

Residential Air Barrier Requirements

Insulation alone is not enough to moderate indoor temperatures. Sealing the building envelope is critical to good thermal performance of the building. Insulation is important because it traps pockets of air, creating stagnant air resistant to temperature change, while a well-seated air barrier stops air movement from scrubbing away those air pockets.

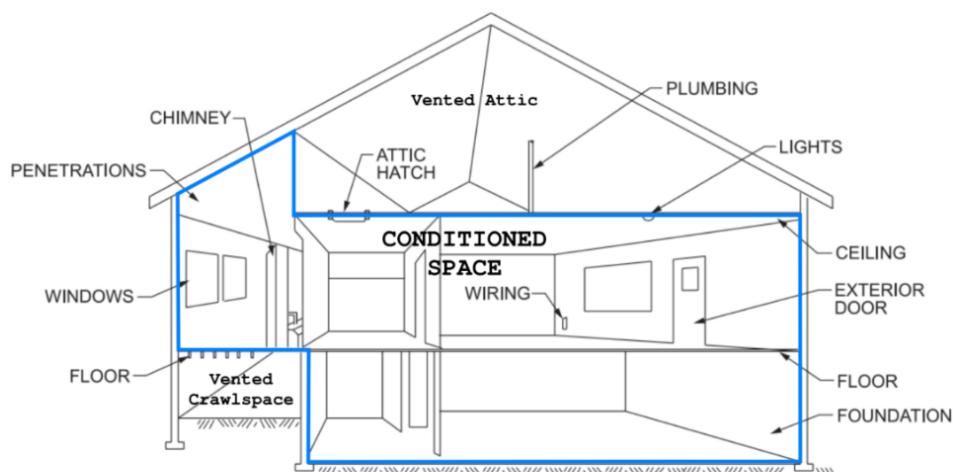
Per the 2021 International Energy Conservation Code as amended, the air barrier shall be verified by the code official and a review of the construction documents and other supporting data shall be conducted to assess compliance. Highlight the continuous air barrier in any color but red, or show details and sections. If you can't show the proposed air barrier in detail, how will you install it, seal it and pass the maximum air leakage test?

Air Barrier Definition: One or more materials joined together in a continuous manner to restrict or prevent the passage of air through the building thermal envelope and its assemblies.

Building Thermal Envelope Definition: Basement walls, exterior walls, floors, ceilings, roofs, and any other building element assemblies that enclose conditioned space or provide a boundary between conditioned unconditioned space.

Air sealant options include, but not limited to:

- Caulking
- Gasketing
- Weather stripping
- Sealing with air barrier material, suitable film, or solid material
- Self-sealing continuous materials
- Concrete
- Spray foam
- Structural insulated panels
- Insulated concrete forms



Commentary Figure N1102.4
TYPICAL SOURCES OF AIR LEAKAGE

The air barrier and air sealing shall be inspected by an approved air leakage testing agency. The Air Barrier/Air Sealing Certification Form shall be filled and given to the building inspector by framing inspection.

TABLE N1102.4.1.1 (R402.4.1.1) AIR BARRIER, AIR SEALING AND INSULATION INSTALLATION ^a

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
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.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
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.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance, R-value, of not less than R-3 per inch. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.

Windows, skylights, and doors	The space between framing and skylights, and the jambs of windows and doors, shall be sealed.	—
Rim joists	Rim joists shall include an exterior air barrier. ^b The junctions of the rim board to the sill plate and the rim board and the subfloor shall be air sealed.	Rim joists shall be insulated so that the insulation maintains permanent contact with the exterior rim board. ^b
Floors, including cantilevered floors and floors above garages	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking. Alternatively, floor framing cavity insulation shall be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extending from the bottom to the top of all perimeter floor framing members.
Basement, crawl space, and slab foundations	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder/air barrier in accordance with Section N1102.2.10. Penetrations through concrete foundation walls and slabs shall be air sealed. Class I vapor retarders shall not be used as an air barrier on below-grade walls and shall be installed in accordance with Section R702.7.	Crawl space insulation, where provided instead of floor insulation, shall be installed in accordance with Section N1102.2.10. Conditioned basement foundation wall insulation shall be installed in accordance with Section N1102.2.8.1. Slab-on-grade floor insulation shall be installed in accordance with Section N1102.2.10.
Shafts, penetrations	Duct and flue shafts and other similar penetrations 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.	Insulation shall be fitted tightly around utilities passing through shafts and penetrations in the building thermal envelope to maintain required R-value.
Narrow cavities	Narrow cavities of 1 inch or less that are not able to be insulated shall be air sealed.	Batts to be installed in narrow cavities shall be cut to fit or narrow cavities shall be filled with insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	Insulated portions of the garage separation assembly shall be installed in accordance with Sections N1101.10– N1101.12 and N1102.2.7.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be air sealed in accordance with Section N1102.4.5.	Recessed light fixtures installed in the building thermal envelope shall be airtight and IC rated, and shall be buried or surrounded with insulation.
Plumbing, wiring or other obstructions	All holes created by wiring, plumbing or other obstructions in the air barrier assembly shall be air sealed.	Insulation shall be installed to fill the available space and surround wiring, plumbing, or other obstructions, unless the required R-value can be met by installing insulation and air barrier systems completely to the exterior side of the obstructions.
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.	Exterior walls adjacent to showers and tubs shall be insulated. No vapor barrier in wet locations.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical and communication boxes. Alternatively, air-sealed boxes shall be installed.	—
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.	—
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.	—

a. Inspection of log walls shall be in accordance with the provisions of ICC 400.

b. Air barrier and insulation full enclosure is not required in unconditioned/ventilated attic spaces and at rim joists.