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# ICC-ES Report

## ESR-3422

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Reissued 09/2015  
This report is subject to renewal 09/2016.

**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**  
**SECTION: 07 41 13—METAL ROOF PANELS**

**REPORT HOLDER:**

**FIRESTONE BUILDING PRODUCTS COMPANY, LLC**

**250 WEST 96<sup>TH</sup> STREET  
INDIANAPOLIS, INDIANA 46240-1316**

**EVALUATION SUBJECT:**

**UNA-CLAD<sup>®</sup> STANDING SEAM METAL ROOF PANELS  
UC-3, UC-4, UC-6, UC-6 HD, AND UC-14**



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# ICC-ES Evaluation Report

**ESR-3422**

Reissued September 2015

This report is subject to renewal September 2016.

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**DIVISION: 07 00 00—THERMAL AND MOISTURE  
PROTECTION**
**Section: 07 41 13—Metal Roof Panels**
**REPORT HOLDER:**

**FIRESTONE BUILDING PRODUCTS COMPANY, LLC**  
 250 WEST 96<sup>TH</sup> STREET  
 INDIANAPOLIS, INDIANA 46240-1316  
 (800) 428-4442  
[www.firestonebpc.com](http://www.firestonebpc.com)

**EVALUATION SUBJECT:**
**UNA-CLAD® STANDING SEAM METAL ROOF PANELS  
UC-3, UC-4, UC-6, UC-6 HD, AND UC-14**
**1.0 EVALUATION SCOPE**
**Compliance with the following codes:**

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

**Properties evaluated:**

- Weather resistance
- Fire classification
- Wind uplift resistance

**2.0 USES**

UNA-CLAD® Standing Seam Metal Roof Panels are used as roof coverings and are recognized for use as Class A or Class B roof coverings when installed in accordance with this report.

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

UNA-CLAD® Standing Seam Metal Roof Panels are available in preformed standing seam profiles produced from steel, aluminum, and copper sheet. Materials used in panel fabrication conform to the following specifications:

Aluminum: ASTM B209; minimum 0.032 inch thick (0.81 mm);  $F_y$  = minimum 21 ksi.

Galvanized Steel: ASTM A653 G90; minimum 24 gauge [0.025 inch thick (0.64 mm)];  $F_y$  = minimum 50 ksi.

Galvalume® Steel: ASTM A792 AZ50; minimum 24 gauge [0.025 inch thick (0.64 mm)];  $F_y$  = minimum 50 ksi.

Copper: ASTM B370; minimum 16 oz./sq.ft. (0.0416 kg/m<sup>2</sup>);  $F_y$  = minimum 38 ksi.

The panel profiles are as follows:

- **UC-3:** Formed to 8-inch- to 20-inch-wide (203 mm to 508 mm) panels, with 1.0-inch- or 1.5-inch-high (25 mm or 38 mm) mechanically locking seams. See Figure 1.
- **UC-4:** Formed to 9.75-inch- to 17.75-inch-wide (248 mm to 451 mm) panels, with 1.5-inch-high (38 mm) snap-locking seams. See Figure 2.
- **UC-6:** Formed to 8-inch- to 24-inch-wide (203 mm to 610 mm) panels, with 1.5-inch- or 2.0-inch-high (38 mm or 51 mm) mechanically locking seams. See Figure 3.
- **UC-6 HD:** Formed to 12-inch- to 22-inch-wide (305 mm to 559 mm) panels, with 1.5-inch- or 2.0-inch-high (38 mm or 51 mm) mechanically locking seams. See Figure 4.
- **UC-14:** Formed to 8-inch- to 18-inch-wide (203 mm to 457 mm) panels, with 1.75-inch-high (44 mm) snap-locking seams. See Figure 5.

**3.2 Roof Deck:**

Solid or closely fitted decking must be minimum <sup>15</sup>/<sub>32</sub>-inch-thick (11.9 mm) plywood or lumber sheathing complying with IBC Section 2304.7.2 or IRC Section R803, or minimum No. 22 gauge [0.030 inch thick (0.76 mm)] steel complying with IBC Section 2210.1.1.2.

**3.3 Underlayment and Flashing:**

Underlayment must be in accordance with IBC Section 1507.4.5 or IRC Section R905.10.5, as applicable. Where specified in Table 1, the underlayment is GAF VersaShield® Fire-Resistant Roof Deck Protection ([ESR-2053](#)). Flashing must be in accordance with IBC Section 1503.2 or IRC Section R903.2, as applicable.

**3.4 Insulation:**

Foam plastic insulation, where used, must have a flame-spread index of not more than 75 in accordance with ASTM E84 or UL 723 when tested at the maximum thickness intended for use. Polyisocyanurate and polystyrene foam plastic insulation must comply with ASTM C1289 and ASTM C578, respectively. See Tables 1 and 2 for insulations used with specific roof systems.

**3.5 Panel Clips and Bearing Plates:**

Panel clips are fabricated as described below. Dimensional drawings are shown in Figure 6.

- **UC-3 Fixed Clip:** ASTM A653 G90, minimum 24 gauge [0.024 inch thick (0.61 mm)]; or 300 series stainless steel, minimum No. 26 gauge [0.018 inch thick (0.46 mm)].

- **UC-3 Expansion Clip:** 300 series stainless steel, minimum No. 28 gauge [0.016 inch thick (0.41 mm)].
- **UC-3 Super Clip:** ASTM A653 G90 or 300 series stainless steel; G90, minimum No. 22 gauge [0.031 inch thick (0.79 mm)] base with 24 gauge [0.025 (0.64 mm)] tab. Stainless steel, minimum No. 24 gauge [0.024 inch thick (0.61 mm)] base with 26 gauge [0.018 inch thick (0.46 mm)] tab.
- **UC-6 Fixed Clip:** ASTM A653 G90 steel, minimum No. 24 gauge [0.023 inch thick (0.58 mm)].
- **UC-6 Low-Float Clip:** ASTM A653 G90 or 300 series stainless steel; G90, minimum No. 16 gauge [0.058 inch thick (1.47 mm)] base with No. 22 gauge [0.031 inch thick (0.79 mm)] tab. Stainless steel, minimum No. 22 gauge [0.031 inch thick (0.79 mm)] tab.
- **UC-6 Super Clip:** ASTM A653 G90 or 300 series stainless steel; G90, minimum No. 22 gauge [0.031 inch thick (0.79 mm)] base with No. 24 gauge [0.025 inch (0.64 mm)] tab. Stainless steel, minimum No. 24 gauge [0.024 inch thick (0.61 mm)] base with 26 gauge [0.018 inch thick (0.46 mm)] tab.
- **UC-14 Clip:** ASTM A653 G90 or 300 series stainless steel, minimum No. 18 gauge [0.050 inch thick (1.27 mm)].
- **UC Bearing Plate:** ASTM A653 G90 or 300 series stainless steel; minimum No. 20 gauge [0.037 inch thick (0.94 mm)] and No. 22 gauge [0.032 inch thick (0.82 mm)], respectively.

### 3.6 Fasteners:

- Tru-Fast Corp T-17: No.10-12 by 1-inch self-drilling fasteners with a 0.435-inch-diameter (11 mm) pancake head. Available in galvanized and stainless steel.
- Firestone Drill Point Fasteners: #12-13 self-drilling fasteners with 0.435-inch-diameter (11 mm) pancake head. Firestone Drill Point Fasteners, as specified in the manufacturer's published installation instructions, are made from carbon steel and have a red epoxy coating.

## 4.0 DESIGN AND INSTALLATION:

### 4.1 General:

Installation of the UNA-CLAD<sup>®</sup> standing seam metal roof panels must be in accordance with this report, IBC Section 1507.4 or IRC Section R905.10, as applicable, and the manufacturer's published installation instructions. The manufacturer's installation instructions must be available on the jobsite at all times during installation.

The roof panels must be installed on solid or closely fitted decking or steel decking, as specified in Section 3.2, having a minimum roof slope of 3:12 (25 percent). Penetrations and terminations of the panels must be flashed and made weathertight in accordance with the manufacturer's published installation instructions and IBC Section 1503.2 or IRC Section R903.2, as applicable.

### 4.2 Fire Classification:

The steel, copper, and aluminum roof panels are components of roof assemblies classified as Class A or B roof assemblies in accordance with ASTM E108 or UL 790 when installed as specified in Table 1.

Under the 2012 IBC or 2012 IRC, copper and steel roof panels are considered Class A roof coverings, when installed, without insulation, as described in Section 4.1 of this report on steel roof decks in accordance with Exception 2 to IBC Section 1505.2 and Exception 2 to IRC

Section R902.1. The copper roof panels are considered Class A roof coverings, when installed, without insulation, as described in Section 4.1 of this report in accordance with Exception 3 to IBC Section 1505.2 and Exception 3 to IRC Section R902.1.

Under the 2009 IBC or 2009 IRC, copper and steel roof panels are considered Class A roof coverings, when installed as described in Section 4.1 of this report, without insulation, on steel roof decks in accordance with Exception 2 to IBC Section 1505.2 and Exception 2 to IRC Section R902.1.

### 4.3 Wind Uplift Resistance:

The allowable wind uplift pressures for UNA-CLAD<sup>®</sup> Standing Seam Metal Roof Panels are provided in Table 2.

## 5.0 CONDITIONS OF USE

The UNA-CLAD<sup>®</sup> standing seam metal roof panels 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, this report and the manufacturer's published installation instructions. In the event of conflicts between this report and the manufacturer's instructions, this report governs.
- 5.2 The metal panels must be installed only by applicators approved by Firestone Building Products Company, LLC.
- 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 R316.5.2, 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 Above-deck thermal insulation must comply with the applicable standard specified in IBC Table 1508.2 or IRC Table R906.2, as applicable.
- 5.6 Design wind uplift pressure on any roof area, including edge and corner zones, must not exceed the allowable wind pressure for the system. Refer to the allowable wind uplift pressure for the metal panels as listed in Table 1.
- 5.7 The allowable wind uplift pressures listed in Table 2 are for the roof covering only. The deck and framing to which the roof covering is attached must be designed for the applicable components and cladding wind loads in accordance with the IBC or IRC, as applicable.
- 5.8 Calculations demonstrating that the required wind resistance is less than the allowable wind resistance must be submitted to the code official.
- 5.9 The panels are manufactured in Anoka, Minnesota, College Park, Georgia, Las Vegas, Nevada, and Warren, Michigan, under a quality control program with inspections by ICC-ES.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Metal Roof Coverings (AC166), dated October 2012.

**7.0 IDENTIFICATION**

The panels are identified with a label bearing the product name, the material type, the manufacturer's name

(Firestone Building Products Company, LLC), and the evaluation report number (ESR-3422).



FIGURE 1—UNA-CLAD® UC-3

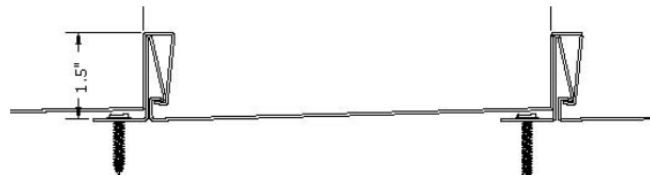


FIGURE 2—UNA-CLAD® UC-4

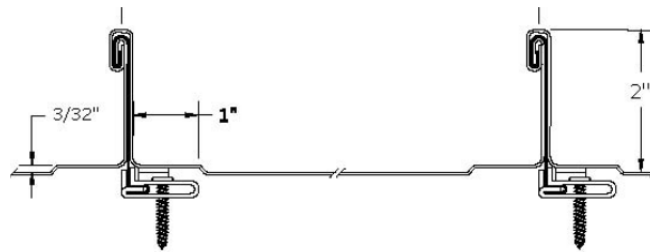


FIGURE 3—UNA-CLAD® UC-6

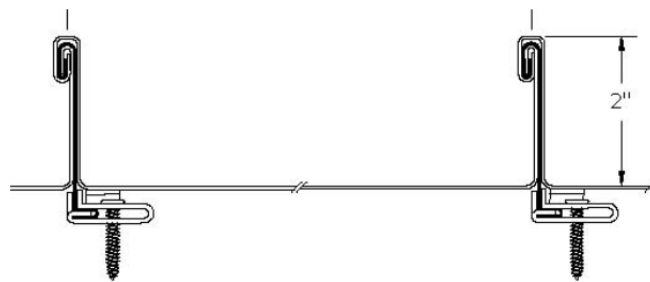


FIGURE 4—UNA-CLAD® UC-6 HD

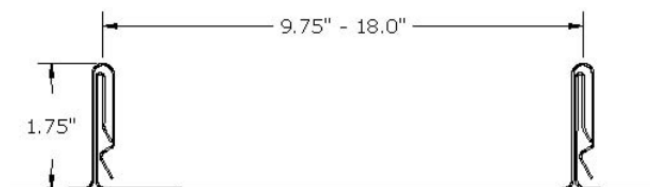


FIGURE 5—UNA-CLAD® UC-14

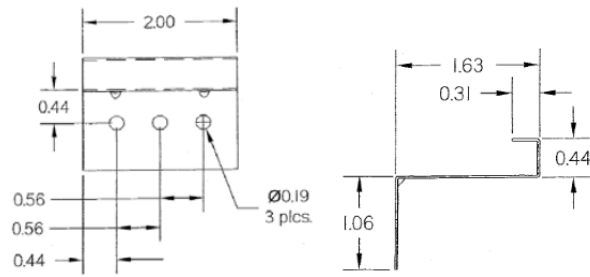


FIGURE 6—UNA-CLAD® UC-3 FIXED CLIP

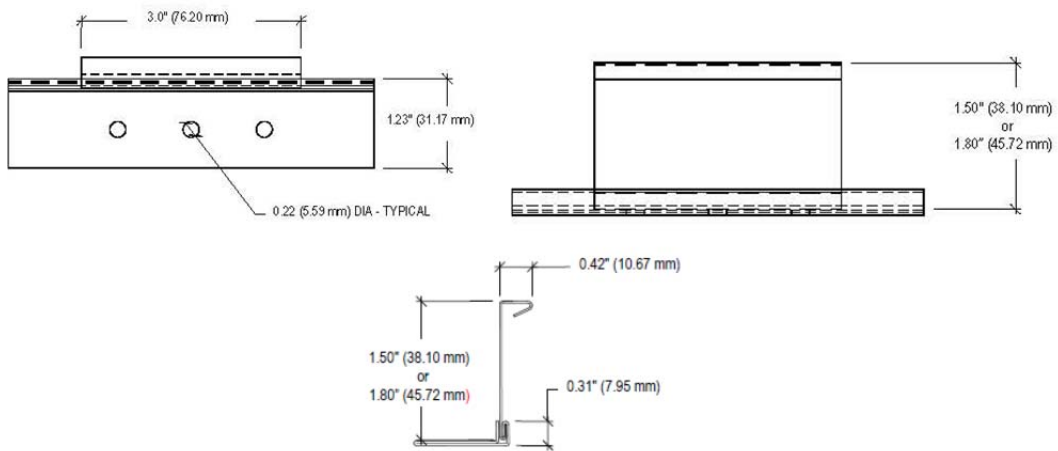


FIGURE 7—UNA-CLAD® UC-3 SUPER CLIP

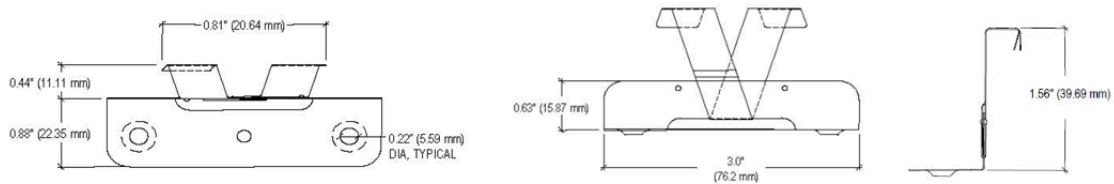


FIGURE 8—UNA-CLAD® UC-3 EXPANSION CLIP

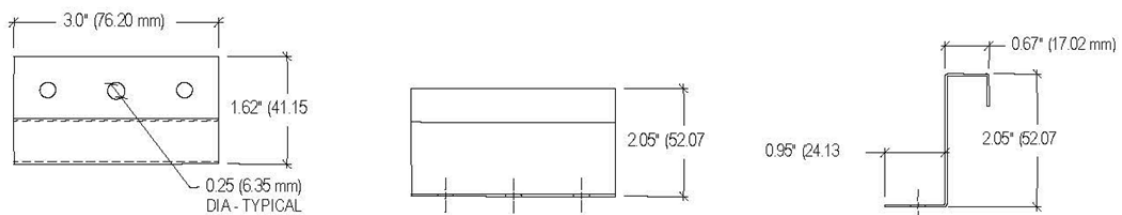


FIGURE 9—UNA-CLAD® UC-6 FIXED CLIP

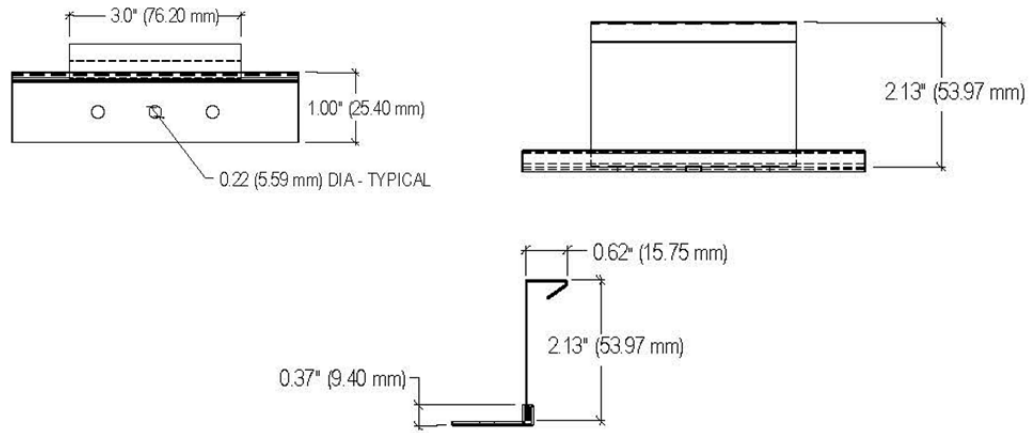


FIGURE 10—UNA-CLAD® UC-6 SUPER CLIP

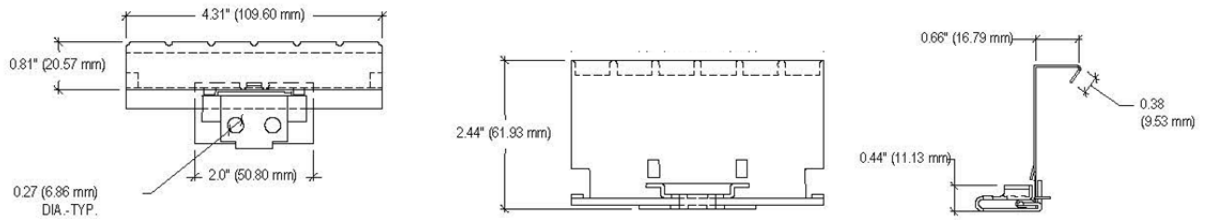


FIGURE 11—UNA-CLAD® UC-6 LOW-FLOAT CLIP

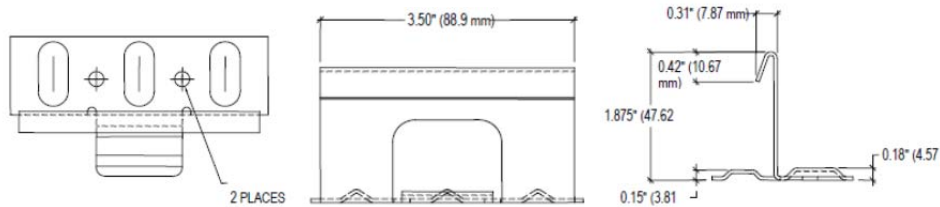


FIGURE 12—UNA-CLAD® UC-14 CLIP

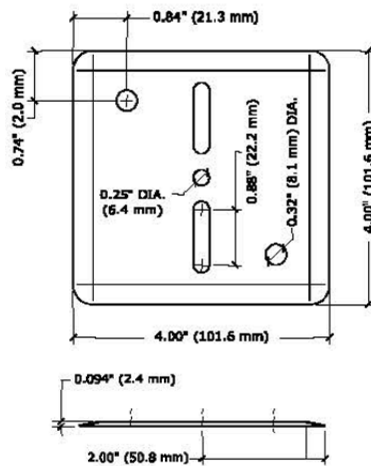


FIGURE 13—UNA-CLAD® UC BEARING PLATE



TABLE 1—FIRE CLASSIFICATION ASSEMBLIES

SYSTEM NO.	ROOF CLASS	SUBSTRATE <sup>1</sup>	MAX. ROOF SLOPE	ASSEMBLY DETAIL <sup>2,3,4</sup>	
1	A	Combustible	Unlimited	<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+GL"
				<b>Cover Board:</b>	G-P Products "DensDeck" <sup>®</sup> , 1/4 in. thick min, or 1/2 in. thick min UL Classified gypsum board with joints in barrier board offset 6 in. with joints in deck.
				<b>Ply Sheet (Optional):</b>	Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or equivalent UL Classified Prepared Roofing Accessory.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel, copper, or aluminum.
2	A	Combustible	Unlimited	<b>Barrier Board:</b>	G-P Products "DensDeck" <sup>®</sup> , 1/4 in. thick min, or 1/2 in. thick min UL Classified gypsum board with joints in barrier board offset 6 in. with joints in deck.
				<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+ GL" or "HailGard".
				<b>Ply Sheet (Optional):</b>	Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or equivalent UL Classified Prepared Roofing Accessory.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel, copper, or aluminum.
3	A	Combustible	Unlimited	<b>Barrier Board:</b>	G-P Products "DensDeck" <sup>®</sup> , 1/4 in. thick min, or 1/2 in. thick min UL Classified gypsum board with joints in barrier board offset 6 in. with joints in deck, or minimum one layer GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection".
				<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+ GL" or "HailGard".
				<b>Ply Sheet (Optional):</b>	Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or equivalent UL Classified Prepared Roofing Accessory.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel.
4	A	Combustible	Unlimited	<b>Barrier Board:</b>	G-P Products "DensDeck" <sup>®</sup> , 1/4 in. thick min, or 1/2 in. thick min UL Classified gypsum board with joints in barrier board offset 6 in. with joints in deck, or minimum one layer GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection".
				<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+ GL" or "HailGard".
				<b>Ply Sheet:</b>	Any UL Classified Type G2 or G3 base/ply sheet, Type 30 felt or equivalent UL Classified Prepared Roofing Accessory.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in copper.
5	A	Combustible	Unlimited	<b>Underlayment or Barrier Board:</b>	One layer GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Ply Sheet:</b>	One layer Type 30 base sheet or "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+ GL", "ISOGARD HD" or "HailGard".
				<b>Ply Sheet (Optional):</b>	Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or equivalent UL Classified Prepared Roofing Accessory.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel or copper.
6	A	Combustible	Unlimited	<b>Underlayment or Barrier Board:</b>	Two layers GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection".
				<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+ GL", "ISOGARD HD" or "HailGard".
				<b>Ply Sheet (Optional):</b>	Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or equivalent UL Classified Prepared Roofing Accessory.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in aluminum.
7	A	Combustible	Unlimited	<b>Barrier Board:</b>	One or more plies GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+ GL", "ISOGARD HD" or "HailGard".
				<b>Ply Sheet (Optional):</b>	Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or equivalent UL Classified Prepared Roofing Accessory.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel.
8	A	Combustible	Unlimited	<b>Barrier Board:</b>	One or more plies GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+ GL", "ISOGARD HD" or "HailGard".
				<b>Ply Sheet:</b>	Any UL Classified Type G2 or G3 base/ply sheet, Type 30 felt or equivalent UL Classified Prepared Roofing Accessory.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in copper.
9	A	Combustible	Unlimited	<b>Barrier Board:</b>	One or more plies GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+ GL", "ISOGARD HD" or "HailGard".
				<b>Ply Sheet (Optional):</b>	Any UL Classified Type G1, G2 or G3 base/ply sheet, Type 15, 20 or 30 felt or equivalent UL Classified Prepared Roofing Accessory.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel, fastened to 2x2 wood battens.

TABLE 1—FIRE CLASSIFICATION ASSEMBLIES (Continued)

SYSTEM NO.	ROOF CLASS	SUBSTRATE <sup>1</sup>	MAX. ROOF SLOPE	ASSEMBLY DETAIL <sup>2,3,4</sup>	
10	A	Combustible	Unlimited	<b>Insulation (Optional):</b>	Firestone "ISO 95+ GL."
				<b>Barrier Board or Cover Board:</b>	G-P Products "DensDeck <sup>®</sup> ", 1/4 in. thick min, or 1/2 in. thick min UL Classified gypsum board with joints in barrier board offset 6 in. with joints in deck, or minimum one layer GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection".
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel.
11	A	Combustible	Unlimited	<b>Insulation (Optional):</b>	Firestone "ISO 95+ GL".
				<b>Barrier Board or Cover Board:</b>	G-P Products "DensDeck <sup>®</sup> ", 1/4 in. thick min, or 1/2 in. thick min UL Classified gypsum board with joints in barrier board offset 6 in. with joints in deck, or minimum one layer GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection " and one layer of any UL Classified Type 30 felt or Type G2 base/ply sheet.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in copper.
12	A	Combustible	Unlimited	<b>Insulation (Optional):</b>	Firestone "ISO 95+ GL".
				<b>Barrier Board or Cover Board:</b>	G-P Products "DensDeck <sup>®</sup> ", 1/4 in. thick min, or 1/2 in. thick min UL Classified gypsum board with joints in barrier board offset 6 in. with joints in deck, or minimum two layers GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection".
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in aluminum.
13	A	Combustible	Unlimited	<b>Insulation (Optional):</b>	Firestone "ISO 95+GL", "ISOGARD HD" or "HailGard".
				<b>Barrier Board or Cover Board:</b>	One layer GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Ply Sheet (Optional):</b>	One layer Type 30 base sheet or "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel.
14	A	Combustible	Unlimited	<b>Insulation (Optional):</b>	Firestone "ISO 95+GL", "ISOGARD HD" or "HailGard".
				<b>Barrier Board or Cover Board:</b>	One layer GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Ply Sheet:</b>	One layer Type 30 base sheet or "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in copper.
15	A	Combustible	Unlimited	<b>Insulation (Optional):</b>	Firestone "ISO 95+GL", "ISOGARD HD" or "HailGard".
				<b>Underlayment or Cover Board:</b>	Two or more layers GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection".
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in aluminum.
16	A	Combustible	Unlimited	<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+GL", "ISOGARD HD" or "HailGard".
				<b>Underlayment or Cover Board:</b>	One or more plies GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel.
17	A	Combustible	Unlimited	<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+GL", "ISOGARD HD" or "HailGard".
				<b>Underlayment or Cover Board:</b>	Two or more plies GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in copper.
18	A	Combustible	Unlimited	<b>Insulation (Optional):</b>	Firestone "ISO 95+GL", "ISOGARD HD" or "HailGard".
				<b>Underlayment or Cover Board:</b>	One or more layers GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel, fastened to 2x2 wood battens.
19	A	Noncombustible	Unlimited	<b>Insulation (Optional):</b>	Any thickness Firestone "ISO 95+GL", Resista, Firestone HailGard, Any UL Classified insulation any thickness.
				<b>Cover Board (Optional):</b>	Firestone ISOGARD HD, G-P Products "DensDeck <sup>®</sup> ", 1/4 in. thick min, 7/16 inch OSB, 1/2 in. high density wood fiber board or 15/32 in. plywood.
				<b>Ply Sheet:</b>	Firestone Clad Gard SA-N, Clad-Gard SA-S, Clad Gard R or Clad-Gard MA (not UL Classified).
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel, copper, or aluminum.
20	B	Combustible	Unlimited	<b>Underlayment:</b>	One layer GAF Materials Corp "GAF VersaShield <sup>®</sup> Fire-Resistant Roof Deck Protection", mechanically fastened.
				<b>Panel:</b>	UC-3, UC-4, UC-6, UC-6 HD, and UC-14 in steel, copper, or aluminum.

For SI 1 inch = 25.4 mm.

<sup>1</sup>Wood deck must be a minimum of 15/32-inch-thick (11.9 mm) plywood. Steel deck must be a minimum of No. 22 gauge galvanized steel [0.030 inch (0.76 mm)].

<sup>2</sup>All foam plastic insulation must be UL-classified foam plastic for roofing systems, and must be limited to the maximum thickness noted.

<sup>3</sup>Barrier or cover boards, ply sheets, underlayments, and panels must be UL-classified for roofing systems.

<sup>4</sup>GAF's VersaShield<sup>®</sup> Fire-Resistant Roof Deck Protection is recognized in ICC-ES evaluation report [ESR-2053](#) and must be installed accordingly.



TABLE 2—WIND RESISTANCE ASSEMBLIES

System No.	Deck <sup>1</sup>	Insulation <sup>2</sup>	Barrier or Cover Board <sup>6</sup>	Under-layment	Panel		Allowable Uplift Pressure (psf)
					Type	Attachment <sup>3, 4, 5</sup>	
W-1	Plywood	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-3 with 1.5-inch seam (max. 16-inch wide)	UC-3 Expansion Clips at 18 inches o.c. attached with (2) #10-12 x 1-inch Pancake Head wood screws	79
W-2	Plywood	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-3 with 1.5-inch seam (max. 16-inch wide)	UC-3 Expansion Clips at 12 inches o.c. attached with (2) #10-12 x 1-inch Pancake Head wood screws	86
W-3	Plywood	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-3 with 1.5-inch seam (max. 16-inch wide)	UC-3 Expansion Clips at 8 inches o.c. attached with (2) #10-12 x 1-inch Pancake Head wood screws	101
W-4	Plywood	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-3 with 1.5-inch seam (max. 16-inch wide)	UC-3 Super Clips at 6 inches o.c. attached with (2) #10-12 x 1 1/2-inch Pancake Head screws	129
W-5	Plywood	Optional	Optional	Section 3.3	Minimum 0.032 Aluminum UC-3 with 1.5-inch seam (max. 20-inch wide)	UC-3 Super Clips at 18 inches o.c. attached with (2) #10-12 x 1 1/2-inch Pancake Head wood screws	111
W-6	Plywood	Optional	Optional	Section 3.3	Minimum 0.032 Aluminum UC-3 with 1.5-inch seam (max. 20-inch wide)	UC-3 Super Clips at 12-inches o.c. attached with (2) #10-12 x 1 1/2-inch Pancake Head wood screws	129
W-7	Plywood	Optional	Optional	Section 3.3	Minimum 16 oz. Copper UC-3 with 1.5-inch seam (max. 20-inch wide)	UC-3 Super Clips at 12-inches o.c. attached with (2) #10-12 x 1 1/2-inch Pancake Head wood screws	77
W-8	5/8-inch Plywood	Optional	Optional	Section 3.3	Minimum 26 gauge steel UC-4 (max. 9 3/4-inch wide)	(2) #10-12 x 1-inch PH wood screws with washers at 12-inch o.c.	53
W-9	5/8-inch Plywood	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-4 (max. 18-inch wide)	(2) #10-12 x 1-inch PH wood screws with washers at 18 inch o.c.	53
W-10	Plywood	Optional	Optional	Section 3.3	Minimum 0.032 Aluminum UC-4 (max. 9 3/4-inch wide)	(2) #10-12 x 1-inch Pancake Head wood screws at 12 inch o.c.	109
W-11	3/4-inch Plywood	Optional	Optional	Section 3.3	Minimum 16 oz. Copper UC-4 (max. 14-inch wide)	#10-12 x 1-inch PH wood screws at 9 inch o.c.	53
W-12	5/8-inch Plywood	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-6 or UC-6 HD (max. 18-inch wide)	UC-6 Clip at 30 inches o.c. attached with (2) #12-12 x 2-inch Pancake Head wood screws	53
W-13	5/8-inch Plywood	Optional	Optional	Section 3.3	Minimum 0.032 Aluminum UC-6 or UC-6 HD (max. 18-inch wide)	UC-6 Clip at 30 inches o.c. attached with (2) #12-12 x 2-inch Pancake Head wood screws	53
W-14	5/8-inch Plywood	Optional	Optional	Section 3.3	Minimum 24 gauge Steel UC-14 (max. 16-inch wide)	UC-14 Clip at 12 inches o.c. attached with (2) #10-12 x 1-inch Pancake Head wood screws	79
W-15	5/8-inch Plywood	Optional	Optional	Section 3.3	Minimum 24 gauge Steel UC-14 (max. 16-inch wide)	UC-14 Clip at 6 inches o.c. attached with (2) #10-12 x 1-inch Pancake Head wood screws	100
W-16	5/8-inch Plywood	Optional	Optional	Section 3.3	Minimum 0.032 Aluminum UC-14 (max. 16-inch wide)	UC-14 Clip at 12 inches o.c. attached with (2) #10-12 x 1-inch Pancake Head wood screws	74
W-17	5/8-inch Plywood	Optional	Optional	Section 3.3	Minimum 0.032 Aluminum UC-14 (max. 16-inch wide)	UC-14 Clip at 6 inches o.c. attached with (2) #10-12 x 1-inch Pancake Head wood screws	86

TABLE 2—WIND RESISTANCE ASSEMBLIES (Continued)

System No.	Deck <sup>1</sup>	Insulation <sup>2</sup>	Barrier or Cover Board <sup>6</sup>	Under-layment	Panel		Allowable Uplift Pressure (psf)
					Type	Attachment <sup>3, 4, 5</sup>	
S-1	Steel	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-3 with 1.5-inch seam (max. 16-inch wide)	UC-3 Super Clip with (2) #12-13 PH screws at 30-inch o.c.	53
S-2	Steel	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-3 with 1.5-inch seam (max. 16-inch wide)	UC-3 Expansion Clip with (2) #12-13 PH screws at 24-inch o.c.	53
S-3	Steel	Optional	<sup>7</sup> / <sub>16</sub> -inch-thick OSB installed with Firestone HD HailGard Fasteners at a rate of 24 per 4 ft x 8 ft board	Section 3.3	Minimum 24 gauge UC-3 with 1.5-inch seam (max. 20-inch wide)	UC-3 Expansion Clip at 12 inches o.c. attached to the cover board with (2) Firestone UNA-CLAD #10 fasteners	53
S-4	Steel	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-3 with 1.5-inch seam (max. 20-inch wide)	UC-3 Expansion Clip at 12 inches o.c. attached with (2) Firestone UNA-CLAD #12 Drill Point Fasteners. Firestone Bearing Plates are placed under each clip prior to installing the screws.	53
S-5	Steel	Optional	<sup>7</sup> / <sub>16</sub> -inch-thick OSB installed with Firestone All-Purpose Fasteners and Insulation Fastening Plates at rate of 16 per 4 ft x 8 ft board	Section 3.3	Minimum 24 gauge steel UC-3 with 1.5-inch seam (max. 20-inch wide)	UC-3 Expansion Clip at 12 inches o.c. attached with (2) Firestone UNA-CLAD #10-12 x 1-inch screws secured to cover board.	60
S-6	Steel	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-3 with 1.5-inch seam (max. 16-inch wide)	UC-3 Super Clips at 12 inches o.c. attached with (2) #12-13 Pancake Head SMS screws	81
S-7	Steel	Optional	<sup>7</sup> / <sub>16</sub> -inch-thick OSB installed with HD HailGard Fasteners at rate of 24 per 4 ft x 8 ft board	Section 3.3	Minimum 0.032 Aluminum UC-3 with 1.5-inch seam (max. 20-inch wide)	UC-3 Expansion Clips at 12 inches o.c. attached with (2) #10-12 x 1-inch Pancake Head screws secured to cover board	53
S-8	Steel	Optional	Optional	Section 3.3	Minimum 0.032 Aluminum UC-3 with 1.5-inch seam (max. 20-inch wide)	UC-3 Expansion Clip with (2) #12-13 PH screws at 12 inches o.c.	53
S-9	Steel	Optional	Optional	Section 3.3	Minimum 0.040 Aluminum UC-3 with 1.5-inch seam (max. 12-inch wide)	UC-3 Super Clip at 18 inches o.c. attached with (2) #12-13 Pancake Head screws	134
S-10	Steel	Optional	Optional	Section 3.3	Minimum 0.040 Aluminum UC-3 with 1.5-inch seam (max. 12-inch wide)	UC-3 Super Clip at 12 inches o.c. attached with (2) #12-13 Pancake Head screws	150
S-11	Steel	Optional	Optional	Section 3.3	Minimum 16 oz. Copper UC-3 with 1.5-inch seam (max. 20-inch wide)	UC-3 Super Clip at 8 inches o.c. attached with (2) #12-13 Pancake Head screws	84
S-12	Steel	Optional	<sup>7</sup> / <sub>16</sub> -inch-thick OSB installed with Firestone All-Purpose Fasteners and Insulation Fastening Plates at rate of 16 per 4 ft x 8 ft board	Section 3.3	Minimum 24 gauge steel UC-4 (max. 9 <sup>3</sup> / <sub>4</sub> -inch wide)	(2) Firestone UNA-CLAD #10-12 Fasteners with washers at 12 inches o.c. secured to cover board	53
S-13	Steel	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-4 (max. 18-inch wide)	(2) #12-15 PH screws with washers at 18 inches o.c.	53
S-14	Steel	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-4 (max. 9 <sup>3</sup> / <sub>4</sub> -inch wide)	(2) Firestone UNA-CLAD #12 Drill Point Fasteners with washers at 12 inches o.c. Firestone Bearing Plates are placed under the metal panels at each bearing attachment point prior to installing the screws.	83
S-15	Steel	Optional	Optional	Section 3.3	Minimum 040 Aluminum UC-4 (max. 18-inch wide)	(2) #12-15 PH screws with washers at 18 inches o.c.	53
S-16	Steel	Optional	<sup>7</sup> / <sub>16</sub> -inch-thick OSB installed with Firestone All-Purpose Fasteners and Insulation Fastening Plates at rate of 16 per 4 ft x 8 ft board	Section 3.3	Minimum 24 gauge UC-6 (max. 18-inch wide)	UC-6 Super Clip at 12 inches o.c. attached with (2) Firestone UNA-CLAD #10-12 x 1-inch fasteners to cover board	45

TABLE 2—WIND RESISTANCE ASSEMBLIES (Continued)

System No.	Deck <sup>1</sup>	Insulation <sup>2</sup>	Barrier or Cover Board <sup>6</sup>	Under-layment	Panel		Allowable Uplift Pressure (psf)
					Type	Attachment <sup>3, 4, 5</sup>	
S-17	Steel	Optional	N/A	Section 3.3	Minimum 24 gauge steel UC-6 or UC-6 HD (max. 18-inch wide)	UC-6 Low Float Clip or UC-6 Super Clip with (2) #14-13 Pancake Head screws at 30-inch o.c. Firestone Bearing Plates are placed under each clip prior to installing the screws.	53
S-18	Steel	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-6 or UC-6 HD (max. 18-inch wide)	UC-6 Low Float Clip or UC-6 Super Clip at 30-inches o.c. attached with (2) #14 Pancake Head screws. Firestone Bearing Plates are placed under each clip prior to installing the screws.	53
S-19	Steel	Optional	Optional	Section 3.3	Minimum 24 gauge steel UC-6 (max. 18-inch wide)	UC-6 Super Clip at 12-inches o.c. attached with (2) Firestone UNA-CLAD #12 Drill Point Fasteners. Firestone Bearing Plates are placed under each clip prior to installing the screws.	68
S-20	Steel	Optional	<sup>7</sup> / <sub>16</sub> -inch-thick OSB installed with Firestone HD HailGard Fasteners at rate of 24 per 4-ft x 8-ft board	Section 3.3	Minimum 0.032 Aluminum UC-6 or UC-6 HD (max. 18-inch wide)	UC-6 Low Float Clip or UC-6 Super Clip at 24-inches o.c. attached with (2) #10-12 x 1-inch Pancake Head screws to the cover board	53
S-21	Steel	Optional	<sup>7</sup> / <sub>16</sub> -inch-thick OSB installed with Firestone HD HailGard Fasteners at rate of 24 per 4-ft x 8-ft board	Section 3.3	Minimum 24 gauge steel UC-14 (max. 18-inch wide)	UC-14 Clips with (2) #10-12 x 1-inch PH screws at 36-inch o.c. secured to cover board	53
S-22	Steel	Optional	<sup>7</sup> / <sub>16</sub> -inch-thick OSB installed with Firestone HD HailGard Fasteners at rate of 24 per 4-ft x 8-ft board	Section 3.3	Minimum 0.032 Aluminum UC-14 (max. 16-inch wide)	UC-14 Clips with (2) #10-12 x 1-inch PH screws at 18-inch o.c. secured to cover board	53
S-23	Steel	Optional	Optional	Section 3.3	Minimum 0.032 Aluminum UC-14 (max. 18-inch wide)	UC-14 Clips at 18-inches o.c. attached with (2) #12-13 Pancake Head screws. Firestone Bearing Plates are placed under each clip prior to installing the screws	53

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

<sup>1</sup>Wood deck must be a minimum <sup>15</sup>/<sub>32</sub>-inch-thick (11.9 mm) plywood, unless otherwise noted in this report. Steel deck must be a minimum No. 22 gauge galvanized steel [0.030 inch (0.76 mm)].

<sup>2</sup>All foam plastic insulation must be limited to lesser of 10-inch maximum thickness or the maximum thickness for which the flame spread index (in accordance with ASTM E84 or UL 723) is no greater than 75.

<sup>3</sup>All installations over foam plastic insulation require use of UC Bearing Plate.

<sup>4</sup>Fastener spacing is the maximum allowable for the rated pressure.

<sup>5</sup>Minimum penetration through the deck for fasteners is 1 inch for wood decks and <sup>3</sup>/<sub>4</sub> inch for steel decks.

<sup>6</sup>Optional barrier board to be minimum <sup>7</sup>/<sub>16</sub> inch-thick OSB installed with HD Hailgard Fasteners at a rate of 24 per 4 ft x 8 ft board, where applicable.