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ABSTRACT:

Exterior deck coatings in residential construction are expected to perform as waterproofing and traffic surface. The dual purpose combined with wood framed construction is a tall order. What material choices exist?

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REFERENCES:

ASTM C957 - Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane With Integral Wearing Surface
ASTM C1127 - Standard Guide for Use of High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with an Integral Wearing Surface
ASTM E2266 - Standard Guide for Design and Construction of Low-Rise Frame Building Wall Systems to Resist Water Intrusion

Exterior Deck Coatings

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Dual Purposes

Exterior deck coatings in residential construction are expected to perform as a waterproofing and traffic surface. The coating must prevent water intrusion to the occupied space below, and must withstand foot traffic and furniture used to enjoy the outdoors and the view. The dual purpose combined with wood framed construction is a tall order. What material choices exist?

The coatings are normally applied over wood framed construction - often cantilevered floor framing creating a flush finished floor condition between interior and exterior. Keeping water out of the building interior without an elevation change and help from gravity is especially difficult.

Selecting the right waterproof traffic coatings for wood construction subject to bending and dimensional changes from variable moisture content is a challenge. The wrong choice or the wrong details will lead to unhappy owners when leaks are discovered.

Material Choices

Fiberglass Coatings

Historically, along the New Jersey shore, fiberglass deck coatings have been popular choice. If it works for boats, it must work for residential decks. After all, both must keep the water out. But there is one difference.

Homes do not have bilges and bilge pumps to capture and remove intruding water. Homes absorb and hold the water, until saturation - potentially causing hidden damage - until the water is released and the leak is discovered. Transferring technology from one industry to another does not always work. Fiberglass coatings are field constructed from a resin, reinforcing mesh, and a gel coat. The coating is hand laid up in multiple layers. The resin is applied to the substrate, the reinforcing mesh embedded, and then coated with additional resin. A final gel coat is applied as the decorative finish available in practically any color. The resulting fiberglass coating is seamless, rigid, and smooth. Seamless is a good thing for resisting water. A rigid material applied over a much less rigid substrate causes stresses at the bond line between the materials. When sufficient, the stresses will cause cracking in the fiberglass coating. Rigid coatings are also subject to damage from impact loads. A smooth surface is slick when wet and may contribute to slips-and-falls.

There are no known industry standards governing fiberglass deck coatings. There are no manufacturers offering a "system" that is designed and tested to perform as a deck coating. Buyers must rely on the reputation and capability of the installer to select the system components and produce a coating that will perform as expected.

Elastomeric Coatings

Elastomeric coatings suitable for residential decks are available in two chemistries: polyurethane and polyurea. The systems usually include a primer plus two or three finish coats depending on the expected traffic conditions. Two finish coats are normally used for pedestrian traffic coatings.

The completed coating is seamless with an orange peel texture. Aggregate can be broadcast into the surface to improve slip-resistance. Like fiberglass, the coating can conform to odd shapes, protrusions and penetrations. The coating is self-flashing for vertical terminations. The coatings are available in limited standard colors. Custom colors may be available, depending on the manufacturer and the quantity.

Both coatings are flexible and both adhere well to wood substrates. Polyurethane coatings have superior abrasion resistance that permit their use for vehicular traffic. Polyurea coatings have superior adhesion and elongation properties - a decided advantage for residential wood construction. Both coatings are easily repaired when damaged and renewed when worn.

Elastomeric coatings are available from a large number of manufacturers that distribute their products nationally. Due to commercial use, elastomeric coating manufacturers participate in trade organizations that develop standardized performance testing for reporting product quality. The available networks allow architects to require the manufacturer's representative to be present at the project site to inspect the product installation.

Maintenance

Nothing is forever.

Coatings degrade from exposure to the elements and wear from traffic abrasion. Regardless the material selected, the coatings must be maintained. Inspect the coating, annually, to be sure the surface is sound and the terminations are watertight. Advise owners that they must periodically renew the surface to ensure continuous performance and enjoyment. Waiting for the leak to make the repair will cost so much more than the preventative maintenance.

Recommendations

Choose the coating wisely. Seamless coatings can provide excellent water resistance. Consider all the performance requirements and material attributes to meet the demands of the specific project conditions. Choose flexible coatings for flexible substrates. Do not expect rigid materials to accommodate substrate movement.

Use gravity to your advantage. Remember what roofing manufacturers always require - minimum 8 inches vertical base flashing. Include a step up from the exterior to the interior. Eliminate the easy path for wind-blown water penetrating sealed joints at flush conditions.

Conceal coating base flashings with metal flashings. Do not give water an opportunity to penetrate the coating substrate. Use two piece flashings so the base flashing can be exposed and resurfaced with the horizontal deck coating.

Create drips at deck overhangs. Do not simply wrap the coating around the overhang and expect water to stay out of the building. Detail the coating termination so sealant is not the primary water deterrent. Sealants are rarely maintained.

Get rain water off the deck. Slope the deck surface for positive drainage. Provide a way to remove the water, whether an internal drain, scuppers, or other means. Redundancy is important. A single deck drain may clog making the deck a pond.

Footnote: The source material for This Tech Tips was taken from a Conspectus expert witness report from an exterior deck renovation project for a New Jersey shore condominium association.

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