

HOME BUILDERS GUIDE TO MEETING THE 2012 CODE REQUIREMENTS

Written by The Britt/Makela Group



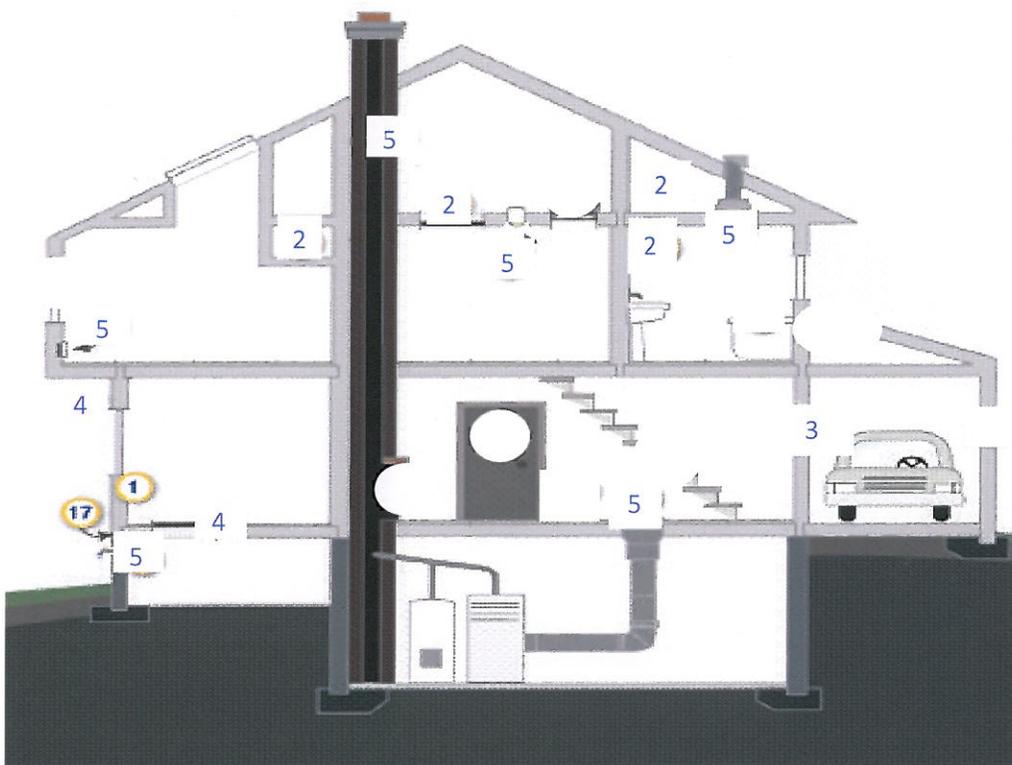
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HOME BUILDERS GUIDE TO MEETING THE 2012 CODE REQUIREMENTS

This brochure outlines methods for building a home that will meet the 2012 IECC air changes per hour (ACH) requirements.

Homes in Climate Zones 1 and 2 must have ≤ 5 ACH @ 50 Pascals, and those in Climate Zones 3 through 8 must have ≤ 3 ACH @ 50 Pascals. There are two general approaches in construction to meeting these requirements: air-permeable insulation and air-impermeable insulation. Air-permeable insulation includes fiberglass batt and various types of blown-in insulation.

The 2012 IRC defines air-impermeable insulation as "... having an air permeance equal to or less than 0.02 L/s-m[sic] equal to or less than 0.02 L/s-m² at 75 Pa pressure differential tested according to ASTM E 2178 or E 283," (Chapter 2: Definitions). Spray-foam insulation meets this requirement. This brochure illustrates both air-impermeable and air-permeable insulation methods. The 2012 IECC requires both a visual inspection and Blower Door testing (R402.4.1.1 Installation and R402.4.1.2 Testing). Compliance with Table R402.4.1.1 Air Barrier and Insulation Installation will assist you in reaching the ACH Testing requirements.



Air Sealing Trouble Spots with reference to IECC Table R 402.1.1

1. Air Barrier and Thermal Barrier Alignment
2. Ceiling/Attic
3. Walls
4. Floors/Rim Joists
5. Shafts/Penetrations

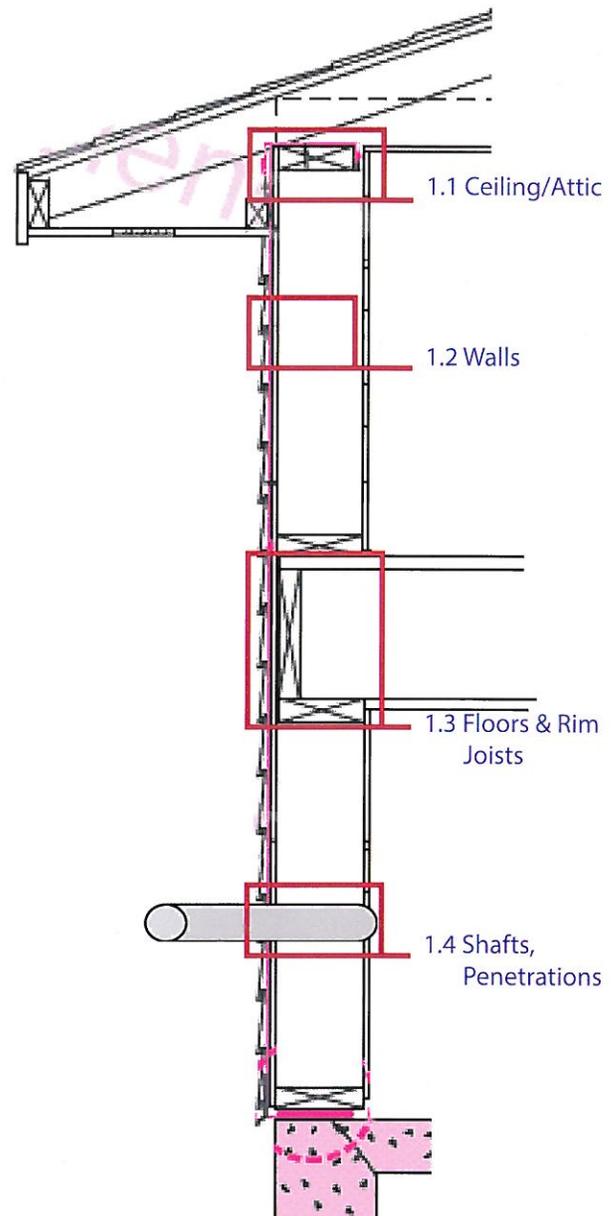
Homes with less than five air changes per hour require ventilation according to Section R303.4 Mechanical ventilation of the 2012 IRC. Requirements can be found in Section M1507.3 Whole-house mechanical ventilation system, but is not discussed in this brochure. IRC requirements for fire-resistant construction, Section R302, must be followed and adhered by and are not discussed in this brochure.

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1. Air Permeable Insulation

Typical construction methods to achieve three air changes per hour at 50 Pascals.

Typical construction methods focus on providing a continuous air barrier around the entire house through the use of housewrap, caulk, gaskets, tape, backer rods and blocking. This approach requires attention to detail in all steps of construction, as demonstrated in the following pages.



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1.1 Ceiling/Attic

The ceiling and attic are two of the largest sources of leakage areas in a home. The meeting of the ceiling and exterior wall requires special attention as well as penetrations in the ceiling assembly. All joints in gypsum board, penetrations, chases, or other cavities adjacent to attic or other unconditioned space should be properly blocked and sealed with appropriate materials.

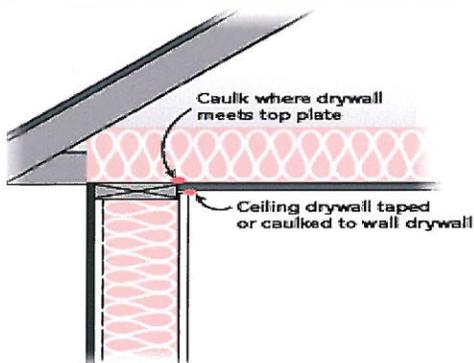
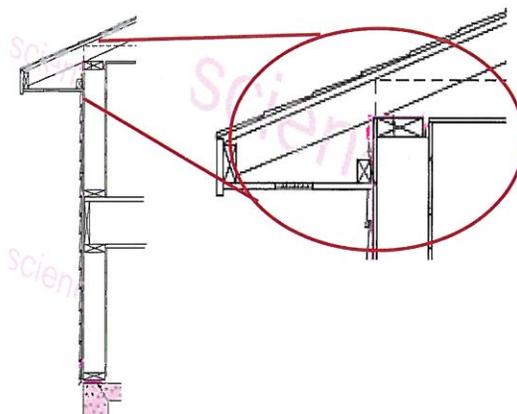
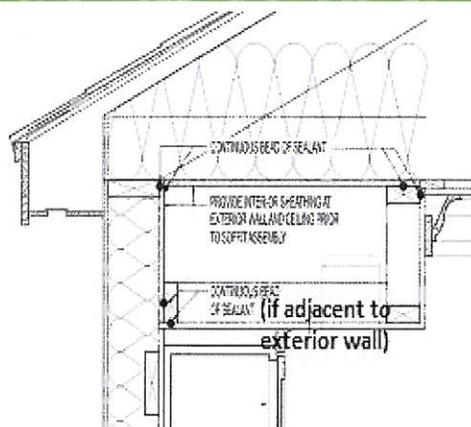
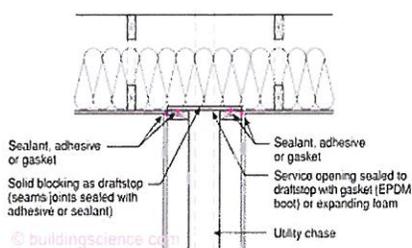


Figure 2.1. Seal the wall drywall to the top plate and ceiling drywall.

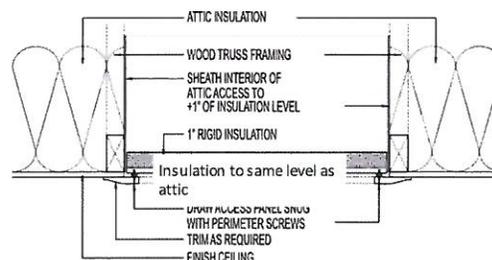
Ceiling Assembly Sealed to Wall Assembly



Soffit



Chase

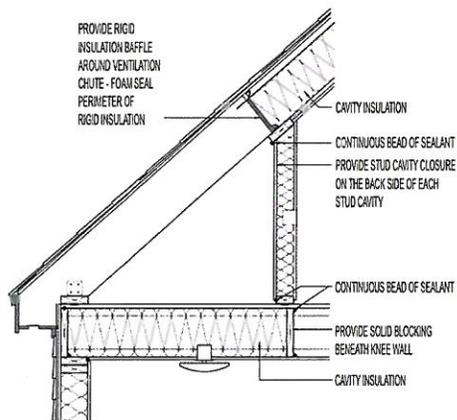
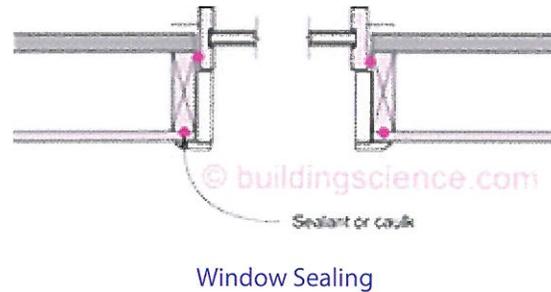
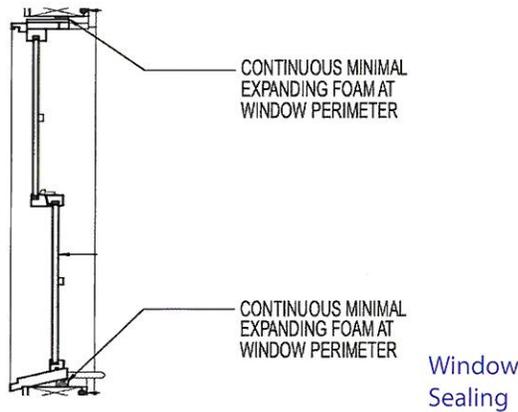
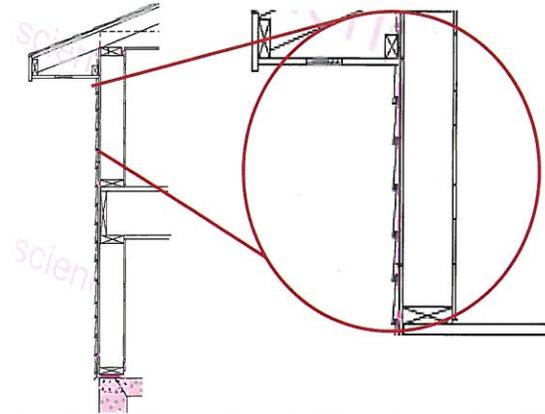


Attic Access Hatch

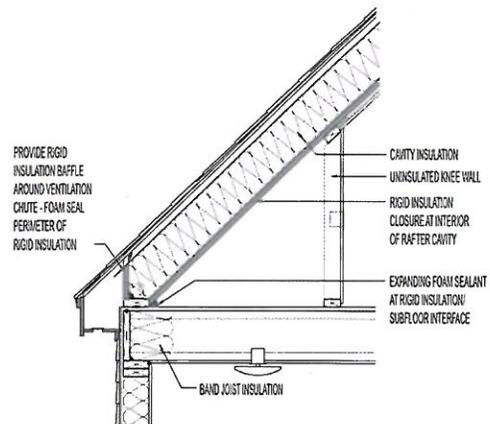
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1.2 Walls

All wall penetrations must be properly integrated into the air barrier with caulking, gaskets, or other appropriate material. Special care must be taken to properly flash and seal windows and doors.



Attic Knee Wall Sealing with Insulated Floor & Wall

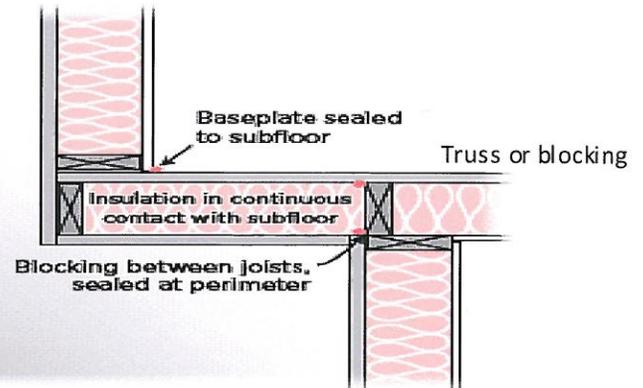
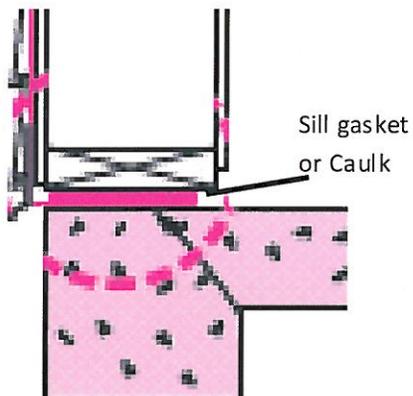
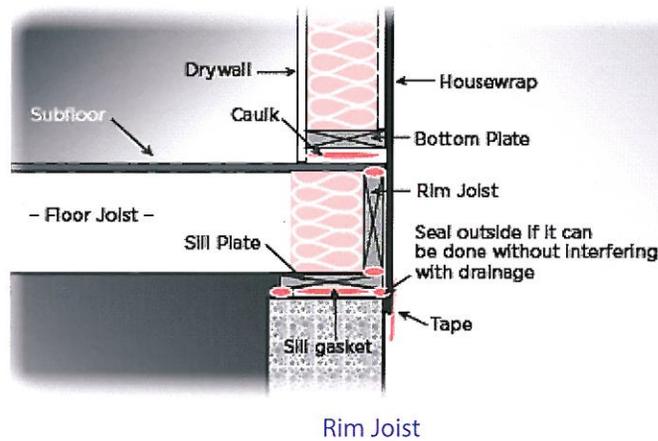
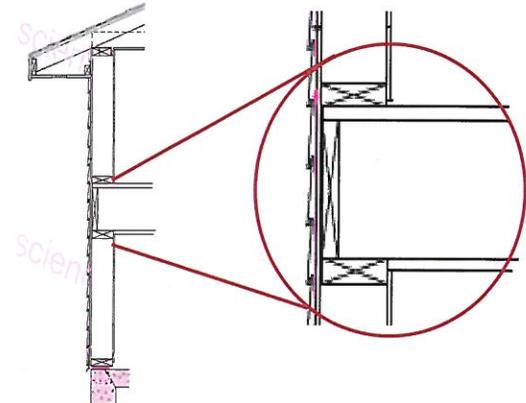


Attic Knee Wall Sealing with Insulated Roof Deck

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1.3 Floors and Rim Joists

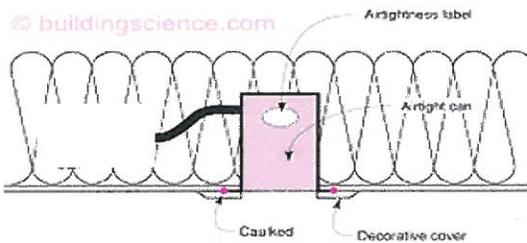
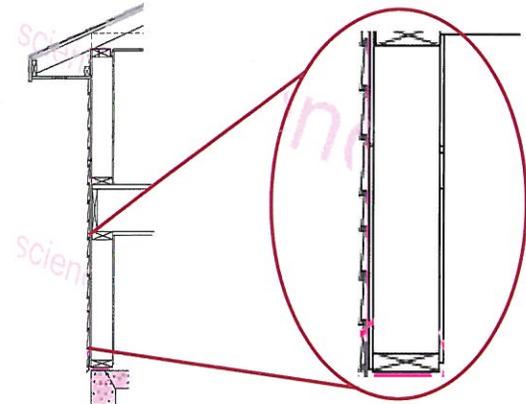
All plates, joists and drywall must be sealed, as well as all butted joints of material. Housewrap can be taped to foundation unless it interferes with drainage.



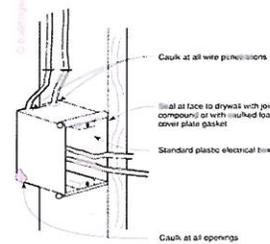
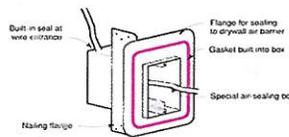
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1.4 Shafts, Penetrations

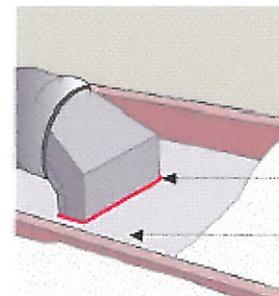
All penetrations (electrical, plumbing, and mechanical) in assemblies adjoining unconditioned space must be properly caulked or otherwise sealed with appropriate materials.



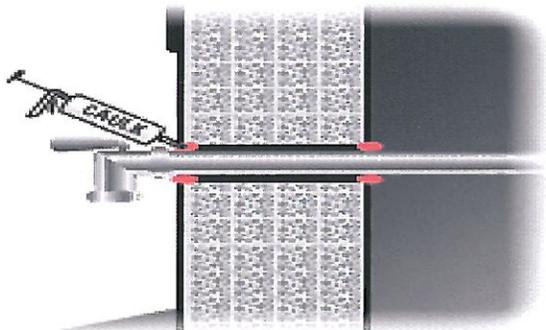
Insulation-Contact Rated Recessed Lighting



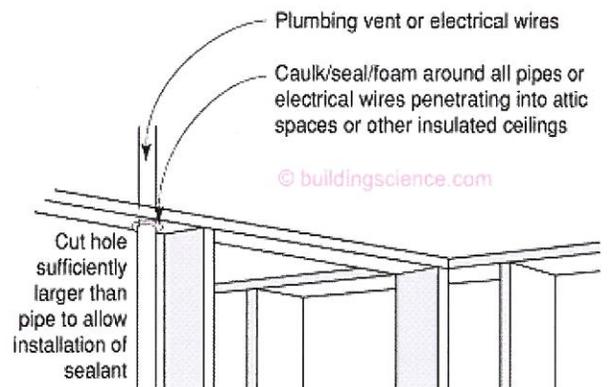
Wall Outlet



HVAC Boot Registers



All utility service penetrations caulked or otherwise

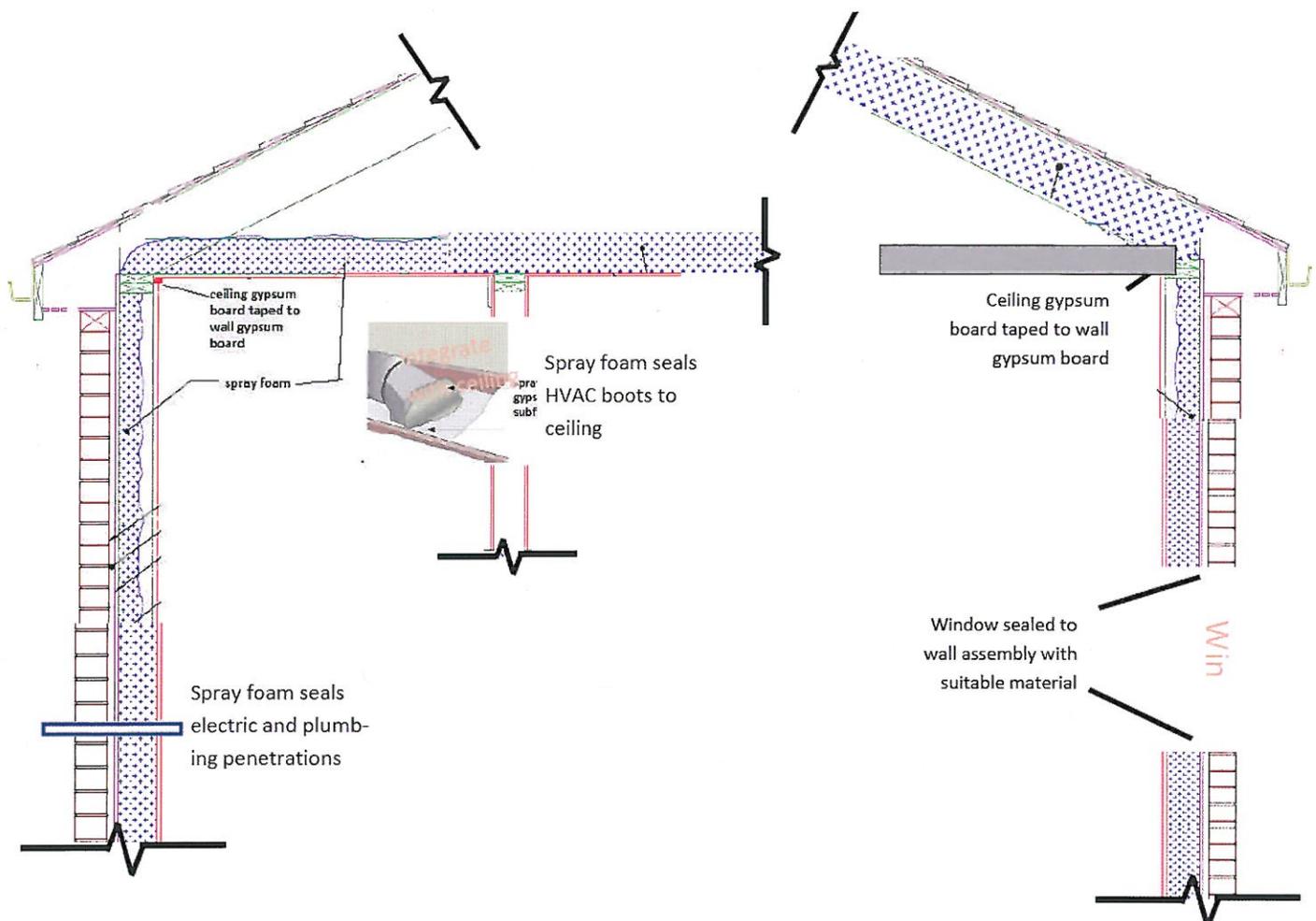


Plumbing and Electrical Penetrations in Top

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2.1 Air-Impermeable Insulation: Ceiling/Attics and Walls

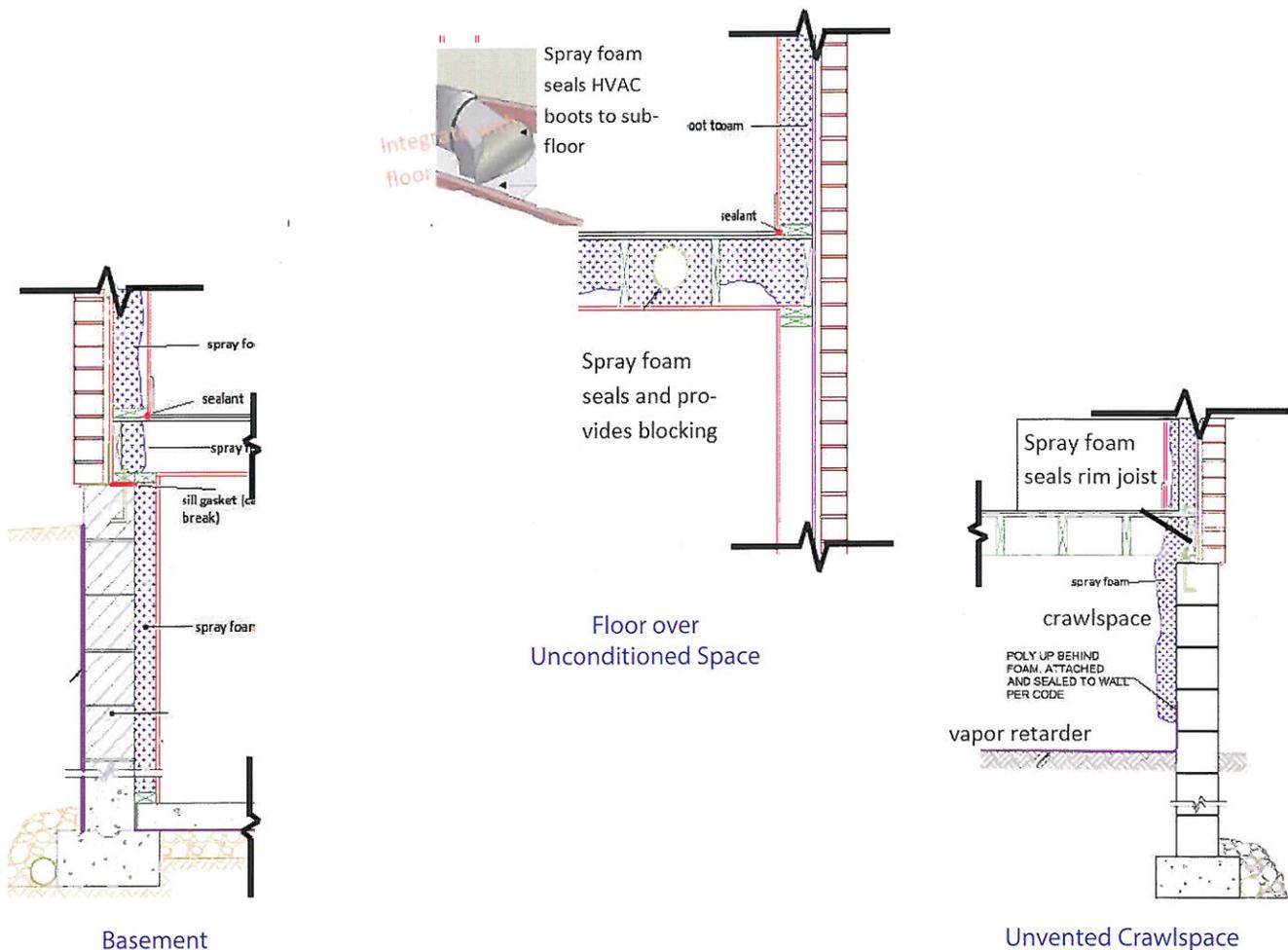
All plates, joists and drywall must be sealed, as well as all butted joints of material. Housewrap can be taped to foundation unless it interferes with drainage.



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2.2 Air-Impermeable Insulation: Floors and Foundations

Air-impermeable insulation such as spray foam can achieve three air changes per hour at 50 Pascals easily and reliably. Penetrations and details are sealed when insulating, requiring little extra attention to detail (unless fire protection is needed).



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Britt/Makela Group (BMG) has over 25 years of experience in commercial and residential building code development, adoption, and consulting on the local, state, national and international levels. BMG is dedicated to increasing energy efficiency through education and technical support to the building, design, enforcement and manufacturing industry.

All images are courtesy of the Building Science Corp.