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Air Barriers and Pressure Testing

Continuous air barriers, capable of preventing air movement through exterior walls, floors and ceilings, have been required by the **Seattle Energy Code** for more than a year now. These air barriers can either be specially-designed membrane products or can be made up of typical building materials that are carefully joined together into a continuous barrier.

Air barriers likely save more energy per dollar invested than any other code requirement, because even very small cracks through a wall can create drafts, allow large quantities of conditioned air to escape, and support mold growth inside wall assemblies. Losses as high as 30 percent of conditioned air are not uncommon.

The air barrier must be pressure tested, typically using a "blower door" apparatus: After the windows, doors and other openings have been installed and permanently sealed to the air barrier, specially-designed fans are set up in door openings to pressurize and depressurize the building. Air barrier connections must be tough, permanent and flexible, to accommodate building movements and changing air pressures. Most buildings have been able to pass the test.

The rules are different for houses than for other building types:

- **For single-family houses, duplexes and townhouses**, the air leakage standard is based on the floor area of the house. For a 2,000 square foot house, air leakage is limited to about 1,500 cfm (cubic feet per minute) under test conditions, and homebuilders have now become quite expert at sealing up new houses. These dwelling units must pass the air leakage test to get a Certificate of Occupancy.
- **For all other buildings in Seattle**, the air leakage rate is based on the area of the building envelope, and must be less than 0.40 cfm for each square foot of building envelope, at a pressure of 1.57 pounds per square foot. (Elsewhere in Washington state, only buildings higher than five stories currently require the air barrier.) If the building passes the test, simply show the test results to the inspector. If not, then submit the test results and an air barrier inspection report to your building inspector (Option 1 in Section 1314.6.3 of the Seattle Energy Code). In future code cycles, passing the test will likely be mandatory for all buildings. Permit drawings must clearly indicate where the air barriers will be located within the building envelope assemblies, and detail how they connect to window and door frames, foundation walls, and other building elements to form a continuous separation between the interior and exterior air.
- **Additions to existing buildings** must also follow the air barrier rules, although the

existing building does not. The addition must be carefully separated from the existing building during testing.

- **Sick Building Syndrome?** Many people are concerned about the potential health impacts of tight wall construction, and feel that the walls should “breathe.” However, air barriers help prevent moisture intrusion in walls and ceilings, which could otherwise cause mold growth and allergic reactions. Ventilation is definitely required, but in a planned and controlled manner, not just through the cracks around your window frames.

See Seattle Energy Code 502.4.5 for houses and townhouses, and Section 1314.6 for all other buildings, plus references to further technical information.

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