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**Initial Approval**  
June, 2012

**Re-Approved**  
July, 2020

See all Pei ES Listings at: [www.p-e-i.com](http://www.p-e-i.com)

### Report Owner (Fabricator)

#### **Vinyl By Design**

67002 State Road 15  
New Paris, IN 46553

### Approved Manufacturing Location\*

#### **Homeland Vinyl Products**

3300 Pinson Valley Parkway  
Birmingham, AL 35217

### Product

**Birmingham Rail System**

**Birmingham T- Rail System**

### Evaluation Report Information

**Vinyl By Design** Contact: Doug & Nola Pyle: 574-831-5420

**Vinyl By Design** website: [vbdinc.com](http://vbdinc.com)

*\*Manufacturer approved based on agreement between the fabricator and approved manufacturer. Pei Evaluation Service® approves the fabrication of the guardrail systems as tested as long as the approved manufacturing location maintains their third party ISO 17065 based evaluation report and ISO 17020 accredited inspection service program. Quarterly inspections of the fabricator are performed by Progressive Engineering, Inc. (Pei) with verification of compliance affidavits from the approved manufacturer.*

### General Details

The **Birmingham Rail System** and **Birmingham T-Rail System** are used as exterior guards for balconies, porches, and decks of structures. The guardrails are manufactured from rigid polyvinyl chloride [coextruded PVC] that is manufactured by Homeland Vinyl Products. The guardrail systems are comprised of several interchangeable components, consisting of top and bottom rails, balusters, mounting brackets, and structural aluminum reinforcements. The top and bottom railings are fabricated with routed openings spaced under 4-inches to accommodate the vertical balusters.

The **Birmingham** guardrail systems have been tested and evaluated for structural strength to meet design loads and requirements of the International Building Code, International Residential Code, and structural performance requirements of ICC-ES Acceptance Criteria AC174 as evaluated under the Code Compliance section of this **PER**.

### Product Descriptions

The **Birmingham Rail System** uses a rectangular shaped profile for the top and bottom rails. The rectangular profile measures 2-inch width x 3.5-inch height x 0.120-inch thick vinyl wall. The Birmingham Rail is designed to be installed with a P-Channel or H-Channel insert manufactured from 6063-T6 aluminum alloy and may be constructed in any configuration as evaluated in Table 1 of this report. The rail system is available in the following colors: White, Tan, Adobe, Honey Maple and Mocha Walnut. The **Birmingham Rail** system components are shown on page four (4) of this evaluation report.

The **Birmingham T-Rail System** uses a "T" shaped profile as the top rail and the rectangular profile as the bottom rail. The "T" shape profile measures a width of 3.5-inch x 3.5-inch height x 0.090-inch thick vinyl wall. The **Birmingham T-Rail** is designed to be installed with a P-Channel or H-Channel insert manufactured from 6063-T6 aluminum alloy and may be constructed in any configuration as evaluated in Table 1 of this report. The rail system is available in the following colors: White, Tan, Adobe, Honey Maple and Mocha Walnut. The **Birmingham T-Rail** system components are shown on page five (5) of this evaluation report.

### General Product Usage

1. The **Birmingham Rail System** and **Birmingham T-Rail System** shall be installed in accordance with the **Vinyl By Design** Installation Instructions and subject to the conditions of this **PER**. A copy of the **Vinyl By Design** Railing Installation Instructions shall be made easily available to the installer.
2. All framing, wood posts, beams, joists, stringers and associated connections needed to support the **Birmingham** style railing systems are outside the scope of this **PER**. All framing shall follow applicable codes or be designed by a licensed Engineer. Stairways shall be designed and constructed in accordance with the applicable codes.
3. All Vinyl By Design guardrail systems shall be fastened to wood framing in accordance with the bracket component described in Table 1 and fastening requirements in Table 2.
4. The routed holes in the railing shall not be altered or made larger. The tight fit is important to the integrity of the rail assembly.

**Code Compliance**

International Residential Code			International Building Code		
2012	2015	2018	2012	2015	2018
Section R301.5 Section R312.1	Section R301.5 Section R312.1	Section R301.5 Section R312.1	Section 1607.8.1 Section 1013 Section 2605 Section 2606.4	Section 1607.8.1 Section 1015 Section 2605 Section 2606.4	Section 1607.8.1 Section 1015 Section 2605 Section 2606.4

**Note:**

1. Evaluated and approved to meet or exceed requirements in 2012, 2018 and 2018 International Building Code (IBC) and International Residential Code (IRC) only if installed as product was tested. See Table 1 for approved code compliance assemblies and Table 2 for approved fastener requirements. See Figure 1 through 19 for profile details.
2. Limited to Type V-B Construction.

**Test Documentation**

- Test Report 01.10932.01.138b - ASTM E84-03 - Dated: 5/6/2005
- Test Report No. D3348.01-119-19 - ICC-ES AC174 (2012) - Dated: 3/24/2014
- Test Report No. C0270.01-119-19 - ICC-ES AC174 (2012) - Dated: 12/20/2012
- Test Report 85730.02-119-19 - ICC-ES AC174 (2009) - Dated: 10/06/2009
- Test Report 53597.01-119-19 - ICC-ES AC174 (2004) - Dated: 6/13/2005
- PEI Test Report 2019-6309 (A) - ASTM D7032 Guardrail Test on a Summit II Rectangular Hollow Utility Composite Railing System (P-Rail Insert) w/Summit II Level PVC Brackets - Dated 11-19-2019
- PEI Test Report 2019-6309 (B) - ASTM D7032 Guardrail Test on a Summit II Gorilla T-Rail Composite Railing System (P-Rail Insert) w/Summit II Gorilla T-Rail Level PVC Brackets - Dated 11-21-2019
- PEI Test Report 2019-6309 (C) - ASTM D7032 Guardrail Test on a Summit II Rectangular Hollow Utility Composite Railing System w/Summit II Level PVC Brackets - Dated 11-25-2019
- PEI Test Report 2019-6309 (D) - ASTM D7032 Guardrail Test on a Summit II Gorilla T-Rail Composite Railing System (H-Rail Insert) w/Summit II Gorilla T-Rail Level PVC Brackets - Dated 1-6-2020

**Tested to**

- ASTM D790-07** - Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- ASTM D1761-06** - Standard Test Methods of Mechanical Fasteners in Wood
- ASTM D2565-99** (Reapproved 2008) - Practice for Operating Xenon-Arc-Type Light Exposure Apparatus With and Without Water for Exposure of Plastics.
- ASTM D6109-05** - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber.
- ASTM D7032-17** - Standard Specification for Establishing Performance Ratings for Wood Plastic Composite Deck Boards and Guardrail Systems (Guards for Handrails)
- ASTM E84-03** - Standard Test Method for Surface Burning Characteristics of Building Materials.  
Flame Spread Index: 15 and Smoke Developed Index: 885
- ICC-ES AC174** - Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails)

**Table 1 - Guardrail System Specifications and Code Limitations<sup>1,5</sup>**

Top Rail	Rail Length and Height	2012		2015		2018		Aluminum Channel Reinforcement in Top Rail Required <sup>4,7</sup>	Waymark Summit Brackets		Waymark Summit II Brackets
		IRC <sup>2</sup>	IBC <sup>3</sup>	IRC <sup>2</sup>	IBC <sup>3</sup>	IRC <sup>2</sup>	IBC <sup>3</sup>		PVC	ASA	PVC
<b>Birmingham Rail</b>	96-in x 42-in	X	X	X	X	X	X	P-Channel / H-Aluminum	X <sup>6</sup>	X <sup>6</sup>	X
<b>Birmingham T-Rail</b>	120-in x 42-in	X		X		X		P-Channel	X	X	--
	96-in x 42-in	X	X	X	X	X	X	P-Channel / H-Aluminum	X	X	X

**Notes:**

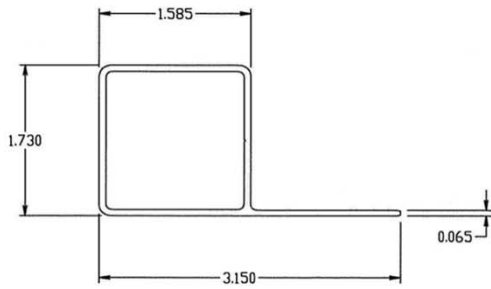
1. All guardrail systems have been tested at a maximum height of 42-in (measuring from walking surface to top of top rail). A shorter guardrail system may be installed at the same span length as long as local code requirements for rail heights are met.
2. IRC - One and Two-Family Dwellings
3. IBC - All Use Groups
4. The aluminum P-Channel insert is manufactured from 6063-T6 aluminum alloy. See Figure 1 for profile detail.
5. Bottom rails are not installed with an aluminum alloy reinforcement. An optional footblock shall be installed at the mid-span for rail lengths over 4-ft.
6. Bracket material includes both rectangular bracket and deckover bracket styles.
7. The aluminum Large H-Channel insert is manufactured from 6005A T-61 aluminum. See Figures 2 & 3 for profile detail.

**Table 2 - Guardrail Fastening Requirements<sup>1</sup>**

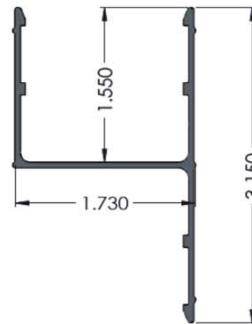
Rail Profile	Connection	Bracket	Fastener <sup>2</sup>	Quantity
<b>Birmingham Rail</b>	Top Rail Bracket to Post	Waymark Summit (Rectangular or Deckover)	#8-8 x 1-1/2-in SS pan-head, self-drilling screw	4
	Bottom Rail Bracket to Post		#8-8 x 1-1/2-in SS pan-head, self-drilling screw	4
	Rail Bracket to Rail		#10 x 3/4-in SS pan-head, self-drilling screw	2
<b>Birmingham Rail</b>	Top / Bottom Rail Bracket to Post	Waymark Summit II (Rectangular)	#9 x 1-1/2-in SS pan-head, self-drilling screw	4
	Bracket to Top Guardrail (side)		#10 x 3/4-in SS pan-head, self-drilling screw	1
	Bracket to Bottom Guardrail (Side)		#10 x 3/4-in SS pan-head, self-drilling screw	1
<b>Birmingham T-Rail</b>	Top Rail Bracket to Post	Waymark Summit	#8-8 x 1-1/2-in SS pan-head, self-drilling screw	6
	Bottom Rail Bracket to Post		#8-8 x 1-1/2-in SS pan-head, self-drilling screw	6
	Rail Bracket to Rail		#10 x 3/4-in SS pan-head, self-drilling screw	2
<b>Birmingham T-Rail</b>	Top / Bottom Rail Bracket to Post	Waymark Summit II (Rectangular)	#9 x 1-1/2-in SS pan-head, self-drilling screw	6/4
	Bracket to Top Guardrail (side)		#10 x 1-in galvanized pan-head, self-drilling screw	1
	Bracket to Bottom Guardrail (Side)		#10 x 3/4-in SS pan-head, self-drilling screw	1

**Notes:**

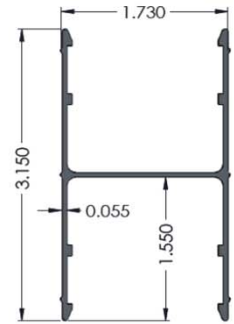
1. Mechanical fastener not required for crush block to bottom rail.
2. SS - Stainless Steel



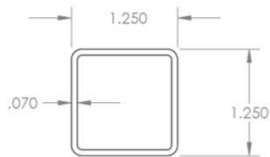
**Figure 1 - Top Rail P-Channel**



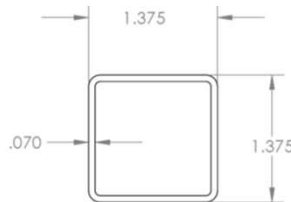
**Figure 2 - Top Rail H-Channel**



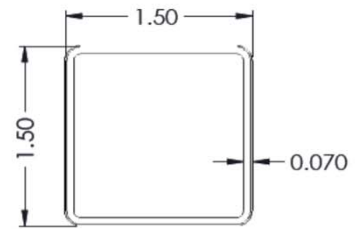
**Figure 3 - Top Rail H-Channel**



**Figure 4 - 1-1/4" Square Baluster**



**Figure 5 - 1-3/8" Square Baluster**



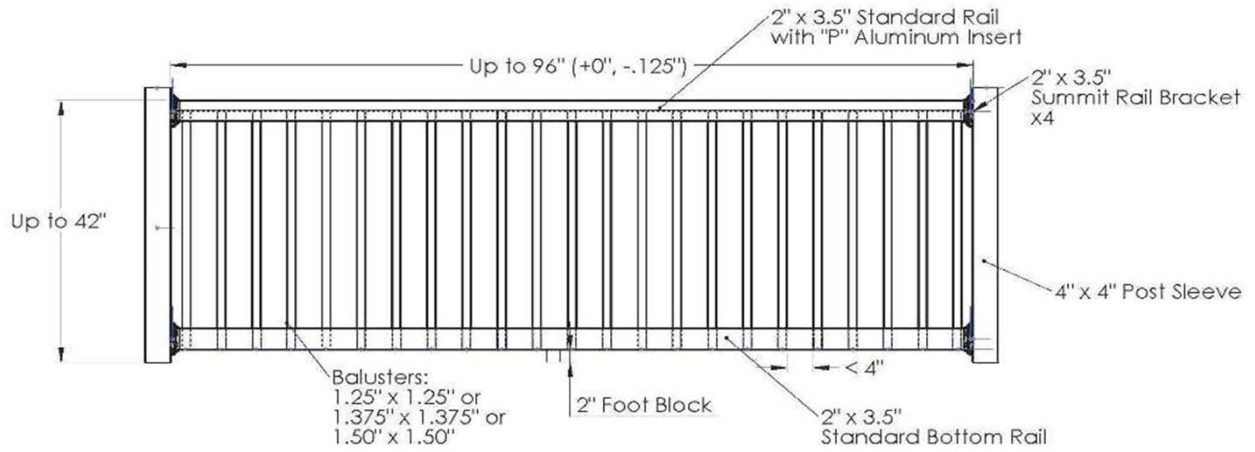
**Figure 6 - 1-1/2" Square Baluster**



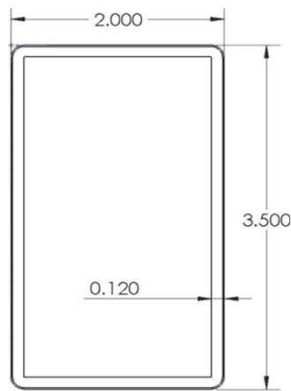
**Figure 7 - Typical Phillips Pan-Head Self-Drilling Stainless Steel Screw per Table 2**



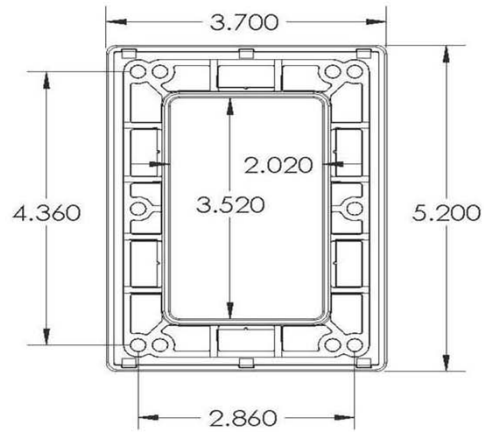
**Figure 8 - Typical Square Pan-Head Self-Drilling Stainless Steel Screw per Table 2**



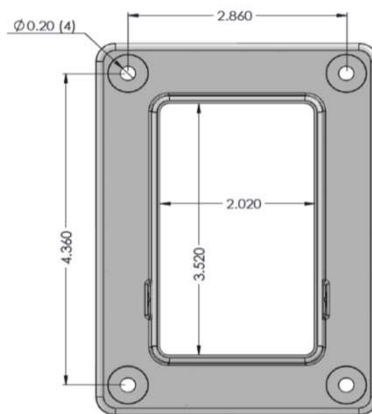
**Figure 9 - Birmingham Rail System with "P" or "H" Aluminum Insert**



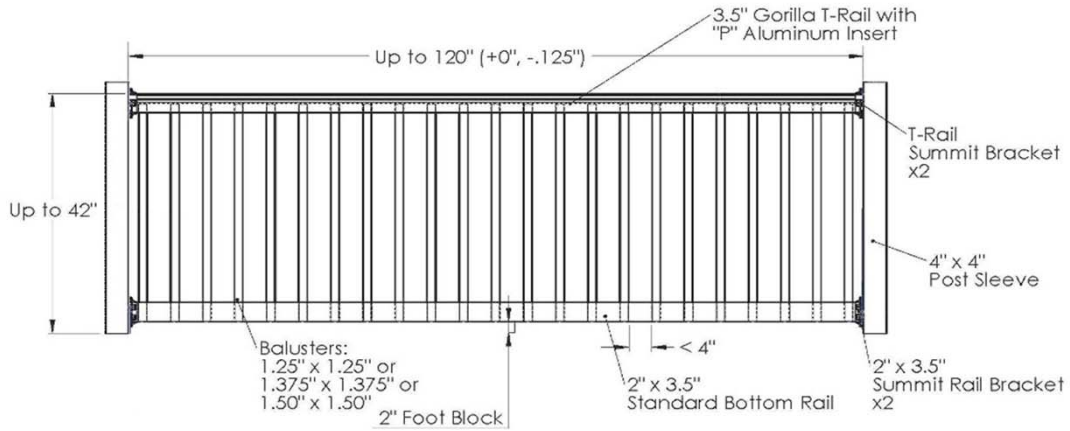
**Figure 10 - 2" X 3.5" Top & Bottom Rail**



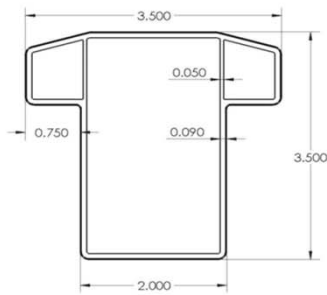
**Figure 11 - Waymark Summit Rectangular Bracket**



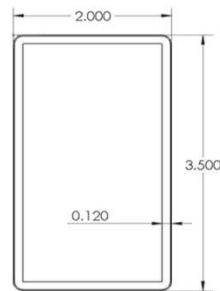
**Figure 12 - Waymark Summit II Rectangular Bracket**



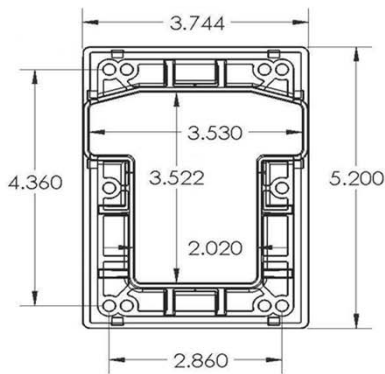
**Figure 13 - T-Rail System with "P" or "H" Aluminum Insert**



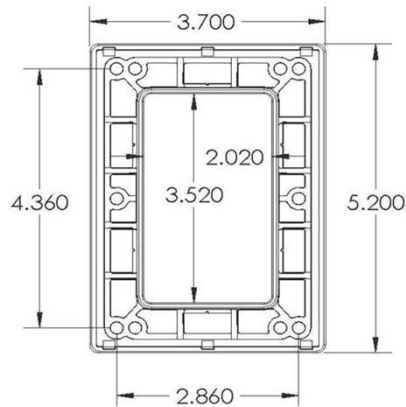
**Figure 14 - T-Rail Profile Top Rail**



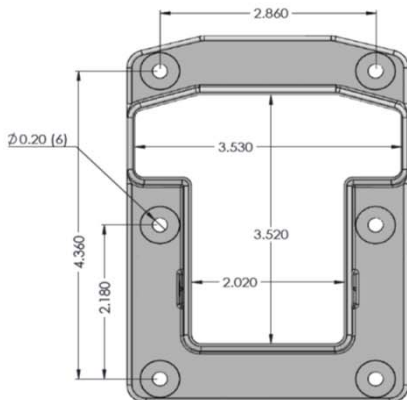
**Figure 15 - 2" X 3.5" Bottom Rail**



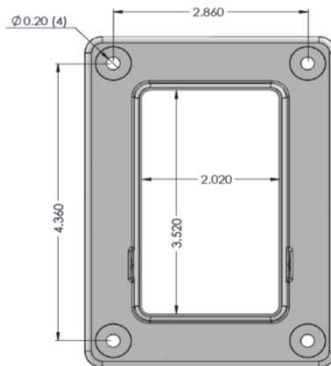
**Figure 16 - Waymark Summit "T" Profile Bracket**



**Figure 17 - Waymark Summit Rectangular Bracket**



**Figure 18 - Waymark Summit II "T" Profile Bracket**



**Figure 19 - Waymark Summit II Rectangular Bracket**

### Product Labeling

Guardrail Systems fabricated by **Vinyl by Design** must be labeled with at least the following information:

1. Fabricator Name and Location
2. Color and Quantity Packaged
3. Purchase Order Number
4. Date Product was Packaged
5. Product Part Number / Name or Description
6. Third Party Certifications
7. **Pei Evaluation Service**<sup>®</sup> Name and **PER** Number

### Acceptable Evaluation Marks



### Quality Assurance Documentation

A Product Evaluation Service Agreement between **Pei Evaluation Service**<sup>®</sup> and **Vinyl By Design**

A Follow-up Inspection Service Agreement between *Progressive Engineering Inc.* and **Vinyl By Design**

A **Pei Evaluation Service**<sup>®</sup> Fabricator Agreement between **PER** Owner and Approved Manufacturer

Vinyl By Design Quality Control Manual - Dated: 1/10/2020

Vinyl Railing Installation Instructions with Homeland Vinyl Profiles

Homeland Vinyl Products Inc. Quality Control Manual - Dated: 5/30/2019

Affidavit from Homeland Vinyl Products for Railing Program - Dated: 5/8/2012