ICC-ES Evaluation Report

ESR-2460

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DIVISION: 09-FINISHES
Section: 09250-Gypsum Board

REPORT HOLDER:

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EVALUATION SUBJECT:

GLASROC® SHEATHING AND GLASROC® SHEATHING TYPE X

1.0 EVALUATION SCOPE

Compliance with the following codes:

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

Properties evaluated:

- Structural
- Noncombustibility
- Surface burning characteristics
- Fire-resistance-rated construction
- Physical properties

2.0 USES

GlasRoc® Sheathing and GlasRoc® Sheathing Type X are used as exterior wall sheathing and as exterior soffit board complying with ASTM C 1177 as specified in Table 2506.2 of the IBC ~~and Section R702.3.1 of the IRC.~~ * The sheathing is intended for use as solid sheathing behind a variety of exterior wall cladding materials on buildings of all construction types under the IBC and ~~buildings under the IRC.~~ * The sheathing may be used to resist transverse wind loads when installed in accordance with Section 4.2.1, and racking loads due to wind and seismic forces when installed in accordance with Sections 4.2.2 and 4.2.3. GlasRoc® Sheathing Type X may be used as a component of a fire-resistance-rated wall assembly when installed in accordance with Section 4.3.

3.0 DESCRIPTION

3.1 General:

GlasRoc® Sheathing and GlasRoc® Sheathing Type X are glass mat gypsum substrates with water-resistant cores and surfaces and fully embedded glass mats beneath the surface of each face. The exterior face is coated with an acrylic coating. GlasRoc® Sheathing and GlasRoc® Sheathing Type X are manufactured to conform to the physical property requirements specified in Section 5 of ASTM C 1177. GlasRoc® Sheathing and GlasRoc® Sheathing Type X have a Class A interior finish classification in accordance with ASTM E 84 and are classified as noncombustible building materials in accordance with ASTM E 136.

3.2 GlasRoc® Sheathing:

GlasRoc® Sheathing is $^1/_2$ inch (12.7 mm) thick and 48 inches (1219 mm) wide, and is available in lengths of 96, 108 and 120 inches (2438, 2743 and 3048 mm).

3.3 GlasRoc® Sheathing Type X:

GlasRoc® Sheathing Type X is $^5/_8$ inch (15.9 mm) thick and 48 inches (1219 mm) wide, and is available in lengths of 96, 108 and 120 inches (2438, 2743 and 3048 mm).

4.0 DESIGN AND INSTALLATION

4.1 General:

GlasRoc® Sheathing and GlasRoc® Sheathing Type X must be installed in accordance with ASTM C 1280 (Standard Specification for Application of Gypsum Sheathing) for IBC applications ~~or IRC Section R702.3.5 for IRC applications~~ *, the manufacturer's published installation instructions, and this report.

When installed on exterior walls, the sheathing must be covered with an approved water-resistive barrier where required by the code, and an approved exterior wall covering. The sheathing must not be used as a nailing base, and any mechanical attachments of exterior coverings must be made directly to the framing. All fasteners must be driven so that the heads are at or slightly below the surface of the sheathing without fracturing the core.

The manufacturers published installation instructions and this report must be strictly adhered to, and a copy of the instructions must be available at all times on the jobsite during installation.

4.2 Design:

4.2.1 Transverse Wind Resistance: GlasRoc® Sheathing and GlasRoc® Sheathing Type X may be used to resist transverse wind loads when installed as described in Tables 2 and 3. Design wind loads are determined in accordance with Section 1609 of the IBC. The design wind loads must not exceed the allowable transverse wind loads shown in Tables 2 and 3.

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4.2.2 Engineered Shear Walls—Wind Loads: GlasRoc® Sheathing and GlasRoc® Sheathing Type X may be used as components of wood-framed engineered shear walls for resisting wind loads when installed as described in Table 1. Design wind loads must be determined in accordance with Section 1609 of the IBC. The design wind loads must not exceed the allowable racking shear loads shown in Table 1.

4.2.3 Engineered Shear Walls—Seismic Provisions: GlasRoc® Sheathing and GlasRoc® Sheathing Type X may be used as components of wood-framed engineered shear walls for resisting seismic loads when installed as described in Table 1. Recognition of GlasRoc® Sheathing and GlasRoc® Sheathing Type X for seismic performance of shear walls is limited to Seismic Design Categories A, B, C and D for wood construction under the IBC ~~and IRC.~~ The maximum building height is limited to 35 feet (10.6 m) for buildings located in areas having a Seismic Design Category C or D. The response modification factor, R, shall be equal to 2; the system overstrength factor, Ω_o, shall be equal to $2^1/_2$; and the deflection amplification factor, C_d, shall be equal to 2. Design loads must be determined in accordance with Section 1613 of the IBC. The design loads must not exceed the allowable racking shear loads shown in Table 1.

*

4.3 1-Hour Limited Load-bearing Fire-resistance-rated Wall Assembly:

The $^5/_8$-inch-thick (15.9 mm) GlasRoc® Sheathing Type X must be installed horizontally or vertically and attached with 6d cement-coated cooler nails, complying with ASTM C 514, spaced 7 inches (178 mm) on center for the field, edge, and end nail spacing. Studs must be 2-by-4 Douglas fir No. 2 or better with a minimum specific gravity of 0.50. The stud spacing must not exceed 16 inches (406 mm) on center. Nails must have minimum edge and end distances of $^3/_8$ inch (9.5 mm). When GlasRoc® Sheathing Type X gypsum wallboard is installed only on the exterior side, $^5/_8$-inch-thick (15.9 mm), Type X gypsum board conforming to ASTM C 36 and ASTM C 1396 must be installed on the interior side using the same fastening schedule. All interior board joints without corner beads installed must be covered with 2-inch-wide (51 mm) joint tape and two layers of joint compound. All interior board nail heads must be covered with two layers of joint compound. Allowable axial bearing loads on wood studs must not exceed a maximum load of 1200 lbf/ft (17.5 kN/m) or 1600 lbf/stud (7.12 kN/stud). The wall height must not exceed 10 feet (3 m). Refer to Figure 1 for wall assembly details.

4.4 Thermal Barrier:

The sheathing may be used as a thermal barrier for foam plastic insulation when installed in accordance with ASTM C 1280.

5.0 CONDITIONS OF USE

The GlasRoc® Sheathing and GlasRoc® Sheathing Type X 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 manufactured, identified and installed in accordance with this report, the manufacturer's published installation instructions and the applicable code. If there is a conflict between the manufacturer's published installation instructions and this report, this report governs.

5.2 Use as a fire-resistance-rated assembly is limited to the axial loads described in Section 4.3.

5.3 When the sheathing is not installed as an engineered shear wall, as described in Sections 4.2.2 and 4.2.3, the stud walls must be braced by other materials in accordance with the applicable code.

5.4 Shear walls using the sheathing must not be used to resist forces imposed by masonry and/or concrete walls.

5.5 The sheathing is manufactured by CertainTeed Gypsum and Ceiling Manufacturing, Inc., in Cody, Wyoming, under a quality control program with inspections by RADCO (AA-650).

6.0 EVIDENCE SUBMITTED

6.1 Reports of physical property testing in accordance with ASTM C 473, for compliance with ASTM C 1177.

6.2 Reports of surface-burning tests in accordance with ASTM E 84.

6.3 Reports of noncombustibility tests in accordance with ASTM E 136.

6.4 Reports of tests on fire-resistance-rated wall assembly in accordance with ASTM E 119.

6.5 Reports of racking shear tests in accordance with ASTM E 72 and Section 4.1 of the ICC-ES Acceptance Criteria for Racking Shear Evaluation of Proprietary Sheathing Materials Used as Braced Wall Panels (AC269).

6.6 Reports of transverse load tests in accordance with ASTM E 330.

6.7 Engineering calculations.

7.0 IDENTIFICATION

Each GlasRoc® Sheathing and GlasRoc® Sheathing Type X board must bear a label that includes the report holder's name (CertainTeed Gypsum, Inc.), a plant identifier and date code, the product name, the board thickness, the name of the inspection agency (RADCO, AA-650), and the evaluation report number (ESR-2460).

TABLE 1—ALLOWABLE SHEAR LOADS (plf) FOR GLASROC® SHEATHING AND GLASROC® SHEATHING TYPE X IN ENGINEERED WOOD CONSTRUCTION[1, 2, 3, 5, 6]

SHEATHING TYPE	MAXIMUM STUD SPACING (inches o.c.)	MAXIMUM HEIGHT-TO-WIDTH ASPECT RATIO	FASTENER TYPE	FASTENER SPACING (inches o.c. Edges, field)	ALLOWABLE SHEAR LOAD (plf)
GlasRoc	16[4]	1:1	Roofing nails[7] $7/16$-inch head x $1\frac{3}{4}$ inches long	4,8	85
			Type W, No. 6 bugle head screws $1\frac{1}{4}$ inches long	4,8	85
GlasRoc Type X	24[4,8]	1:1	Roofing nails[7] $7/16$-inch head x $1\frac{3}{4}$ inches long	4,8	88
			Type W, No. 6 bugle head screws $1\frac{5}{8}$ inches long	4,8	74

For **SI:** 1 inch = 25.4 mm, 1 pound per lineal foot (plf) = 14.6 N/m.

[1]The sheathing is installed with the long dimension either parallel or perpendicular to the studs.
[2]All ends and edges of sheathing must be supported by framing members.
[3]The nails and screws must have a minimum edge distance of $\frac{3}{8}$ inch (9.5 mm).
[4]Wall studs are nominally 2-by-4 No. 1 grade Douglas-fir-larch with a minimum specific gravity of 0.50.
[5]Allowable shear values are for short-term loads due to wind and seismic forces. Allowable shear must be reduced by 50 percent for dynamic loading due to earthquake for buildings in Seismic Design Category D.
[6]Wood stud shear walls sheathed with GlasRoc Sheathing and GlasRoc Sheathing Type X must not be used to resist horizontal loads from concrete or masonry walls.
[7]For properties of the roofing nails, refer to ASTM F 1667.
[8] When used in fire-resistance-rated wall assemblies in accordance with Section 4.3, stud spacing must not exceed 16 inches on center.

TABLE 2—ALLOWABLE TRANSVERSE WIND LOADS FOR (psf) GLASROC® SHEATHING AND GLASROC® SHEATHING TYPE X IN ENGINEERED WOOD CONSTRUCTION[1, 2, 3, 5, 6]

SHEATHING TYPE	MAXIMUM STUD SPACING (inches o.c.)	FASTENER TYPE	FASTENER SPACING (inches o.c. Edges, Field)	ALLOWABLE LOAD (psf)
GlasRoc	16[4]	Roofing nails[7] $7/16$-inch head x $1\frac{1}{2}$ inches long	4, 8	22
		Type W, No. 6 bugle head screws $1\frac{1}{4}$ inches long	4, 8	24
	24[4]	Roofing nails[7] $7/16$-inch head x $1\frac{1}{2}$ inches long	4, 8	17
		Type W, No. 6 bugle head screws $1\frac{1}{4}$ inches long	4, 8	16
GlasRoc Type X	16[4]	Roofing nails[7] $7/16$-inch head x $1\frac{3}{4}$ inches long	4, 8	24
		Type W, No. 6 bugle head screws $1\frac{1}{4}$ inches long	4, 8	30
	24[4,8]	Roofing nails[7] $7/16$-inch head x $1\frac{1}{2}$ inches long	4, 8	16
		Type W, No. 6 bugle head screws $1\frac{3}{8}$ inches long	4, 8	17

For **SI:** 1 inch = 25.4 mm, 1 pound per lineal foot (plf) = 14.6 N/m, 1 pound per square foot (psf) = 48 Pa.

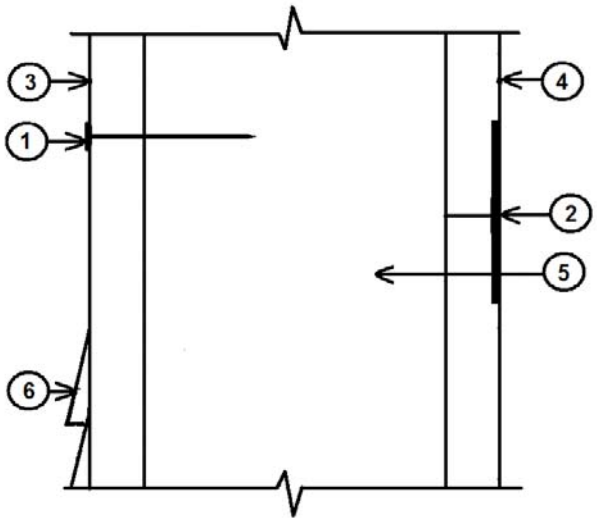
[1]The sheathing is installed with the long dimension either parallel or perpendicular to the studs.
[2]All ends and edges of sheathing must be supported by framing members, except where edges or ends are perpendicular to studs.
[3]The nails and screws must have a minimum edge distance of $\frac{3}{8}$ inch (9.5 mm).
[4]Wall studs are nominally 2-by-4 No. 1 grade Douglas-fir-larch with a minimum specific gravity of 0.50.
[5]Allowable values are for short-term wind loads.
[6]Wood stud walls sheathed with GlasRoc Sheathing and GlasRoc Sheathing Type X must not be used to resist horizontal loads from concrete or masonry walls.
[7]For properties of the roofing nails, refer to ASTM F 1667.
[8] When used in fire-resistance-rated wall assemblies in accordance with Section 4.3, stud spacing must not exceed 16 inches on center.

TABLE 3—ALLOWABLE TRANSVERSE WIND LOADS (psf) FOR GLASROC® SHEATHING AND GLASROC® SHEATHING TYPE X IN ENGINEERED STEEL STUD CONSTRUCTION[1, 2, 3, 5]

SHEATHING TYPE	MAXIMUM STUD SPACING (inches o.c.)	FASTENER TYPE	FASTENER SPACING	ALLOWABLE LOAD
GlasRoc	16	$1^1/_4$-inch #6 bugle drywall screws	4, 4	-26
			4, 8	-20
			8, 8	+38
			8, 8	-18
GlasRoc Type X	8	$1^1/_4$-inch #6 bugle drywall screws	4, 4	-58
			4, 8	-51
	16	$1^1/_4$-inch #6 bugle drywall screws	4, 4	-30
			4, 8	-23
			8, 8	-27
			8, 8	+47
	24	$1^1/_4$-inch #6 bugle drywall screws	4, 4	-18
			4, 8	-16
			8, 8	+29

For **SI:** 1 inch = 25.4 mm, 1 pound per lineal foot (plf) = 14.6 N/m, 1 pound per square foot (psf) = 48 Pa.

[1]The sheathing is installed with the long dimension either parallel or perpendicular to the studs.
[2]All ends and edges of sheathing must be supported by framing members, except where edges or ends are perpendicular to studs.
[3]The screws must have a minimum edge distance of $^3/_8$ inch (9.5 mm).
[4]Wall studs are nominally $3^5/_8$ x $1^5/_8$, 18 gage steel studs.
[5]Allowable values are for short-term wind loads.



[1]Cement-coated, 6d nails spaced 7 inches on center for the field, end and edge nail spacing with minimum edge and end distances of $^3/_8$ inch (9.5 mm).
[2]Fiber tape, 2-inch (51 mm) or wider, and two layers of joint compound for all joints without corner bead installed.
[3]GlasRoc® Sheathing Type X, $^5/_8$ inch thick (15.9 mm), installed horizontally or vertically.
[4]GlasRoc® Sheathing Type X or Type X gypsum board, $^5/_8$ inch thick (15.9 mm), meeting the requirements of ASTM C 36 and ASTM C 1396, fastened and finished as described in Notes 1 and 2, installed horizontally or vertically.
[5]Nominally 2-inch-by-4-inch Douglas fir No. 2 or better spaced a maximum of 16 inches (406 mm) center to center.
[6]An approved weather-resistant exterior wall envelope.

FIGURE 1—1-HOUR FIRE-RESISTANCE-RATED WALL ASSEMBLY