

# Pre-drywall, Post-insulation

# Pre-drywall, post-insulation



- Insulation installed properly

## St. Louis 2018 IECC Energy Code - Comprehensive Field Inspection Checklist

Yes  
No  
N/A

### Pre-Drywall, post-insulation (Insulation installed properly)

- Wall insulation installed in substantial contact and continuous alignment with the air barrier(s)
- Wall insulation neatly fills cavity (no voids, no insulation compression due to wiring & plumbing)
- Attic insulation prep properly performed
  - Dams and vent baffles extend over top plate of exterior walls
  - Dams installed at attic access and to adjacent uninsulated areas (porches & garages, etc.)
  - Insulation installed under elevated HVAC/appliance platforms in attics
- Attic pull-down stairs sealed into rough opening
- Cantilevered floors insulated properly (R-19)
- Rim/band areas insulated properly (R-20)
- Ducts insulated to R-8 in attics, R-6 in other unconditioned space.  
Visually check for sealant at seams and fittings
- Floor insulation supported and in full contact with subfloor sheathing
- Floor assembly end-dam barriers installed under attic knee walls (such as for bonus room floors above garages)
- Mechanical spaces receiving outdoor combustion air have continuous, air sealed and insulated thermal envelope (walls, floors, ceiling as applicable) to isolate from main house
- R-3 Hot water piping insulation installed (and recirculation system pipe insulation & controls)
  - Piping  $\frac{3}{4}$  inch and larger in nominal diameter
  - Piping serving more than one dwelling unit
  - Piping located outside the conditioned space
  - Piping from the water heater to a distribution manifold
  - Piping located under a floor slab & buried in piping
  - Supply and return piping in recirculation systems other than demand recirculation systems

## Pre-drywall, post-insulation

- Insulation **NOT** aligned with ceiling air barrier



WHAT'S WRONG WITH THESE PICTURES?



## Installing Insulation



- Voids / Gaps
- Compression / Incomplete Fill
- Alignment with air barrier

## Pre-drywall, post-insulation

Yes  
 No  
 N/A

1. Wall insulation installed in substantial contact and continuous alignment with the air barrier(s)

1. Wall insulation in substantial contact and continuous alignment with air barrier (typically sheathing and drywall)



# Pre-drywall, post-insulation



Yes  
No  
N/A

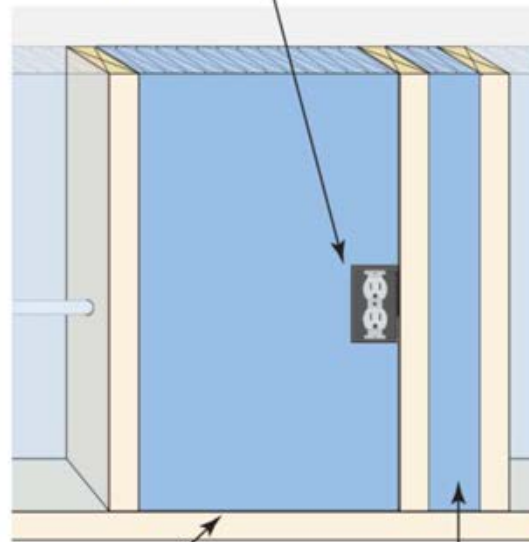
2. Wall insulation neatly fills cavity (no voids, no insulation compression due to wiring & plumbing)

2. Wall insulation neatly fills cavity (no voids, no insulation compression)

## Voids / Gaps

Passing Grade

Insulation is notched and completely surrounds electrical box

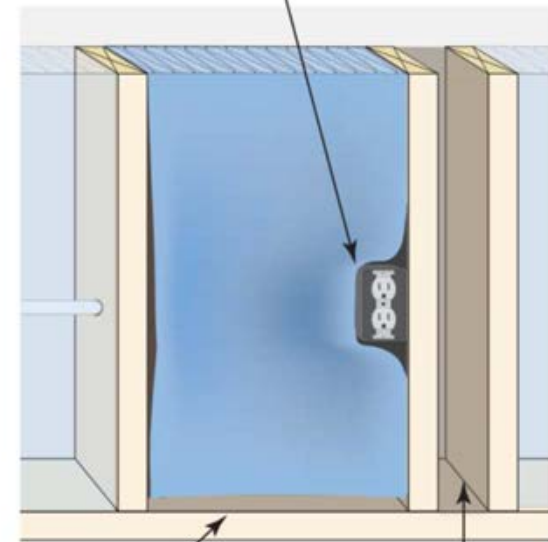


Insulation fully fills cavity at top and bottom

Narrow cavity fully insulated

Unacceptable Installation

Incomplete insulation coverage around electrical box



Insulation does not extend to bottom of cavity

Narrow cavity not insulated

# Pre-drywall, post-insulation

Yes  
No  
N/A

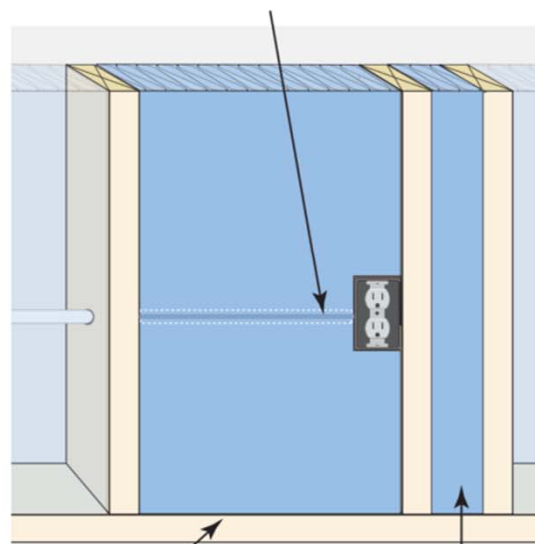
2. Wall insulation neatly fills cavity (no voids, no insulation compression due to wiring & plumbing)

2. Wall insulation neatly fills cavity (no voids, no insulation compression)

## Compression / Incomplete Fill

Passing Grade

Insulation is slit around electrical wire

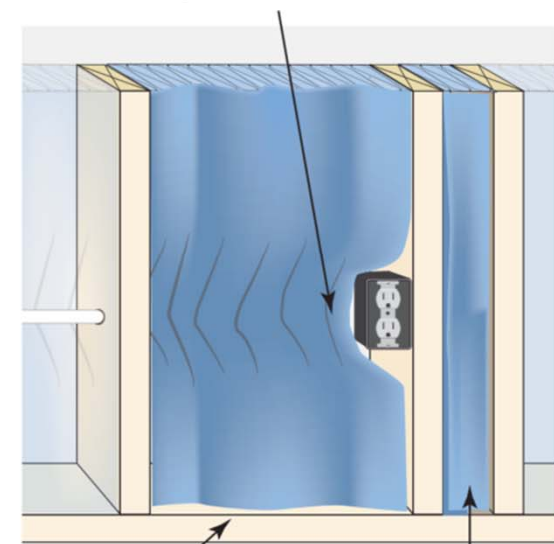


Insulation extends from front to back and fully fills entire cavity

Proper width insulation fully fills narrow cavity

Unacceptable Installation

Insulation is compressed behind electrical wire



Insulation does not fully fill entire cavity

Improper width insulation is compressed into narrow cavity

## Wall Insulation Details

- Batt is slit or split to allow the wire to bisect the cavity & not compress the insulation



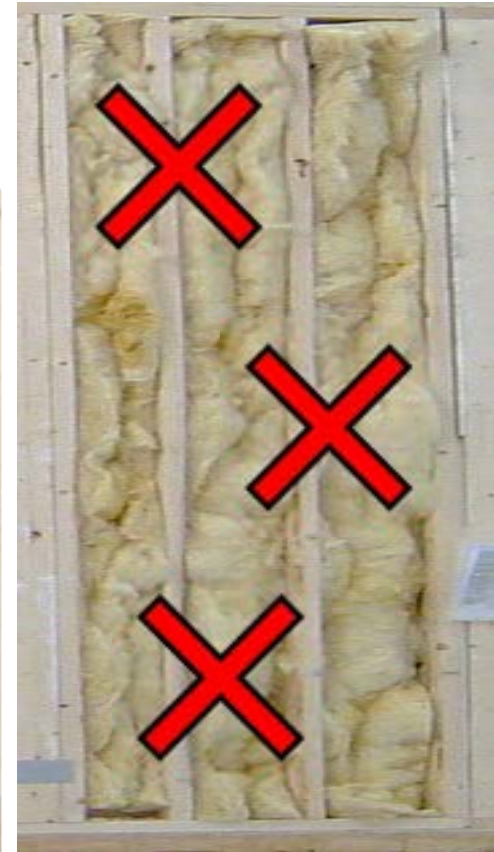
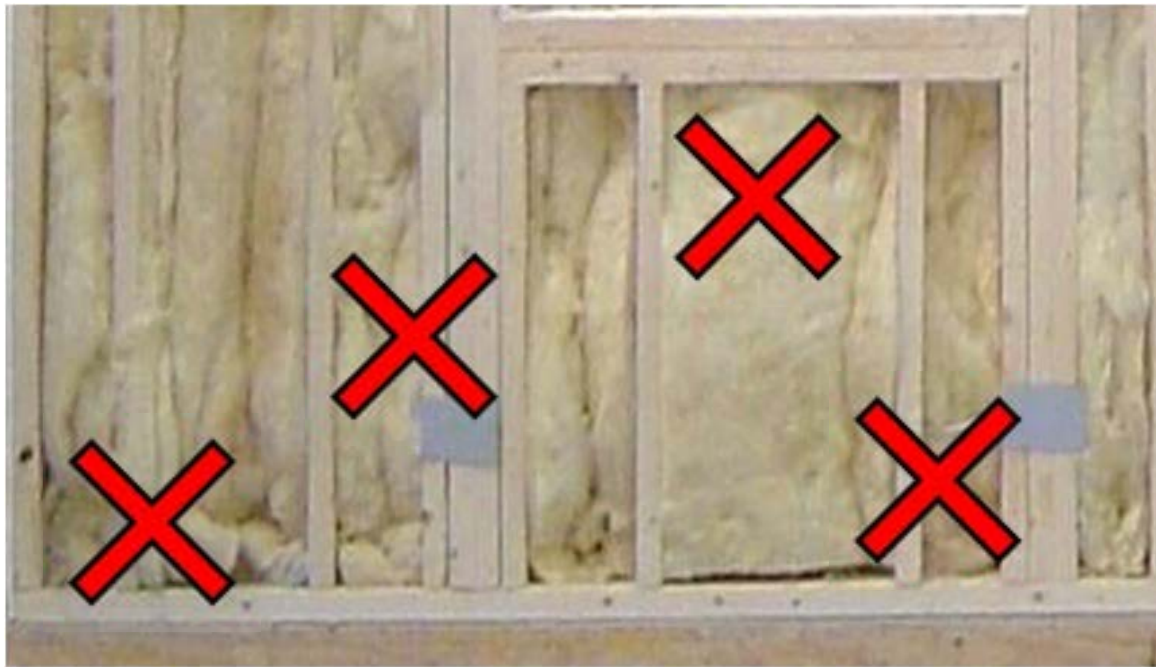


## Wall Insulation Details



- Wire is compressing the insulation
- Voids around electrical outlet
- Missed a whole cavity

# Wall Insulation Details



# Installation Videos



YouTube Search

## Keys to Proper Batt Installation

- #1** - Fill the cavity top-to-bottom, side-to-side and back-to-front
- #2** - Leave no gaps between insulation and framing members - studs and top & bottom plates
- #3** - Split around wiring
- #4** - Insulate behind electrical boxes and other voids created by cavity obstructions

3:27 / 11:14

# Pre-drywall, post-insulation



Yes  
No  
N/A

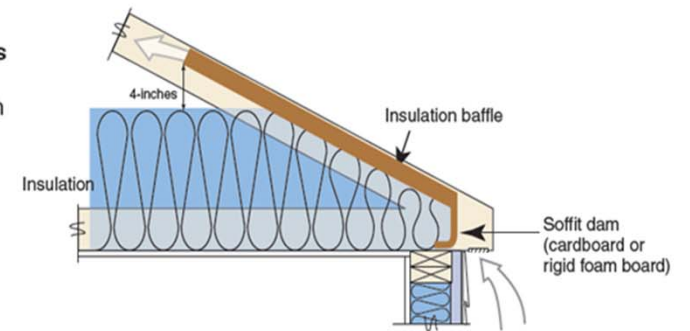
3. Attic insulation prep properly performed

- Dams and vent baffles extend over top plate of exterior walls
- Dams installed at attic access and to adjacent uninsulated areas (porches & garages, etc.)
- Insulation installed under elevated HVAC/appliance platforms in attics

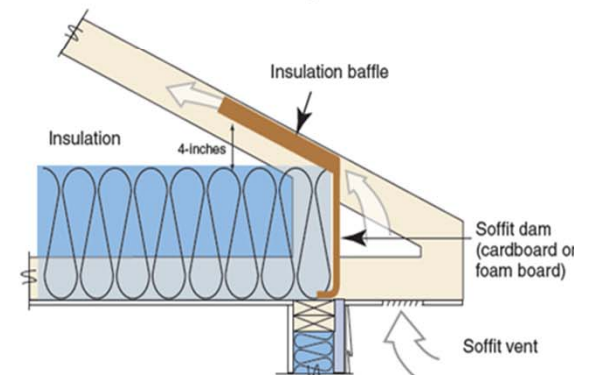
## 3. Attic insulation preparation (dams, baffles, elevated platforms)



Standard Truss  
with tapered  
insulation depth



Energy Truss  
with full height insulation  
(recommended)





# Pre-drywall, post-insulation



Yes  
No  
N/A

3. Attic insulation prep properly performed

- Dams and vent baffles extend over top plate of exterior walls
- Dams installed at attic access and to adjacent uninsulated areas (porches & garages, etc.)
- Insulation installed under elevated HVAC/appliance platforms in attics

## 3. Attic insulation preparation (dams, baffles, elevated platforms)



## Pre-drywall, post-insulation

N/A  
No  
Yes

4. Attic pull-down stairs sealed into rough opening

4. Attic pull-down stairs sealed into rough opening

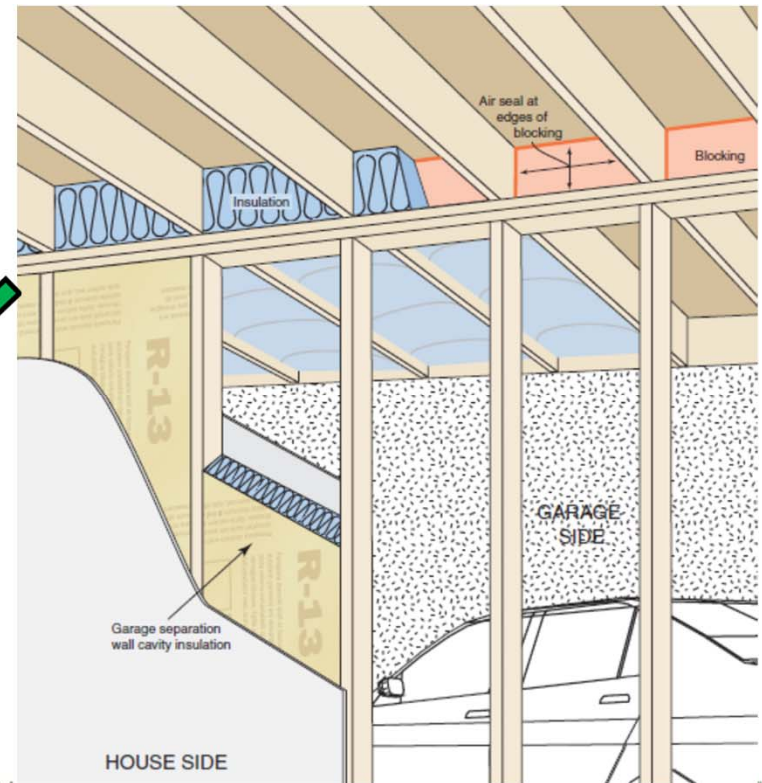
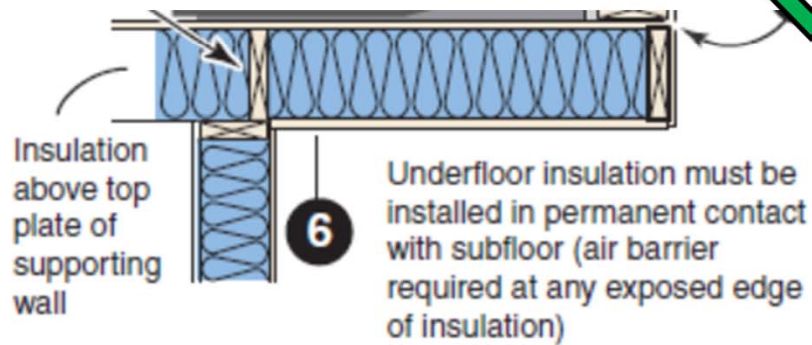


# Pre-drywall, post-insulation

Yes  
No  
N/A

## 5. Cantilevered floors insulated properly (R-19)

### 5. Cantilevered floors insulated properly





# Pre-drywall, post-insulation

N/A  
No  
Yes

6. Rim/band areas insulated properly (R-20)

6. Rim/band areas insulated properly (R-20 or R-13+5)



**Rigid  
Foam  
Board**



**Batt  
Insulation**

**Bagged  
Insulation**



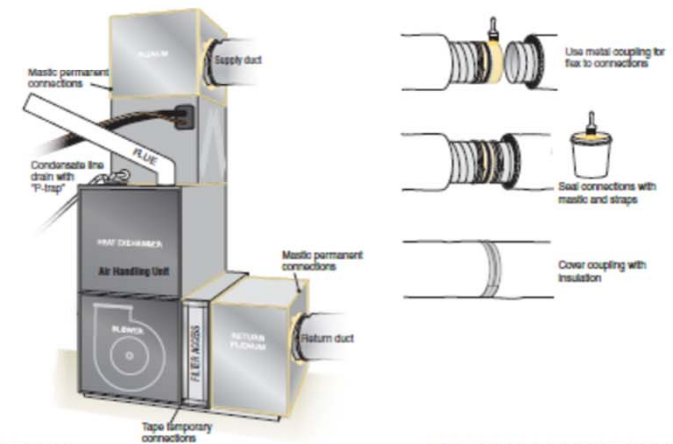
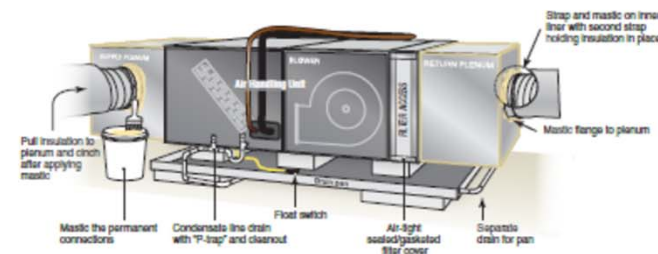
# Pre-drywall, post-insulation



Yes  
No  
N/A

- 7. Ducts insulated to R-8 in attics, R-6 in other unconditioned space  
Visually check for sealant at seams and fittings

7. Ducts insulated properly (including boots)  
Visual check for sealing



# Pre-drywall, post-insulation



Yes  
No  
N/A

- 7. Ducts insulated to R-8 in attics, R-6 in other unconditioned space  
Visually check for sealant at seams and fittings

- 7. Ducts insulated properly (including boots)  
Visual check for sealing



# Pre-drywall, post-insulation

N/A  
NO  
YES  
□ □ □

8. Floor insulation supported and in full contact with subfloor

8. Floor insulation supported and in full contact with subfloor sheathing



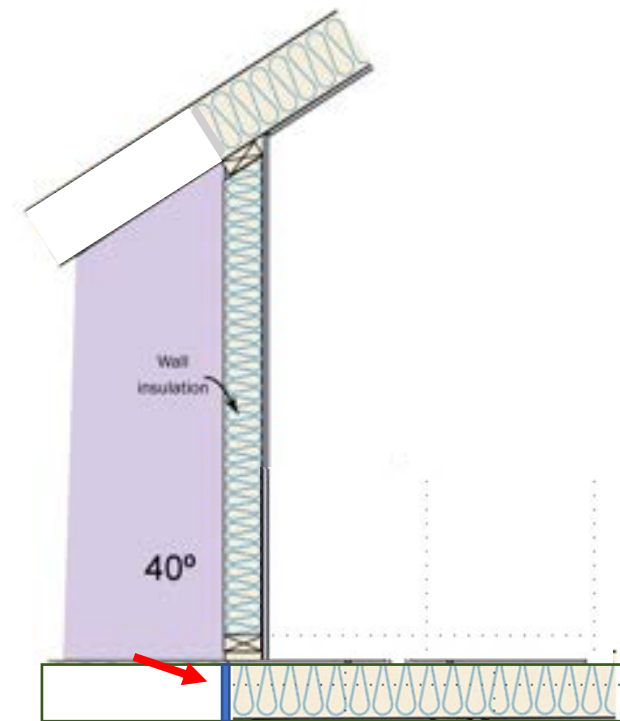
# Pre-drywall, post-insulation



N/A  
No  
Yes

- 9. Floor assembly end-dam barriers installed under attic knee walls (such as for bonus room floors above garages)

9. Floor assembly insulation has end dams installed under attic knee walls



# Pre-drywall, post-insulation

10. Mechanical spaces (i.e., combustion closets) are sealed and insulated to isolate from main house

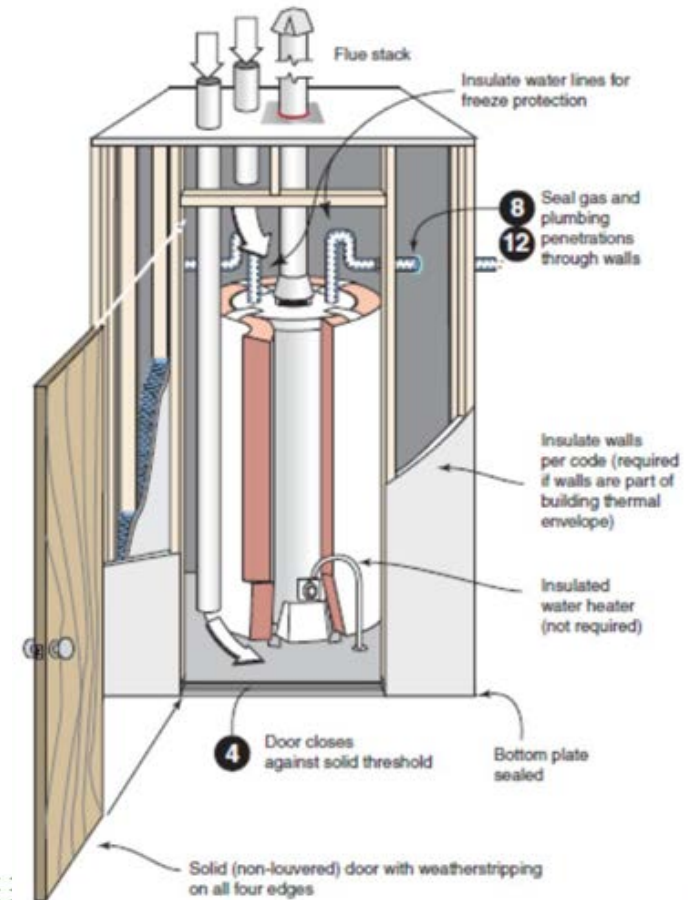
Yes  
No  
N/A

10. Mechanical spaces receiving outdoor combustion air have continuous, air sealed and insulated thermal envelope (walls, floors, ceiling as applicable) to isolate from main house



## Combustion closet

Combustion air inlets  
as per mechanical and/or fuel gas code



# Pre-drywall, post-insulation

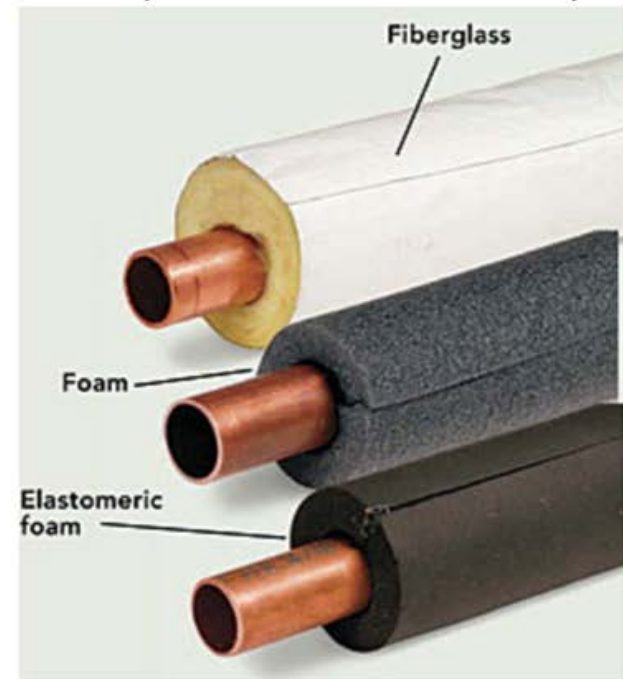
## 11.R-3 hot water pipe insulation



Yes  
No  
N/A

11. R-3 Hot water piping insulation installed (and recirculation system pipe insulation & controls)

- Piping 3/4 inch and larger in nominal diameter
- Piping serving more than one dwelling unit
- Piping located outside the conditioned space
- Piping from the water heater to a distribution manifold
- Piping located under a floor slab & buried in piping
- Supply and return piping in recirculation systems other than demand recirculation systems



# Final Inspection

- Confirm all items prior to Certificate of Occupancy

## **Final inspection** (confirm prior to Certificate of Occupancy)

1. Blower door and duct leakage passing results correctly displayed on energy code certificate
2. Mechanical ventilation system installed for homes < 5 ACH50
3. Duct boots insulated and sealed to drywall and/or subfloor
4. Underfloor insulation installed in complete contact with air barrier and permanently secured in place (e.g., wire staves)
5. Crawlspace has complete (min. 6-mil poly) vapor barrier (overlapped and sealed to foundation)
6. Conditioned Crawlspace Wall has insulation installed as per code (402.2.11)
7. Basement wall insulated as per code (~~R-13 cavity or R-10 continuous for CZ 4~~; amended to R-0)
8. Attic access (pull-down stairs or hatch) meets R-38 insulation and air sealing requirements (pull-down stairs door is sealed into rough opening)
9. Utility (e.g., gas piping) penetrations sealed at exterior.
10. Plumbing penetrations in drywall are sealed
11. Attic Ceiling insulation is properly installed: coverage is consistent, proper depth throughout
  - Attic contains Loose-fill Insulation Card and Rulers (1 per 300 sf)
  - Dams and vent baffles extend over top plate of exterior walls at eave/soffit vents
  - Dams installed at attic access and to adjacent uninsulated portions (porches & garages, etc.)
  - Insulation shield around appliance vent pipes and chimneys
12. Refrigerant line-set insulation is protected from elements and air sealed at envelope junction
13. Efficient lighting for 90% of bulbs– CFL's, linear fluorescent & LED (not incandescent or halogen)



# Final inspection

Yes  
No  
N/A

1. Blower door and duct leakage passing results correctly displayed on energy code certificate

1. Blower door (<3 ACH<sub>50</sub>) and duct leakage (≤ 4%) passing results correctly obtained and displayed on energy code certificate



# Final inspection

Yes  
No  
N/A

1. Blower door and duct leakage passing results correctly displayed on energy code certificate

1. Blower door and duct leakage passing results correctly obtained and displayed on **energy code certificate**



# Final inspection

Yes  
No  
N/A

1. Blower door and duct leakage passing results correctly displayed on energy code certificate

1. Blower door and duct leakage passing results correctly obtained and displayed on energy code certificate



**2018 ALABAMA ENERGY CODE COMPLIANCE FORM**

Builder: Builder 2 Date: \_\_\_\_\_  
 License Number: 1224181900  
 Property Address: 104 Elm St NE  
 Birmingham, AL 35202  
 Conditioned Floor Space: 1,200 sq ft  
 Signature: \_\_\_\_\_

**Duct & Envelope Tightness (DET) Testing**

**Duct System 1 Blower Door**  
 Tested by: Contractor A Fan Flow at 50 Pascals (CFM)<sub>50</sub>: 1,100 CFM  
 License Number: 1224181900 Total Conditioned Volume (ft<sup>3</sup>): 16,000 ft<sup>3</sup>  
 ACH<sub>50</sub> (CFM<sub>50</sub> x 60 / Volume): 4.88 ACH<sub>50</sub>  
 Measured duct leakage (CFM<sub>100</sub>): 24 CFM "A<sub>50</sub> Duct Leakage": 1.43  
 Zone Area Served: 700 sq ft CFM<sub>100</sub> / 100 sq ft: 1.43  
 Duct Test: Energy - 100% of Zone ACH<sub>50</sub> Within Envelope Duct System 1 Compliant:

**Duct System 2**  
 Tested by: Contractor A  
 License Number: 1224181900  
 Measured duct leakage (CFM<sub>100</sub>): 11 CFM  
 Zone Area Served: 800 sq ft  
 Duct Test: Duct/Construction, Leakage in Situ

**Mechanical**  
 Water Heating Energy Factor (EF): 0.61  
 No. of Heating and Cooling Systems: 1  
 Main Heating System: Gas Forced Air Furnace  
 AFUE: 80  
 Main Cooling System: Air Conditioner  
 SEER: 13.00

Mandatory Envel \_\_\_\_\_  
 Builder Representative: \_\_\_\_\_  
 Jurisdiction Representative: \_\_\_\_\_



Insulation Rating	R-Value	
Above-Grade Wall	13.00	
Below-Grade Wall	0.00	
Floor	30.00	
Ceiling / Roof	64.70	
Ductwork (unconditioned spaces):		
Glass & Door Rating	U-Factor	SHGC
Window	0.28	0.28
Door	0.33	
Heating & Cooling Equipment	Efficiency	
Heating System:		
Cooling System:		
Water Heater:		
Name:	Date:	
Comments		

**2020 Georgia Residential Energy Code Compliance Certificate**

This certificate shall be posted on or near the electrical distribution panel or air handler. Jurisdiction Logo and/or Contact Information: \_\_\_\_\_  
 Permit #: \_\_\_\_\_ Here

House Address or Community/Lot: 123 Fake Street, Citytown Georgia

**Builder Summary**  
 Builder Company Name: Joe Builder Homes Signature: \_\_\_\_\_ Contact (email/phone): Joe@JBH.com (833)444-5555 Date: 1/1/2020

**Compliance Pathways (check one)**  
 Prescriptive: R603-404  
 UA Trade-off: R603.1.5  
 RESCheck: R603.1.5  
 Simulated Performance: R605  
 Energy Rating Index (ERI): R606  
 All Items

**Mechanical Summary**  
 Heating System Type: \_\_\_\_\_ Efficiency (AFUE, SEER, COP or other): \_\_\_\_\_ Cooling System Type: \_\_\_\_\_ Efficiency (SEER, EER or other): \_\_\_\_\_ Water Heating Type: \_\_\_\_\_ Efficiency (EF or other): \_\_\_\_\_  
 Gas  Air conditioner  Gas  
 Heat pump  Heat pump  Electric  
 Other  Other: \_\_\_\_\_  
 Yes  No Manual L, S, O or equivalent complete?

**Required Mechanical Ventilation**  
 Exhaust (check one):  Continuous  Demand  Supply  Demand  Demand  
 Design Ventilation Rate (CFM): \_\_\_\_\_  
 Balanced:  If installed, list outdoor air min. per hour: \_\_\_\_\_

**Duct and Envelope Tightness Testing Summary**  
 Contact (email/phone): \_\_\_\_\_ DET Number ID: \_\_\_\_\_  
 Lea Keyhaus leakeyhaus@gmail.com (222)333-4444 SF-04-11-2015-07

**Envelope Tightness Testing (1.3 ACH<sub>50</sub>)** [Envelope Tightness = Blower Door Fan Flow x 60 / Thermal Envelope Volume]  
 Blower Door Fan Flow (CFM)<sub>50</sub>: 1,880 Thermal Envelope Volume (ft<sup>3</sup>): 27,400 Envelope Tightness (ACH<sub>50</sub>): 4.1  
 If multifamily unit and conducting sampling, this unit is not required to be tested. Mark N/A.

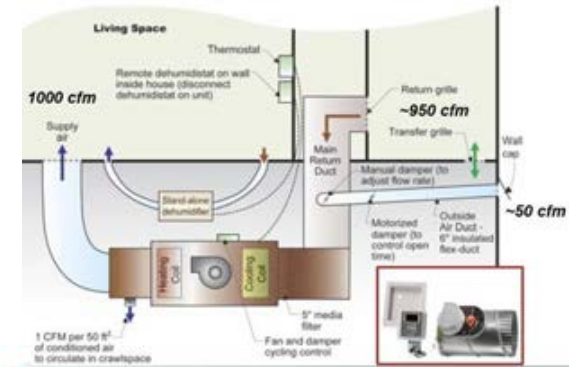
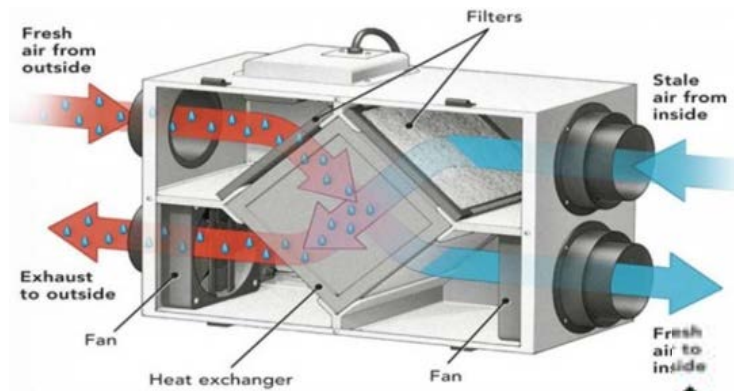
[Total Duct Leakage x 100 x Fan Flow / Area Served]		
System 1	System 2	System 3
Main (Attic)	2nd Floor (Attic)	
78	52	
1400	1350	
5.6	3.9	
PCT	PCT	

# Final inspection

Yes  
No  
N/A

2. Mechanical ventilation system installed for homes < 5 ACH50

2. Mechanical ventilation system installed for homes < 5 ACH50 (as per IRC)



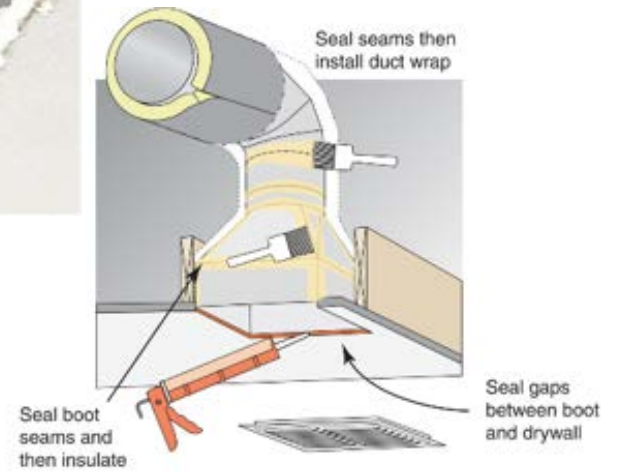
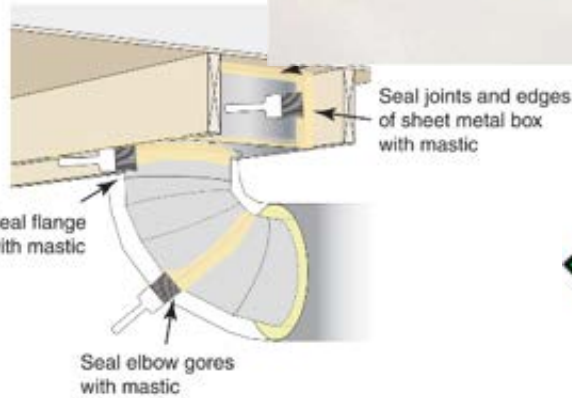
# Final inspection

Yes  
No  
N/A



3. Duct boots insulated and sealed to drywall and/or subfloor

3. Duct boots insulated and sealed to drywall/ subfloor



# Final inspection

Yes  
 No  
 N/A

4. Underfloor insulation installed in complete contact with air barrier and secured

4. Underfloor insulation installed in complete contact with air barrier and permanently secured in place (e.g., wire staves)

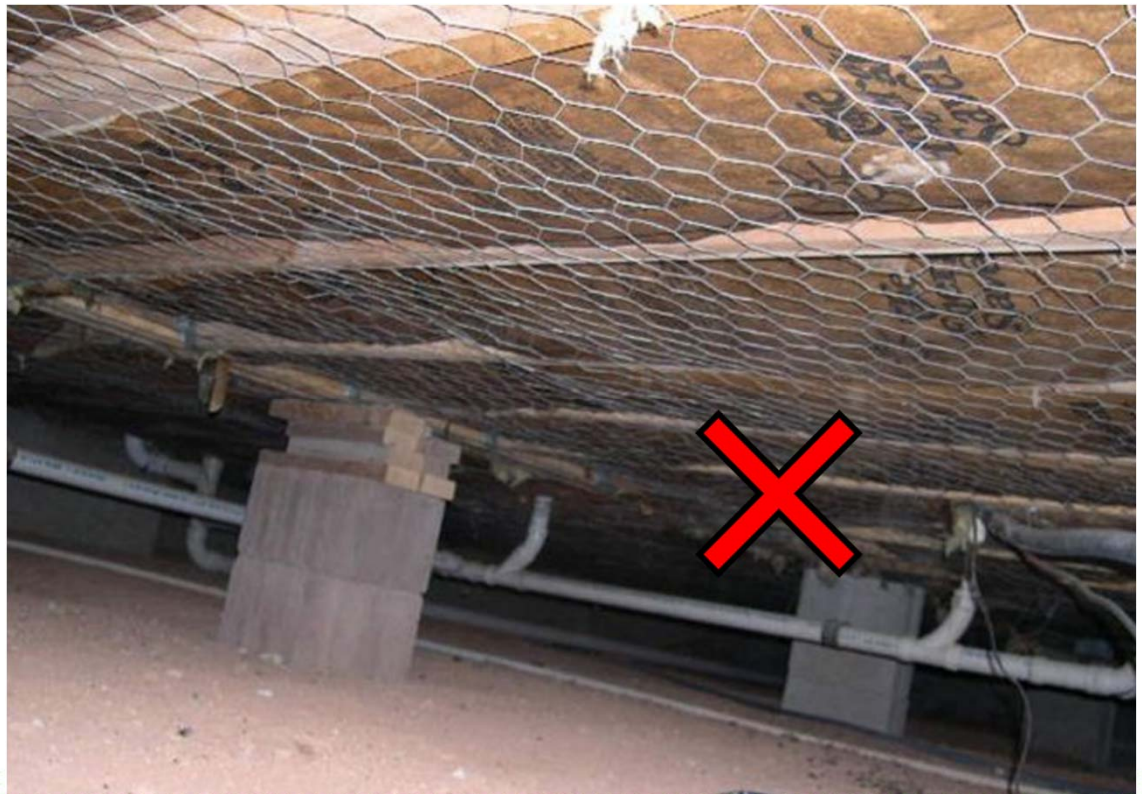


# Final inspection

Yes	No	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 4. Underfloor insulation installed in complete contact with air barrier and permanently secured in place (e.g., wire staves)

- 4. Underfloor insulation installed in complete contact with air barrier and secured



# Final inspection

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No
<input type="checkbox"/>	N/A

- 4. Underfloor insulation installed in complete contact with air barrier and permanently secured in place (e.g., wire staves)

4. Underfloor insulation installed in complete contact with air barrier and secured





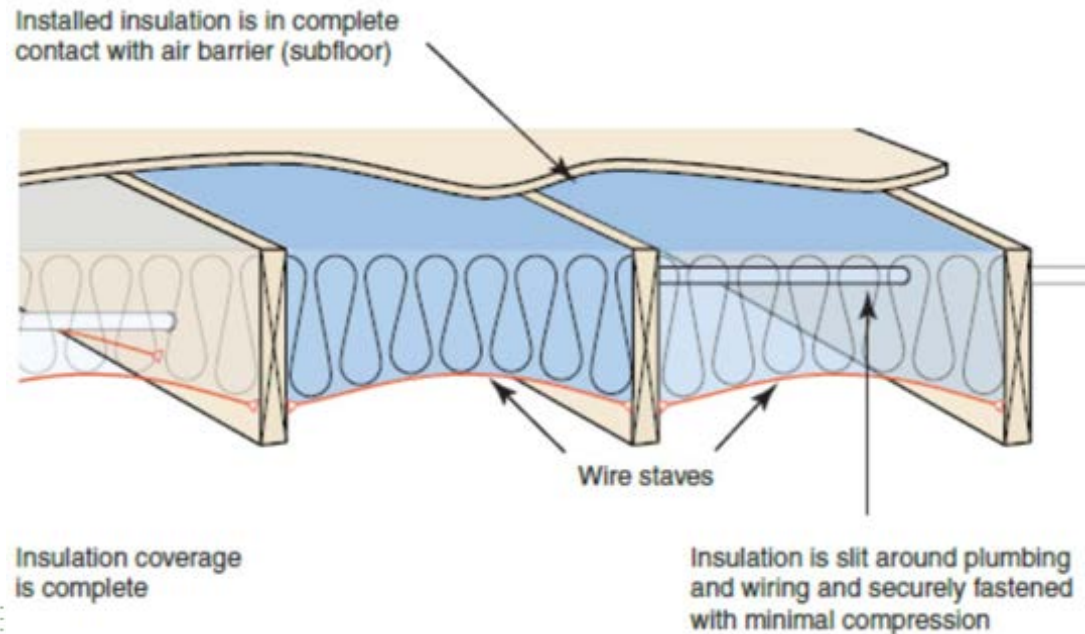
# Final inspection

Yes  
No  
N/A

4. Underfloor insulation installed in complete contact with air barrier and permanently secured in place (e.g., wire staves)

Passing Grade

4. Underfloor insulation installed in complete contact with air barrier and secured

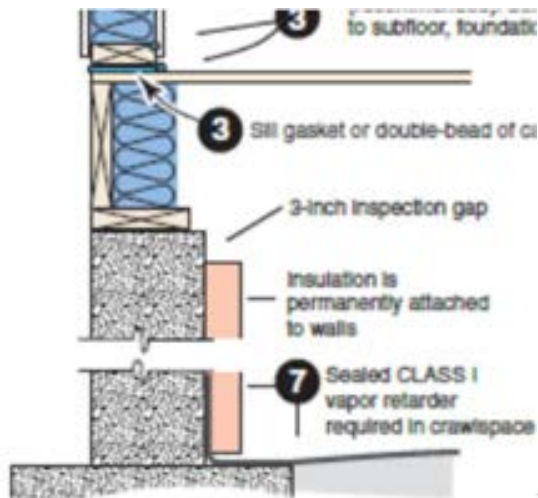


# Final inspection

Yes  
 No  
 N/A

5. Crawlspace has complete (min. 6-mil poly) vapor barrier (overlapped and sealed to foundation)

5. Standard vented and conditioned crawlspaces have 6-mil poly vapor retarder sealed to foundation



# Final inspection

Yes  
 No  
 N/A

6. Conditioned Crawlspace Wall has insulation installed as per code (402.2.11)

6. Conditioned crawlspaces have wall insulation per code (402.2.11) (R-10 continuous for CZ-4)

**R402.2.11 Crawl space walls.** As an alternative to insulating floors over crawl spaces, crawl space walls shall be insulated provided that the crawl space is not vented to the outdoors. Crawl space wall insulation shall be permanently fastened to the wall and shall extend downward from the floor to the finished grade elevation and then vertically or horizontally for not less than an additional 24 inches (610 mm). Exposed earth in unvented crawl space

foundations shall be covered with a continuous Class I vapor retarder in accordance with the *International Building Code* or *International Residential Code*, as applicable. Joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend not less than 6 inches (153 mm) up stem walls and shall be attached to the stem walls.



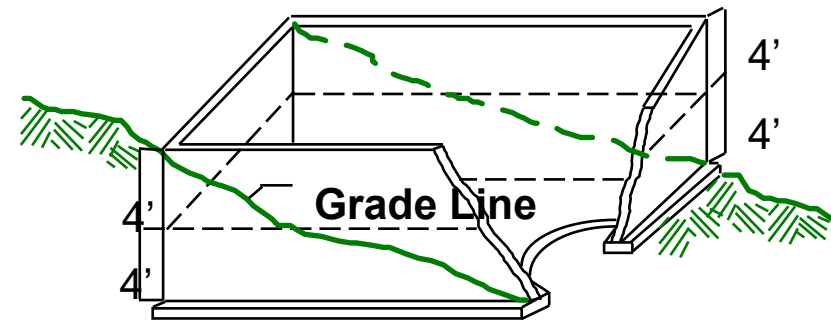
# Final inspection

Yes  
No  
N/A

7. Basement wall insulated as per code (R-13 cavity or R-10 continuous for CZ-4; amended to R-0)

7. Basement wall insulated as per code (R-13 cavity or R-10 continuous for CZ-4)

*Note: St. Louis amended to R-0*



# Final inspection

Yes  
No  
N/A

7. Basement wall insulated as per code (~~R-13 cavity or R-10 continuous for CZ-4~~; amended to R-0)

## 7. Insulated basement wall methods

Cellulose blanket/batt



Rigid foil-faced poly-iso foam board



Fiberglass batt w/ vinyl backing



# Final inspection

Yes No N/A

7. Basement wall insulated as per code (~~R-13 cavity or R-10 continuous for CZ-4~~; amended to R-0)

## 7. Insulated basement wall methods

Rigid foam board



Fiberglass batt in AGW, foam board on concrete



Spray Polyurethane Foam



# Final inspection

Yes  
No  
N/A

7. Basement wall insulated as per code (R-13 cavity or R-10 continuous for CZ-4; amended to R-0)

## 7. Insulated basement wall methods

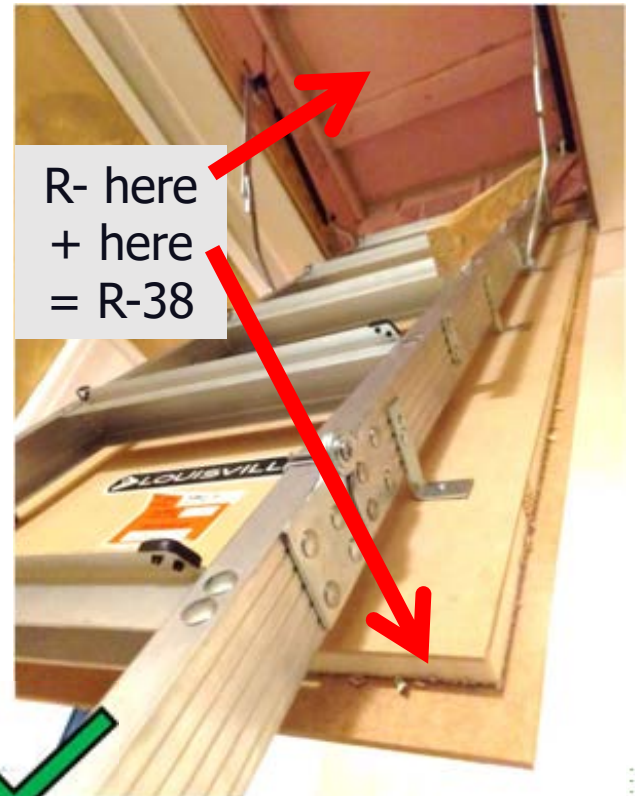
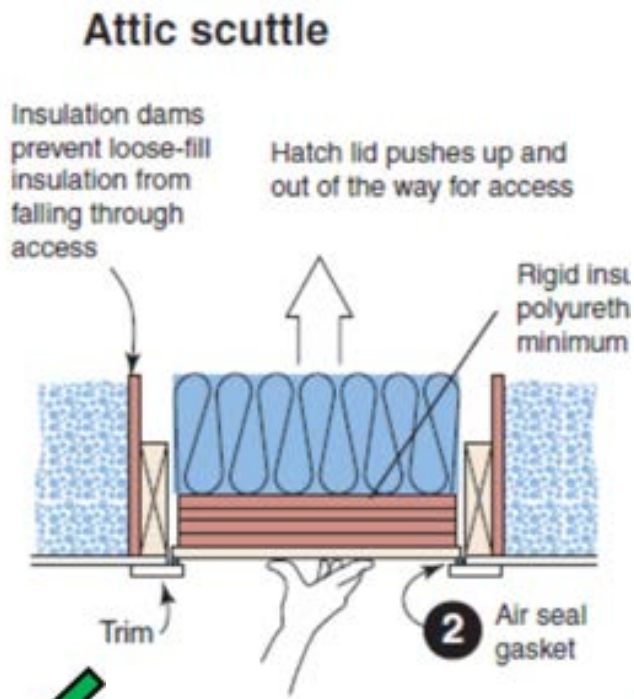


# Final inspection

Yes No N/A

8. Attic access (pull-down stairs or hatch) meets R-38 insulation and air sealing requirements (pull-down stairs door is sealed into rough opening)

8. Attic access (pull-down stairs or hatch) meets air sealing and insulation (\*R-38) requirements



R- here  
+ here  
= R-38



# Final inspection

Yes	No	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Attic access (pull-down stairs or hatch) meets R-38 insulation and air sealing requirements (pull-down stairs door is sealed into rough opening)

8. Attic access (pull-down stairs or hatch) meets air sealing and insulation (\*R-38) requirements



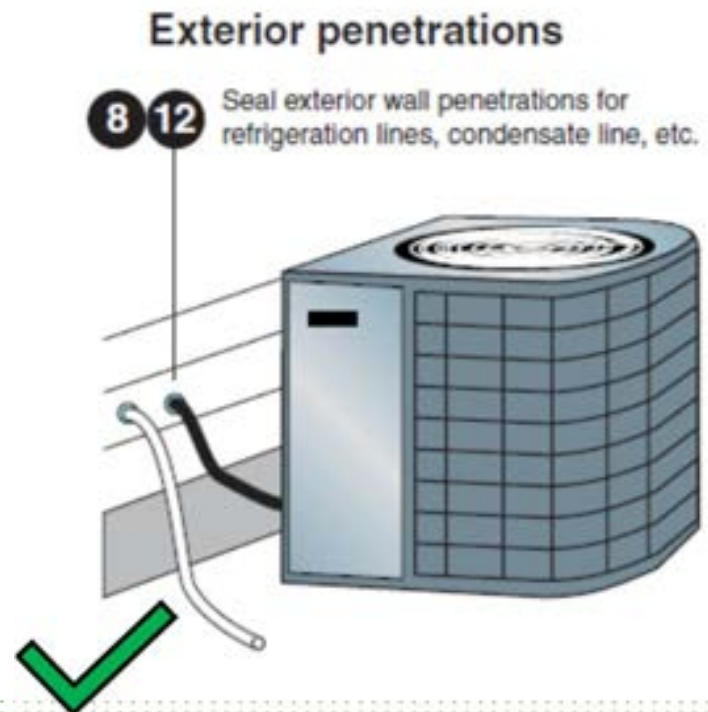
Total R-38

# Final inspection

Yes  
No  
N/A

9. Utility (e.g., gas piping) penetrations sealed at exterior

9. Utility (e.g, gas piping) penetrations sealed



# Final inspection

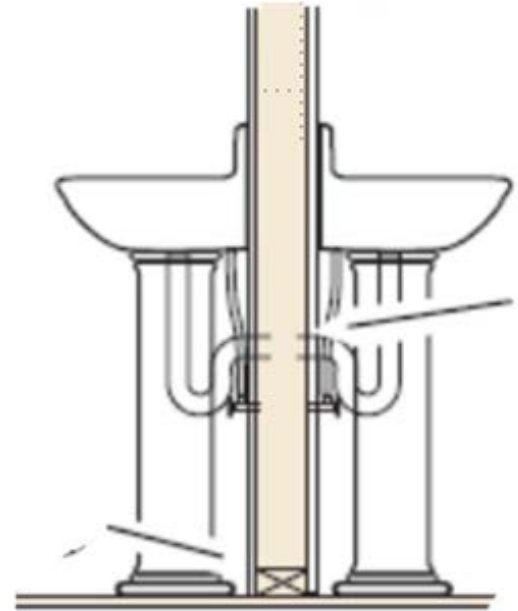
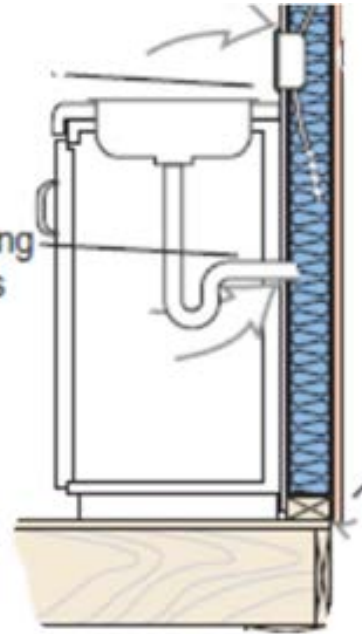
Yes  
No  
N/A

10. Plumbing penetrations in drywall are sealed

## 10. Plumbing penetrations sealed to drywall



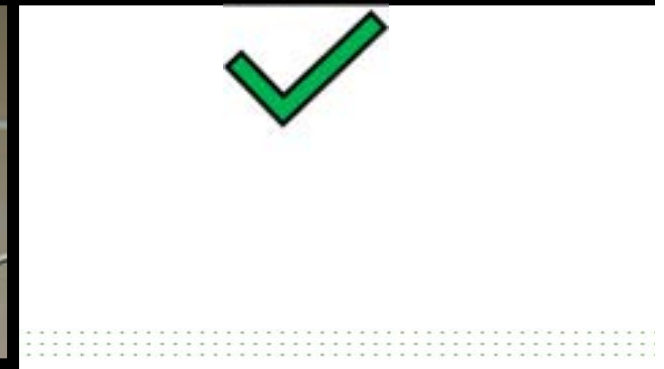
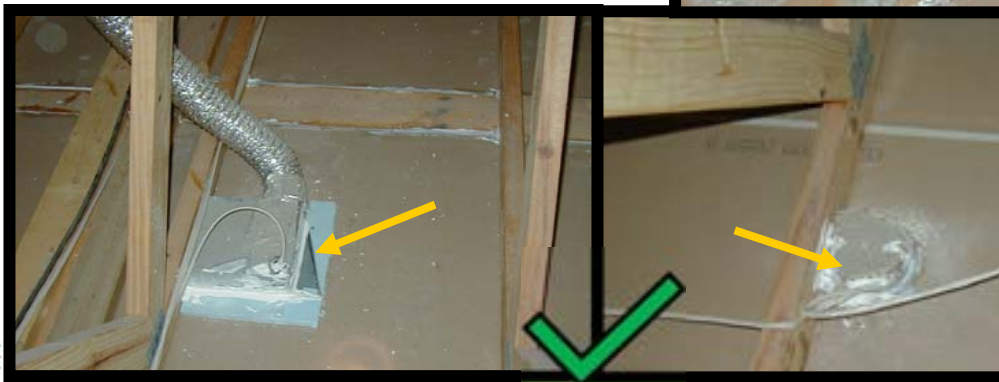
Seal plumbing penetrations



## Before ceiling insulation...

Drywall is the only ceiling Air Barrier

- After drywall, but before ceiling insulation is added, interior wall plate leak paths are sealed with caulk, foam, or gaskets
- Light fixture boxes are caulked
- Bath vent fan rough openings sealed with foam and caulked to the drywall



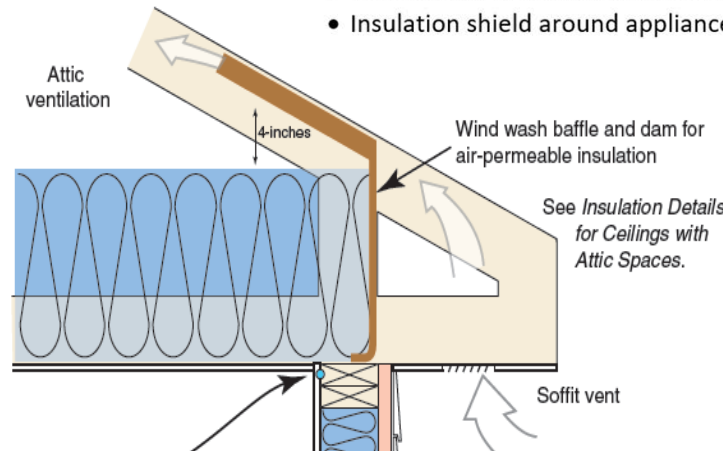
# Final inspection

Yes  
No  
N/A

11. Attic Ceiling insulation is properly installed: coverage is consistent, proper depth throughout

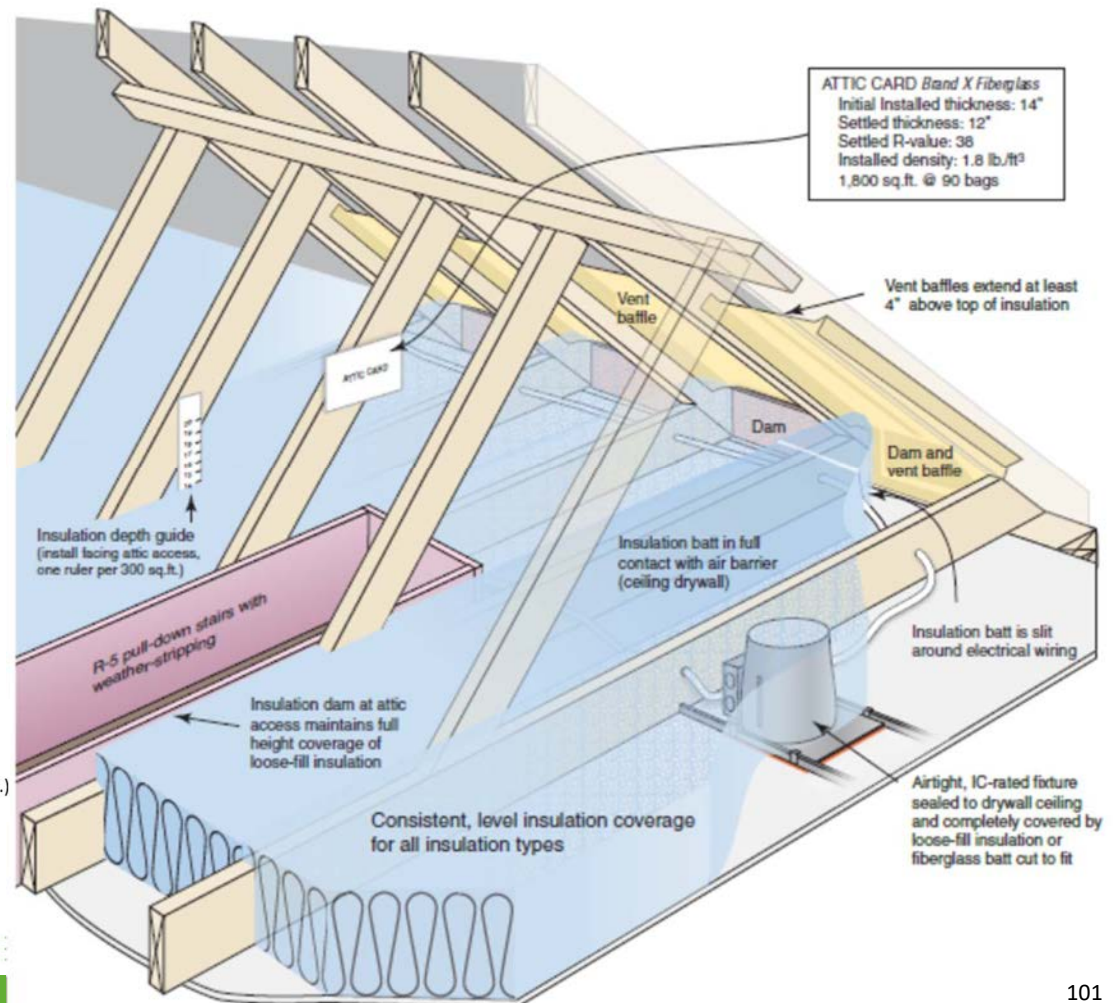
- Attic contains Loose-fill Insulation Card and Rulers (1 per 300 sf)
- Dams and vent baffles extend over top plate of exterior walls at eave/soffit vents
- Dams installed at attic access and to adjacent uninsulated portions (porches & garages, etc.)
- Insulation shield around appliance vent pipes and chimneys

11. Attic ceiling insulation is consistent, proper depth throughout (card & rulers, dams & baffles, shields)



## Final inspection

### 11. Attic ceiling insulation is consistent, proper depth throughout (card & rulers, dams & baffles, shields)



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# Final inspection

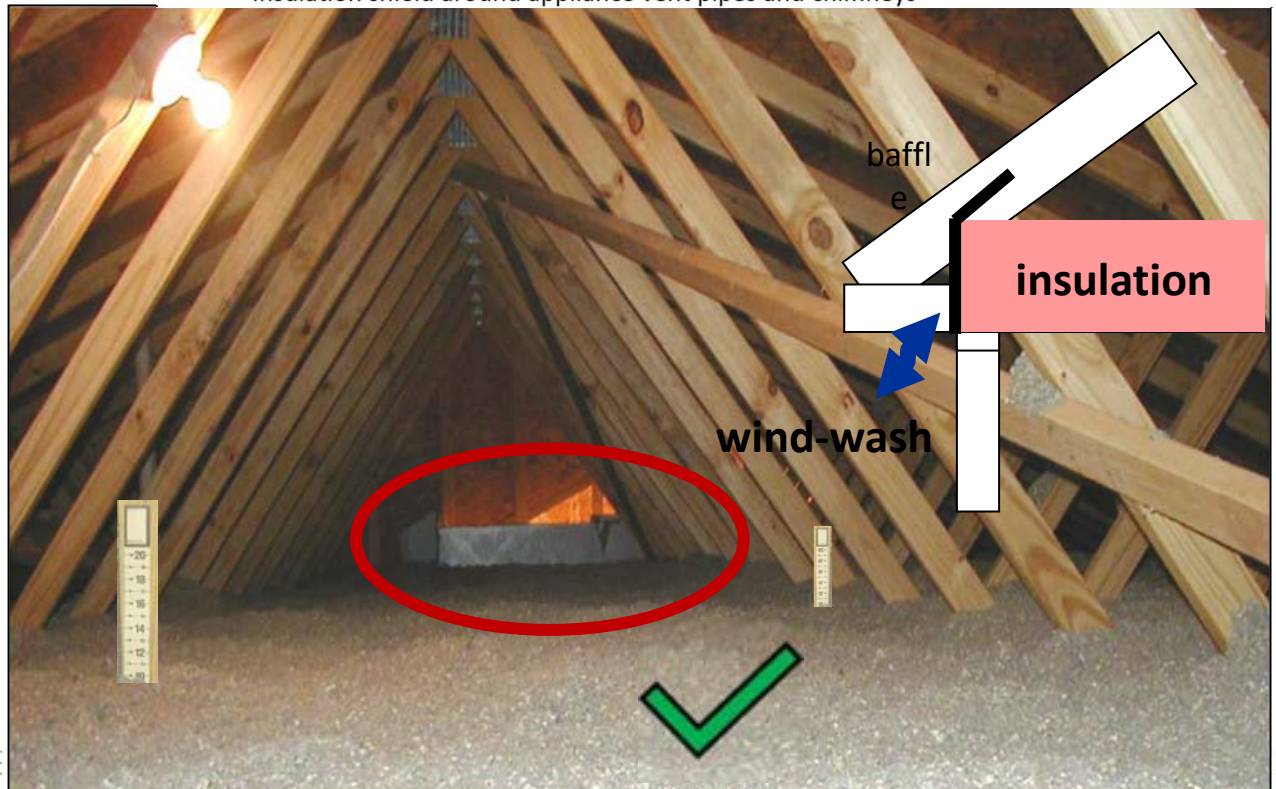
SPY  
NO  
N/A  
YES  
□ □ □



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# Final inspection

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SPR  
NO  
N/A  
YES



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# Final inspection

Yes  
No  
N/A

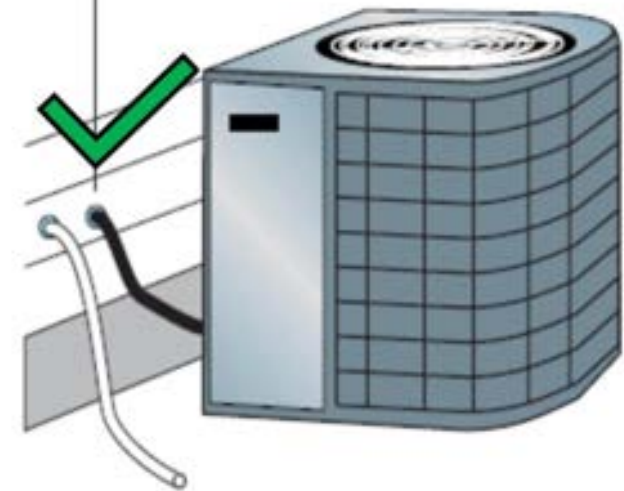
12. Refrigerant line-set insulation is protected from elements and air sealed at envelope junction

12. Refrigerant line-set insulation is protected (and air sealed)



## Exterior penetrations

8 12 Seal exterior wall penetrations for refrigeration lines, condensate line, etc.



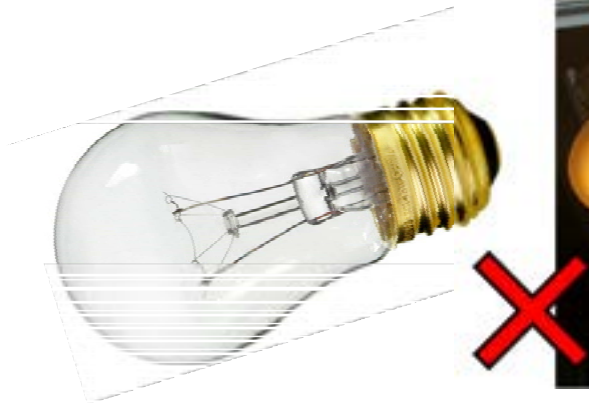
# Final inspection



Yes  
No  
N/A

13. Efficient lighting for 90% of bulbs– CFL's, linear fluorescent & LED (not incandescent or halogen)

13. Efficient light bulbs – 90% are fluorescents, CFL or LED





**Thank you!**

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