Air barriers and the new energy code

IECC 2012’s air barrier requirements could limit design options

by Mark S. Graham

The International Energy Conservation Code,* 2012 Edition (IECC 2012) includes a new requirement intended to limit air leakage through buildings’ thermal envelopes, including roof assemblies. The requirement, a change from IECC 2009, will significantly affect the design and installation of certain roof assemblies.

IECC 2012
IECC 2012 Section C402.4—Air Leakage (Mandatory) requires all commercial (non-residential) buildings, except those in climate zones 1 through 3, to include a continuous air barrier. Climate zones 1 through 3 include Alabama, Florida, Hawaii, Louisiana, Mississippi and South Carolina and portions of Arizona, Arkansas, California, Georgia, Nevada, New Mexico, North Carolina, Oklahoma, Tennessee, Texas and Utah.

The required air barrier is permitted to be located on the inside or outside of the building envelope, located within assemblies composing the building envelope and any combination thereof. The air barrier is required to be across all joints and assemblies comprising the building envelope. Air barrier joints and seams need to be sealed, including sealing transitions and changes in materials. Special provisions are provided for sealing recessed lighting fixtures, air barrier penetrations, doors and access openings, and outdoor air intakes and exhausts.

IECC 2012 provides for three compliance options for air barrier selection and evaluation: materials, assemblies or whole building testing.

Considerations
Although certain roof system types, including built-up, polymer-modified bitumen and adhered single-ply membranes are considered to comply with the new air barrier requirement, other roof system types will require additional testing to substantiate compliance. These include mechanically attached and ballasted single-ply membranes, metal panels and shingle-type roof coverings.

For some of these roof system types, it may be more practical to provide the necessary air barrier at or below the roof deck level by using a cast-in-place or precast concrete roof deck, spray foam below the roof deck or a gypsum board ceiling. IECC 2012 includes specific density and thickness requirements for closed and open-cell spray foam for it to be considered deemed to comply.

I recommend designers consult roof system manufacturers regarding how their specific roof system configurations function as air barriers according to IECC 2012’s requirements. Also, roof system manufacturers should be consulted for specific penetration and perimeter sealing instructions to comply with IECC 2012’s requirements.

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