



# Code Compliance Research Report CCRR-0229

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**DIVISION: 06 00 00 Wood, Plastics, and Composites**

**Section: 06 63 00 Plastic Railings**

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## REPORT SUBJECT:

*Veranda® ArmorGuard™* Rail System

## 1.0 SCOPE OF EVALUATION

### 1.1. Building Codes:

- 2012 International Building Code (IBC)
- 2012 International Residential Code (IRC)
- 2009 International Building Code (IBC)
- 2009 International Residential Code (IRC)
- 2014 Florida Building Code (FBC)  
(Excluding High Velocity Hurricane Zones)

### 1.2. Properties

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

## 2.0 USES

2.1. The *Veranda® ArmorGuard™* railing system is 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. Railing systems are provided as level guardrails for level walking areas such as decks, balconies, and porches, and sloped guardrails for open sides of stairways.

## 3.0 DESCRIPTION

3.1. Materials and Processes – The *Veranda® ArmorGuard™* railing system is a co-extruded wood plastic composite (WPC) with polyethylene (PE) capped profile produced in the following colors: Nantucket Gray and Brazilian Walnut.

3.2. Level and stair guardrails are provided in lengths up to 72 inches between supports and a 42 inch installed height.

3.3. The top rail, bottom rail and sub rails all consist of the same profile with dimensions 3-1/2 inch by 1-1/4 inch. They are WPC co-extruded and capped. Two of the rails are connected with minimum #10 x 2-1/2 inch screws to form the top rail. One of these profiles is used as the bottom rail. See Figure 1.

3.3.1. Balusters are 1-5/16 inch square co-extruded WPC pickets and also are cut to length as crush blocks. See Figure 2.

3.3.2. The post wraps consist of four 4-5/8 inch wide by 5/8 inch thick WPC panels with routed edges that fit together and are held in place with construction glue and screws to form a full post sleeve. See Figure 3.

## 4.0 PERFORMANCE CHARACTERISTICS

4.1. The guardrails listed in this report have demonstrated the capacity to resist the design loads specified in Chapter 16 of the IBC and Section R301 of the IRC when tested in accordance with ICC-ES AC174 and ASTM D 7032.

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

4.3. Materials used have a flame spread index not exceeding 200 when tested in accordance with ASTM E 84.

4.4. Materials are deemed equivalent to preservative treated or naturally durable wood for resistance to weathering effects, attack from termites and fungus decay as tested in accordance with ASTM D 7032.

## 5.0 INSTALLATION

Installation shall be in accordance with the manufacturer's installation instructions and this report. Where differences occur between this report and the manufacturer's installation instructions, this report shall govern.

5.1. Guardrails are attached to supports with stainless steel brackets that use stainless steel screws for anchorage. See Table 2 for fastening schedule and Figures 4 and 5 for bracket detail.

5.2. Railing systems may be attached to conventional wood posts or other suitable wood support structures. Wood in the supporting structure 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. Conventional wood posts or other wood supports are not within the scope of this report.

## 6.0 SUPPORTING EVIDENCE

6.1. Manufacturer's drawings and installation instructions.

6.2. Reports of testing in accordance with ICC-ES AC174, Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails), Revised February 2014.

6.3. Reports of testing and engineering analysis demonstrating compliance with the performance requirements of ASTM D 7032-08, Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Railing and Guardrail Systems (Guards or Handrails).

6.4. Quality control manual in accordance with ICC-ES AC10, Acceptance Criteria for Quality Documentation, dated June 2014.

## 7.0 CONDITIONS OF USE

The *Veranda® ArmorGuard™* railing applications identified in this report are deemed to comply with the intent of the provisions of the referenced building codes subject to the following conditions.

7.1. Guardrails recognized in this report are limited to exterior use in one and two family dwellings regulated by the IRC.

7.2. Conventional wood guardrail supports including 4x4 posts, and framing are not within the scope of this report and are subject to evaluation and approval by the building official. Conventional wood posts and structural support framing for post installations must satisfy the design load requirements specified in Chapter 16 of the building code and must provide suitable material for anchorage. Where required by the building official, engineering calculations and details shall be provided.

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

7.4. Only those types of fasteners and fastening methods described in this report have been evaluated for the installation of the *Veranda® ArmorGuard™* railing systems; other methods of attachment are outside the scope of this report.

7.5. All products are manufactured in New London, North Carolina by Fiber Composites LLC in accordance with the manufacturer's approved quality control system with inspections by PFS (IAS AA-652).

## 8.0 IDENTIFICATION

The *Veranda® ArmorGuard™* railing described in this Research Report are identified by a marking bearing the report holder's name (Fiber Composites LLC), the Intertek Mark, the Code Compliance Research Report number (CCRR-0229) and the following statement: "ASTM D 7032 Compliant. See CCRR-0229 at <https://whdirectory.intertek.com> for uses and performance levels."

The label shall also include the phrase "For Use in One- and Two-Family Dwellings Only."



## 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 at <https://whdirectory.intertek.com> is recommended to ascertain the current version and status of this report.

**Table 1 – Code Occupancy Classification**

Guardrail System	Maximum Guardrail Dimensions <sup>1</sup>	Guardrail Type	Baluster	Code Occupancy Classification
Veranda® ArmorGuard™	6 ft. (72 in.) by 42 in.	Level / In-Line Application	1-5/16 in Square, Solid, Co-Extruded, WPC Picket	IBC one- and two-family dwellings only and,  IRC
	6 ft. (72 in.) by 42 in.	Stair		

<sup>1</sup> Guardrails are qualified up to and including the listed maximum guardrail system dimensions for use in the referenced Code Occupancy Classification. Guardrail lengths are actual railing lengths, i.e. clear space between supports for level rails and sloping length of rail between supports for stair rails. Stair rail heights are projected vertically to the leading edge of the stair tread.

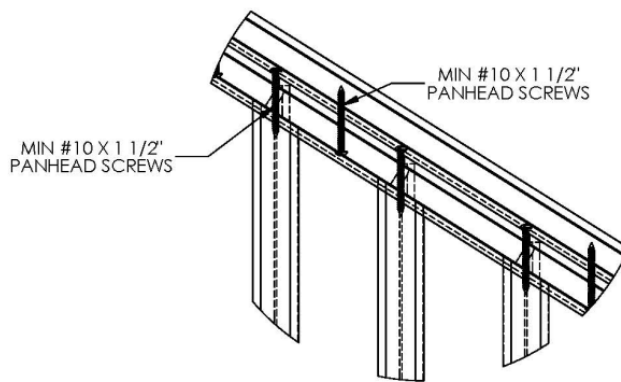
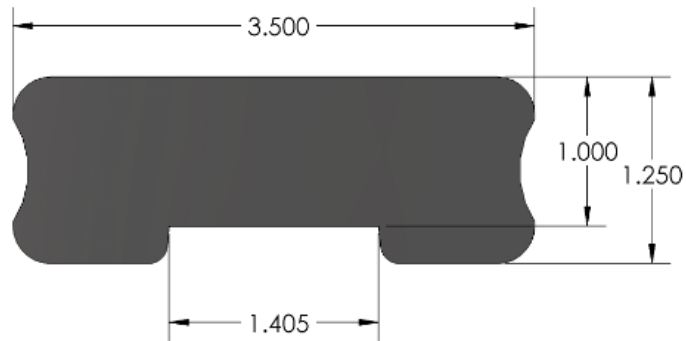
**Table 2 – Fastening Schedule**

Connection	Fastener
Rail Bracket to Post <sup>1</sup>	Two #10 x 2" (0.130 in minor diameter) flat-head, stainless steel screws
Rail Bracket to Rail <sup>1</sup>	Three #10 x 1" (0.130 in minor diameter) flat-head, stainless steel screws
Baluster to Rail	One #10 x 1-3/4" (0.130 in minor diameter) pan-head, stainless steel screw
Top Rail Cap to Sub-Rail - Level Guardrail <sup>2</sup>	Eight #10 x 1-3/4" (0.130 in minor diameter) pan-head, stainless steel screw
Top Rail Cap to Sub-Rail - Stair Guardrail <sup>3</sup>	Four #10 x 1-3/4" (0.130 in minor diameter) pan-head, stainless steel screw

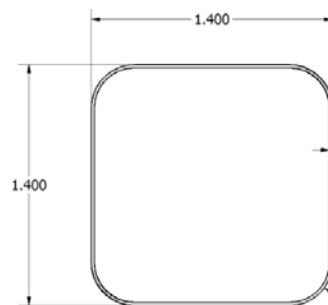
<sup>1</sup> 1/8 in diameter pre-drill

<sup>2</sup> Refer to Figure 6 for fastener locations.

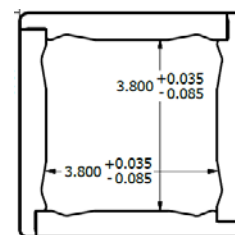
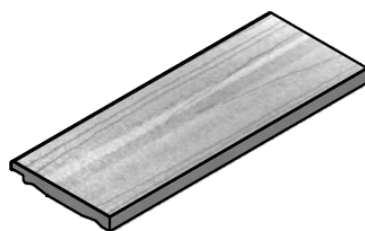
<sup>3</sup> Located between bracket and 1st baluster and at 1/3rd points; 1/8 in diameter pre-drill with 3/8 in diameter countersink 1/4 in deep.



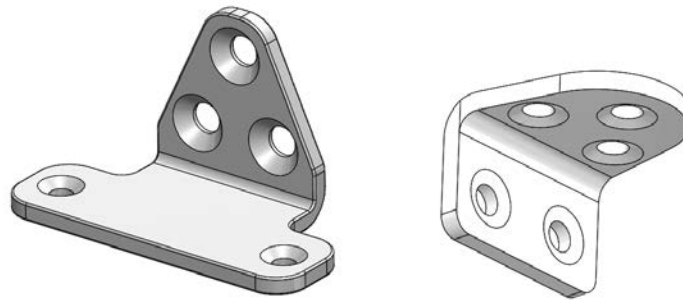
**Figure 1 – Top Rail, Bottom Rail and Sub Rail Profile and Connection of Profiles for Top Rail**



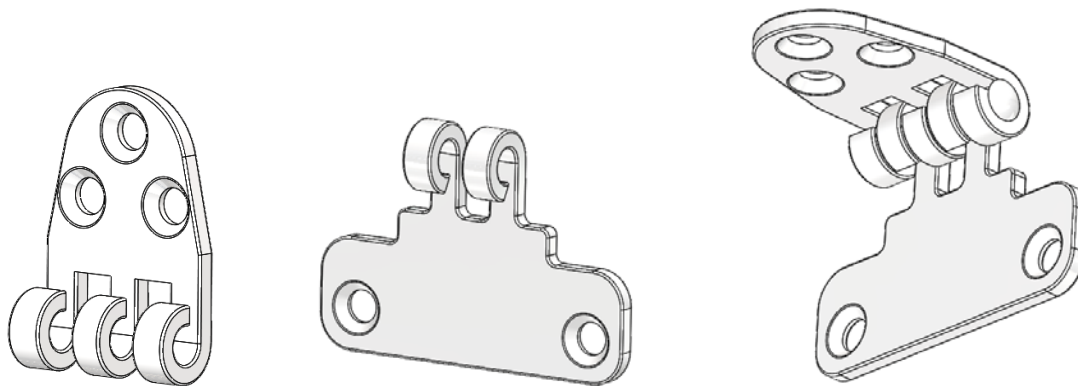
**Figure 2 - Square Solid WPC Co-extruded Picket**



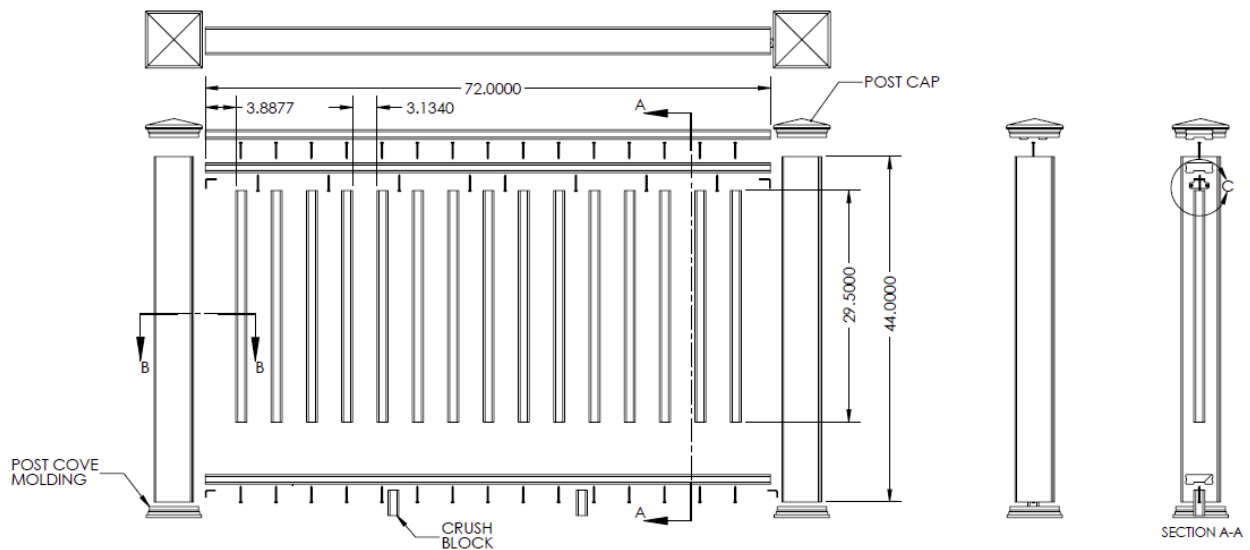
**Figure 3 - Post Wrap Component and Assembly**



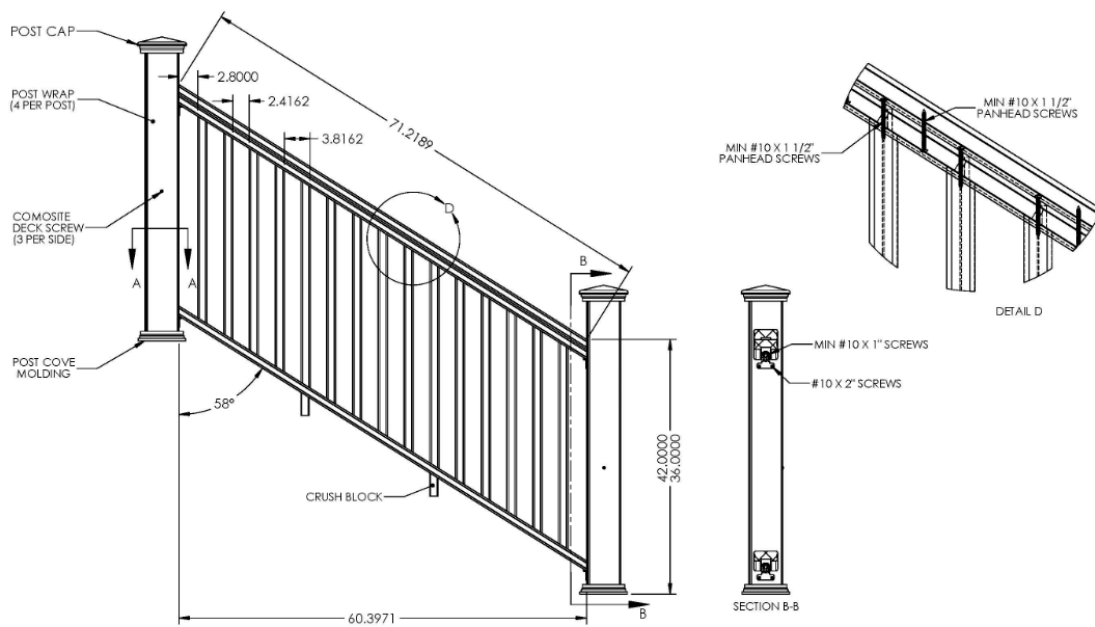
**Figure 4 - Level Application Top Subrail (left) and Bottom Rail (right) Brackets**



**Figure 5 – Top and Bottom Stair Rail Brackets**



**Figure 6 – Level Rail Assembly**



**Figure 7 – Stair Rail Assembly**