

DIVISION: 06 – WOOD, PLASTICS, AND COMPOSITES
Section: 06 63 00 – Plastic Railings

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REPORT SUBJECT:
CP300 Composite Railing (aka. FX-2 Guardrail Systems)

1.0 SCOPE OF EVALUATION

This research report addresses compliance with the following Codes:

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

NOTE: This report references 2015 Code sections with [2012] Code sections shown in brackets where they differ.

FX-2 Guardrail Systems / CP300 Composite Railing has been evaluated for the following properties:

- Structural Performance
- Durability
- Surface Burning
- Decay Resistance
- Termite Resistance

2.0 USES

2.1. *FX-2 / CP300 Railing Systems* are a guardrail under the definitions of the referenced codes. It is intended for use at or near the open sides of elevated walking areas of buildings and walkways as required by the codes.

2.2. Guardrails are provided as level guards for level walking areas such as decks, balconies and porches.

2.3. Guardrail systems recognized in this report may be used in One- and Two-Family Dwellings regulated by the IRC and all construction types regulated by the IBC in accordance with IBC Section 1406.3, Exception 2. Guardrails less than 42 inches high are limited to use in One- and Two-Family Dwellings (IRC). See Table 1 for additional restrictions based upon Use and Occupancy classification.

3.0 DESCRIPTION

3.1. Level guardrails are provided with rail lengths up to 72 inches in length (measured between the inside of support posts) and an installed height of up to 42 inches. See Table 1 for qualified lengths and configurations.

3.2. *FX-2 Guardrail Systems / CP300 Composite Railing* are an assemblage of an extruded Wood-Plastic Composite (WPC) material with a PVC capstock available in three colors: White, Black, and Walnut.

3.3. The guardrail system includes a top rail, a bottom rail, vertical balusters, 4 inch square post sleeves, 5-1/4 inch square post sleeves, rail-to-post brackets, support block, decorative moldings, and post caps

3.4. The top rail and sub-rail are co-extruded WPC rails with a PVC capstock. The top rail is contoured and has overall nominal sectional dimensions of 3-3/8 inches wide by 2-1/2 inches tall. The “H” sub-rail has overall nominal dimensions of 1-7/8 inch by 1-3/4 inch. See Figures 1-2.

3.5. The bottom rail is co-extruded WPC with a PVC capstock contoured profile and is 2-1/4 inch wide by 2-1/8 inch high. See Figure 3.

3.6. The infill area consists of 1-1/4 inch square, hollow, co-extruded WPC pickets with a PVC capstock. See Figure 10.

3.7. Top and bottom rails are attached directly to structural supports with stainless steel mounting brackets. See Figures 4 through 6.

3.8. Structural supports may be conventional wood framing. A co-extruded WPC post sleeve with PVC



capstock with an overall width of 5-1/4 inches square is utilized to sleeve a conventional 4x4 wood post.

3.9. A support block is installed between the lower rail and the deck surface midway between supports.

4.0 PERFORMANCE CHARACTERISTICS

4.1. The guardrail system described in this report has demonstrated the capacity to resist the design loadings specified in Chapter 16 of the IBC and Section R301 of the IRC when tested in accordance with ICC-ES AC174.

4.2. Structural performance has been demonstrated for a temperature range from -20°F to 125°F.

4.3. Materials used are deemed equivalent to preservative treated or naturally durable wood for resistance to weathering effects, decay, and attack from termites.

4.4. The WPC material used in the guardrail system has a flame spread index of less than 200 when tested according to ASTM E 84.

5.0 INSTALLATION

FX-2 Guardrail Systems / CP300 Composite Railing must be installed in accordance with the manufacturer's published installation instructions, the applicable Code and this Research Report. The manufacturer's published installation instructions and this Research Report must be strictly adhered to, and a copy of the instructions must be available on the jobsite during installation.

5.1. The top and bottom rails are attached to structural supports as depicted in Figures 6 and 9 utilizing 316 stainless steel brackets. Also see Figure 4 and Table 2.

5.2. The top and bottom rails may be attached to conventional wood supports; however, conventional wood supports, including wood posts, are outside the scope of this report.

5.3. 4x4 conventional wood posts may be covered by post sleeves, decorative caps, and moldings.

5.4. Square WPC balusters are connected to the top and bottom rails using pin grip connectors. See Figure 10 and 11.

5.5. The wood in the supporting structure including support posts shall have a specific gravity of 0.50 or greater (Southern Yellow Pine or better) and a minimum thickness to allow full penetration of the bracket mounting screws.

6.0 SUPPORTING EVIDENCE

6.1. Drawings and installation instructions submitted by the manufacturer.

6.2. Reports of testing demonstrating compliance with the performance requirements of ICC-ES AC174, Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails), revised December 2014.

6.3. The reports of testing demonstrate compliance with the performance requirements of ASTM D 7032-10a [-08], Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails).

6.4. Documentation of an Intertek approved quality control system for the manufacturing of products recognized in this report.

7.0 CONDITIONS OF USE

The *FX-2 Guardrail Systems / CP300 Composite Railing* described in this Research Report complies with, or is a suitable alternative to, what is specified in those Codes listed in Sections 1.0 and 2.0 of this report, subject to the following conditions:

7.1. Installation must comply with this Research Report, the manufacturer's published installation instructions and the applicable Code. In the event of a conflict between the manufacturer's instructions and this report, this report governs.

7.2. Conventional wood supports including support posts for guardrails are not within the scope of this report and are subject to evaluation and approval by the building official. Supports must satisfy the design load requirements specified in Chapter 16 of the IBC and must provide suitable material for anchorage of the rail brackets (See 5.5 under "Installation"). Where required by the building official, engineering calculations and details prepared by a licensed design professional shall be provided.



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7.3. Compatibility of fasteners and other metallic components with the supporting structure, including chemically treated wood, is not within the scope of this report.

7.3.1. FX-2 / CP300 products are manufactured in Mount Joy, Pennsylvania and York, Nebraska in accordance with the approved quality control system and with inspections by Intertek.

8.0 IDENTIFICATION

The FX-2 Guardrail Systems / CP300 Composite Railing described in this Research Report are identified by a marking bearing the report holder’s name (Fairway Architectural Railing Solutions) the Intertek Mark, and the Code Compliance Research Report number (CCRR-0176) and the following statements: “See CCRR-0176 at https://whdirectory.intertek.com for uses and performance levels” and “For use in One- and Two-Family Dwellings Only” (when applicable).



9.0 CODE COMPLIANCE RESEARCH REPORT USE

9.1. Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

9.2. Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

9.3. Reference to the Intertek website address: whdirectory.intertek.com is recommended to ascertain the current version and status of this report.

TABLE 1 – QUALIFIED GUARDRAIL SYSTEMS AND USE CATEGORIES

Railing System Dimensions ¹	Guardrail Type	Code Occupancy Classification
72 in by 42 in	Level	IBC – All Use Groups
72 in by 36 in or 42 in	Level	IRC – One- and Two-Family Dwellings

¹ Guardrails are qualified up to and including the listed maximum guardrail system dimensions for use in the referenced Code Occupancy Classification.





TABLE 2 – FASTENING SCHEDULE

Connection	Fastener Quantity and Size
Top Rail Bracket to Post ¹	Two #10-12 x 2-1/4 in pan head, stainless steel screws (0.183 in major diameter, 0.125 in minor diameter)
Top Rail Bracket to Top Rail ¹	One #10-12 x 3/4 in pan head, stainless steel screw 2 (0.190 in major diameter, 0.123 in minor diameter) Connects Bracket to Sub-Rail -and- One #10-12 x 1-3/4 in pan head, stainless steel screw 3 (0.182 in major diameter, 0.119 in minor diameter) Connects Bracket to Sub-Rail to Top Rail Cap
Sub-Rail to Top Rail Cap ^{1, 4}	Two #10-12 x 1-3/4 in pan head, stainless steel screws (0.182 in major diameter, 0.119 in minor diameter)
Bottom Rail Bracket Mounting Screw to Post ⁵	One #14-10 x 2 in pan head, stainless steel screw (0.250 in major diameter, 0.185 in minor diameter)
Bottom Rail Bracket to Bottom Rail	One #10-12 x 3/4 in pan head, stainless steel screw (0.190 in major diameter, 0.123 in minor diameter)
Support Block Bracket to Bottom Rail	One #10-12 x 3/4 in pan head, stainless steel screw (0.190 in major diameter, 0.123 in minor diameter)

- ¹ 5/32 in diameter pre-drill in post and/or rail
- ² Installed in the bracket slot closer to the post
- ³ Installed in the bracket slot farther from the post.
- ⁴ Fasteners located at quarter points relative to rail length.
- ⁵ 3/16 in diameter pre-drill in post

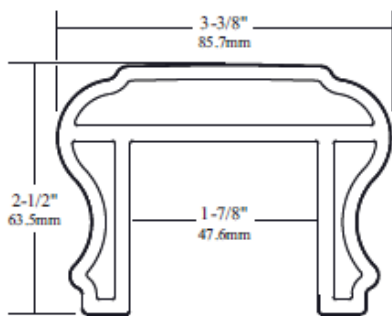


FIGURE 1 – TOP RAIL PROFILE

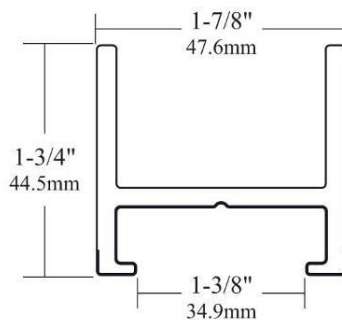


FIGURE 2 – SUB-RAIL PROFILE

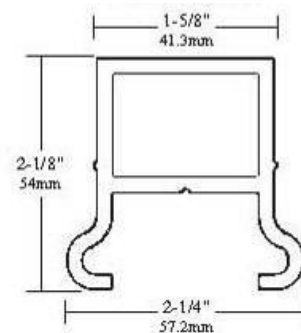


FIGURE 3 – BOTTOM RAIL PROFILE



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Top Rail Fastener

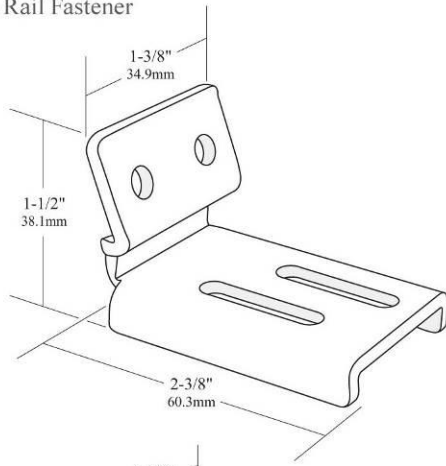


FIGURE 4 – TOP RAIL BRACKET

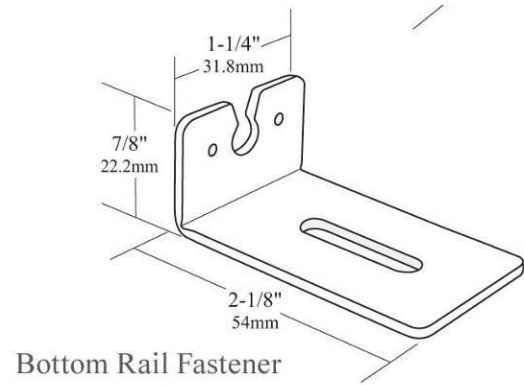


FIGURE 5 – BOTTOM RAIL BRACKET

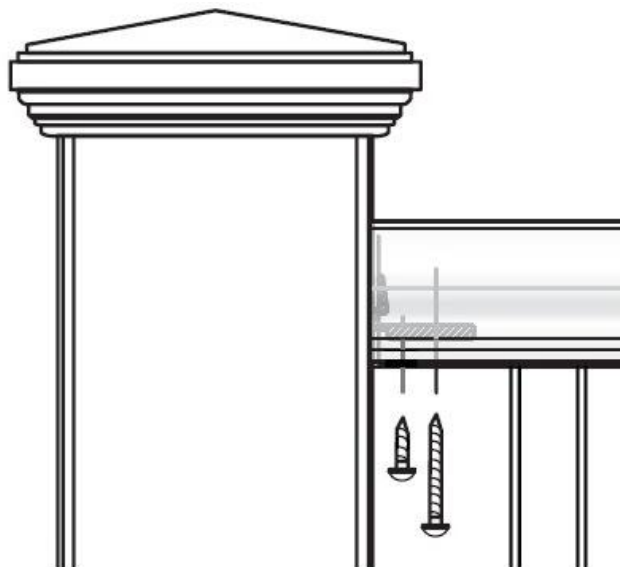


FIGURE 6 – TOP RAIL TO BRACKET CONNECTION DETAIL

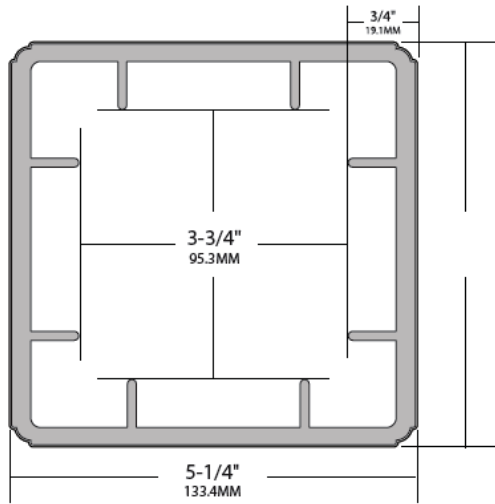


FIGURE 7 – 5-1/4" X 5-1/4" POST SLEEVE

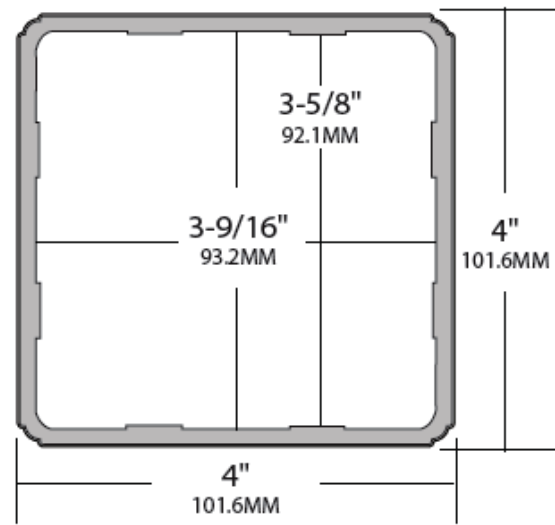


FIGURE 8 – 4" X 4" POST SLEEVE

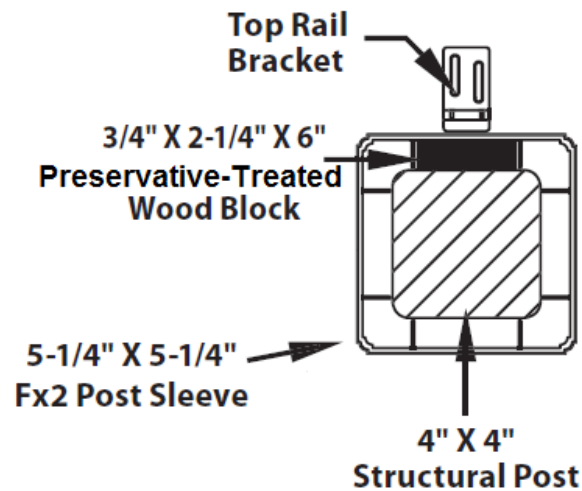


FIGURE 9 – POST SLEEVE INTERNAL DETAIL FOR 5-1/4" SQUARE POST SLEEVE

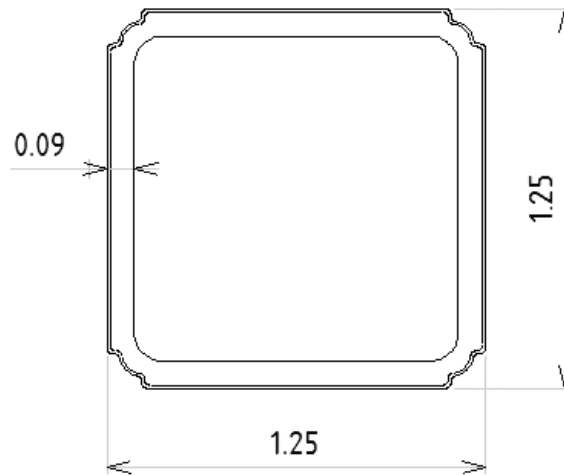


FIGURE 10 – SQUARE WPC BALUSTER

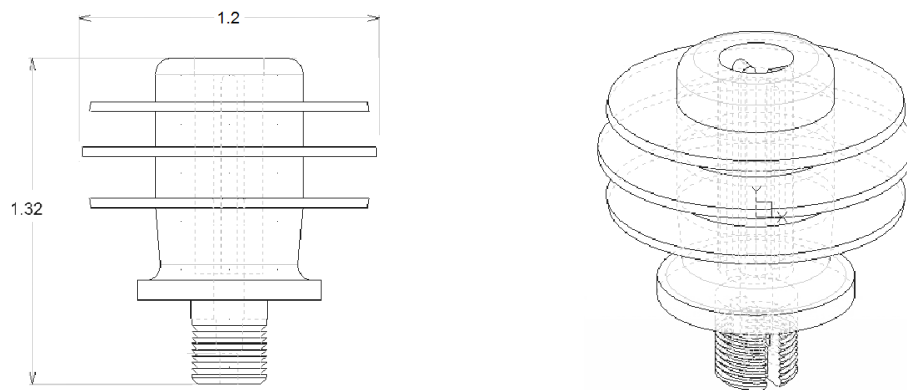
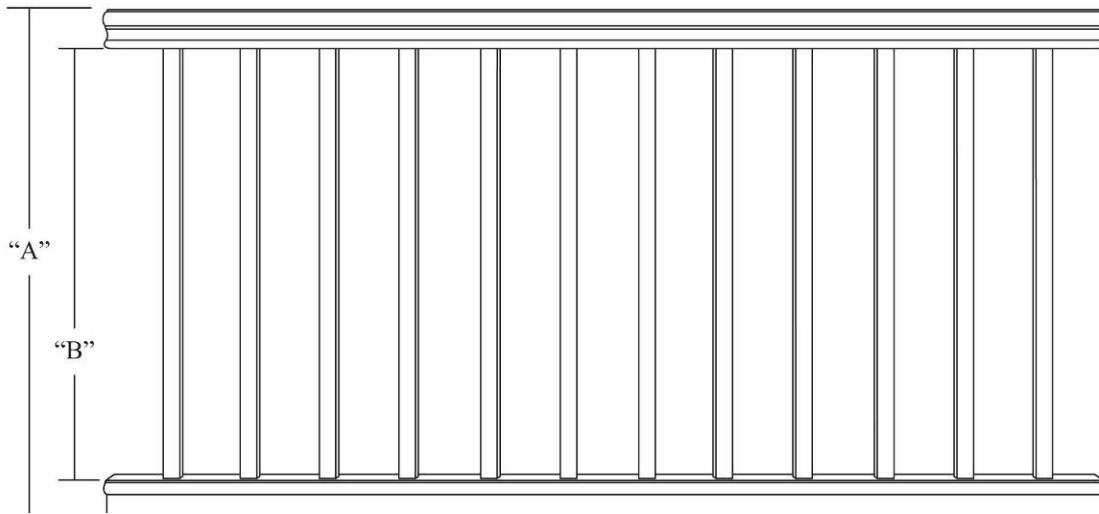


FIGURE 11 – PIN GRIP BALUSTER CONNECTOR



30" Balusters (36" Rail Height)

"A" - 34-1/8" "B" - 29-1/2"
866.8mm 749.3mm

36" Balusters (42" Rail Height)

"A" - 40-1/8" "B" - 35-1/2"
1019.2mm 901.7mm

FIGURE 12 – GUARDRAIL ASSEMBLY