ICC-ES Evaluation Report

ESR-2290

Issued April 1, 2010

This report is subject to re-examination in one year.

DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07450—Fiber-Reinforced Cementitious Panels
Section: 07460—Siding

REPORT HOLDER:

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EVALUATION SUBJECT:

HARDIESHINGLE™ PANELS, HARDIEPLANK ™ LAP SIDING, AND HARDIESHINGLE™ INDIVIDUAL SHINGLES

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)

Properties evaluated:

- Weather protection
- Structural
- Types I, II, III, and IV (noncombustible) construction
- Fire-resistance-rated construction
- Thermal resistance

2.0 USES

James Hardie fiber-cement panels, plank lap siding, and cladding shingles are used as exterior wall covering.

3.0 DESCRIPTION

3.1 General:

The exterior sidings are single-faced, cellulose fiber–reinforced cement (fiber-cement) products. Exterior sidings are identified as HardieShingle™ panel siding, HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding, and HardieShingle™ individual shingles.

The products comply with ASTM C 1186 as Grade II, Type A. The products have a flame-spread index of 0 and a smoke-developed index of 5 when tested in accordance with ASTM E 84. The products (HardiePlank™, Cemplank®, Sentry™, RFC®, and HardieShingle™) are classified as noncombustible when tested in accordance with ASTM E 136. For testing in accordance with ASTM C 177, conductance "K" and resistance "R" values for the products are as shown in Table 2 of this report. When tested in accordance with ASTM E 96, desiccant method, products with a thickness of $^1/_4$ inch (6.4 mm) and $^5/_{16}$ inch (7.5 mm) have demonstrated the permeance values given in Table 3 of this report.

3.2 Siding:

HardieShingle™ panels, HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding, and HardieShingle™ individual shingles may be used as siding on exterior walls. The exterior sidings are supplied either unprimed or primed for subsequent application of a compatible primer and/or exterior-grade top coat. Nominal product dimensions are noted in Table 1.

3.2.1 HardieShingle™ Panels: HardieShingle™ panels are available in a variety of finish textures and are offered in three configurations: half-round, staggered-edge, and square-edge.

3.2.2 HardiePlank™ (Cemplank®, Sentry™ and RFC®) Lap Siding: Hardiplank, Cemplank, Sentry and RFC lap sidings are available in a variety of finish textures.

3.2.3 HardieShingle™ Individual Shingles: HardieShingle™ individual shingles are available in a variety of finish textures.

3.3 Fasteners:

Fastener spacing must be as shown in the tables of this report. Fasteners must be corrosion-resistant steel.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 Walls: The maximum basic wind speeds for positive or negative transverse load resistance of HardieShingle™ panel, HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding, and HardieShingle™ individual shingles are presented in Tables 4 through 14.

4.2 Installation:

4.2.1 General: Installation must comply with this report, and a copy of this report must be available at all times on the jobsite during installation. All products are permitted to be cut to shape on-site by the score-and-snap method using a score-and-snap knife, a hand guillotine or a handsaw utilizing a carbide blade. A clear distance of 6 inches (152 mm) must be maintained between the siding

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and grade. Fasteners used to attach the products are described in Tables 4 through 14.

4.2.2 HardieShingle™ Panels: When installation is on braced wood or metal framing members or solid wood sheathing, a water-resistive barrier must be applied over the wood or metal framing members or solid wood sheathing in accordance with the applicable code. The first notched panel must be trimmed so the end aligns with the furthest stud and is secured above keyways [approximately 8 inches (203 mm) clearance from butt edges of panel] on 16-inch (406 mm) or 24-inch (610 mm) centers [maximum 13 3/4-inch (349 mm) centers for application only to minimum 7/16-inch-thick (11.1 mm) oriented strand board sheathing (OSB) complying with U.S. DOC PS2]. The panels must be fastened in accordance with the provisions of Table 4 of this report. A nominally 1¼-inch-wide-by-¼-inch-thick (31.8 mm by 6.4 mm) starter strip and a minimum 8 1/4-inch-wide (210 mm) HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding starter course are installed over the water-resistive barrier, with the bottom of the starter strip and starter course even with the bottom of the bottom plate. The siding must be applied horizontally commencing from the bottom course of a wall.

The second course, and every following even number course (i.e., fourth, sixth) must commence the equivalent of one full stud cavity from the straight edge end. The fasteners must penetrate through the previous course and into the substrate (framing members, wood structural panel sheathing or concrete masonry units).

When a course is interrupted by a window or doorway, the notched panel application pattern continues as if the wall were complete. Trim and corners must be installed and the siding must be finished in accordance with the manufacturer's application instructions. A 1/8-inch (3.2 mm) gap must be left at locations where the siding butts against door and window trim and at internal or external corners; such gaps must be flashed in accordance with the applicable code, then caulked. Vertical joints must occur over framing members and must be sealed with caulking or covered with battens.

4.2.3 HardiePlank™ (Cemplank®, Sentry™ and RFC®) Lap Siding: When installation is on braced wood or metal framing members or solid wood sheathing, the lap siding must be fastened either through the overlapping planks (face nailed) or through the top edge of single planks (blind nailed) in accordance with the provisions of Table 5 of this report. A water-resistive barrier must be applied over the wood or metal framing members or solid wood sheathing in accordance with the applicable code. Lap siding is also permitted to be fastened to a wall constructed of concrete masonry units complying with ASTM C 90, in accordance with Tables 6 through 11. The lap siding requires the use of a starter strip to set the first course on the proper angle and to create a drip edge. A nominally 1¼-inch-wide-by-5/16-inch-thick (31.8 mm by 7.9 mm) starter strip is installed over the water-resistive barrier, with the bottom of the starter strip even with the bottom of the bottom plate. The siding must be applied starting at the bottom course of the wall, with a minimum 1 1/4-inch-wide (31.8 mm) overlap at the top of each plank. Vertical joints must occur over studs, except where the "off-stud splice device" is installed or where the planks are installed to solid wood sheathing complying with the applicable code, and must be staggered on subsequent courses. Where the "off-stud splice device is installed, the splice device's bottom lip must be placed over the adjacent solid course of planks. The plank must then be fastened to the framing with corrosion-resistant fasteners. The abutting plank must be positioned and fastened into place ensuring that the lower edges of the two planks align. The metal device must be located centrally over the vertical joint.) Vertical joints between planks must be lightly butted or gapped and must be protected by one of the following methods: (a) sealed with caulking in accordance with the caulk manufacturer's published gapping requirements and caulking application instructions; or (b) covered with an H-section joint cover; or (c) located over a strip of nonperforated flashing complying with ASTM D 226, Type I felt, or other approved flashing. Trim and corners must be installed and the siding must be finished in accordance with the manufacturer's application instructions. A 1/8-inch (3.2 mm) gap must be left at locations where the siding butts against door and window trim and at internal or external corners; such gaps must be flashed in accordance with the applicable code, then caulked.

4.2.4 HardieShingle™ Individual Shingles: When installed on solid wood sheathing or equivalent, the cladding shingles are fastened in accordance with the provisions of either Table 12, 13 or 14 of this report. A water-resistive barrier in accordance with the applicable code must be applied over the substrate to which the shingles are attached.

The individual shingles require the use of a starter strip to set the first course on the proper angle and to create a drip edge. The nominally 1¼-inch-wide-by-¼-inch-thick (31.8 mm by 6.4 mm) starter strip and a minimum 8 1/4-inch-wide (210 mm) HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding starter course are installed over the water-resistive barrier with the bottom of the starter strip and starter course even with the bottom of the bottom plate. Shingles are spaced a maximum of ¼ inch (6.4 mm) apart leaving a minimum side lap of 1½ inches (38 mm) between the joints of successive courses. Fasteners must be spaced a minimum of ¾ inch (19 mm) and a maximum of 1 inch (25.4 mm) from shingle edges and must be positioned to be covered a nominal 1¼ inches (32 mm) by the succeeding shingle course; for 12-inch-wide (305 mm) shingles, the third nail (see Table 14) must be installed mid-span of the shingle. Nails must secure shingles but must not be over-driven. Trim and corners must be installed and the shingles must be finished in accordance with the manufacturer's application instructions. A 1/8-inch (3.2 mm) gap must be left at locations where the shingle butts against door and window trim and at internal or external corners; such gaps must be flashed in accordance with the applicable code, then caulked.

4.3 Fire-resistance-rated Assembly (HardiePlank™ Lap Siding):

The asymmetrical, load-bearing, one-hour fire-resistance-rated wall assembly must consist of nominally 2-by-4 wood studs spaced a maximum of 24 inches (610 mm) on center, with two top plates and a single bottom plate. One layer of 5/8-inch-thick (15.9) Type X gypsum wallboard complying with ASTM C 36 or ASTM C 1396, 48 inches (1219 mm) wide, must be applied vertically to the interior face of the studs and secured with minimum 1 3/4-inch-long (44 mm) cup-head gypsum wall board nails, spaced 7 inches (178 mm) on center at board edges and intermediate framing members. All board joints must be backed by framing. The 5/8-inch-thick (15.9 mm) Type X gypsum wallboard joints and nail heads must be finished in accordance with ASTM C 840 or GA216. The exterior face of the wall must be covered with one layer of 1/2-inch-thick (12.7 mm) Type X water-resistant core treated gypsum sheathing complying with ASTM C 36 or ASTM C 1396 and one layer of maximum 12-inch-wide (305 mm) HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding

lapped a minimum of $1^1/_4$ inches (32 mm). The $^1/_2$-inch-thick (12.7 mm) Type X water-resistant core-treated gypsum sheathing must be applied vertically to the exterior side of the framing members with vertical edges staggered 24 inches (610 mm) from the joints on the opposite side. All board joints must be backed by framing. The $^1/_2$-inch-thick (12.7 mm) Type X water-resistant core-treated gypsum sheathing must be fastened to the framing members with $1^3/_4$-inch-long (44 mm) roofing nails spaced 7 inches (178 mm) on center in the field and 4 inches (102 mm) on center along the perimeter of each board. The outer layer of $^5/_{16}$-inch-thick (7.5 mm), maximum 12-inch-wide (305 mm) HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding must be applied over the $^1/_2$-inch-thick (12.7 mm) Type X water-resistant core-treated gypsum sheathing by attaching $1^1/_2$-inch-wide (38 mm) HardiePlank™ (Cemplank®, Sentry™ and RFC®) starter strips attached through the gypsum sheathing into the bottom plate and 12-inch-wide (305 mm) HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding applied horizontally with a minimum nominally $1^1/_4$-inch (32 mm) head lap, and fastened with a single 6d corrosion-resistant common nail driven through the lapped planks at each stud.

The axial load must be the lesser of the following, provided structural consideration for axial, flexural and bearing perpendicular-to-grain stresses is in accordance with ANSI/AF&PA NDS-2005 (IBC or IRC):

1. Maximum 100 percent of full allowable axial compressive design load permitted for the wood species.
2. Maximum allowable wood axial stress of 0.78 F'_c, which must not exceed 0.78 F'_c at a slenderness ratio l_e/d of 33.

5.0 CONDITIONS OF USE

The HardieShingle™ panel, HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding, and HardieShingle™ individual shingles 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 The James Hardie® Building Products, Inc., products listed in this report must be installed in accordance with this report and the manufacturer's published installation instructions. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.

5.2 HardieShingle™ panel, HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding, and HardieShingle™ individual shingles must be installed on exterior walls braced in accordance with the applicable code.

5.3 Design wind speeds applied to the James Hardie® sidings described in this report must be determined in accordance with the applicable code and must be less than those shown in the wind speed tables in this report.

5.4 The fiber-cement products installed on exterior walls must be installed over a water-resistive barrier in accordance with the applicable code and this report.

5.5 For use in fire-resistance-rated construction, installation must be in accordance with Section 4.3.

5.6 Flashing must be installed at all penetrations and terminations in accordance with the applicable code.

5.7 The products are manufactured at the following locations, with quality control inspections by Intertek Testing Services, Inc.:

- Cleburne, Texas
- Peru, Illinois
- Plant City, Florida
- Pulaski, Virginia
- Sparks, Nevada
- Tacoma, Washington
- Waxahachie, Texas

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Fiber Cement Siding Used as Exterior Wall Siding (AC90), dated November 2008.

7.0 IDENTIFICATION

Pallets of the James Hardie® Building Products, Inc., HardieShingle™ panels, HardiePlank™ (Cemplank®, Sentry™ and RFC®) lap siding, and HardieShingle™ individual shingles must bear a label identifying the manufacturer's name and telephone number, the product name, the name of the inspection agency [Intertek Testing Services, Inc. (AA-690)], and the evaluation report number (ESR-2290).

TABLE 1—STANDARD NOMINAL PANEL, PLANK & SHINGLE DIMENSIONS

Product	Width (Inches)	Length or Height	Thicknesses (Inches)
HardiePlank™ lap siding	4, 5¼, 6, 6¼, 7¼, 7½, 8, 8¼, 9¼, 9 1/2 & 12	12, 14 feet	5/16
Cemplank® lap siding	5¼, 6, 6¼, 7¼, 7½, 8, 8¼, 9 1/2 & 12	12, 14 feet	5/16
RFC® lap siding	6¼, 7½, 8¼, 9½ & 12	12, 14 feet	5/16
HardieShingle™ panel (square & staggered edge)	48	16 inches	¼
HardieShingle™ panel (half round)	48	16, 19 inches	¼
HardieShingle™ individual shingles	6, 8, & 12	18 inches	¼

For **SI:** 1 inch = 25.4 mm, 1 ft = 305 mm

TABLE 2—"K" AND "R" VALUES FOR FIBER-CEMENT PRODUCTS

Product Thickness[3] (inch)	Thermal Conductance[1] K_{eff}=(Btu/hr-ft^2-°F)/inch	Thermal Resistance[1] R = 1/K_{eff}	Actual Thermal Conductance[2] (K_{eff})	Actual Thermal Resistance[2] (R)
¼	1.95	0.51	7.80	0.13
5/16	2.07	0.48	6.62	0.15

For **SI:** 1 inch = 25.4 mm, 1 Btu/h-ft^2-°F = 5.678 W/m^2-K

[1]Based on 1 inch of panel thickness.
[2]Actual value for panel thickness shown.

TABLE 3—PERMEANCE VALUES FOR FIBER-CEMENT PRODUCTS

Product Thickness (inch)	Permeance (perms)
¼	1.75
5/16	1.54

For **SI:** 1 inch = 25.4 mm, 1 perm = 57 mg/(s·m^2·Pa), per ASTM E96

TABLE 4—MAXIMUM BASIC WIND SPEED (fastest mile) (mph)

Product	Thick. (in.)	Fastener Type	Fastener Spacing (in.)	Frame Type[1]/[5]	Stud Spacing (in.)	Bldg. Height (ft.)	Exposure Category		
							B	C	D
HardieShingle™ Panel straight or half round Installation	1/4	0.083" shank ×0.187" HD x 1-1/2" long ring shank nail	13.75	Attached to 7/16" OSB sheathing only	NA	0-15 20 40 60	126 121 105 95	85 85 85 -	- - - -
HardieShingle™Panel Staggered Installation	1/4	0.083" shank ×0.187" HD x 1-1/2" long ring shank nail	13.75	Attached to 7/16" OSB sheathing only	NA	0-15 20 40 60	105 105 95 85	85 - - - -	- - - - -
HardieShingle™ Panel	1/4	0.083" shank ×0.187" HD x 1-1/2" long ring shank nail[2]	at each stud[3]	Nominal 2 × 4[1] or Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 158	137 137 126 116	116 116 105 105
HardieShingle™ Panel	1/4	0.083" shank ×0.187" HD x 1-1/2" long ring shank nail[2]	at each stud[3]	Nominal 2 × 4[1] or Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60 100	147 137 126 116 95	105 100 95 89 -	85 85 - - -

For **SI:** 1 foot = 305 mm, 1 inch = 25.4 mm, 1 mph – 0.44 m/s

[1]Values are for species of wood having a specific gravity of 0.40 or greater.
[2]For application to metal framing members, fasteners must be ET & F Fastening Systems, Inc. ET&F Panelfast® nail, ET & F No. AGS-100-0150, head diameter = 0.313 in., shank diameter = 0.100 in., length = 1.5 in. Metal studs must be maximum Fye 33 Ksi
[3]For application to ASTM C90 concrete masonry wall, fasteners must be either ET & F Fastening Systems, Inc. ET&F block nail (ET & F No. ASM-144-0125, head dia. = 0.30 in., shank dia. = 0.14 in., length = 1.25 in.) or Max System block nail (CP-C 832 W7-ICC, head dia. = 0.30 in., shank dia. = 0.15 in., length = 1.3 in.) applied at the equivalent fastener or stud spacing.
[4]Wind speed design assumptions per of ASCE 7.05: I = 1.0, K_{zt} = 1, K_d = 0.85, G_{cpi} = 0.18, G_{cpi} = 1.4 for height ≤ 60 feet and 1.80 for height > 60 feet.
[5]For application to wood framing or wood-based sheathing, the minimum fastener penetration must be 1 inch into framing or the sheathing thickness as applicable.

TABLE 5—MAXIMUM WIND SPEED (mph)

Product	Product (in.)		Fastener Type	Fastening Method	Frame Type[1]	Stud Spacing (in.)	Building Height (ft.)	Exposure Category		
	Thick.	Width						B	C	D
HardiePlank™	5/16	4	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	168	168	147
							20	168	168	147
							40	168	158	137
							60	168	147	126
HardiePlank™	5/16	6	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	168	168	147
							20	168	168	147
							40	168	158	137
							60	168	147	126
HardiePlank™	5/16	6¼	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	168	168	147
							20	168	168	137
							40	168	158	137
							60	168	147	126
HardiePlank™	5/16	7¼ 7½	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	168	158	126
							20	168	147	126
							40	168	137	121
							60	168	126	116
HardiePlank™	5/16	8	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	168	147	126
							20	168	147	126
							40	168	137	116
							60	168	126	105
HardiePlank™	5/16	8¼	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	168	147	126
							20	168	147	116
							40	168	131	116
							60	158	126	105
HardiePlank™	5/16	9¼ 9½	ET & F pin 0.100 × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	168	137	116
							20	168	137	116
							40	158	126	105
							60	147	116	105
HardiePlank™	5/16	12	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15	145	131	119
							20	145	127	116
							40	139	119	110
							60	131	114	106
							100	109	96	90
HardiePlank™	5/16	4	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	168	137	116
							20	168	137	116
							40	158	121	105
							60	147	116	100
HardiePlank™	5/16	6	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	168	137	116
							20	168	137	116
							40	158	121	105
							60	147	116	100
HardiePlank™	5/16	6¼	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	168	137	116
							20	168	126	110
							40	147	121	105
							60	137	116	95
HardiePlank™	5/16	7¼ 7½	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	168	116	100
							20	158	116	95
							40	137	105	89
							60	126	95	89
HardiePlank™	5/16	8	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	168	116	95
							20	158	116	95
							40	137	105	89
							60	126	95	85
HardiePlank™	5/16	8¼	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15	158	116	95
							20	158	105	95
							40	137	100	85
							60	126	95	85

TABLE 5—MAXIMUM WIND SPEED (mph) (Continued)

HardiePlank™	5/16	9¼ 9½	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	147 147 126 126	105 105 95 95	85 85 85 -
HardiePlank™	5/16	12	ET & F pin 0.100" × 1.5" × 0.25" HD	Face Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	106 106 102 96	96 93 87 -	87 85 - -
HardiePlank™	5/16	4	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	158 158 147 137	126 121 110 105	105 100 95 95
HardiePlank™	5/16	6	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	158 158 147 137	126 121 110 105	105 100 95 95
HardiePlank™	5/16	6¼	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	168 158 137 126	116 116 105 100	100 95 89 85
HardiePlank™	5/16	7¼ 7½	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	147 137 121 110	105 100 89 85	85 85 - -
HardiePlank™	5/16	8	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60 100	137 126 116 105 85	95 95 85 85 -	85 - - - -
HardiePlank™	5/16	8¼	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	137 126 116 105	95 95 85 -	- - - -
HardiePlank™	5/16	4	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	158 147 126 121	110 105 95 95	95 85 85 -
HardiePlank™	5/16	6	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	158 147 126 121	110 105 95 95	95 85 85 -
HardiePlank™	5/16	6¼	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60 100	147 137 126 105 85	105 100 95 89 -	85 85 - - -
HardiePlank™	5/16	7¼ 7½	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	137 126 116 105	95 95 85 85	85 - - -
HardiePlank™	5/16	8	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	126 116 100 95	85 85 - -	- - - -
HardiePlank™	5/16	8¼	ET & F Panelfast 0.100" × 1.5" × 0.313" HD	Blind Nailed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	116 105 95 85	- - - -	- - - -

TABLE 5—MAXIMUM WIND SPEED (mph) (Continued)

HardiePlank™	5/16	4	6d common 2" long	Face Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 168	168 168 158 147	147 147 137 137
HardiePlank™	5/16	6	6d common 2" long	Face Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 168	168 168 158 147	147 147 137 131
HardiePlank™	5/16	6¼	6d common 2" long	Face Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 168	168 168 158 147	147 137 137 131
HardiePlank™	5/16	7¼ 7½	6d common 2" long	Face Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 168	158 158 137 137	137 137 137 131
HardiePlank™	5/16	8	6d common 2" long	Face Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 168	158 158 137 131	126 126 116 116
HardiePlank™	5/16	8¼	6d common 2" long	Face Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 168	158 147 137 126	126 116 116 116
HardiePlank™	5/16	9¼ 9½	6d common 2" long	Face Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 158 137	147 137 137 137	121 116 110 105
HardiePlank™	5/16	12	6d common 2" long	Face Nailed	2 × 4 wood	16	0-15 20 40 60 100	125 125 120 113 94	113 110 103 98 -	103 101 95 91 -
HardiePlank™	5/16	4	6d common 2" long	Face Nailed	2 × 4 wood	24	0-15 20 40 60	137 137 137 137	126 126 116 105	105 105 95 95
HardiePlank™	5/16	6	6d common 2" long	Face Nailed	2 × 4 wood	24	0-15 20 40 60 100	137 137 137 137 116	126 126 116 105 95	105 105 95 95 85
HardiePlank™	5/16	6¼	6d common 2" long	Face Nailed	2 × 4 wood	24	0-15 20 40 60	137 137 137 137	126 116 110 105	105 100 95 95
HardiePlank™	5/16	7¼ 7½	6d common 2" long	Face Nailed	2 × 4 wood	24	0-15 20 40 60	137 137 137 137	116 110 105 100	95 95 89 85
HardiePlank™	5/16	8	6d common 2" long	Face Nailed	2 × 4 wood	24	0-15 20 40 60	137 137 126 121	116 105 95 95	95 85 85 85
HardiePlank™	5/16	8¼	6d common 2" long	Face Nailed	2 × 4 wood	24	0-15 20 40 60	137 137 126 121	110 105 95 89	95 89 85 85
HardiePlank™	5/16	9¼ 9½	6d common 2" long	Face Nailed	2 × 4 wood	24	0-15 20 40 60	137 137 116 116	105 100 95 85	85 85 - -

TABLE 5—MAXIMUM WIND SPEED (mph) (Continued)

HardiePlank™	5/16	12	6d common 2" long	Face Nailed	2 × 4 wood	24	0-15 20 40 60	102 102 98 93	93 90 - -	- - - -
HardiePlank™	5/16	4	No. 8-18 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 168	168 158 147 137	137 137 131 126
HardiePlank™	5/16	6	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 168	168 158 147 137	137 137 131 126
HardiePlank™	5/16	6¼	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 168	168 158 147 137	137 137 126 121
HardiePlank™	5/16	7¼ 7½	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 168	147 147 131 126	126 121 116 105
HardiePlank™	5/16	8	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 158	147 147 131 126	126 121 116 105
HardiePlank™	5/16	8¼	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 158	147 137 131 121	126 121 116 105
HardiePlank™	5/16	9¼ 9½	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	168 168 158 147	137 131 121 116	116 110 105 100
HardiePlank™	5/16	12	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	16	0-15 20 40 60	168 168 137 137	126 121 110 105	105 95 95 89
HardiePlank™	5/16	4	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	168 168 158 147	137 137 126 116	116 116 110 105
HardiePlank™	5/16	6	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	168 168 158 147	137 137 126 116	116 116 110 105
HardiePlank™	5/16	6¼	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	168 168 158 147	168 158 147 137	116 110 105 100

TABLE 5—MAXIMUM WIND SPEED (mph) (Continued)

HardiePlank™	5/16	7¼ 7½	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	168 168 147 137	126 121 110 105	105 105 95 95
HardiePlank™	5/16	8	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	168 168 147 137	126 121 110 105	105 100 95 89
HardiePlank™	5/16	8¼	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	168 168 137 131	121 121 105 100	105 100 95 89
HardiePlank™	5/16	9¼ 9½	No. 8 × 1-5/8" long × 0.323" HD ribbed bugle head screw	Face Screwed	Min. No. 20 ga. × 3.62" × 1.375" Metal C-stud	24	0-15 20 40 60	158 158 137 126	116 110 100 95	95 95 89 85
HardiePlank™	5/16	4	No. 11 ga. 1-1/4" long Galv. roofing Nail	Blind Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 168	168 168 147 147	147 137 131 126
HardiePlank™	5/16	6	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 168	168 168 147 147	147 137 131 126
HardiePlank™	5/16	6¼	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 168	168 158 147 137	137 137 126 126
HardiePlank™	5/16	7¼ 7½	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 168	147 147 137 126	126 126 116 110
HardiePlank™	5/16	8	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 158	147 137 131 126	121 116 110 110
HardiePlank™	5/16	8¼	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 168 158	147 137 130 121	121 121 110 105
HardiePlank™	5/16	9¼ 9½	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	16	0-15 20 40 60	168 168 158 147	137 131 116 116	116 110 105 100
HardiePlank™	5/16	12	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	16	0-15 20 40 60	168 158 137 126	121 116 110 100	100 95 89 89
HardiePlank™	5/16	4	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	24	0-15 20 40 60	168 168 168 168	147 137 126 121	121 121 110 105
HardiePlank™	5/16	6	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	24	0-15 20 40 60	168 168 168 158	147 137 126 121	121 121 110 105

TABLE 5—MAXIMUM WIND SPEED (mph) (Continued)

HardiePlank™	5/16	6¼	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	24	0-15 20 40 60	168 168 168 147	142 137 126 121	116 116 110 105
HardiePlank™	5/16	7¼ 7½	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	24	0-15 20 40 60	168 168 147 137	131 126 116 110	105 105 95 95
HardiePlank™	5/16	8	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	24	0-15 20 40 60	168 168 137 126	126 121 110 105	105 95 95 89
HardiePlank™	5/16	8¼	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	24	0-15 20 40 60	168 158 137 126	126 121 105 105	100 100 95 89
HardiePlank™	5/16	9¼ 9½	No. 11 ga. 1-1/4" long galv. roofing Nail	Blind Nailed	2 × 4 wood	24	0-15 20 40 60	158 147 131 121	116 105 100 95	95 89 85 85
HardiePlank™	5/16	4	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 168	168 158 147 137	137 137 126 121
HardiePlank™	5/16	6	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 168	168 158 147 137	137 137 126 121
HardiePlank™	5/16	6¼	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 158	158 158 147 137	142 131 126 121
HardiePlank™	5/16	7¼ 7½	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	16	0-15 20 40 60	168 168 168 158	152 147 137 126	126 116 116 110
HardiePlank™	5/16	8	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	16	0-15 20 40 60	168 168 158 147	147 137 126 121	116 116 105 105
HardiePlank™	5/16	8¼	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	16	0-15 20 40 60	168 168 158 147	142 137 126 116	121 116 110 105

TABLE 5—MAXIMUM WIND SPEED (mph) (Continued)

HardiePlank™	5/16	9¼ 9½	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	16	0-15 20 40 60	168 168 158 137	137 126 116 110	116 105 105 100
HardiePlank™	5/16	4	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15 20 40 60	168 168 152 147	137 131 121 116	116 110 105 100
HardiePlank™	5/16	6	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15 20 40 60	168 168 152 147	137 131 121 116	116 110 105 100
HardiePlank™	5/16	6¼	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15 20 40 60	168 168 158 147	137 131 121 116	116 105 105 100
HardiePlank™	5/16	7¼ 7½	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15 20 40 60	168 168 147 137	126 116 105 89	105 100 89 89
HardiePlank™	5/16	8	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15 20 40 60	168 158 142 131	121 116 105 100	100 100 89 89
HardiePlank™	5/16	8¼	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15 20 40 60	168 158 142 126	121 116 105 100	100 100 89 89
HardiePlank™	5/16	9¼ 9½	No. 8 x 1-1/4 in. long x 0.375 in. HD ribbed waferhead screws	Blind Screwed	Min. No. 20 ga. X 3.62" x 1.375" Metal C-stud	24	0-15 20 40 60	158 147 131 121	116 105 95 89	95 89 85 85
HardiePlank™	5/16	4	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	16	0-15 20 40 60	158 147 126 121	110 105 100 95	95 85 85 85
HardiePlank™	5/16	6	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	16	0-15 20 40 60	158 147 126 121	110 105 100 95	95 85 85 85

TABLE 5—MAXIMUM WIND SPEED (mph) (Continued)

HardiePlank™	5/16	6¼	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	16	0-15 20 40 60	158 147 126 121	110 105 95 89	85 85 85 -
HardiePlank™	5/16	7¼ 7½	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	16	0-15 20 40 60	137 137 116 110	100 95 89 85	85 85 - -
HardiePlank™	5/16	8	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	16	0-15 20 40 60	137 131 116 105	95 95 85 85	85 - - -
HardiePlank™	5/16	8¼	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	16	0-15 20 40 60	137 126 116 105	95 95 85 85	- - - -
HardiePlank™	5/16	9¼ 9½	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	16	0-15 20 40 60	126 121 105 100	89 85 - -	- - - -
HardiePlank™	5/16	4	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	24	0-15 20 40 60	131 131 105 100	95 89 85 -	- - - -
HardiePlank™	5/16	6	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	24	0-15 20 40 60	131 131 105 100	95 89 85 -	- - - -
HardiePlank™	5/16	6¼	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	24	0-15 20 40 60	126 121 105 95	89 85 - -	- - - -
HardiePlank™	5/16	7¼ 7½	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	24	0-15 20 40 60	121 116 100 95	85 85 - -	- - - -
HardiePlank™	5/16	8	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	24	0-15 20 40	116 105 95	- - -	- - -
HardiePlank™	5/16	8¼	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	24	0-15 20 40 60	116 105 95 85	- - - -	- - - -

TABLE 5—MAXIMUM WIND SPEED (mph) (Continued)

HardiePlank™	5/16	9¼ 9½	0.089" shank × 0.221" HD × 2" long galv. siding Nail	Face Nailed	2 × 4	24	0-15 20 40 60	105 95 85 85	- - - -	- - - -
HardiePlank™	5/16	4	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	16	0-15 20 40 60	168 158 137 126	116 110 105 100	95 95 89 85
HardiePlank™	5/16	5¼	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	16	0-15 20 40 60 100	162 162 155 147 122	147 143 133 127 108	133 130 123 118 101
HardiePlank™	5/16	6	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	16	0-15 20 40 60	168 158 137 126	116 110 105 100	95 95 89 85
HardiePlank™	5/16	6¼	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	16	0-15 20 40 60 100	151 151 145 137 114	137 133 124 119 101	125 122 115 111 94
HardiePlank™	5/16	7¼ 7½	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	16	0-15 20 40 60 100	140 140 134 127 105	127 123 115 110 93	115 113 106 102 87
HardiePlank™	5/16	8	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	16	0-15 20 40 60	137 131 116 105	100 95 89 85	85 85 - -
HardiePlank™	5/16	8¼	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	16	0-15 20 40 60 100	127 127 122 116 96	116 112 104 100 85	105 102 96 93 80
HardiePlank™	5/16	9¼ 9½	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	16	0-15 20 40 60 100	112 112 107 101 84	101 98 92 88 74	92 90 85 82 70
HardiePlank™	5/16	4	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	24	0-15 20 40 60	137 126 116 105	95 95 85 85	- - - -
HardiePlank™	5/16	6	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	24	0-15 20 40 60	137 126 116 105	95 95 85 85	- - - -

TABLE 5—MAXIMUM WIND SPEED (mph) (Continued)

HardiePlank™	5/16	6¼	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	24	0-15 20 40 60	137 126 110 100	85 85 - -	- - - -
HardiePlank™	5/16	7¼ 7½	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	24	0-15 20 40	116 116 100	85 85 -	- - -
HardiePlank™	5/16	8	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	24	0-15 20 40 60	116 116 95 89	85 85 - -	- - - -
HardiePlank™	5/16	8¼	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	24	0-15 20 40 60	116 110 100 89	85 - - -	- - - -
HardiePlank™	5/16	9¼ 9½	0.083" shank × 0.194" HD × 1¼" long galv. siding Nail	Blind Nailed	2 × 4	24	0-15 20 40 60	105 105 89 85	- - - -	- - - -
HardiePlank™	5/16	12	0.092" shank × 0.222" HD × 2.5" long galv. siding Nail	Face Nailed	2 × 4	16	0-15 20 40 60 100	124 124 119 113 93	113 109 102 98 -	102 100 94 91 -
HardiePlank™	5/16	12	0.092" shank × 0.222" HD × 2.5" long galv. siding Nail	Face Nailed	2 × 4	24	0-15 20 40 60	101 101 97 92	92 89 - -	- - - -
HardiePlank™	5/16	≤ 9½	0.091" shank, 0.221" HD, 1.5" long corrosion resistant Nail	Face Nailed through the overlap @ 12" o.c.	7/16" thick APA rated OSB sheathing or equivalent solid sheathing	-	0-15 20 40 60	131 126 105 100	95 89 85 -	- - - -

For **SI:** 1 inch = 25.4 mm, 1 foot = 305 mm, 1 mph = 0.44 m/s

[1]Values are for species of wood having a specific gravity of 0.42 or greater, unless otherwise noted.
[2]Face = Fastened through the overlapping plank. Blind = Fastened through the top edge of single plank.
[3]Wind speed design assumptions per ASCE 7-05: I = 1.0, K_{zt} = 1, K_d = 0.85, G_{cpi} = 0.18, G_{cpi} = 1.1, G_{cp} = 1.4 for height ≤ 60 feet and 1.80 for height > 60 feet.
[4]ET&F pin fasteners have knurled shanks.
[5]For attaching to wood framing, the minimum fastener penetration into studs must be 1 inch.
[6]Metal framing members must have a minimum F_y = 33 ksi.

TABLE 6 (100 mph)
MAXIMUM FASTENER SPACING (in.)
HardiePlank™ LAP SIDING FASTENED TO ASTM C 90 CONCRETE MASONRY WALL

Building Height (feet)	≤6½-inch wide			7¼- & 7½-inch wide			8- & 8¼-inch wide			9¼- & 9½-inch wide		
	Exposure			Exposure			Exposure			Exposure		
	B	C	D	B	C	D	B	C	D	B	C	D
0-15	24	24	24	24	24	24	24	24	21	24	23	19
20	24	24	24	24	24	23	24	24	20	24	21	18
30	24	24	24	24	24	21	24	22	19	24	20	17
40	24	24	23	24	24	20	24	21	18	24	19	16
50	24	24	22	24	22	19	24	20	17	24	18	15
60	24	24	22	24	22	19	24	19	17	23	17	15

For **SI:** 1 inch = 25.4 mm, 1 foot = 305 mm, 1 mph = 0.44 m/s

[1]Fasteners must be ET&F Fastening Systems, Inc. ET&F block Nail (ET & F No. ASM-144-125, head dia. = 0.30 in., shank dia. = 0.14 in., length = 1.25-in. long) or Max System block Nail (CP-C 832 W7-ICC, head dia. = 0.30 in., shank dia. = 0.15 in., length = 1.3 in.).
[2] Maximum basic wind speed (3-second gust) must be 100 mph.
[3]Interpolation to address building height and other plank widths is permitted.
[4]The lap conceals the fasteners of the previous course (Blind Nailed).

TABLE 7 (110 mph)
ALLOWABLE FASTENER SPACING (in.)
HardiePlank™ LAP SIDING FASTENED TO ASTM C 90 CONCRETE MASONRY WALL

Building Height (feet)	≤6½-inch wide			7¼- & 7½-inch wide			8- & 8¼-inch wide			9¼- & 9½-inch wide		
	Exposure			Exposure			Exposure			Exposure		
	B	C	D	B	C	D	B	C	D	B	C	D
0-15	24	24	22	24	24	19	24	21	17	23	19	15
20	24	24	21	24	22	18	24	20	16	23	18	15
30	24	24	20	24	20	17	24	18	15	23	16	14
40	24	22	19	24	19	16	24	17	15	21	15	13
50	24	21	18	24	18	16	22	16	14	20	14	12
60	24	20	18	23	18	15	21	16	14	19	14	12

For **SI:** 1 inch = 25.4 mm, 1 foot = 305 mm, 1 mph = 0.44 m/s

[1]Fasteners must be ET&F Fastening Systems, Inc. ET&F block Nail (ET & F No. ASM-144-125, head dia. = 0.30 in., shank dia. = 0.14 in., length = 1.25-in. long) or Max System block Nail (CP-C 832 W7-ICC, head dia. = 0.30 in., shank dia. = 0.15 in., length = 1.3 in.).
[2]Maximum basic wind speed (3-second gust) must be 110 mph.
[3]Interpolation to address building height and other plank widths is permitted.
[4]The lap conceals the fasteners of the previous course (Blind Nailed).

TABLE 8 (120 mph)
MAXIMUM FASTENER SPACING (in.)
HardiePlank™ LAP SIDING FASTENED TO ASTM C 90 CONCRETE MASONRY WALL

Building Height (feet)	≤6½-inch wide			7¼- & 7½-inch wide			8- & 8¼-inch wide			9¼- & 9½-inch wide		
	Exposure			Exposure			Exposure			Exposure		
	B	C	D	B	C	D	B	C	D	B	C	D
0-15	24	23	19	24	20	17	21	18	15	19	16	13
20	24	22	18	24	19	16	21	17	14	19	15	12
30	24	20	17	24	17	15	21	15	13	19	14	12
40	24	19	16	22	16	14	20	14	12	18	13	11
50	24	18	16	21	16	13	18	14	12	17	12	11
60	23	17	15	20	15	13	18	13	11	16	12	10

For **SI:** 1 inch = 25.4 mm, 1 foot = 305 mm, 1 mph = 0.44 m/s

[1]Fasteners must be ET&F Fastening Systems, Inc. ET&F block Nail (ET & F No. ASM-144-125, head dia. = 0.30 in., shank dia. = 0.14 in., length = 1.25-in. long) or Max System block Nail (CP-C 832 W7-ICC, head dia. = 0.30 in., shank dia. = 0.15 in., length = 1.3 in.).
[2]Maximum basic wind speed (3-second gust) must be 120 mph.
[3]Interpolation to address building height and other plank widths is permitted.
[4]The lap conceals the fasteners of the previous course (Blind Nailed).

TABLE 9 (130 mph)
ALLOWABLE FASTENER SPACING (in.)
HardiePlank™ LAP SIDING FASTENED TO ASTM C 90 CONCRETE MASONRY WALL

Building Height (feet)	≤6½-inch wide			7¼- & 7½-inch wide			8- & 8¼-inch wide			9¼- & 9½-inch wide		
	Exposure			Exposure			Exposure			Exposure		
	B	C	D	B	C	D	B	C	D	B	C	D
0-15	24	20	16	21	17	14	18	15	12	16	14	11
20	24	19	15	21	16	13	18	14	12	16	13	11
30	24	17	14	21	15	12	18	13	11	16	12	10
40	22	16	14	19	14	12	17	12	11	15	11	9
50	21	15	13	18	13	11	16	12	10	14	11	9
60	20	15	13	17	13	11	15	11	10	13	10	9

For **SI:** 1 inch = 25.4 mm, 1 foot = 305 mm, 1 mph = 0.44 m/s

[1]Fasteners must be ET&F Fastening Systems, Inc. ET&F block Nail (ET & F No. ASM-144-125, head dia. = 0.30 in., shank dia. = 0.14 in., length = 1.25-in. long) or Max System block Nail (CP-C 832 W7-ICC, head dia. = 0.30 in., shank dia. = 0.15 in., length = 1.3 in.).
[2]Maximum basic wind speed (3 second gust) must be 130 mph.
[3]Interpolation to address building height and other plank widths is permitted.
[4]The lap conceals the fasteners of the previous course (Blind Nailed).

TABLE 10 (140 mph)
ALLOWABLE FASTENER SPACING (in.)
HardiePlank™ LAP SIDING FASTENED TO ASTM C 90 CONCRETE MASONRY WALL

Building Height (feet)	≤6½-inch wide			7¼- & 7½-inch wide			8- & 8¼-inch wide			9¼- & 9½-inch wide		
	Exposure			Exposure			Exposure			Exposure		
	B	C	D	B	C	D	B	C	D	B	C	D
0-15	21	17	14	18	15	12	16	13	11	14	12	10
20	21	16	13	18	14	12	16	12	10	14	11	9
30	21	15	12	18	13	11	16	11	10	14	10	9
40	19	14	12	16	12	10	15	11	9	13	9	8
50	18	13	11	15	11	10	14	10	9	12	9	8
60	17	13	11	15	11	10	13	10	9	12	9	8

For **SI:** 1 inch = 25.4 mm, 1 foot = 305 mm, 1 mph = 0.44 m/s

[1]Fasteners must be ET&F Fastening Systems, Inc. ET&F block Nail (ET & F No. ASM-144-125, head dia. = 0.30 in., shank dia. = 0.14 in., length = 1.25-in. long) or Max System block Nail (CP-C 832 W7-ICC, head dia. = 0.30 in., shank dia. = 0.15 in., length = 1.3 in.).
[2]Maximum basic wind speed (3-second gust) must be 140 mph.
[3]Interpolation to address building height and other plank widths is permitted.
[4]The lap conceals the fasteners of the previous course (Blind Nailed).

TABLE 11 (150 mph)
ALLOWABLE FASTENER SPACING (in.)
HardiePlank™ LAP SIDING FASTENED TO ASTM C 90 CONCRETE MASONRY WALL

Building Height (feet)	≤6½-inch wide			7¼- & 7½-inch wide			8- & 8¼-inch wide			9¼- & 9½-inch wide		
	Exposure			Exposure			Exposure			Exposure		
	B	C	D	B	C	D	B	C	D	B	C	D
0-15	18	15	12	16	13	11	14	11	9	12	10	8
20	18	14	12	16	12	10	14	11	9	12	10	8
30	18	13	11	16	11	9	14	10	8	12	9	7
40	16	12	10	14	10	9	13	9	8	11	8	7
50	15	12	10	13	10	9	12	9	8	11	8	7
60	15	11	10	13	10	8	11	8	7	10	8	7

For **SI:** 1 inch = 25.4 mm, 1 foot = 305 mm, 1 mph = 0.44 m/s

[1]Fasteners must be ET&F Fastening Systems, Inc. ET&F block Nail (ET & F No. ASM-144-125, head dia. = 0.30 in., shank dia. = 0.14 in., length = 1.25-in. long) or Max System block Nail (CP-C 832 W7-ICC, head dia. = 0.30 in., shank dia. = 0.15 in., length = 1.3 in.).
[2]Maximum basic wind speed (3-second gust) must be 150 mph.
[3]Interpolation to address building height and other plank widths is permitted.
[4]The lap conceals the fasteners of the previous course (Blind Nailed).

TABLE 12—ALLOWABLE BASIC WIND SPEEDS (mph) FOR HardieShingle™ INDIVIDUAL SHINGLE EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				B	C
Minimum 15/32 inch thick plywood complying with DOC PS 1-95	Min. 0.121 in. shank x 0.371 in. HD x 1-1/4 in. long corrosion resistant roofing Nail	8 inch exposure 2 roofing nails 9 inches from butt edge	0-15 20 40 60 100	126 126 126 126 95	110 105 95 89
		7 inch exposure 2 roofing nails 8 inches from butt edge	0-15 20 40 60 100	126 126 126 126 110	126 121 110 105 89
		6 inch exposure 2 roofing nails 7 inches from butt edge	0-15 20 40 60 100	126 126 126 126 121	126 126 121 116 100

For **SI:** 1 foot = 305 mm, 1 inch = 25.4 mm, 1 mph = 0.44 m/s

[1]Table values are based on an importance factor of 1.0.

TABLE 13—ALLOWABLE BASIC WIND SPEEDS (mph) FOR HardieShingle™ INDIVIDUAL SHINGLE EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				B	C
Minimum 7/16 inch thick OSB sheathing complying with DOC-PS 2-92	Min. 0.091 in. shank x 0.221 in. HD x 1-1/2 in. long corrosion resistant siding Nail	8 inch exposure 2 siding nails 9 inches from butt edge	0-15 20 40 60	126 126 105 100	89 89 85
		7 inch exposure 2 siding nails 8 inches from butt edge	0-15 20 40 60	126 126 121 116	105 100 95 89
		6 inch exposure 2 siding nails 7 inches from butt edge	0-15 20 40 60 100	126 126 126 126 100	116 110 105 95 85

For **SI:** 1 foot = 305 mm, 1 inch = 25.4 mm, 1 mph = 0.44 m/s

[1]Table values are based on an importance factor of 1.0.

TABLE 14—ALLOWABLE BASIC WIND SPEEDS (mph) FOR HardieShingle™ INDIVIDUAL SHINGLE EXTERIOR WALL FINISH

Sheathing Type	Fastener Type	Weather Exposure and Fastener Location	Height of Building (feet)	Exposure Category	
				B	C
Minimum 7/16 inch thick OSB sheathing complying with DOC-PS 2-95	Min. 0.091 in. shank x 0.221 in. HD x 1-1/2 in. long corrosion resistant siding Nail	8 in. exposure 3 siding nails per 12 in. wide, 9 in. from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60	116 110 100 95	116 110 100 95
		7 in. exposure 3 siding nails per 12 in. wide, 8 inches from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60	126 121 110 105	126 121 110 105
		6 in. exposure 3 siding nails per 12 in. wide, 7 inches from butt edge, 2 siding nails per 6 & 8 in. wide	0-15 20 40 60 100	126 126 126 121 85	126 126 126 121 85

For **SI:** 1 foot = 305 mm, 1 inch = 25.4 mm, 1 mph = 0.44 m/s

[1]Table values are based on an importance factor of 1.0.

ICC-ES Evaluation Report

ESR-2290 Supplement

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This report is subject to re-examination in one year.

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DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07450—Fiber-Reinforced Cementitious Panels
07460—Siding

REPORT HOLDER:

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EVALUATION SUBJECT:

HARDIESHINGLE™ PANELS, HARDIEPLANK ™ LAP SIDING, AND HARDIESHINGLE™ INDIVIDUAL SHINGLES

PURPOSE OF THE SUPPLEMENT

This supplement is issued to indicate that the fiber-cement panels, plank lap siding and cladding shingles described in the master report ESR-2290 may be used where noncombustible or ignition-resistant exterior walls complying with Section 1403.4 of the 2007 *California Building Code* are required, provided installation is in accordance with the master report and the additional requirements of Sections 1405.15, 1405.16, and 1405.17of the 2007 *California Building Code*.

The exterior wall coverings may be used in the construction of new buildings located in Fire Hazard Severity Zones within State Responsibility Areas or any Wildland-Urban Interface Fire Area, provided installation is also in accordance with the master report and the additional requirements of Sections 701A.3 and 704A.3 of the 2007 *California Building Code.*

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

This supplement expires concurrently with the master report issued on April 1, 2010.

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