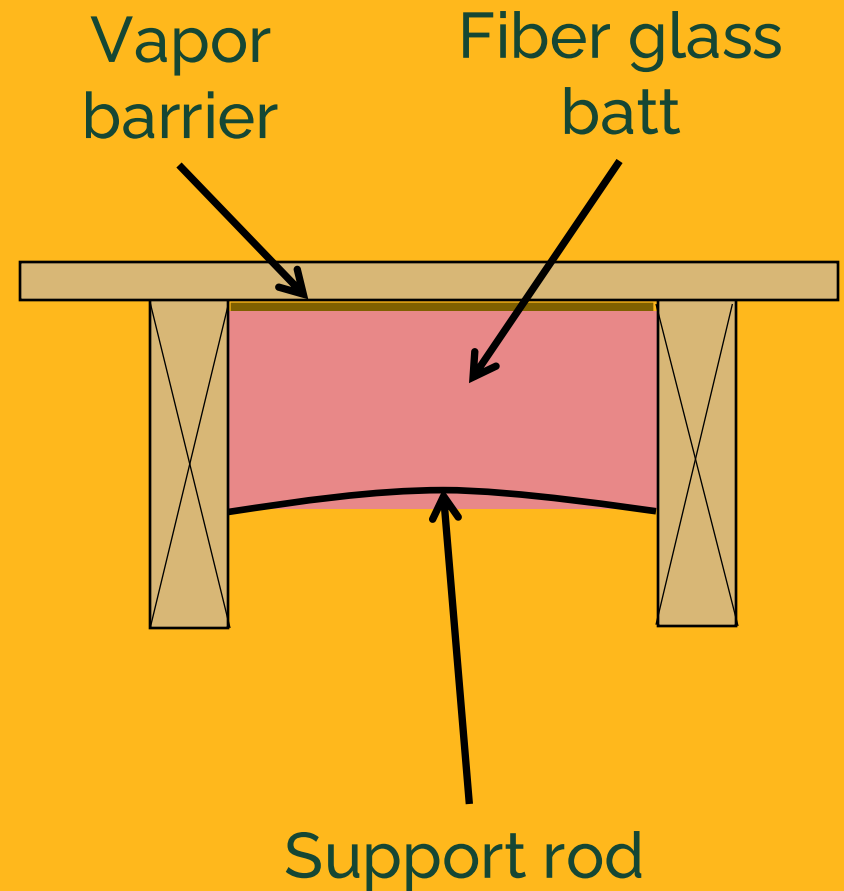
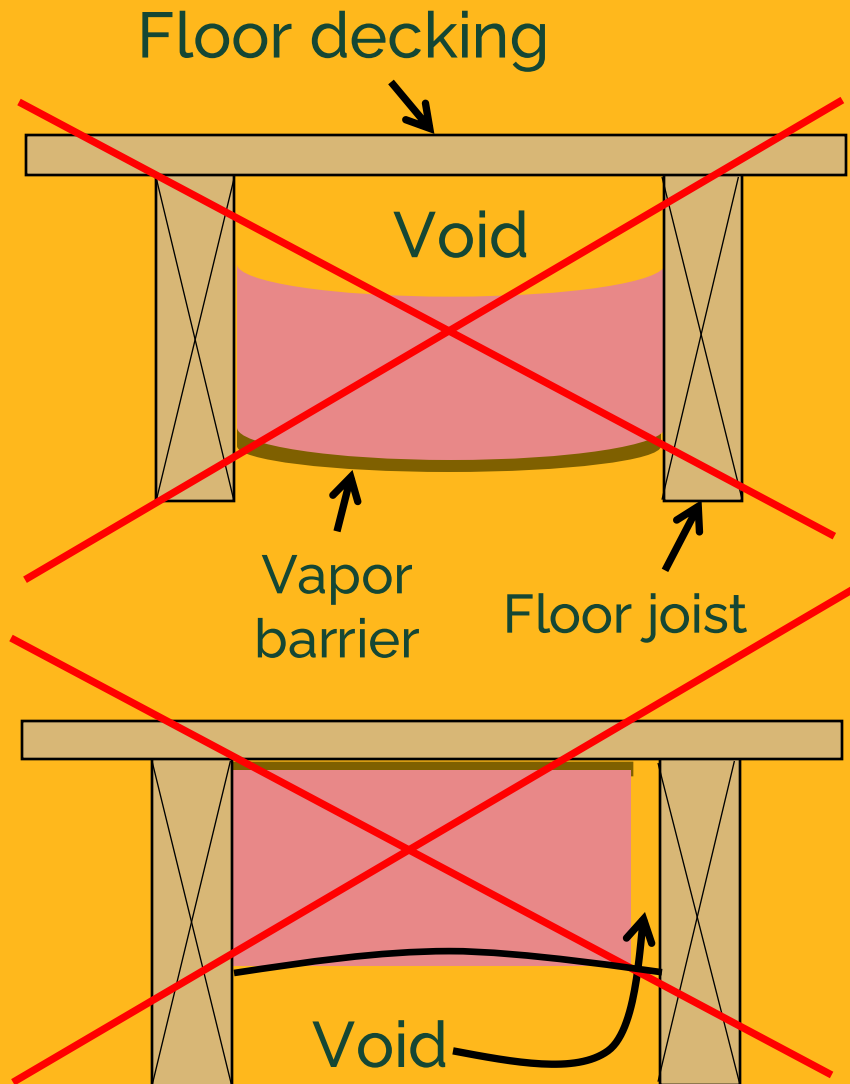
Use batts when the insulation covers equipment that may need periodic servicing such as:

- pipes
- ducts
- electrical equipment

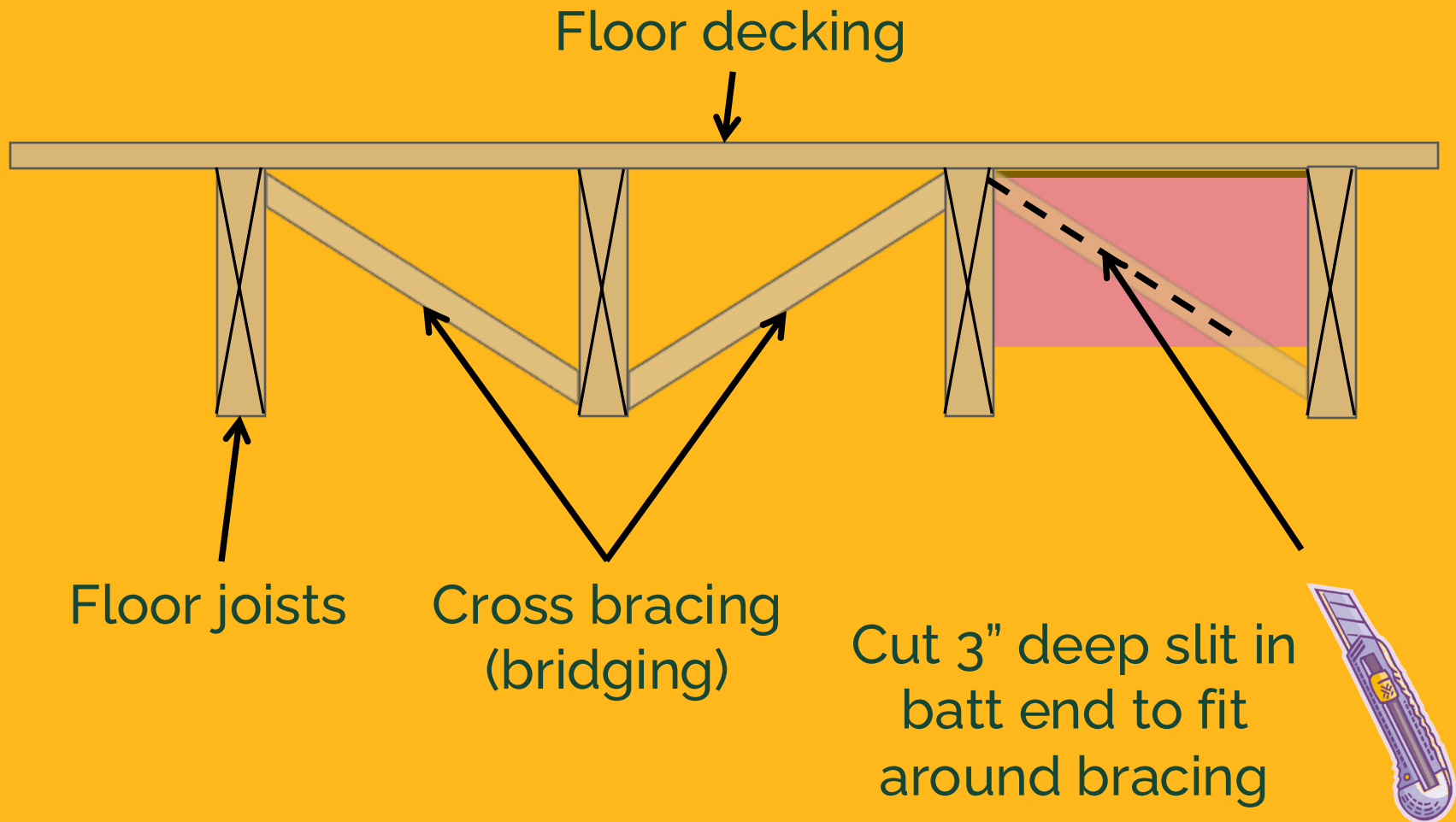




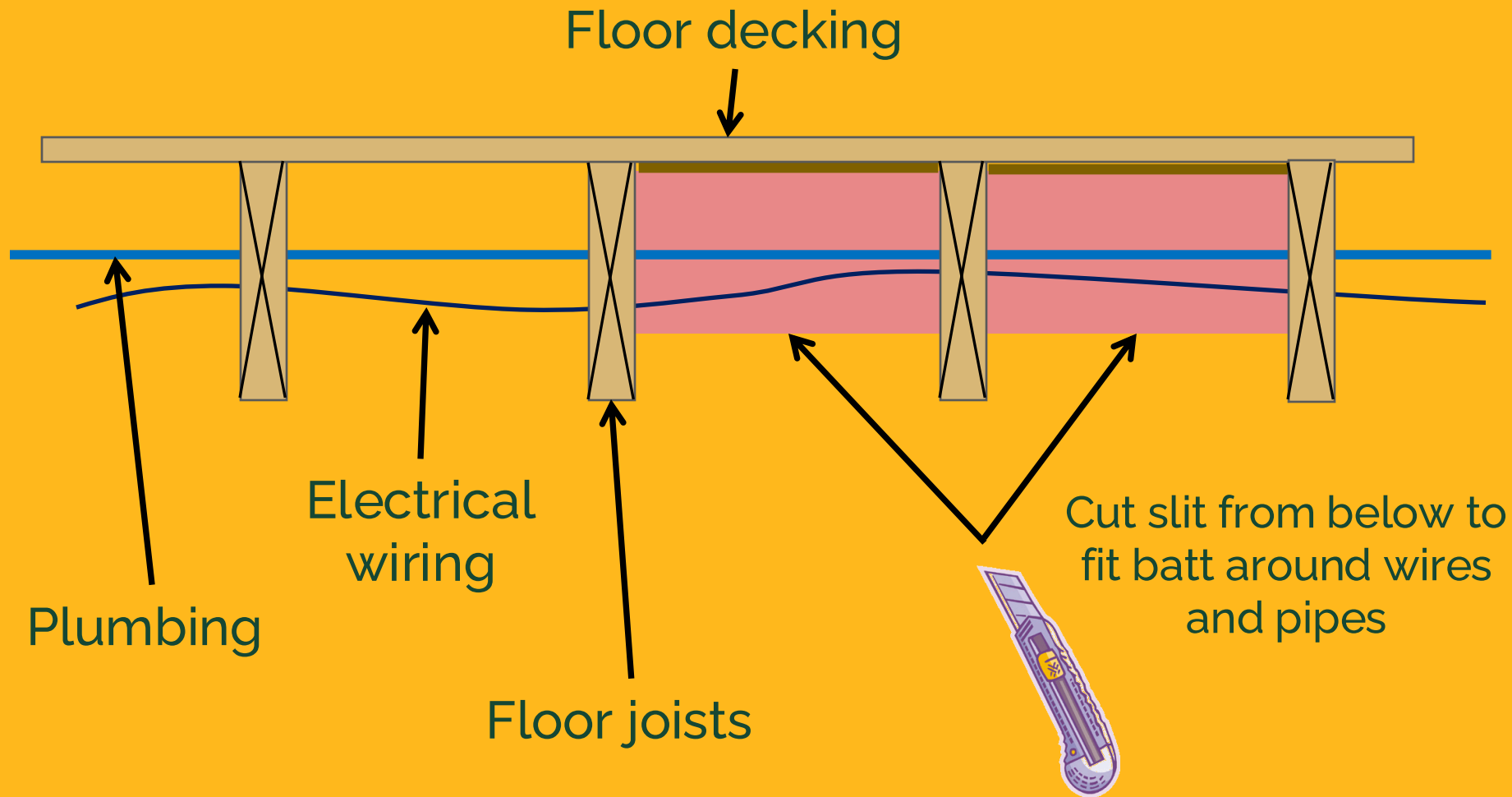
# Installing Ceiling Insulation: Batts



# Installing Around Bracing



# Installing Around Wires & Pipes



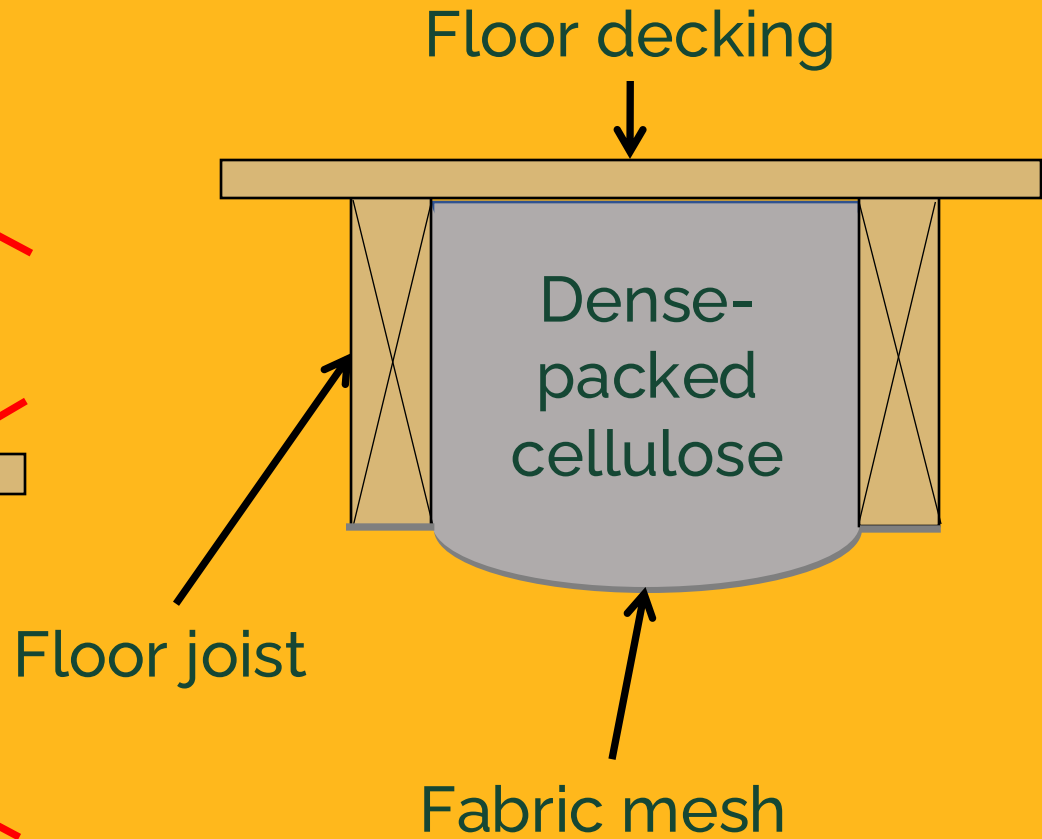
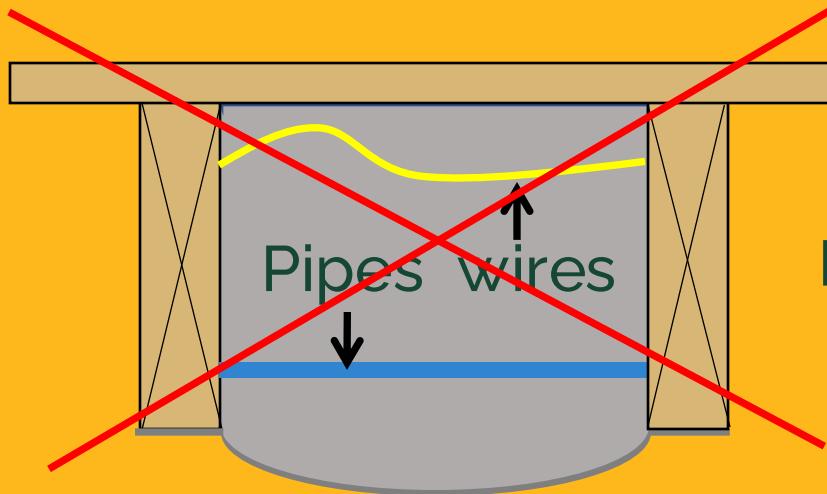
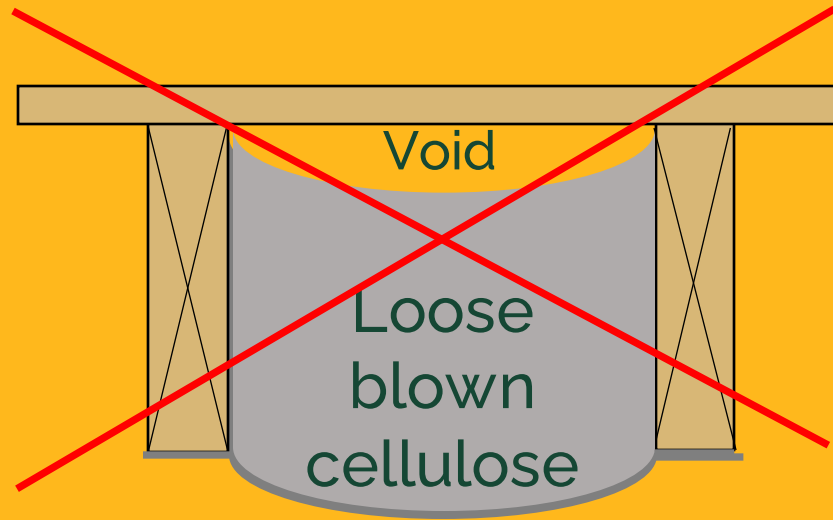
# Ceiling Insulation: Cellulose

Use cellulose when:

- there are no obstructions or equipment
- the ceiling area will not require access



# Ceiling Insulation: Cellulose





# Failed Measure



The customer directed the Inspector to fiberglass batting that was installed on the basement ceiling. This measure was not included in the original Post Inspection Detail form. It was found that 825 sq. ft. of basement ceiling had 6" R-19 batts installed. The batts were installed by stapling them to the subflooring above, which causes undue compression and is against manufacturer installation specifications. With the compression, the average depth was less than 5" at R-15 and therefore this measure was not completed to specification.

# Failed Measure



# Summary



## What we covered:

- Working safely in basements and crawlspaces is paramount
- Including the basement within the thermal boundary depends on the existing conditions of the home and the homeowner's future plans

# Questions

???

# Lunch Break

