ICC-ES Evaluation Report

ESR-2280

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This report also contains:

- **CA Supplement**

Subject to renewal April 2027

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES **Section: 06 16 00—Sheathing** **DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION** **Section: 07 46 46—Fiber-Cement Siding** **DIVISION: 09 00 00—FINISHES** **Section: 09 30 00—Tiling**	**REPORT HOLDER:** **JAMES HARDIE BUILDING PRODUCTS, INC.**	**EVALUATION SUBJECT:** **1/4" HARDIEBACKER® EZ GRID®, HARDIEBACKER® 500, HARDIEBACKER® CEMENT BOARD WITH HYDRODEFENSE™ TECHNOLOGY, AND HARDIEBACKER® PROGRID™ CEMENT BOARDS, AND 1/4" HARDIEBACKER® UNDERLAYMENT**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012, 2009 and 2006 *International Building Code®* (IBC)
- 2021, 2018, 2015, 2012, 2009 and 2006 *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:

- Structural
- Noncombustibility
- Thermal resistance
- Fire resistance
- Exterior Sheathing
- Waterproofness

2.0 USES

The 1/4" HardieBacker® Underlayment may be used as floor underlayment applied to the interior of buildings. The 1/4" HardieBacker® EZ Grid® Cement Board, HardieBacker® ProGrid™ Cement Board, HardieBacker® 500 Cement Board and HardieBacker® Cement Board with Hydrodefense™ Technology panels may be used as backer boards for wall tile in tub and shower areas, and wall panels in shower areas, in accordance with IBC Section 2509.2 and IRC Section R702.4.2.

HardieBacker® 500 Cement Board and HardieBacker® Cement Board with Hydrodefense™ Technology may also be used in exterior wall applications as a backer board for exterior tile, slate, marble, stone, thin brick, and manufactured stone in buildings constructed under the IRC and any type of construction in buildings constructed under the IBC. In jurisdictions adopting the 2021, 2018, 2015 or 2012 IBC, exterior walls in types I-IV construction shall be constructed in accordance with the limitations noted in Section 5.10 of this report.

HardieBacker® Cement Board with Hydrodefense™ Technology is also a waterproof backer board when tested in accordance with Section 4.5 of ANSI A118.10.

Wall installations may be used in fire-resistance-rated construction as set forth in Section 4.3 of this report. Table 3 identifies specific uses for the panels.

3.0 DESCRIPTION

3.1 General:

The 1/4" HardieBacker® EZ Grid® Cement Backer Board, HardieBacker® ProGrid™ Cement Backer Board, HardieBacker® 500 Cement Backer Board, HardieBacker® Cement Board with Hydrodefense™ Technology, and 1/4" HardieBacker® Underlayment are single-faced, cellulose fiber–reinforced cement (fiber-cement) panels. Nominal dimensions are noted in Table 1.

The 1/4" HardieBacker® EZ Grid®, HardieBacker® ProGrid™, HardieBacker® Cement Board with Hydrodefense™ Technology, and HardieBacker® 500 cement backer boards comply with ASTM C1288, Grade I. The 1/4" HardieBacker® EZ Grid®, HardieBacker® ProGrid™ Cement Backer Board, HardieBacker® 500 Cement Backer Board, HardieBacker® Cement Board with Hydrodefense™ Technology, and 1/4" HardieBacker® Underlayment backer boards comply with ANSI A118.9 as cementitious backer units (CBU's).

The cement board panels have a flame-spread index of 0 or less and a smoke-developed index of 5 or less when tested in accordance with ASTM E84 and are classified as noncombustible in accordance with ASTM E136. Permeance values for the panels are noted in Table 2.

3.2 Materials:

3.2.1 1/4" HardieBacker® EZ Grid®, HardieBacker® ProGrid™, HardieBacker® 500 Cement Board and HardieBacker® Cement Board with Hydrodefense™ Technology: The 1/4" HardieBacker® EZ Grid® cement board and HardieBacker® ProGrid™ cement board have a smooth surface imprinted with a grid pattern to facilitate cutting, and are also imprinted with a fastener pattern to facilitate attachment to subflooring. The HardieBacker® 500 and HardieBacker® Cement Board with Hydrodefense™ Technology cement boards have a smooth-finished surface. Each of the boards described in this section have square edges for butt joints. The reverse side of these backer boards has a lightly textured surface.

3.2.2 1/4" HardieBacker® Underlayment: The product has a smooth surface, an acrylic-based seal coat and square edges for butt joints. The reverse side of the backer board has a lightly textured surface and is unsealed.

3.2.3 Fasteners: Fastener types and spacing used to secure the products are as shown in Table 3. Fasteners must be corrosion-resistant steel.

4.0 DESIGN AND INSTALLATION

4.1 Design: Walls:

Framing assembly components must be sized and constructed to meet applicable building code requirements. When installed over wall framing, the wall framing members must be spaced not more than 16 inches (406 mm) on center. When installed on a floor, the joists must not be spaced more than 24 inches (610 mm) on center, and a subfloor (complying with the applicable code) must be installed prior to installation of the Hardie Backer boards. Allowable deflection of horizontal and vertical framing must be limited to 1/360 of the span, unless otherwise specified by finish material requirements. Steel framing must be a minimum of No. 20 gage [0.0329 inch (0.84 mm) minimum thickness] and corrosion-resistant in accordance with the applicable code. Use of panels to resist in-plane racking shear loads is outside the scope of this report.

Installation must comply with this report, and a copy of this report must be available at all times on the jobsite during installation. Additional details in the applicable manufacturer's product information sheets must be observed during installation. Where differences occur between the manufacturer's product information sheets and this report, this report governs. All products may 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.

4.2 Installation:

4.2.1 1/4" HardieBacker® EZ Grid®, HardieBacker® ProGrid™, HardieBacker® Cement Board with Hydrodefense™ Technology, and HardieBacker® 500 Cement Board Backer Boards; and 1/4" HardieBacker® Underlayment:

4.2.1.1 Interior Floors: When 1/4" HardieBacker® EZ Grid® HardieBacker® ProGrid™, HardieBacker® Cement Board with Hydrodefense™ Technology, and HardieBacker® 500 Cement Board backer boards and ¼" HardieBacker® Underlayment are utilized as underlayment on floors, the subfloor assembly must consist of a minimum 5/8-inch-thick (15.9 mm), Exposure 1, Group 2 or 3 species plywood, or equivalent thickness of subfloor, designed to limit the maximum out-of-plane deflection of the panel, including live and dead loads, to 1/360 of the span, in accordance with the applicable code. [Tables 2304.8(1), 2304.8(2), 2304.8(3) and 2304.8(4) for the 2021, 2018 and 2015 IBC; Tables 2304.7(1), 2304.7(2), 2304.7(3) and 2304.7(4) for the 2012 and 2009 IBC; and Tables R503.1, R503.2.1.1(1), and R503.2.1.1(2) for the IRC, tabulate subfloor and subfloor/underlayment design load capacity.] Joints in the backer boards must be provided where existing structural joints (building control joints) occur and where changes in direction occur, such as in L-shaped rooms. For large tiled areas, joints must be provided in accordance with ANSI A108.01, Section 3.7.

The subfloor must be covered with a minimum 3/32-inch-thick (2.4 mm) latex, or acrylic-modified thinset setting material complying with ANSI A118.4, before installation of the backer boards on the subfloor. Board joints must be in moderate contact, in a staggered brick pattern, and fastened before the setting material films over. Backer board edges must be staggered from subfloor joints, and four corners of the backer board sheets must not meet at one point. Backer board edges must be kept 1/8 inch (3.2 mm) away from walls and cabinet bases, and the cut edges of the backer boards must be turned to the outside (towards walls and cabinet bases). Fastener types and spacing are as specified in Table 3. Fasteners must be located a minimum of 3/8 inch (9.5 mm) and a maximum of 3/4 inch (19.1 mm) from board edges, and nominally 2 inches from corners.

Floor tiles complying with ANSI A137.1 must be laid over the backer board in accordance with ANSI A108, using either acrylic or latex-modified thinset mortars complying with ANSI A118.4.

Prior to setting the tile, all backer board joints must be filled with the same mortar used to set the tiles. While the mortar is still wet, 2-inch-wide (51 mm), high-strength, coated, alkali-resistant, glass fiber reinforcing tape must be embedded into the wet mortar, leveled, and allowed to thoroughly dry.

4.2.1.2 Interior Walls (Tile Finish): HardieBacker® 500, HardieBacker® Cement Board with Hydrodefense™ Technology, HardieBacker® ProGrid™ , 1/4" HardieBacker® EZ Grid® and 1/4" HardieBacker® Underlayments and backer boards are installed with the long dimension either vertical or horizontal to nominally 2-by-4 wood framing members or minimum No. 20 gage [0.0329-inch (0.84 mm)] minimum thickness metal framing members spaced a maximum of 16 inches (406 mm) on center with end joints staggered from adjacent courses in both vertical and horizontal applications. All board edges of the 1/4" HardieBacker® EZ Grid® and 1/4" HardieBacker® Underlayment must be supported by framing. Vertical board edges of the HardieBacker® board must be supported by framing. To comply with ANSI A 108.11, framing members must be spaced a maximum of 16 inches (406 mm) on center as required by ANSI A 108.11. Fasteners and fastener spacing must be as specified in Table 3. Fasteners must be located at least 3/8 inch (9.5 mm) from board edges and a minimum of 2 inches (51 mm) from corners. Corner gaps must be filled with a silicone sealant compatible with fiber-cement backer board. Backer boards must be placed with a minimum 1/4-inch (6.4 mm) clearance from the floor surfaces and other horizontal tile termination locations, such as above tub edges. This gap must be free of adhesive and grout and must be filled with a flexible sealant. For large tiled areas, movement joints must be provided in accordance with ANSI A108.01, Section 3.7.

Ceramic wall tiles complying with ANSI A137.1 must be applied over the backer board in accordance with ANSI A108, with flexible Type I mastic adhesives complying with ANSI A136.1, or acrylic or latex-modified thinset mortars complying with ANSI A118.4.

Prior to setting the tile, all backer board joints must be filled with the same mastic or mortar used to set the tiles. While the mastic or mortar is still wet, 2-inch-wide (51 mm), high-strength, coated, alkali-resistant, glass fiber reinforcing tape is embedded into the wet mastic or mortar, leveled, and allowed to thoroughly dry.

4.2.1.3 Interior Walls (Paint or Wallpaper Finish): HardieBacker® 500 Cement Boards, HardieBacker® Cement Board with Hydrodefense™ Technology and 1/4" HardieBacker® Underlayment must be installed with the long dimension either vertical or horizontal over nominally 2-by-4 wood framing members or minimum No. 20 gage [0.0329 inch (0.84 mm)] minimum thickness metal framing members spaced a maximum of 16 inches (406 mm) on center, with end joints staggered from adjacent courses in both vertical and horizontal applications. Panel edges must be supported by framing.

Fastener types and spacing are as specified in Table 3. Fasteners must be located at least 3/8 inch (9.5 mm) from board edges, and a minimum of 2 inches (51 mm) from corners. Panels must be placed with a minimum 1/4-inch (6.4 mm) clearance from the floor surface. Metal or PVC corner angles are attached with the above-described nails or screws placed approximately 12 inches (305 mm) on center.

A flush-joint procedure must be used on backer board panels. Gypsum board joint compounds, complying with ASTM C474 and C475, are troweled into the joints. Paper joint tape is embedded into the wet joint compound and allowed to dry thoroughly. A second coat of joint compound, approximately 8 inches (203 mm) wide, is then applied across the joint and allowed to dry. A third coat of joint compound, 10 inches (254 mm) wide, is applied across the joint. Joint compound must also be applied over all fastener heads in intermediate locations.

Internal corners are finished by filling with joint compound, working the joint tape into the joint, and applying a second coat of joint compound. A third coat of joint compound is applied over the joint area.

External corners are treated by filling the joint with joint compound and allowing it to dry thoroughly. Corrosion-resistant metal or PVC corner angles are then fastened to the corner, followed by a second coat of joint compound. When the second coat is completely dry, a third coat of joint compound is applied over the joint area. Joint compound is applied over all fastener heads in intermediate locations.

Texturing may be applied to backer board panels similar to applications of texturing to gypsum wallboard. For surfaces to receive paint, drywall primer suitable for high-moisture areas must be applied as recommended by the paint manufacturer. For surfaces to receive wallpaper, the backer board surface is primed with a primer suitable for high-moisture areas as recommended by the wallpaper manufacturer.

4.2.1.4 Exterior Walls (Tile Finish): HardieBacker® 500 and HardieBacker® Cement Board with Hydrodefense™ Technology cement backer boards must be installed over wood structural panel sheathing. A water-resistive barrier in accordance with the applicable code must be applied over the wood structural panel sheathing. A clear distance of 6 inches (152 mm) must be maintained between the backer board and the earth. HardieBacker® 500 and HardieBacker® Cement Board with Hydrodefense™ Technology cement boards are installed with the long dimension either vertical or horizontal to nominally 2-by-4 wood framing members or minimum No. 20 gage [0.0329 inch (0.84 mm) minimum thickness] metal framing members spaced at a maximum of 16 inches (406 mm) on center, with end joints staggered from adjacent courses. Vertical joints are fastened at abutting sheet edges. Vertical board edges of the HardieBacker® 500 and HardieBacker® Cement Board with Hydrodefense™ Technology must occur over framing members. Fasteners and fastener spacing must be as specified in Table 3, and when a specified level of wind resistance is required, the HardieBacker® 500 and HardieBacker® Cement Board with Hydrodefense™ Technology cement boards are attached to framing members, appropriately spaced, with fastener types, lengths and spacing as described in Table 4. Fasteners must be located at least 3/8 inch (9.5 mm) from board edges and a minimum of 2 inches (51 mm) from corners. Corner gaps must be filled with a silicone sealant compatible with fiber-cement backer board. For large tiled areas, movement joints must be provided in accordance with ANSI A108.01, Section 3.7.

Ceramic wall tiles complying with ANSI A137.1 must be applied over the backer board in accordance with ANSI A108, with acrylic or latex-modified thinset mortars complying with ANSI A118.4.

Prior to setting the tile, all backer board joints must be filled with the same mortar used to set the tiles. While the mortar is still wet, 2-inch-wide (51 mm), high-strength, coated, alkali-resistant, glass fiber reinforcing tape must be embedded into the wet mortar, leveled, and allowed to thoroughly dry.

Additional details in the manufacturer's installation instructions must be observed before and during installation.

4.2.2 1/4" HardieBacker® Underlayment:

4.2.2.1 General: The 1/4" HardieBacker® Underlayment is installed over a structurally sound subfloor assembly designed to limit the maximum deflection, including live and dead loads, to 1/360 of the span, in accordance with the applicable code. [Tables 2304.8(1), 2304.8(2), 2304.8(3) and 2304.8(4) for the 2021, 2018 and 2015 IBC; Tables 2304.7(1), 2304.7(2), 2304.7(3) and 2304.7(4) for the 2012 and 2009 IBC;or Tables R503.1, R503.2.1.1(1), and R503.2.1.1(2) for the IRC, tabulate subfloor or subfloor/underlayment design load capability.]

When the underlayment is installed on existing floor construction, floor finishes and subflooring must be repaired, removed and/or replaced as necessary to create a smooth and level surface. The ability of the existing floor structure and subfloor to support the additional loads of the underlayment and the new floor finish must be substantiated. Alterations must comply with applicable codes.

The underlayment must then be installed, with board joints in moderate contact (not forced together), in a staggered brick pattern to the subfloor and fastened before the setting material films over. Underlayment edges must be staggered with subfloor joints, and four corners of the underlayment sheets must not meet at one point. Underlayment edges must be kept 1/8 inch (3.2 mm) back from walls and cabinet bases and cut edges of underlayment turned to the outside (toward walls and cabinet bases).

4.2.2.2 Resilient Flooring: With the smooth face up, the underlayment is placed over the prepared subflooring and fastened to support framing with the fastener types and spacing specified in Table 3. Fasteners must be located at least 3/8 inch (9.5 mm) from board edges and a minimum of 2 inches (51 mm) from corners. Fastener heads must be flush with the surface. Fasteners must be of sufficient length to penetrate at least 1 inch (25.4 mm) into sound subflooring or framing.

To minimize the possibility of surface irregularities in the underlayment and fastener heads penetrating through the resilient flooring, the underlayment must be installed to provide a flush and level surface. Height variations are treated by filling joints, gouges and low spots with a water-resistant, cementitious leveling compound recommended by the floor-covering manufacturer. After the leveling compound has dried, filled areas must be sanded level to the surrounding underlayment.

Prior to application of the resilient flooring, the prepared 1/4" HardieBacker® Underlayment surface must be free of all debris, oil, paint, caulk, joint compound and other foreign substances. Additional guidance for installations is contained in ASTM F1482, Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring.

Finish floor coverings must be installed in accordance with the flooring material manufacturer's published instructions. Seams of finish floor coverings must not occur directly over the 1/4" HardieBacker® Underlayment joints.

4.2.2.3 Tile: With the smooth face up, the installation of the 1/4" HardieBacker® Underlayment must comply with Section 4.2.1.1 of this report.

4.3 One-hour Fire-resistance-rated Assemblies:

4.3.1 Assembly 1: The nonsymmetrical, nonload-bearing, one-hour fire-resistance-rated wall assembly consists of minimum 3 5/8-inch-deep (92 mm), No. 20 gage [0.0359 inch (0.91 mm)], steel "C" studs spaced at a maximum of 24 inches (610 mm) on center with corresponding top and bottom tracks. One layer of 5/8-inch-thick (15.9 mm) Type X gypsum board complying with ASTM C36 or C1396, 48 inches (1220 mm) wide, is applied vertically to one face of the wall framing and secured with 1 1/4-inch-long (32 mm), Type S, gypsum board screws spaced 8 inches (203 mm) on center at board edges and 12 inches (305 mm) on center at intermediate framing members. All board joints must be backed by framing members. The 5/8-inch-thick (15.9 mm) gypsum board joints and screw heads must be finished in accordance with ASTM C840 or GA 216. The opposite face of the wall is covered with one layer of 1/2-inch-thick (12.7 mm) Type X gypsum board complying with ASTM C36 or ASTM C1396, followed by one layer of 1/4" HardieBacker® EZ Grid® or 1/4" HardieBacker® Underlayment backer board. Boards must be applied vertically to framing members with vertical edges staggered 24 inches (610 mm). The 1/2-inch-thick (12.7 mm) Type X gypsum board is fastened to the framing members with 1 1/4-inch-long (32 mm), Type S, gypsum board screws spaced 24 inches (610 mm) on center. All board joints must be backed by framing members. The 1/4" HardieBacker® EZ Grid® or 1/4" HardieBacker® Underlayment backer board is fastened through the gypsum board to the framing members with minimum 1 5/8-inch-long (41 mm) by minimum 0.323-inch (8.2 mm) self-drilling, corrosion-resistant, ribbed bugle head or ribbed wafer head screws located a maximum of 8 inches (203 mm) on center. Backer board joints and fasteners require treatment similar to that described in Section 4.2.1.2 or 4.2.1.3 of this report.

4.3.2 Assembly 2: The symmetrical, nonload-bearing, one-hour fire-resistance-rated wall assembly consists of minimum 3 5/8-inch-deep (92 mm), No. 20 gage [0.0359 inch (0.91 mm)], steel "C" studs spaced at a maximum of 24 inches (610 mm) on center with corresponding top and bottom tracks. Both sides of the wall are covered with one layer of 1/2-inch-thick (12.7 mm) Type X gypsum board complying with ASTM C36 or ASTM C1396, followed by one layer of 1/4" HardieBacker® EZ Grid® or 1/4" HardieBacker® Underlayment. Boards are applied either perpendicular (horizontally) or parallel (vertically) to framing members. All board joints must be backed by framing. Base layer and face layer board joints of both wall sides must be offset by 24 inches (610 mm). The 1/2-inch-thick (12.7 mm) Type X gypsum board is fastened to the framing members with minimum 1-inch-long (25.4 mm), Type S, gypsum board screws spaced a maximum of 24 inches (610 mm) on center, and the gypsum board joints and screw heads are finished in accordance with

ASTM C840 or GA 216. The 1/4" HardieBacker® EZ Grid® or 1/4" HardieBacker® Underlayment is fastened through the gypsum board to the framing members with minimum 1 5/8-inch-long (41 mm), minimum 0.323-inch (8.2 mm) self-drilling, corrosion-resistant, ribbed buglehead or ribbed waferhead screws located a maximum of 8 inches (203 mm) on center. Backer board joints and fasteners require finish treatment similar to that described in Section 4.2.1.2 or 4.2.1.3 of this report.

4.3.3 Assembly 3: The nonsymmetrical, nonload-bearing, one-hour fire-resistance-rated wall assembly consists of minimum 3 5/8-inch-deep (92 mm), No. 25 gage (0.0209-inch), steel "C" studs spaced at a maximum of 16 inches (406 mm) on center with corresponding top and bottom tracks. One layer of 5/8-inch-thick (15.9 mm) Type X gypsum wallboard complying with ASTM C36 or ASTM C1396, 48 inches (1220 mm) wide, is applied either vertically or horizontally to one face of the wall framing and secured with minimum 1 1/4-inch-long (32 mm), Type S gypsum wallboard screws, spaced 8 inches (203 mm) on center at board edges and at intermediate framing members. The gypsum wallboard joints and screw heads are finished in accordance with ASTM C840 or GA 216. The stud cavities are insulated with minimum 3-inch-thick (76 mm), 3 pcf (48 kg/m^3), unfaced, friction-fit, mineral fiber insulation complying with ASTM C665, Type I. The opposite face of the wall is covered with one layer of 13/32-inch-thick (10.5 mm) HardieBacker® 500 Cement Board, HardieBacker® Cement Board with Hydrodefense™ Technology, or HardieBacker® ProGrid™ backer board. The backer boards are applied either vertically or horizontally, with vertical and horizontal edges staggered from the wallboard edges. The backer boards are fastened through to the framing members with minimum 1-inch-long (25.4 mm), No. 8-18 by 0.323-inch self-drilling, corrosion-resistant, ribbed buglehead (or equivalent) screws spaced a maximum of 8 inches (203 mm) on center. The side of the wall clad with HardieBacker® 500, HardieBacker® Cement Board with Hydrodefense™ Technology, or HardieBacker® ProGrid™ backer board must be tiled as described in Section 4.2.1.2 or 4.2.1.4 of this report.

4.3.4 Assembly 4: The nonsymmetrical, limited load-bearing, one-hour fire-resistance-rated wall assembly must consist of nominally 2-by-4 wood studs spaced at a maximum of 16 inches (406 mm) on center with a double top plate and a single bottom plate. The axial load must be the least of the following, provided structural consideration for axial, flexural and bearing perpendicular-to-grain stresses is in accordance with ANSI/AWC NDS-2018 for the 2021 and 2018 IBC (ANSI/AWC NDS-2015 for the 2015 IBC and IRC;ANSI/AF&PA NDS-2010 for the 2012 IBC and IRC; ANSI/AF&PA NDS-2005 for the 2009 and 2006 IBC and IRC):

1. Maximum axial load of 800 pounds (3560 N) per stud.
2. Maximum 34.6 percent of full allowable design axial load must be used for the wood species as shown in the NDS.
3. 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.

One layer of 5/8-inch-thick (15.9 mm) Type X gypsum wallboard complying with ASTM C36 or ASTM C1396, 48 inches (1220 mm) wide, is applied either vertically or horizontally to one face of the wall framing and secured with minimum 1 7/8-inch-long (22 mm) cuphead gypsum wallboard nails, spaced 8 inches (203 mm) on center at board edges and intermediate framing members. The gypsum wallboard joints and nail heads are finished in accordance with ASTM C840 or GA 216. The stud cavities are insulated with minimum 3-inch-thick (76 mm), 3 pcf, unfaced, friction-fit, mineral fiber insulation complying with ASTM C665, Type I. The opposite face of the wall is covered with one layer of 13/32-inch-thick (10.5 mm) HardieBacker® 500, HardieBacker® Cement Board with Hydrodefense™ Technology, or HardieBacker® ProGrid™ backer board. The backer board is applied either vertically or horizontally, with vertical and horizontal edges staggered from the gypsum wallboard edges on the opposite face. The backer board is fastened through to the framing members with minimum 1 1/2-inch-long (38 mm), corrosion-resistant roofing nails located a maximum of 8 inches (203 mm) on center. Backer board joints and fasteners require treatment similar to that described in Section 4.2.2.2 of this report. The side of the wall clad with HardieBacker® 500, HardieBacker® Cement Board with Hydrodefense™ Technology, or HardieBacker® ProGrid™ backer board must be finished with tiles complying with ANSI A137.1 as described in Section 4.2.1.2 or 4.2.1.4 of this report.

4.3.5 Assembly 5: The symmetrical, nonload-bearing, one-hour fire-resistance-rated wall assembly consists of minimum 3 5/8-inch-deep (92 mm), No. 20 gage [0.0329 inch (0.84 mm) minimum thickness], steel "C" studs spaced at a maximum of 16 inches (406 mm) on center with corresponding top and bottom tracks. The stud cavities are insulated with minimum 3-inch-thick (76 mm), 3 pcf, unfaced, friction-fit, mineral fiber insulation complying with ASTM C665, Type I. Both sides of the wall are covered with one layer of 13/32-inch-thick (10.5 mm) HardieBacker® 500, HardieBacker® Cement Board with Hydrodefense™ Technology, or

HardieBacker® ProGrid® backer board applied either perpendicular (horizontally) or parallel (vertically) to framing members. Vertical board joists must be backed by framing and centered over framing. Vertical joints on opposite sides of studs must be offset 16 inches (406 mm). The HardieBacker® 500, HardieBacker® Cement Board with Hydrodefense™ Technology, or HardieBacker® ProGrid™ backer board is fastened to the framing members with minimum 1¼-inch-long (32mm), No. 8 by 0.375-inch-head-diameter (9.5 mm), self-drilling, corrosion-resistant, ribbed wafer-head screws located a maximum of 8 inches (203 mm) on center. Backer board joints and fasteners require finish treatment similar to that described in Section 4.2.1.2 or 4.2.1.4 of this report. The HardieBacker® 500, HardieBacker® Cement Board with Hydrodefense™ Technology or HardieBacker® ProGrid™ backer board must be finished with tiles complying with ANSI A137.1 as described in Section 4.2.1.2 or 4.2.1.4 of this report.

5.0 CONDITIONS OF USE:

The James Hardie® Building Products, Inc., ¼" HardieBacker® Underlayment, ¼" HardieBacker® EZ Grid®, HardieBacker® ProGrid™, HardieBacker® 500, and HardieBacker® Cement Board with Hydrodefense™ Technology Cement Board backer boards 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 published installation instructions. In the event of a conflict between this report and the manufacturer's instructions, this report governs.

5.2 The panel products are limited to use in interior installations only, except for the HardieBacker 500 and HardieBacker® Cement Board with HydrodefenseTM Technology cement boards.

5.3 When use is in exterior wall applications, a water-resistive barrier complying with the code must be installed behind the HardieBacker 500 and HardieBacker® Cement Board with HydrodefenseTM Technology cement board. Flashing must be installed at all penetrations and terminations in accordance with the applicable code.

5.4 When used as a base for wall tile or as wall panels in wet areas, the panels must not be applied over a vapor retarder.

5.5 Evaluation of the use of the HardieBacker® Cement Board with HydrodefenseTM Technology as a shower receptor is outside of the scope of this report.

5.6 Support framing must be designed to a maximum allowable deflection of 1/360 of the span, unless otherwise specified by finish material requirements.

5.7 Installation of a vapor retarder in exterior walls must be in accordance with code requirements.

5.8 Recognition of fiber-cement substrate sheets as listed protective assemblies, as referenced in Section 308 of the International Mechanical Code®, is outside the scope of this report.

5.9 Use of the products to resist racking shear loads is outside the scope of this report.

5.10 In jurisdictions adopting the 2021, 2018, 2015, and 2012 IBC, vertical and lateral flame propagation 2018 IBC Section 1402.5; and 2015 and 2012 IBC Section 1403.5, exterior walls on buildings of Type I, II, III or IV construction that are greater than 40 feet (12.2 m) in height above grade plane and that contain a combustible water-resistive barrier must be shown to comply with NFPA 285, except as permitted under Exception 2 of the 2021 and 2018 IBC Section 1402.5 and 2015 IBC Section 1403.5.

5.11 Flashing must be installed at all penetrations and terminations in accordance with the applicable code and the manufacturer's instructions.

5.12 The products are manufactured in Cleburne, Texas; Peru, Illinois; Pulaski, Virginia; Sparks, Nevada; Prattville, Alabama; and Fontana, California, under a 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 Interior Substrate Sheets Used in Wet and Dry Areas (AC378), dated August 2012, Editorially Revised January 2021.

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Reinforced Cementitious Sheets Used as Wall and Ceiling Sheathing and Floor Underlayment (AC376), dated August 2012, Editorially Revised January 2021.

6.3 Data in accordance with ANSI A118.9-1999, American National Standard for Test Methods and Specifications for Cementitious Backer Units.

6.4 Data in accordance with Section 4.5 of ANSI A118.10-2014, American National Standard for Test Methods and Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation.

7.0 IDENTIFICATION

7.1 James Hardie Building Products, Inc., 1/4" HardieBacker® Underlayment, 1/4" HardieBacker® EZ Grid®, HardieBacker® ProGridTM, HardieBacker® 500 cement backer boards and HardieBacker® Cement Board with HydrodefenseTM Technology bear a label with the James Hardie name and telephone number, the product name, and the evaluation report number (ESR-2280).

7.2 The report holder's contact information is the following:

JAMES HARDIE BUILDING PRODUCTS, INC.
10901 ELM AVENUE
FONTANA, CALIFORNIA 92337
(909) 942-7343
www.jameshardie.com
info@jameshardie.com

TABLE 1—STANDARD NOMINAL PANEL DIMENSIONS[1]

PRODUCT	WIDTH (inches)	LENGTH (feet)	THICKNESS (inch)
1/4" HardieBacker® (underlayment)	36 and 48	5, 8, 9, 10	1/4
1/4" HardieBacker® EZ Grid® (underlayment)	36	5	1/4
HardieBacker® 500, HardieBacker® ProGrid™, and HardieBacker® Cement Board with Hydrodefense™ Technology (backer board)	32, 36, 48	5 and 8	13/32

For **SI:** 1 inch = 25.4 mm, 1 foot = 304.8 mm.

[1]Panel products are also available in other lengths, widths, and thicknesses by special arrangement.

TABLE 2—PERMEANCE VALUES FOR FIBER-CEMENT PRODUCTS

PRODUCT AND THICKNESS (inch)	PERMEANCE (perms)
1/4" HardieBacker® (1/4)	1.75
HardieBacker® (13/32)	2.84

For **SI**: 1 inch = 25.4 mm, 1 perm = 57 mg/(s·m2·Pa).

TABLE 3—FASTENERS

PRODUCT	APPLICATION	FASTENER[1,2]	FASTENER SPACING
1/4" HardieBacker® EZ Grid; 1/4" HardieBacker® Underlayment; HardieBacker® ProGrid™; HardieBacker 500; HardieBacker® Cement Board with Hydrodefense™ Technology	Interior Wall: wood framing, tile finish	Minimum 1 1/4-inch-long (32 mm), corrosion-resistant (galvanized or stainless steel) roofing nails or minimum 1 1/4-inch-long (32 mm), No. 8 by 0.375-inch-head-diameter (9.5 mm), self-drilling, corrosion-resistant, ribbed wafer-head screws	8 inches on center along all supports
HardieBacker® 500; HardieBacker® Cement Board with Hydrodefense™ Technology	Exterior Wall: wood framing, tile finish	Minimum 1 3/4-inch-long (44 mm), corrosion-resistant (galvanized or stainless steel) roofing nails or minimum 1 1/4-inch-long (32 mm), No. 8 by 0.375-inch-head-diameter (9.5 mm), self-drilling, corrosion-resistant, ribbed wafer-head screws	8 inches on center along all supports
1/4" HardieBacker® Underlayment; HardieBacker® 500; HardieBacker® Cement Board with Hydrodefense™ Technology	Interior Wall: wood framing, paint or wallpaper finish	Minimum 1 3/8-inch-long (35 mm) gypsum board nails or minimum 1-inch-long (25.4 mm) No. 8 x 0.323-inch-head-diameter (8.2 mm), self-drilling, corrosion resistant, ribbed bugle-head screws	8 inches on center along all supports
1/4" HardieBacker® EZ Grid; 1/4" HardieBacker® Underlayment; HardieBacker® ProGrid™; HardieBacker® 500; HardieBacker® Cement Board with Hydrodefense™ Technology	Interior Wall: steel framing, tile finish	Minimum 1 1/4-inch-long (32 mm), No. 8 by 0.375-inch-head-diameter (9.5 mm), self-drilling, corrosion-resistant, ribbed wafer-head screws	8 inches on center along all supports
HardieBacker 500; HardieBacker® Cement Board with Hydrodefense™ Technology	Exterior Wall: steel framing, tile finish	Minimum 1 1/4-inch-long (32 mm), No. 8 by 0.375-inch-head-diameter (9.5 mm), self-drilling, corrosion-resistant, ribbed wafer-head screws	8 inches on center along all supports
1/4" HardieBacker® Underlayment; HardieBacker® 500; HardieBacker® Cement Board with Hydrodefense™ Technology	Interior Wall: steel framing, paint or wallpaper finish	Minimum 1-inch-long (25.4 mm), No. 8 x 0.323-inch-head-diameter (8.2 mm), self-drilling, corrosion resistant, ribbed bugle-head screws	8 inches on center along all supports
1/4" HardieBacker® EZ Grid; 1/4" HardieBacker® Underlayment; HardieBacker® ProGrid™; HardieBacker® 500; HardieBacker® Cement Board with Hydrodefense™ Technology	Interior Flooring underlayment, tile finish	1 1/4-inch-long (32 mm), corrosion-resistant (galvanized or stainless steel) roofing nails or minimum 1-inch-long (25.4 mm), No. 8 by 0.323-inch-head-diameter (8.2 mm), self-drilling, corrosion-resistant, ribbed bugle-head screws. To comply with ANSI A108.11, minimum 1 1/4-inch-long (32 mm), No. 8 by 0.375-inch-head-diameter (9.5 mm), self-drilling, corrosion resistant ribbed wafer-head screws must be used	8 inches edge, 8 inches field
1/4" HardieBacker® Underlayment	Interior Flooring underlayment, resilient floor finish	3d, corrosion-resistant, ring shank nails or No. 18 gage (0.0475-inch) corrosion-resistant staples with 1/4-inch (6.4 mm) crowns	3 inches edge, 6 inches field[3]

For **SI:** 1 inch = 25.4 mm.

[1]Screws into wood framing must be of sufficient length to penetrate at least 1 inch into wood members.
[2]Screws into steel framing must be of sufficient length to penetrate the metal framing at least three full threads.
[3]Fasteners must be in a random/staggered pattern in the field.

TABLE 4—TRANSVERSE LOAD (WIND LOAD) RESISTANCE[1]

Product	Minimum Product thickness (In.)	Fastener Type[3, 4]	Fastener Spacing (In.)	Frame Type	Stud Spacing (In.)	Allowable positive and negative load[5]
HardieBacker® 500; HardieBacker® Cement Board with Hydrodefense™ Technology	$^{13}/_{32}$	Minimum $1^{1}/_{4}$-inch-long (32 mm), No. 8 by 0.375-inch-head-diameter (9.5 mm), self-drilling, corrosion-resistant, ribbed wafer-head screws	8	2X4 Wood[2]	16	91.9 psf (4400 Pa)
HardieBacker® 500; HardieBacker® Cement Board with Hydrodefense™ Technology	$^{13}/_{32}$	No. 11 ga., x $1^{3}/_{4}$-inchlong (44 mm) galvanized roofing nails	8	2X4 Wood[2]	16	30.1 psf (1441 Pa)
HardieBacker® 500; HardieBacker® Cement Board with Hydrodefense™ Technology	$^{13}/_{32}$	Minimum $1^{1}/_{4}$-inch-long (32 mm), No. 8 by 0.375-inch-head-diameter (9.5 mm), self-drilling, corrosion-resistant, ribbed wafer-head screws	8	Min No. 20 ga. x $3^{5}/_{8}$ in. x $1^{3}/_{8}$ in. metal C-stud[3]	16	91.7 psf (4391 Pa)

For **SI:** 1 ft = 305 mm, 1 inch = 25.4 mm, 1 mph=0.44 m/s, 1 psf = 47.88 Pa

[1] Installation must be in accordance with Section 4.2.1.4 of this report.
[2] Values are for species of wood having a specific gravity of .042 or greater.
[3] Screws into steel framing must be of sufficient length to penetrate the metal framing at least three full threads.
[4] Screws into wood framing must be of sufficient length to penetrate at least 1 inch into wood members.
[5] Allowable load is based on a factor of safety of 3.0 applied to the ultimate load.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 16 00—Sheathing

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 46 46—Fiber-Cement Siding

DIVISION: 09 00 00—FINISHES
Section: 09 30 00—Tiling

REPORT HOLDER:

JAMES HARDIE BUILDING PRODUCTS, INC.

EVALUATION SUBJECT:

1/4" HARDIEBACKER® EZ GRID®, HARDIEBACKER® 500, HARDIEBACKER® CEMENT BOARD WITH HYDRODEFENSE™ TECHNOLOGY, AND HARDIEBACKER® PROGRID™ CEMENT BOARDS, AND 1/4" HARDIEBACKER® UNDERLAYMENT

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that 1/4" HARDIEBACKER® EZ GRID®, HARDIEBACKER® 500, HARDIEBACKER® CEMENT BOARD WITH HYDRODEFENSE™ TECHNOLOGY, and HARDIEBACKER® PROGRID™ CEMENT BOARDS, and 1/4" HARDIEBACKER® UNDERLAYMENT, described in ICC-ES evaluation report ESR-2280, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2019 *California Building Code®* (CBC)

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

- 2019 *California Residential Code®* (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The 1/4" HARDIEBACKER® EZ GRID®, HARDIEBACKER® 500, and HARDIEBACKER® PROGRID™ CEMENT BOARDS, HARDIEBACKER® CEMENT BOARD WITH HYDRODEFENSE™ TECHNOLOGY, and 1/4" HARDIEBACKER® UNDERLAYMENT described in Sections 2.0 through 7.0 of the evaluation report ESR-2280, comply with CBC Chapter 14, provided the design and installation are in accordance with the 2018 *International Building Code®* (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapter 14, as applicable.

2.1.1 OSHPD: The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA: The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The 1/4" HARDIEBACKER® EZ GRID®, HARDIEBACKER® 500, HARDIEBACKER® CEMENT BOARD WITH HYDRODEFENSE™ TECHNOLOGY, and HARDIEBACKER® PROGRID™ CEMENT BOARDS, and 1/4" HARDIEBACKER® UNDERLAYMENT, described in Sections 2.0 through 7.0 of the evaluation report ESR-2280, comply with CRC Chapter 7, provided the design and installation are in accordance with the 2018 *International Residential Code®* (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued April 2025.