

Roofing/Waterproofing Details and the Architect's Standard of Care

By Colin Murphy, RRC, FRCI, and Lonnie Haughton

Across the nation, most states or jurisdictions have adopted the new International Building Code and/or International Residential Code (the 'I-Codes') to replace the three older building codes (ICBO Uniform Building Code, BOCA National Building Code, and SBCCI Standard Building Code) that had divided the country into distinct areas of model building code influence.

During the lengthy processes that led to the melding of these three "model" codes into the unified I-Codes, the negotiators added new language that helps clarify an issue that has been argued for decades in various forums for building defects mediation and litigation: The project designer's standard of care for ensuring that the contractor has all details and guidance required for weatherproof construction of the exterior walls and roof covering.

In the past, it was not uncommon for a project architect or specifier to pass a major portion of the design responsibility over to the building contractor by simply calling

the designer's entire guidance for proper flashing and weatherproofing of the exterior wall and roof covering systems consisted solely of the brief specification, "Comply with applicable code requirements" inserted into the General Notes. In these cases, the project's design professional quite simply is stating that while it is his/her general "design intent" that the building envelope shall not leak, it is up to the contractor to figure out how to carry out this broad mandate.

Note that while the Request for Information (RFI) and submittal processes, where applicable, can induce further clarification as to the design, the architect may not be contractually bound to respond once the construction drawing phase is complete. Further, after the project has been bid and the work has commenced, there are generally time and/or cost constraints that significantly limit the potential processes of design clarification when all the contractor has been provided is the "intent."

If, at a later period, these building walls or roof do experience leakage or mold proliferation due to waterproofing or flashing defects, it has been our experience that this "design intent" defense by the project architect can be successful in the litigation process. The builder's continuation of the construction, even when the design guidance has been minimal, can be considered to represent an acceptance of the additional design responsibility and a commitment by the builder to carry out the work in conformance with the controlling building code.

- "The contractor is charged with knowing, understanding, and complying with code provisions and is liable when there is a violation."¹

However, the referenced new I-Codes² now make it completely clear that the final responsibility for a detailed and effective design for the building envelope remains with the project's designated design professional and/or the qualified roofing and

waterproofing design professionals assisting the project. Prior to issuance of the building permit, the construction documents must include comprehensive waterproofing details:

- "... including flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves, or parapets, means of drainage, water-resistive membrane, and details around openings."³

Further:

- "The exterior wall envelope shall **be designed** [bold emphasis added] and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water-resistive barrier behind the exterior veneer..."⁴
- "Roof coverings shall **be designed** [bold emphasis added], installed, and maintained in accordance with this code and the approved manufacturer's instructions such that the roof covering shall serve to protect the building or structure."⁵

Note in the code language quoted above the addition (new to the I-Codes) of the short phrase "be designed," which advises the project's design professional that his/her standard of care typically will include project-specific detailing (typically during the pre-construction process) of the wall and roof covering systems and their associated flashings. No longer should it be argued that these critical tasks can simply be passed on to the contractor and his/her subcontractors.

"Be designed" is an example of a "performance" requirement within the I-Codes; the project architect is being advised that his/her envelope design must be well-detailed and well-specified and must provide long-term weatherproof performance. If the design fails to perform properly, the

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out "flashing" on a typical wall section or roof plan within the project documents. We have seen construction drawings in which

responsibility for this failure rests primarily with the project's design professional, while it is the contractor and subcontractors who remain responsible for proper installation of the well-conceived waterproofing design in accordance with industry standards.

Like the older model building codes, the Chapters and Sections of the I-Codes are written in a combination of "prescriptive" and "performance" language. It is interesting to note that a comparison of the flashing requirements of Chapter 14 (Exterior Walls) and Chapter 15 (Roof Assemblies and Rooftop Structures) of the International Building Code reveals a higher proportion of general performance language in Chapter 14 while Chapter 15 presents a greater degree of prescriptive instructions about proper flashing materials, dimensions, and securement. These differences can be attributed to the decades of service by past and present roofing manufacturers, industry organizations, and associated roofing professionals dedicated to identifying the minimum requirements for assured long-term, weather-resistive performance of the various roof covering systems. In comparison, the overall body of knowledge for prop-

er exterior wall cladding and below-grade waterproofing is less developed, less validated, and more inconsistent and scattered. To address this lack, the authors of Chapter 14 have fallen back on broad performance language:

- "Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect it to the exterior."⁶

A good example of the difference between "performance" and "prescriptive" language in the I-Codes is a brief comparison of how the International Building Code (IBC) and International Residential Code (IRC) address joint overlaps of loose-laid sheet goods (e.g., asphalt-saturated building paper or polyolefin housewraps) used as the weather resistive barrier at exterior walls. The IRC (Section R703.2) simply prescribes minimum 6" vertical overlaps and minimum 2" horizontal overlaps. The IBC (Section 1404.2) requires the overlaps to be appropriately configured to provide "continuous water-resistive" performance. In other words, the IBC expects the project designer (or its qualified representatives) to evaluate

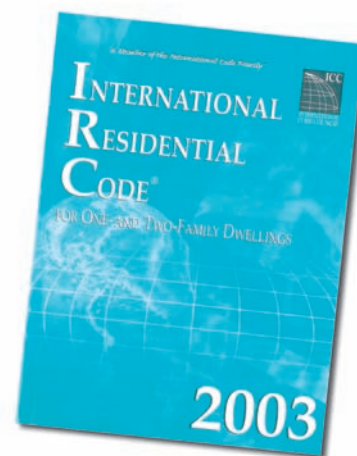
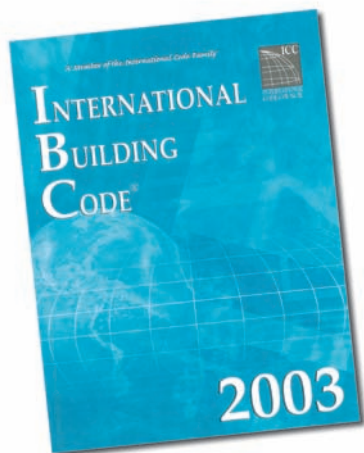
local climate conditions, the building's exposure, and the expected weather-resistive performance of the cladding and flashing designs in order to determine appropriate overlap dimensions of the loose-laid sheet weather-resistive barrier installed at the exterior walls.

Similar design responsibilities are associated with the roof covering system:

- "The designer will typically include in his or her roof specification compatibility of materials, deck type, weather conditions, roof slope, structural loads, roof drainage, roof penetrations, energy, and future reroofing."⁷

It is important to recognize that in most cases, the design responsibility mandated by the I-Codes cannot be fulfilled simply by providing to the contractor a manufacturer's packet of generic details and guide specifications. The I-Codes task the design professional with project-specific design responsibilities that are greater in scope than the downloadable product information promoted by sales representatives across the nation. Unless these sales and technical

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"A MINIMUM OF ONE LAYER OF No. 15 ASPHALT FELT...SHALL BE ATTACHED TO THE SHEATHING, WITH FLASHING...IN SUCH A MANNER AS TO PROVIDE A CONTINUOUS WATER-RESISTIVE BARRIER BEHIND THE EXTERIOR WALL ENVELOPE." — 2003 IBC

The International Residential Code provides prescriptive instructions for proper installation of the weather-resistive barrier, while the International Building Code simply specifies an installation that provides proper weather-resistive performance.

personnel and their employers formally accept project-specific responsibility for the successful long-term performance of the roofing, cladding, or waterproofing design that they are marketing, then this burden continues to rest with the project's design professional.

Similarly, while the generic MasterSpec and MasterFormat guide specifications

the responsible design professional may not even be a "registered" professional (i.e., a licensed architect or engineer), but this lack of formal credentials does not absolve him or her from code-prescribed responsibility for a successful envelope design.

While there are many architects who are well qualified to fully evaluate, detail, and specify even the most complex flashing,

¹ *Legal Aspects of Code Administration*, International Code Council, Falls Church, VA, 2002.

² In addition to the 2003 International Building Code and 2003 International Residential Code, the I-Code series includes the 2003 International Fire Code, 2003 International Plumbing Code, 2003 International Mechanical Code, 2003 International Fuel Gas Code, 2003 International Energy Conservation Code, 2003 International Private Sewage Code, 2003 ICC Performance Code for Buildings and Facilities, 2003 International Property Maintenance Code, 2003 International Zoning Code, 2003 International Existing Building Code, and the 2003 International Urban-Wildland Code. Most jurisdictions, however, have adopted only some (or just one) of these many model codes.

³ 2003 IBC, Section 106.1.3.

⁴ 2003 IBC, Section 1403.2 and 2003 IRC, Section R703.1.

⁵ 2003 IBC, Section 1503.1 and 2003 IRC, Section R903.1.

⁶ 2003 IBC, Section 1405.3.

⁷ IBC Commentary, Vol. 1, Section 1503.1.

⁸ 2003 IBC, Section 106.3.4.1.


"THE I-CODES TASK THE DESIGN PROFESSIONAL WITH PROJECT-SPECIFIC DESIGN RESPONSIBILITIES THAT ARE GREATER IN SCOPE THAN THE DOWNLOADABLE PRODUCT INFORMATION PROMOTED BY SALES REPRESENTATIVES ACROSS THE NATION."

published respectively by the American Institute of Architects (AIA) and the Construction Specifications Institute (CSI) are important resources for the design professional, neither of these tools can provide the code-required design review necessary to ensure weather-resistive performance of the building envelope. Even the comprehensive standards and details published by the nation's most respected industry organizations (e.g., the National Roofing Contractors Association and the Asphalt Roofing Manufacturers Association) cannot be blindly substituted for the project-specific design review prescribed by the I-Codes.

In all of these cases, the referenced standards, details, and guide specifications can be invaluable components of the project-specific design review, but the I-Codes make it clear that ultimately someone must assume responsibility for design performance. For large projects in most jurisdictions, this person likely will be the "registered design professional in responsible charge."

- "The registered design professional in responsible charge shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building."⁸

For some small projects, depending on the requirements of the local jurisdictions,

cladding, and roof covering systems, for most designers and specifiers these critical tasks are best carried out by qualified roofing and waterproofing specialists whose professional services for each project will include acceptance of the mantle of design liability imposed by the I-Codes. Without doubt, the nation's most qualified and knowledgeable body of roofing and waterproofing experts are the registered roof consultants (RRCs) who comprise the foundation of the Roof Consultants Institute. 

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Colin Murphy founded Exterior Research & Design, LLC (originally Trinity Engineering, Inc.) in Seattle, WA in 1986 and has since expanded the firm to include offices in Waterbury, CT and Portland, OR. Colin is a Registered Roof Consultant and has been elected to the RCI Jury of Fellows. He also is a LEED Accredited Professional, a certified EIFS Third Party Inspector and an ICC-certified Building Inspector. Colin is the principal author of *The Roof Construction Guide for General Contractors*, published in 1998 by RCI.



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