

ICC-ES Evaluation Report

ESR-4333

Reissued October 2019

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A Subsidiary of the International Code Council®

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 46 46—Fiber-Cement Siding

REPORT HOLDER:

WALPANEL INC.

EVALUATION SUBJECT:

WALPANEL WALLSHELL® U-SHEILD™ PANELS AND WALLSHELL® V-SHIELD™ PANELS

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2015, 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.

Properties evaluated:

- Physical characteristics
- Weather resistance
- Wind load resistance
- Durability
- Non-Combustibility

1.2 Evaluation to the following green code(s) and/or standards:

- 2016 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

- See Section 3.1

2.0 USES

The Walpanel Wallshell U-Shield Panels and Wallshell V-Shield Panels are used as exterior wall cladding panels that are attached to a supporting framing assembly to form a wall cladding system.

3.0 DESCRIPTION

3.1 General:

The Walpanel Wallshell U-Shield Panel and Wallshell V-Shield Panel wall cladding systems are open-jointed wall cladding systems that allow air to circulate between the

façade systems and the exterior face of walls. When used as an exterior wall covering, the wall cladding systems must be installed over a water-resistive barrier.

The attributes of the Walpanel Wallshell U-Shield Panel and Wallshell V-Shield Panel wall cladding systems have been verified as conforming to the provisions of (i) CALGreen Sections A4.405.1.3 (prefinished materials) and A5.406.1.2 (reduced maintenance); (ii) ICC 700-2015 and ICC 700-2012 Sections 601.7, 11.601.7, and 12.1(A).601.7 (site-applied finishing materials); and (iii) ICC 700-2008 Section 601.7 (site-applied finishing materials). Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. The code may provide supplemental information as guidance.

3.2 Components:

3.2.1 Panels: The Walpanel Wallshell U-Shield Panels and Wallshell V-Shield Panels are fiber-reinforced cement panels manufactured from Portland cement, reinforcing fibers, and additives. The panels comply with ASTM C1186 as Type A, Grade II, fiber-cement sheets; have a flame-spread index of 10 or less and a smoke-developed index of 5 or less when tested in accordance with ASTM E84; and are classified as noncombustible when tested in accordance with ASTM E136. The panels may be cut to accommodate various architectural designs.

The Walpanel Wallshell U-Shield Panels are available in a maximum untrimmed width of approximately 48 inches (actually 1220 mm) in approximately 1/2 inch (actually 12 mm) and 5/8 inch (actually 16 mm) nominal thicknesses, and in a maximum untrimmed length of approximately 96 inches (actually 2440 mm). The panels are available in various surface textures and colors, as noted in the approved quality documentation.

The Walpanel Wallshell V-Shield Panels are available in a maximum untrimmed width of approximately 48 inches (actually 1220 mm) in approximately 5/16 inch (actually 8 mm), 3/8 inch (actually 10 mm), and 1/2 inch (actually 12 mm) nominal thicknesses, and in a maximum untrimmed length of approximately 96 inches (actually 2440 mm). The panels are available in various surface textures and colors, as specified in the approved quality documentation.

For interior use, the Walpanel Wallshell U-Shield Panels and Wallshell V-Shield Panels have a Class A finish in accordance with IBC Section 803.1.1 when tested in accordance with ASTM E84.

3.2.2 Attachment Systems:

The attachment systems used to attach the Walpanel

Wallshell U-Shield Panels and Wallshell V-Shield Panels to the supporting members of wall cladding systems are, respectively, a concealed attachment system and visible fasteners. The concealed fastening system consists of undercut anchors made of Type 316 stainless steel and connecting clip assemblies made of Type 6063-T5 aluminum alloy, conforming to product specifications in the approved quality documentation. The visible fasteners are stainless steel rivets conforming to product specifications in the approved quality documentation.

4.0 DESIGN AND INSTALLATION

4.1 General:

The Walpanel Wallshell U-Shield Panel and Wallshell V-Shield Panel wall cladding systems must be installed over exterior walls and wall framing that are capable of supporting the imposed loads including, but not limited to, transverse wind loads and gravity loads. The wall cladding systems must be securely connected to the supporting wall assembly substrate with corrosion-resistant fasteners that are compatible with the wall assembly substrate.

Walpanel Wallshell U-Shield Panels must be attached to support framing members with the concealed attachment system described in Section 3.2.2. Walpanel Wallshell V-Shield Panels are directly attached to the support framing members with the visible attachment fasteners, described in Section 3.2.2, installed through the face of the panels. Connection of the fastening system to the wall assembly substrate must be designed in accordance with Section 4.2.

4.2 Design:

Wind load capacities, including nominal strengths, ASD strengths, and LRFD strengths, given in Table 1, are based on transverse load testing in accordance with ASTM E330 on the Walpanel Wallshell U-Shield Panels installed in accordance with Section 4.3.2; and the Wallshell V-Shield Panel walls installed in accordance with Section 4.3.3.

In-plane shear strengths (gravity resistance) and transverse load strengths, given in Table 2, are based on shear load and transverse load testing in accordance with ASTM C1354 on the individual concealed and visible attachment systems attached to Walpanel Wallshell U-Shield Panel and Wallshell V-Shield Panel, respectively.

For transverse load design of exterior wall assemblies constructed with the Walpanel Wallshell U-Shield Panel and Wallshell V-Shield Panel wall cladding systems, the applied transverse loads, determined in accordance with IBC Chapter 16 or Section R301.2.1 of the IRC, as applicable, must be equal to or less than the corresponding capacity, which must be the lesser of ASD strengths or LRFD strengths noted in Tables 1 and 2.

The exterior wall, wall framing and the attachment of the panel wall cladding systems to the supporting exterior wall or wall framing to withstand gravity and transverse forces must be designed by a registered design professional in accordance with the IBC, and the details must be submitted to the code official for approval. The capacities of the exterior walls or wall framing and the connection between the wall cladding system and its supporting exterior walls or wall framing must be equal to or greater than those noted in this section (Section 4.2) and in Tables 1 and 2, unless the capacities of the façade systems described in this evaluation report are reduced accordingly.

4.3 Installation:

4.3.1 General: The Walpanel Wallshell U-Shield Panels,

Wallshell V-Shield Panels, and the wall cladding systems constructed using Walpanel Wallshell U-Shield Panels or Wallshell V-Shield Panels must be installed in accordance with the manufacturer's published installation instructions and this evaluation report. A copy of the manufacturer's published installation instructions must be available on the jobsite at all times during construction.

The wall cladding systems must be installed over wall assemblies complying with IBC Section 1403.3. Exterior wall assemblies, on which the wall cladding systems are to be installed, must include flashing, a water-resistive barrier, a means of draining water, and protection against condensation in accordance with IBC Section 1403.2. The wall cladding system boundaries at the top, bottom, and around building openings must be finished in accordance with the manufacturer's published installation instructions to prevent entry of pests and vermin. A ventilation path must be maintained to allow air to flow into, out of, and within the cavity between the water-resistive barrier and the wall cladding systems.

Exterior wall assemblies, on which the wall cladding systems are to be installed, must include flashing in accordance with IBC Section 1405.4.

4.3.2 Walpanel Wallshell U-Shield Panels: The Walpanel Wallshell U-Shield Panels must be attached horizontally to L-shaped metal framing members using the concealed attachment system described in Section 3.2.2. The maximum on-center spacing between the concealed attachment systems along the length of the panels must be 16 inches (actually 406 mm) and the maximum on-center spacing between the concealed attachment systems along the width of the panels must be 14.5 inches (actually 366 mm). The minimum number of concealed attachment systems must be 0.75 per square feet (0.093 m²). The concealed attachment systems must be installed perpendicular to the panels into pre-drilled anchor holes using a special drilling tool provided by the anchor manufacturer. The connecting clips in the concealed attachment system are secured together by using two Type 304 M6x16 stainless steel hexogen setting screws provided by with the concealed attachment system. The minimum edge distances between the concealed attachment systems to the long edge of the panel must be 4.72 inches (actually 120 mm) and 8 inches (actually 200 mm) between the concealed attachment systems to the short edge of the panel. The maximum spacing between panels at joints is ³/₈ inch (actually 9.5 mm). The framing members supporting the panels must be designed by a registered design professional. Refer to Figure 1 for an illustration of a Walpanel Wallshell U-Shield Panel wall cladding system supported by a concealed attachment system.

4.3.3 Walpanel Wallshell V-Shield Panels: The Walpanel Wallshell V-Shield Panels must be attached horizontally to L-shaped, Z-shaped and Hat-shaped vertical steel framing members using the visible fasteners described in Section 3.2.2. The maximum on-center spacing between the visible fasteners along the length of the panels must be 16 inches (actually 406 mm) and the maximum on-center spacing between the visible fasteners along the width of the panels must be 17.7 inches (actually 450 mm). The minimum number of visible fasteners must be 1 per square feet (0.093 m²). The minimum edge distances between the visible fasteners and long edge of the panel must be minimum 3.15 inches (actually 80 mm) and 1 inch (25 mm) between the visible fasteners and panel ends. The maximum joint spacing between panel ends is ³/₈ inch (9.5 mm). The steel framing members must have a minimum

tensile yield strength of 33,000 psi (230 MPa), 0.079 inch (2 mm) minimum base-metal thickness and a minimum 2 inches (50.4 mm) leg length and designed by a registered design professional. Refer to Figure 2 for an illustration of a Walpanel Wallshell V-Shield Panel wall cladding system supported by visible attachment fasteners.

5.0 CONDITIONS OF USE

The Walpanel Wallshell U-Shield Panels, Wallshell V-Shield Panels and the wall cladding systems constructed using Walpanel Wallshell U-Shield Panels or Wallshell V-Shield Panels 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 must comply with this evaluation report, the manufacturer’s published installation instructions, and the applicable code. In the event of a conflict between the manufacturer’s published installation instructions and this report, this report governs.
- 5.2 The Walpanel Wallshell U-Shield Panels and Wallshell V-Shield Panels must be installed, by qualified installers recognized by Walpanel Inc. in accordance with Section 4.2 and 4.3 of this evaluation report.
- 5.3 The Walpanel Wallshell U-Shield Panel and Wallshell V-Shield Panel wall cladding systems and the support of the wall cladding systems must be designed in accordance with the applicable code and Section 4.2 of this evaluation report.
- 5.4 Drawings, design details, and calculations verifying the adequacy of the fastening to connect the Walpanel Wallshell U-Shield Panels and Wallshell V-Shield Panels attachment system to the supporting wall must be submitted to the building code official for approval. These must be prepared by a registered design professional when required by the statutes of the jurisdiction in which the system is to be installed.
- 5.5 Support of the Walpanel Wallshell U-Shield Panel wall cladding systems, including the screw connections between the concealed attachment systems and the L-shaped metal supporting framing members, and the supporting framing, is outside the scope of this evaluation report.
- 5.6 When installed on exterior walls, the Walpanel Wallshell U-Shield Panels and Wallshell V-Shield Panels must be installed only on exterior walls incorporating sheathing capable of resisting the design wind pressures, both positive and negative. The sheathing must be covered with a water-resistive barrier, as required by the applicable code, and a ventilation path must be maintained between the water-resistive barrier and the panels.

- 5.7 When the wall cladding system is installed over exterior walls on buildings of Types I, II III and IV construction in accordance with Section 1403.5 of the 2012 IBC, the walls are limited to 40 feet (12 192 mm) or less in height above the grade plane.
- 5.8 When the wall cladding system is installed over exterior walls on buildings of Types I, II III and IV construction in accordance with Exception 2 to Section 1402.5 of the 2015 IBC, the walls are not limited to 40 feet (12 192 mm) in height above the grade plane.
- 5.9 When installed with joint spaces between adjacent Walpanel Wallshell U-Shield Panels and Wallshell V-Shield Panels on interior walls required to have a Class A finish, the Walpanel Wallshell U-Shield Panels and Wallshell V-Shield Panels must be installed over a substrate having a Class A finish.
- 5.10 The Walpanel Wallshell U-Shield Panels and Wallshell V-Shield Panels are manufactured in Zhejiang province, China under an approved quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Fiber Cement Siding Used as Exterior Wall Siding (AC90), dated June 2012 (editorially revised September 2015).
- 6.2 Reports of testing in accordance with ASTM E84, Test Method for Surface Burning Characteristics of Building Materials.
- 6.3 Reports of testing in accordance with ASTM E136, Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
- 6.4 Reports of testing in accordance with ASTM E330, Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

7.0 IDENTIFICATION

- 7.1 Each Walpanel Wallshell U-Shield Panel and Wallshell V-Shield Panel is labeled with the name of the manufacturer (Walpanel, Inc.), the panel and attachment system types, the evaluation report number (ESR-4333), and the statement “Panels conform to ASTM C1186, Type A, Grade II specifications”.
- 7.2 The report holder’s contact information is as follows:

**16701 MEDFORD BOULEVARD
SUITE 400
BOWIE, MARYLAND 20715
(888) 998-4611
www.walpanel.com**

TABLE 1—TRANSVERSE WIND LOAD CAPACITIES FOR THE WALL CLADDING SYSTEMS CONSTRUCTED WITH CONCEALED AND VISIBLE ATTACHMENT SYSTEMS

PANEL NAME	FASTENING SYSTEM TYPE	ACTUAL THICKNESS (inch)	NOMINAL STRENGTH FOR TRANSVERSE WIND LOAD ^{1,2,3} (psf)	
			Positive	Negative
WallShell U-Shield	Concealed	1/2	191	211
		5/8	191	211
WallShell V-Shield	Visible	5/16	189	184
		3/8	189	184
		1/2	189	184

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

¹The tabulated positive and negative nominal strengths for transverse wind loads are based on the average values of tested ultimate loads, which are limited by the testing machine loading limitation.

²To calculate the allowable transverse wind loads; divide the tabulated values by the ASD safety factor of 3.0.

³To calculate the LRFD values; multiply the tabulated values by the LRFD strength reduction factor, ϕ , of 0.50.

TABLE 2—ANCHOR SINGLE FASTENER-TO-PANEL CONNECTION CAPACITIES

FASTENING SYSTEM TYPE	PANEL THICKNESS (inch)	NOMINAL STRENGTH ^{1,2} (lbf)	
		In-plane Shear (Gravity)	Pull-out (Negative)
Concealed	1/2	460	325
Visible	5/16	580	180

For SI: 1 inch = 25.4 mm and 1 lbf = 4.448 N.

¹To calculate the allowable shear or transverse loads, divide the tabulated values by the ASD safety factor of 4.0.

²To calculate the LRFD values; multiply the tabulated values by the LRFD strength reduction factor, ϕ , of 0.50.

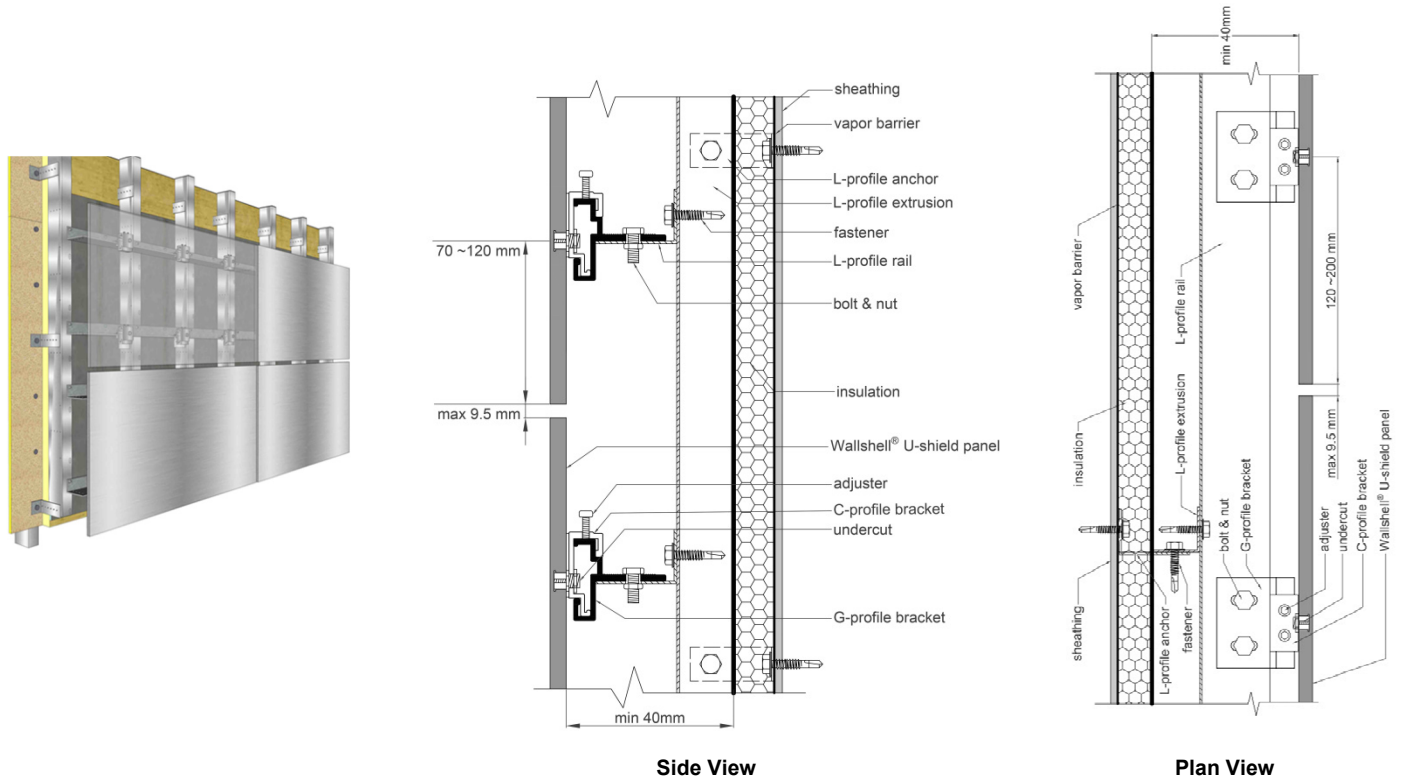


FIGURE 1—ILLUSTRATION OF A WALPANEL WALLSHELL U-SHIELD PANEL CLADDING SYSTEM SUPPORTED BY A CONCEALED ATTACHMENT SYSTEM

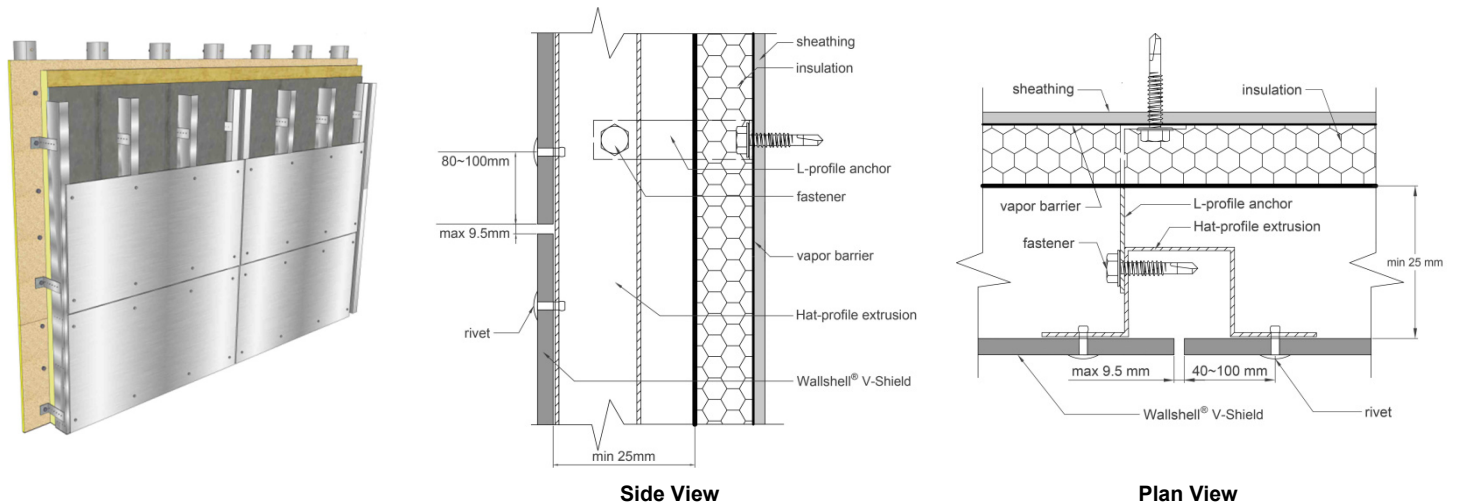


FIGURE 2—ILLUSTRATION OF A WALPANEL WALLSHELL V-SHIELD PANEL CLADDING SYSTEM SUPPORTED BY A VISIBLE ATTACHMENT SYSTEM

ICC-ES Evaluation Report

ESR-4333 CBC and CRC Supplement

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 46 46—Fiber-Cement Siding

REPORT HOLDER:

WALPANEL INC.

EVALUATION SUBJECT:

WALPANEL WALLSHELL® U-SHEILD™ PANELS AND WALLSHELL® V-SHIELD™ PANEL

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Walpanel Wallshell® U-Shield Panels and Wallshell® V-Shield Panels, recognized in ICC-ES main evaluation report ESR-4333, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2016 *California Building Code*® (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2016 *California Residential Code*® (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Walpanel Wallshell® U-Shield Panels and Wallshell® V-Shield Panels, described in Sections 2.0 through 7.0 of the main evaluation report ESR-4333, comply with CBC Chapters 7, 8 and 14, provided the design and installation are in accordance with the 2015 *International Building Code*® (IBC) provisions noted in the main report and the additional requirements of CBC Chapters 16 and 17, as applicable.

The Walpanel Wallshell® U-Shield Panels and Wallshell® V-Shield Panels have not been evaluated under CBC Chapter 7A for use in the exterior design and construction of new buildings located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland—Urban Interface Area.

2.1.1 OSHPD:

The applicable OSHPD Sections of the CBC are beyond the scope of this supplement.

2.1.2 DSA:

The applicable DSA Sections of the CBC are beyond the scope of this supplement

2.2 CRC:

The Walpanel Wallshell® U-Shield Panels and Wallshell® V-Shield Panels, described in Sections 2.0 through 7.0 of the main evaluation report ESR-4333, comply with CRC Chapter 7, provided the design and installation are in accordance with the 2015 *International Residential Code*® (IRC) provisions noted in the main report.

The Walpanel Wallshell® U-Shield Panels and Wallshell® V-Shield Panels have not been evaluated under CRC Section R337 for use in the exterior design and construction of new buildings located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland—Urban Interface Area.

The products recognized in this supplement have not been evaluated for compliance with the *International Wildland—Urban Interface Code*®.

This supplement expires concurrently with the evaluation report, reissued October 2019.