



PFS TECO Research Report 0112

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TYPE OF ACCEPTANCE: Product Material – Wood and Plastics
CSI Specification Division 065000 (Structural Plastic) and 066300 (Plastic Railing)

MANUFACTURER IDENTIFICATION:

Barrette Outdoor Living	Barrette Outdoor Living
740 North Main Street	545 Tilton Road
Bulls Gap, TN 37711	Egg Harbor City, NJ 08215
1-800-336-2383	1-609-593-5400
www.barretteoutdoorliving.com	www.rdirail.com

RESEARCH REPORT SUBJECT: Guardrail Systems for Exterior Applications
Installation on construction complying with IRC Dwellings or complying with IBC and IBC Exceptions in Section 1015.3 of the International Building Code.

DESCRIPTION OF BUILDING COMPONENTS:

Barrette Outdoor Living guardrail system is identified by the name – ***Finyl Line™ (Guardrail) System***. The guardrail system is for use in areas as referenced in the Applicable Codes. The guardrail system provides a protective barrier for walking areas, balconies, porches, stairs and ramps. The guardrail system is manufactured by the co-extrusion process, assembled with molded components and is produced in the colors White, Earth and Sahara.

1. Guardrail – *Finyl Line™*

- (a) The ***Finyl Line™*** guardrail system consists of top rail, bottom rail, balusters and aluminum reinforcing inserts. The top rail, bottom rail and balusters are manufactured with PVC material by the co-extrusion process except for the aluminum baluster and the molded brackets.
- (b) The ***Finyl Line™*** guardrail system has a top rail that comes in two styles: “T” Rail profile and Deck Board “DB” profile. The “T” Rail top rail profile is “T” in shape, hollow in the center, has rounded edges, is pre-routed for balusters and has cap stock on the rail. The Deck Board profile has a flat top for the application of a deck board, is hollow in the center, has rounded edges and is pre-routed for balusters. The deck board for the Deck Board profile top rail is optional and is not provided with the guardrail kit and is not covered in this report. The two top rails have 3 optional reinforcing insert configurations which are as follows: “Heavy H”, “H” and “h”. The reinforcing inserts are an extruded 6005-T5 Aluminum material. See Table 1 in this report for drawings and dimensions of top rails and inserts.
- (c) The ***Finyl Line™*** guardrail system has a bottom rail that is rectangular in shape, hollow in the center, has rounded edges and is pre-routed for balusters. The bottom rail has two optional reinforcing insert configurations which are as follows: “T” and “h”. The reinforcing inserts are an extruded 6005-T5 Aluminum material. See Table 1 in this report for drawings and dimensions of bottom rails and inserts.
- (d) The ***Finyl Line™*** guardrail system has three baluster designs as follows: square, turned and round. The square and turned balusters are manufactured with PVC material. The square baluster has rounded edges and is hollow in the center. The turned baluster is square on both ends with rounded edges, turned in the middle and is hollow in the center. The round baluster is circular in shape, is hollow in the center and is an extruded 6063-T52 Aluminum material. See Table 1 in this report for baluster drawings and dimensions.
- (e) The ***Finyl Line™*** guardrail system connections for the top and bottom rail to the supports are PVC molded brackets and adapters. The brackets and adapters are secured to the posts with steel screws (stainless, corrosion plated, or galvanized) suitable for use in preservative treated wood. See Table 1 and 3 of this report for a drawing of the bracket and number of fasteners required.
- (f) See Table 2 in this report for the ***Finyl Line™*** guardrail system heights and lengths.
- (g) See manufacturer’s published installation instructions identified as BOM 34115554 dated 12-16-16 and BOM 34115733 dated 12-16-16 for additional installation details.

2. Stairs – Finyl Line™

- (a) The **Finyl Line™** guardrail system can be used as stair guards. See Tables 1, 2 and 3 in this report for maximum length between posts, top and bottom rail connection brackets and fasteners required.
- (b) When the guardrail is used with stairs, the guardrail must be installed in accordance with the manufacturer's published installation instructions, noted in (g) above and information located in Tables 1, 2 and 3 in this report. When the manufacturer's published installation instructions differ from this report, this report governs. Additionally, in order to comply with the IBC or IRC graspability requirements, a separate handrail complying with IBC Section 1014.3 or IRC Section R311.7.8.3 must be provided. Specific details regarding the construction installation and attachment to the stair guardrail and/or posts have not been evaluated and are outside the scope of this research report. Specific details when required must be furnished to the authority having jurisdiction.

APPLICABLE CODES:

- 2015 *International Building Code®* (IBC)
- 2012 *International Building Code®* (IBC)
- 2009 *International Building Code®* (IBC)
- 2006 *International Building Code®* (IBC)
- 2015 *International Residential Code®* (IRC)
- 2012 *International Residential Code®* (IRC)
- 2009 *International Residential Code®* (IRC)
- 2006 *International Residential Code®* (IRC)

APPLICABLE CHARACTERISTICS REVIEWED:

1. Structural Performance:

- (a) Barrette Outdoor Living **Finyl Line™** guardrail system has been reviewed for maximum spans as indicated in Table 2. Table 2 in this report also indicates the limitations of use evaluated for each design.

2. Temperature:

- (a) Barrette Outdoor Living **Finyl Line™** guardrail system has been reviewed for evaluated temperature range of -20° degrees F (-29° degrees C) to 125° degrees F (52° degrees C).

3. Flame Spread Index:

- (a) Barrette Outdoor Living **Finyl Line™** guardrail system flame spread rating was less 200 for PVC material when tested in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*.

4. Decay Resistance:

- (a) The material used in the Barrette Outdoor Living **Finyl Line™** guardrail system in this report does not contain any wood and has been deemed comparable to naturally resistant wood or to preservative treated wood for resistance to fungal decay.

5. Termite Resistance:

- (a) The material used in the Barrette Outdoor Living **Finyl Line™** guardrail system in this report does not contain any wood and has been deemed equivalent to naturally resistant wood or to preservative treated wood for resistance to termite attack.

6. UV Testing:

- (a) The UV testing was conducted and an appropriate adjustment factor was applied in accordance with ASTM D7032-10, *Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails)*.

7. Fastening:

- (a) Barrette Outdoor Living **Finyl Line™** guardrail system top and bottom rails must be fastened to posts with PVC molded brackets using steel (stainless, corrosion plated or galvanized) screws. See Table 3 in this report and manufacturers installation instructions, noted as (g) above.
- (b) Barrette Outdoor Living **Finyl Line™** guardrail system stair top and bottom rails must be fastened to posts with PVC molded brackets using steel (stainless, corrosion plated or galvanized) screws. See Table 1 of this report for drawings on the brackets.

- (c) The fasteners and brackets are supplied by the manufacturer and must be used in the installation of the Barrette Outdoor Living guardrail system. Use of other brackets and fasteners is not covered under this report.

8. Posts:

- (a) Wood posts or other wood support framing members are not covered under this report and fall outside of this report. Wood posts and other wood must be designed to meet the load requirement in the building code and the wood members must have a minimum specific gravity of 0.50 (southern yellow pine or better) and a minimum thickness to allow full penetration of bracket mounting screws. Other wood posts or wood members not meeting these requirements are not covered under this report.

APPLICABLE USES:

The Barrette Outdoor Living guardrail system evaluated in this report are for installations on construction complying with IRC or IBC. See Table 2 for guardrail system limitations.

LIMITATIONS OF ACCEPTANCE:

The Barrette Outdoor Living **Finyl Line™** guardrail system described in this report comply with those codes listed in the Applicable Codes section above and are subject to the following conditions:

1. Barrette Outdoor Living **Finyl Line™** guardrail system is limited to exterior construction complying with the IRC and the IBC. The guardrail systems provide a protective barrier for walking areas, balconies, porches, stairs and ramps.
2. Installation of the guardrail system must comply with this report; the manufacturer's published installation instructions identified as BOM 34115554 dated 12-16-16 and BOM 34115733 dated 12-16-16 and the applicable code. When the guardrail installation instructions differ from this report, this report governs.
3. The fasteners described in this report have been evaluated for the installation of the Barrette Outdoor Living **Finyl Line™** system guardrail and handrail only. Structural wood posts and framing support members for posts must be designed to satisfy load requirements (live and dead) indicated in the building code. Material necessary for anchorage of the guardrail system(s) and compatibility of the fasteners to the treated wood supporting construction has not been evaluated.
4. The Barrette Outdoor Living **Finyl Line™** guardrail system indicated in the report must be fastened to the supporting construction as indicated in the manufacturer's published installation instructions and as outlined in this report. When guardrail fastening instructions differ from this report, this report governs.
5. The top rail component for the Barrette Outdoor Living **Finyl Line™** guardrail system does not meet the graspability requirements when used as a handrail for stairs. See Description of Building Components 2(b) in this report for additional requirements.
6. When required, the guardrail system, including a stair (see Description of Building Components 2(b)), in this report must be designed by a professional and submitted to the authority having jurisdiction for final acceptance.
7. The Barrette Outdoor Living **Finyl Line™** guardrail system has not been evaluated as a member of a fire-resistance-rated assembly.
8. Barrette Outdoor Living has Third Party inspection program provided by PFS Corporation (AA-652).

DOCUMENTATION SUBMITTED:

Submitted data was provided in accordance with PFS TECO 1601 (Quality Control Manual, Specifications, Manufacturer's published installation instructions, Test data and Descriptive information) and tested in accordance with ICC-ES AC174, *Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems*.

PRODUCT IDENTIFICATION:

The Barrette Outdoor Living guardrail assembly system must be identified with a label on each component or the packaging. The information required is as follows: Barrette Outdoor Living, product identification (**Finyl Line™**), compliance to ASTM D7032 including the maximum guardrail span and loading, the Research Report number (RR 0112), and the PFS Certification Mark. Guardrails that are 36" high require a label indicating, "Guardrail installation in residential (1 & 2 Family) units only." Guardrails without this information are not covered under this report.

Table 1: Schematics of Finyl Line™ Guardrail System Components

Description	Profile
Top Rail	<p>The top rail section contains two technical drawings. The T-Rail drawing shows a profile with a top flange that is 1.13 units high and 15.9 degrees wide. The total height is 3.50 units. The bottom flange is 2.00 units wide and 0.090 units thick. The total width is 3.50 units. The Deck Board Rail drawing shows a profile with a top flange 0.030 units high and 3.250 units wide. The total height is 3.50 units. The bottom flange is 2.00 units wide and 0.090 units thick. A fillet with a radius of R0.125 is shown at the bottom corner.</p>
Bottom Rail	<p>The bottom rail drawing shows a rectangular profile with a height of 2.00 units and a total width of 3.50 units. The bottom flange is 0.090 units thick.</p>
Inlusters	<p>The inlusters section contains four technical drawings. Square PVC 0.065 shows a square profile with a height of 1.500 units and a width of 1.500 units. The corner radius is R.125. The thickness is 0.065 units. Turned 30 shows a cylindrical profile with a diameter of 1.50 units and a length of 30 3/8 inches. The ends are turned with a diameter of 1.01 inches over a length of 7 1/2 inches. The wall thickness is 0.06 TYP. Round Aluminum shows a circular profile with an outer diameter of 0.750 units and a thickness of 0.050 units. Turned 36 shows a cylindrical profile with a total length of 36.50 units. The ends are turned with a diameter of 1.50 units over a length of 9.84 units. The wall thickness is 0.06 MIN.</p>

<p>Top Rail Insert</p>	<p>Heavy H Stiffener H Stiffener h Stiffener</p>
<p>Bottom Rail Insert</p>	<p>T Stiffener h Stiffener</p>
<p>Level Rail Bracket Kits</p>	<p>Deck Board Rail T Rail</p>
<p>Post Adapters</p>	<p>45 Degree 22.5 Degree Round Post</p>

Table 2: Span Table for Finyl Line™ Guardrail Assembly

Guardrail Type	Top Rail Type with Insert	Bottom Rail Insert	Baluster	Max Guardrail Span
Maximum Guardrail Height 36 in. for IRC Residential One- and Two-Family Residential Dwellings				
Level	DB Rail with Heavy H Stiffener	h	Square Turned 30 Round	120-in.
	T Rail with Heavy H Stiffener	h		
Stair	T Rail with Heavy H Stiffener	h		117.5
Level	DB Rail with H Stiffener	T		96-in.
	T Rail with H Stiffener	T		
Stair	DB Rail with H Stiffener	T		93.5-in.
	T Rail with H Stiffener	T		
Level	DB Rail with h Stiffener	T		72-in.
	T Rail with h Stiffener	T		
Stair	DB Rail with h Stiffener	T		69.5-in.
	T Rail with h Stiffener	T		
Maximum Guardrail Height 42 in. for IBC				
Level	DB Rail with Heavy H Stiffener	T	Square Turned 36	96-in.
	T Rail with Heavy H Stiffener	T		
Stair	DB Rail with Heavy H Stiffener	T		93.5-in.
	T Rail with Heavy H Stiffener	T		
Level	DB Rail with H Stiffener	T		72-in.
	T Rail with H Stiffener	T		
Stair	DB Rail with H Stiffener	T		69.5-in.
	T Rail with H Stiffener	T		

for SI conversion: 1 in = 25.4 mm, 1 psi = 47.9 Pa, 1 lbf = 0.0044 kN

Refer to Table 3 for fastening schedule

Maximum span is clear length between posts measured parallel to top/bottom rail

Table 3: Fastening Schedule for Finyl Line™ Guardrail Assembly

Location	Connection	Fasteners
Top Rail	Bracket to Post	Four #10 x 1-1/2" pan-head, square drive, 410 SS with zinc screw
	Bracket with 45° or 22.5° Adapter to Post	Four #10 x 3" pan-head, square drive, 410 SS with zinc screw ¹
	Bracket with Column Adapter to Post	Four #10 x 2" pan-head, square drive, 410 SS with zinc screw ¹
	Bracket to Rail	Four #10 x 1" pan-head, square drive, 410 SS with zinc screw
	DB Rail to Deckboard Filler Plate ²	#10 x 3/4" truss head 410 SS with zinc screw @ 12" o/c both lips ²
Bottom Rail	Bracket to Post	Four #10 x 1-1/2" pan-head, square drive, 410 SS with zinc screw
	Bracket with 45° or 22.5° Adapter to Post	Four #10 x 3" pan-head, square drive, 410 SS with zinc screw ¹
	Bracket with Column Adapter to Post	Four #10 x 2" pan-head, square drive, 410 SS with zinc screw ¹
	Bracket to Rail	Four #10 x 1" pan-head, square drive, 410 SS with zinc screw

¹ Pre drill with 5/32" drill bit.

² Deckboard Filler plate is optional and not included with the kit. Fasteners included are not evaluated in this report.