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**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**  
**Section: 07 53 23—Ethylene-Propylene-Diene-Monomer Roofing**

**Section: 07 54 19—Polyvinyl-Chloride Roofing**  
**Section: 07 54 23—Thermoplastic-Polyolefin Roofing**

**REPORT HOLDER:**

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**EVALUATION SUBJECT:**

**CARLISLE EPDM, PVC AND TPO SINGLE-PLY ROOFING MEMBRANES**

**ADDITIONAL LISTEES:**

**KELLY COMPANY/2001 INC.**  
 325 THOMASTON AVENUE  
 WATERBURY, CONNECTICUT 06702  
 (203) 575-9220

**MULE-HIDE PRODUCTS COMPANY, INC.**  
 1195 PRINCE HALL DRIVE  
 BELOIT, WISCONSIN 53511  
 (800) 786-1492

**VERSICO**  
 POST OFFICE BOX 1289  
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**WEATHERBOND**  
 POST OFFICE BOX 251  
 PLAINFIELD, PENNSYLVANIA 17081  
 (866) 471-5125

**1.0 EVALUATION SCOPE**
**Compliance with the following codes:**

- 2012 and 2009 *International Building Code*® (IBC)

- 2012 and 2009 *International Residential Code*® (IRC)
- ~~2013 Abu Dhabi International Building Code (ADIBC)†~~ \*

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

- ~~Other Codes (see Section 8.0)~~ \*

**Properties evaluated:**

- Weather resistance
- Roof covering fire classification
- Wind uplift resistance
- Impact resistance

**2.0 USES**

Carlisle ethylene propylene diene monomer (EPDM), polyvinyl chloride (PVC) and thermoplastic polyolefin (TPO) single-ply roofing membranes are used as roof coverings in adhered and mechanically fastened membrane roofing systems.

**3.0 DESCRIPTION**
**3.1 General:**

The EPDM, PVC and TPO Membrane Roofing Systems described in this report consist of single-ply roofing membranes, insulation where used, barrier board or slip sheet where used, flashing, mechanical fasteners and adhesives that are installed on a combustible or noncombustible deck. See Table 1 for Carlisle product trade names and corresponding product names for Mule-Hide Products Company, Inc., WeatherBond, Versico and Kelly Company/2001 Inc., the additional listees.

**3.2 EPDM Membranes:**

**3.2.1 Sure-Seal:** Sure-Seal is a black, nonreinforced EPDM membrane, 45 mils thick [0.045 inch (1.14 mm)].

**3.2.2 Sure-Seal FR:** Sure-Seal FR is a black, nonreinforced EPDM membrane with fire retardants. Available thicknesses range from 45 mils (0.045 inch [1.14 mm]) to 90 mils (0.090 inch [2.29 mm]).

**3.2.3 Sure-White:** Sure-White is a white, nonreinforced EPDM membrane. It is available in thicknesses of 60 mils [0.060 inch (1.52 mm)] and 90 mils [0.090 inch (2.29 mm)].

**3.2.4 Sure-Tough:** Sure-Tough is a black, reinforced membrane consisting of a polyester reinforcement encapsulated between two EPDM membrane plies. It is available in thicknesses ranging from 45 mils [0.045 inch (1.14 mm)] to 75 mils [0.075 inch (1.90 mm)].

**3.2.5 Sure-Tough FR:** Sure-Tough FR is a black, reinforced membrane consisting of a polyester

reinforcement encapsulated between two EPDM membrane plies with fire retardants. Available thicknesses are 45 mils [0.045 inch (1.14 mm)] and 60 mils [0.060 inch (1.52 mm)].

**3.2.6 Sure-Seal FleeceBACK:** Sure-Seal FleeceBACK is a 45-mil to 90-mil [0.045 inch to 0.090 inch (1.14 mm to 2.29 mm)] non-reinforced EPDM bonded to a 5.5-ounce-per-square-yard (0.18 kg/m<sup>2</sup>) polyester fleece. Available product thicknesses range from 100 mils [0.100 inch (2.55 mm)] to 145 mils [0.145 inch (3.68 mm)].

**3.2.7 Sure-White FleeceBACK:** Sure-White FleeceBACK is a 45-, 60- or 90-mil [0.045, 0.060 or 0.090 inch (1.14, 1.52 or 2.29 mm)] nonreinforced white EPDM bonded to a 5.5-ounce-per-square-yard (0.18 kg/m<sup>2</sup>) polyester fleece. Available product thicknesses are 100, 115 and 145 mils [0.100, 0.115 or 0.145 inch (2.54, 2.92 or 3.68 mm)].

**3.2.8 Sure-Seal AFX:** Sure-Seal AFX is a 45-mil [0.045 inch (1.14 mm)] or 60-mil [0.060 inch (1.52 mm)] non-reinforced EPDM bonded to a 7.5-ounce-per-square-yard (0.25 kg/m<sup>2</sup>) polyester fleece. Available thicknesses are 90 mils [0.090 inch (2.29 mm)] and 105 mils [0.105 inch (2.67 mm)].

### 3.3 PVC Membranes:

**3.3.1 Sure-Flex and Sure-Flex KEE:** Sure-Flex and Sure-Flex KEE are membranes consisting of a polyester reinforcement encapsulated between two plies of PVC. The membrane is available in white, gray, tan and custom colors. Available thicknesses range from 50 mils [0.050 inch (1.27 mm)] to 80 mils [0.080 inch (2.03 mm)].

**3.3.2 Sure-Flex FRS:** Sure-Flex FRS membrane consists of a fiberglass reinforcement encapsulated between two plies of PVC. The membrane is available in white, gray and custom colors. Available thicknesses range from 50 mils [0.050 inch (1.27 mm)] to 80 mils [0.080 inch (2.03 mm)].

**3.3.3 Sure-Flex FleeceBACK:** Sure-Flex FleeceBACK is the Sure-Flex membrane, described in Sections 3.3.1 and 3.3.2, with a laminated 5.5-ounce-per-square-yard (0.18 kg/m<sup>2</sup>) polyester fleece backing. Available thicknesses range from 105 mils [0.105 inch (2.67 mm)] to 135 mils [0.135 inch (3.43 mm)].

### 3.4 TPO Membranes:

**3.4.1 Sure-Weld:** Sure-Weld membrane consists of a polyester reinforcement encapsulated between two plies of TPO. The membrane is available in white, gray, tan and custom colors. Available thicknesses range from 45 mils [0.045 inch (1.14 mm)] to 80 mils [0.080 inch (2.03 mm)].

**3.4.2 Sure-Weld HS:** Sure-Weld HS is the Sure-Weld membrane formulated with an additional flame retardant for fire resistance at higher slopes. The membrane is available in white, gray, tan and custom colors. Available thicknesses are 45 mils [0.045 inch (1.14 mm)] and 60 mils [0.060 inch (1.52 mm)].

**3.4.3 SAT-TPO:** SAT-TPO is a self-adhered version of the Sure-Weld HS membrane with adhesive.

**3.4.4 Sure-Weld FleeceBACK: Sure-Weld FleeceBACK** is the Sure-Weld HS membrane, 45 mils [0.045 inch (1.14 mm)], 60 mils [0.60 inch (1.52 mm)] and 80 mils [0.60 inch (2.03 mm)] thick, with a laminated 5.5-ounce-per-square-yard (0.18 kg/m<sup>2</sup>) polyester fleece backing. Available thicknesses are 100 mils [0.100 inch (2.54 mm)], 115 mils [0.115 inch (2.92 mm)] and 135 mils [0.135 inch (3.43 mm)].

**3.4.5 Sure-Weld AFX:** Sure-Weld AFX is the Sure-Weld HS membrane with a laminated 10-ounce-per-square-yard (0.34 kg/m<sup>2</sup>) polyester fleece backing. Available

thicknesses range from 120 mils [0.120 inch (3.05 mm)] to 155 mils [0.155 inch (3.94 mm)].

**3.4.6 Spectro-Weld:** Spectro-Weld is the Sure-Weld membrane, described in Section 3.4.1, formulated with a brighter white color. Available thicknesses are 60 mils [0.060 inch (1.52 mm)] and 80 mils [0.080 inch (2.03 mm)].

**3.4.7 Spectro-Weld FleeceBACK:** Spectro-Weld FleeceBACK is the Spectro-Weld membrane with a laminated 5.5-ounce-per-square-yard (0.18 kg/m<sup>2</sup>) polyester fleece backing. It is 115 mils [0.115 inch (2.92 mm)] thick.

### 3.5 Insulation:

See Tables 2 through 4 for insulations for use with specific roofing systems. Foam plastic insulation, where used, must have a flame-spread index of not more than 75 when tested at the maximum thickness intended for use in accordance with ASTM E84.

### 3.6 Barrier Board:

Barrier board, where used, must be either minimum 1/4-inch-thick (6.4 mm) G-P Gypsum Corporation "DensDeck," minimum 1/4-inch-thick (6.4 mm) Owens Corning "Strataguard," minimum 1/4-inch-thick (6.4 mm) USG "Securock," or minimum 1/2-inch-thick (12.7 mm) gypsum board. Barrier board must be UL-listed for roofing applications or UL-classified gypsum board.

### 3.7 Slip Sheet:

The slip sheet, where used, must include Carlisle "FR Base Sheet 1S or 2S," GAF "VersaShield® Fire-Resistant Roof Deck Protection ([ESR-2053](#))," Elk "VersaShield FB-1S or FB-2S, or Atlas FR 10 or FR 50."

### 3.8 Flashing:

Flashing must be provided in accordance with IBC Section 1503.2 or IRC Section R903.2, as applicable. Where flashing is of metal, the metal must be corrosion-resistant, minimum No. 26 gage [0.019 inch (0.483 mm)] galvanized steel.

### 3.9 Fasteners:

Fasteners, used to mechanically attach insulation and membranes to the roof deck, must be corrosion-resistant, and must be Carlisle fasteners, plates or fastening bars, unless otherwise noted in this report. Refer to Table 4 for spacing of fasteners.

**3.9.1 HP Fastener:** This is an epoxy-coated steel screw used in combination with Carlisle's fastening plates or bars to mechanically attach roofing insulation and membranes to steel or wood substrate. Fastener length must be selected to penetrate through the steel deck a minimum of 3/4 inch (19.1 mm), and into the wood deck a minimum of 1 inch (25.4 mm).

**3.9.2 InsulFast Insulation Fastener:** This is an epoxy-coated steel screw used in combination with Carlisle's insulation plates to mechanically attach roofing insulation to steel or wood substrates. Fastener length must be selected to penetrate through the steel deck a minimum of 3/4 inch (19.1 mm), or into the wood deck a minimum of 1 inch (25.4 mm).

**3.9.3 HP Purlin Fastener:** This is an epoxy-coated steel screw used in combination with Carlisle's fastening plates or bars to mechanically attach roofing insulation and membranes to structural steel members. Fastener length must be selected to penetrate through the steel member a minimum of 3/4 inch (19.1 mm).

**3.9.4 HD 14-10 Fastener:** This is a heavy-duty, epoxy-coated steel screw used in combination with Carlisle's fastening plates or bars to mechanically attach roofing

insulation and membranes to concrete roof deck. Fastener length must be selected to penetrate into the concrete deck a minimum of 1 inch (25.4 mm).

**3.9.5 CD-10 Fastener:** The CD-10 is an epoxy-coated, hammer-driven, nonthreaded fastener specifically designed to be used with insulation and seam fastening plates to secure membrane and insulation to structural concrete. Fastener length must be selected to penetrate into the concrete deck a minimum of 1 inch (25.4 mm).

**3.9.6 Lite-Deck Fastener:** The Lite-Deck Fastener is used in conjunction with a specially designed 3-inch (76.2 mm) Lite-Deck Metal Plate for insulation attachment to gypsum, cementitious wood fiber (Tectum [\[ESR-1112\]](#)), and lightweight concrete decks. Fastener length must be selected to penetrate into the deck a minimum of 2 inches (50.8 mm).

**3.9.7 GypTec Fastener:** The GypTec Fastener is a glass-filled nylon auger fastener designed for securing mechanically attached membranes and insulation to gypsum and cementitious wood fiber (Tectum [\[ESR-1112\]](#)) decks. Fastener length must be selected to penetrate into the deck a minimum of 1.5 inches (38.1 mm).

**3.9.8 HP Polymer Seam Plate:** This is a 2-inch-diameter (50 mm) polymer plate designed to be used with HP and HD 14-10 fasteners to mechanically attach roofing membranes to the roof deck.

**3.9.9 Sure-Tite Fastener and ST Fastening Bar:** This is a heavy-duty, epoxy-coated steel screw and bar used to secure reinforced EPDM membranes to steel or wood deck. The bar is 1-inch-wide-by-0.040-inch-thick-by-10-foot-long (25.4 mm by 1.1 mm by 3.1 m) galvalume-coated steel with prepunched holes 6 inches (150 mm) on center.

**3.9.10 HP-X Fastener:** This is an epoxy-coated carbon steel screw used in combination with the Piranha Fastening Plate to mechanically attach TPO membranes to steel or wood substrate. Fastener length must be selected to penetrate through the steel deck a minimum of  $\frac{3}{4}$  inch (19.1 mm), and into the wood deck a minimum of 1 inch (25.4 mm).

**3.9.11 Piranha Fastening Plate:** This is a  $2\frac{3}{8}$ -inch-diameter galvalume-coated steel plate designed to be used with HP-X fasteners to mechanically attach PVC and TPO membranes to the roof deck.

**3.9.12 HP-XTRA Fastener:** This is an epoxy-coated carbon steel screw used in combination with the Piranha XTRA Fastening Plate to mechanically attach PVC and TPO membranes to steel or wood substrate. Fastener length must be selected to penetrate through the steel deck a minimum of  $\frac{3}{4}$  inch (19.1 mm) and into the wood deck a minimum of 1 inch (25.4 mm).

**3.9.13 Piranha XTRA Fastening Plate:** This is a  $2\frac{3}{8}$ -inch-diameter galvalume-coated steel plate designed to be used with HP-XTRA fasteners to mechanically attach PVC and TPO membranes to the roof deck.

**3.9.14 PVC Oval Barbed Plate:** This is a  $1\frac{1}{2}$ -inch-by- $2\frac{3}{4}$ -inch (35 mm by 69.85 mm) Oval Barbed Plate designed to be used with HP-X Fasteners to mechanically attach PVC membranes to the roof deck.

**3.9.15 OMG Inc. RhinoBond Plate:** The RhinoBond Plate is a 3-inch-diameter (76.2 mm), 0.028-inch-thick (0.7 mm) galvalume-coated steel plate, coated with a proprietary adhesive and used with the HP-X fastener to mechanically attach PVC and TPO membranes to the roof deck. The adhesive bonds the plate to the underside of the membrane.

### 3.10 Adhesives:

**3.10.1 90-8-30A Bonding Adhesive:** 90-8-30A Bonding Adhesive is a high-strength, solvent-based contact adhesive used to adhere EPDM membranes to the insulation or substrate. It has a coverage rate of approximately 60 square feet per gallon (1.5 m<sup>2</sup>/L). The adhesive is supplied in 5-gallon (18.9 L) containers and has a shelf life of one year.

**3.10.2 Aqua Base 120:** Aqua Base 120 is a high-strength, water-based contact adhesive used to adhere EPDM, TPO and PVC membranes to the insulation or substrate. It has a coverage rate of approximately 120 square feet per gallon (3 m<sup>2</sup>/L). The adhesive is supplied in 5-gallon (18.9 L) containers and has a shelf life of one year.

**3.10.3 Sure-Flex Low-VOC PVC Bonding Adhesives:** Sure-Flex Low VOC PVC Bonding Adhesives is high-strength, solvent-based contact adhesives used to adhere PVC membranes to an insulation or substrate. They have a coverage rate of approximately 60 square feet per gallon (1.5 m<sup>2</sup>/L). The adhesive is supplied in 5-gallon (18.9 L) containers with a shelf life of one year.

**3.10.4 Sure-Weld Bonding Adhesive:** Sure-Weld Bonding Adhesive is a high-strength, solvent-based contact adhesive used to adhere TPO membranes to an insulation or substrate. It has a coverage rate of approximately 60 square feet per gallon (1.5 m<sup>2</sup>/L). The adhesive is supplied in 5-gallon (18.9 L) containers with a shelf life of one year.

**3.10.5 Low VOC Bonding Adhesive:** Low VOC Bonding Adhesive is a high-strength, solvent-based contact adhesive used to adhere EPDM and TPO membranes to an insulation or substrate. It has a coverage rate of approximately 60 square feet per gallon (1.5 m<sup>2</sup>/L). The adhesive is supplied in 5-gallon (18.9 L) containers with a shelf life of one year.

**3.10.6 HydroBond PVC Water-Based Adhesive:** HydroBond PVC Water-Based Adhesive is a water-based, wet lay-in, one-sided adhesive to be used to adhere Sure-Flex PVC and PVC FleeceBACK membranes to an insulation or substrate. It has a coverage rate of 100 square feet per gallon (2.5 m<sup>2</sup>/L). The adhesive is supplied in 5-gallon (18.9 L) containers with a shelf life of one year.

**3.10.7 Low VOC Bonding Adhesive 1168:** Low VOC Bonding Adhesive 1168 is high-strength, solvent-based contact adhesive used to adhere EPDM and TPO membranes to an insulation or substrate. It has a coverage rate of approximately 60 square feet per gallon (1.58 m<sup>2</sup>/L). The adhesive is supplied in 5-gallon (18.9 L) containers with a shelf life of one year.

**3.10.8 Solvent-Free EPDM Bonding Adhesive:** Solvent-Free EPDM Bonding Adhesive is a high-strength, polymer-based adhesive. This adhesive can be used to adhere all Sure-Seal or Sure-White EPDM membranes as a one-sided, wet lay-in adhesive. It has a coverage rate of 100 square feet per gallon (2.5 m<sup>2</sup>/L). The adhesive is supplied in 5-gallon (18.9 L) containers with a shelf life of six months.

**3.10.9 Cold Applied Adhesive:** Cold Applied Adhesive is a solvent-free, asphalt-modified polyether adhesive. This adhesive can be used with all Sure-Seal or Sure-Weld AFX membranes as a one-sided, wet lay-in adhesive. It has a coverage rate of 67 square feet per gallon (1.6 m<sup>2</sup>/L). The adhesive is supplied in 5-gallon (18.9 L) containers with a shelf life of one year.



**3.10.10 FAST Adhesives:** FAST 100, FAST 100LV, FAST Adhesive Dual Cartridge, FAST Adhesive Box Sets, Flexible FAST and FAST Bag-in-a-Box Adhesives are two-component polyurethane adhesives used to adhere FleeceBACK membranes and insulations to various substrates. The adhesives have a coverage rate of approximately 100 square feet per gallon (2.5 m<sup>2</sup>/L). The adhesives are supplied in 15-gallon (56.7 L) and 50-gallon (189 L) drums, box sets, and cartridge tubes and cylinders, and have a shelf life of one year.

**3.10.11 OlyBond 500 Adhesive:** OlyBond 500 Spot Shot and OlyBond 500 BA are two-component polyurethane adhesives used to adhere insulations to various substrates. The adhesives have a coverage rate of approximately 100 square feet per gallon (2.5 m<sup>2</sup>/L). The adhesives are supplied in cartridge tubes and box sets, and have a shelf life of one year.

### 3.11 Impact Resistance:

The EPDM, PVC, and TPO roofing membranes described in this report meet requirements for impact resistance in IBC Section 1504.7, based on testing in accordance with FM 4470.

## 4.0 INSTALLATION

### 4.1 General:

Installation of the EPDM, PVC, and TPO roofing membranes described in this report must comply with the applicable code, the manufacturer's published installation instructions and this report. The manufacturer's published installation instructions must be available at all times on the jobsite during installation.

The substrate to which the membrane is to be applied must be clean, dry, and free of frost, loose fasteners, and other protrusions or contaminants that will interfere with the adhesion or attachment of the membrane or that will puncture the membrane. All materials must be protected against contact with incompatible materials. Where gypsum board is used as barrier board in the roofing assembly, weather protection must be provided to prevent damage to the gypsum board prior to application of the roofing membrane.

The slope of the roof on which the single-ply membranes are installed must not be more than the maximum slope indicated for the particular assembly as listed in Tables 2 and 3.

Penetrations and terminations of the roof covering must be flashed and made weather tight in accordance with the requirements of the membrane manufacturer and the applicable code.

### 4.2 Fire Classification:

**4.2.1 New Construction:** The adhered and mechanically fastened EPDM, PVC, and TPO single-ply membrane roofing systems, when installed in accordance with this report, are Class A, B or C roof covering systems in accordance with ASTM E108 or UL 790, as noted in Tables 2 and 3.

**4.2.2 Reroofing:** The existing deck must be inspected to verify that the structure to be reroofed is structurally sound and adequate to support and secure the roofing membrane. Prior to installation of new roof coverings, inspection by and written approval from the code official having jurisdiction must be required.

Class A, B or C roof covering systems may be installed over existing classified roof covering systems under the following conditions without additional roof classification

tests, provided the resulting classification is the lower of the new or existing roofing classification:

- New uninsulated systems installed only over existing uninsulated assemblies.
- New insulated systems installed over existing uninsulated systems only.

### 4.3 Wind Resistance:

**4.3.1 New Construction:** The allowable wind uplift pressures for the EPDM, PVC, and TPO roofing membranes as parts of roof assemblies are noted in Tables 4 and 5.

Metal edge securement systems must be listed in accordance with ANSI/SPRI ES-1 and designed and installed for wind loads in accordance with IBC Section 1504.5 and IBC Chapter 16. As an alternate to listed metal edge securement systems for mechanically attached membranes, Carlisle SecurEdge 300 [0.050-inch (1.27 mm) 3003 aluminum] and Carlisle SecurEdge 3000 [0.040-inch (1.02 mm) 3003 aluminum] fascia systems may be used. The maximum allowable load for Carlisle SecurEdge 300 is 234 plf (348 kg/m) and the maximum allowable load for Carlisle SecurEdge 3000 is 200 plf (298 kg/m) based on testing in accordance with ANSI/SPRI ES-1 Test RE-1.

**4.3.2 Reroofing:** Mechanically anchored systems may be accepted based on the adequacy of anchors penetrating through existing roof coverings into structural substrates. Since the composition and/or condition of any particular existing underlying material may vary widely, reroofing with adhered systems is outside the scope of this report.

## 5.0 CONDITIONS OF USE

The single-ply EPDM, PVC, and TPO roofing membranes described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Installation must comply with the applicable code, the manufacturer's published installation instructions and this report. The instructions within this report must govern if there are any conflicts between the manufacturer's installation instructions and this report.
- 5.2** The adhered and mechanically fastened single-ply membrane roofing systems must be installed by professional roofing contractors who are trained and approved by the manufacturer.
- 5.3** Foam plastic insulation must be separated from the interior of the building by an approved thermal barrier in accordance with IBC Section 2603.4.1.5 or IRC Section R316.4, as applicable.
- 5.4** Foam plastic insulation, where used, must bear the label of an approved agency indicating that the foam plastic has a flame-spread index of not more than 75 when tested at the maximum thickness intended for use in accordance with ASTM E84 or UL 723, subject to the approval of the code official.
- 5.5** Design wind uplift pressure on any roof area, including edge and corner zones, must not exceed the allowable wind uplift pressure for the system installed in that particular area. Refer to allowable wind uplift pressures for systems as listed in Table 4.
- 5.6** The allowable wind uplift pressures listed in Table 4 are for the roof covering system only. The deck and framing to which the system is attached must be designed for the applicable components and cladding wind loads in accordance with the applicable code.

- 5.7 When application is over existing roofs, documentation of the wind-uplift resistance of the composite roof construction must be submitted to the code official for approval at the time of permit application.
- 5.8 The roofing membranes are manufactured at Carlisle, Pennsylvania; Greenville, Illinois; Tooele, Utah; and Senatobia, Mississippi, under a quality control program with inspections by ICC-ES.
- 5.9 For buildings under the IBC, above-deck thermal insulation board must comply with the applicable standards listed in IBC Table 1508.2 or IRC Table R906.2, as applicable.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with ICC-ES Acceptance Criteria for Membrane Roof Covering Systems (AC75), dated July 2010 (editorially revised April 2014).

## 7.0 IDENTIFICATION

Each roll of the roofing membrane must bear a label noting the product name, the manufacturer's name (Carlisle SynTec) or the name of the additional listee, the manufacturer's address or plant code and the ICC-ES evaluation report number (ESR-1463).

## \* 8.0 OTHER CODES

~~In addition to the codes referenced in Section 1.0, the products in this report were evaluated for compliance with the requirements of the following codes:~~

- ~~■ BOCA® National Building Code/1999 (BNBC)~~
- ~~■ 1999 Standard Building Code® (SBC)~~
- ~~■ 1997 Uniform Building Code™ (UBC)~~

~~For compliance under the above codes, see Sections 2 through 7 of this report, except revise the following sections to read as follows:~~

## ~~3.8 Flashing:~~

~~Flashing must be provided in accordance with SBC Section 1503.2, BNBC Section 1508.1 and UBC Section 1509, as applicable. Where flashing is of metal, the metal must be corrosion resistant, minimum No. 26 gage [0.019 inch (0.483 mm)] galvanized steel.~~

## ~~3.11 Impact Resistance:~~

~~The EPDM, PVC, and TPO roofing membranes described in this report meet requirements for impact resistance in BNBC Section 1505.4.2, and SBC Section 1504.6, based on testing in accordance with FM 4470.~~

~~4.3.1 New Construction: The allowable wind uplift pressures for the EPDM, PVC, and TPO roofing membranes as parts of roof assemblies are noted in Tables 4 and 5.~~

## ~~5.0 CONDITIONS OF USE~~

~~The single-ply EPDM, PVC, and TPO roofing membranes described in this report comply with, or are suitable alternatives to what is specified in, these codes listed in Section 8.0 of this report, subject to the following conditions:~~

~~See Sections 5.1 through 5.8, except revise Section 5.3 to read as follows:~~

~~5.3 Foam plastic insulation must be separated from the interior of the building by an approved thermal barrier in accordance with BNBC Section 2603.4.1.5, SBC Section 2603.5.1.5, and UBC Sections 2602.4 and 2602.5.3, as applicable.~~

TABLE 1—PRODUCT NAMES

| CARLISLE PRODUCT NAME                  | KELLY CO./ 2001 INC. PRODUCT NAME      | MULE-HIDE PRODUCT NAME                 | VERSICO PRODUCT NAME                   | WEATHERBOND PRODUCT NAME                          |
|--|--|--|--|---|
| Sure-Seal                              | PREMIUM, C-EPDM-C STANDARD             | Mule-Hide Standard EPDM                | Versigard Non-reinforced EPDM Membrane | WeatherBond RBR EPDM Non-reinforced Membrane      |
| Sure-Seal FR                           | C-EPDM-C                               | Mule-Hide FR EPDM                      | VersiGard FR Nonreinforced EPDM        | WeatherBond RBR FR EPDM Non-reinforced Membrane   |
| Sure-Seal FleeceBACK                   | PREMIUM                                | -                                      | VersiFleece EPDM Membrane              | -   |
| Sure-Seal AFX                          | -                                      | -                                      | VersiFleece AC EPDM Membrane           | -   |
| Sure-Tough Reinforced                  | PREMIUM, C-EPDM-C, STANDARD, C-EPDM-CR | Mule-Hide Standard Reinforced EPDM     | Versigard Reinforced EPDM Membrane     | WeatherBond RBR Standard Reinforced EPDM Membrane |
| Sure-Tough FR Reinforced               | C-EPDM-CR Type 1                       | Mule-Hide FR Reinforced EPDM           | VersigardFR Reinforced                 | WeatherBond RBR FR Reinforced EPDM Membrane       |
| Sure-White                             | PREMIUM, EPDM RF - White               | Mule-Hide White-on-Black EPDM          | Versigard Nonreinforced EPDM -White    | WeatherBond RBR White EPDM Membrane               |
| Sure-White FleeceBACK                  | -                                      | -                                      | -                                      | -   |
| Sure-Weld                              | Reinforced TPO / White TPO             | Mule-Hide TPO-c                        | Versiweld Reinforced TPO Membrane      | WeatherBond PRO TPO Membrane                      |
| Sure-Weld HS                           | -                                      | Mule-Hide TPO-c (FR)                   | Versiweld ES                           | -   |
| SAT-TPO                                | -                                      | Mule-Hide SA-TPO                       | Versiweld QA TPO                       | WeatherBond PRO PAS TPO                           |
|  |  |  |  |   |
| Sure-Weld FleeceBACK                   | -                                      | Mule-Hide TPO-c Fleece Back            | VersiFleece TPO Membrane               | -   |
| Sure-Weld AFX                          | -                                      | Mule-Hide TPO-C Fleece Back Plus       | VersiFleece AC TPO Membrane            | -   |
| Spectro-Weld                           | -                                      | -                                      | -                                      | -   |
| Spectro-Weld FleeceBack                | -                                      | -                                      | -                                      | -   |
| Sure-Flex                              | -                                      | Mule-Hide PVC Membrane                 | VersiFlex Reinforced PVC Membrane      | WeatherBond PRO PVC                               |
| Sure-Flex KEE                          | -                                      | -                                      | VersiFlex-E PVC Membrane               | -   |
| Sure-Flex FRS                          | -                                      | Mule-Hide FRS PVC Membrane             | VersiFlex FRS Reinforced PVC Membrane  | -   |
| Sure-Flex FleeceBack                   | -                                      | -                                      | VersiFleece PVC Membrane               | -   |
| 90-8-30A Bonding Adhesive              | 2001 Inc. Bonding Adhesive             | Mule-Hide Bonding Adhesive             | G200SA Yellow Substrate Adhesive       | WeatherBond RBR LC-60 Bonding Adhesive            |
| Solvent-Free EPDM Bonding Adhesive     | -                                      | -                                      | Solvent-Free EPDM Bonding Adhesive     | Solvent-Free EPDM Bonding Adhesive                |
| Aqua Base 120 Bonding Adhesive         | -                                      | Mule-Hide WBBA-2000 Bonding Adhesive   | Aqua Base 120 Bonding Adhesive         | Aqua Base 120 Bonding Adhesive                    |
| Sure-Weld Bonding Adhesive             | -                                      | Mule-Hide TPO-c Bonding Adhesive       | Versiweld Bonding Adhesive             | WeatherBond PRO TPO Bonding Adhesive              |
| Low VOC Bonding Adhesive               | -                                      | Mule-Hide Low VOC Bonding Adhesive     | LOW VOC Bonding Adhesive               | LOW VOC Bonding Adhesive                          |
| Low VOC Bonding Adhesive 1168          |  | -                                      | Low VOC Bonding Adhesive 1168          | Low VOC Bonding Adhesive 1168                     |
|  |  |  |  |   |
| Sure-Flex Low VOC PVC Bonding Adhesive | -                                      | Mule-Hide Low VOC PVC Bonding Adhesive | VersiFlex Low VOC PVC Bonding Adhesive | WeatherBond Low VOC PVC Bonding Adhesive          |
| HydroBond PVC Water-Based Adhesive     | -                                      | -                                      | HydroBond PVC Water-Based Adhesive     | HydroBond PVC Water-Based Adhesive                |
| Cold Applied Adhesive                  | -                                      | -                                      | Cold Applied Adhesive                  | -   |
| FAST 100 Adhesive                      | -                                      | Mule-Hide SP-100 Adhesive              | FAST 100 Adhesive                      | -   |
| FAST 100 LV Adhesive                   | -                                      | Mule-Hide SP-100-LT Adhesive           | FAST 100 LV Adhesive                   | -   |
| OlyBond 500 Adhesive                   | -                                      | -                                      | OlyBond 500 Adhesive                   | OlyBond 500 Adhesive                              |

TABLE 2—FIRE CLASSIFICATION ASSEMBLIES—ADHERED ROOFING SYSTEMS<sup>2,5</sup>

| SYSTEM NO. | ROOF CLASS | DECK   | BARRIER BOARD OR SLIP SHEET   | INSULATION <sup>1</sup>   | MEMBRANE/MAX. ROOF SLOPE  |
|------------|------------|--|---|---|---|
| 1          | A          | Noncombustible   | —   | Any of the following insulations, 1-inch min. to 6-inch max. thickness: Carlisle “SecurShield Polyiso”, “Polyiso HP-H”, Hunter Panels “H-Shield” or “H-Shield-CG”   | Sure-Weld, Spectro-Weld - <sup>1</sup> / <sub>4</sub> :12<br>Sure-Seal, Sure-Tough, Sure-White, Sure-Seal FleeceBACK, Sure-Weld HS, SAT-TPO, Sure-Weld FleeceBACK, Spectro-Weld FleeceBACK - <sup>1</sup> / <sub>2</sub> :12<br>Sure-White FleeceBACK, Sure-Flex, Sure-Flex FRS - <sup>3</sup> / <sub>4</sub> :12     |
| 2          | A          | Noncombustible   | —   | <sup>1</sup> / <sub>2</sub> -inch-thick fiberboard <sup>4</sup> , <sup>1</sup> / <sub>2</sub> -inch-thick fiberboard <sup>4</sup> or barrier board (see Section 3.6) over 5-inch max Insulfoam EPS <sup>3</sup> , <sup>1</sup> / <sub>2</sub> -inch-thick fiberboard or barrier board (see Section 3.6) over System No. 1 insulations | Sure-White FleeceBACK- <sup>3</sup> / <sub>4</sub> :12<br>Sure-Seal, Sure-Tough - 1:12<br>Sure-White, Sure-Seal FleeceBACK, Sure-Weld, Spectro-Weld, Sure-Weld HS, SAT-TPO, Sure-Weld FleeceBACK, Spectro-Weld FleeceBACK, Sure-Flex, Sure-Flex FRS - <sup>1</sup> / <sub>2</sub> :12                                 |
| 3          | A          | Noncombustible or Combustible - min. <sup>15</sup> / <sub>32</sub> -inch-thick plywood or min. <sup>7</sup> / <sub>16</sub> -inch-thick OSB. | Barrier board (see Section 3.6)   | —   | Sure-White FleeceBACK- <sup>3</sup> / <sub>4</sub> :12<br>Sure-White, Sure-Seal FleeceBACK - <sup>1</sup> / <sub>2</sub> :12<br>Sure-Tough, Sure-Weld, Spectro-Weld, Sure-Weld FleeceBACK, Spectro-Weld FleeceBACK - 3:12<br>Sure-Weld HS, SAT-TPO - 4:12<br>Sure-Seal FR, Sure-Flex, Sure-Flex FRS – unlimited slope |
| 4          | A          | Combustible - min. <sup>15</sup> / <sub>32</sub> -inch-thick plywood or min. <sup>7</sup> / <sub>16</sub> -inch-thick OSB.                   | Barrier board (see Section 3.6) or Slip sheet: 2 layers (see Section 3.7) | Any of the following insulations, 1-inch min. to 6-inch max. thickness: Carlisle “SecurShield Polyiso”, Polyiso HP-H”, Hunter Panels “H-Shield” or “H-Shield-CG”  | Sure-Weld, Spectro-Weld - <sup>1</sup> / <sub>4</sub> :12<br>Sure-Seal, Sure-Tough, Sure-White, Sure-Seal FleeceBACK, Sure-Weld HS, SAT-TPO, Sure-Weld FleeceBACK, Spectro-Weld FleeceBACK - <sup>1</sup> / <sub>2</sub> :12<br>Sure-White FleeceBACK, Sure-Flex, Sure-Flex FRS - <sup>3</sup> / <sub>4</sub> :12     |
| 5          | C          | Combustible - min. <sup>15</sup> / <sub>32</sub> -inch-thick plywood or min. <sup>7</sup> / <sub>16</sub> -inch-thick OSB.                   | —   | Any of the following insulations, 2-inch min. to 6-inch max. thickness: Carlisle “Polyiso HP-H” or Hunter Panels “H-Shield”   | Sure-Weld, Spectro-Weld, Sure-Weld HS, SAT-TPO, Sure-Flex, Sure-Flex FRS – unlimited slope  |
| 6          | A          | Combustible  | —   | Single layer of minimum 3.0" or double layer of minimum 1.5" Carlisle “SecurShield Polyiso” or Hunter Panels “H-Shield-CG”  | EPDM, PVC, and TPO Membranes - <sup>1</sup> / <sub>2</sub> :12  |
| 7          | B          | Combustible  | —   | Single layer of minimum 1.9" Carlisle “SecurShield Polyiso” or Hunter Panels “H-Shield-CG”  | EPDM, PVC, and TPO Membranes - <sup>1</sup> / <sub>2</sub> :12  |

For SI: 1 inch = 25.4 mm.

<sup>1</sup> All foam plastic insulation must be UL-classified foamed plastic for roofing systems, and must be limited to the maximum thickness in accordance with Section 5.4 of this report or the maximum thickness in accordance with this table, whichever is less.

<sup>2</sup> See Section 3.10 for adhesive application rate.

<sup>3</sup> UL Classified EPS may be installed below min. 1-inch-thick Carlisle or Hunter Panels polyisocyanurate insulations (max slope 1:12) or below min. <sup>1</sup>/<sub>2</sub>-inch-thick Carlisle SecurShield HD or Hunter Panels H-Shield HD (max slope 2:12) on noncombustible decks.

<sup>4</sup> Carlisle SecurShield HD or Hunter Panels H-Shield HD may replace fiberboard and may be used as a coverboard over any insulation. When these two boards are used directly below the Sure-Weld membrane, the slope is limited to max. <sup>1</sup>/<sub>2</sub>:12.

<sup>5</sup> When these systems are used for reroofing or recovering, installation must be in accordance with Sections 4.2.2 and 5.7 of this report, and

\* IBC Section 1510, IRC Section R907, ~~IBC Section 1512, SBC Section 1510 or UBC Appendix to Chapter 15,~~ as applicable.

TABLE 3—FIRE CLASSIFICATION ASSEMBLIES—MECHANICALLY FASTENED ROOFING SYSTEMS<sup>4</sup>

| SYSTEM NO. | ROOF CLASS | DECK   | BARRIER BOARD OR SLIP SHEET  | INSULATION <sup>1</sup>  | MEMBRANE/MAX. ROOF SLOPE   |
|------------|------------|--|--|--|--|
| 1          | A          | Noncombustible   | —  | Any of the following insulations, 1-inch min. to 6-inch max. thickness: Carlisle “SecurShield Polyiso” or “Polyiso HP-H”, Hunter Panels “H-Shield” or “H-Shield-CG”  | Sure-Tough, Sure-Weld, Spectro-Weld, Sure-Flex, Sure-Flex FRS - 1/2:12<br>Sure-Weld HS - 1 1/2:12<br>Sure-Tough FR - 2:12    |
| 2          | A          | Noncombustible   | —  | 1/2-inch-thick fiberboard <sup>3</sup> , 1/2-inch-thick fiberboard <sup>4</sup> or barrier board (see Section 3.6) over 5-inch max Insulfoam EPS <sup>2</sup> , 1/2-inch-thick fiberboard or barrier board (see Section 3.6) over System No. 1 insulations | Sure-Tough, Sure-Weld HS, Sure-Flex, Sure-Flex FRS - 1:12<br>Sure-Weld, Spectro-Weld - 1 1/2:12<br>Sure-Tough FR - 3 1/2:12  |
| 3          | A          | Noncombustible   | —  | To 5-inch max: Insulfoam SP  | Sure-Weld, Spectro-Weld, Sure-Weld HS, Sure-Flex, Sure-Flex FRS - 1/2:12   |
| 4          | A          | Noncombustible or Combustible - min. 15/32-inch-thick plywood or min. 7/16-inch-thick OSB. | Barrier board (see Section 3.6)  | —  | Sure-Tough, Sure-Weld, Spectro-Weld - 3:12<br>Sure-Tough FR - 3 1/2:12<br>Sure-Weld HS, Sure-Flex, Sure-Flex FRS - unlimited |
| 5          | A          | Combustible - min. 15/32-inch-thick plywood or min. 7/16-inch-thick OSB.                   | Barrier board (see Section 3.6) or Slip sheet: 2 layers, (see Section 3.7) | Any of the following insulations, 1-inch min. to 6-inch max. thickness: Carlisle “SecurShield Polyiso” or “Polyiso HP-H”, Hunter Panels “H-Shield” or “H-Shield-CG”  | Sure-Tough, Sure-Weld, Spectro-Weld, Sure-Flex, Sure-Flex FRS - 1/2:12<br>Sure-Weld HS, 1 1/2:12<br>Sure-Tough FR - 2:12     |
| 6          | A          | Combustible - min. 15/32-inch-thick plywood or min. 7/16-inch-thick OSB                    | Slip sheet, 2 layers (see Section 3.7)                                     | —  | Sure-Tough - 1:12<br>Sure-Tough FR, Sure Weld, Spectro-Weld, Sure-Weld HS, Sure-Flex, Sure-Flex FRS - 1 1/2:12               |
| 7          | B          | Combustible - min. 15/32-inch-thick plywood or min. 7/16-inch-thick OSB.                   | Slip sheet, 1 layer (see Section 3.7)                                      | —  | Sure-Tough, Sure-Tough FR, Sure-Weld, Spectro-Weld, Sure-Weld HS, Sure-Flex, Sure-Flex FRS - 1 1/2:12                        |
| 8          | C          | Combustible - min. 15/32-inch-thick plywood or min. 7/16-inch-thick OSB.                   | —  | Any of the following insulations, 2-inch min. to 6-inch max. thickness: Carlisle “SecurShield Polyiso” or “Polyiso HP-H”, Hunter Panels “H-Shield” or H-Shield CG”   | Sure-Weld, Spectro-Weld, Sure-Weld HS, Sure-Flex, Sure-Flex FRS - unlimited  |
| 9          | A          | Combustible  | —  | Single layer of minimum 3-inch or double layer of minimum 1.5-inch Carlisle “SecurShield Polyiso” or Hunter Panels “H-Shield-CG”   | EPDM, PVC, and TPO Membranes - 1/2:12  |
| 10         | B          | Combustible  | —  | Single layer of minimum 1.9-inch Carlisle “SecurShield Polyiso” or Hunter Panels “H-Shield-CG” or single layer of an inverted G3 cap sheet.  | EPDM, PVC, and TPO Membranes - 1/2:12  |

For SI: 1 inch = 25.4 mm.

<sup>1</sup>All foam plastic insulation must be UL-classified foamed plastic for roofing systems, and must be limited to the maximum thickness in accordance with Section 5.4 of this report or the maximum thickness in accordance with this table, whichever is less.

<sup>2</sup>UL Classified EPS may be installed below min. 1-inch-thick Carlisle or Hunter Panels polyisocyanurate insulations (max slope 1:12) or below min. 1/2-inch-thick Carlisle SecurShield HD or Hunter Panels H-Shield HD (max slope 2:12) on noncombustible decks.

<sup>3</sup>Carlisle SecurShield HD or Hunter Panels H-Shield HD may replace fiberboard and may be used as a coverboard over any insulation. When these two boards are used directly below the Sure-Weld membrane, the slope is limited to 1/2:12.

<sup>4</sup>When these systems are used for reroofing or recovering, installation must be in accordance with Sections 4.2.2 and 5.7 of this report, and

\* IBC Section 1510, IRC Section R907, ~~BNBC Section 1512, SBC Section 1510 or UBC Appendix to Chapter 15,~~ as applicable.



TABLE 4—WIND RESISTANCE—MECHANICALLY FASTENED ASSEMBLIES<sup>4,7</sup>

| SYSTEM NO. | MAXIMUM ALLOWABLE WIND UPLIFT (psf) | DECK <sup>3</sup> | INSULATION <sup>5</sup>  | MEMBRANE                  | MEMBRANE FASTENING  | MAXIMUM FASTENER SPACING (inches) | MAXIMUM FASTENER ROW SPACING <sup>8</sup> |
|------------|-------------------------------------|-------------------|--|---------------------------|---|-----------------------------------|---|
| 1          | 45                                  | Noncombustible    | Foam plastic insulation <sup>1,2</sup> , 1/2-inch-thick fiberboard <sup>6</sup> or barrier board (See Sect. 3.6) | Sure-Tough                | HP-X Fastener & Metal Fastening Bar                           | 12                                | 6 ft 6 inches                             |
| 2          | 75                                  | Noncombustible    | Same as System No. 1   | Sure-Tough                | HP-X Fastener & Metal Fastening Bar                           | 6                                 | 6 ft 6 inches                             |
| 3          | 52                                  | Noncombustible    | Same as System No. 1   | Sure-Tough                | HP Fastener & Polymer Seam Plate                              | 6                                 | 9 ft 6 inches                             |
| 4          | 45                                  | Noncombustible    | Same as System No. 1   | Sure-Tough                | Sure-Tite Fastener & ST Fastening Bar                         | 12                                | 9 ft 6 inches                             |
| 5          | 30                                  | Noncombustible    | Same as System No. 1   | Sure-Tough (75 mil)       | HP Fastener & Polymer Seam Plate                              | 12                                | 9 ft 6 inches                             |
| 6          | 60                                  | Noncombustible    | Same as System No. 1   | Sure-Tough (75 mil)       | HP Fastener & Polymer Seam Plate                              | 6                                 | 9 ft 6 inches                             |
| 7          | 45                                  | Noncombustible    | Same as System No. 1   | Sure-Weld or Spectro-Weld | HP-X or HP-Xtra Fasteners with Piranha or Piranha Xtra Plates | 12                                | 7 ft 6 inches                             |
| 8          | 45                                  | Noncombustible    | Same as System No. 1   | Sure-Weld or Spectro-Weld | HP-Xtra Fasteners with Piranha Xtra Plates                    | 12                                | 9 ft 6 inches                             |
| 9          | 60                                  | Noncombustible    | Same as System No. 1   | Sure-Weld or Spectro-Weld | HP-X or HP-Xtra Fasteners with Piranha or Piranha Xtra Plates | 6                                 | 9 ft 6 inches                             |
| 10         | 67                                  | Noncombustible    | Same as System No. 1   | Sure-Weld or Spectro-Weld | HP-X or HP-Xtra Fasteners with Piranha or Piranha Xtra Plates | 6                                 | 7 ft 6 inches                             |
| 11         | 30                                  | Noncombustible    | Same as System No. 1   | Sure-Weld or Spectro-Weld | HP-X or HP-Xtra Fasteners with Piranha or Piranha Xtra Plates | 12                                | 11 ft 6 inches                            |
| 12         | 60                                  | Noncombustible    | Same as System No. 1   | Sure-Weld or Spectro-Weld | HP-X or HP-Xtra Fasteners with Piranha or Piranha Xtra Plates | 6                                 | 11 ft 6 inches                            |
| 13         | 53                                  | Noncombustible    | Same as System No. 1   | Sure-Flex                 | HP-X Fasteners with Piranha Plates                            | 6                                 | 6 ft 4 inches                             |
| 14         | 83                                  | Noncombustible    | Same as System No. 1   | Sure-Flex                 | HP-X Fasteners with Piranha Plates                            | 6                                 | 2 ft 11 inches                            |
| 15         | 30                                  | Noncombustible    | Same as System No. 1   | Sure-Flex                 | HP-X or HP-Xtra Fasteners with Piranha or Piranha Xtra Plates | 18                                | 6 ft 4 inches                             |
| 16         | 45                                  | Noncombustible    | Same as System No. 1   | Sure-Flex                 | HP-X or HP-Xtra Fasteners with Piranha or Piranha Xtra Plates | 12                                | 6 ft 4 inches                             |
| 17         | 53                                  | Noncombustible    | Same as System No. 1   | Sure-Flex                 | HP-X Fasteners with Piranha Plates                            | 12                                | 2 ft 11 inches                            |
| 18         | 45                                  | Noncombustible    | Same as System No. 1   | Sure-Weld                 | HP-X Fasteners with OMG RhinoBond Plates                      | 1 per 5.3 ft <sup>2</sup>         | N/A                                       |
| 19         | 60                                  | Noncombustible    | Same as System No. 1   | Sure-Weld                 | HP-X Fasteners with OMG RhinoBond Plates                      | 1 per 4 ft <sup>2</sup>           | N/A                                       |

For SI: 1 inch = 25.4 mm; 1 ft = 0.305 m; 1 psf = 47.88 Pa.

<sup>1</sup>Foam plastic insulation must be any of the following (1-inch min. to 6-inch max. thickness): Carlisle “SecurShield Polyiso”, “Polyiso HP-H” Hunter Panels “H-Shield” or Hunter Panels “H-Shield- CG”.

<sup>2</sup>All foam plastic insulation must be UL-classified foamed plastic for roofing systems, and must be limited to the maximum thickness in accordance with Section 5.4 of this report or the maximum thickness in accordance with this table, whichever is less.

<sup>3</sup>Steel deck must be minimum No. 22 gage galvanized steel [base-metal thickness 0.030 inch (0.76 mm)]. Concrete must have a minimum compressive strength ( $f'_c$ ) of 2500 psi. See Section 5.6 of this report.

<sup>4</sup>For existing metal roofing, the assemblies listed must be installed by fastening through the roofing and into structural members (purlins, angle iron, beams, etc.) capable of resisting all expected loads. The maximum allowable wind uplift (field) pressures are shown in Column 2.

<sup>5</sup>UL Classified EPS may be installed below min. 1-inch-thick Carlisle or Hunter Panels polyisocyanurate insulations (max slope 1:12) or below min. 1/2-inch-thick Carlisle SecurShield HD or Hunter Panels H-Shield HD (max slope 2:12) on noncombustible decks.

<sup>6</sup>Carlisle SecurShield HD or Hunter Panels H-Shield HD may replace fiberboard and may be used as a coverboard over any insulation. When these two boards are used directly below the Sure-Weld membrane, the slope is limited to 1/2:12.

<sup>7</sup>When these systems are used for reroofing or recovering, installation must be in accordance with Sections 4.2.2 and 5.7 of this report, and IBC Section 1510, IRC Section R907, ~~BNBC Section 1512, SBC Section 1510 or UBC Appendix to Chapter 15~~, as applicable.

<sup>8</sup>Fastener row spaces shown are for field of roof only. See Section 4.3 for recognized fascia systems for mechanically fastened roof assemblies. The maximum allowable load for Carlisle SecurEdge 300 is 234 plf (348 kg/m). The maximum allowable load for Carlisle SecurEdge 3000 is 200 plf (298 kg/m). Distance between the edge of the roof and the first row of fasteners must be determined accordingly.

TABLE 5—WIND RESISTANCE—ADHERED ASSEMBLIES<sup>5</sup>

| SYSTEM NO. | ALLOWABLE WIND UPLIFT (FIELD) (psf) | DECK <sup>2</sup>             | INSULATION / MIN. THICKNESS <sup>1,3</sup>  | INSULATION FASTENING RATE | MEMBRANE TYPE   |
|------------|-------------------------------------|-------------------------------|---|---------------------------|---|
| 1          | 45                                  | Combustible or Noncombustible | 1/2 inch fiberboard <sup>4, 15</sup> , 1/32 inch OSB, or barrier board (See Section 3.6)  | 1 per 2 ft <sup>2</sup>   | EPDM, PVC and TPO Membranes                                   |
| 2          | 45                                  | Combustible or Noncombustible | Carlisle “Polyiso HP-H” or “SecurShield Polyiso”; Hunter Panels “H-Shield” or “H-Shield-CG” / 1.4 inch with 1/2-inch Securock coverboard (optional) | 1 per 3.2 ft <sup>2</sup> | EPDM, PVC and TPO Membranes                                   |
| 3          | 45                                  | Combustible or Noncombustible | Carlisle “Polyiso HP-H” or “SecurShield Polyiso”; Hunter Panels “H-Shield” or “H-Shield-CG” / 2.0 inch with 5/8-inch Securock coverboard (optional) | 1 per 4 ft <sup>2</sup>   | EPDM, PVC and TPO Membranes                                   |
| 4          | 68                                  | Combustible or Noncombustible | Carlisle “Polyiso HP-H” or “SecurShield Polyiso”; Hunter Panels “H-Shield” or “H-Shield-CG” / 1.0 inch  | FAST Adhesive             | FleeceBACK Membranes  |
| 5          | 75                                  | Combustible or Noncombustible | Carlisle “Polyiso HP-H” or “SecurShield Polyiso”; Hunter Panels “H-Shield” or “H-Shield-CG” / 2.0 inch with 1/2-inch Securock coverboard (optional) | 1 per 1.6 ft <sup>2</sup> | EPDM, PVC and TPO Membranes                                   |
| 6          | 120                                 | Combustible or Noncombustible | Carlisle “Polyiso HP-H” or “SecurShield Polyiso”; Hunter Panels “H-Shield” or “H-Shield-CG” / 2.0 inch  | 1 per 1 ft <sup>2</sup>   | TPO Membranes; EPDM membranes (with noncombustible deck only) |
| 7          | 128                                 | Combustible or Noncombustible | Carlisle “Polyiso HP-H” or “SecurShield Polyiso”; Hunter Panels “H-Shield” or “H-Shield-CG” / 2.0 inch with 1/2-inch Securock coverboard (optional) | 1 per 1 ft <sup>2</sup>   | EPDM and TPO Membranes  |
| 8          | 135                                 | Combustible or Noncombustible | Carlisle “Polyiso HP-H” or “SecurShield Polyiso”; Hunter Panels “H-Shield” or “H-Shield-CG” / 2.0 inch with 1/2-inch Securock coverboard (optional) | 1 per 1 ft <sup>2</sup>   | FleeceBACK Membranes  |
| 9          | 143                                 | Combustible or Noncombustible | 1/2 inch DensDeck Prime   | 1 per 1 ft <sup>2</sup>   | FleeceBACK Membranes  |

For SI: 1 inch = 25.4 mm; 1 ft = 0.305 m; 1 psf = 47.88 Pa

<sup>1</sup>All foam plastic insulation must be UL-classified foamed plastic for roofing systems, and must be limited to the maximum thickness in accordance with Section 5.4 of this report or the maximum thickness in accordance with this table, whichever is less.

<sup>2</sup>Steel deck must be minimum No. 22 gage galvanized steel [base-metal thickness 0.030 inch (0.76 mm)]. Concrete must have a minimum compressive strength (f<sub>c</sub>) of 2500 psi. See Section 5.6 of this report.

<sup>3</sup>UL Classified EPS may be installed below min. 1-inch-thick Carlisle or Hunter Panels polyisocyanurate insulations (max slope 1:12) or below min. 1/2-inch-thick Carlisle SecurShield HD or Hunter Panels H-Shield HD (max slope 2:12) on noncombustible decks.

<sup>4</sup>Carlisle SecurShield HD or Hunter Panels H-Shield HD may replace fiberboard and may be used as a coverboard over any insulation. When these two boards are used directly below the Sure-Weld membrane, the slope is limited to 1/2:12.

<sup>5</sup>When application is over existing roofs, documentation of the wind-uplift resistance of the composite roof construction must be submitted to the code official for approval at the time of permit application. For reroofing or recovering, installation must be in accordance with IBC Section 1510, IRC Section R907, ~~BNBC Section 1512, SBC Section 1510 or UBC Appendix to Chapter 15~~, as applicable.

\* Deleted by the City of Los Angeles