ICC-ES Evaluation Report

ESR-5074

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES **Section: 06 50 00—Structural Plastics** **Section: 06 63 00—Plastics Railings**	**REPORT HOLDER:** **CAPITAL RAILING, LLC**	**EVALUATION SUBJECT:** **CONTEMPORARY (RECTANGULAR) RAIL, T- RAIL, CONTOUR RAIL, PALISADES RAIL AND BARRETTE OUTDOOR LIVING RAIL SYSTEMS**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, and 2012 *International Building Code*® (IBC)
- 2021, 2018, 2015, and 2012 *International Residential Code*® (IRC)

Properties evaluated:

- Structural
- Durability
- Surface burning characteristics

2.0 USES

The Contemporary (Rectangular) Rail, T- Rail, Contour Rail, and Palisades Rail Systems (GUARDRAIL SYSTEMS) are for exterior use as guardrails for balconies, porches, and decks of Type V-B construction (IBC) and other types of construction in applications where untreated wood is permitted by IBC Section 1406.3, or in structures constructed in accordance with the IRC.

3.0 DESCRIPTION

3.1 General: The GUARDRAIL SYSTEMS are manufactured from rigid polyvinyl chloride [coextruded PVC] by Homeland Vinyl Products. The GUARDRAIL SYSTEMS are comprised of several interchangeable components, consisting of top and bottom routed rails, balusters, mounting brackets, and structural reinforcements. The GUARDRAIL SYSTEMS' top and bottom rails are fabricated with routed openings spaced under 4-inches (101.6 mm) to accommodate the vertical balusters.

3.2 The Contemporary Rail System

The Contemporary Rail System uses a rectangular shaped profile for the top and bottom rails. The rectangular rail measures 2-in (50.8 mm) width x 3.5-in (88.9 mm) height x 0.120-in (3.05 mm) thick vinyl wall. The Contemporary Rail System must comply with the specifications in Table 1 of this report. This rail system is available in the following colors: White, Tan, Adobe, Honey Maple and Mocha Walnut. The rectangular rail is also used as the bottom rail in conjunction with the T-Rail, Contour Rail, and Palisades Rail Systems. The Contemporary Rail System components are illustrated in Figure 1 of this report.

3.3 The T-Rail System

The T-Rail System uses a "T" shaped profile as the top rail and the rectangular profile as the bottom rail. The "T" shaped profile measures 3.5-in (88.9 mm) width x 3.5-in height (88.9 mm) x 0.090-in (2.29 mm) thick vinyl wall. The T-rail must comply with the specifications in Table 1 of this report. This rail system is available in the following colors: White, Tan, Adobe, Honey Maple and Mocha Walnut. The T-Rail System components are illustrated in Figure 2 of this report.

3.4 The Contour Rail System

The Contour Rail System uses a breadloaf shaped profile as the top rail and the rectangular profile as the bottom rail. The breadloaf profile measures 3-in (76.2 mm) width x 3.513-in (89.23 mm) height x 0.090-in (2.23 mm) thick vinyl wall. The Contour Rail must comply with the specifications in Table 1 of this report. This rail system is available in the following colors: White, Tan, Adobe, Honey Maple and Mocha Walnut. The Contour Rail System components are illustrated in Figure 3 of this report.

3.5 The Palisades Rail System

The Palisades Rail System uses an oriental shaped profile as the top rail and the rectangular profile as the bottom rail. The oriental profile measures 2.86-in (72.64 mm) width x 2.486-in (63.144 mm) height x 0.072-in (1.829 mm) thick vinyl wall. The Palisades Rail must comply with the specifications in Table 1 of this report. The Palisades Rail System is only available in the color white. The components are illustrated in Figure 4 of this evaluation report.

3.6 The Barrette Outdoor Living Rail System

The Barrette Outdoor Living Rail System has two (2) top rail styles, a "T" Rail and a "DB" profile. The "T" shaped profile measures 3.5-in (88.9 mm) width x 3.5-in (88.9 mm) height x 0.090-in (2.29 mm) thick vinyl wall. The "DB" profile measures 3.25-in (82.55 mm) width x 3.5-in (88.9 mm) height x 0.090-in (2.29 mm) thick PVC wall. The Barrette Outdoor Living Rail System is only available in the colors white and tan. The components are illustrated in Figure 5 of this report.

3.7 Durability: When subjected to weathering, insect attack, and other decaying elements, materials used to manufacture GUARDRAIL SYSTEMS are equivalent in durability to preserve-treated or naturally durable lumber when used in locations described in Section 2.0 of this report.

3.8 Surface-burning Characteristics: When tested in accordance with ASTM E84, GUARDRAIL SYSTEMS have a flame-spread index of no greater than 200.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The GUARDRAIL SYSTEMS are satisfactory to resist the loads specified in Section 1607.9.1 of the 2021 IBC; Section 1607.8.1 of the 2018, 2015 and 2012 IBC; Table R301.5 of the IRC. The post and post anchorage requirements are outside the scope of this report.

4.2 Installation:

Installation of the GUARDRAIL SYSTEMS must comply with Table 2 of this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions must always be available at the jobsite during installation.

5.0 CONDITIONS OF USE:

The GUARDRAIL SYSTEMS described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The GUARDRAIL SYSTEMS listed in this evaluation report shall be installed in accordance with the manufacturer's published Installation Instructions and subject to the conditions of this evaluation report. The manufacturer's published installation instructions must always be available at the jobsite during installation.

5.2 The GUARDRAIL SYSTEMS are for use in exterior and combustible construction applications.

5.3 All framing, wood posts, beams, joists, stringers and associated connections needed to support the guardrail systems are outside the scope of this report.

5.4 The GUARDRAIL SYSTEMS shall be fastened to wood framing in accordance with the bracket systems described in Table 2.

5.5 The routed holes in the rails shall not be altered or made larger. The tight fit is important to the integrity of the GUARDRAIL SYSTEMS assembly.

5.6 The GUARDRAIL SYSTEMS described in this report have been evaluated to the design rating and requirements of Table 1 of this report.

5.7 The GUARDRAIL SYSTEMS are manufactured at Capital Railing, LLC's manufacturing facilities located in Baltimore, Maryland, under an approved 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 April 2021).

7.0 IDENTIFICATION

7.1 The Contemporary (Rectangular) Rail, T- Rail, Contour Rail, Palisades Rail and Barrette Outdoor Living Rail Systems (GUARDRAIL SYSTEMS) described in this report are identified on each package by a label bearing the name of the report holder's name (Capital Railing, LLC); the product name; color; quantity packaged; the allowable span, the date of manufacture; product part number/name or description; third party certifications, and the ICC-ES evaluation report number (ESR-5074).

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

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Table 1 - Guardrail System Specifications and Code Limitations[1,6]

Top Rail	Rail Length and Height	2012		2015		2018		2021		Aluminum Channel Reinforcement in Top Rail Required[4,5]	Waymark Summit Brackets	
		IRC[2]	IBC[3]	IRC[2]	IBC[3]	IRC[2]	IBC[3]	IRC[2]	IBC[3]		PVC	ASA
T-Rail	120-in x 42-in	X		X		X		X		P-Channel	X	X
	96-in x 42-in	X	X	X	X	X	X	X	X	P-Channel	X	X
	96-in x 42-in	X		X		X		X		H-Channel	X	X
	72-in x 42-in	X		X		X		X		Inverted h-Channel	X	X
Contemporary Rail	96-in x 42-in	X	X	X	X	X	X	X	X	P-Channel	X[7]	X[7]
	72-in x 42-in	X		X		X		X		Inverted h-Channel	X[7]	X[7]
Contour Rail	96-in x 42-in	X	X	X	X	X	X	X	X	P-Channel	X	X
	72-in x 42-in	X		X		X		X		Inverted h-Channel	X	X
Palisades Rail	96-in x 42-in	X		X		X		X		Palisades Contoured	Vinylast Bracket	

For **SI**: 1 in. = 25.4 mm

[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 and Palisades Contoured rail insert are manufactured from 6063-T6 aluminum alloy. See Figures 1 and 4 on page 4 for profile detail.
[5] The aluminum H-Channel insert and Inverted h-Channel insert are manufactured from 6005A-T61 aluminum alloy. See Figures 2 and 3 on page 4 for profile details.
[6] Bottom rails are not installed with an aluminum alloy reinforcement. A footblock shall be installed at the mid-span for rail lengths over 4-ft.
[7] Bracket material includes both rectangular bracket and deckover bracket styles.

Table 2 - Guardrail Fastening Requirements[1]

Rail Profile	Connection	Bracket	Fastener[2]	Quantity
Contemporary Rail	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
T-Rail	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
Contour Rail	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
Palisades Rail	Top Rail Bracket to Post	Vinylast	#10-8 x 2-1/2-in SS flat-head, Type 17 point screw	4
	Bottom Rail Bracket to Post	Waymark Summit	#8-8 x 1-1/2-in SS pan-head, Type 17 point screw	4
	Top Rail Bracket to Rail	Vinylast	#8-18 x 1-1/4-in CS pan-head, self-drilling screw	2
	Bottom Rail Bracket to Rail	Waymark Summit	#10-16 x 3/4" CS pan-head, self-drilling screw	2
Barrette - Trail Profile[3]	Top Rail Bracket to Post	Level Rail Bracket Kits	#10- x 1-1/2-in pan-head, square drive, 410 SS w/Zinc Screw	4
	Top Rail Bracket to Rail		#10- x 1-in pan-head, square drive, 410 SS w/Zinc Screw	4
	Bottom Rail Bracket to Post	Level Rail Bracket Kits	#10- x 1-1/2-in pan-head, square drive, 410 SS w/Zinc Screw	4
	Bottom Rail Bracket to Rail		#10- x 1-in pan-head, square drive, 410 SS w/Zinc Screw	4

For **SI**: 1 in. = 25.4 mm

[1] Mechanical fastener not required for crush block to bottom rail.
[2] SS - Stainless Steel ----- CS - Carbon Steel
[3] Predrill with 5/32" drill bit.

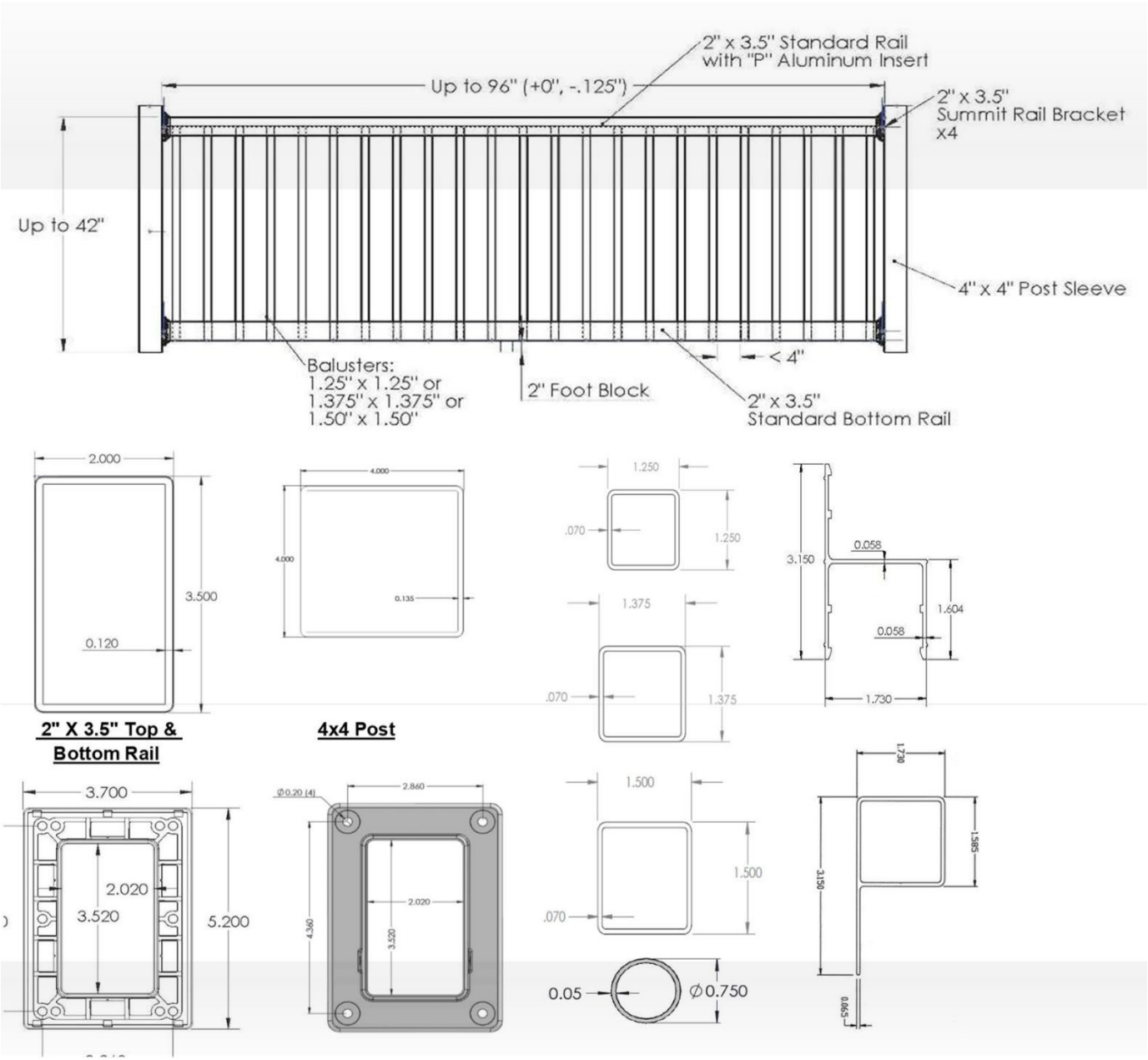


Figure 1 – Contemporary Rail System with Aluminum Inserts

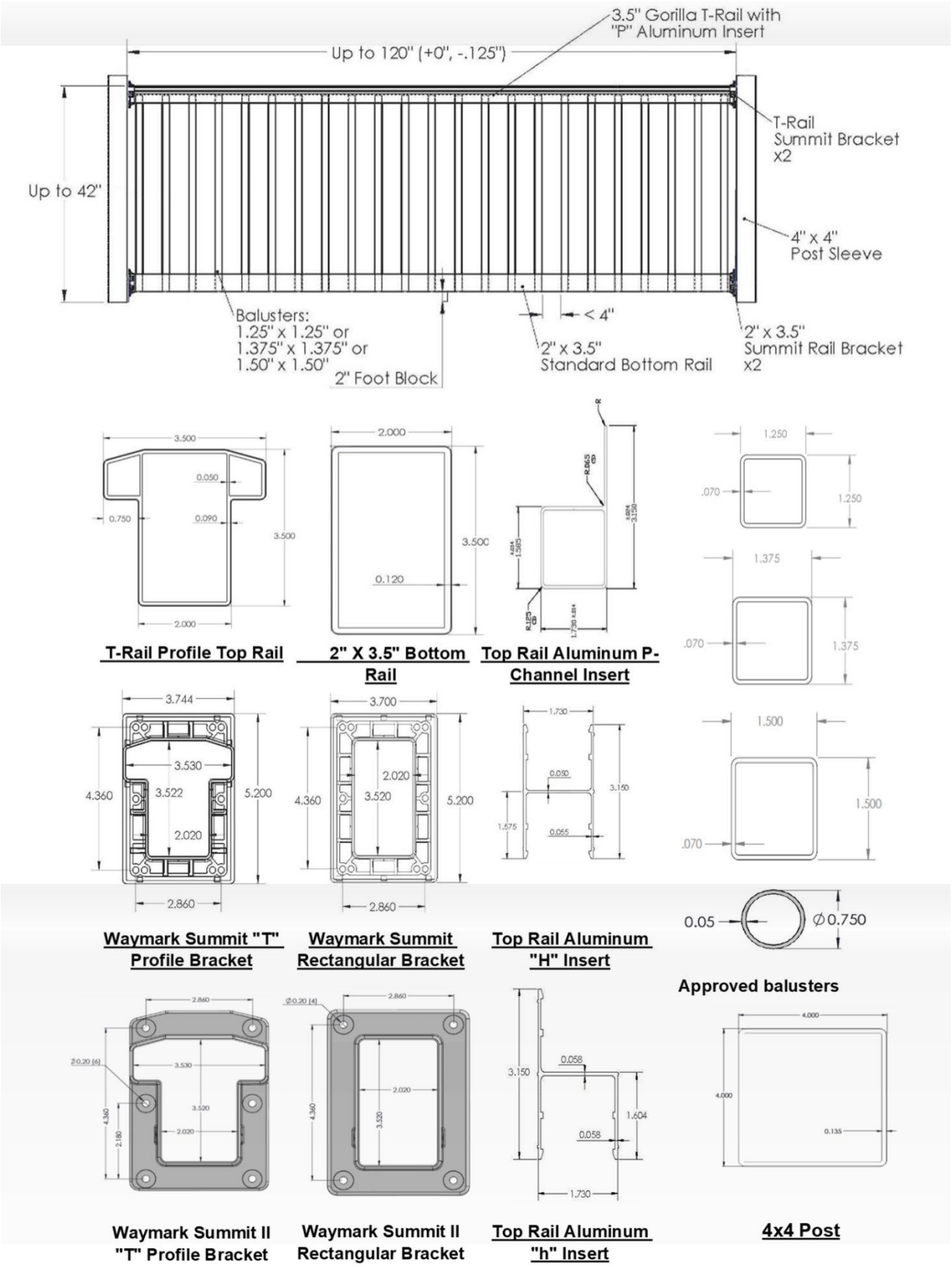


Figure 2 – T-Rail System with Aluminum Inserts Contemporary Rail System with Aluminum Inserts

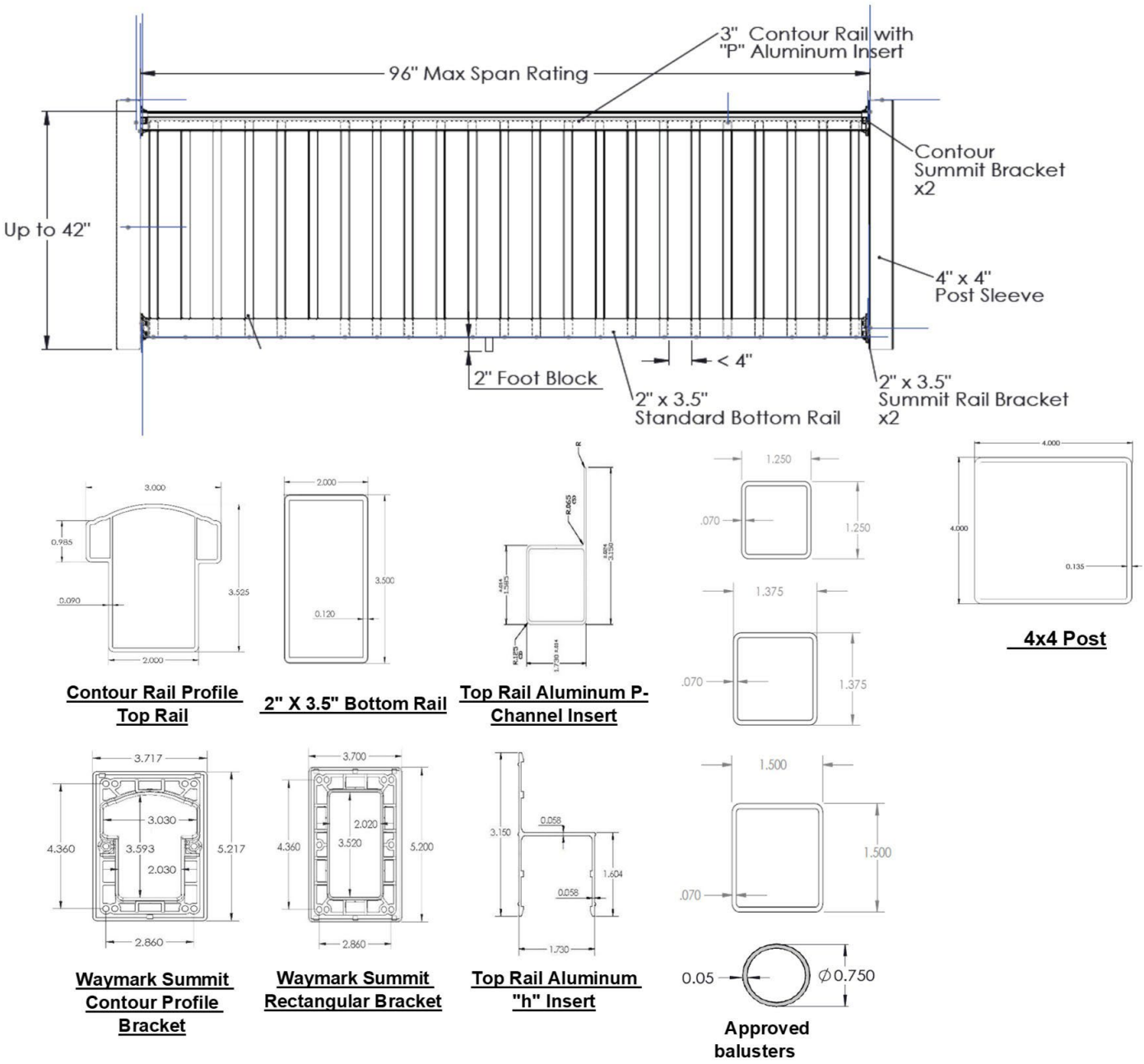


Figure 3 – Contour Rail System with Aluminum Inserts

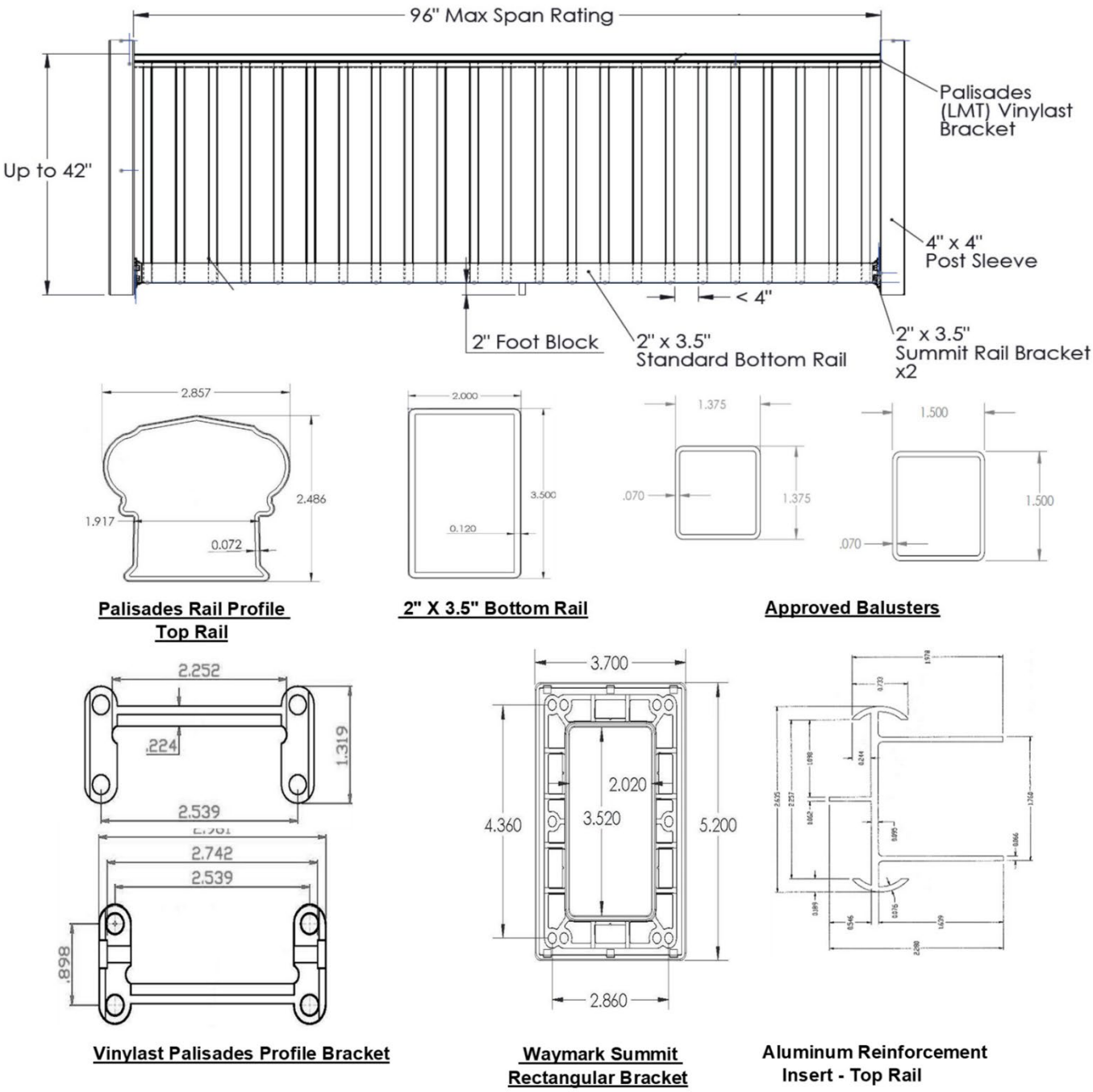
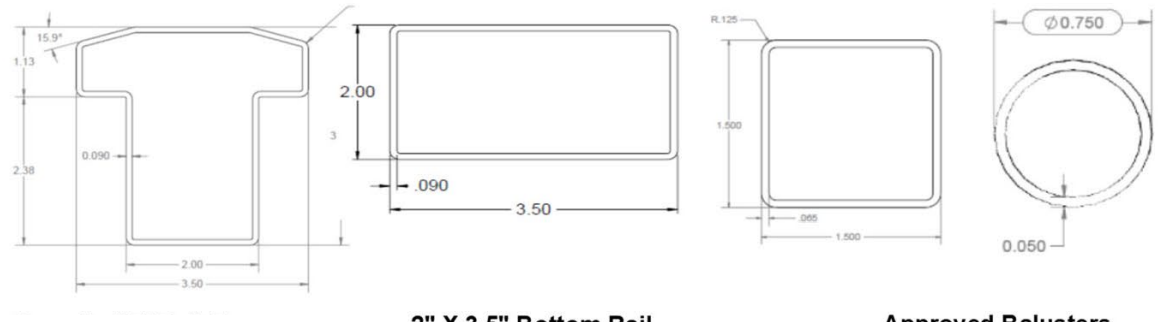


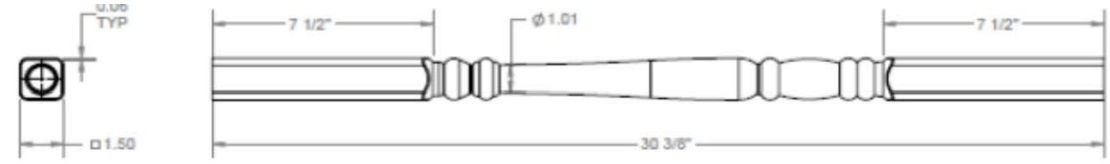
Figure 4 – Palisades Rail System with Palisades Contoured Aluminum Insert



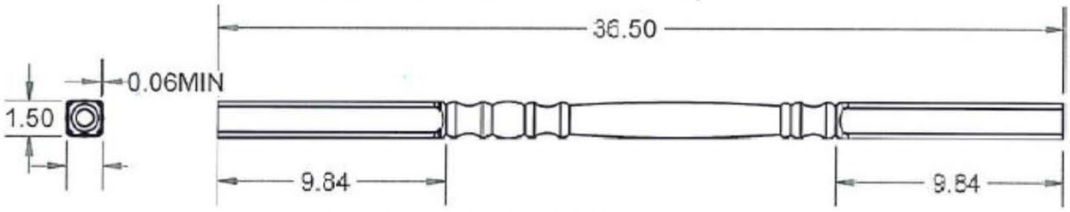
Barrette Outdoor Living Rail Top Rail

2" X 3.5" Bottom Rail

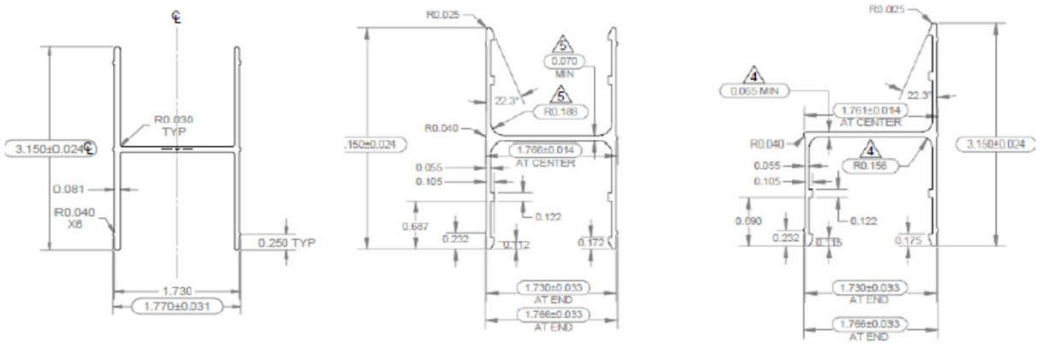
Approved Balusters



Turned 30 Baluster - IRC Use Only

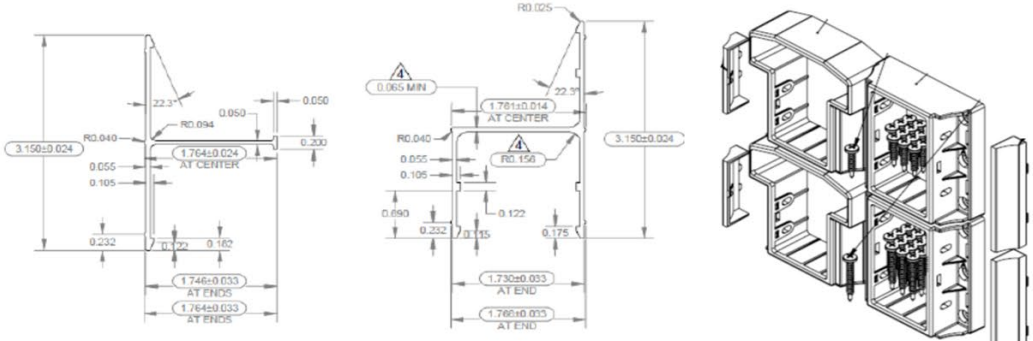


Turned 36 Baluster - IBC Use Only



Top Rail Inserts

Heavy "H" Insert **"H" Insert** **"h" insert**



Bottom Rail Inserts

"T" Stiffener **"h" Stiffener** **"T" Rail Bracket**

Figure 5 – Barrette Outdoor Living Rail System