



Success with 2009 IECC in South Carolina:
Tech Tips for Builders

FOUNDATION



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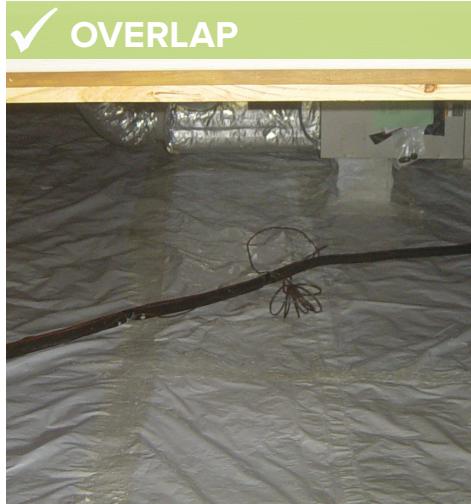




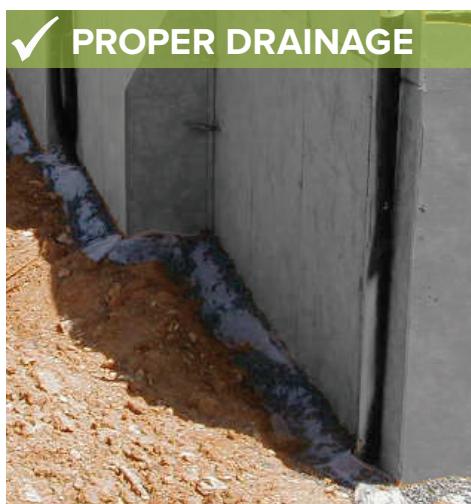
TECH TIPS: FOUNDATION

Success with 2009 IECC in South Carolina for Builders

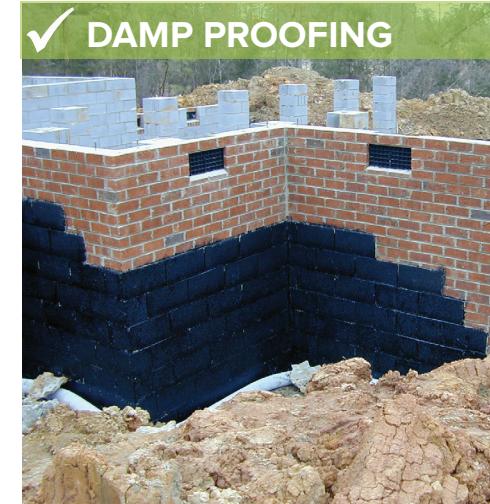
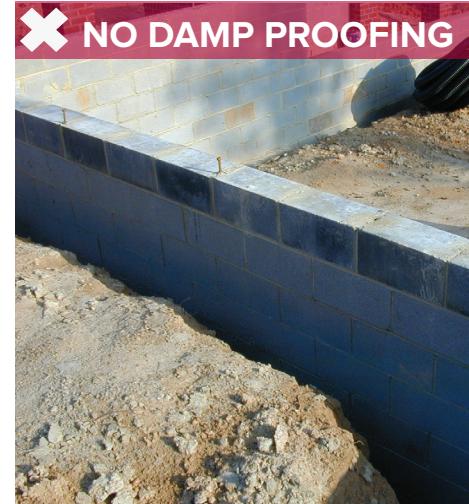
1. If installing poly sheeting, install at least 6-mil thickness and overlap at least 6 inches.



3. Install a drainage system along entire foundation footing of below-grade walls.



2. Damp proof the exterior of all below-grade walls.



4. Install exterior insulation without gaps, voids, misalignments or compression and with a rigid, opaque and weather-resistant protective covering.





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FRAMING



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TECH TIPS: FRAMING

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2. Frame attic to allow the full amount of required insulation under attic platform.

X INSUFFICIENT DEPTH



✓ SUFFICIENT DEPTH



2. Frame attic to allow the full amount of required insulation under attic platforms.

X INSUFFICIENT DEPTH



✓ SUFFICIENT DEPTH



3. Frame corners and headers to allow for insulation installation.

X WRONG FRAMING

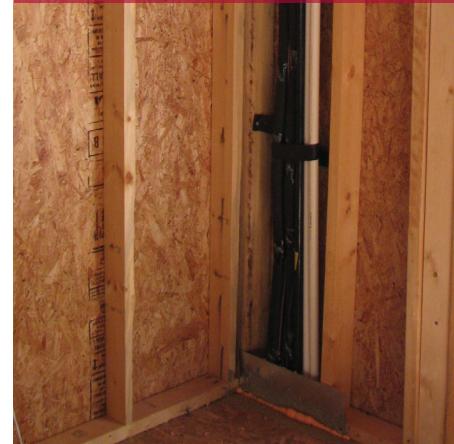


✓ RIGHT FRAMING



3. Frame corners and headers to allow for insulation installation.

X WRONG FRAMING



✓ RIGHT FRAMING





TECH TIPS: FRAMING

Success with 2009 IECC in South Carolina for Builders

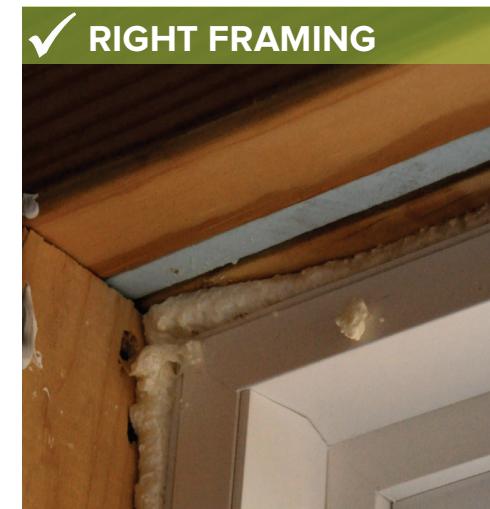
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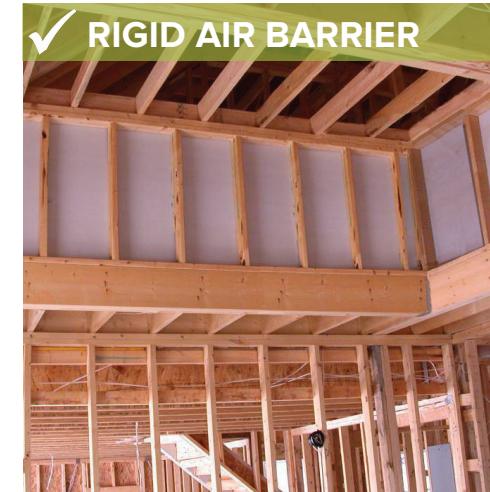
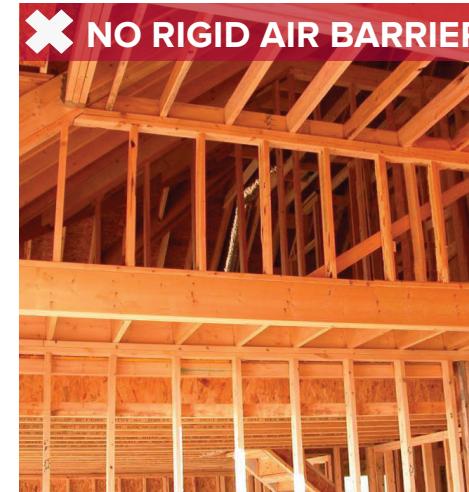
4. For walls separating conditioned and unconditioned space, install framing that allows for the required R-value, has a top plate, bottom plate and an exterior air barrier. RECOMMENDED: rigid air barrier.



3. Frame corners and headers to allow for insulation installation.



4. For walls separating conditioned and unconditioned space, install framing that allows for the required R-value, has a top plate, bottom plate and an exterior air barrier. RECOMMENDED: rigid air barrier.





TECH TIPS: FRAMING

Success with 2009 IECC in South Carolina for Builders

- 4.** For walls separating conditioned and unconditioned space, install framing that allows for the required R-value, has a top plate, bottom plate and an exterior air barrier. RECOMMENDED: rigid air barrier.

✗ NO RIGID AIR BARRIER



✓ RIGID AIR BARRIER



- 5.** For walls that will not have an interior finish and are separating conditioned and unconditioned spaces, insulate wall cavities and install an interior air barrier. RECOMMENDED: rigid air barrier.

✗ NO AIR BARRIER



✓ AIR BARRIER

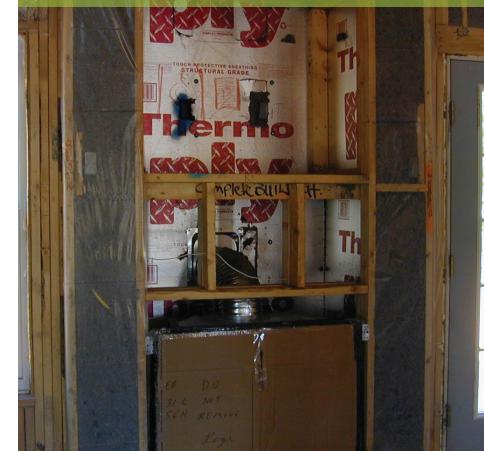


- 5.** For walls separating conditioned and unconditioned space, install framing that allows for the required R-value, has a top plate, bottom plate and an exterior air barrier. RECOMMENDED: rigid air barrier.

✗ NO INSULATION



✓ WALL INSULATED



- 5.** For walls that will not have an interior finish and are separating conditioned and unconditioned spaces, insulate wall cavities and install an interior air barrier. RECOMMENDED: rigid air barrier.

✗ NO AIR BARRIER



✓ AIR BARRIER





TECH TIPS:

FRAMING

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- 5.** For walls that will not have an interior finish and are separating conditioned and unconditioned spaces, insulate wall cavities and install an interior air barrier. RECOMMENDED: rigid air barrier.

✗ NO AIR BARRIER



✓ AIR BARRIER



- 6.** Cap all dropped ceilings/soffits, shafts and chases with an air barrier and air seal. RECOMMENDED: rigid air barrier.

✗ SOFFIT UNCAPPED



✓ SOFFIT CAPPED



- 6.** Cap all dropped ceilings/soffits, shafts and chases with an air barrier and air seal. RECOMMENDED: rigid air barrier.

✗ SOFFIT UNCAPPED



✓ SOFFIT CAPPED



- 6.** Cap all dropped ceilings/soffits, shafts and chases with an air barrier and air seal. RECOMMENDED: rigid air barrier.

✗ CHASE UNCAPPED



✓ CHASE CAPPED





TECH TIPS: FRAMING

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- 7.** For all floor systems within the conditioned envelope, install a band or blocking separating conditioned and unconditioned space.
RECOMMENDED: rigid air barrier.

✗ NO BLOCKING



✓ BLOCKING INSTALLED

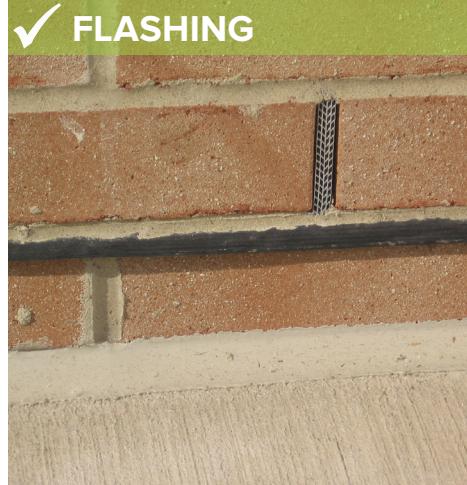


- 9.** Install flashing at the bottom of all exterior walls and at roof-wall connections.

✗ NO FLASHING



✓ FLASHING

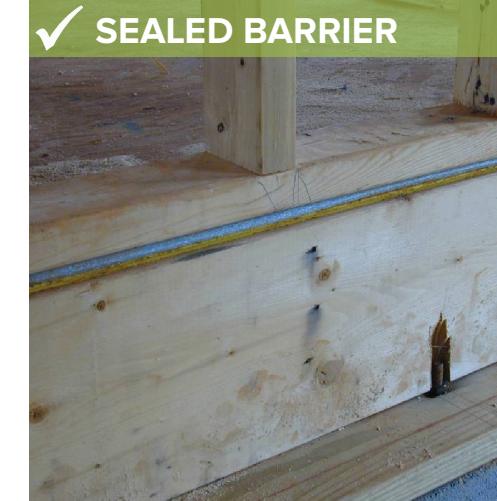


- 8.** For cantilevers, insulate, attach an air barrier to the underside and air seal. This air barrier can be the exterior finish material if it is airtight.
RECOMMENDED: rigid air barrier.

✗ NO RIGID AIR BARRIER



✓ SEALED BARRIER



- 9.** Install flashing at the bottom of all exterior walls and at roof-wall connections.

✗ NO FLASHING



✓ FLASHING INSTALLED





TECH TIPS: FRAMING

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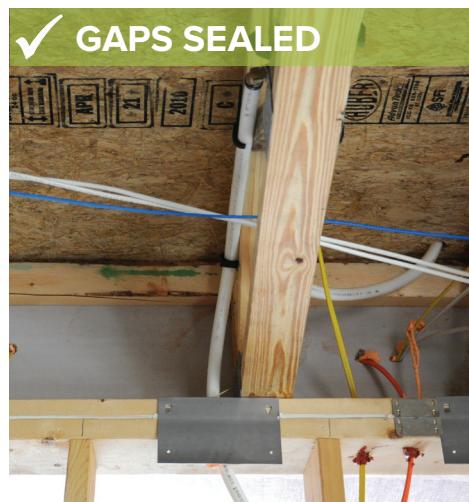
- 9.** Install flashing at the bottom of all exterior walls and at roof-wall connections.



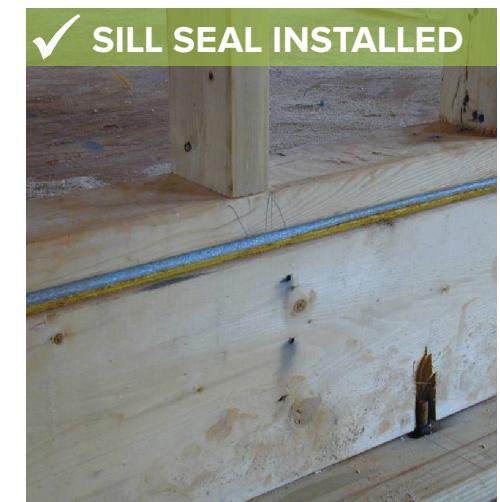
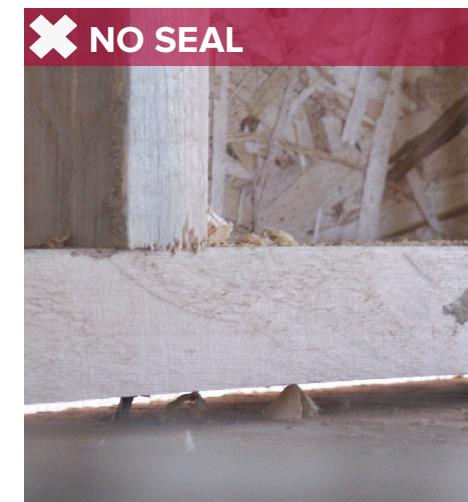
- 10.** Install an overlapped drainage plane on all exterior walls (i.e. building wrap).



- 11.** Air seal all gaps and voids between conditioned and unconditioned spaces.



- 11.** Air seal all gaps and voids between conditioned and unconditioned spaces.





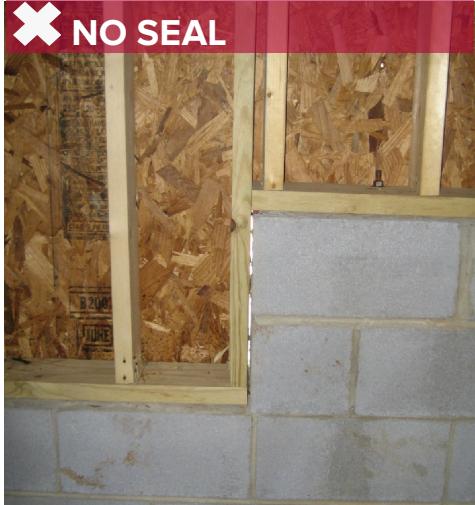
TECH TIPS:

FRAMING

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11. Air seal all gaps and voids between conditioned and unconditioned spaces.

✗ NO SEAL



✓ CAULK INSTALLED





Success with 2009 IECC in South Carolina:
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HVAC INSTALLATION





TECH TIPS: HVAC INSTALLATION

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1. Seal all duct work to drywall and/or subfloor and all HVAC penetrations in the building envelope with foam, caulk or mastic.

INSULATION



SEAL

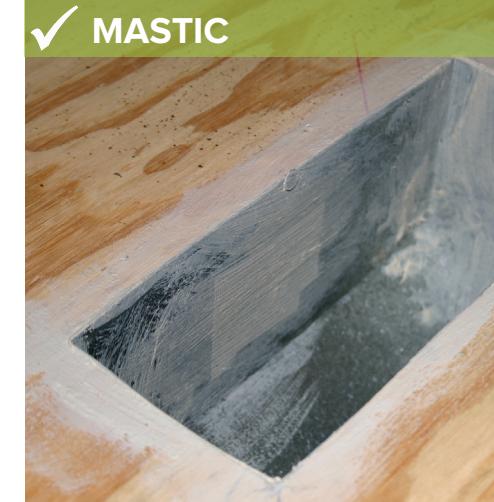


1. Seal all duct work to drywall and/or subfloor and all HVAC penetrations in the building envelope with foam, caulk or mastic.

NONE



MASTIC



2. Seal all HVAC components at all joints, seams and corners with bucket mastic.

TAPE



BUCKET MASTIC



3. Mechanically fasten all metal duct work with screws. Attach the inner liner of flexible ducts with nylon/plastic straps and tighten with a manufacturer-approved tool.

TAPE



PLASTIC STRAP





TECH TIPS: HVAC INSTALLATION

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- 4.** Insulate all supply ductwork in unconditioned space to R-8. Insulate all return duct work to R-6. If exterior insulation, mechanically fasten duct insulation with straps and seal all joints and seams of vapor retarder.

✗ UNINSULATED BOOT



✓ INSULATED BOOT



- 6.** Support flexible duct (including spot ventilation) at least every 4 feet and do not bend greater than 90°.

✗ NO SUPPORT



✓ SUPPORT



- 5.** Do not compress insulated flexible ducts more than the thickness of the insulation.

✗ COMPRESSION



✓ NO COMPRESSION



- 6.** Support flexible duct (including spot ventilation) at least every 4 feet and do not bend greater than 90°.

✗ GREATER THAN 90°



✓ LESS THAN 90°





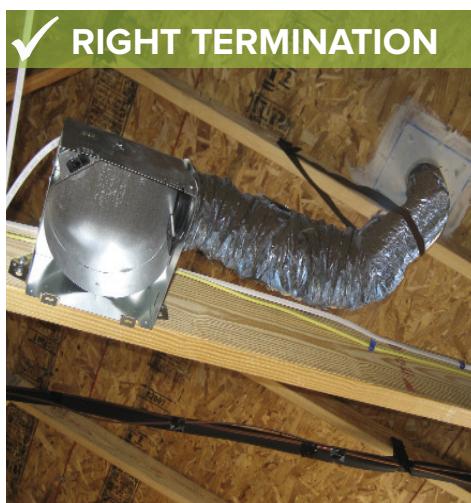
TECH TIPS: HVAC INSTALLATION

Success with 2009 IECC in South Carolina for Builders

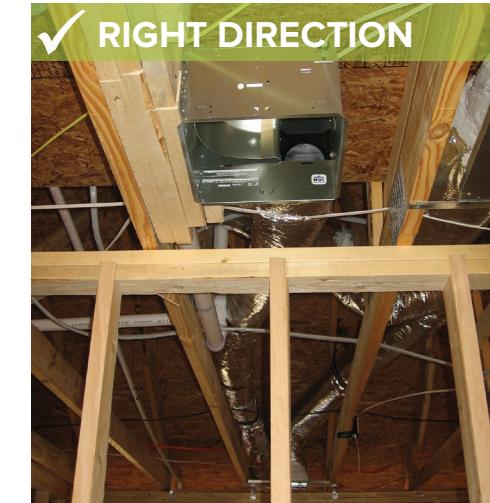
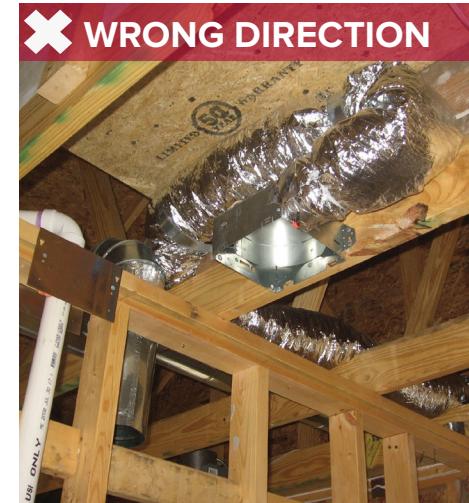
- 7.** Install outside air ventilation intakes at least 10 feet from any exhaust vent or stack.



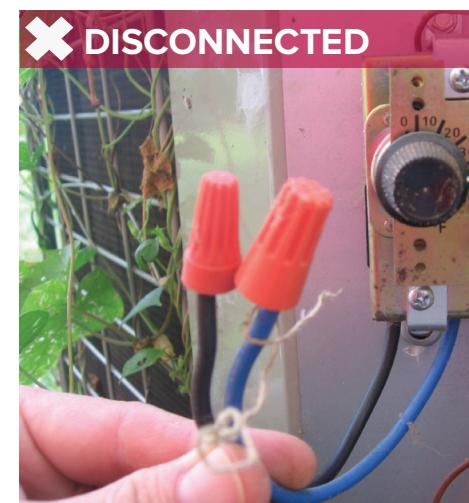
- 9.** Terminate exhaust ventilation duct work to the outside and install a screen over the termination.



- 8.** Coordinate bath fan exhaust duct direction with Electrical Contractor.



- 10.** For heat pumps, install a heat strip outdoor temperature lockout that prevents supplemental heat operation and set it to the balance point.





CRITICAL DETAIL: DUCT SEALING BOOTS

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It is recommended to seal all joints in the air distribution system with bucket duct mastic and fabric mesh.

The tester will be measuring the total duct leakage and the duct leakage to the outside at CFM at 25 Pa (with reference to the outside).

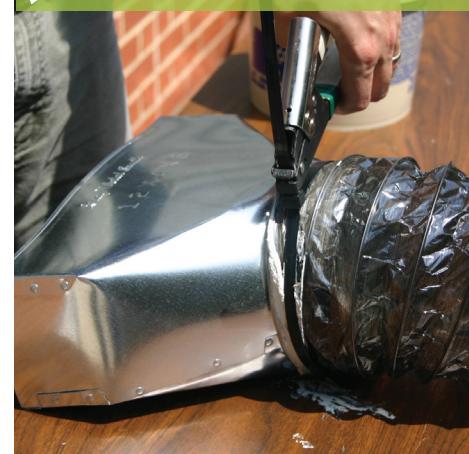
✓ MASTIC BOOT



✓ INSTALL LINER



✓ INSTALL ZIP TIE



✓ MASTIC CONNECTION



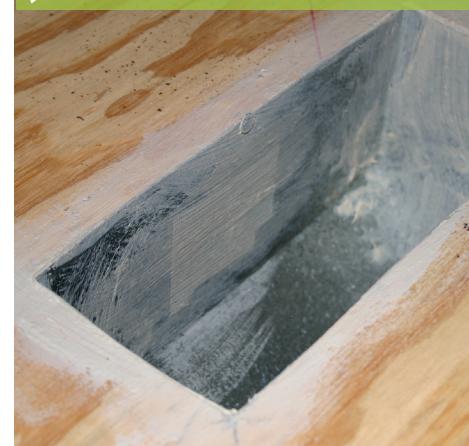
✓ INSULATE BOOT



✓ SEAL SEAMS



✓ SEAL TO SUBFLOOR



✓ SEAL TO DRYWALL





CRITICAL DETAIL: DUCT SEALING PLENUMS

Success with 2009 IECC in South Carolina for Builders

It is recommended to seal all joints in the air distribution system with bucket duct mastic and fabric mesh.

The tester will be measuring the total duct leakage and the duct leakage to the outside at CFM at 25 Pa (with reference to the outside).

✓ MASTIC PLENUM



✓ MASTIC COLLAR



✓ INSTALL ZIP TIE



✓ MASTIC CONNECTION



✓ INSULATE COLLAR



✓ SEAL SEAMS



✓ MASTIC AIR HANDLER



✓ USE BUCKET MASTIC





Success with 2009 IECC in South Carolina:
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ELECTRICAL

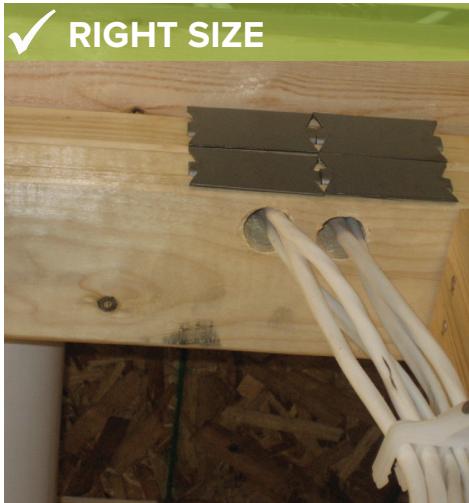




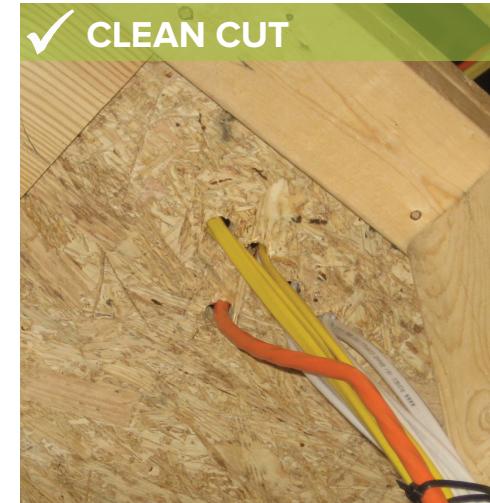
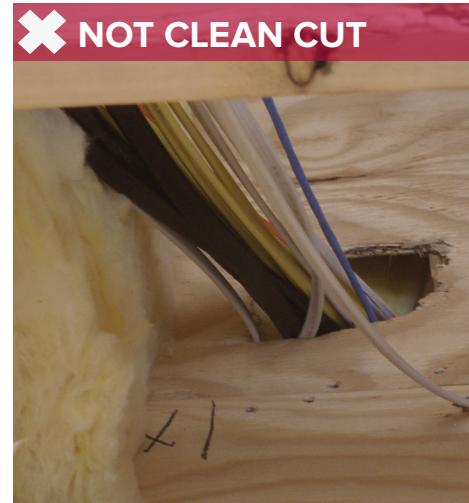
TECH TIPS: ELECTRICAL

Success with 2009 IECC in South Carolina for Builders

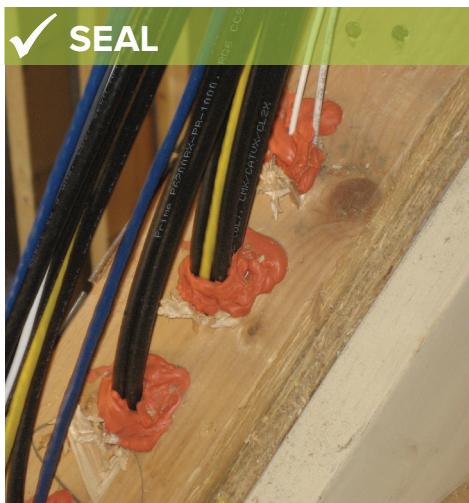
- Cut all holes cleanly and no more than 1 inch larger than the penetrating object.



- Cut all holes cleanly and no more than 1 inch larger than the penetrating object.



- Air seal electrical penetrations between conditioned and unconditioned space. Use fire-rated sealants where applicable.



- Air seal electrical penetrations between conditioned and unconditioned space. Use fire-rated sealants where applicable.





TECH TIPS: ELECTRICAL

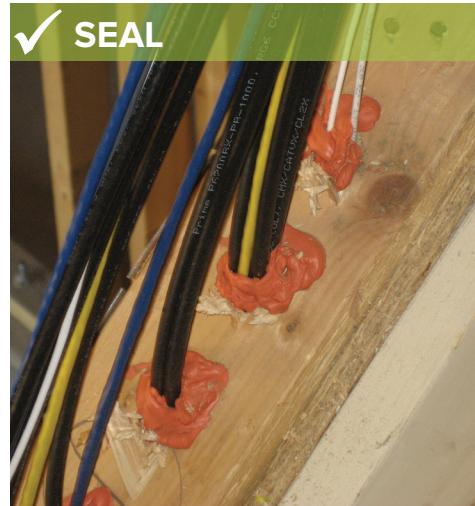
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- 2.** Air seal electrical penetrations between conditioned and unconditioned space. Use fire-rated sealants where applicable.

✗ NO SEAL



✓ SEAL



- 3.** Install recessed lighting fixtures that are insulation-contact rated (IC), sealed to drywall with caulk foam or gasket, and are airtight or are located in an airtight sealed box.

✗ NOT IC AND AIR TIGHT



✓ IC AND AIR TIGHT

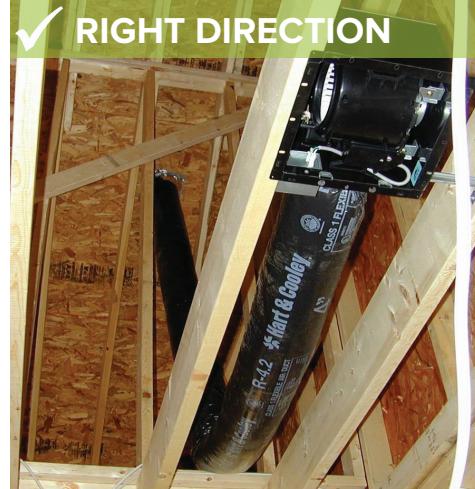


- 4.** Coordinate bath fan exhaust duct direction with HVAC Contractor.

✗ WRONG DIRECTION



✓ RIGHT DIRECTION



- 4.** Coordinate bath fan exhaust duct direction with HVAC Contractor.

✗ WRONG DIRECTION



✓ RIGHT DIRECTION





CRITICAL DETAIL: DUCT SEALING PLENUMS

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It is recommended to seal all joints in the air distribution system with bucket duct mastic and fabric mesh.

The tester will be measuring the total duct leakage and the duct leakage to the outside at CFM at 25 Pa (with reference to the outside).

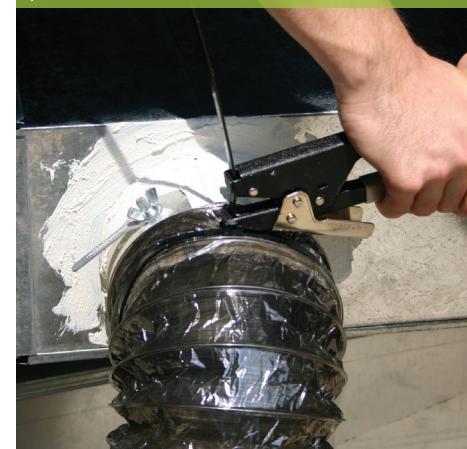
✓ MASTIC PLENUM



✓ MASTIC COLLAR



✓ INSTALL ZIP TIE



✓ MASTIC CONNECTION



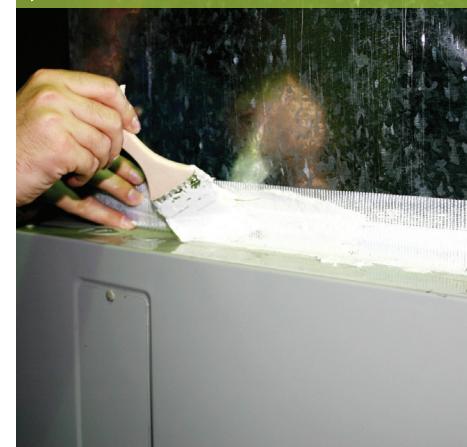
✓ INSULATE COLLAR



✓ SEAL SEAMS



✓ MASTIC AIR HANDLER



✓ USE BUCKET MASTIC





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PLUMBING



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TECH TIPS: PLUMBING

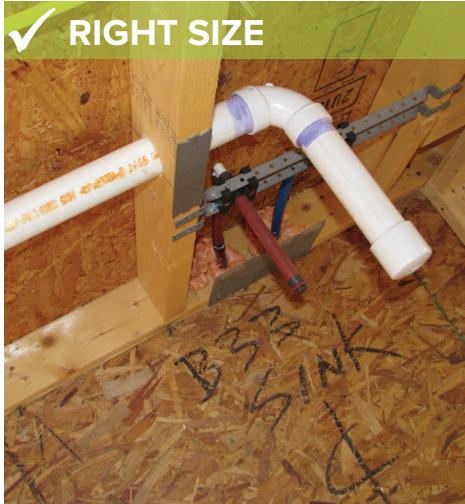
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- Cut all holes cleanly and no more than 1 inch larger than the penetrating object.

✗ WRONG SIZE



✓ RIGHT SIZE



- Air seal all penetrations between conditioned and unconditioned space. Use fire-rated sealants where applicable.

✗ INSULATION



✓ SEAL



- Cut all holes cleanly and no more than 1 inch larger than the penetrating object.

✗ WRONG SIZE

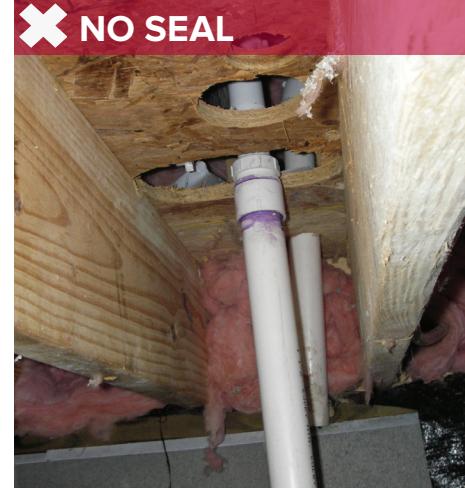


✓ RIGHT SIZE



- Air seal all penetrations between conditioned and unconditioned space. Use fire-rated sealants where applicable.

✗ NO SEAL



✓ SEAL





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AIR SEALING



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TECH TIPS:

AIR SEALING

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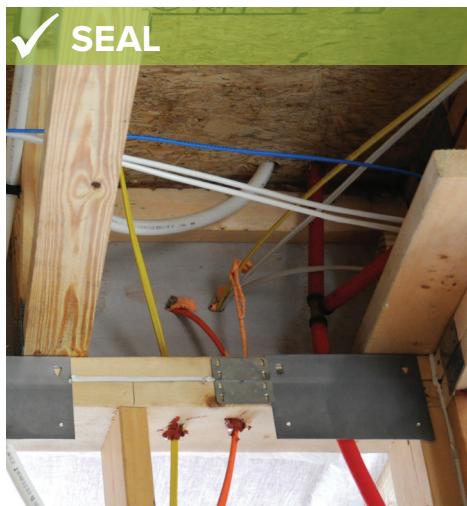
1. Air seal all dropped ceilings/soffits, shafts and chases.



1. Air seal all dropped ceilings/soffits, shafts and chases.



2. For all floor systems within the conditioned envelope, air seal bands or blocking that separates condition and unconditioned space.



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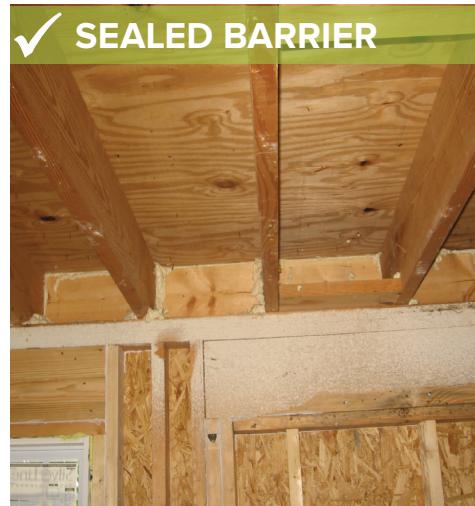


TECH TIPS:

AIR SEALING

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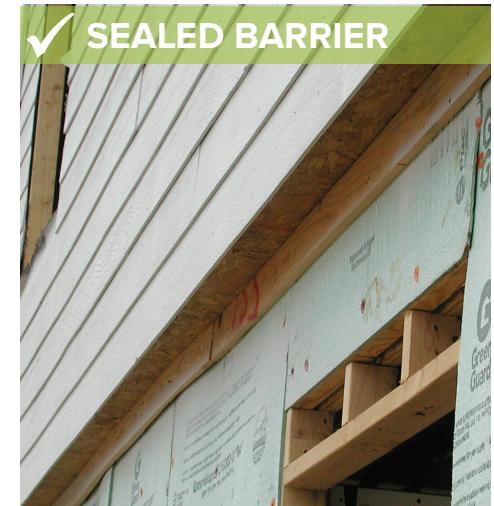
3. Air seal all rigid air barriers that enclose overhanging floor cavities.



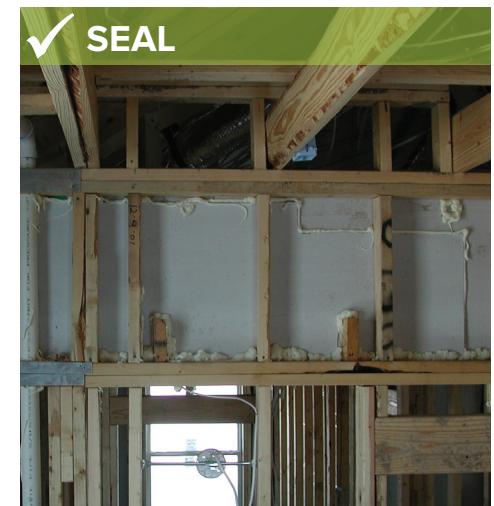
4. Air seal all gaps and voids between conditioned and unconditioned spaces.



3. Air seal all rigid air barriers that enclose overhanging floor cavities.



4. Air seal all gaps and voids between conditioned and unconditioned spaces.





TECH TIPS:

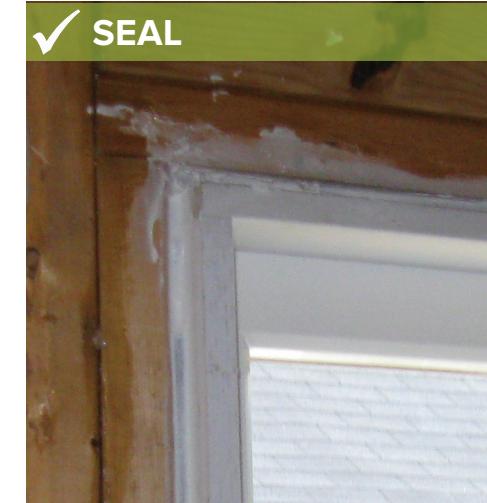
AIR SEALING

Success with 2009 IECC in South Carolina for Builders

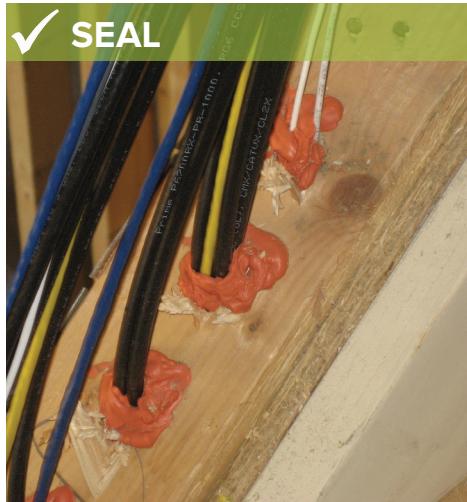
- 5.** Air seal around windows and doors using backer rod, caulk or low expansion foam.



- 5.** Air seal around windows and doors using backer rod, caulk or low expansion foam.



- 6.** Air seal all penetrations between conditioned and unconditioned spaces. Use fire-rated sealants where applicable.



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TECH TIPS:

AIR SEALING

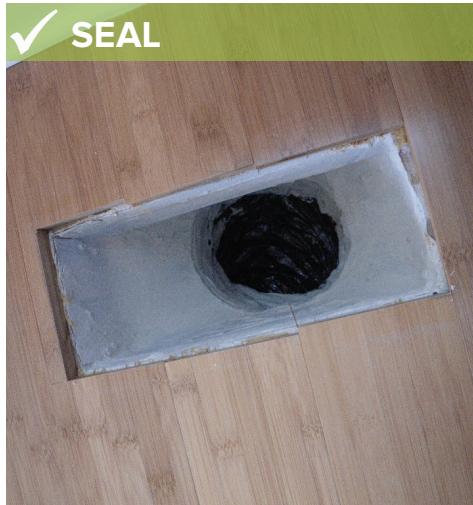
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7. Air seal supply and return duct terminations to drywall and/or subfloor with caulk, foam or equivalent material. Use fire-rated sealants where applicable.

✗ TAPE



✓ SEAL



7. Air seal supply and return duct terminations to drywall and/or subfloor with caulk, foam or equivalent material. Use fire-rated sealants where applicable.

✗ NO SEAL



✓ SEAL





Success with 2009 IECC in South Carolina:
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INSULATION



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TECH TIPS: INSULATION

1. For vented attics, install wind baffles on top of all exterior walls, leaving room for insulation over top plates and ventilation above.



1. For vented attics, install wind baffles on top of all exterior walls, leaving room for insulation over top plates and ventilation above.



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TECH TIPS: INSULATION

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2. Install insulation to meet the 2009 IECC R-value requirements.^a

CLIMATE ZONE	CEILING	FRAME WALL	MASS WALL ^b	FLOOR	BASEMENT WALL ^c	CRAWL SPACE WALL ^c	SLAB ^e
Zone 3	R-30	R-13	R-5/8	R-19	R-5/13 ^d	R-5/13	0



- a. R-Values are minimums.
- b. The second R-value applies when more than half of the insulation is on the interior of the mass wall.
- c. "R-5/13" means R-5 continuous insulation sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
- d. Basement wall insulation is not required in warm-humid locations defined by Figure 301.1 and Table 301.1 of the 2009 IECC.
- e. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or two feet, whichever is less in Climate Zones 1-3 for heated slabs.

Interactive Map:

<http://energycode.pnl.gov/EnergyCodeReqs/>



TECH TIPS: INSULATION

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- 3.** Install insulation to fill the cavity between conditioned and unconditioned space without gaps, voids, misalignments or compression.

✗ GAPS

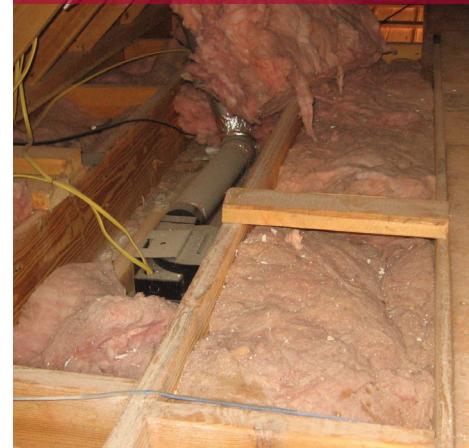


✓ NO GAPS



- 3.** Install insulation to fill the cavity between conditioned and unconditioned space without gaps, voids, misalignments or compression.

✗ VOIDS



✓ NO VOIDS



- 3.** Install insulation to fill the cavity between conditioned and unconditioned space without gaps, voids, misalignments or compression.

✗ MISALIGNMENT



✓ NO MISALIGNMENT



- 3.** Install insulation to fill the cavity between conditioned and unconditioned space without gaps, voids, misalignments or compression.

✗ COMPRESSION



✓ NO COMPRESSION





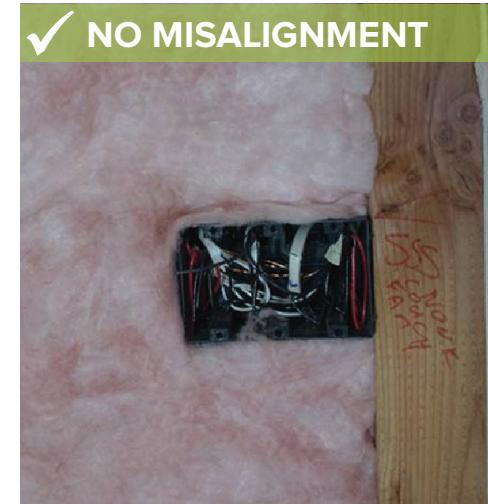
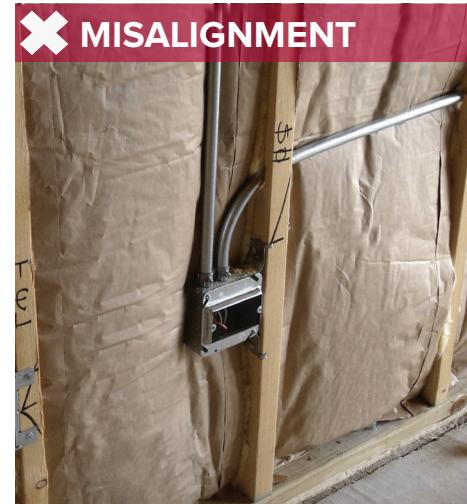
TECH TIPS: INSULATION

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- 4.** Cut and split insulation around blocking, plumbing, HVAC and electrical components.



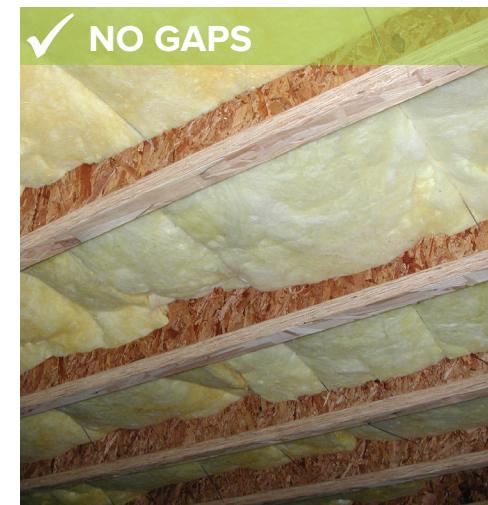
- 4.** Cut and split insulation around blocking, plumbing, HVAC and electrical components.



- 5.** Install insulation to completely fill floor and/or cantilever framing or to maintain permanent contact with the subfloor.



- 5.** Install insulation to completely fill floor and/or cantilever framing or to maintain permanent contact with the subfloor.





TECH TIPS: INSULATION

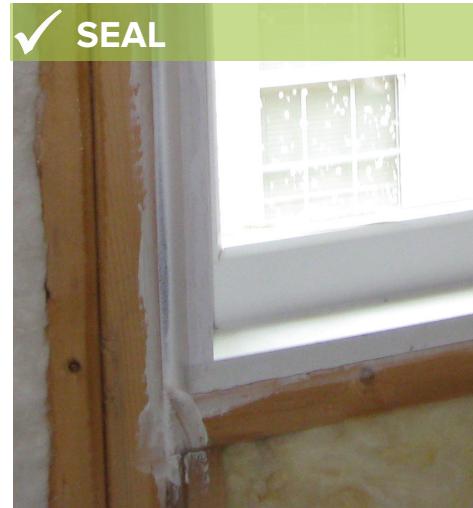
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- 6.** Air seal around windows and doors using backer rod, caulk or low expansion foam.

✗ INSULATION



✓ SEAL



- 7.** Insulate the attic access and install weather stripping around the perimeter.

✗ NO INSULATION



✓ INSULATION



- 7.** Insulate the attic access to the same level as surroundings and install weather stripping around the perimeter.

✗ NO INSULATION



✓ INSULATION



- 8.** For attics with loose fill insulation, install baffles around the attic access opening.

✗ NO BAFFLES



✓ RIGHT INSTALLATION

