

ICC-ES Evaluation Report

ESR-3947

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A Subsidiary of the International Code Council®

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 50 00—Structural Plastics

Section: 06 63 00—Plastic Railings

REPORT HOLDER:

TREX COMPANY INC.

EVALUATION SUBJECT:

**TREX® TRANSCEND® SERIES RAILING SYSTEM
TREX® SELECT® SERIES RAILING SYSTEM**

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2015, 2012 and 2009 *International Residential Code*® (IRC)

Property evaluated:

- Structural
- Durability
- Surface-burning Characteristics

1.2 Evaluation to the following green code(s) and/or standards:

- 2016 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

- See Section 3.1

2.0 USES

The Trex® Transcend® Series Railing System and Trex® Select® Series Railing System described in this report are limited to exterior use as guards for balconies, porches, and decks in Residential Group R buildings of Type V-B construction and other types of construction in applications where untreated wood is permitted by IBC Section 1406.3 or in buildings constructed in accordance with the IRC.

3.0 DESCRIPTION

3.1 General:

Trex® Transcend® Series Railing System and Trex® Select® Series Railing System are guards consisting of

top and bottom rails, balusters, baluster spacers, rail-to-post brackets, foot blocks, with decorative post sleeves, post sleeve caps and post sleeve skirts. The top and bottom rails, post sleeves, and the Transcend and Select balusters are composed of extruded wood-plastic composite core material, with a polyvinyl chloride (PVC) or acrylic cap layer.

The attributes of the railing systems have been verified as conforming to the provisions of (i) CALGreen Section A5.406.1.2 for reduced maintenance; (ii) ICC 700-2015 and ICC 700-2012 Sections 601.7, 11.601.7, and 12.1(A).601.7 for site-applied finishing materials; and (iii) ICC 700-2008 Section 601.7 for site-applied finishing materials. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.2 Guards:

3.2.1 Trex® Transcend® Series Railing System: The height of the railing assembly is 36 inches or 42 inches (914.4 mm or 1066.8 mm) above the walking surface. The top rail has overall dimensions of 3.31 inches wide by 2.45 inches tall (84.1 mm by 62.2 mm). The bottom rail has overall dimensions of 3.0 inches wide by 2.0 inches tall (76.2 mm by 50.8 mm). The balusters can be either 1.42 inch (36.1 mm) or 1.125 inch (28.6 mm) square profiles. A baluster spacer, made of PVC with a PVC or acrylic cap layer, is installed onto the top and bottom rails. Each post is covered with a 4.45 inch (113 mm) square composite post sleeve. Rails are attached to posts with nylon composite brackets.

Transcend® Series Railing System components are available in 7 colors: Charcoal Black, Classic White, Fire Pit, Gravel Path, Rope Swing, Tree House, and Vintage Lantern.

3.2.2 Trex® Select® Series Railing System: The height of the railing assembly is 36 inches (914.4 mm) above the walking surface. The top rail has overall dimensions of 2.75 inches wide by 2.0 inches tall (69.9 mm by 50.8 mm). The bottom rail has overall dimensions of 2.0 inches wide by 2.75 inches tall (50.8 mm by 69.9 mm). The balusters are 1.125 inch (28.6 mm) square profiles. Balusters are installed directly into openings machined into the upper and lower rails. Each post is covered with a 4.45 inch (113 mm) square composite post sleeve. Rails are attached to posts with nylon brackets.

Select® Series Railing System is available in white color.

3.3 Durability:

When subjected to weathering, insect attack, and other decaying elements, the material used to manufacture the Trex® Transcend® Railing System and Trex® Select® Railing System are equivalent in durability to code-complying, preservative-treated or naturally durable lumber when used in locations in described in Section 2.0 of this report. Trex® Transcend® Railing System and Trex® Select® Railing System have been evaluated for structural performance when exposed to temperatures from -20°F (-29°C) to 125°F (52°C).

3.4 Surface-burning Characteristics:

When tested in accordance with ASTM E84, Trex® Transcend® Railing System and Trex® Select® Railing System have a flame-spread index of no greater than 200.

4.0 DESIGN AND INSTALLATION

4.1 General:

The Trex® Transcend® Series Railing System and Trex® Select® Series Railing System must be installed in accordance with the manufacturer's published installation instructions, the approved construction documents and this report. The manufacturer's published installation instructions must be available at all times on the jobsites during installation.

4.2 Design:

The Trex® Transcend® Series Railing System and Trex® Select® Series Railing System are satisfactory to resist loads specified in Section 1607.8.1 of the 2015 and 2012 IBC, Section 1607.7.1 of the 2009 IBC and Table R301.5 of the IRC, when installed at the maximum clear distance between the posts as noted in Table 1. When the railing is supported on one or both ends by the supporting structure, the maximum clear distance between the post and supporting structure or between the structures must comply with the spans noted in Table 1.

4.3 Installation:

4.3.1 Trex® Transcend® Series Railing System:

Composite post sleeves are installed over a conventional treated wood 4x4 post, having a minimum specific gravity of 0.55. The attachment of the posts to the deck structure must be adequate and is outside the scope of this report. The top and bottom rail assemblies are attached to the composite post sleeves using mounting brackets. The bracket screws are installed through the composite post sleeve, into the 4x4 wooden post using two #8 x 2-inch-long (50.8 mm) wood screws. Each mounting bracket attaches to the top and bottom rail using two #12 x 1.5-inch-long (38.1 mm) self-drilling flathead screws. Baluster spacers are installed in the top and bottom rails to hold the balusters in place. Foot blocks are installed at mid-span of the bottom rail between the deck surface and the rail using one #10 x 2-inch-long (50.8 mm) screw.

4.3.2 Trex® Select® Series Railing System:

Composite post sleeves are installed over a conventional treated wood 4x4 post, having a minimum specific gravity of 0.55. The attachment of the posts to the deck structure must be adequate and is outside the scope of this report. The top and bottom rail assemblies are attached to the composite post sleeves using mounting brackets. The bracket screws are installed through the composite post sleeve, into the 4x4 wooden post using four #8 x 2-inch-long (50.8 mm) wood screws. Each mounting bracket attaches to the top and bottom rail using four #10 x 1-inch-long (25.4 mm) pan-head screws. Balusters are installed directly into the holes in the rail profiles. Foot blocks are

installed at mid-span of the bottom rail between the deck surface and the rail using one #10 x 2-inch-long (50.8 mm) screw.

5.0 CONDITIONS OF USE

The Trex® Transcend® Series Railing System and Trex® Select® Series 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 This Trex® Transcend® Series Railing System and Trex® Select® Series Railing System are limited to exterior use as guards for balconies, porches, and decks in Residential Group R buildings of Type V-B construction and other types of construction in applications where untreated wood is permitted by IBC Section 1406.3, or in building constructed in accordance with the IRC.
- 5.2 Installation of the Trex® Transcend® Series Railing System and Trex® Select® Series Railing System must comply with this evaluation report, the manufacturer's published installation instructions and the applicable code. When the manufacturer's published installation instructions differ from this evaluation report, this evaluation report governs.
- 5.3 Only those types of fasteners and fastening methods described in this evaluation report have been evaluated for the installation of Trex® Transcend® Railing System and Trex® Select® Railing System. The compatibility of fasteners with the supporting construction, including chemically treated wood, is outside the scope of this report.
- 5.4 The Trex® Transcend® Series Railing System and Trex® Select® Series Railing System must be directly fastened to supporting construction having adequate strength and stiffness. Where required by the code official, engineering calculations and construction documents consistent with this report must be submitted for approval. The calculations must 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 must contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.5 The use of Trex® Transcend® Series Railing System and Trex® Select® Series Railing System on stairs has not been evaluated and is outside the scope of this evaluation report.
- 5.6 Structural posts and attachment of the posts to the supporting structure are outside the scope of this report.
- 5.7 The Trex® Transcend® Railing System and Trex® Select® Railing System are manufactured in Winchester, Virginia, under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail systems (Guards and Handrails) (AC174), dated January 2012 (Editorially revised December 2014).

7.0 IDENTIFICATION

7.1 The Trex® Transcend® Series Railing System and Trex® Select® Series Railing System described in this report are identified by a stamp on each individual piece or on the packaging, bearing the report holder's name (Trex Company, Inc.), the product name (The Trex® Transcend® Series Railing System or Trex® Select® Series Railing System), the allowable span, ICC-ES evaluation report number (ESR-3947).

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

TREX COMPANY INC.
160 EXETER DRIVE
WINCHESTER, VIRGINIA 22602
(540) 542-6300
www.trex.com

TABLE 1—MAXIMUM GUARDRAIL SYSTEM SPANS¹

PRODUCT NAME / COMPONENT	APPLICABLE BUILDING CODE ^{2,3}		MAXIMUM SPAN ^{4,5} (inches)
	IBC	IRC	
Trex® Transcend® Railing System	Yes	Yes	67.5
Trex® Transcend® Railing System	No ⁶	Yes	91.75
Trex® Select® Railing System	No ⁶	Yes	68.25

For SI: 1 inch = 25.4 mm; 1 foot = 305 mm.

¹The ability of the supporting construction, including posts, to resist the reactionary loads must be justified to the satisfaction of the code official.

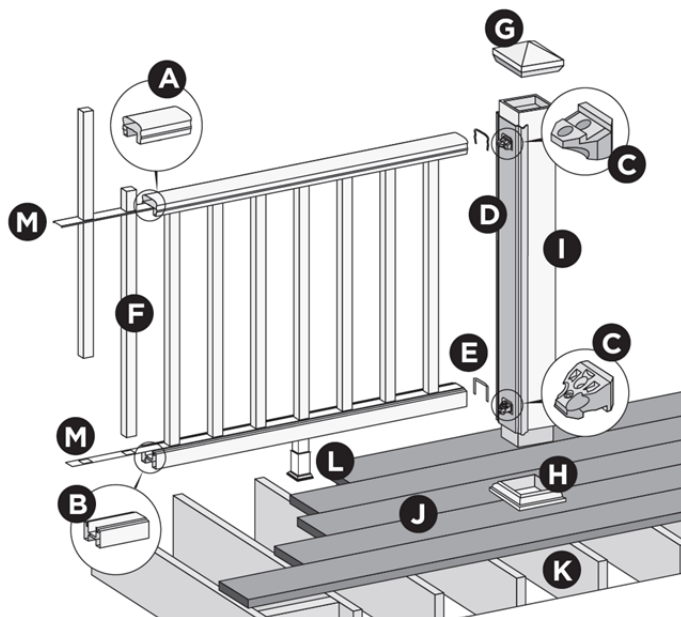
²Indicates compliance with the respective building codes.

³The minimum height of the top rails is 42 inches in accordance with Section 1015 of the 2015 IBC and Section 1013 of the 2012 and 2009 IBC and 36 inches in accordance with IRC Section R312.

⁴Maximum span is the clear distance measured from edge-of-post to edge-of-post, edge-of-post to edge-of-structure, or edge-of-structure to edge-of-structure.

⁵Maximum allowable span has been adjusted for durability. No further increases are permitted.

⁶Exempt in One- and Two-Family Dwellings.



- A. Top Rail
- B. Bottom Rail
- C. Railing Bracket
- D. **Assembly Guide Template
- E. **Gaskets
- F. Balusters
- G. Post Cap
- H. Post Skirt
- I. Trex® Composite Post Sleeve
- J. **Trex® Decking
- K. **Code-Approved Wood Joists
- L. Trex® Footblock
- M. Baluster Spacer

Note: Items marked with ** are outside the scope of this report.

FIGURE 1—TYPICAL TREX® TRANSCEND® SERIES RAILING ASSEMBLY

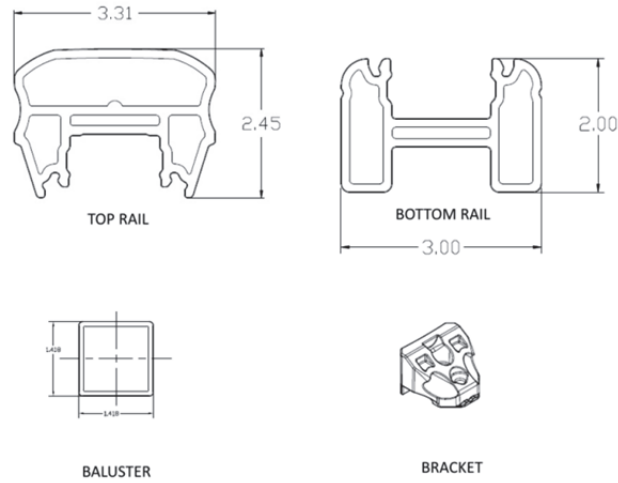


FIGURE 2—TREX® TRANSCEND® SERIES RAILING COMPONENTS

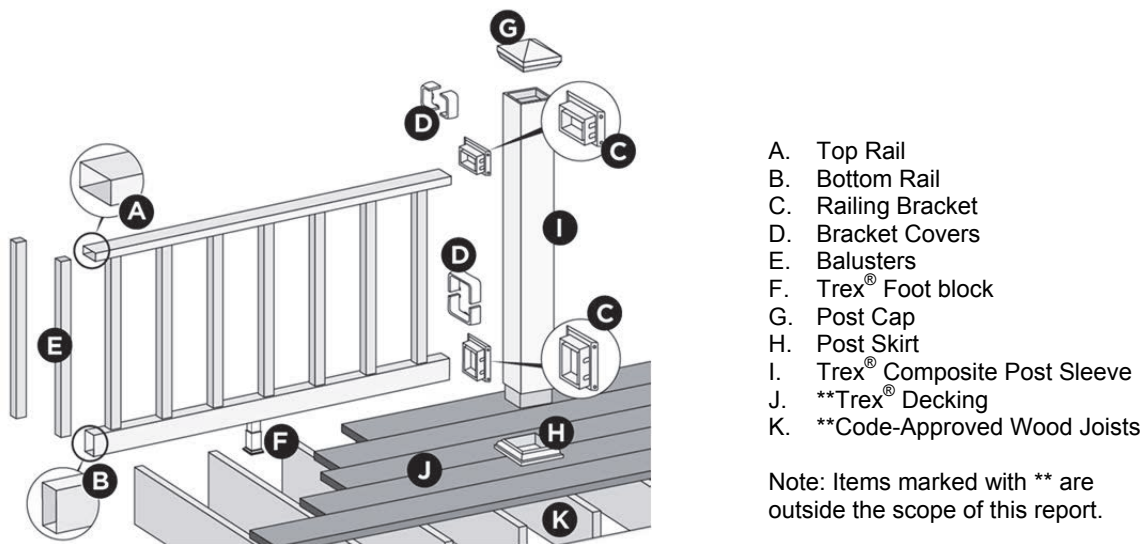


FIGURE 3—TYPICAL TREX® SELECT® SERIES RAILING ASSEMBLY

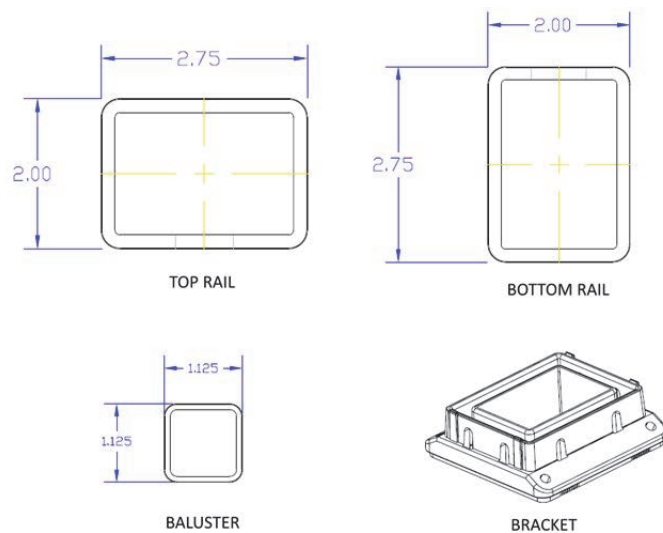


FIGURE 4—TREX® SELECT® SERIES RAILING COMPONENTS

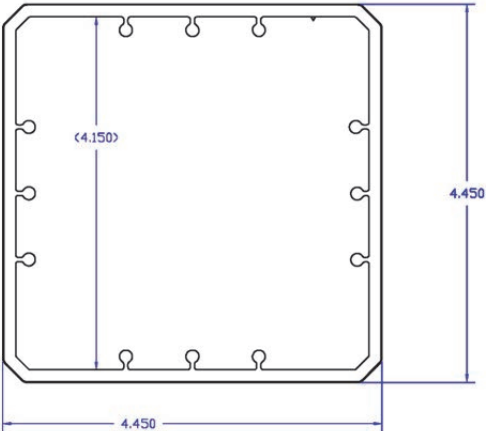


FIGURE 5—TREX® TRANSCEND® AND SELECT® SERIES COMPOSITE POST SLEEVE