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DIVISION: 06—WOOD AND PLASTICS
Section: 06500—Structural Plastics
Section: 06610—Plastic Railings and Guards

REPORT HOLDER:

TIMBERTECH® LIMITED
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EVALUATION SUBJECT:

**5/4 PLANK TIMBERTECH® DECKING AND TIMBERTECH®
ORNAMENTAL RAILING SYSTEM**

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2003 *International Building Code*® (IBC) (deck board only)
- 2003 *International Residential Code*® (IRC)

Properties evaluated:

- Structural
- Durability
- Surface-burning characteristics

2.0 USES

The 5/4 Plank TimberTech® Decking evaluated in this report is limited to exterior use as a deck board for balconies, porches, stair treads and decks of Type V-B construction (IBC) and structures constructed in accordance with the IRC. The TimberTech® Ornamental Railing System evaluated in this report is limited to exterior use as a guard for balconies, porches, and decks of structures constructed in accordance with the IRC.

3.0 DESCRIPTION

3.1 General:

The 5/4 Plank TimberTech® Decking and the TimberTech® Ornamental Railing System are wood thermoplastic composite lumber (WTCL) products consisting of wood flour and high-density polyethylene (HDPE), with percentages as described in the quality control manual. The 5/4 Plank TimberTech® Decking and the TimberTech® Ornamental Railing System are manufactured by an extrusion process in four colors: cedar, grey, redwood and whitesand.

3.2 Deck Board:

3.2.1 General: The 5/4 Plank TimberTech® Decking is manufactured in 5/4-inch-by-6-inch (31.8 by 152 mm) nominal

dimensions with actual measurements of 1.0 inch by 5.43 inches (25.4 by 140 mm); and in lengths of 12, 16, and 20 feet (3660, 4880 and 6100 mm). See Figure 1 for a typical cross section.

3.2.2 Durability: When subjected to weathering, insect attack, and other decaying elements, material used to manufacture the 5/4 Plank TimberTech® Decking is equivalent in durability to preservative-treated or naturally durable lumber when used in locations described in Section 2.0 of this report. The 5/4 Plank TimberTech® Decking has been evaluated for structural performance when exposed to a temperature range from -20°F (-29°C) to 125°F (52°C).

3.2.3 Surface-burning Characteristics: When tested in accordance with ASTM E 84, the 5/4 Plank TimberTech® Decking has a flame-spread index of no greater than 200.

3.3 Guard Rail System:

3.3.1 General: The TimberTech® Ornamental Railing System is installed with a height of 36 inches (914 mm). The top and bottom rails are comprised of a structural 2 1/2-inch-by-2 1/2-inch (64 by 64 mm) universal structural core. The top rail has a second 2 3/4-inch-by-2 3/8-inch (70 by 60 mm) "bread loaf" shaped ornamental attachment affixed atop the universal structural core. The baluster is a 1 3/8-inch-square (35 mm) solid spindle. See Figure 2 for typical component cross sections.

3.3.2 Durability: When subjected to weathering, insect attack, and other decaying elements, material used to manufacture the TimberTech® Ornamental Railing System is equivalent in durability to preservative-treated or naturally durable lumber when used in locations described in Section 2.0. The TimberTech® Ornamental Railing System has been evaluated for structural performance when exposed to a temperature range from -20°F (-29°C) to 125°F (52°C)

3.3.3 Surface-burning Characteristics: When tested in accordance with ASTM E 84, the TimberTech® Ornamental Railing System has a flame-spread index of no greater than 200.

4.0 DESIGN AND INSTALLATION

4.1 General:

Installation of the 5/4 Plank TimberTech® Decking and the TimberTech® Ornamental Railing System shall comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions shall be available at the jobsite at all times during installation. When the manufacturer's published installation instructions differ from this report, this report shall govern.

4.2 Deck Boards:

4.2.1 General: The 5/4 Plank TimberTech® Decking shall be installed utilizing two No.8 by 2 1/2-inch (64 mm) stainless steel

or corrosion-resistant deck screws at each support. Holes shall be predrilled in the 5/4 Plank TimberTech® Decking when screws are installed within 1 1/2 inches (38 mm) of the plank end and during cold weather installation, as specified in the manufacturer's published installation instructions. Fasteners shall be installed approximately 3/4 inch (19.1 mm) from the end and edges of each board. Butt joints shall be supported with a double joist allowing a gap as recommended in the manufacturer's published installation instructions. A minimum edge gap of 1/8 inch (3.2 mm) shall be provided for the 5/4 Plank TimberTech® Decking. The maximum distance of extension past the last support shall be 2 inches (51 mm).

4.2.2 Structural:

4.2.2.1 Deck Boards: The 5/4 Plank TimberTech® Decking, when used as a deck board, will have an allowable capacity, when installed at a maximum center-to-center spacing of the supporting construction, as prescribed in Table 1.

4.2.2.2 Deck Boards Used as Stair Treads: The 5/4 Plank TimberTech® Decking, when used as a stair tread, is satisfactory to resist the code-prescribed concentrated load of 300 lbf (1.33 kN) when installed at a maximum center-to-center spacing of the supporting construction as shown in Table 2.

4.3 Guard Rail:

4.3.1 General: The top and bottom universal rails of the TimberTech® Ornamental Railing System shall be attached to each end of each baluster utilizing one No. 9 by 3 1/2-inch-long (89 mm) corrosion-resistant screw. Balusters shall be spaced a maximum of 5 inches (127 mm) on center. The ornamental "bread loaf" top rail attachment shall be fastened to the universal structural core with a stainless steel or corrosion-resistant screw at 24 inches (610 mm) on center. The universal structural rails shall be supported by the connection to the last baluster installed adjacent to the supporting construction, as illustrated in the manufacturer's published installation instructions. The baluster shall then be attached to the supporting construction such that it is capable of resisting the applicable loads as specified in Table R301.5 of the IRC. See Section 5.7 of this report for additional information regarding this issue. Support blocks shall be installed, as shown in the manufacturer's published installation instruction, at a maximum spacing of 24 inches (610 mm) on center.

4.3.2 Structural: The TimberTech® Ornamental Railing System will resist the loads specified in Table R301.5 of the IRC when installed at a maximum length as prescribed in Table 3 of this report and when the guardrail is supported on both ends by the supporting construction. See Figure 3 for a typical rail assembly.

5.0 CONDITIONS OF USE

The 5/4 Plank TimberTech® Decking and the TimberTech® Ornamental Railing System 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 use of the 5/4 Plank TimberTech® Decking shall be limited to exterior use as a deck board for balconies, porches, stair treads, and decks of Type V-B construction (IBC) and structures constructed in accordance with the IRC.
- 5.2 The use of the TimberTech® Ornamental Railing System shall be limited to exterior use as a guardrail for balconies, porches, and decks of structures constructed in accordance with the IRC.
- 5.3 Installation shall comply with this report, the manufacturer's published installation instructions and

the applicable code. Only those fasteners and fastener configurations described in this report have been evaluated for the installation of the 5/4 Plank TimberTech® Decking and TimberTech® Ornamental Railing System. When the manufacturer's published installation instructions differ from this report, this report shall govern.

- 5.4 The use of the 5/4 Plank TimberTech® Decking as a component of a fire-resistance-rated assembly is outside the scope of this report.
- 5.5 The compatibility of the fasteners and other metal hardware with the supporting construction, including chemically treated wood, is outside the scope of this report.
- 5.6 Adjustment factors outlined in the AFPA *National Design Specification* and applicable codes shall not apply to the allowable capacity and maximum spans for the 5/4 Plank TimberTech® Decking and TimberTech® Ornamental Railing System.
- 5.7 The TimberTech® Ornamental Railing System has not been evaluated with a post installed in the system. The determination of the ability of the supporting construction to resist the code-specified loads is outside the scope of this report.
- 5.8 The 5/4 Plank TimberTech® Decking and the TimberTech® Ornamental Railing System shall be fastened directly to supporting construction. Where required by the code official, engineering calculations and construction documents consistent with this report shall be submitted for approval. The calculations shall verify that the supporting construction complies with the applicable building code requirements and is adequate to resist the loads imparted upon it from the products and systems discussed in this report. The documents shall contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.9 The 5/4 Plank TimberTech® Decking and the TimberTech® Ornamental Railing System are produced in Wilmington, Ohio, under a quality control program with inspections by Architectural Testing, Inc. (AA-676).

6.0 EVIDENCE SUBMITTED

- 6.1 Manufacturer's published installation instructions.
- 6.2 Data establishing compliance of the guard system with the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) (AC174), dated April 2002 (editorially revised July 1, 2004).
- 6.3 Data establishing compliance of the deck board with the ICC-ES Acceptance Criteria for Thermoplastic Composite Lumber Products (AC109), dated June 2004.
- 6.4 A quality control manual.

7.0 IDENTIFICATION

The 5/4 Plank TimberTech® Decking and the TimberTech® Ornamental Railing System described in this report are identified on each individual piece or the packaging by a stamp bearing the manufacturer's name (TimberTech® Limited) and/or trademark, the product name, the name of the inspection agency (Architectural Testing, Inc.) and the evaluation report number (ESR-1400). Additionally, the railing system packaging shall be labeled "For Use in One- and Two-Family Dwellings Only."

TABLE 1—DECK BOARD SPAN RATING

DECKBOARDS	MAXIMUM SPAN (in.)	ALLOWABLE CAPACITY (lbf/ft ²) ²
5/4 Plank TimberTech® Decking	24	100

For SI: 1 inch = 25.4 mm, 1 lbf/ft² = 47.9 Pa.

¹Maximum span shall be measured center-to-center of the supporting construction.

²Maximum allowable capacity has been adjusted for durability. No further increases are permitted.

TABLE 2—MAXIMUM STAIR TREAD SPANS¹

DECK BOARDS USED AS STAIR TREADS	MAXIMUM SPAN (in.)
5/4 Plank TimberTech® Decking	12

For SI: 1 inch = 25.4 mm.

¹Maximum span shall be measured center-to-center of the supporting construction.

TABLE 3—MAXIMUM GUARDRAIL SPAN^{2,3}

PRODUCT NAME	APPLICABLE BUILDING CODE ⁴		MAXIMUM SPAN (ft-in) ¹
	IBC	IRC	
TimberTech® Ornamental Railing	—	yes	8'-0"

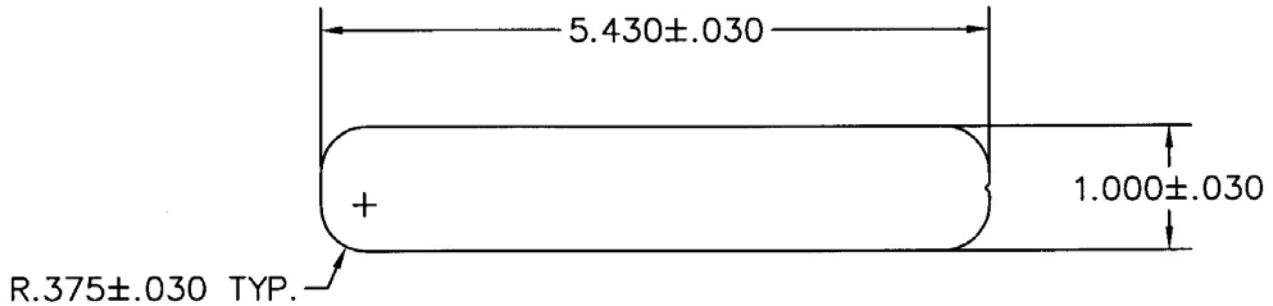
For SI: 1 inch = 25.4 mm, 1 ft = 305 mm.

¹Maximum span shall be measured from edge-of-supporting-construction to edge-of-supporting-construction.

²Maximum allowable span has been adjusted for durability. No further increases are permitted.

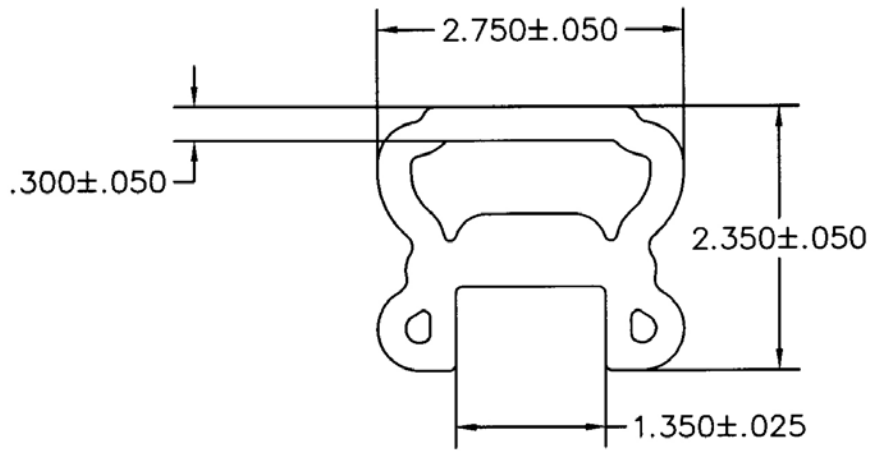
³Evaluation of this guardrail does not include the post, post sleeve or post base attachment. The ability of the supporting construction to resist the reactionary loads shall be established as required by the code official.

⁴Indicates compliance with the respective building codes.

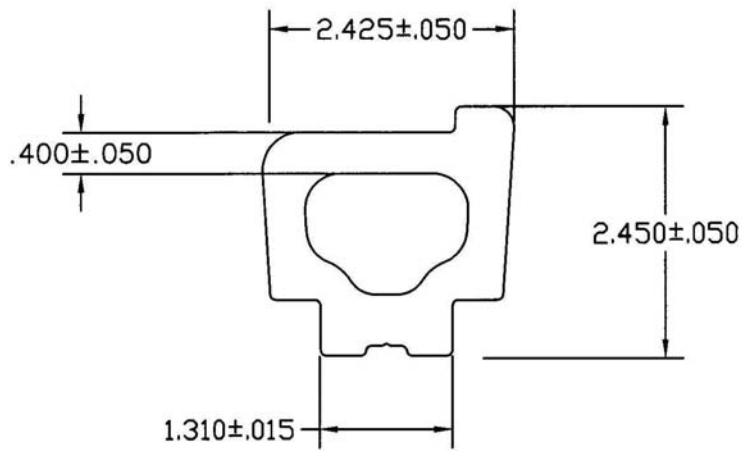


For SI: 1 inch = 25.4 mm

FIGURE 1—5/4 PLANK TIMBERTECH® DECKING CROSS SECTION



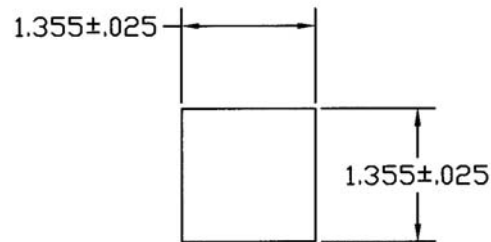
ORNAMENTAL TOP RAIL



UNIVERSAL RAIL

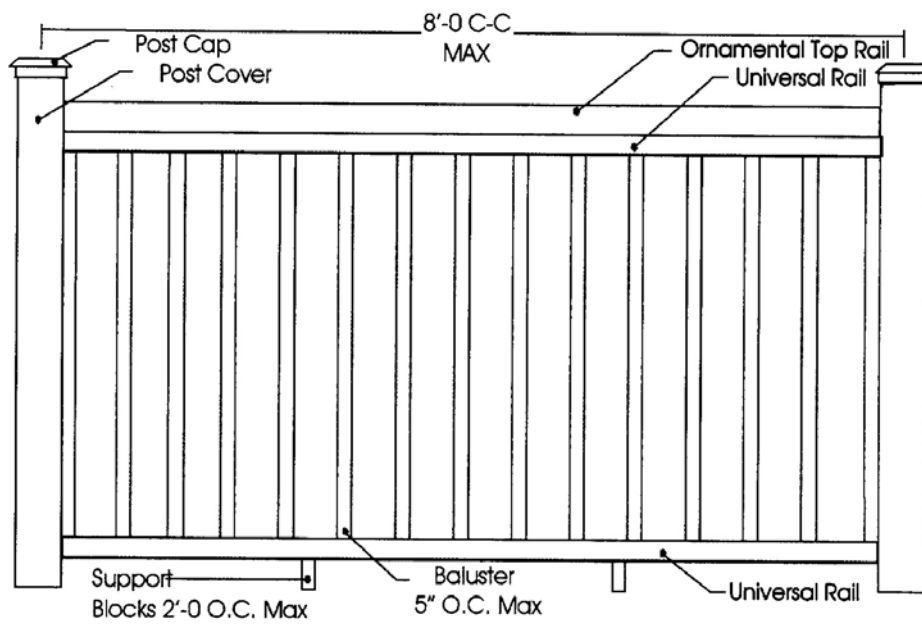
(Orientation is as installed in bottom rail)

BALUSTER



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

FIGURE 2—GUARDRAIL COMPONENT PROFILES



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

(Note: the post is outside the scope of this evaluation report)

FIGURE 3—TIMBERTECH® ORNAMENTAL GUARDRAIL SYSTEM