AIR BARRIERS

General

Properly installed air barriers are critical to maximizing the thermal performance of the exterior envelope.

Specifications and details (where applicable) for air barriers should be included in both new construction and additions.

Related Sections

U-M Design Guideline Sections:
SID-D Energy and Water Conservation
SID-F Codes and Regulatory Agencies

Reference Documents:
ASHRAE 189.1 Standard for the Design of High-Performance, Green Buildings (current edition)
ASTM E 783 Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
ASTM E 2357 Test Method for Determining Air Leakage of Air Barrier Assemblies
ASTM E 2178 Standard Test Method for Air Permeance of Building Materials
780 CMR 8th Edition Chapter 13 Proposed MA Front-End Amendments to the *International Energy Conservation Code 2009* (IECC 2006), Paragraphs 5.2.4.3 and 5.2.4.3.1.

Air Barrier Design Standards

Comply with the requirements of applicable building codes and the current version of ASHRAE 189.1. Current applicable codes for UM buildings can be determined by referring to the Codes and Regulatory Agencies page of this web site at the following address:
http://www.umaec.umich.edu/desguide/sid/sid_f.pdf

Design Requirements

Air barriers are required in the exterior building envelope of all new buildings and additions. Where a portion of the building contains unconditioned space which has conditions differing from those of the conditioned space by more than 50% of the difference between the conditioned space and design ambient conditions, a continuous air barrier shall also be provided between the conditioned and unconditioned spaces within the building.

Design a fully continuous air barrier for the entire building envelope capable of controlling air leakage into and out of the conditioned spaces. The air barrier assembly must be designed to withstand positive and negative air pressures due to design wind pressures, stack effect and fan pressures. Pay particular attention to the design of the air barrier at joints and points of intersection of two different building materials to maintain continuity. The design shall have enough strength and flexibility to accommodate differential movement of material

substrates. Design the air barrier to remain in continuous contact with its substrate material in the building envelope.

For additions, design a complete air barrier for the addition enclosure as described above. Where existing walls and/or roof construction abut the new addition, continue the air barrier through the wall or roof construction in order to prevent air leakage at the juncture between the new and old construction.

Drawings

Include complete detail drawings of all transitions, perimeter sealing around fenestrations, penetrations through the exterior walls by structural members, parapet walls, etc.

Specifications

Specifications should include instructions about prepping surfaces and any primers needed to insure proper adhesion of air barrier materials.

Include language for coordination of all trades whose work impacts the continuity of the air barrier. Reference the Air Barrier specification section in all of the affected trades.

Include in the specifications the requirement for a pre-installation meeting with mandatory attendance by all trades whose work is related to the air barrier.

Air Barrier Product Selection

UM does not have a preference for a particular type of air barrier or air barrier assembly. Select materials which are listed by the Air Barrier Association of America http://www.airbarrier.org/materials/index_e.php. It is acceptable to have a combined air barrier and vapor retarder; however, in this case the barrier must be located on the warm side of the building envelope.

The air barrier assembly must be durable. When it will be concealed within the building envelope, design it to last the lifetime of the building envelope.

In situations where flammable air barrier products adjoin a wall cavity, provide thermal protection which is in direct contact with the flammable material.

Inspection and Testing of Air Barrier Installations

UM will employ independent inspectors and testing for projects involving exterior envelope work. Consult with Design Manager regarding the scope of testing for the project.