Advanced Air Sealing

Ensure comfort & moisture protection

Efficiency Vermont Residential New Construction Guidance

Why air tightness matters

As air tightness requirements and goals have gotten more stringent—2.0 ACH, 1.0 ACH and below—builders are finding that they need to incorporate additional air sealing details into their projects. The Vermont State Residential Energy Code air sealing requirements are a great starting point, but there are additional strategies to consider to reach the increased airtight thresholds.

Increase comfort

Reduce drafts

Protect against moisture

Reduce risk of long-term damage in wall and ceiling cavities

Waste less energy

Create environment for more efficient heating and cooling

Prepare for mechanical ventilation

Control fresh air supply and exhaust stale air

Determine the location of the air barrier. Whether it's the exterior shell or interior of the home, the key is to keep the air barrier continuous across all transitions in the building such as floors, walls, ceilings, foundation walls, and slabs.

An interior air barrier is best composed of OSB or plywood sheathing (with joints taped), or with a "smart" vapor retarder membrane that functions as an air barrier.

The photo to the right shows an interior air barrier used to create an airtight ceiling assembly below the attic trusses, which could also be achieved using OSB or plywood with taped seams. A wiring and lighting chase is created below the air barrier which eliminates penetrations between the house and attic. The bottom photo shows an exterior air barrier using exterior sheathing with all joints and window openings properly taped.

Regardless of where the air barrier is placed, it is important to consider moisture management, vapor control, and the drying potential of the wall.

The details matter. Simplifying the building design makes it easier to keep the air barrier continuous and to detail it well. Under the slab, the use of a thicker 15 mil poly vapor barrier with the joints taped and lapped, and the poly wrapped up and taped to the inside of the foundation wall (or framed wall), limits air leakage from the under slab.

Limit holes to the exterior. Consider a condensing gas dryer which does not require venting to the outdoors. Limit, or eliminate, recessed cans in attic/roof ceilings. Relocate the attic hatch access to outside the main living space. Create an access panel through the garage or an attic gable end. Seal all penetrations to the air barrier with a durable, airtight sealant that will last the lifetime of the building.

Advanced air sealing materials: Think beyond just spray foam. There are a variety of high performance tapes on the market that are used for air sealing and airtight construction. High performance modern tapes can create an airtight seal around window rough openings where low expansion spray foams often fail. There are also liquid applied air sealing products available. The important take away is that to achieve the more stringent air tightness threshold, you shouldn't rely on spray foam alone.