

ICC-ES Evaluation Report

ESR-1668

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DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION

Section: 07 46 46—Fiber-Cement Siding

REPORT HOLDER:

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EVALUATION SUBJECT:

WEATHERBOARDS™ FIBERCEMENT LAP SIDING,
VERTICAL PANEL SIDING, SOFFIT PANELS AND
SHAPES SIDING

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2009 and 2006 *International Building Code*® (IBC)
- 2009 and 2006 *International Residential Code*® (IRC)

Properties evaluated:

- Weather resistance
- Transverse loading
- Surface burning characteristics
- Fire-resistive-rated construction

2.0 USES

Certainteed's WeatherBoards™ fibercement lap and panel products are intended for use as exterior wall coverings and soffits.

3.0 DESCRIPTION

Weatherboards™ products are autoclaved, single-faced wall coverings manufactured from a proprietary mixture of cellulose fiber, portland cement, silica, clay or fly ash and limestone. See Table 1 for dimensions and surface texture. Design wind pressures must be determined based on Section 1609 of the IBC except that design wind pressures for buildings being designed in accordance with the IRC may be determined based on Table 2, when applicable. See Table 3 for allowable wind pressures, fastener schedules, and installation requirements. Wind pressures noted in Table 3 are allowable values for positive and negative directions. See Table 4 for allowable fastener withdrawal capacities.

WeatherBoards™ exhibit a flame-spread index of 25 or less and smoke-developed index of 450 or less when tested in accordance with ASTM E 84.

WeatherBoards™ lap and vertical panel siding products are recognized in this report as a component of a one-hour, fire-resistance-rated, limited-load-bearing, wood-stud wall assembly, where installed in accordance with Section 4.6 of this report.

Lap siding, vertical panel siding, soffit panels and shapes siding come in lengths and widths as described in Table 1. All edges are square. Shapes siding is a panel-type product available with various designs.

4.0 INSTALLATION

4.1 General:

The lap, vertical panel and shapes sidings must be installed over nominally 2-inch-thick wood or minimum No. 20 gage [0.036 inch (0.91 mm)], 3.625-inch-by-1.375-inch (92 by 34.9 mm), 33 ksi steel, C-stud framing members. A water-resistive barrier complying with the applicable code must be installed under the siding. A water-resistive barrier and sheathing must be installed in accordance with the applicable code. Fasteners must be spaced no closer than $\frac{3}{4}$ inch (19.1 mm) from the panels' horizontal edges, and must be no closer than $\frac{3}{8}$ inch (9.5 mm) from the panel vertical edges. Fasteners shall be corrosion-resistant and sized as specified in Tables 3 and 4 of this report. Installation must comply with this report and the published manufacturer's application instructions.

Where nonstructural or nonfastener base structural sheathing is used under the siding, fastener length must be increased to provide a minimum $1\frac{1}{4}$ -inch (31.8 mm) penetration into the framing. Blind fastening is acceptable on lap siding installed according to the assemblies noted in Table 3 and Figure 2 of this report.

The installation of the WeatherBoards™ must be in accordance with the limitations described in Section 1405.16 of the 2009 IBC or Section 1405.15 of the 2006 IBC, as applicable, for all construction types.

4.2 Lap Siding:

Lap siding must be applied horizontally, commencing from the bottom of a wall, and with a minimum $1\frac{1}{4}$ -inch-wide (31.8 mm) overlap at the top of each board. Vertical joints between planks must be over studs and must be staggered on subsequent courses. These vertical joints between planks must be lightly butted or gapped $\frac{1}{8}$ inch (3.2 mm), and must be protected by one of the following methods: (a) sealed with caulking; or (b) covered with an H-section joint

cover; or (c) located over a strip of flashing. Horizontal joints must be flashed with Z-flashing and blocked with solid wood framing. A $\frac{1}{8}$ -inch (3.2 mm) gap must be left at locations where the siding butts against door and window trim and at corners; such gaps must be flashed in accordance with the applicable code, then caulked. Trim and corners must be installed and the siding must be finished in accordance with the manufacturer's application instructions. A clear distance of 6 inches (152 mm) must be maintained between the siding and the ground.

4.3 Vertical Panel Siding:

The vertical panel siding must be applied with the long dimension of the panel in the vertical direction parallel to the framing. All panel edges must be backed by nominally 2-inch or thicker wood or minimum No. 20 gage [0.036 inch (0.91 mm)], 3.625-inch-by-1.375-inch (92 by 34.9 mm), steel C-stud framing members. Vertical joints must be lightly butted, must occur over framing members, and must be sealed with caulking or covered with battens. Horizontal joints must be weatherproofed by leaving a $\frac{3}{8}$ -inch (9.5 mm) gap, which must be flashed with corrosion-resistant metal "Z" flashing and caulked. Where siding butts against door and window trim, and at corners, a $\frac{1}{8}$ -inch (3.2 mm) gap must be left and flashed in accordance with the applicable code and caulked. Trim and corners must be installed and the siding must be finished in accordance with the manufacturer's published application instructions. A clear distance of 6 inches (152 mm) must be maintained between the siding and the ground.

4.4 Soffit Panels:

The soffit panels must be attached to framing spaced a maximum of 24 inches (610 mm) on center, with the long dimension of the panel perpendicular to framing. Fasteners and fastener spacing must be as described for vertical siding in Section 4.3 and Tables 3 and 4. Fasteners must be stainless steel or hot-dipped galvanized, and fastener spacing must not exceed 6 inches (152 mm) on center.

4.5 Shapes Panels:

Shapes siding is installed as is the lap siding noted in Section 4.2.

4.6 Transverse Wind Pressures:

WeatherBoards™ must be attached to wall framing so that the allowable transverse wind load pressure (based on the siding size, framing spacing, and fastening schedule) noted in Table 3 exceeds the design wind pressures of the applicable code or as noted in Table 2 of this report. Additionally, the allowable fastener withdrawal capacity for the fastener, noted in Table 4 (based on fastener type specified for the assembly in Table 3, penetration, and framing species) must exceed the minimum fastener load in pounds per fastener specified in Table 3.

4.7 One-hour Fire-resistance-rated Assembly:

The lap and vertical panel siding products noted in Table 1 are recognized as components of one-hour, fire-resistance-rated, limited-load-bearing, wood-stud wall

assemblies when constructed in accordance with Figure 1 of this report. Wall design is limited to the allowable stress design approach, using the edition of the National Design Specification for Wood Construction (NDS) specified in the applicable code. The allowable axial load for a wall assembly constructed with lap siding must be the lesser of the following: (a) 49 percent or less of the allowable axial design stress calculated in accordance with the NDS referenced in the applicable code; (b) from the 2005 NDS, 1,200 pounds (5335 N) per 2-by-4 stud or 228.5 psi (1.57 N/mm²) when No. 2 southern pine studs are used in the construction of a wall having an unbraced height of 9 feet (2743 mm); (c) 0.78 F'_c ; or (d) 0.78 of the stress calculated for studs with a slenderness ratio l_e/d of 33. Allowable axial load for a wall assembly constructed with vertical panel siding must be the lesser of the following: (a) 73.4 percent of the allowable axial design stress calculated in accordance with the NDS referenced in the applicable code; (b) from the 2005 NDS, 1,800 pounds (8000 N) per 2-by-4 stud or 342.9 psi (2.37 N/mm²) when No. 2 southern pine studs are used in construction of a wall having an unbraced height of 9 feet (2743 mm); or (c) 0.78 F'_c ; or (d) 0.78 of the stress calculated for studs with a slenderness ratio l_e/d of 33.

5.0 CONDITIONS OF USE

The Certainteed Fibercement products 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 products must be installed in accordance with this report and the manufacturer's instructions. In the event of a conflict, the instructions in this report shall govern.
- 5.2 The products must be subject to the limitations described in Section 4.1 for all construction types.
- 5.3 The products have not been evaluated for racking resistance. Walls must be braced by other means as required by the applicable code.
- 5.4 The products are manufactured in Terre Haute, Indiana, Roaring River, North Carolina, and White City, Oregon, under a quality control program with inspections by QAI Laboratories, Inc. (AA-723).

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Fiber Cement Panels Used as Exterior Wall Siding (AC90), dated October 2005 (editorially revised January 2011).
- 6.2 Report of testing in accordance with ASTM E 119 and ASTM E 84.

7.0 IDENTIFICATION

The lap siding, vertical panel siding, soffit panels, and shapes siding must bear a label noting the product name; the manufacturer's name; the name of the inspection agency (QAI Laboratories, Inc.); the manufacturing plant location; and the evaluation report number (ESR-1668).

**TABLE 1—DESCRIPTION OF WEATHERBOARDS™
LAP SIDING, VERTICAL SIDING AND SOFFIT PANELS**

PRODUCT TYPE		WIDTH	LENGTH	THICKNESS
Lap Siding	Smooth	5 1/4, 6 1/4, 7 1/4, 8 1/4, 9 1/4, 12 inches	12 feet	5/16 inch
	Cedar	5 1/4, 6 1/4, 7 1/4, 8 1/4, 9 1/4, 12 inches	12 feet	5/16 inch
	Smooth Beaded	7 1/2 inches	12 feet	5/16 inch
	Textured Beaded	7 1/2 inches	12 feet	5/16 inch
	Textured Dutch Lap	8 1/4 inches	12 feet	5/16 inch
Shapes Siding	Perfection Shingle	8 1/4 inches	12 feet	7/16 inch
	Random Square Straight Edge	16 inches (7" exposure)	48 inches	5/16 inch
	Random Square Staggered Edge	16 inches (7" exposure)	48 inches	5/16 inch
	Half Rounds	16 inches (7" exposure)	48 inches	5/16 inch
	Octagons	16 inches (7" exposure)	48 inches	5/16 inch
Vertical Siding	Stucco	4 feet	8, 9, 10 feet	5/16 inch
	Cedar 8" Groove	4 feet	8, 9, 10 feet	5/16 inch
	Cedar No Groove	4 feet	8, 9, 10 feet	5/16 inch
	Smooth	4 feet	8, 9, 10 feet	5/16 inch
Soffit Panels	Cedar	12, 16, 24 inches	12 feet	1/4 inch
	Cedar Ventilated	12, 16, 24 inches	12 feet	1/4 inch
	Smooth	12, 16, 24 inches	12 feet	1/4 inch
	Smooth Ventilated	12, 16, 24 inches	12 feet	1/4 inch

For SI: 1 inch = 25.4 mm; 1 foot = 304.8 mm.

INSTRUCTIONS FOR THE USE OF TABLES 2 and 3

- STEP 1.** Determine the design wind pressure using Section 1609 of the IBC. For buildings designed in accordance with the IRC, the design wind pressures may be determined from Table 2, when applicable.
- STEP 2.** Based on the CertainTeed WeatherBoards™ product, the stud spacing, and the specified fastening schedule from Table 3 for the applicable code, determine the allowable wind pressure and the nail load for the assembly.
- STEP 3.** Compare the allowable wind pressure (from Table 3) to the design wind pressure. If the design wind pressure is larger than the allowable design wind pressure (from Table 3), choose another assembly from Table 3 such that allowable design pressure (from Table 3) is greater than or equal to the design wind pressure.

TABLE 2—DESIGN WIND PRESSURES, IRC ONLY

WIND VELOCITY, mph	85	90	100	110	120	130	140	150
Mean Roof Height	Wall Wind Pressures, lbf/ft² (negative)							
15 ft	21.1	23.6	29.2	35.2	42.0	49.2	57.1	65.6
20 ft	22.4	25.2	31.1	37.5	44.8	52.5	60.9	69.9
25 ft	23.5	26.3	32.5	39.3	46.8	54.9	63.7	73.2
30 ft	24.4	27.3	33.7	40.7	48.6	57.0	66.1	75.9
40 ft	25.9	29.1	35.9	43.4	51.7	60.6	70.3	80.8
50 ft	27.1	30.4	37.6	45.4	54.1	63.5	73.6	84.6
60 ft	28.2	31.6	39.0	47.1	56.2	65.9	76.5	87.8

¹ Design pressures taken from Table R301.2(2), Wall Zone 5, Effective Wind Area of 10, multiplied by the adjustment factor for building height and exposure from Table R301.2(3). Based on Exposure C.

² For buildings designed in accordance with the IBC or when the provisions of this table are not applicable, the design wind pressure must be determined using Section 1609 of the IBC.

³ Design wind pressures specified above must be less than the applicable maximum allowable wind load pressure specified in Table 3 of this report.

⁴ For SI: 1 mph = 1.61 km/h; 1 lbf/ft² = 47.8803 kPa; 1 ft = 304.8 mm.

TABLE 3—ALLOWABLE WIND PRESSURES AND REQUIRED FASTENER SCHEDULE

PRODUCT	PRODUCT DIMS (in.)		FASTENER TYPE	FASTENING METHOD ¹	FRAMING TYPE	FRAMING SPACING (in)	ALLOWABLE WIND PRESSURES (lb/ft ²) AND FASTENER LOAD (lbs) ²
	Thick.	Width					
Vertical Siding	5/16	48	8d box nails	Face nailed	2x4 #2 SPF	16	51 Fastener Load: 45
Vertical Siding	5/16	48	8d box nails	Face nailed	2x4 #2 SPF	24	34 Fastener Load: 45
Vertical Siding	5/16	48	6d box nails	Face nailed 4" edge 8" field	2x4 #2 SPF	16	44 Fastener Load: 39
Vertical Siding	5/16	48	6d box nails	Face nailed 4" edge 8" field	2x4 #2 SPF	24	31 Fastener Load: 41
Vertical Siding	5/16	48	6d box nails	Face nailed 6" edge 12" field	2x4 #2 SPF	16	35 Fastener Load: 47
Vertical Siding	5/16	48	6d box nails	Face nailed 6" edge 12" field	2x4 #2 SPF	24	23 Fastener Load: 47
Vertical Siding	5/16	48	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Face screwed 12" edge 12" field	Min. 20 ga., 3.625"x 1.375" Metal C-stud	24	18 Fastener Load: 37
Vertical Siding	5/16	48	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Face screwed 12" edge 12" field	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	25 Fastener Load: 33
12" Lap Siding	5/16	12.00	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Face screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	23 Fastener Load: 28
12" Lap Siding	5/16	12.00	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Blind screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	25 Fastener Load: 28
12" Lap Siding	5/16	12.00	8d box nails	Face nailed	2x4 #2 SPF	24	49 Fastener Load: 88
9 1/4" Lap Siding	5/16	9.25	8d box nails	Face nailed	2x4 #2 SPF	16	76 Fastener Load: 70
9 1/4" Lap Siding	5/16	9.25	8d box nails	Face nailed	2x4 #2 SPF	24	64 Fastener Load: 88
9 1/4" Lap Siding	5/16	9.25	6d box nails	Face nailed	2x4 #2 SPF	16	50 Fastener Load: 46
9 1/4" Lap Siding	5/16	9.25	6d box nails	Blind nailed	2x4 #2 SPF	24	25 Fastener Load: 34
9 1/4" Lap Siding	5/16	9.25	6d 2" Roofing nails, HD Galv., Maze Nails #HD-105	Blind nailed	2x4 #2 SPF	16	40 Fastener Load: 35
9 1/4" Lap Siding	5/16	9.25	6d 2" Roofing nails, HD Galv., Maze Nails #HD-105	Blind nailed	2x4 #2 SPF	24	22 Fastener Load: 29

TABLE 3—ALLOWABLE WIND PRESSURES AND REQUIRED FASTENER SCHEDULE (continued)

PRODUCT	PRODUCT DIMS (in.)		FASTENER TYPE	FASTENING METHOD ¹	FRAMING TYPE	FRAMING SPACING (in)	ALLOWABLE WIND PRESSURES (lb/ft ²) AND FASTENER LOAD (lbs) ²
	Thick.	Width					
9 1/4" Lap Siding	5/16	9.25	7d nails, HD Galv., Maze Nails #225HD-022	Face nailed	2x4 #2 SPF	16	68 Fastener Load: 61
9 1/4" Lap Siding	5/16	9.25	7d nails, HD Galv., Maze Nails #225HD-022	Face nailed	2x4 #2 SPF	24	45 Fastener Load: 60
9 1/4" Lap Siding	5/16	9.25	7d nails, HD Galv., Maze Nails #225HD-022 into OSB	Face nailed	2x4 #2 SPF	16	91 Fastener Load: 81
9 1/4" Lap Siding	5/16	9.25	7d nails, HD Galv., Maze Nails #225HD-022 into OSB	Face nailed	2x4 #2 SPF	24	70 Fastener Load: 93
9 1/4" Lap Siding	5/16	9.25	6d nails, HD Galv., Maze Nails #200HD-018 into OSB	Blind nailed	2x4 #2 SPF w/ 7/16" OSB	16	83 Fastener Load: 74
9 1/4" Lap Siding	5/16	9.25	6d nails, HD Galv., Maze Nails #200HD-018 into OSB	Blind nailed	2x4 #2 SPF w/ 7/16" OSB	24	67 Fastener Load: 90
9 1/4" Lap Siding	5/16	9.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Face screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	20 Fastener Load: 18
9 1/4" Lap Siding	5/16	9.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Blind screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	19 Fastener Load: 18
9 1/4" Lap Siding	5/16	9.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Blind screwed	Min. 16 ga., 3.625"x 1.375" Metal C-stud	16	32 Fastener Load: 29
9 1/4" Lap Siding	5/16	9.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500 into OSB	Blind screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud w/ 7/16" OSB	16	23 Fastener Load: 21
9 1/4" Lap Siding	5/16	9.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500 into OSB	Blind screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud w/ 7/16" OSB	24	22 Fastener Load: 30
9 1/4" Lap Siding	5/16	9.25	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Blind nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud w/ 7/16" OSB	16	22 Fastener Load: 20
9 1/4" Lap Siding	5/16	9.25	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Blind nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud w/ 7/16" OSB	24	20 Fastener Load: 27
8 1/4" Lap Siding	5/16	8.25	7d nails, HD Galv., Maze Nails #225HD-022	Face nailed	2x4 #2 SPF	16	45 Fastener Load: 35
8 1/4" Lap Siding	5/16	8.25	7d nails, HD Galv., Maze Nails #225HD-022	Face nailed	2x4 #2 SPF	24	37 Fastener Load: 43
8 1/4" Lap Siding	5/16	8.25	6d 2" Roofing nails, HD Galv., Maze Nails #HD-105	Blind nailed	2x4 #2 SPF	16	41 Fastener Load: 32
8 1/4" Lap Siding	5/16	8.25	6d 2" Roofing nails, HD Galv., Maze Nails #HD-105	Blind nailed	2x4 #2 SPF	24	32 Fastener Load: 37

TABLE 3—ALLOWABLE WIND PRESSURES AND REQUIRED FASTENER SCHEDULE (continued)

PRODUCT	PRODUCT DIMS (in.)		FASTENER TYPE	FASTENING METHOD ¹	FRAMING TYPE	FRAMING SPACING (in)	ALLOWABLE WIND PRESSURES (lb/ft ²) AND FASTENER LOAD (lbs) ²
	Thick.	Width					
8 1/4" Lap Siding	5/16	8.25	6d nails, HD Galv., Maze Nails #200HD-018	Blind nailed w/ Off-Stud Joiner	2x4 #2 SPF	16	37 Fastener Load: 28
8 1/4" Lap Siding	5/16	8.25	6d nails, HD Galv., Maze Nails #200HD-018	Blind nailed	2x4 #2 SPF	16	32 Fastener Load: 25
8 1/4" Lap Siding	5/16	8.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Bulldex "Rock-On" S-12 #2159500	Blind screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	19 Fastener Load: 14
8 1/4" Lap Siding	5/16	8.25	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Face nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	24 Fastener Load: 19
8 1/4" Lap Siding	5/16	8.25	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Blind nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	24 Fastener Load: 19
7 1/4" Lap Siding	5/16	7.25	6d box nails	Face nailed	2x4 #2 SPF	16	46 Fastener Load: 32
7 1/4" Lap Siding	5/16	7.25	6d box nails	Blind nailed	2x4 #2 SPF	16	22 Fastener Load: 16
7 1/4" Lap Siding	5/16	7.25	6d box nails	Face nailed	2x4 #2 SPF	24	34 Fastener Load: 36
7 1/4" Lap Siding	5/16	7.25	1 3/4" Roofing nails	Blind nailed	2x4 #2 SPF	16	32 Fastener Load: 22
7 1/4" Lap Siding	5/16	7.25	6d 2" Roofing nails, HD Galv., Maze Nails #HD-105	Blind nailed	2x4 #2 SPF	16	64 Fastener Load: 43
7 1/4" Lap Siding	5/16	7.25	6d 2" Roofing nails, HD Galv., Maze Nails #HD-105	Blind nailed	2x4 #2 SPF	24	44 Fastener Load: 44
7 1/4" Lap Siding	5/16	7.25	6d nails, HD Galv., Maze Nails #200HD-018	Blind nailed	2x4 #2 SPF	24	24 Fastener Load: 25
7 1/4" Lap Siding	5/16	7.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Bulldex "Rock-On" S-12 #2159500	Blind screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	24	19 Fastener Load: 19
7 1/4" Lap Siding	5/16	7.25	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Face nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	22 Fastener Load: 15
7 1/4" Lap Siding	5/16	7.25	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Face nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	24	20 Fastener Load: 20
6 1/4" Lap Siding	5/16	6.25	6d box nails	Face nailed	2x4 #2 SPF	16	53 Fastener Load: 31
6 1/4" Lap Siding	5/16	6.25	6d box nails	Blind nailed	2x4 #2 SPF	16	32 Fastener Load: 19

TABLE 3—ALLOWABLE WIND PRESSURES AND REQUIRED FASTENER SCHEDULE (continued)

PRODUCT	PRODUCT DIMS (in.)		FASTENER TYPE	FASTENING METHOD ¹	FRAMING TYPE	FRAMING SPACING (in)	ALLOWABLE WIND PRESSURES (lb/ft ²) AND FASTENER LOAD (lbs) ²
	Thick.	Width					
6 1/4" Lap Siding	5/16	6.25	6d box nails	Face nailed	2x4 #2 SPF	24	38 Fastener Load: 33
6 1/4" Lap Siding	5/16	6.25	1 3/4" Roofing nails	Blind nailed	2x4 #2 SPF	16	43 Fastener Load: 38
6 1/4" Lap Siding	5/16	6.25	6d nails, HD Galv., Maze Nails #200HD-018	Blind nailed	2x4 #2 SPF	24	32 Fastener Load: 28
6 1/4" Lap Siding	5/16	6.25	6d 2" Roofing nails, HD Galv., Maze Nails #ID-105	Blind nailed	2x4 #2 SPF	16	40 Fastener Load: 23
6 1/4" Lap Siding	5/16	6.25	6d 2" Roofing nails, HD Galv., Maze Nails #ID-105	Blind nailed	2x4 #2 SPF	24	45 Fastener Load: 37
6 1/4" Lap Siding	5/16	6.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Blind screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	23 Fastener Load: 13
6 1/4" Lap Siding	5/16	6.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Blind screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	24	19 Fastener Load: 17
5 1/4" Lap Siding	5/16	5.25	7d nails, HD Galv., Maze Nails #225HD-022	Face nailed	2x4 #2 SPF	16	48 Fastener Load: 21
5 1/4" Lap Siding	5/16	5.25	7d nails, HD Galv., Maze Nails #225HD-022	Face nailed	2x4 #2 SPF	24	38 Fastener Load: 25
5 1/4" Lap Siding	5/16	5.25	6d nails, HD Galv., Maze Nails #200HD-018	Blind nailed	2x4 #2 SPF	16	44 Fastener Load: 19
5 1/4" Lap Siding	5/16	5.25	6d nails, HD Galv., Maze Nails #200HD-018	Blind nailed	2x4 #2 SPF	24	31 Fastener Load: 21
5 1/4" Lap Siding	5/16	5.25	8d nails, HD Galv., Maze Nails #C-CEM8	Face nailed	2x4 #2 SPF	16	53 Fastener Load: 23
5 1/4" Lap Siding	5/16	5.25	8d nails, HD Galv., Maze Nails #C-CEM8	Blind nailed	2x4 #2 SPF	16	62 Fastener Load: 27
5 1/4" Lap Siding	5/16	5.25	8d nails, HD Galv., Maze Nails #C-CEM8	Face nailed	2x4 #2 SPF	24	45 Fastener Load: 30
5 1/4" Lap Siding	5/16	5.25	8d nails, HD Galv., Maze Nails #C-CEM8	Blind nailed	2x4 #2 SPF	24	33 Fastener Load: 22
5 1/4" Lap Siding	5/16	5.25	6d 2" Roofing nails, HD Galv., Maze Nails #ID-105	Blind nailed	2x4 #2 SPF	16	40 Fastener Load: 18
5 1/4" Lap Siding	5/16	5.25	6d 2" Roofing nails, HD Galv., Maze Nails #ID-105	Blind nailed	2x4 #2 SPF	24	37 Fastener Load: 25

TABLE 3—ALLOWABLE WIND PRESSURES AND REQUIRED FASTENER SCHEDULE (continued)

PRODUCT	PRODUCT DIMS (in.)		FASTENER TYPE	FASTENING METHOD ¹	FRAMING TYPE	FRAMING SPACING (in)	ALLOWABLE WIND PRESSURES (lbf/feet ²) AND FASTENER LOAD (lbs) ²
	Thick.	Width					
5 1/4" Lap Siding	5/16	5.25	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Blind nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	26 Fastener Load: 11
5 1/4" Lap Siding	5/16	5.25	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Face nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	24	19 Fastener Load: 13
5 1/4" Lap Siding	5/16	5.25	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Blind nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	24	19 Fastener Load: 13
5 1/4" Lap Siding	5/16	5.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Face screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	24 Fastener Load: 11
5 1/4" Lap Siding	5/16	5.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Blind screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	20 Fastener Load: 9
5 1/4" Lap Siding	5/16	5.25	1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500	Blind screwed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	24	19 Fastener Load: 13
Shapes	5/16	16	6d Ring shank nail, HD Galv., Maze Nails #C-S205-A	Blind Nailed	2x4 #2 SPF	24	28 Fastener Load: 32
Shapes	5/16	16	6d Ring shank nail, HD Galv., Maze Nails #C-S205-A	Blind Nailed	2x4 #2 SPF w/ 5/8" OSB	16	89 Fastener Load: 69
Shapes	5/16	16	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Blind nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	16	23 Fastener Load: 18
Shapes	5/16	16	.100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA	Blind nailed	Min. 20 ga., 3.625"x 1.375" Metal C-stud	24	18 Fastener Load: 21
Shapes	5/16	16	1 1/2" Roofing nail	Blind Nailed	2x4 #2 SPF w/ 5/8" OSB	24	67 Fastener Load: 77

For SI: 1 inch = 25.4mm, 1 pound/foot² = 47.8803 kPa: 1 pound = 4.448N.

¹ See Figure 2 of this report for a description of face and blind nailing.

² Fastener load represents the withdrawal load exerted on the fastener at the specified allowable wind pressure.

³ For these assemblies the walls must be solidly sheathed with minimum 7/16-inch OSB structural wood panels complying with DOC PS-2 and installed with 8d nails spaced a maximum of 4-inches o.c. on the edges and a maximum of 8-inches o.c. in the field.

⁴ For these assemblies the walls must be solidly sheathed with minimum 5/8-inch OSB structural wood panels complying with DOC PS-2 and installed with 8d nails spaced a maximum of 4-inches o.c. on the edges and a maximum of 8-inches o.c. in the field.

TABLE 4—ALLOWABLE FASTENER WITHDRAWAL CAPACITY (pounds)^{1,2,3}

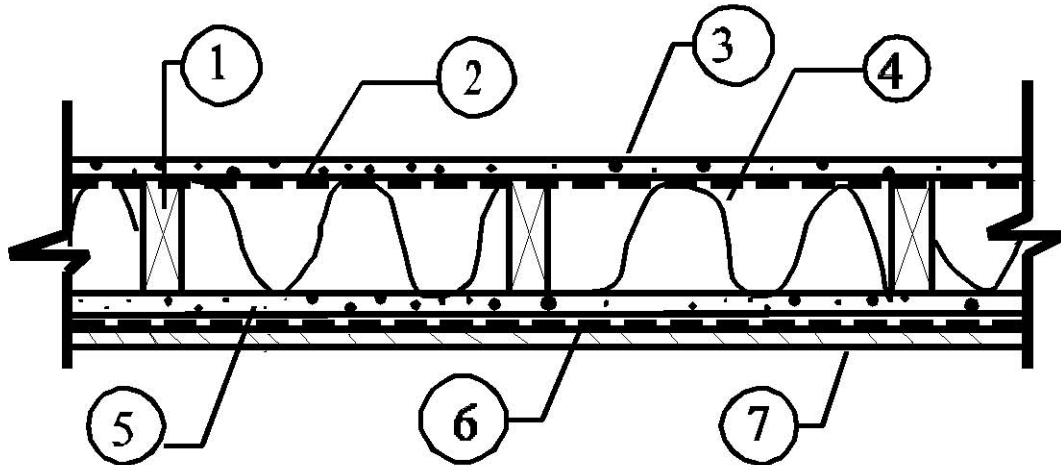
FASTENER	PRODUCT APPLICATION		FRAMING MATERIAL ⁴					
			Spruce-Pine-Fir, 0.42 s.g.	Hem-Fir, 0.46 s.g.	Douglas Fir-Larch, 0.50 s.g.	Southern Pine, 0.55 s.g.	20 ga Steel	7/16" OSB
6d box nail	Lap siding - blind nailed		43.2	54.0	64.8	83.7	—	—
	Panel		43.2	54.0	64.8	83.7	—	—
8d box nail	Lap siding - face nailed		54.0	66.0	84.0	115.0	—	—
	Panel		63.0	77.0	98.0	125.0	—	—
1 3/4" roofing nail	Lap siding - blind nailed		43.7	54.1	67.9	86.3	—	—
	Panel		—	—	—	—	—	—
6d nail Maze nails #200 HD-018	Lap siding - blind nailed		40.2	—	—	—	—	16.0
	Panel		40.2	—	—	—	—	16.0
7d nail Maze nails #225 HD-022	Lap siding - face nailed		38.8	—	—	—	—	11.0
	Panel		38.8	—	—	—	—	11.0
8d nail Maze nails #C-CEM8	Lap siding	Face nailed	45.3	—	—	—	—	—
		Blind nailed	45.3	—	—	—	—	—
	Panel		45.3	—	—	—	—	—
6D roofing nail Maze nails #HD-105	Lap siding - blind nailed		59.3	—	—	—	—	28.0
	Panel		59.3	—	—	—	—	28.0
1 1/2" ring shank roofing nails Maze nails #R103-A	Lap siding - blind nailed		—	—	—	—	—	13.7
	Panel		—	—	—	—	—	13.7
6d ring shank Maze nails #C-S205A	Lap siding - blind nailed		54.5	—	—	—	—	16.5
	Panel		54.5	—	—	—	—	16.5
0.100" x 1 1/2 pins ET&F #AGS-100-0150NA	Lap siding	Face nailed	—	—	—	—	35.0	—
		Blind nailed	—	—	—	—	35.0	—
	Panel		—	—	—	—	35.0	—
1 5/8" screws ITW Buildex "Rock-On" S-12	Lap siding - blind nailed		—	—	—	—	59.3	—
	Panel		—	—	—	—	59.3	—
1 5/8" screws ITW Buildex "Rock On" Hi-Lo	Lap siding - blind nailed		—	—	—	—	—	50.8
	Panel		—	—	—	—	—	50.8

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

¹ Where nonstructural sheathing is located under the siding, the length of the fastener must be increased an equivalent length so as to provide the required 1 1/4-inch fastener penetration.

² 6d box and 8d box nails are hot-dipped galvanized box nails. They are minimum 1 3/4-inch-long, stainless steel or hot-dipped galvanized nails having a head diameter of 3/8 inch.

³ The allowable fastener withdrawal value specified above must be greater than or equal to the minimum fastener load specified in Table 3 of this report.



- ITEM 1:** Allowable axial load for a wall assembly constructed with WeatherBoards™ FiberCement Lap Siding must be 49 percent or less of the allowable axial design stress calculated in accordance with the *National Design Specification for Wood Construction* (This equates to 1,200 lbs, (5335 N) per 2x4 or 228.5 psi (1.57 N/mm²) when No. 2 Southern Pine studs are used in the construction of a wall having an unbraced height of 9 ft (2.7 m)). Allowable axial load for a wall assembly constructed with WeatherBoards™ FiberCement Vertical Siding must be 73.4 percent or less of the allowable axial design stress calculated in accordance with the *National Design Specification for Wood Construction* (This equates to 1800 lbs (8000 N) per 2x4 stud or 342.9 psi (2.37 N/mm²) when No. 2 Southern Pine studs are used in construction of a wall having an unbraced height of 9 ft (2.7 m)).
- ITEM 2:** Continuous vapor barrier in accordance with the applicable code and the manufacturer's instructions.
- ITEM 3:** Interior side of wall assembly must be covered with ⁵/₈-inch thick ASTM C36-95b Type X gypsum wall board. Wall board must be fastened to wood framing with ¹/₈-inch long No. 6 Type W drywall screws spaced 8 inches on center at the edges and 12 inches in center in the field. All screw heads must be covered with joint compound and all wallboard joints must be covered with joint compound and taped and treated with joint compound. Joint compound must comply with ASTM C474 and C475.
- ITEM 4:** Insulation must be provided and must be either mineral wool or fiberglass. Mineral wool must have a nominal density of 2.5 lbs/ft³. The fiberglass must be R13. Batts must be 16 inches wide.
- ITEM 5:** Exterior side of wall assembly must be covered with ⁵/₈-inch thick ASTM C79-95 Type X gypsum sheathing. Gypsum sheathing must be fastened to wood framing with ¹/₈-inch long No. 6 Type S drywall screws spaced 8 inches on center at the edges and 12 inches on center in the field.
- ITEM 6:** Weather-resistive barrier in accordance with this report and the applicable code.
- ITEM 7:** Exterior wall covering must be either WeatherBoards™ FiberCement Lap Siding or WeatherBoards™ FiberCement Vertical Siding. Where Lap siding is utilized the overlap must be a minimum of 1¹/₄ inches and face fastened with 2¹/₂-inch-long double hot-dipped galvanized roofing fasteners with a head diameter of d inch. The fastening schedule for WeatherBoards™ FiberCement Vertical Siding must be a maximum of 6 inches o.c. at the edges and 12 inches o.c. in the field with 8d common nails.

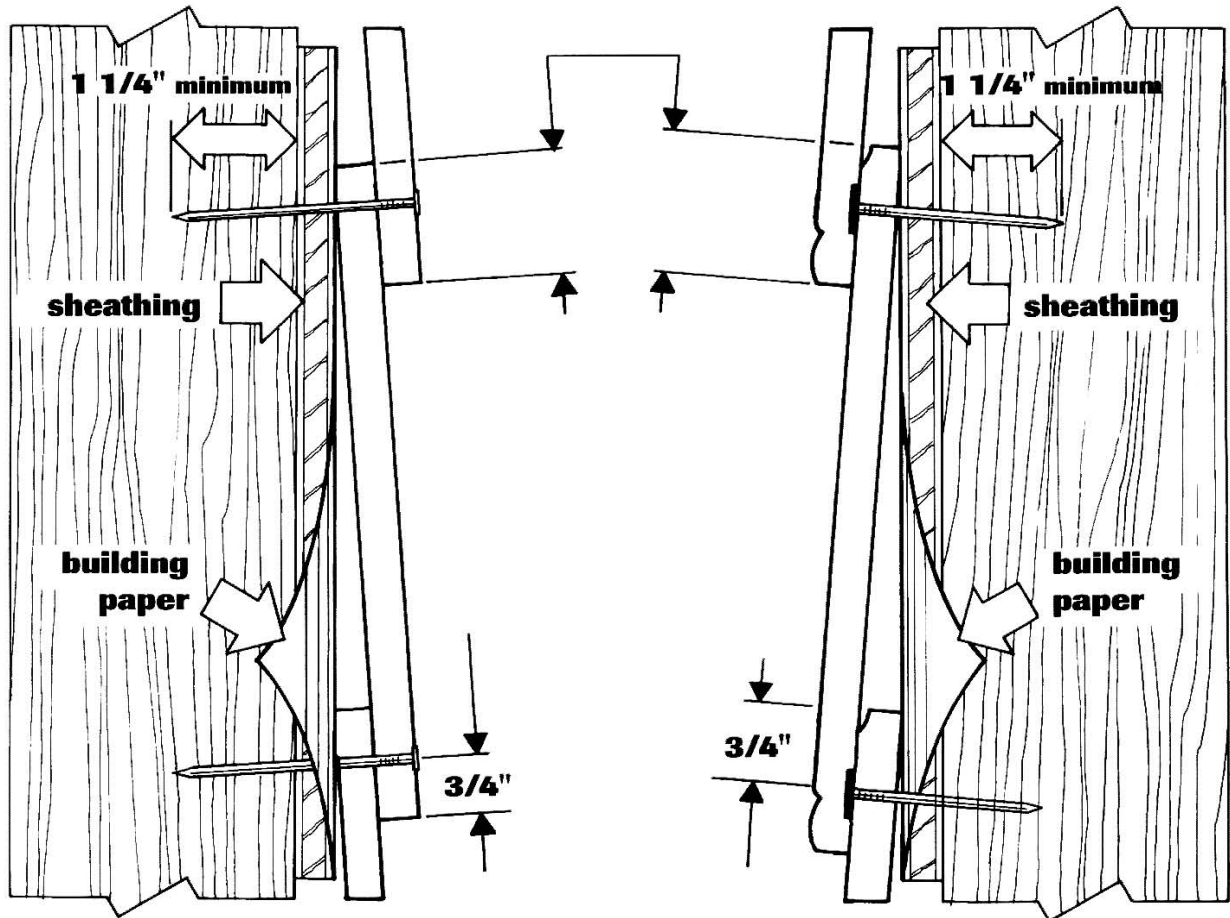
For SI: 1 inch = 25.4 mm; 1 lbf = 4.448 N.

FIGURE 1—ONE-HOUR FIRE-RESISTANCE-RATED WALL ASSEMBLY FOR WEATHERBOARDS™ FIBERCEMENT LAP AND VERTICAL SIDING

face nail option

blind nail option

**1 1/4" overlap
minimum**



NOTES:

¹See Section 4.2.2 and Table 3 of this report for the fastening requirements of lap siding.

²For SI: 1 inch = 25.4 mm.

FIGURE 2—WEATHERBOARDS™ FIBERCEMENT LAP SIDING INSTALLATION DIAGRAMS