Code Compliance Research Report
CCRR-0163

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DIVISION: 05 00 00 - METALS
Section: 05 52 00 – Metal Railings

REPORT HOLDER:
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REPORT SUBJECT:
Westbury® Aluminum Railing

- *Tuscany* Series (Style C10, C101)
- *Riviera* Series (Styles C30, C301, C30R, C301R, C31, C311, C32, C321, C33, C331, C34 and C341)
- *Veranda* Series (Style C70)
- *VertiCable* Series (Style C80)
- *Screen Rail*

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2015 and 2012 *International Building Code®* (IBC)
- 2015 and 2012 *International Residential Code®* (IRC)
- 2018 *International Residential Code®* (IRC), Limited to Tuscany Series, Veranda Series, and Riviera Series "Heavy" rail. See Table 2.
- 2020 *Florida Building Code* (see Section 9.0)
- 2020 *Florida Building Code Residential* (See Section 9)

1.2 *Westbury®* Aluminum Railing has been evaluated for the following properties (see Table 1):

- Structural Performance

1.3 *Westbury® Aluminum Railing* has been evaluated for the following uses (see Table 2):

- The *Westbury®* Aluminum 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.
- Guardrails are provided as level guardrails for level walking areas such as decks, balconies, and porches.

2.0 STATEMENT OF COMPLIANCE

Westbury® Aluminum Railing complies with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.0.

3.0 DESCRIPTION

3.1 Level guardrails are provided with rail lengths up to 96 inches` in length (measured between the inside of support posts) and an installed height of up to 42 inches. See Table 2 for qualified configurations.

3.2 The *Westbury® Aluminum Railing* system is an assemblage of extruded aluminum top and bottom rails, balusters, structural aluminum posts, rail to post brackets, decorative moldings and post caps.

3.3 Systems may include extruded PVC rail inserts, tempered glass panels, austenitic (300 series) stainless steel fasteners, cast Zamak 3 brackets, and A360 brackets. See Figure 20.

3.4 The system is available in various colors and architectural grade powder coated finishes.

3.4.1 Rails - Each of the top, mid, and bottom aluminum rails are routed to accept various infill components described in Section 3.4.2 for the various railing systems as shown in Figure 1 through 11.

3.4.1.1 The *Tuscany, Riviera and Veranda* top rails are extruded 6005-T5 aluminum rails with internal longitudinal ribs, and dimensions of 1.74 inches wide by 1.38 inches tall. The *Tuscany and Riviera* Series use PVC rail inserts as a baluster retainer. The Veranda Series uses a rubber insert as a glass infill retainer. See Figures 12 and 16.

3.4.1.2 The *VertiCable* top rail is an extruded 6005-T5 aluminum rail with one internal longitudinal rib, dimensions of 1.74 inches wide by 1.38 inches tall and a 0.14-inch x 1-3/16 inch wide 6005-T5 aluminum plate that is drilled for the cable and baluster infills. See Table 3 for the cable fastening schedule and Figure 32 for cross sections of the *VertiCable* top rail sections.

3.4.1.3 The mid-rail is an extruded 6005-T5 aluminum rail with internal longitudinal ribs, dimensions of 1.74 inches wide by 1.25 inches tall. A PVC rail insert is used as a baluster retainer. See Figure 14.

3.4.1.4 The *Tuscany*, *Riviera* and *Veranda* bottom rails are extruded 6005-T5 aluminum rails with internal longitudinal ribs and are 1.74 inches wide by 1.25 inches tall. A PVC rail insert is used as a baluster retainer. See Figure 13.

3.4.1.5 The *VertiCable* bottom rail is an extruded 6005-T5 aluminum rail with internal longitudinal ribs and is 1.74 inches wide by 1.25 inches tall. A 1-1/2 wide x 0.125 inch thick bar made from 6005-T5 aluminum is inserted into the bottom rail intermittently for the retaining of the round baluster infills. See Table 3 for the cable fastening of the infills. See Figure 33 for a cross section of the *VertiCable* bottom rail.

3.4.1.6 The *Screen Rail* top and bottom rails are 2 inches wide by 1-1/4 inch high by 0.06-inch wall extruded 6063-T6 aluminum with longitudinal ribs of various geometry. See Figure 12 and Figure 13.

3.4.2 The guardrail infills vary by guardrail style:

3.4.2.1 The *Tuscany* Series (Style C10 and C101) utilizes a square and round profile, 6063-T6 aluminum balusters in various lengths. See Figure 17 and Table 2 for applicable assemblies.

3.4.2.2 The *Veranda Series* (Style C70) infill area of the railing system (see Figure 8) utilizes a 1/4 inch thick tempered glass panel in various sizes.

3.4.2.3 The *Riviera Series* (Styles C30, C301, C30R, C301R, C31, C311, C32, C321, C33, C331, C34 and C341) infill area of the railing system is configured with 6063-T6 aluminum balusters, square and round profiles and with tabbed 6063-T6 aluminum rings between the top and mid-rail. See Figure 2 through Figure 7, Figure 17 and Table 2 for applicable assemblies.

3.4.2.4 The *VertiCable* (Style C80) infill area utilizes 1/8" diameter, 1x19, S31600 stainless steel cables spaced at 3.00 inches on center between the hollow balusters (See Figure 9). Also, see Table 3 for cable fastening methods.

3.4.2.5 The *VertiCable* (Style C80) uses 5/8" hollow balusters that are equally spaced along the rail. The 5/8" baluster, 0.19 in wall, are aluminum extrusions used with the 36" tall configuration. The 5/8" stainless steel baluster, 0.09" wall, is 304 stainless steel used with the 42" tall configuration. See Figures 9 and 10.

3.4.2.6 The *Screen Rail* baluster is a 0.75 in square by 0.05-inch wall extruded 6063-T6 aluminum installed with a 3-5/8-inch clear space between balusters. See Figure 17.

3.4.3 Structural Aluminum Posts:

3.4.3.1 Power Posts are a 2-1/2-inch square by 0.12-inch wall extruded 6005-T5 aluminum tube with six internal screw slots. The tube is connected to a 4-1/2-inch square, 1/2 inch thick 6061-T6 aluminum base plate via both a 1/4-inch continuous fillet weld and six #14 by 2-inch diameter. flat-head screws. For the standard Power Post, see Table 3 and Figure 22. For the Power Post crossover assembly, see Table 3 and Figure 21.

3.4.3.2 The 4x4 aluminum post is a 4-inch square by 0.125-inch wall extruded 6063-T6 aluminum tube. The tube is permanently attached to a 6-inch square, 1/2 inch thick 6061-T6 aluminum base plate by a 1/4-inch continuous fillet weld. See Table 3 and Figure 23.

3.4.3.3 2-inch Alum Support Posts are a 2-inch square by 0.09-inch wall extruded 6005-T5 aluminum tube with two internal screw slots. The tube is connected to a 3-7/8-inch

square, 1/2 inch thick 6061-T6 aluminum base plate via both a 1/4-inch continuous fillet weld and two #14-14 x 2 inch flat-head screws. For the Alum Support Post, see Table 2 and Figure 24. For the *2" Post* crossover assembly, see Table 3 and Figure 21.

3.4.3.4 Westbury 2-inch HD Fascia Mount Posts are a 2-inch square by 0.09-inch wall extruded 6005-T5 aluminum tube with two internal screw slots. The tube is connected to wood or concrete substructure via aluminum angle brackets and plates using stainless steel bolts and rods. See Table 2 and Figure 28.

3.4.3.5 3-inch aluminum post mounts are a 3-inch square by 0.09-inch wall extruded aluminum tube. The tube is connected to a 5-inch square, 3/8 inch thick aluminum base plate via a 1/4-inch continuous fillet weld. See Figure 25.

3.4.3.6 6-inch aluminum post mounts are a 6-inch square by 0.11-inch wall extruded aluminum tube. The tube is connected to a 7.75-inch square, 3/8 inch thick aluminum base plate via a 1/4-inch continuous fillet weld. See Figure 26.

3.4.3.7 The *Screen Rail* post is 2 inches square by 0.09-inch wall extruded from 6063-T6 aluminum. Tabbed slots accommodate the installation of the screen. See Figure 11 and Figure 31.

3.4.4 Support blocks are installed between the lower rail and the deck surface midway between supports, with the exception of Westbury C-10 Tuscany railings that are 72 inches or less between posts. See Figure 19.

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 both the IBC and the FBC and Section R301 of the IRC when tested in accordance with ICC-ES AC273.

5.0 INSTALLATION

5.1 General:

Westbury® Aluminum Railing must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

5.2 Application: The top and bottom rails are attached directly to structural posts utilizing cast Zamak 3 mounting brackets via mechanical fasteners. See Figure 20 and Tables 4-8.

5.3 Guardrails may be assembled in various configurations. Refer to Figure 1 through Figure 10 for overall assembly and Tables 4-8 for the fastening schedule.

5.4 Infill components (aluminum balusters and aluminum rings) are inserted into routed holes in the aluminum rails and secured via PVC rail inserts that are installed internally to the rails. See Figure 15.

5.5 The infill component for the *Veranda* Series (Style C70) consists of a glass panel which is inserted into the top rail and slides up, to clear bottom rail. The glass panel is aligned with the bottom insert and pushed down into that insert.

5.6 The cable infill for the *VertiCable* consists of both 1/8-inch diameter stainless steel cables and 5/8-inch diameter hollow aluminum balusters. The steel cables must be installed with the stainless-steel cable tensioner below the bottom rail tensioned to 200 pounds of tension per cable.

5.7 *Power Post* shim plates are 4-1/2 inches long by 3/4 inch wide by 1/16 inch thick austenitic (300 series) stainless steel plates. The 4" aluminum post shim plates are 6 inches long by 3/4 inch wide by 0.06 inch thick austenitic (300 series) stainless steel plates. The 3" square aluminum post shim plates are 5 inches long by 3/4 inch wide by 0.06 inch thick austenitic (300 series) stainless steel plates. The 6" square aluminum post shim plates are 7.75 inches long by 3/4 inch wide by 0.06 inch thick austenitic (300 series) stainless steel plates.

5.8 The 2" square aluminum posts must be installed with the two internal screw channels perpendicular with the rail line. See Figure 24 Two shim plates are utilized under the base of the 2-inch aluminum post mount. The shim plates line the perimeter of the post base. Shim plates are 3.88 inches long by 0.75 inches wide by 0.06 inch thick austenitic stainless-steel plates.

5.9 *Screen Rail* assemblies are installed between the structural porch framing (posts and/or walls). The aluminum *Screen Rail* post (nonload-bearing) is installed alongside the load-bearing porch framing (post or wall) and attached at the top and bottom with a post base/cap bracket (See Figure 20).

5.10 The Westbury 2-inch HD Fascia Mount Posts are installed in the following conditions:

5.10.1 Line Post Installation (See Figure 28):

5.10.1.1 The deck is constructed with one 2x8 pressure-treated Southern Yellow Pine installed between 16-inch spaced deck framing on the back side of the rim joist. Each 2x8 block is attached to the deck framing with #10 x 3-inch deck screws in accordance with the National Design Specification for Wood Construction (ANSI/AWC NDS). Two angle mount brackets used where the backer blocks meet each joist. Two 5/16-inch x 2-1/2-inch bolts are installed through the angle mount brackets and joist and secured with a 5/16-inch nut and washer.

5.10.1.2 Posts are drilled with two 3/8-inch dia. holes on each side of the post, spaced 3 inches apart, 1 inch from the back of the post and starting 1 inch from the bottom of the post. Attach angle brackets to post sides with four 3/8-inch x 1-inch bolts and aluminum post insert with threaded holes.

5.10.1.3 Attach post to rim joist using angle mount brackets. Four 5/16-inch dia. holes are drilled through the rim joist and backer blocks. Four 5/16-inch x 4-inch bolts are installed through the angle mount brackets, rim joist, backer blocks and backer plates. Secure by tightening 5/16-inch nuts on the bolts.

5.10.2 Inside Corner Post Installation (See Figure 29):

5.10.2.1 The deck is constructed with one 2x8 pressure-treated SYP backer block and 6x6 pressure-treated SYP block. The 2x8 and 6x6 blocks are attached to the deck framing with #10 x 3-inch deck screws in accordance with the National Design Specification for Wood Construction (ANSI/AWC NDS).

5.10.2.2 Posts are drilled with three 3/8-inch dia. holes on each side of the post, spaced 1-1/2 inches apart. Attach angle brackets to post sides with six 3/8-inch x 1-inch bolts and aluminum post insert with threaded holes.

5.10.2.3 Attach post to double beam and joist using 3-hole angle mount brackets. Three 5/16-inch dia. holes are drilled through the double beam and 2x8 backer block. Three 5/16-inch x 6-inch bolts are installed through the angle mount bracket, backer block, and backer plate. Secure by tightening 5/16-inch nuts on the bolts. Three 3/8-inch dia. holes are drilled through the joist and 6x6 block. Three 3/8-inch x 8-1/2-inch bolts are installed through the angle mount bracket, joist, 6x6 block and backer plate. Secure by tightening 3/8-inch nuts on the bolts.

5.10.3 Corner Post Installation (See Figure 30):

5.10.3.1 The deck is constructed with one 6x6 pressure-treated SYP block. The 6x6 blocks are attached to the deck framing with #10 x 3-inch deck screws in accordance with the National Design Specification for Wood Construction (ANSI/AWC NDS).

5.10.3.2 Posts are drilled with three 3/8-inch dia. holes on each side of the post, spaced 1-1/2 inches apart. Attach angle brackets to post sides with six 3/8-inch x 1-inch bolts and aluminum post insert with threaded holes.

5.10.3.3 Attach post to rim joist using 3-hole angle mount brackets. Three 3/8-inch dia. holes are drilled through the rim joist and 2x8 backer block. Six 3/8-inch x 6-inch bolts are installed through the angle mount bracket, rim joist, 6x6 block, and backer plate. Secure by tightening 3/8-inch nuts on the bolts.

6.0 CONDITIONS OF USE

The guardrail assemblies identified in this report are deemed to comply with the intent of the provisions of the referenced building codes subject to the following conditions:

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

6.2 Attachment of guardrail systems described herein to conventional wood supports is outside the scope of this report.

6.3 Austenitic stainless-steel shim plates are used to prevent direct contact between the structural post base plate and the supporting structure. Compatibility of fasteners and other metallic components with the supporting structure, including chemically treated wood, is outside the scope of this report.

6.4 Shim plates must be used for all structural post installations as described in Sections 5.7 and 5.8.

6.5 Anchorage of the structural surface mounted posts are not within the scope of this report and is subject to evaluation and approval by the building official. Anchors must satisfy the design load requirements specified in Chapter 16 of the building code and must meet the following minimum requirements:

6.5.1 A minimum of four anchor bolts must be used and located in the four pre-drilled holes in the structural post base plate.

6.5.2 The anchors must have a minimum nominal diameter equal to 3/8 inch.

6.5.3 When the supporting structure is a wood-framed deck, installation must include anchorage to suitable structural framing. Decking is not considered structural framing, and anchorage to decking alone is not an approved installation method.

6.5.4 For post installation on concrete or other rigid supports such as structural steel, the installation uses four 3/8-inch diameter anchor bolts located in the pre-drilled holes in the structural post base plate. The type and length of the anchor bolts is dependent upon the material and condition of the supporting structure and is not within the scope of this report.

6.5.5 The structural wood framing detailed in Figure 27 is an acceptable mounting method for the 2" square aluminum post limited to the IRC or FBC Residential only.

6.5.6 Where required by the building official, engineering calculations and details shall be provided. The calculations shall verify that the anchorage and supporting structure complies with the building code for the type and condition of the supporting construction.

6.6 The glass infill panel of guardrails is considered a hazardous location as defined by Sections 2406.4 of the IBC and 2406.3 of the FBC. Glass must be identified by permanent etching as required by Sections 2406.3 of the IBC and 2406.2 of the FBC. Each section of glass must bear the manufacturer's name or mark and the applicable test standard. (Class A of ANSI Z97.1 and Category II of 16 CFR 1201).

6.7 The *Screen Rail* post is nonload-bearing and must be attached to structural posts and walls that support building construction. The evaluation of the *Screen Rail* post is limited to supporting the guardrail loads only.

6.8 Guardrails with glass infill are not approved for use in wind-borne debris regions as defined by the IBC in accordance with Section 2407.1.4. Thus, glass balusters are also not approved for use in the High Velocity Hurricane Zone (HVHZ) under the FBC.

6.9 All products are manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Drawings and installation instructions submitted by Digger Specialties, Inc.

7.2 Data demonstrating compliance with the performance requirements of ICC-ES AC273, Acceptance Criteria for Handrails and Guards, revised March 2016 with additional testing including increased test loads to address IBC and FBC

Section 2407.1.1 for assemblies that utilize a glass in-fill panel.

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

8.0 IDENTIFICATION

The *Westbury® Aluminum Railing* guardrail assemblies that are described in this report shall be identified with labeling on the individual components and/or the packaging such that the product is identifiable at the point of use. The label shall include at least the following information:

8.1 The manufacturer's name (Digger Specialties, Inc.)

8.2 Address and telephone number

8.3 The product name (*Westbury® Aluminum Railing*)

8.4 The name and/or identifying mark of the independent inspection agency

8.5 For 36" high guardrail systems, the label shall also include the phrase, "For Use in One- and Two- Family Dwellings Only."

8.6 The Intertek Mark as shown below, and the Code Compliance Research Report number (CCRR-0163).

CODE COMPLIANCE
Intertek
CCRR-0163

9.0 FLORIDA BUILDING CODE

9.1 Scope of Evaluation:

The *Westbury® Aluminum Railings* were evaluated for compliance with the *Florida Building Code – Building.*

9.2 Conclusion:

The *Westbury® Aluminum Railings*, described in Sections 2.0 through 7.0 of this Research Report, comply with the *Florida Building Code* subject to the following conditions:

- *Westbury® Tuscany*, *Riviera* and *VertiCable* Series comply with the *Florida Building Code* including High-Velocity Hurricane Zone (HVHZ) provisions.
- *Veranda* model complies with the Florida Building Code excluding the High-Velocity Hurricane Zones (HVHZ).
- Intertek is a Florida State Product Evaluation Entity.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 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.

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

10.3 Reference to the https://bpdirectory.intertek.com is recommended to ascertain the current version and status of this report.

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TABLE 1 – PROPERTIES EVALUATED

PROPERTY	APPLICABLE CODE SECTIONS[1]			
	IBC SECTION	IRC SECTION	FBC - Building	FBC - Residential
Structural Performance	1607.8	R301.5	1607.8	R301.5

[1]Section numbers pertain to the most recent edition cited in Section 1.1 of this Report.

TABLE 2A – 2015/2012 IBC AND IRC, FBC GUARDRAIL SYSTEMS AND USE CATEGORIES

***Westbury*® Aluminum Guardrail System**	**Guardrail Type**	**Maximum Guardrail Dimensions[1]**	**Code Occupancy Classification**
Tuscany Series & *Riviera Series* (“Light” top rail)	Level	8’ x 42"	IBC and FBC IRC and FBC-Residential
	Level	8’ x 36"	IRC / FBC-Residential Only[2,4]
	Level 45 deg.	8’ x 36"	IRC / FBC-Residential Only[2,4]
Tuscany (“Light” top rail) *(no center support under bottom rail)*	Level	6’ x 42"	IBC and FBC IRC and FBC-Residential
		6’ x 36"	IBC and FBC (limited)[2] IRC / FBC-Residential Only[2]
VertiCable Series	Level	6’ x 42"	IBC and FBC IRC and FBC-Residential
		8' x 36"	IRC / FBC-Residential Only[2]
Veranda Series	Level	6’ x 42"	IBC and FBC[3,4] IRC and FBC-Residential[3,4]
		6’ x 36"	IRC / FBC-Residential Only[2,3,4]
Screen Rail	Level	61” x 42”	IBC – All Use Groups

[1] 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. Guardrail height is walking surface to top of top rail. Minimum installed height shall be 36 inches.

[2] The use of this product shall be limited to exterior use as a guardrail system for balconies and porches for one- and two-family dwellings in accordance with the IRC or FBC-Residential.

[3] Excluding wind-borne-debris regions

[4] Excluding High-Velocity-Hurricane-Zone (HVHZ)

[5] See Table 3 for available support posts.

TABLE 2B – 2018/2015 IRC AND FBC-R GUARDRAIL SYSTEMS AND USE CATEGORIES

Westbury® Aluminum Guardrail System	Guardrail Type	Maximum Guardrail Dimensions[1]	Code Occupancy Classification
Tuscany Series & *Riviera Series* ("Heavy")	Level	8' x 36"	IRC / FBC-Residential Only[2,4]
	Level 45 deg.	8' x 36"	IRC / FBC-Residential Only[2,4]
Veranda Series	Level	6' x 36"	IRC / FBC-Residential Only[2,3,4]

1 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. Guardrail height is walking surface to top of top rail. Minimum installed height shall be 36 inches.

2 The use of this product shall be limited to exterior use as a guardrail system for balconies and porches for one- and two-family dwellings in accordance with the IRC or FBC-Residential.

3 Excluding wind-borne-debris regions

4 Excluding High-Velocity-Hurricane-Zone (HVHZ)

5 See Table 3 for available support posts.

TABLE 3 – POST MOUNTS AND USE CATEGORIES

Post	*Westbury*® Aluminum Guardrail System	Maximum Rail Height[1]	Maximum Railing Length[2]	Fastening	Code Occupancy Classification
2" Square Aluminum PostSurface Mount	*Tuscany Series* *Riviera Series* *VertiCable Series* *Veranda Series* *Screen Rail*	42 inches	8 feet	See Section 6.5 of this report	IRC / FBC-Residential Only
		42 inches	61 inches	See Section 6.5 of this report	IBC and FBC IRC and FBC-Residential
2" Square Aluminum Post Fascia Mount	*Tuscany Series* *Riviera Series* *VertiCable Series* *Veranda Series* *Screen Rail*	42 inches	8 feet	Line Post Installation - See Section 5.10.1	IRC / FBC-Residential Only
				Inside Corner Post Installation - See Section 5.10.25.10.1	IRC / FBC-Residential Only
				Corner Post Installation - See Section 5.10.35.10.1	IRC / FBC-Residential Only
2-1/2" Power Post Surface Mount	*Tuscany Series* *Riviera Series* *VertiCable Series* *Veranda Series*	42 inches	8 feet	See Section 6.5 of this report	IBC and FBC IRC and FBC-Residential
3" Square Aluminum PostSurface Mount	*Tuscany Series* *Riviera* *VertiCable Series* *Veranda Series*	42 inches	8 feet	See Section 6.5 of this report	IRC / FBC-Residential Only
4" Square Aluminum PostSurface Mount	*Tuscany Series* *Riviera Series* *VertiCable Series* *Veranda Series*	42 inches	8 feet	See Section 6.5 of this report	IBC and FBC IRC and FBC-Residential

TABLE 3 – POST MOUNTS AND USE CATEGORIES

Post	*Westbury*® Aluminum Guardrail System	Maximum Rail Height[1]	Maximum Railing Length[2]	Fastening	Code Occupancy Classification
6" Square Aluminum Post Surface Mount	*Tuscany Series* *Riviera Series* *VertiCable Series* *Veranda Series*	42 inches	8 feet	See Section 6.5 of this report	IRC / FBC-Residential Only

1 Rail height is walking surface to top of top rail.
2 Rail lengths are actual railing lengths, i.e. clear space between supports.
3 The use of this product shall be limited to exterior use as a guardrail system for balconies and porches for one- and two-family dwellings in accordance with the IRC or FBC-Residential.
4 Power Posts and 2" Alum Support Posts are supplied with fasteners pre-installed.

TABLE 4 – RIVIERA FASTENER SCHEDULE

Connection	Fastener
Rail Brackets to Post	Two #10-16 x 5/8 in pan-head, self-drilling, 18-8, 300 Series screws [1]
Crossover Assemblies to Top Rail	
Top Rail and Mid-Rail Bracket to "Light" Rail	Two #10-16 x 3/4 in flat-head, self-drilling, 18-8, 300 Series screws [1] (one through each side hole)
Top/Mid Rail Bracket to "Heavy" Rail	Two #10-16 x 3/4 in flat-head, self-drilling, 18-8, 300 Series screws [1] (one through each side hole)
Support Block Screw to Bottom Rail	One #8-18 x 3/4 in pan-head, self-drilling, zinc-plated 18-8, 300 Series screw [1]
Power Post Base Plate to 2-1/2" Structural Post Tube	Six #14-14 x 2 in flat-head, self-drilling, 18-8, 300 Series screws [1] (Two sets of three screws shall be aligned parallel with rail)
Base Plate to 2" Alum Support Post	Two #14-14 x 2 in trim head, Phillips-drive, 18-8, 300 Series screws [1] (Screws shall be aligned perpendicular to rail)
Square Baluster to Rails	Inserted into 0.8-inch square routed hole and held snug with PVC Rail Insert
Round Baluster to Rails	Inserted into 0.79-inch diameter routed hole and held snug with PVC Rail Insert
Bottom Rail Bracket to Rail	No mechanical fastener
45 Degree Rail Bracket to Post	Two #10-16 by 5/8 in. (0.140 in minor diameter) pan-head, self-drilling, stainless steel screws
45 Degree Rail Bracket to Rail	Two #10-16 by 3/4 in. (0.140 in minor diameter) flat-head, self-drilling, stainless steel screws

[1] Permissible grades of the 300 Series stainless steel material include: 304, 305, 316, 384, and/or XM7 (30430), which are all Austenitic Stainless Steel – Cold Worked materials

TABLE 5 – TUSCANY FASTENER SCHEDULE

Connection	Fastener
Rail Brackets to Post	Two #10-16 x 5/8 in pan-head, self-drilling, 18-8, 300 Series screws [1]
Crossover Assemblies to Top Rail	
Top Rail Bracket to "Light" Rail	Two #10-16 x 3/4 in flat-head, self-drilling, 18-8, 300 Series screws [1] (one through each side hole)
Top Rai Bracket to "Heavy" Rail	Two #10-16 x 3/4 in flat-head, self-drilling, 18-8, 300 Series screws [1] (one through each side hole)
Support Block Screw to Bottom Rail	One #8-18 x 3/4 in pan-head, self-drilling, zinc-plated 18-8, 300 Series screw [1]
Power Post Base Plate to 2-1/2" Structural Post Tube	Six #14-14 x 2 in flat-head, self-drilling, 18-8, 300 Series screws [1] (Two sets of three screws shall be aligned parallel with rail)
Square Baluster to Rails	Inserted into 0.8-inch square routed hole and held snug with PVC Rail Insert
Round Baluster to Rails	Inserted into 0.79-inch diameter routed hole and held snug with PVC Rail Insert
Bottom Rail Bracket to Rail	No mechanical fastener
45 Degree Rail Bracket to Post	Two #10-16 by 5/8 in. (0.140 in minor diameter) pan-head, self-drilling, stainless steel screws
45 Degree Rail Bracket to Rail	Two #10-16 by 3/4 in. (0.140 in minor diameter) trim-head, self-drilling, stainless steel screws

[1] Permissible grades of the 300 Series stainless steel material include: 304, 305, 316, 384, and/or XM7 (30430), which are all Austenitic Stainless Steel – Cold Worked materials

TABLE 6 – VERANDA FASTENER SCHEDULE

Connection	Fastener
Rail Brackets to Post	Two #10-16 x 5/8 in pan-head, self-drilling, 18-8, 300 Series screws [1]
Crossover Assemblies to Top Rail	
Top Rail and Mid-Rail Bracket to Rail	Two #10-16 x 3/4 in flat-head, self-drilling, 18-8, 300 Series screws [1] (one through each side hole)
Support Block Screw to Bottom Rail	One #8-18 x 3/4 in pan-head, self-drilling, zinc-plated 18-8, 300 Series screw [1]
Power Post Base Plate to 2-1/2" Structural Post Tube	Six #14-14 x 2 in flat-head, self-drilling, 18-8, 300 Series screws [1] (Two sets of three screws shall be aligned parallel with rail)
Top Rail and Mid-Rail Bracket to Rail	Two #10-16 x 3/4 in flat-head, self-drilling, 18-8, 300 Series screws [1] (one through each side hole)
Glass Panel to Rails	EPDM gasket retaining glass panel in slotted top and bottom rails
Bottom Rail Bracket to Rail	No mechanical fastener

[1] Permissible grades of the 300 Series stainless steel material include: 304, 305, 316, 384, and/or XM7 (30430), which are all Austenitic Stainless Steel – Cold Worked materials

TABLE 7 – VERTICABLE FASTENER SCHEDULE

Connection	Fastener
Rail Brackets to Post	Two #10-16 x 5/8 in pan-head, self-drilling, 18-8, 300 Series screws [1]
Crossover Assemblies to Top Rail	
Top Rail and Mid-Rail Bracket to Rail	Two #10-16 x 3/4 in flat-head, self-drilling, 18-8, 300 Series screws [1] (one through each side hole)
Support Block Screw to Bottom Rail	One #8-18 x 3/4 in pan-head, self-drilling, zinc-plated 18-8, 300 Series screw [1]
Power Post Base Plate to 2-1/2" Structural Post Tube	Six #14-14 x 2 in flat-head, self-drilling, 18-8, 300 Series screws [1] (Two sets of three screws shall be aligned parallel with rail)
Base Plate to 2" Alum Support Post	Two #14-14 x 2 in trim head, Phillips-drive, 18-8, 300 Series screws [1] (Screws shall be aligned perpendicular to rail)
Aluminum Baluster to Rails	slip fit in routing – No mechanical fasteners
Cable Infill to Top Rail Insert	One 0.23 in diameter (OD) hollow 18-8 stainless steel cable stop sleeve, crimp fit to each cable
Cable Infill to Bottom Rail Insert	One 0.23 in diameter (OD) hollow 18-8 stainless steel cable stop sleeve, crimp fit to each cable and one 3/8 in wide by 7/8 in long threaded (20 TPI) stainless steel cable tensioner with 1/2 in 18-8 stainless steel nut per cable
Bottom Rail Bracket to Rail	Two #10-16 x 3/4 in flat-head, self-drilling, 18-8, 300 Series screws [2] (one through each side hole)

[1] Permissible grades of the 300 Series stainless steel material include: 304, 305, 316, 384, and/or XM7 (30430), which are all Austenitic Stainless Steel – Cold Worked materials

TABLE 8 – SCREEN RAIL FASTENER SCHEDULE

Connection	Fastener
Rail Bracket to Post	Two #10-16 x 5/8-inch pan-head, self-drilling, stainless(1) steel screws
Top/Bottom Rail to Brackets	Slip-Fit, no Mechanical Attachment
Baluster to Top/Bottom Rail	Secured in Place with PVC Infill Retainer
Infill Retainer to Rails	Channel Fit
Post Top and Bottom	Two #14 x 1-3/4 Screws

[1] Permissible grades of the 300 Series stainless steel material include: 304, 305, 316, 384, and/or XM7 (30430), which are all Austenitic Stainless Steel – Cold Worked materials

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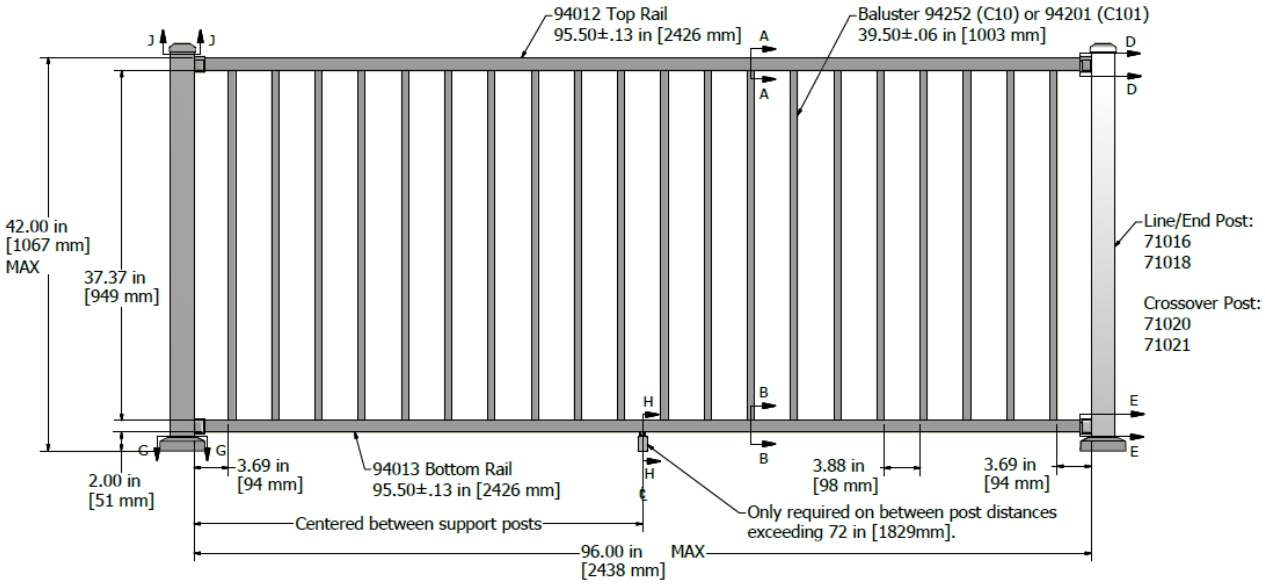


FIGURE 1 - *WESTBURY® TUSCANY* SERIES STYLE C10/C101 ALUMINUM RAILING SYSTEM

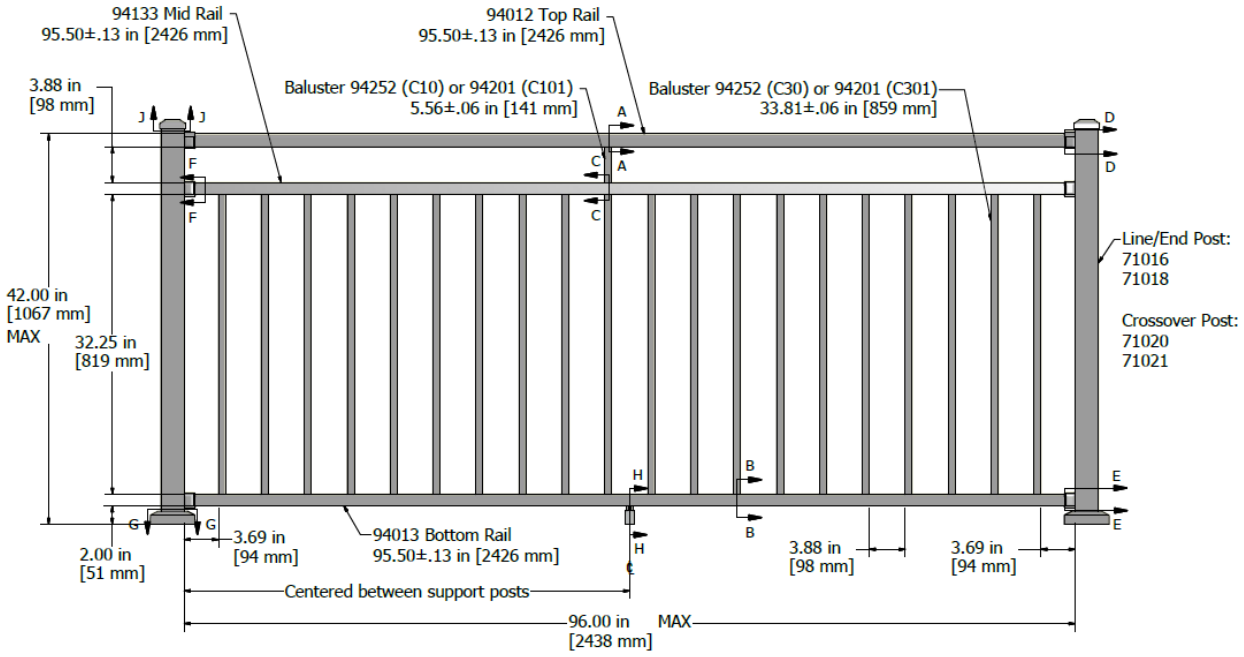


FIGURE 2 - *WESTBURY® RIVIERA* SERIES STYLE C30/301 ALUMINUM RAILING SYSTEM

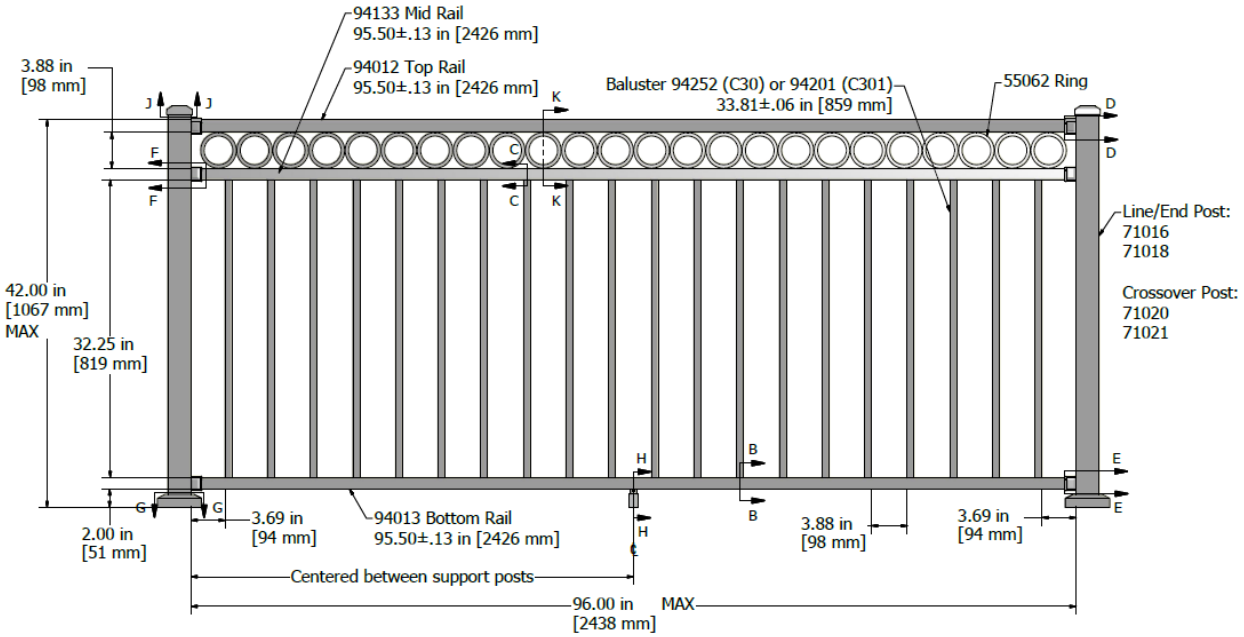


FIGURE 3 - *WESTBURY® RIVIERA* SERIES STYLE C30R/C301R ALUMINUM RAILING SYSTEM

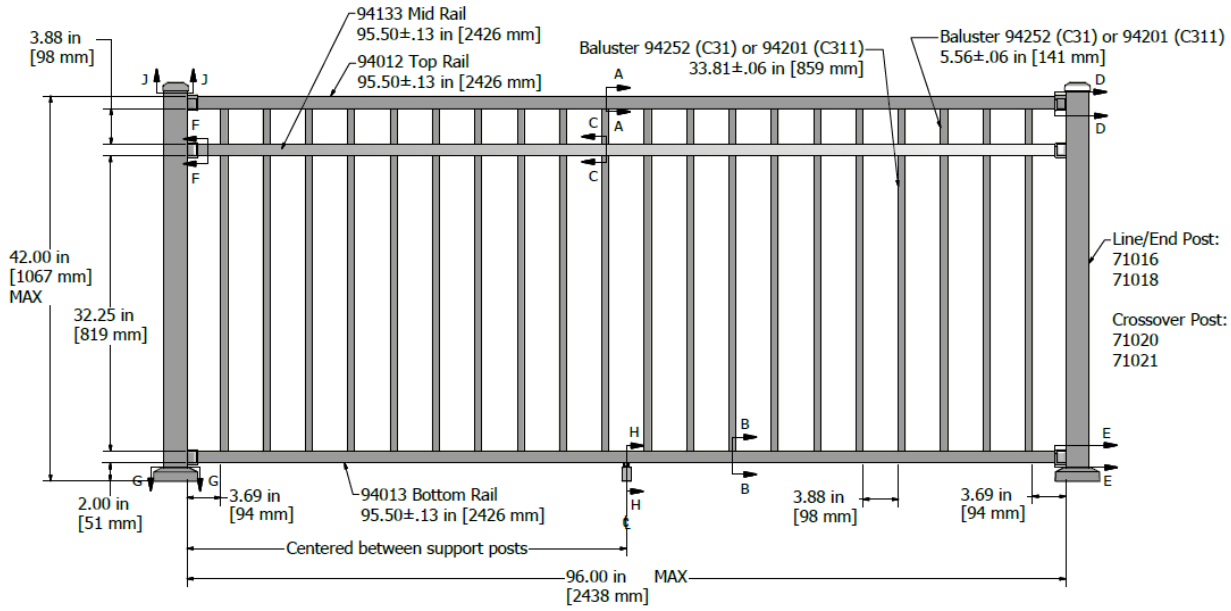


FIGURE 4 - *WESTBURY® RIVIERA* SERIES STYLE C31/C311 ALUMINUM RAILING SYSTEM

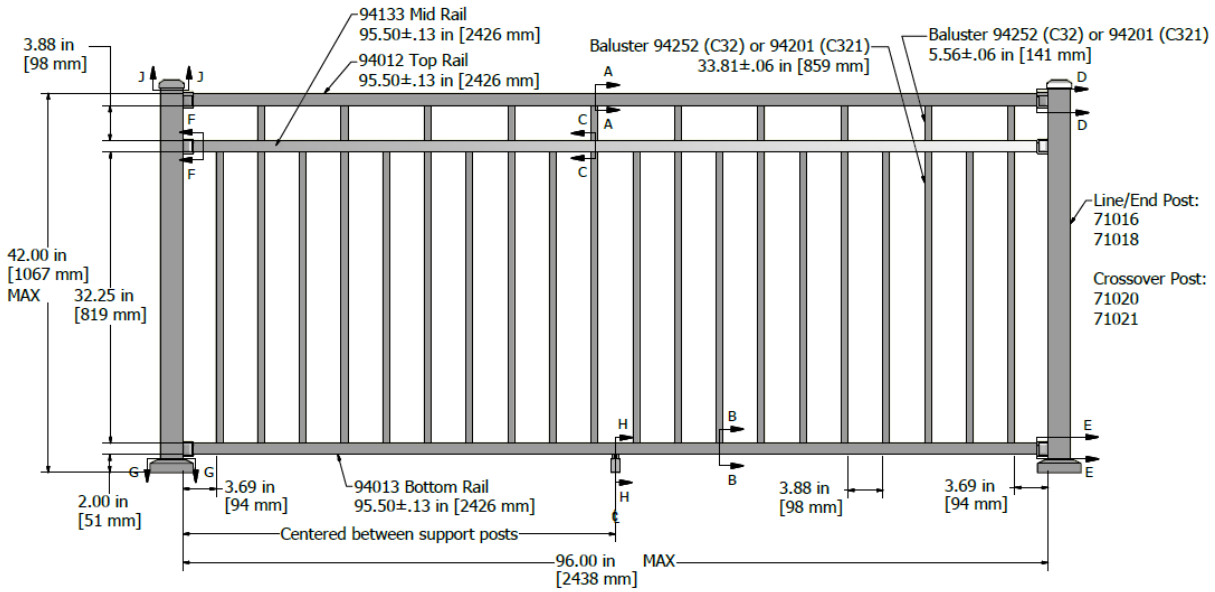


FIGURE 5 - *WESTBURY® RIVIERA* SERIES STYLE C32/C321 ALUMINUM RAILING SYSTEM

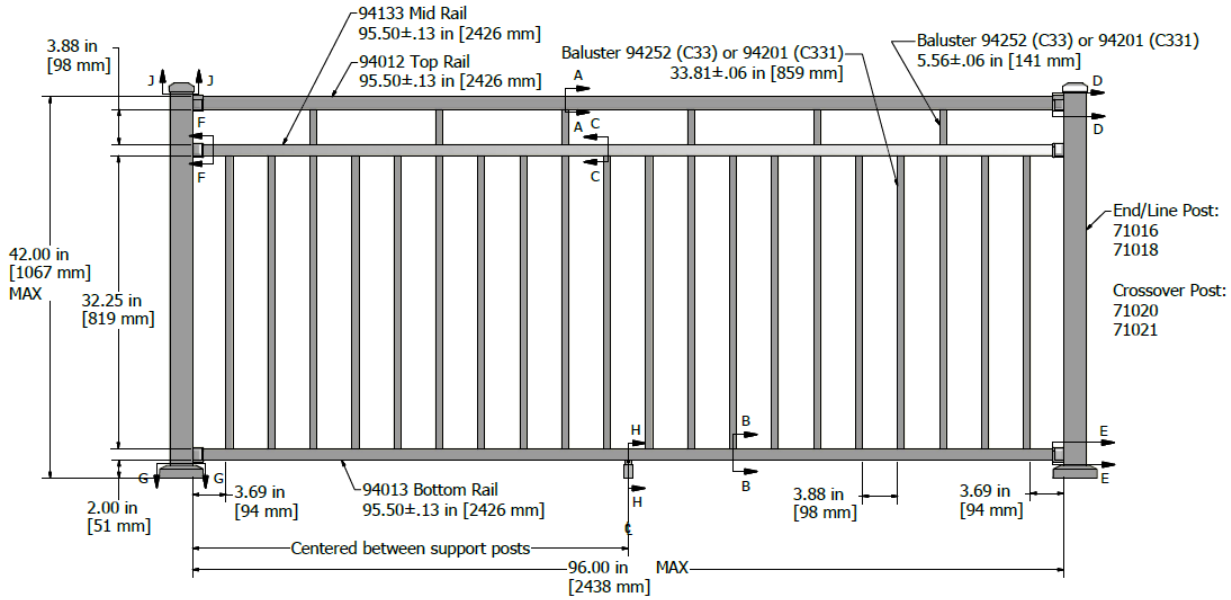


FIGURE 6 - *WESTBURY® RIVIERA* SERIES STYLE C33/C331 ALUMINUM RAILING SYSTEM

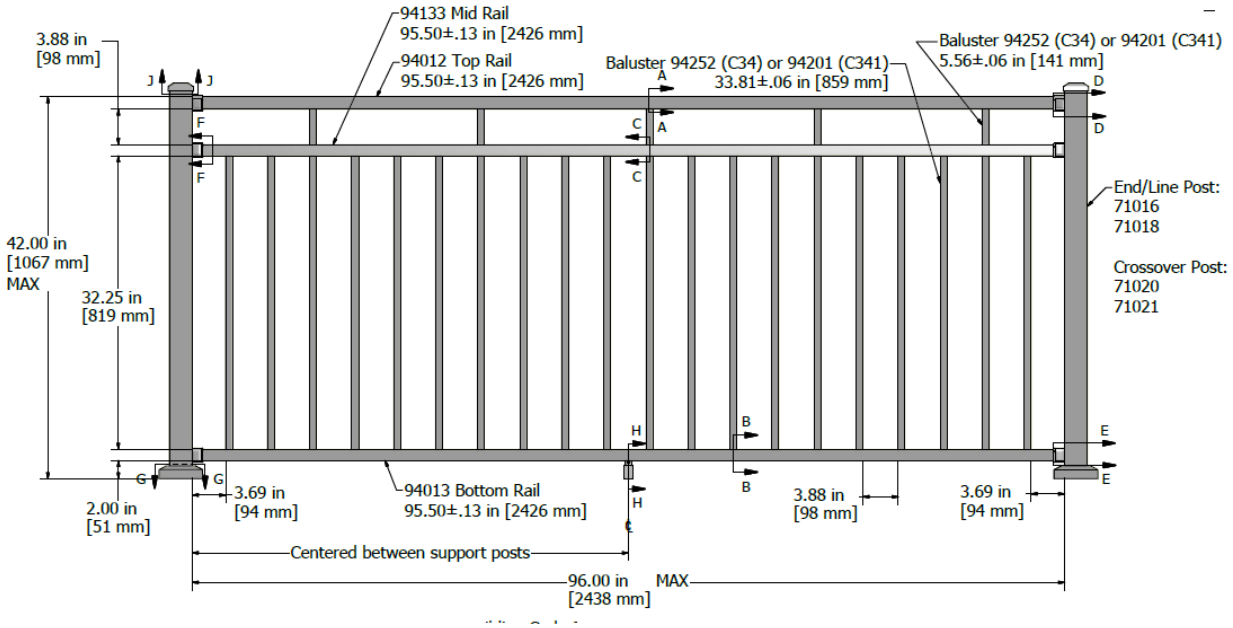


FIGURE 7 - *WESTBURY® RIVIERA* SERIES STYLE C34/C341 ALUMINUM RAILING SYSTEM

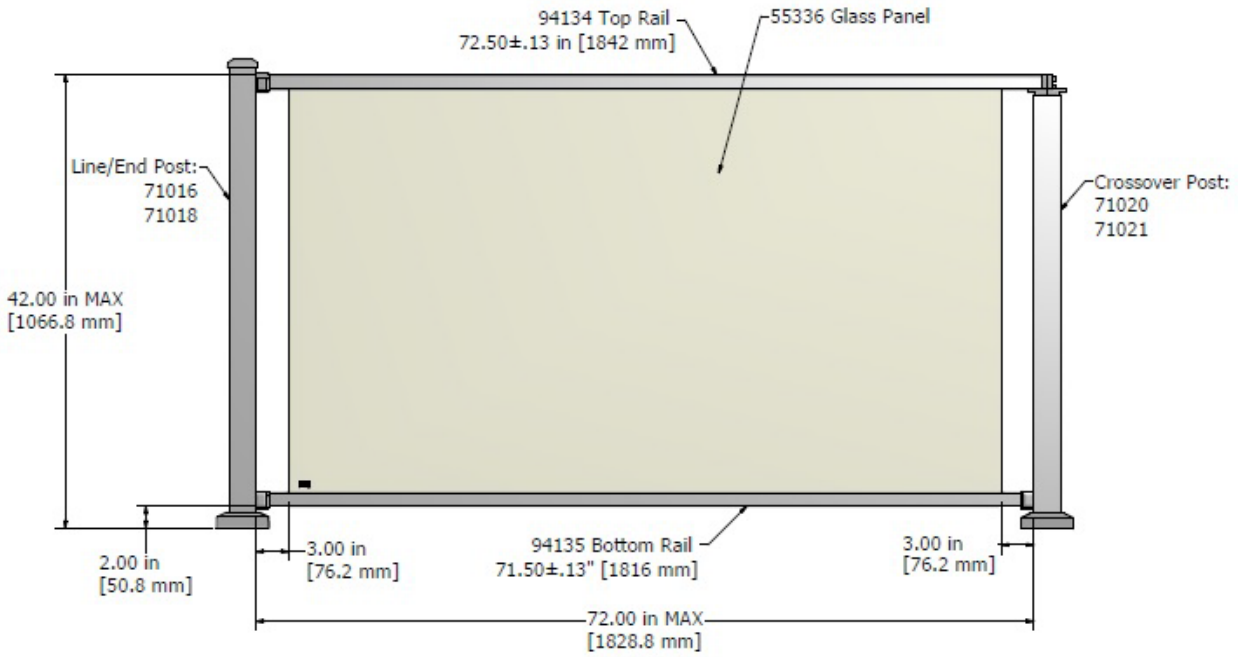


FIGURE 8 - *WESTBURY® VERANDA* SERIES STYLE C70 GLASS RAILING SYSTEM

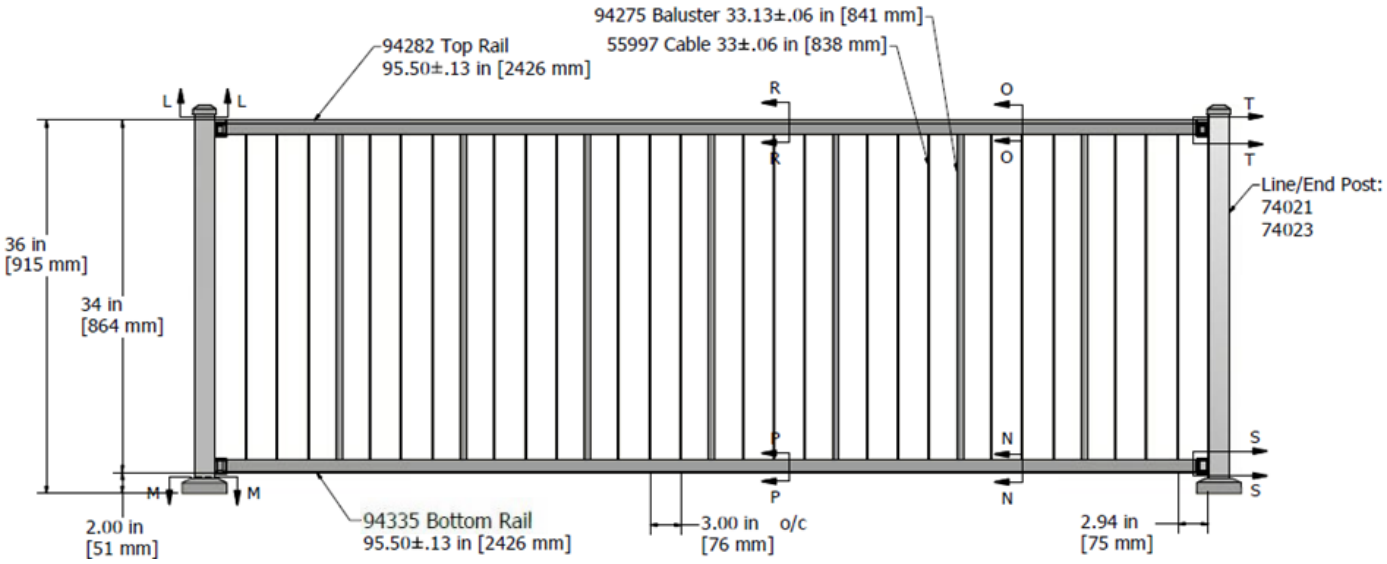


FIGURE 9 - *WESTBURY® VERTICABLE* SERIES STYLE C80 ALUMINUM RAILING SYSTEM (36" TALL)

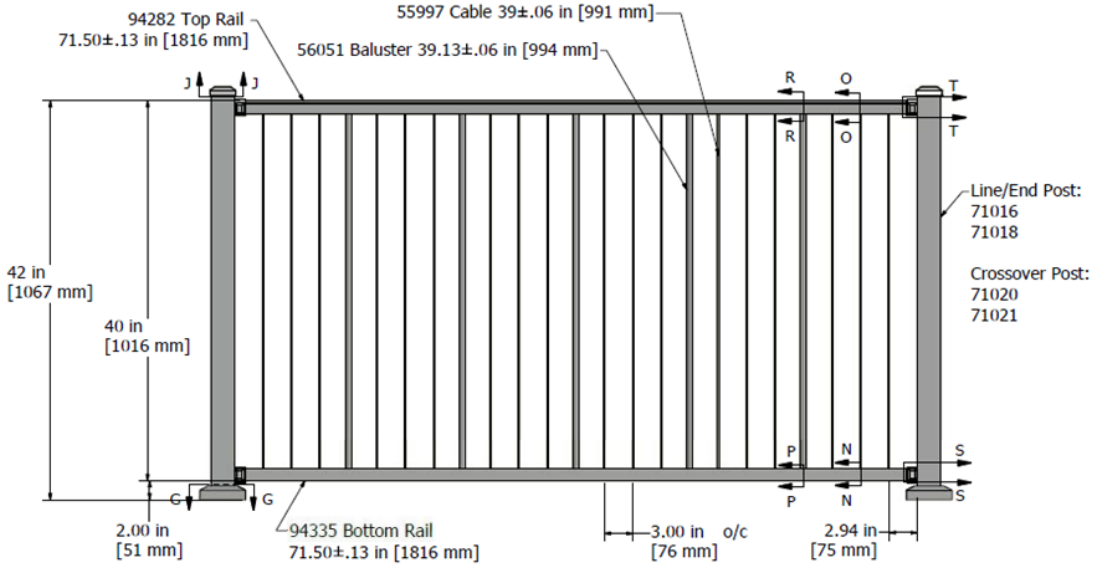


FIGURE 10 - *WESTBURY® VERTICABLE* SERIES STYLE C80 ALUMINUM RAILING SYSTEM (42" TALL)

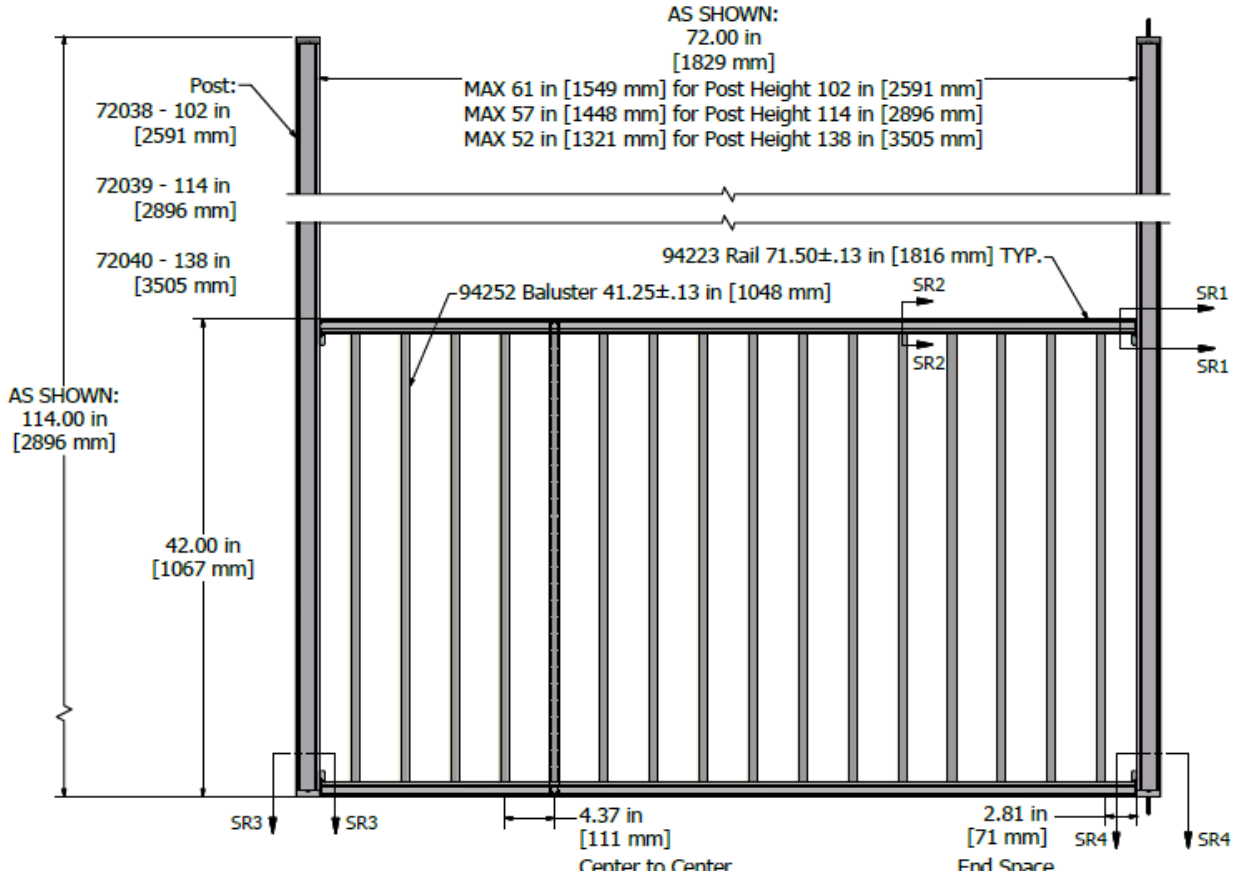
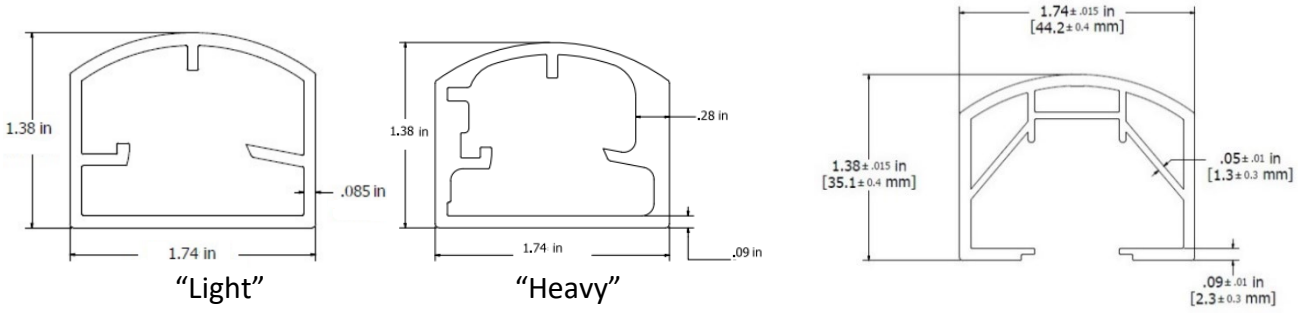
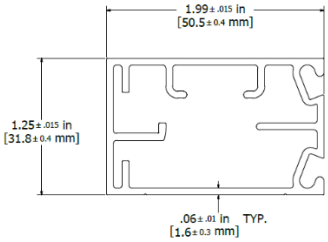


FIGURE 11 –*SCREEN RAIL* ALUMINUM RAILING AND INSTALLATION INTO STRUCTURAL PORCH FRAMING (POSTS AND WALL)



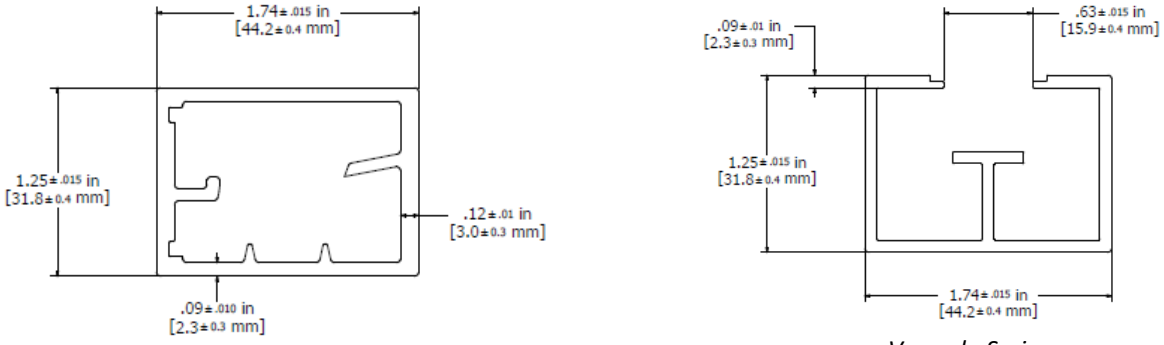
"Light" "Heavy"

Tuscany and *Riviera Series* *Veranda Series*

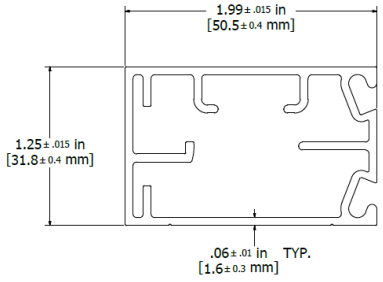


Screen Rail

FIGURE 12 – TOP RAIL PROFILES



Tuscany and *Riviera Series* *Veranda Series*



Screen Rail

FIGURE 13 – BOTTOM RAIL PROFILES

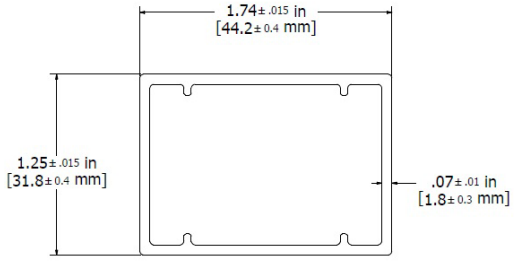


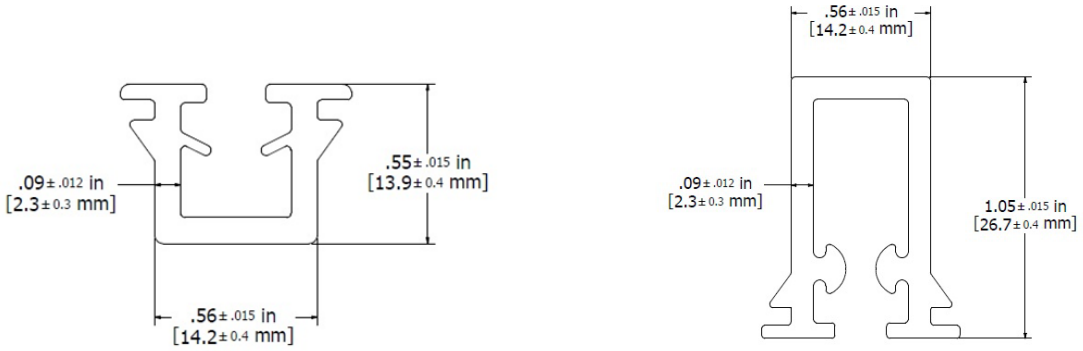
FIGURE 14 – MID-RAIL PROFILE (*RIVIERA* SERIES ONLY)



For Top and Bottom Rails

For Mid-Rail

FIGURE 15 – *TUSCANY*, *RIVIERA* SERIES AND *SCREEN RAIL* PVC INSERTS FOR ALUMINUM BALUSTERS



for Top Rails

for Bottom Rails

FIGURE 16 – *VERANDA* SERIES RUBBER INSERTS FOR GLASS INFILL

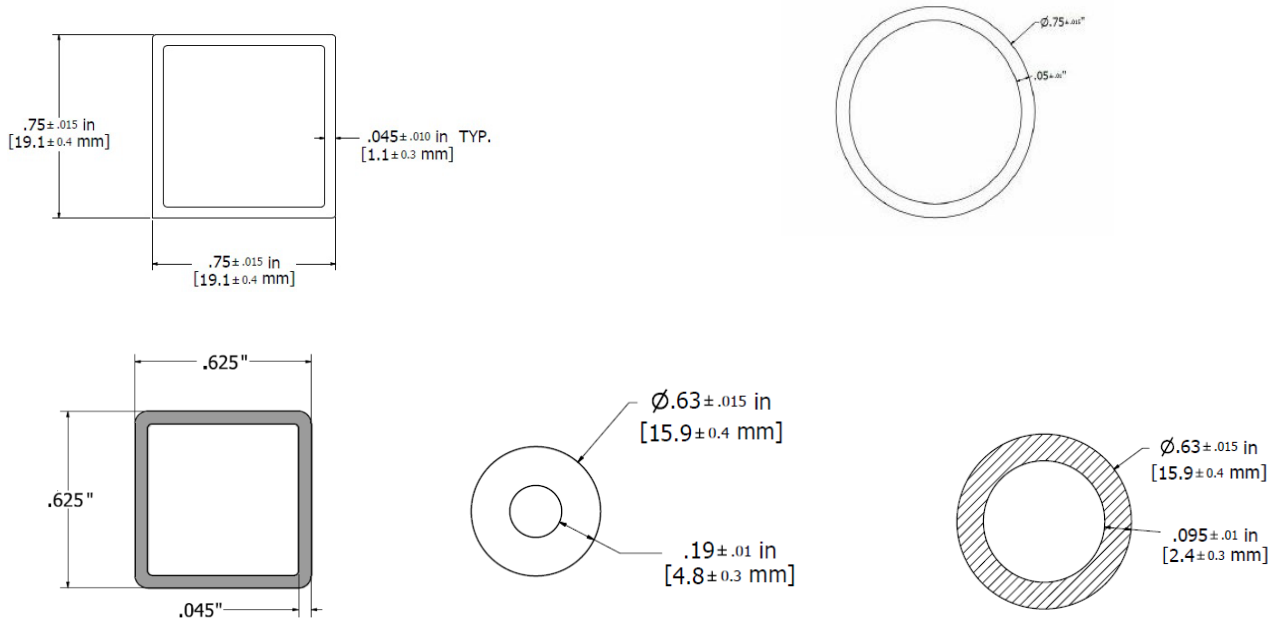


FIGURE 17 – BALUSTERS (ALL ARE ALUMINUM EXCEPT FOR THE 5/8" .095 WALL, WHICH IS STAINLESS)

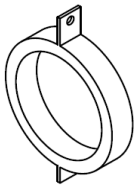


FIGURE 18 – TABBED RING (*RIVIERA* SERIES)

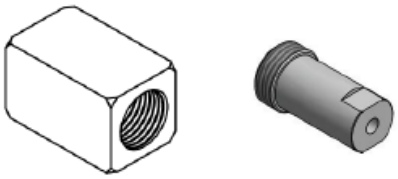
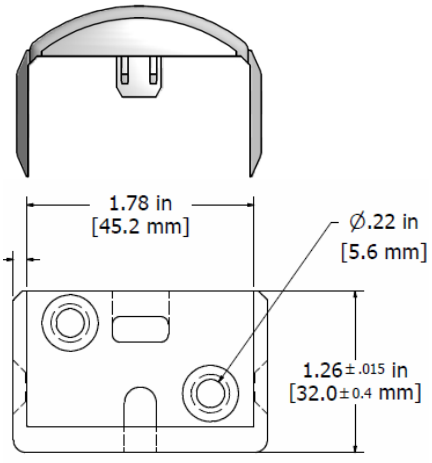
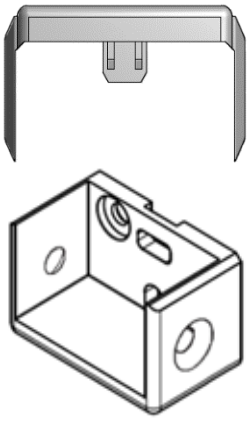
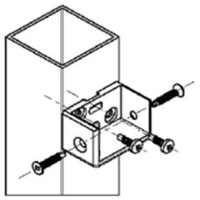


FIGURE 19 - SUPPORT BLOCK COMPONENT

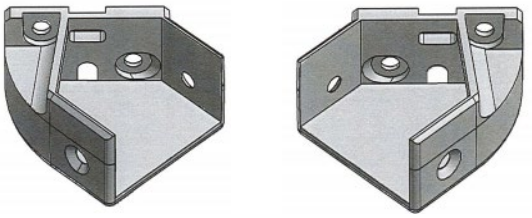




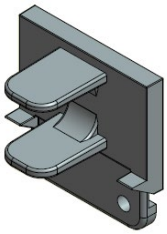


Rail Bracket Installation Detail

Riviera, Tuscany, and *Veranda* Brackets



45 Degree *Tuscany* Brackets

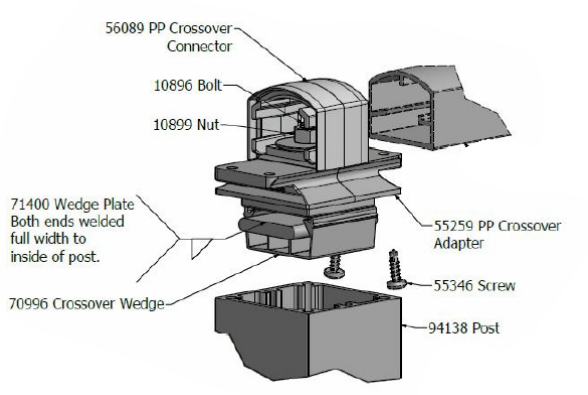


Die Cast Aluminum *Screen Rail* Mount Bracket

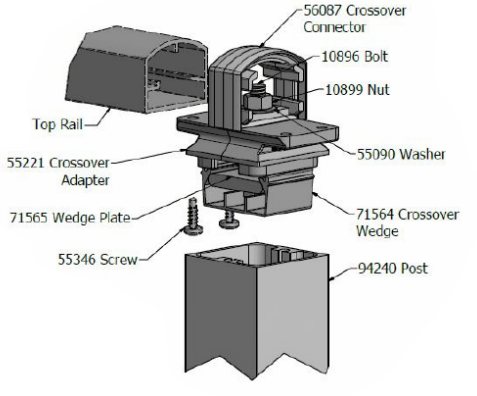


Die-Cast Aluminum Top and Bottom *Screen Rail* Post Bracket

FIGURE 20 –BRACKET COMPONENTS



2 ½" Power Post Crossover



2" Alum Support Crossover

FIGURE 21 –CROSSOVER ASSEMBLIES

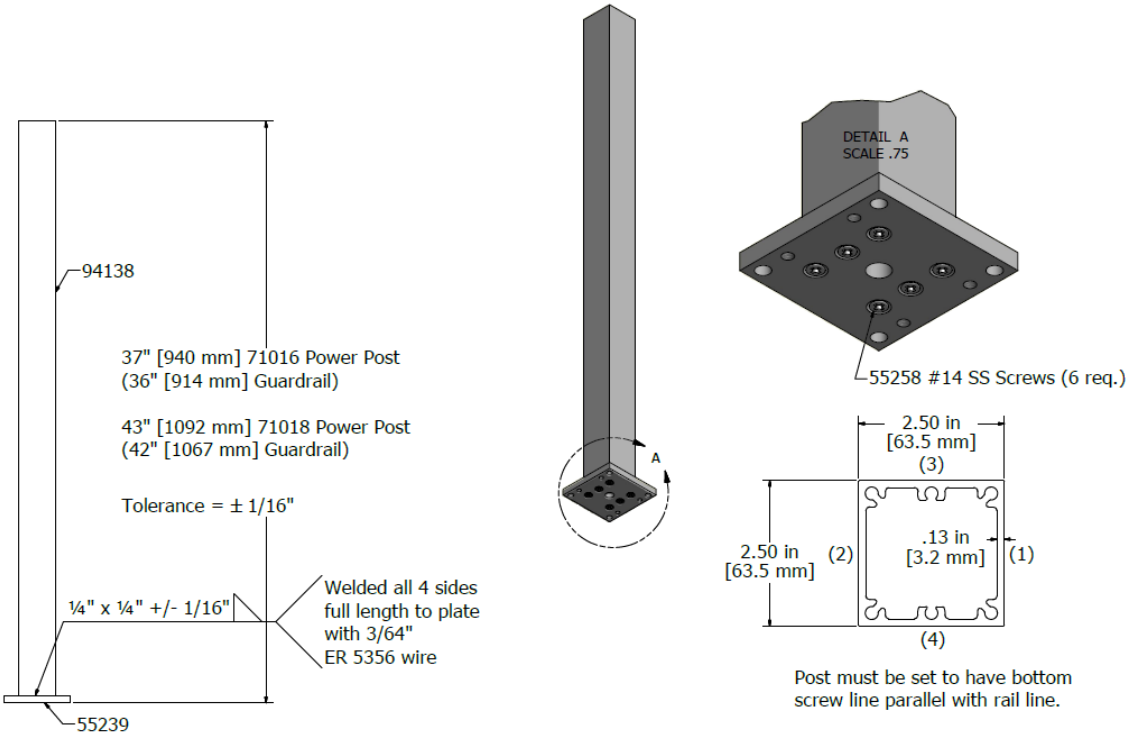


FIGURE 22 – 2-1/2" POWER POST ASSEMBLY

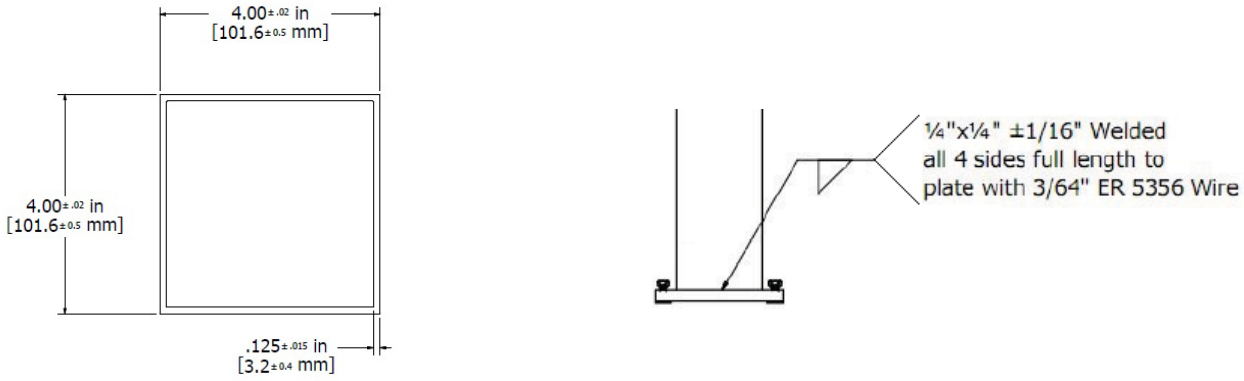


FIGURE 23 – 4X4 ALUMINUM POST ASSEMBLY

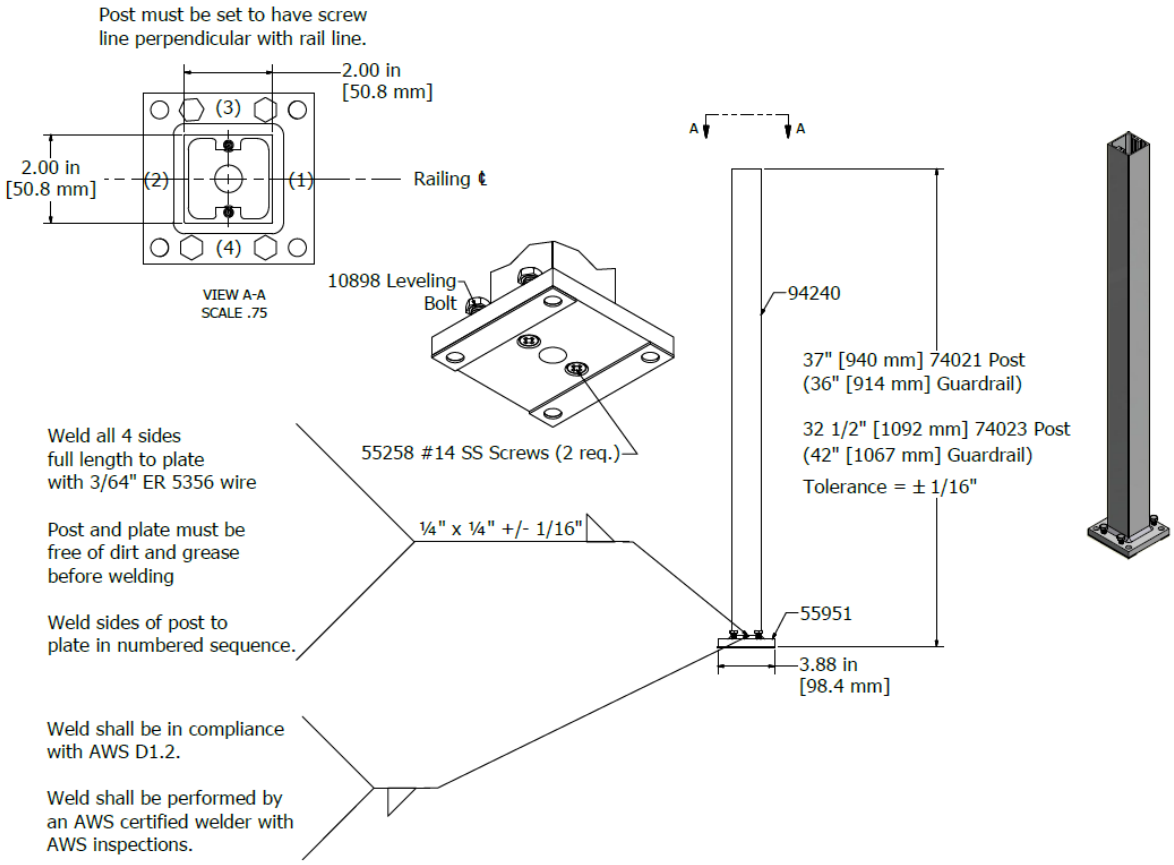


FIGURE 24 – 2" SQUARE ALUMINUM SUPPORT POST ASSEMBLY

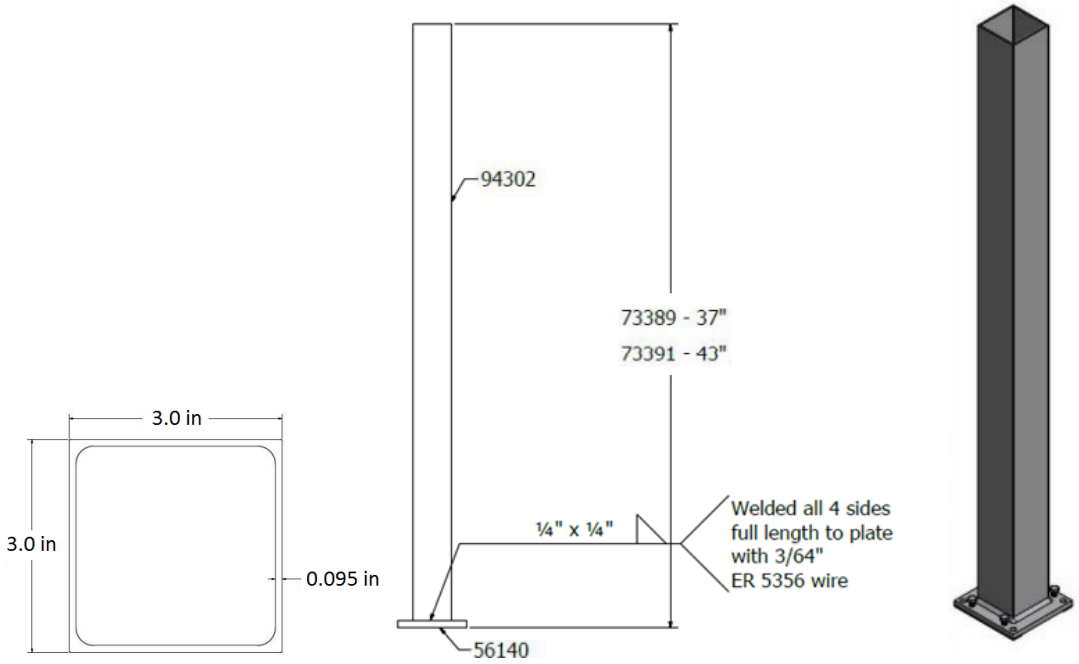


FIGURE 25 – 3" SQUARE ALUMINUM SUPPORT POST ASSEMBLY

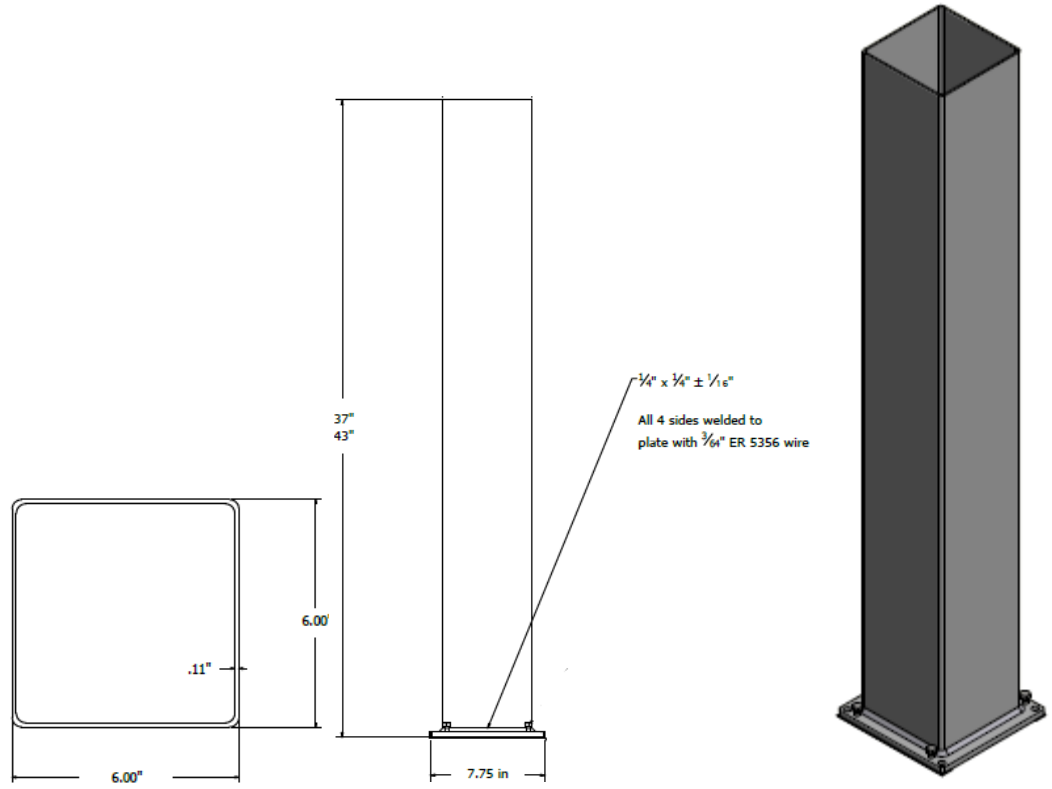


FIGURE 26 – 6" SQUARE ALUMINUM SUPPORT POST ASSEMBLY

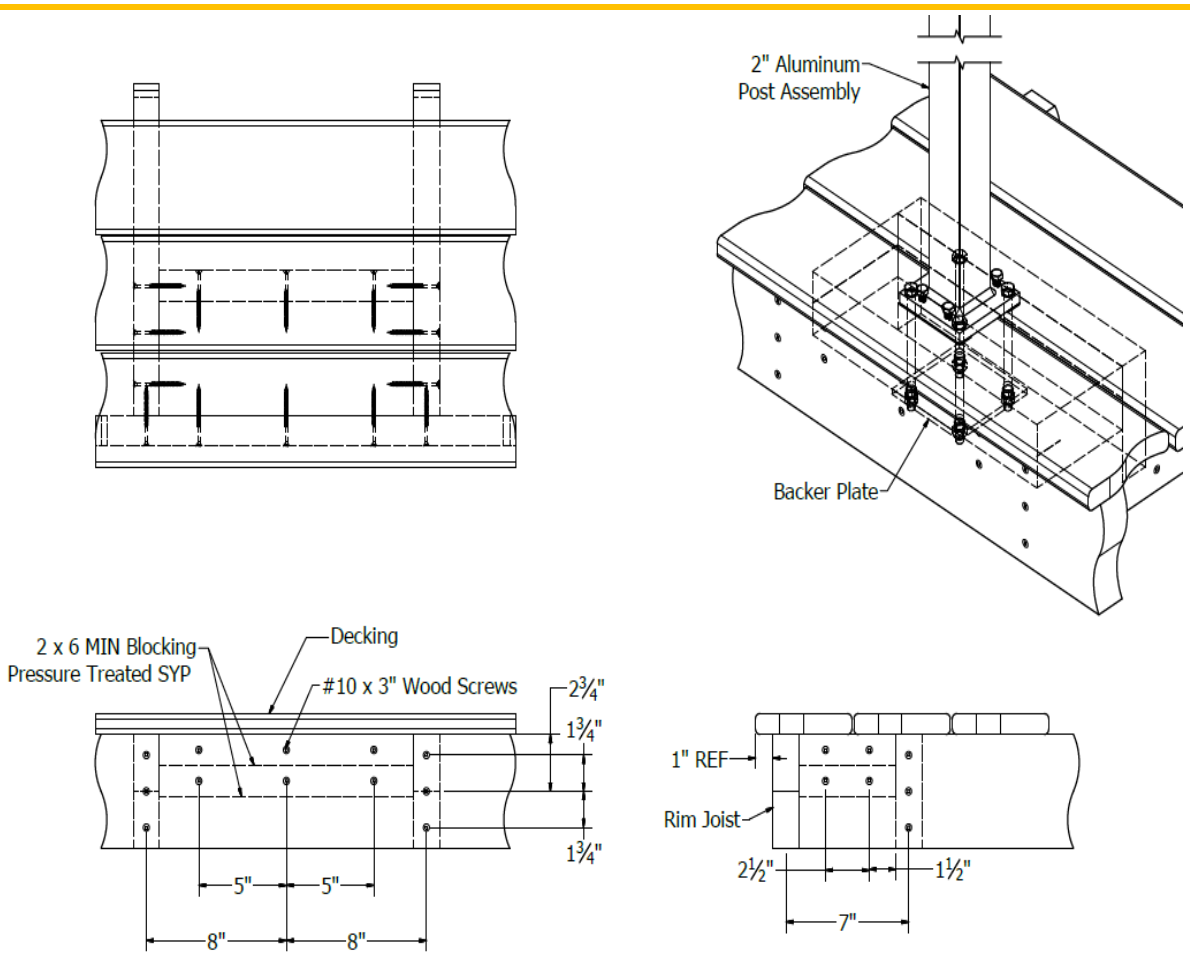
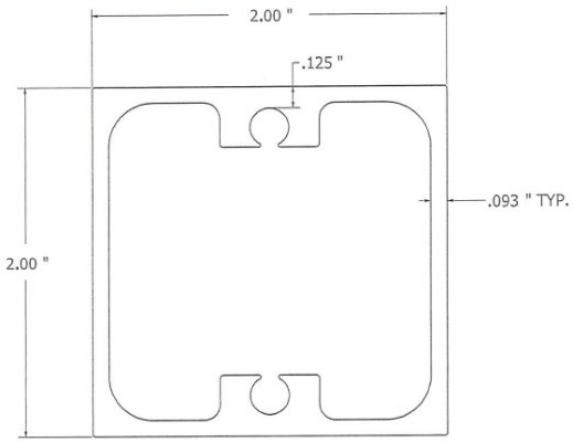
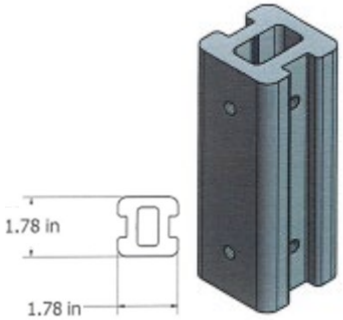


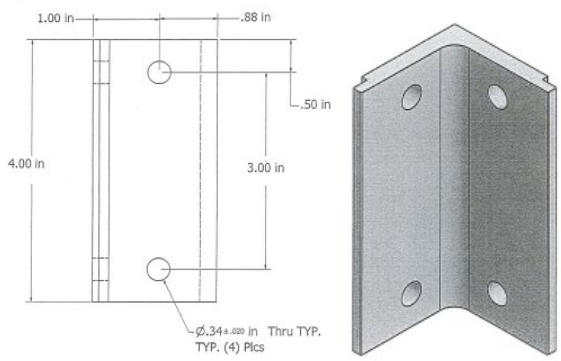
FIGURE 27 – STRUCTURAL WOOD FRAMING 2" POST MOUNT
Limited to IRC and FBC Residential



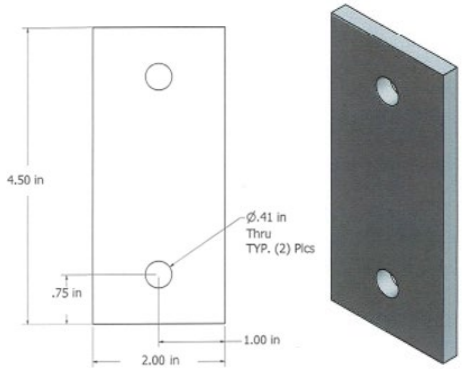
2" HD Aluminum Post



Aluminum Post Insert



2-hole 4 inch Angle Bracket



2-hole 4-1/2 inch Backer Plate

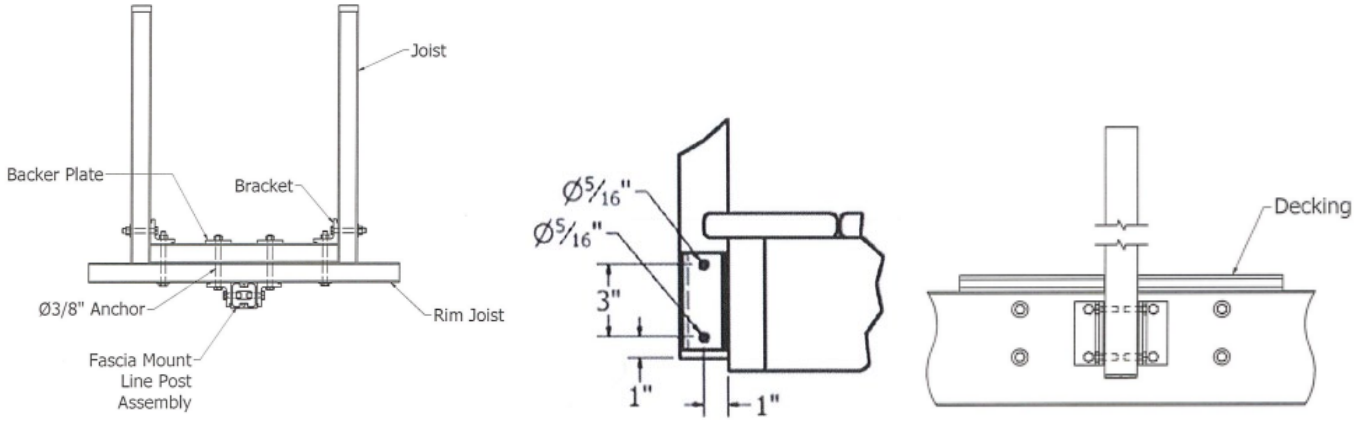
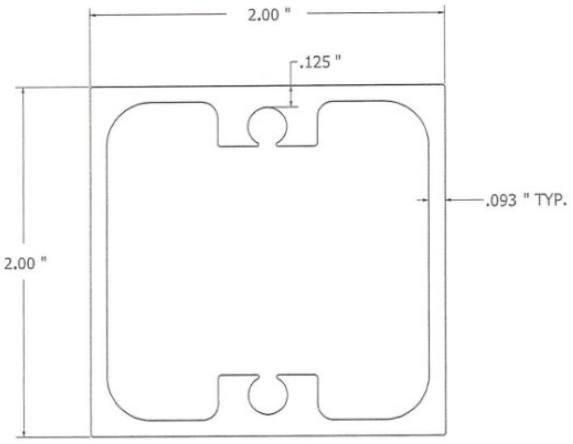


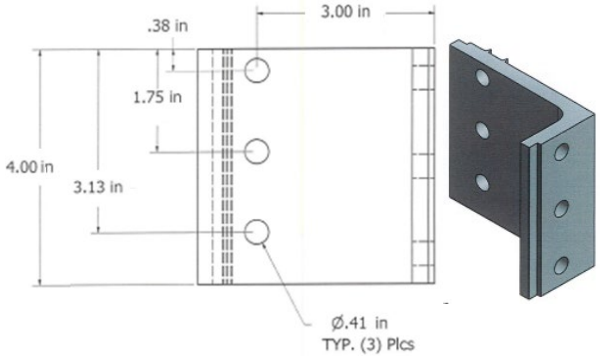
FIGURE 28 – WESTBURY® 2" HD FASCIA MOUNT LINE POST INSTALLATION
Limited to IRC and FBC Residential



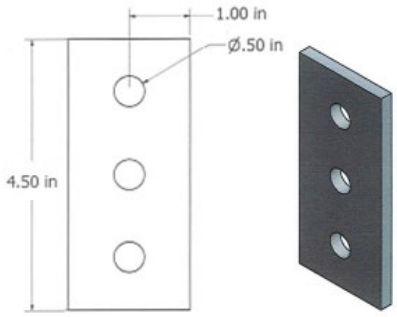
2" HD Aluminum Post



Aluminum Post Insert



3-hole 4 inch Angle Bracket



3-hole 4-1/2 inch Backer Plate

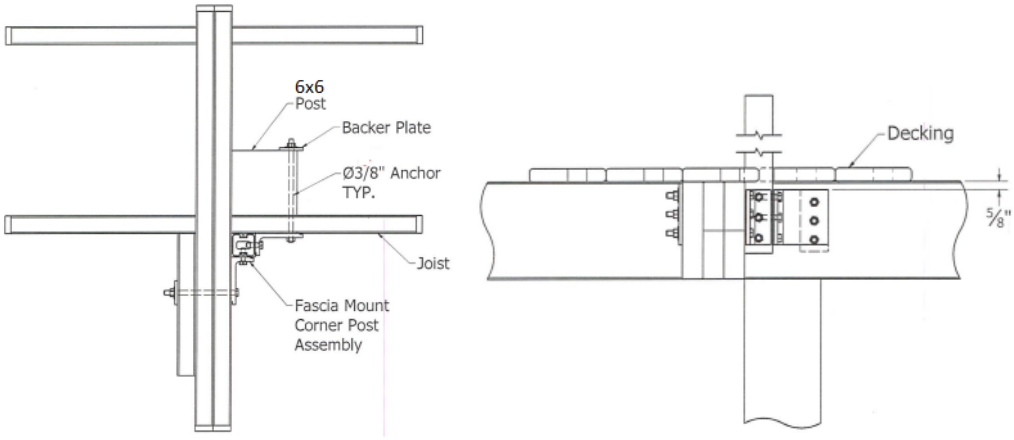
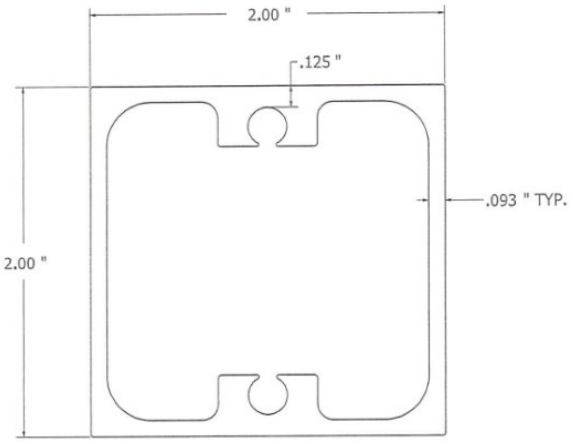


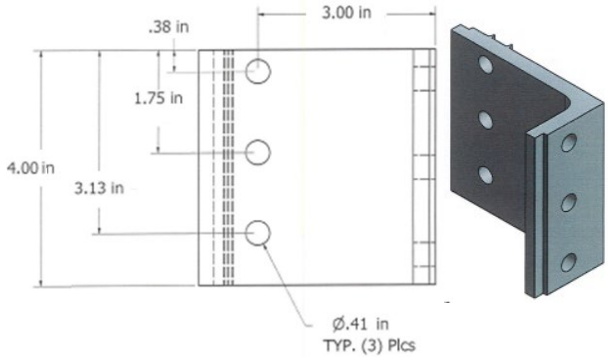
FIGURE 29 – WESTBURY® 2" HD FASCIA MOUNT INSIDE CORNER POST INSTALLATION
Limited to IRC and FBC Residential



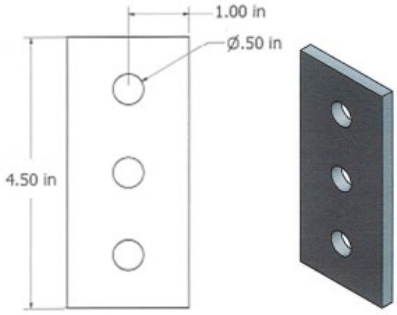
2" HD Aluminum Post



Aluminum Post Insert



3-hole 4 inch Angle Bracket



3-hole 4-1/2 inch Backer Plate

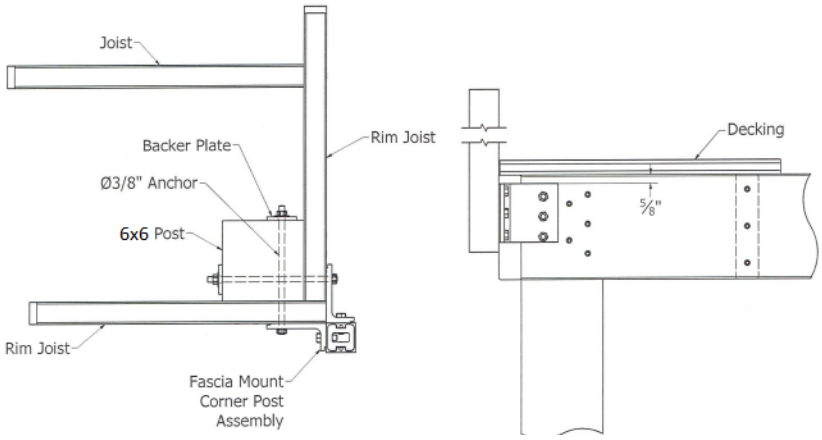


FIGURE 30 – WESTBURY® 2" HD FASCIA MOUNT POST OUTSIDE CORNER POST INSTALLATION
Limited to IRC and FBC Residential

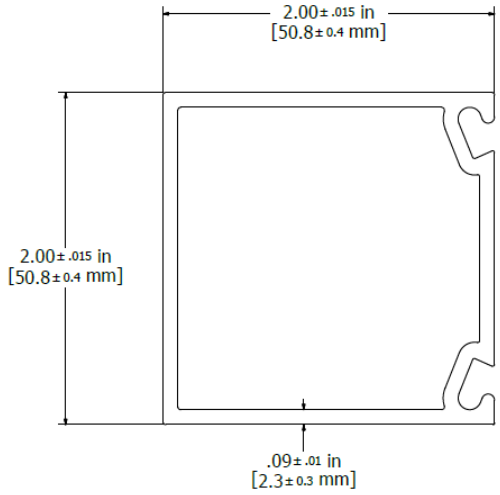


FIGURE 31 - SCREEN RAIL NON-STRUCTURAL POST

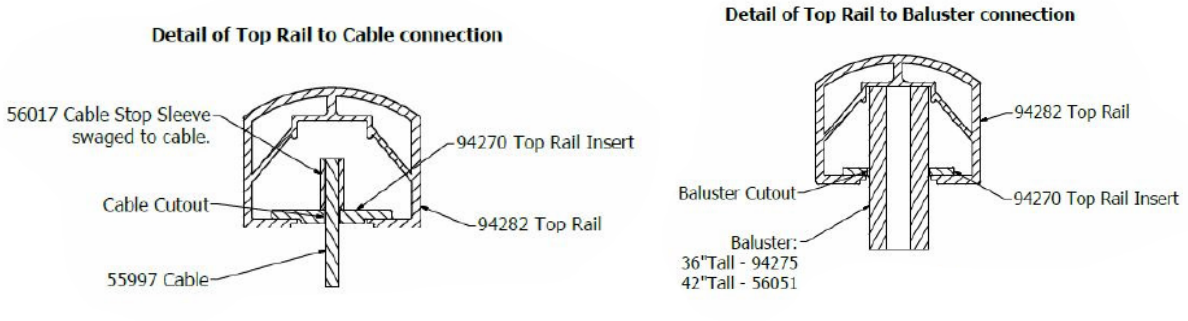


FIGURE 32 – *WESTBURY® VERTICABLE* SERIES C80 TOP RAIL PROFILES

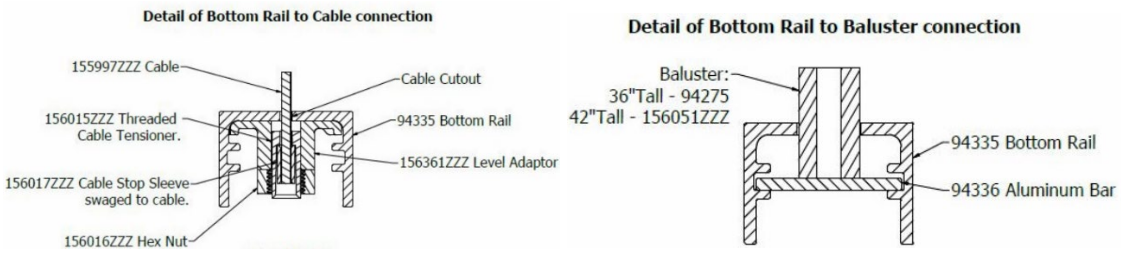


FIGURE 33 – *WESTBURY® VERTICABLE* SERIES C80 BOTTOM RAIL PROFILES