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Re-roofing Over Structural Concrete Decks
July 24, 2018

To: Carlisle SynTec Systems' Manufacturer's Representatives, Distributors, and Authorized Applicators

Subject: Re-roofing Over Structural Concrete Decks

One of the challenges when tearing off over structural concrete decks is addressing residual moisture from leaks, inadequate initial drying, or condensation. When the existing roofing materials are removed and the surface is dried, it can take a long time for invisible moisture absorbed within the slab to dissipate and for the concrete to reach an acceptable relative humidity level. Improper drying causes moisture to stay trapped in the new roofing system, adversely impacting the performance of certain components. For example:

- Paper-faced polyiso can be weakened by moisture absorption, compromising the wind uplift performance of insulation adhesives and/or membrane adhesives.
- Adhesion of peel-and-stick air and vapor barriers can be compromised.
- Mold growth can occur within the roofing assembly.
- Without adequate insulation values, white or light-colored roofing membranes can increase the potential for condensation-related issues; their high solar reflectance results in lower surface temperatures that remain below the dew point for longer periods of time.
 - Note: Darker-colored roofs tend to have a much greater summer dry-down effect, driving moisture back into the building.

Because of these challenges, Carlisle strongly recommends the use of ChannelDry® expanded polystyrene (EPS) insulation in conjunction with One- and Two-way Pressure Relief Breather Vents. Originally designed for roofing over newly poured structural concrete decks, the ChannelDry roof assembly provides an equally viable solution for roof replacement applications over structural concrete because of its tolerance to hidden residual moisture.

Either assembly option listed below may be considered, depending on the project parameters. **In both assemblies, the joints between the deck, walls, and curbs, as well as any gaps around penetrations (pipes, drains, and other protrusions), must be sealed to prevent conditioned interior air from infiltrating the roof assembly.**

Ballasted EPDM Assembly with ChannelDry and Pressure Relief Breather Vents:

This assembly does not rely on fasteners or adhesives to hold the roofing system in place. After sealing all joints and gaps in the substrate, a typical design starts with a base layer of ChannelDry EPS on top of the structural concrete deck, followed by subsequent layers of moisture-resistant EPS or SecurShield® coated glass-faced polyiso. All layers are loose-laid.

The EPDM membrane is then loose-laid over the insulation and subsequently covered with stone ballast or concrete pavers. One-way Pressure Relief Breather Vents are then installed at a rate of one per 2,000 square feet, and Two-way Pressure Relief Breather Vents are installed at a rate of one per 8,000 square feet. The vents are placed over four- to five-inch-diameter core cuts that extend through the insulation and down to the concrete deck to promote drying.

Adhered Assembly with ChannelDry and Pressure Relief Breather Vents:

Ballasted assemblies are impractical in some areas of the country and for certain building heights and structural designs. In these situations, adhered roofing systems are often the best choice.

After sealing all joints and gaps in the substrate, a base layer of ChannelDry EPS is placed directly on the structural concrete deck. SecurShield coated glass-faced polyiso insulation is placed on top of the ChannelDry and then mechanically fastened into the concrete substrate. Alternatively, the SecurShield layer can be attached with FAST™ or Flexible FAST Adhesive if the ChannelDry is mechanically fastened to the concrete substrate.

The single-ply membrane (EPDM, TPO, or PVC) is then adhered to the SecurShield polyiso following Carlisle application procedures.

The final step is the installation of One-way Pressure Relief Breather Vents (one per 2,000 square feet) and Two-way Pressure Relief Breather Vents (one per 8,000 square feet). The vents are placed over four- to five-inch-diameter core cuts that extend through the insulation and down to the concrete deck to permit air circulation and promote drying of the concrete.

Although white reflective membranes can be used in these systems, darker-colored membranes will naturally help accelerate the drying effect of the assembly.

Visit the [Carlisle website](#) for more information on available insulation solutions. If you have any questions, please contact Carlisle's Design Services Department.

Sincerely,

Chris Kann
Building Envelope Designer
cc: Job File