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DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07180—Traffic Coatings
Section: 07540—Thermoplastic Membrane Roofing

REPORT HOLDER:

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EVALUATION SUBJECT:

DURADEK ULTRA ROOF AND WALKING DECK MEMBRANES

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2003 *International Building Code*® (IBC)
- 2003 *International Residential Code*® (IRC)
- 1997 *Uniform Building Code*™ (UBC)

Properties evaluated:

- Durability
- Wind resistance
- Fire classification

2.0 USES

The Duradek Ultra system is a walking deck and classified (rated) roof covering system for use directly over concrete, Hardibacker® underlayment and plywood substrates as described in Section 3.2.3 of this report.

3.0 DESCRIPTION

3.1 General:

Duradek Ultra consists of a membrane and deck adhesive. See Section 4.0 of this report for recognized Duradek configurations and corresponding component requirements.

3.2 Materials:

3.2.1 Membrane: Duradek Ultra membrane is a calendered polyvinyl chloride (PVC) film laminated to a woven, heat-set polyester fabric. The surface of the PVC film is factory-printed and top-coated with a PVC/acrylic finish. The membrane is produced in a variety of colors and patterns and is available in rolls of various widths and lengths. The membrane weighs approximately 55 ounces per square yard (1864 g/m²) and is nominally 0.060 inch [60 mils (1.5 mm)] thick.

3.2.2 Adhesives:

3.2.2.1 Duradek D763-1: A white-colored, water-based, liquid adhesive with a shelf life of six months when stored at temperatures between 45° and 80°F (10° and 26.7°C).

3.2.2.2 Duradek D-811: A yellow-colored, liquid contact adhesive with a shelf life of six months when stored at temperatures between 45° and 80°F (10° and 26.7°C).

3.2.3 Substrates:

3.2.3.1 Plywood: Minimum 5/8-inch-thick (15.9 mm) exterior-grade with tongue-and-groove edges, complying with US Department of Commerce Product Standard PS-1 (UBC Standard 23-2) or PS-2 (UBC Standard 23-3).

3.2.3.2 Hardibacker® Underlayment: A minimum nominally 1/4-inch-thick (6.4 mm) cementitious panel, as described in ICC-ES report NER-405.

3.2.3.3 Concrete: Concrete substrates are to comply with the requirements of the applicable code.

4.0 INSTALLATION

4.1 General:

Installation of the Duradek Ultra system is to be in accordance with the manufacturer's published installation instructions, the applicable code and this report. The manufacturer's installation instructions are to be available on the jobsite during application. Installation is limited to conditions when the weather is dry and the ambient air temperature is a minimum of 45°F (7.2°C). Materials are not to be applied if precipitation is occurring or expected.

4.2 Preparation of Substrates:

Substrates are to be structurally sound, clean and dry, and shall be sloped a minimum of 1/4 inch per 1 foot (2 percent slope).

4.2.1 Plywood: Plywood is to be applied to framing in accordance with the requirements of the applicable code. All unsupported edges are to be blocked. All penetrations through and terminations of the sheathing are to be protected with metal flashing in accordance with the requirements of the applicable code and the manufacturer's published installation instructions.

4.2.2 Concrete: Surfaces are to be clean and free of standing water. All holes, joints and cracks are to be pointed flush with portland cement mortar and all high spots cut or ground off to provide a smooth, even surface. Any foreign material such as paint, grease or oil is to be removed by mechanical means.

4.2.3 Hardibacker: Where Hardibacker is used as a substrate, it is installed over a plywood substrate complying with the requirements set forth in Sections 3.2.3.1 and 4.2.1.

4.3 Membrane Installation:

The membrane is adhered to the substrate with either Duradek D763-1 or Duradek D-811 adhesive. Duradek D763-1 is applied to the substrate with either a U-notched trowel having $\frac{1}{32}$ -inch-deep-by- $\frac{1}{16}$ -inch-wide (0.8 by 1.6 mm) notches spaced $\frac{1}{32}$ inch (0.8 mm) apart or a textured roller. The minimum coverage is 1 gallon per 190 square feet (1L/4.66 m²). Duradek D-811 is applied with either a brush or a roller at a coverage rate of 1 gallon per 95 square feet (1L/2.33 m²). The minimum application temperature for both adhesives is 45°F (7.2°C).

A minimum 2-inch (51 mm) width of Duradek D-811 adhesive is used at the perimeter of the deck and on walls, edges and right-angle corners. Membrane seams are overlapped a minimum of $\frac{3}{4}$ inch (19.1 mm) at edges and ends, and heat-fused with a hot-air seaming tool. Exposed edges, posts and trim strips are sealed with sealant. Typical installation details are shown in Figure 1.

4.4 Method of Repair:

A portion of the membrane larger than the affected area is removed and a new piece of material is prepared that is $\frac{1}{8}$ inch (3.2 mm) larger in dimension than the piece removed. Duradek D763-1 adhesive is applied to the substrate and the patch is placed into the space so it overlaps the existing sheet by $\frac{1}{16}$ inch (1.6 mm). The patch is welded to the existing sheet using a hot-air seaming tool. When substrate damage occurs, the retention of the fire classification and strength properties of the system are to be investigated to the satisfaction of the code official.

4.5 Wind Resistance:

The roof deck construction over which the fully bonded coating is installed is to be designed to resist the minimum design wind pressures set forth in the applicable code.

4.6 Roof Classification:

4.6.1 Class C Classification: When adhered directly to exterior-grade plywood using Duradek D763-1 adhesive, the system provides a Class C roof covering classification in accordance with Section 1505.1 of the IBC, Section R902.1 of the IRC or Section 1504.1 of the UBC. The plywood substrate and installation are to comply with this report and have a slope of $\frac{1}{4}$ inch per 1 foot (2 percent slope). Plywood panel joints are filled with a floor-patch compound from an approved manufacturer.

4.6.2 Class A Classification: When adhered to Hardibacker® underlayment applied over plywood using

Duradek D763-1 adhesive, the system provides a Class A roof covering classification in accordance with Section 1505.1 of the IBC, Section R902.1 of the IRC or Section 1504.1 of the UBC. Hardibacker® panels are fastened to the plywood substrate with ITW Buildex Green Hornet™ Hilo® S® screws spaced 6 inches (152 mm) on center. Screws are to have sufficient length to penetrate the deck framing a minimum of $\frac{3}{4}$ inch (19.1 mm).

Duradek membrane, when adhered over concrete decks, provides a Class A roof covering classification in accordance with Section 1505.1 of the IBC, Section R902.1 of the IRC or Section 1504.1 of the UBC.

5.0 CONDITIONS OF USE

The Duradek Ultra walking deck and roof covering system described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

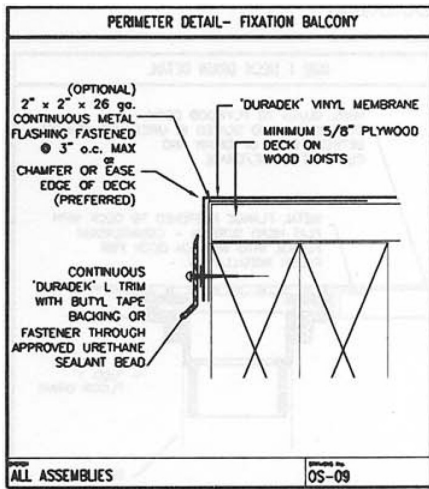
- 5.1 Installation shall comply with this report, the manufacturer's published installation instructions and the applicable code. If there is a conflict between the installation instructions and this report, the conditions of this report shall govern.
- 5.2 The roof deck on which the roof covering system is installed shall be designed to resist the design wind pressures of the applicable code.
- 5.3 The membrane is manufactured in Columbus, Mississippi, under a quality control program with inspections by Intertek Testing Services (AA-688).

6.0 EVIDENCE SUBMITTED

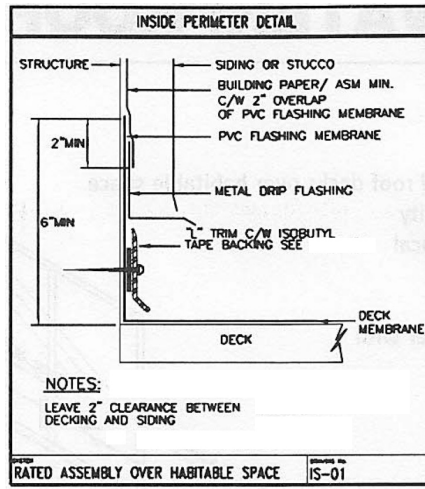
- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Walking Decks (AC39), dated March 2000 (editorially revised October 2004).
- 6.2 Report of testing in accordance with ASTM E 108.

7.0 IDENTIFICATION

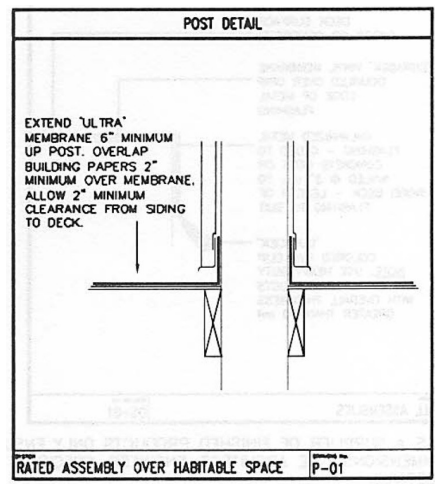
Each roll of membrane is identified with the Duradek (U.S.) Ltd. name and address, the evaluation report number (ESR-2151) and the name of the inspection agency (Intertek Testing Services). The adhesives are identified with the Duradek (U.S.) Ltd. name and address, the product designation, batch number keyed to the date of manufacture, and product expiration date.



OUTER PERIMETER



INSIDE PERIMETER



POST DETAIL

FIGURE 1—TYPICAL INSTALLATION DETAILS