



April 5, 2010

RE: Unvented Attic Assembly as an Alternate Design

Due to the tremendous documentation supporting the benefits of the unvented attic assembly, we felt it necessary to submit this request for approval of the unvented attic assembly as an alternate design in accordance with Section 104 of the 2009 International Building Code. IBC Section 104.11 Alternate Materials, Design and Methods of Construction and Equipment states, “The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with **the intent of the provisions of this code...**” This documentation will provide compelling evidence to support the unvented attic assembly including nationally recognized and accepted code documentation showing the inclusion of the unvented attic assembly in the International Residential Code since ICC released the 2004 Supplement to the IRC.

I would like to thank you for taking time to review this documentation, as I am confident that you will see the evolution of the unvented attic assembly in the International Residential Code since 2004. Surprisingly, this “new age” concept of eliminating “traditional” ventilation from attics dates back more than 20 years to the mid-1980’s. These assemblies have shown excellent performance characteristics over the years, by changing the thermal boundary and achieving two very important benefits:

- Moving the HVAC system, the air handler and ductwork, into the thermal envelope, and therefore conditioned space

And,

- Eliminating the heat and moisture loads associated with “traditional” ventilation due to unwanted air infiltration passing through conventional ceiling insulation

The building industry has known for years that placing the HVAC system inside the thermal envelope is very beneficial for a number of reasons. First of all, lowering the ambient temperature surrounding the HVAC system lowers the operating stress on the equipment, and by lowering the ΔT across the air handler and the ductwork, the system will be more efficient. Most importantly, ALL DUCTS LEAK, and this duct leakage will now be maintained inside the thermal envelope, once again increasing the overall efficiency of the system. Rather than moving the HVAC system, we propose to follow the guidelines of 2006 IRC Section 806.4 (attached), and provide an air-impermeable insulation, *SEALECTION*[®] 500 Spray Foam Insulation, applied directly to the underside of the roof deck, essentially moving the thermal boundary to the roof line and eliminating



DEMILEC (USA) LLC.
POLYURETHANE SYSTEMS MANUFACTURER

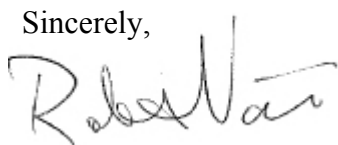
the traditional required ventilation, therefore encompassing the HVAC system within the thermal envelope and achieving the aforementioned benefits. Now, because the attic is “semi-conditioned” based on passive interconnection between the living space and the attic through the ceiling membrane, internal convection currents created by an inherent ΔT between the living space and the attic and traditional duct leakage that is maintained within the newly created thermal envelope, the temperature of an unvented attic, following these code accepted standards, is typically within 8 to 12 degrees of the living space; so rather than having a 120°+ attic applying a heat and moisture load above the living space, we maintain attic temperatures, as part of the thermal envelope, between approximately 85° and 90° at the hottest part of the day.

Please understand, while some of these ideas may seem counter-intuitive, we are achieving these results everyday across the nation, and we are following nationally recognized and approved standards for these unvented attic assemblies. For your review, please find attached a copy of Section 806.4 from the 2004 Supplement to the IRC, the 2006 International Residential Code Commentary and the 2009 International Residential Code. This design parameter was first adopted by ICC in the 2004 Supplement, however, please note, the 2006 IRC Commentary explains this design in detail and states the following:

“The key concept of this section is to move the thermal envelope (insulation) above the attic, resulting in the attic being in a conditioned (or sometimes semi-conditioned) space. Direct air supply to the attic is not required if the attic floor is not insulated; the attic temperature would be similar to interior conditioned spaces. Ducts and/or HVAC equipment in the attic also help moderate the attic conditions.”

Do not hesitate to contact me if you have any questions. I look forward to your acceptance of this Alternate Design Method.

Sincerely,

Sincerely,

Robert Naini
Director of Engineering
DEMILEC (USA) LLC®