

# ICC-ES Evaluation Report

ESR-3485

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Subject to renewal October 2027

This report also contains:

- [City of LA Supplement](#)
- [CA Supplement w/ DSA and OSHPD](#)
- [FL Supplement](#)

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<p><b>DIVISION: 05 00 00 — METALS</b></p> <p><b>Section: 05 52 00 — Metal Railings</b></p>	<p><b>REPORT HOLDER:</b></p> <p>ULTRALOX™</p> <p><b>ADDITIONAL LISTEES:</b></p> <p>WILLIAMS ARCHITECTURAL PRODUCTS™</p> <p>HARMONY RAILING™</p>	<p><b>EVALUATION SUBJECT:</b></p> <p>ALUMINUM RAILING SYSTEM, SCREEN RAILING SYSTEM, VERTICAL CABLE SYSTEM, HORIZONTAL CABLE SYSTEM, PRIVACY RAILING SYSTEM, MESH RAILING SYSTEM, ADA HANDRAIL SYSTEM, AND STANCHION SYSTEM</p>	
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## 1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018, 2015, 2012, 2009, and 2006 [International Building Code® \(IBC\)](#)
- 2024, 2021, 2018, 2015, 2012, 2009, and 2006 [International Residential Code® \(IRC\)](#)

Property evaluated:

Structural

## 2.0 USES

The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System described in this report are limited to exterior or interior use as a guardrail system for balconies, porches, and decks of residential and non-residential buildings constructed in accordance with the IBC and IRC.

## 3.0 DESCRIPTION

### 3.1 Mounting Systems:

#### 3.1.1 Aluminum Posts:

The Aluminum Railing System can be supported to the substrate with aluminum posts, where the posts are available in 2-inch (51 mm) square, 3-inch (76 mm) square, or 2-inch (51 mm) square screen post. Each post is produced from 6005A-T5 aluminum alloy. The post caps are produced from A380 aluminum alloy. The base plates for the 2-inch (51 mm) square post are available in a 4-inch by 4-inch (102 mm by 102 mm) or 5-inch by 5-inch (127 mm by 127 mm) square; the base plates for the 3-inch (76 mm) square post are available in 5-inch by 5-inch (127 mm by 127 mm) square. Each base plate is produced from A369 aluminum alloy. The 2-inch (51 mm) square screen post is attached with L-brackets produced from 5052-H32 aluminum alloy.

The minimum yield and tensile strengths, minimum thickness of the railing components, and manufacturing extrusion process are specified in the approved quality control documentation. The railing components are available in a white, black, bronze, or custom powder coated finish. See [Figures 7, 8, 9, 10, and 11](#) for details.

### **3.1.2 ADA mounting system:**

ADA mounting systems consist of A369 cast aluminum alloy 90° wall returns and mid supports, while the ADA handrails are produced from extruded 6063-T5 aluminum alloy round hollow pipe.

The minimum yield and tensile strengths, minimum thickness of the railing components, and manufacturing extrusion process are specified in the approved quality control documentation. The railing components are available in a white, black, bronze, or custom powder coated finish. See [Figure 3](#) for details.

### **3.1.3 Stanchion System:**

The Aluminum Railing System can be supported to the substrate with stanchions into 2-inch (51 mm) square aluminum posts in lieu of post base plates. The stanchions are produced from extruded 6005A-T5 aluminum alloy.

The minimum yield and tensile strengths, minimum thickness of the railing components, and manufacturing extrusion process are specified in the approved quality control documentation. The railing components are available in a white, black, bronze, or custom powder coated finish. See [Figure 4](#) for details.

**3.2 Guard – In-fill Systems:** Each in-fill system may be installed with available top rail models indicated in [Figure 7](#) of this report.

### **3.2.1 Aluminum Railing System:**

The Aluminum Railing System are guards consisting of a sub-rail panel with top and bottom channel rails and balusters, bottom-rail support leg and top and bottom rail covers. The top and bottom channel rails and balusters are produced from 6063 - T52 aluminum alloy, and the top and bottom rail covers are produced from 6063-T5 aluminum alloy.

The minimum yield and tensile strengths, minimum thickness of the railing components, and manufacturing extrusion process are specified in the approved quality control documentation. The railing components are available in a white, black, bronze, or custom powder coated finish. See [Figure 1](#) for details and [Table 1](#) for maximum spans.

### **3.2.2 Screen Railing System:**

The Screen Railing System are guards consisting of a sub-rail panel with top and bottom channel rails and balusters and top rail cover. The top and bottom channel rails and balusters are produced from 6063 – T52 aluminum alloy, and the top rail covers are produced from 6063-T5 aluminum alloy.

The minimum yield and tensile strengths, minimum thickness of the railing components, and manufacturing extrusion process are specified in the approved quality control documentation. The railing components are available in a white, black, bronze, or custom powder coated finish. See [Figures 5A, 5B and 8](#) for details and [Table 1](#) for maximum spans.

### **3.2.3 Vertical Cable System:**

The Vertical Cable System are guards consisting of extruded aluminum posts and vertical infill with stainless steel wire ropes and top and bottom channel rails. The stainless-steel wire rope is 316SS  $\frac{1}{8}$ -inch (3.2 mm) diameter (7x19), the support rods are 316SS or 2205SS, with 5051A or 6063-T5 aluminum ferrules top and bottom, with solid supports made of 304SS. The tensioning system material is POM or A380 alloy, with 18-8 stainless tensioning screws. The Aluminum Railing components are produced from 6063-T5 aluminum alloy.

The minimum yield and tensile strengths, minimum thickness of the railing components, and manufacturing extrusion process are specified in the approved quality control documentation. The railing components are available in a white, black, bronze, or custom powder coated finish. See [Figure 6A](#) for details and [Table 1](#) for maximum spans.

### **3.2.4 Horizontal Cable System:**

The Horizontal Cable System are guards consisting of extruded aluminum posts and horizontal infill with stainless steel wire strands, top and bottom channel rails and support picket. The stainless steel wire strand is 316SS or 2205SS  $\frac{1}{8}$ -inch (3.2 mm) diameter (1x19), the support picket is 6063-T5 aluminum, with aluminum or stainless ferrules on one end, and 316 stainless fittings on the other end. The aluminum railing components are produced from 6063-T5 aluminum alloy, the posts are produced from 6005A-T5 aluminum alloy. The Horizontal Cable System is available in one series: Horizontal Cable.

The minimum yield and tensile strengths, minimum thickness of the railing components, and manufacturing extrusion process are specified in the approved quality control documentation. The railing components are

available in a white, black, bronze, or custom powder coated finish. See [Figure 6B](#) for details and [Table 1](#) for maximum spans.

### 3.2.5 Privacy Railing System:

The Privacy Railing System are guards consisting of side channels with individual slat infill, with top and bottom channel rails, bottom-rail support leg and top and bottom rail covers. The top and bottom channel rails are produced from 6063-T52 aluminum alloy, and the top and bottom rail covers, side channels, spacers and slats are produced from 6063-T5 aluminum alloy. Inserts into side channels are dual-durometer plastic.

The minimum yield and tensile strengths, minimum thickness of the railing components, and manufacturing extrusion process are specified in the approved quality control documentation. The railing components are available in a white, black, bronze, or custom powder coated finish. See [Figure 1](#) and [Figure 12](#) for details and [Table 1](#) for maximum spans.

### 3.2.6 Mesh Railing System:

The Mesh Railing System are guards consisting of a single mesh panel infill fabricated with mesh perimeter inserts and channels around the all sides, top and bottom channel rails, and bottom-rail support leg and top and bottom rail covers. The top and bottom channel rails are produced from 6063-T52 aluminum alloy, and the top and bottom rail covers and side channels, are produced from 6063-T5 aluminum alloy. Mesh panel is produced from 316 stainless steel. Inserts into side channels are dual-durometer plastic. Locator block for open reveal applications is A380 alloy.

The minimum yield and tensile strengths, minimum thickness of the railing components, and manufacturing extrusion process are specified in the approved quality control documentation. The railing components are available in a white, black, bronze, or custom powder coated finish. See [Figure 1](#) and [Figure 13](#) for details and [Table 1](#) for maximum spans.

## 3.3 ADA Handrail System:

The ADA Handrail System consists of a handrail that is an extruded aluminum round hollow pipe in 6063-T5 aluminum alloy.

The minimum yield and tensile strengths, minimum thickness of the railing components, and manufacturing extrusion process are specified in the approved quality control documentation. The railing components are available in a white, black, bronze, or custom powder coated finish. See [Figure 3](#) for details and [Table 1](#) for maximum spans.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System are satisfactory to resist loads specified in Section 1607.9 for the 2024 and 2021 IBC (Section 1607.8 for the 2018, 2015 and 2012 IBC; Section 1607.7 for the 2009 and 2006 IBC) and IRC Table R301.5, when installed at the maximum clear distance between the posts as noted in [Table 1](#). When the railing is supported on one or both ends by the supporting structure, the maximum clear distance between the post and the supporting structure or between the supporting structures must comply with the spans noted in [Table 1](#).

The ADA Handrails are satisfactory to resist loads specified in Section 1607.9 for the 2021 IBC (Section 1607.8 for the 2018, 2015 and 2012 IBC; Section 1607.7 for the 2009 and 2006 IBC) and IRC Table R301.5. The maximum clear distance between the supports is 72 inches (1828 mm); see [Table 1](#) for maximum spans.

### 4.2 Installation:

Installation must be in accordance with the manufacturer's published installation instructions, this report, and guard height and opening limitations provisions specified in Sections 1014 and 1015 of the 2024, 2021, 2018 and 2015 IBC (Sections 1012 and 1013 of the 2012, 2009 and 2006 IBC) and Sections R311 and R312 of the IRC, as applicable. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.

Each system, excluding the ADA Handrail System and Stanchion System, requires each extruded post to be attached to the post base plate with four M8 x 80 mm long stainless-steel lag screws, which are fastened to the underside of the post base plate, as shown in Figures 9, 10, and 11. The post base plate must be fastened to the supporting wood substrate with a minimum specific gravity of 0.50 using either four –  $\frac{3}{8}$ -inch x 6-inch long (9.5 mm x 152.4 mm) GRK RSS wood screws or four –  $\frac{5}{16}$ -inch x 6-inch long (7.9 mm x 152.4 mm) GRK RSS wood screws. When the supporting substrate is concrete having a minimum compressive strength of 3700 psi (25.5 MPa), each post base plate must be fastened to the supporting

concrete substrate using four ¼-inch x 3-inch long (6.35 mm by 76.2 mm) corrosion resistant coated concrete anchor bolts.

When the optional 4-inches (101.6 mm) square post sleeve is installed over an existing nominal 4-by-4 (101.6 mm x 101.6 mm) wood post, all wood post fastener connections to the supporting substrate and sub-rail connections through the post sleeve to the wood post must be designed by a registered design professional. See Figure 2 for details.

ADA Handrails must have each support attached to the supporting wood substrate with a minimum specific gravity of 0.49. Each 90° Wall Return and mid support is fastened to the wood substrate using three – 5/16-inch x 4 inch-long (7.9 mm by 101.6 mm) construction lag screws. When each 90° Wall Return and mid support is fastened to 3-inches (76.2 mm) square hollow extruded 6005A-T5 aluminum with a wall thickness of 0.065-inch (1.65 mm), each connection must use three – No. 10 x 1½-inch long (38.1 mm) stainless steel TEK screws. See Figure 3 for details and Table 1 for spans.

When stanchions are used to support 2-inch (50.8 mm) square aluminum posts in lieu of post base plates, the 2-inch (50.8 mm) square post must fit over each stanchion at a minimum length of 14.75 inches (374.6 mm). The connections of the stanchion to the stanchion mount and the mount to the supporting structure must be designed by a registered design professional. See Figure 4 for details and Table 1 for spans.

When 2-inch (50.8 mm) square screen post at 96 inches (2,438.4 mm) long is installed with 42-inch (1066.8 mm) tall Aluminum Railing System, the posts with L-brackets must be fastened to the supporting wood substrate with a minimum specific gravity of 0.39 where each connection must use either four - No. 9 x 3¼-inch (82.5 mm) long SPAX screws or four - ¼ inch x 1¾-inch (6.4 mm x 44.5 mm) long TAPCON screws or four – No. 8 x 3⅞ inch (79.4 mm) long GRK screws (Two fasteners per bracket). See Figures 5A, 5B, and 8 for details and Table 1 for spans.

When fascia bracket assembly is used in lieu of post base for 3-inch (76.2 mm) square posts installed over the supporting concrete substrate having a minimum compressive strength of 3900 psi (26.9 MPa), the posts with fascia bracket assembly must be fastened to the supporting concrete substrate using four ¼-inch x 3-inch long (6.35 mm by 76.2 mm) corrosion resistant coated concrete anchor bolts. See Figure 10 for details and see Table 1 for spans.

Infill systems may be between the post or continuous top rail systems. Between the post with infill: The sub-rail panel consisting of two h-channels and infill pickets is attached to an extrusion post on each end by installing top and bottom rail connector clips with No. 8 x ¾-inch-long (19.05 mm) stainless steel TEK screws. Four screws (two inside and one on each side) per each top and bottom connector clip, as shown in Figure 1. The bottom rail connector clip must be located 3¾-inches (95.25 mm) from the top edge of the clip to the bottom of the post base at center. All connector clips must be installed with two #8 x ¾-inch-long (19.05 mm) stainless steel TEK screws. Each top and bottom rail cover snaps over the sub-rail panel's corresponding top and bottom h-channel. Each support leg is fastened at the midspan of the bottom rail with one No. 8 x ¾-inch-long (19.05 mm) stainless steel TEK screw. Continuous top rail systems follow the same procedure as between the post, but crossover brackets are used in lieu of top connector clips. The crossover bracket is secured to the top of each 2-inch (50.8 mm) post with two No. 8 x 1½-inch-long (38.1 mm) stainless steel TEK screws. The sub-rail consisting of two h-channels is attached to the crossover bracket using two No. 8 x ¾-inch-long (19.05 mm) TEK stainless steel screws. Bottom of sub-rail panel is attached with rail connector clips at the bottom as described in between post installations above. Each bottom rail cover snaps over the sub-rail h-channel. Each length of top rail snaps over post and top h-channel. See Figures 1 and 7 for details.

Between the post with screen infill: The sub-rail panel consisting of two screen channels is attached to an extrusion post on each end by installing top rail connector clips with No. 8 x ¾-inch-long (19.05 mm) stainless steel TEK screws. Two screws inside per each top connector clip, as shown in Figure 5A. The bottom rail and perimeter channels are secured using L-brackets as shown in Figure 5A, secured to the substrate every 24 inches (609.6 mm) on-center. The top cover snaps over the corresponding top screen channel.

Between the post or continuous with vertical cable infill: The sub-rail panel consisting of two h-channels and vertical cables with ferrules on each end is attached to an extrusion post on each end by installing top and bottom rail connector clips with No. 8 x ¾-inch-long (19.05 mm) stainless steel TEK screws. Four screws (two inside and one on each side) per each top and bottom connector clip, as shown in Figure 6A. The bottom rail connector clip must be located 3¾-inches (95.25 mm) from the top edge of the clip to the bottom of the post base at center. All connector clips must be installed with two #8 x ¾-inch-long (19.05 mm) stainless steel TEK screws. Support rods to be installed at every 5th cable, and cables tensioned with individual tensioning blocks. Each top and bottom rail cover snaps over the sub-rail panel's corresponding top and bottom h-channel. Each

support leg is fastened at the midspan of the bottom rail with one No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screw.

Between the post or continuous with horizontal cable infill: The sub-rail panel consisting of two h-channels (full frame) or one h-channel (top rail only) and cable lengths is attached to an extrusion post on each end by installing top and/or bottom rail connector clips with No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screws. Four screws (two inside and one on each side) per each top and bottom connector clip, as shown in Figure 6B. The bottom rail connector clip must be located 3 3/4-inches (95.25 mm) from the top edge of the clip to the bottom of the post base at center. All connector clips must be installed with two No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screws. Each top and/or bottom rail cover snaps over the sub-rail panel's corresponding top and bottom h-channel. Spans over 4 feet (1219.2 mm) require support picket, which mounts top and bottom using No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screw into h-channel on top and bottom, or on top and into substrate on bottom. Cables are then ran through correlating holes in post, secured on one side by either a threaded swage or swageless fitting, then on other side by fast fitting. Each support leg (if full frame) is fastened at the midspan of the bottom rail with one No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screw.

Between the post Privacy Railing infill: The sub-rail panel consisting of two h-channels is attached to an extrusion post on each end by installing top and/or bottom rail connector clips with No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screws. Four screws (two inside and one on each side) per each top and bottom connector clip, as shown in Figure 12. The bottom rail connector clip must be located 3 3/4-inches (95.25 mm) from the top edge of the clip to the bottom of the post base at center. All connector clips must be installed with two No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screws. Each top and/or bottom rail cover snaps over the sub-rail panel's corresponding top and bottom h-channel during the last steps of installation. Side channels must be installed to the inside post surface using #8 x 1 1/2 -inch-long (19.05 mm) stainless steel TEK screws every 16 3/4 inches and within 1 1/2 inches from each end. Dual-durometer plastic inserts slide into side channel. Slats are slid individually into side channels from the top, with or without the use of slat spacers. Extended posts may be used with slats extending above full height of railing if compliant with Conditions of use 5.5 of this document. Each support leg is fastened at the midspan of the bottom rail with one No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screw.

Between the post or continuous with Mesh Railing Panel infill: The sub-rail panel consisting of two h-channels is attached to an extrusion post on each end by installing top and bottom rail connector clips with No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screws. Four screws (two inside and one on each side) per each top and bottom connector clip, as shown in Figure 13. The bottom rail connector clip must be located 3 3/4-inches (95.25 mm) from the top edge of the clip to the bottom of the post base at center. All connector clips must be installed with two No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screws. Mesh channels are installed to sides, top and bottom channels using a No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screw every 18" and at each channel end. A dual-durometer insert is snapped into mesh channel and the mesh panel is installed before the top h-channel is assembled. Locator blocks on the top and bottom of the side channels may be used for open reveal, in which they are installed using a No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screw for each block. Each top and bottom rail cover snaps over the sub-rail panel's corresponding top and bottom h-channel. Each support leg is fastened at the midspan of the bottom rail with one No. 8 x 3/4-inch-long (19.05 mm) stainless steel TEK screw.

## 5.0 CONDITIONS OF USE:

The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System described in this report comply with, or are 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** This product is limited to exterior or interior use as a guardrail system for balconies, porches, and decks of residential and non-residential buildings constructed in accordance with the IBC and IRC.
- 5.2** Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. When the manufacturer's published installation instructions differ from this report, this report governs.
- 5.3** Only those fasteners and fastener configurations described in this report have been evaluated for the installation of the Aluminum Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System and ADA handrails. The compatibility of the post base plate's fasteners with the supporting construction, including chemically treated wood, is outside the scope of this report.

- 5.4 The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System must be directly fastened to supporting construction having adequate strength and stiffness. Where required by the code official, engineering calculations and construction documents consistent with this report must be submitted for approval. The calculations must verify that the supporting construction complies with the applicable building code requirements and is adequate to resist the loads imparted upon it from the products and systems discussed in this report. The documents must contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.5 The Privacy Railing System may incorporate taller posts with additional slats extending above the full height of the railing system. Wind load requirements on the railing system above 43 inches (1092.2 mm) are outside the scope of this report.
- 5.6 For the Mesh Railing System, the mesh panel's wire horizontal members must be installed facing in the outward direction
- 5.7 The top rail of the Aluminum Railing System, for use as a handrail, is outside the scope of this report.
- 5.8 The connections of the stanchion to the stanchion mount and the stanchion mount to the supporting structure must be designed by a registered design professional and is outside the scope of this report.
- 5.9 The products are manufactured under a quality control program with inspections by ICC-ES.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Handrails and Guards \(AC273\)](#), dated June 2017 (editorially revised May 2024).

## 7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-3485) along with the name, registered trademark, or registered logo of the report holder [and/or listee] must be included in the product label.
- 7.2 The Aluminum Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA system, and Stanchion system described in this report are identified by a stamp, on each individual piece or on the packaging, bearing the report holder's name (Ultralox), the product name, and the allowable span.

Alternatively, the products described in this report are identified by a stamp, on each individual piece or on the packaging, bearing the additional listee's brand name (Williams Architectural Products, Harmony Railing), the product name (See [Table 2](#) of this report), the allowable span, and the ICC-ES evaluation report number (ESR-3485).

- 7.3 The report holder's contact information is the following:

**ULTRALOX<sup>™</sup>**  
**2737 WEST SERVICE ROAD**  
**EAGAN, MINNESOTA 55121**  
[www.ultralox.com](http://www.ultralox.com)

- 7.4 The Additional listees' contact information is the following:

**WILLIAMS ARCHITECTURAL PRODUCTS<sup>™</sup>**  
**2737 WEST SERVICE ROAD**  
**EAGAN, MINNESOTA 55121**  
**(855) 742-7245**  
[www.williamsrail-fence.com](http://www.williamsrail-fence.com)

**HARMONY RAILING<sup>™</sup>**  
**2737 WEST SERVICE ROAD**  
**EAGAN, MINNESOTA 55121**  
[www.harmonyrailing.com](http://www.harmonyrailing.com)

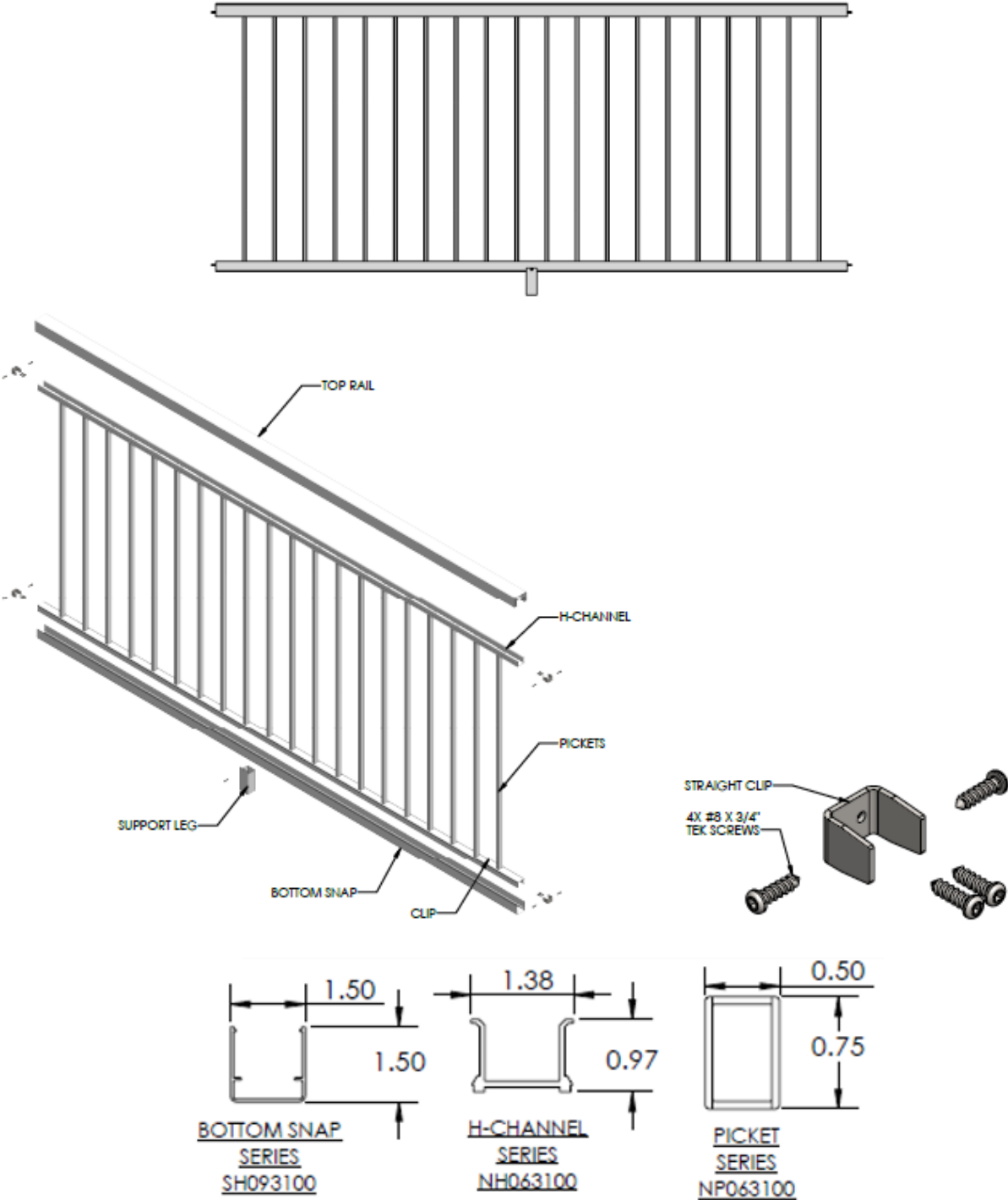
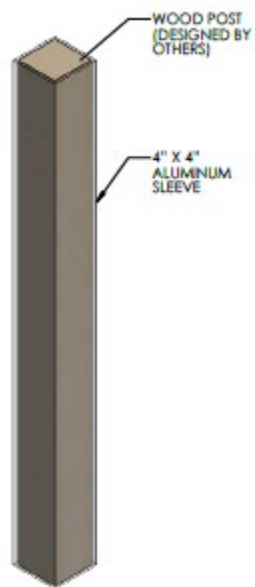


FIGURE 1—TYPICAL ALUMINUM GUARDRAIL ASSEMBLY AND COMPONENT PROFILES



**FIGURE 2— 4"x4" ALUMINUM SLEEVE OVER NOMINAL 4X4 WOOD POST**

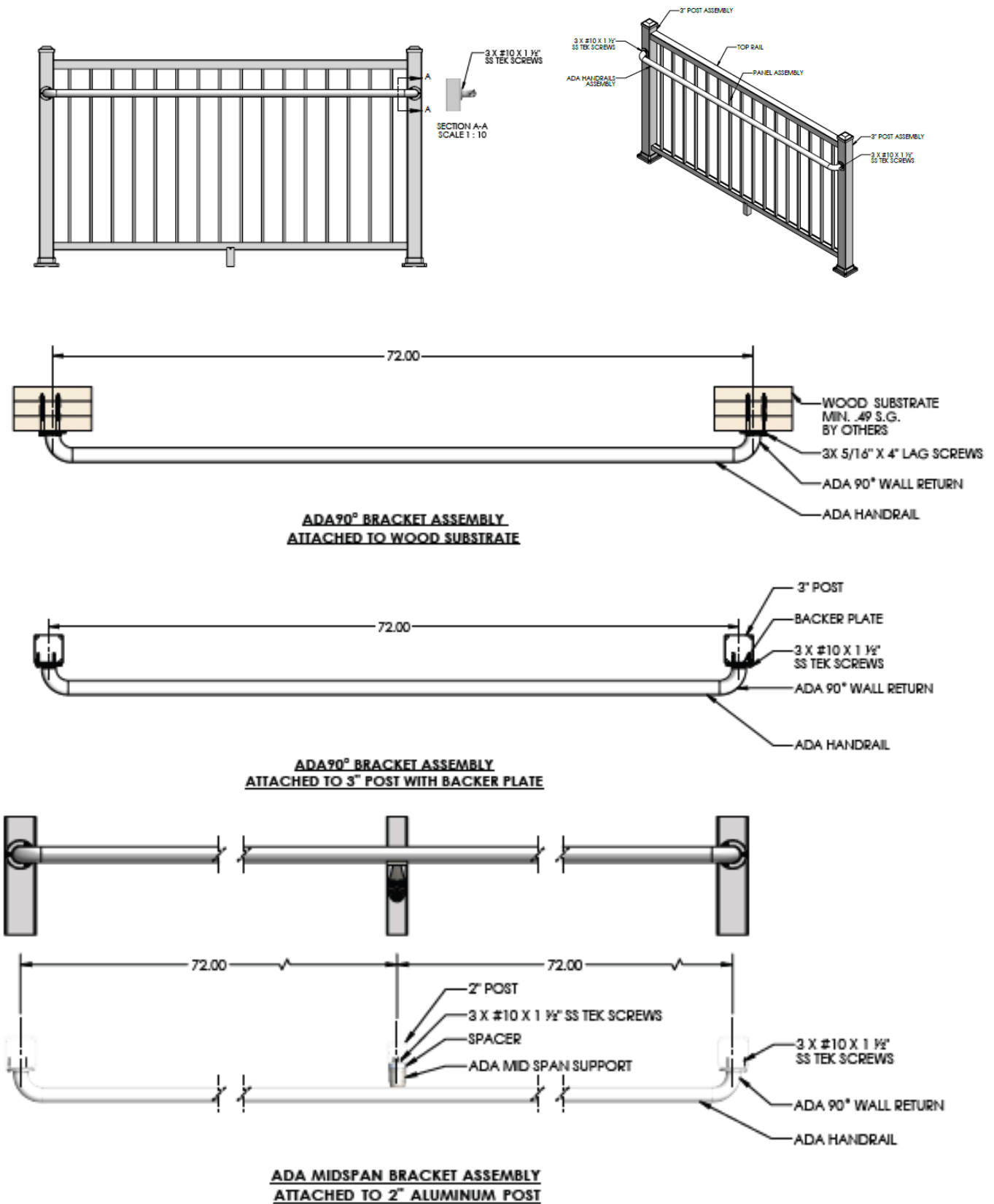
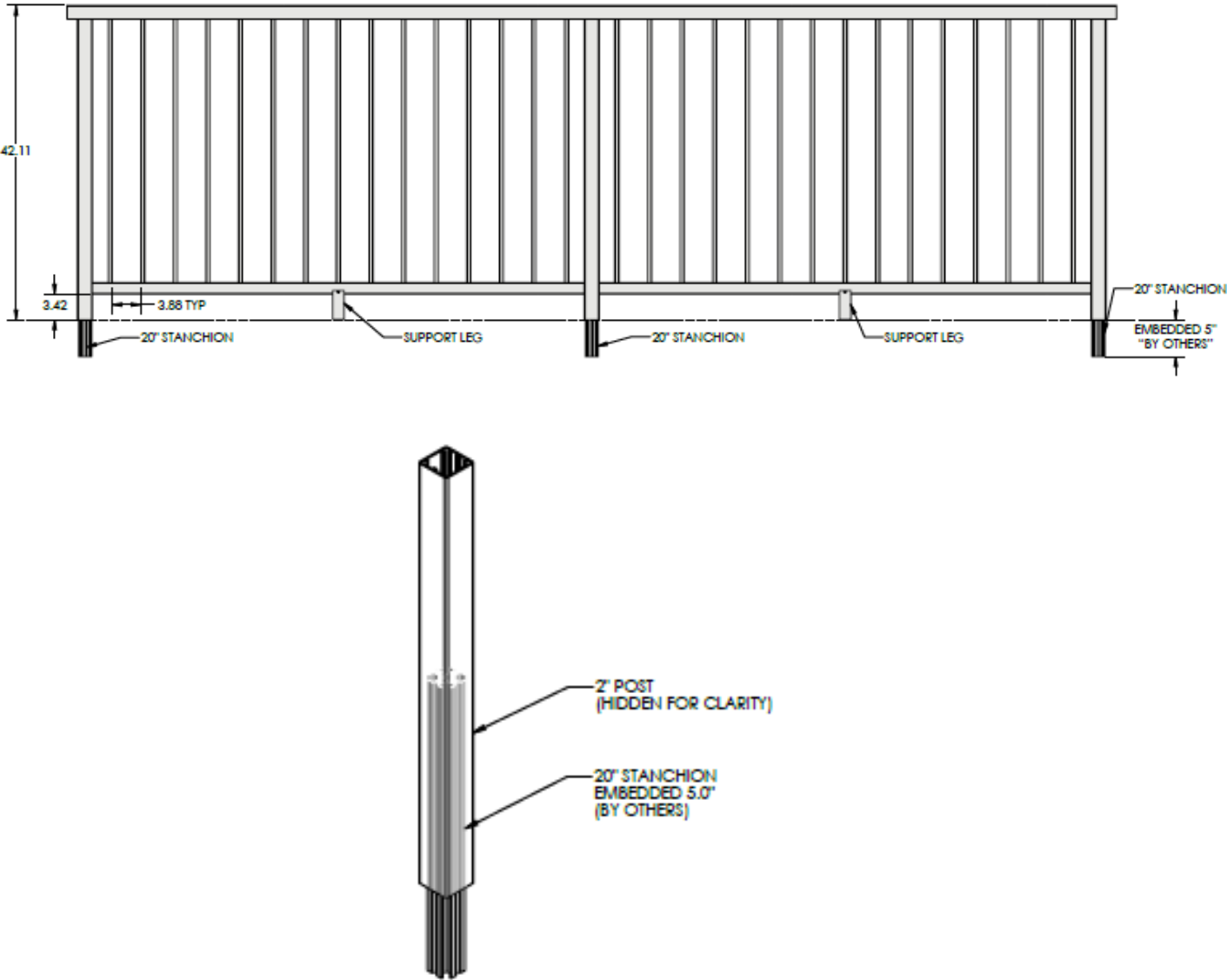
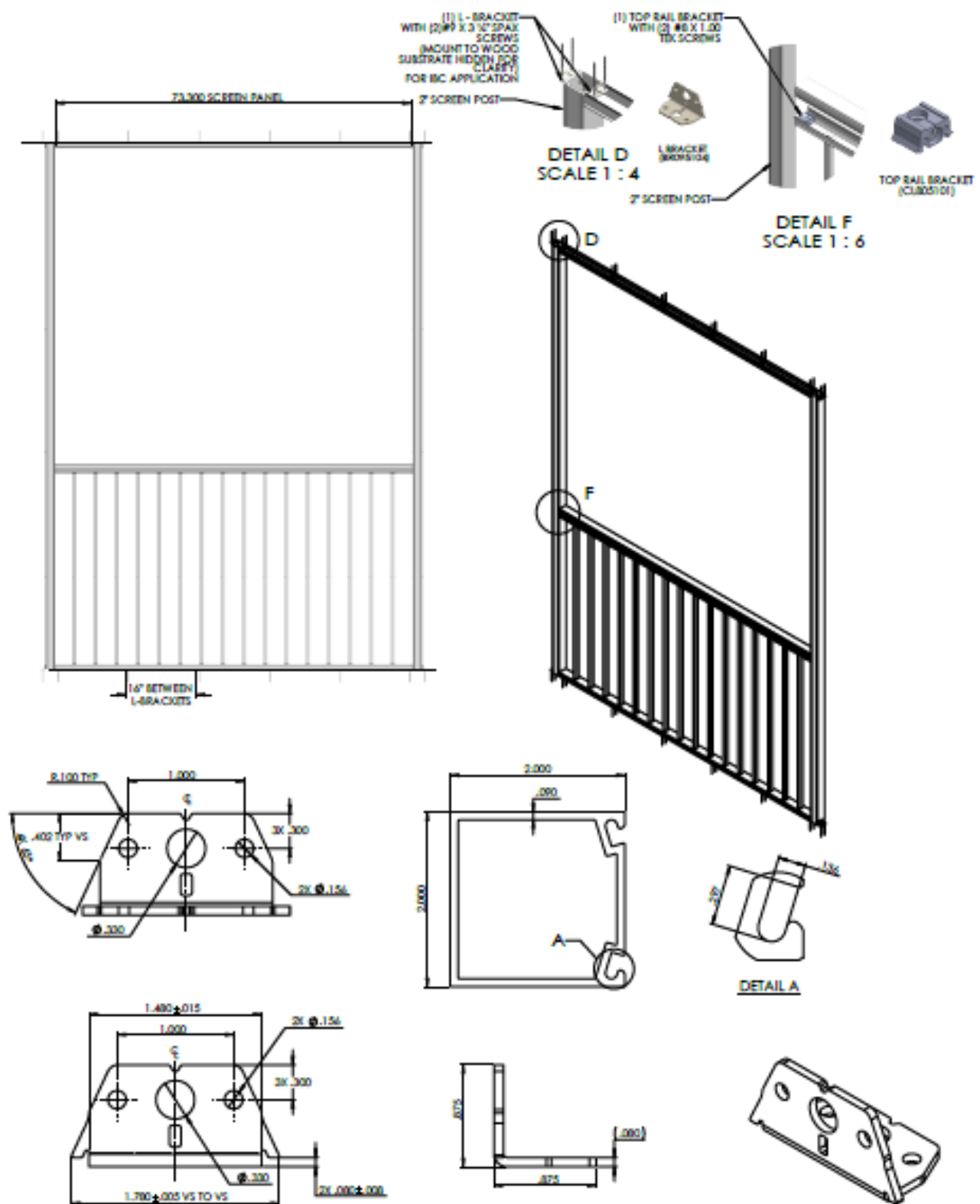


FIGURE 3—TYPICAL ADA HANDRAIL SYSTEM - COMPONENTS



2" POST WITH STANCHION

FIGURE 4—TYPICAL STANCHION SYSTEM - COMPONENTS



**FIGURE 5A—TYPICAL 2-INCH SCREEN RAILING SYSTEM WITH L-BRACKETS ASSEMBLY (WITH POSTS)**

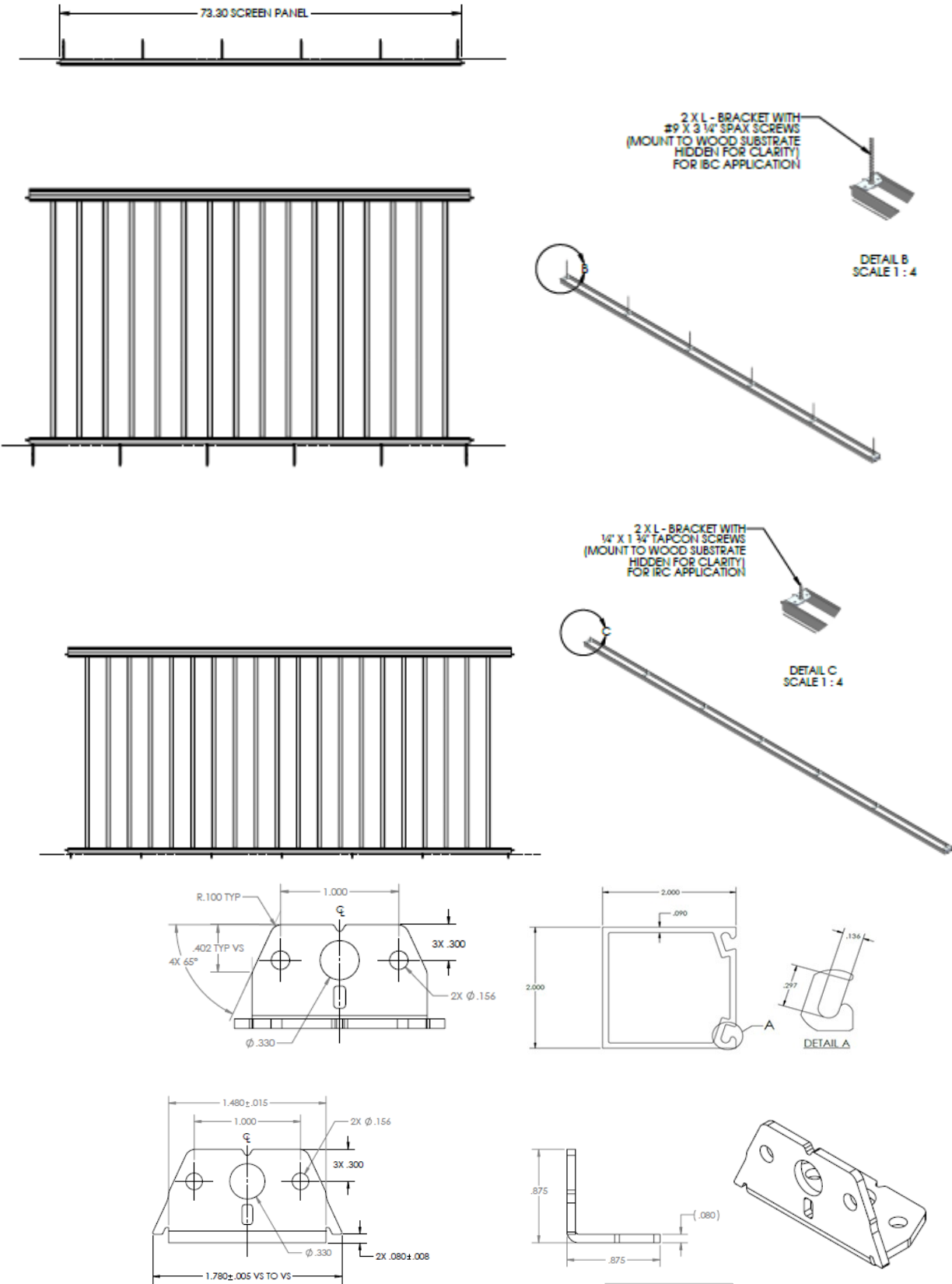


FIGURE 5B—TYPICAL 2-INCH SCREEN RAILING SYSTEM WITH L-BRACKETS ASSEMBLY (WITHOUT POSTS)

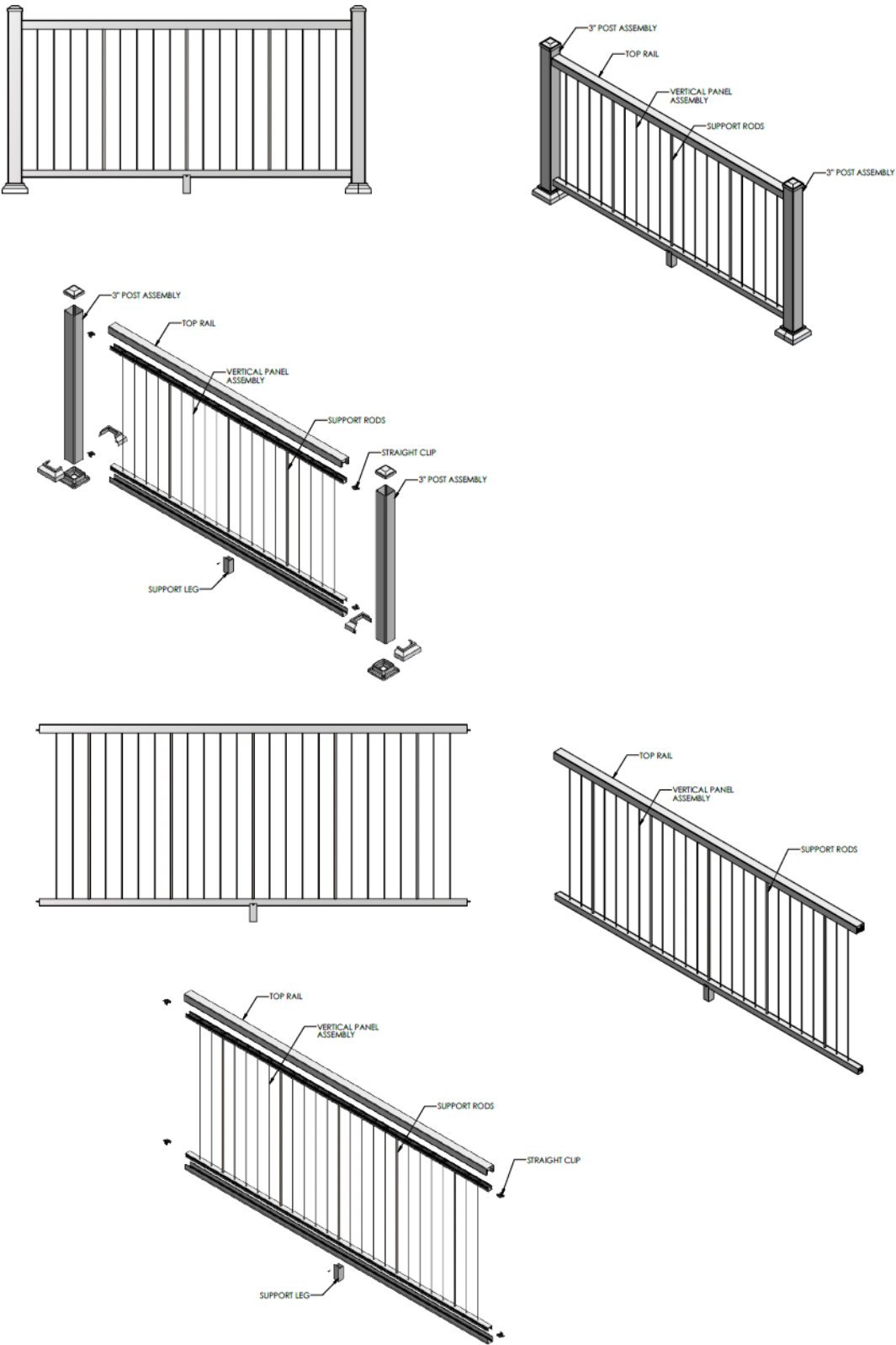


FIGURE 6A—TYPICAL VERTICAL CABLE GUARDRAIL ASSEMBLY AND COMPONENTS (WITH AND WITHOUT POSTS)

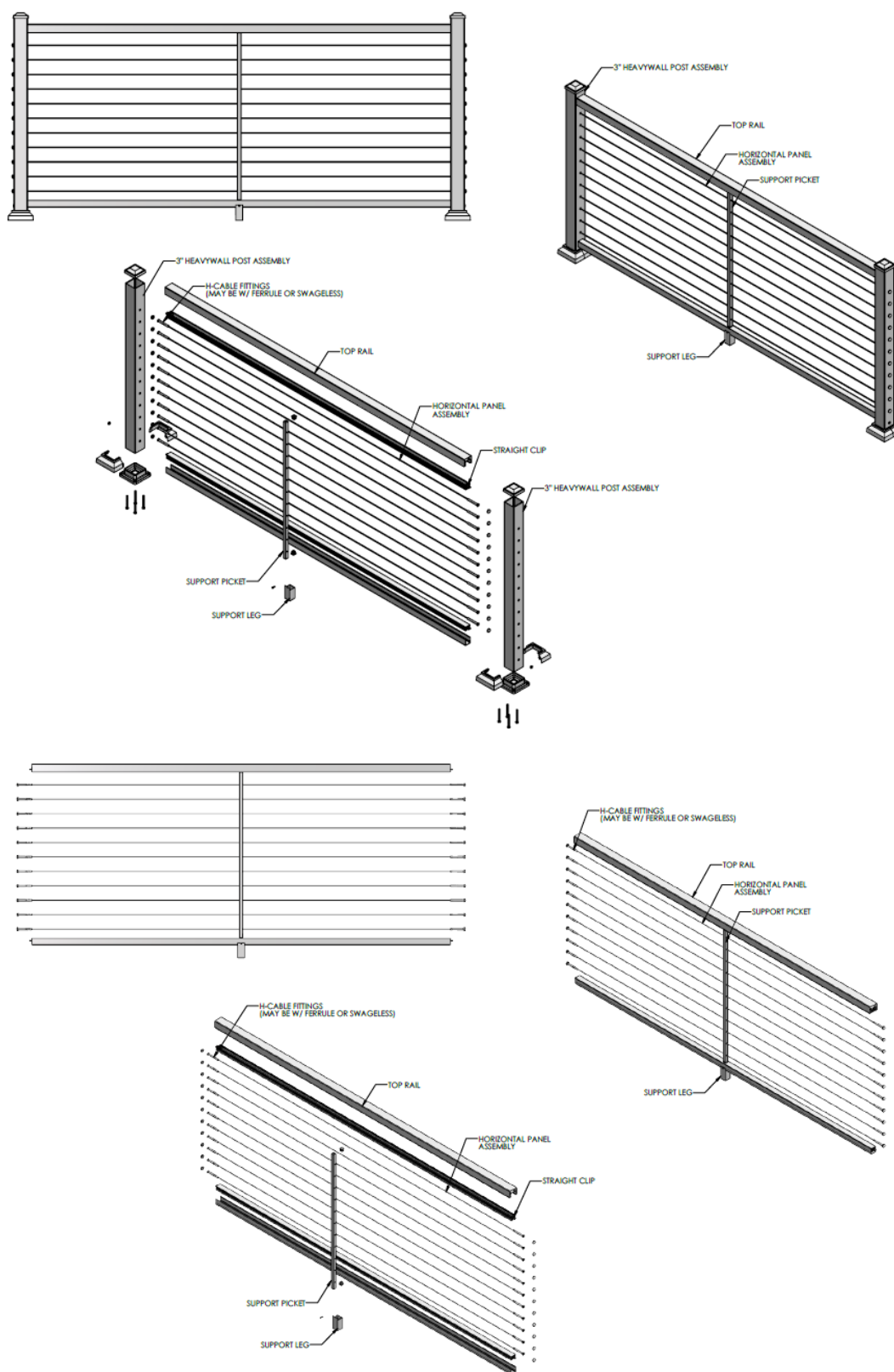


FIGURE 6B—TYPICAL HORIZONTAL CABLE GUARDRAIL ASSEMBLY AND COMPONENTS (WITH AND WITHOUT POSTS)

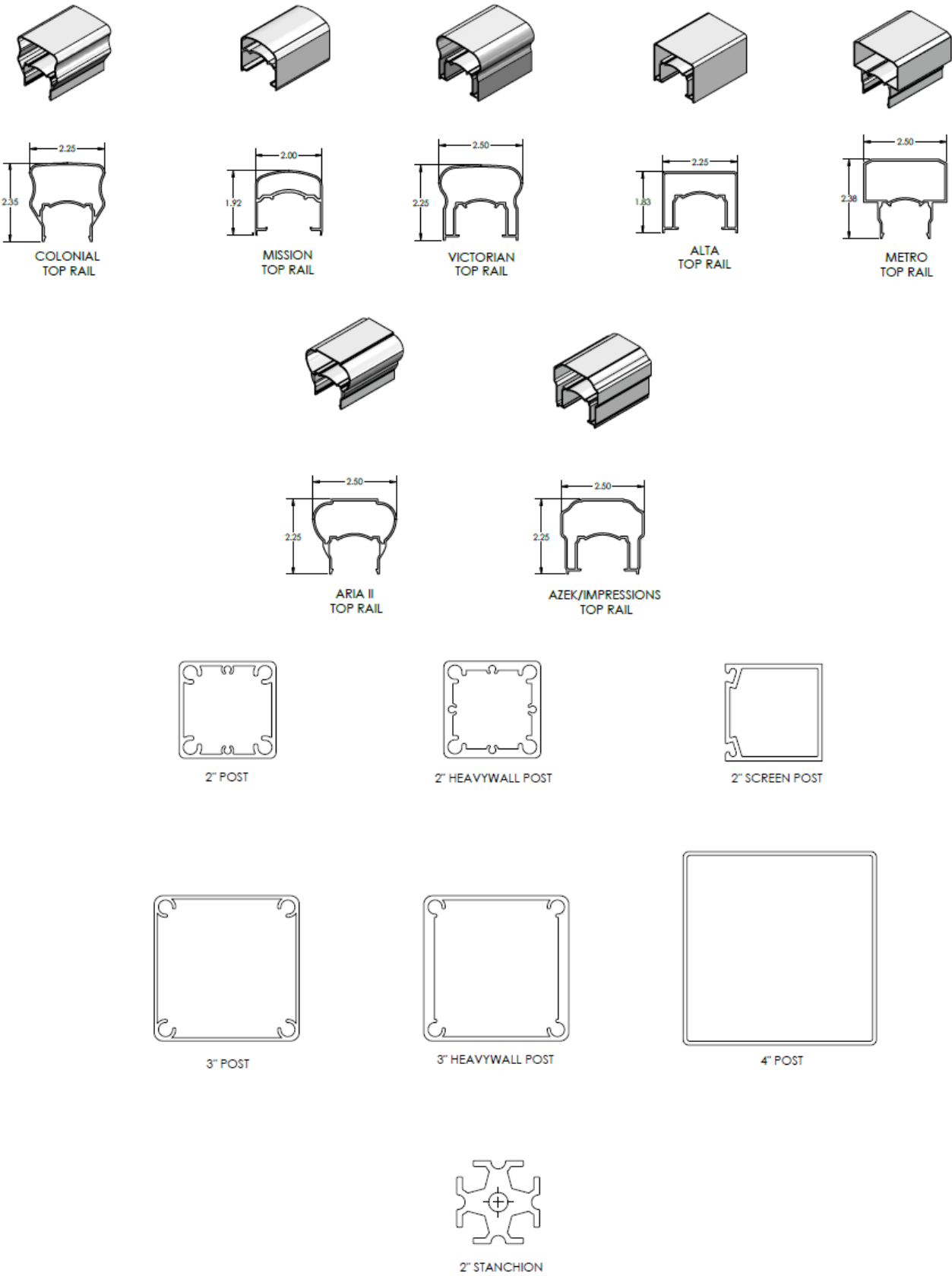


FIGURE 7—TOP RAIL AND POST PROFILES

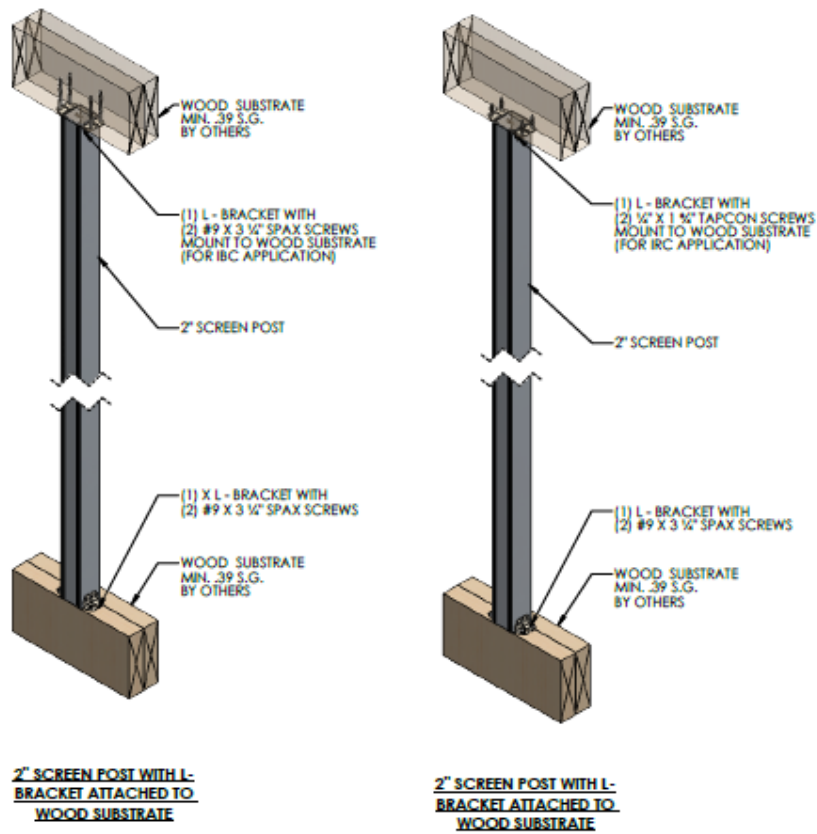


FIGURE 8—2-INCH SCREEN POST WITH L-BRACKETS ATTACHED TO WOOD SUBSTRATE

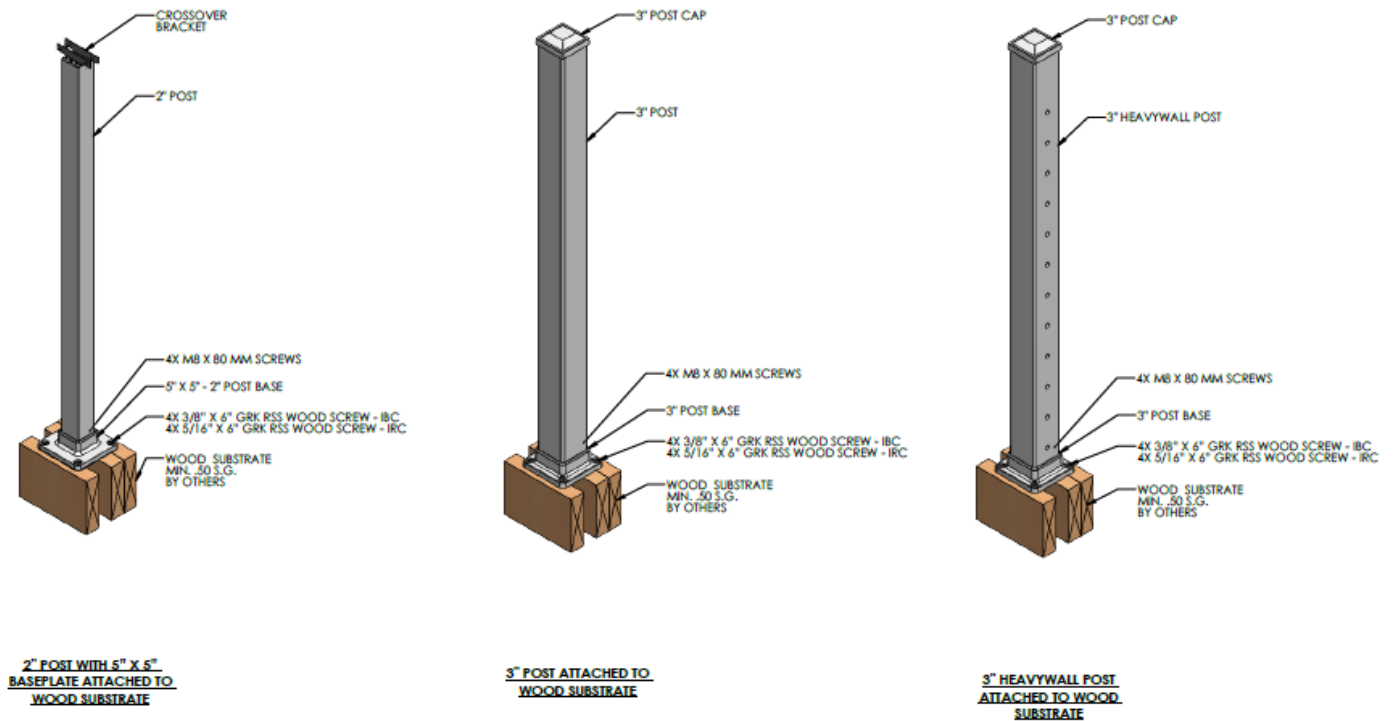


FIGURE 9—2-INCH AND 3-INCH POSTS ATTACHED TO WOOD SUBSTRATE

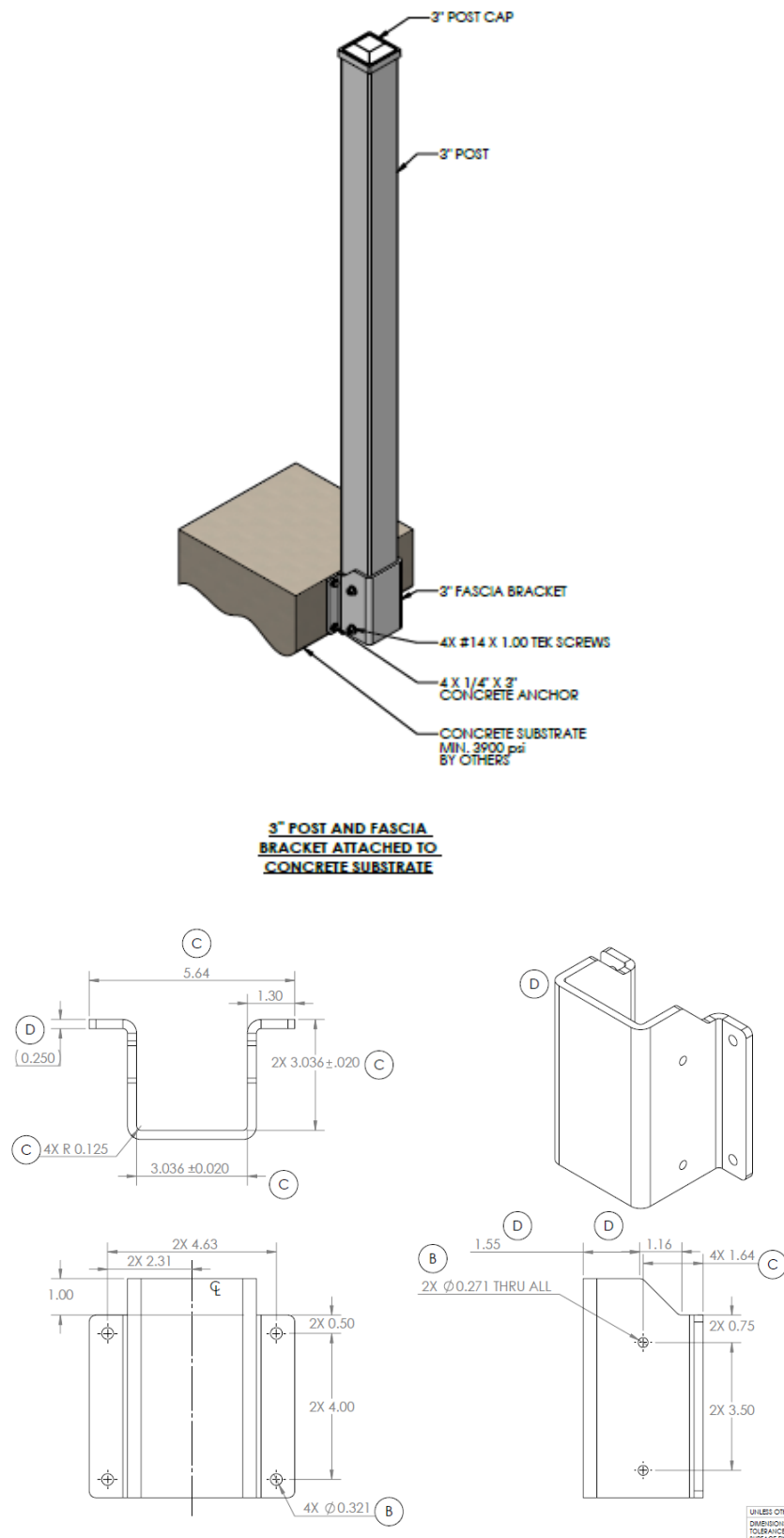


FIGURE 10—FASCIA BRACKET ASSEMBLY FOR 3-INCH POST

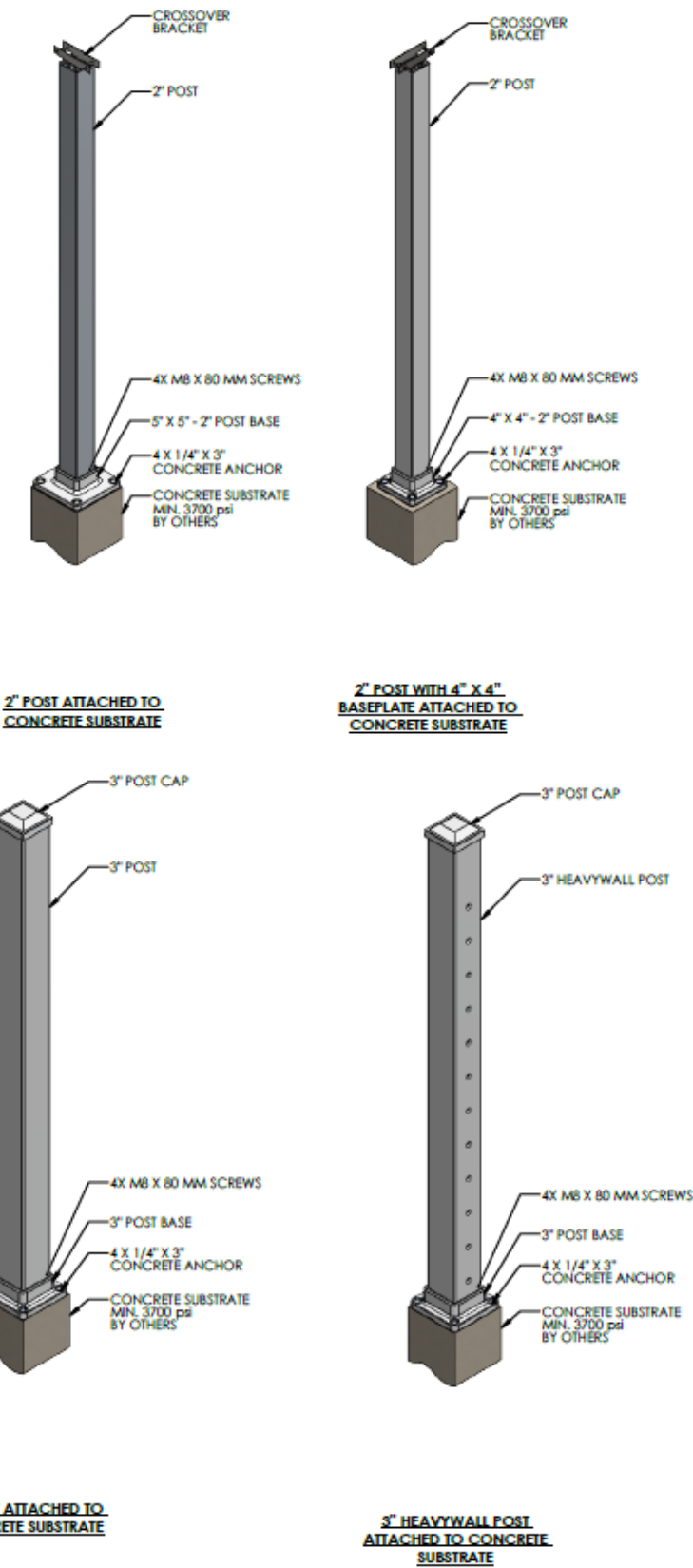
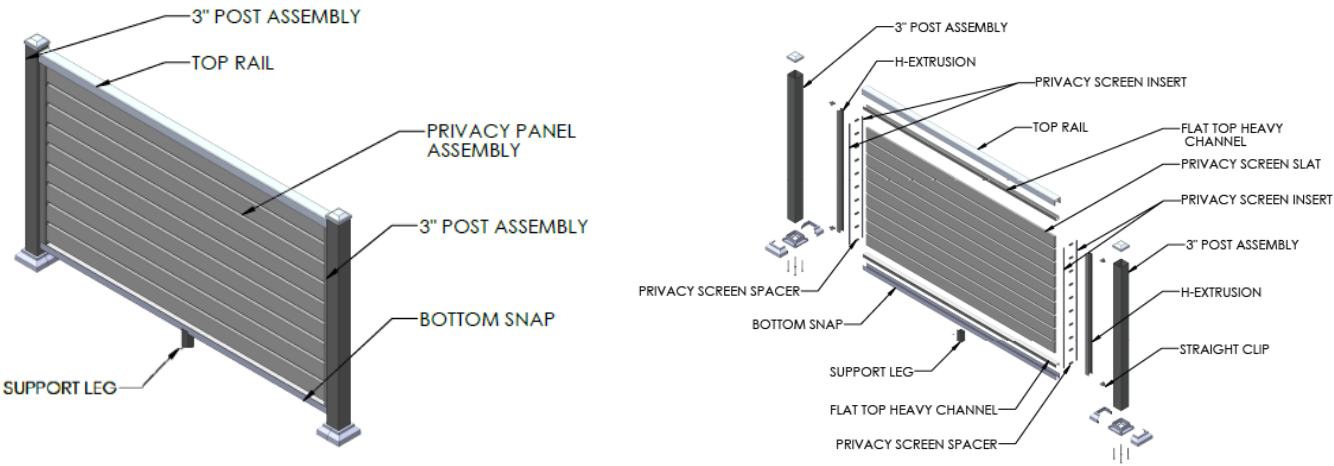
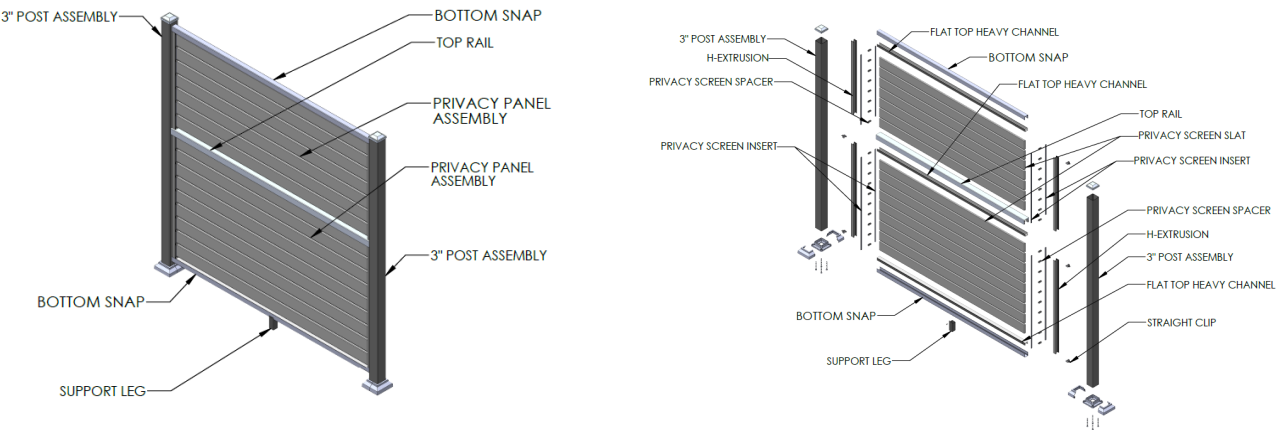


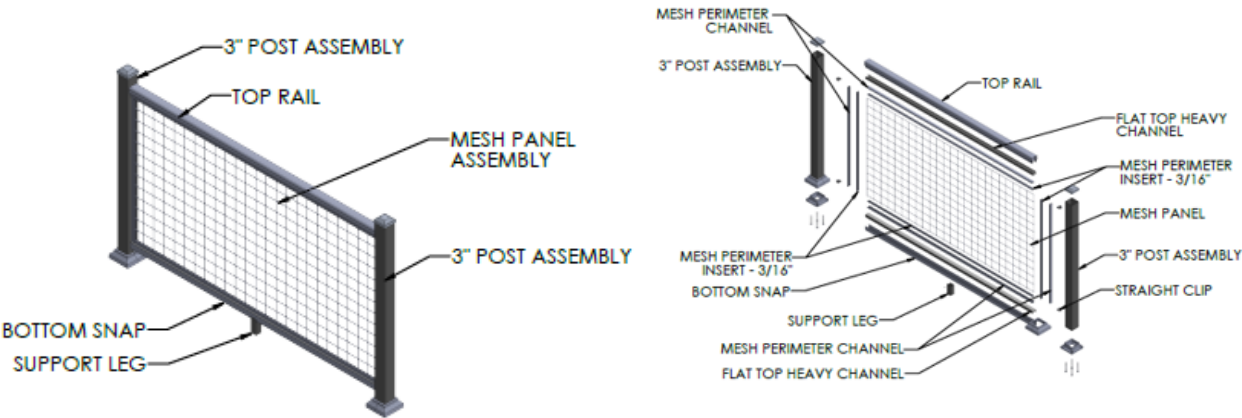
FIGURE 11—2-INCH AND 3-INCH POSTS ATTACHED TO CONCRETE SUBSTRATE



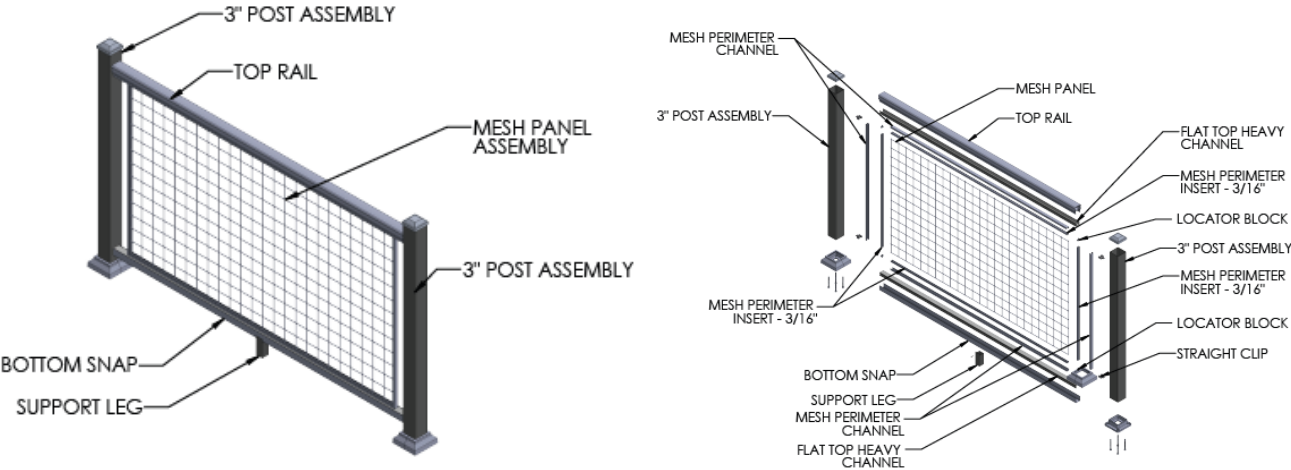
**OPTIONAL EXTENDED HEIGHT**



**FIGURE 12 – PRIVACY RAILING SYSTEM**



**OPTIONAL OPEN REVEAL**



**FIGURE 13 – MESH SCREEN SYSTEM**

TABLE 1—MAXIMUM GUARDRAIL SYSTEM SPANS (CENTER TO CENTER)<sup>1</sup>

MOUNTING SYSTEMS	SYSTEM HEIGHT (INCH)	MAXIMUM SPAN IBC (INCH)	MAXIMUM SPAN IRC (INCH)
3-INCH ALUMINUM POSTS AND 2" ALUMINUM POSTS WITH 5" X 5" BASEPLATE ATTACHED TO WOOD SUBSTRATE <sup>2</sup>	42.000	68.300 <sup>1</sup>	91.313 <sup>1</sup>
3-INCH ALUMINUM POSTS AND 2" ALUMINUM POSTS WITH 5" X 5" BASEPLATE ATTACHED TO CONCRETE SUBSTRATE <sup>3</sup>	42.000	69.430 <sup>1</sup>	91.313 <sup>1</sup>
2-INCH ALUMINUM POSTS (4" X 4" BASE PLATE) ATTACHED TO CONCRETE SUBSTRATE <sup>3</sup>	42.000	66.000 <sup>10</sup>	91.313 <sup>1</sup>
2-INCH ALUMINUM POSTS WITH STANCHIONS MOUNTED TO CONCRETE SUBSTRATE <sup>4</sup>	42.000	66.000 <sup>10</sup>	91.313 <sup>1</sup>
2-INCH SCREEN POST WITH L-BRACKETS ASSEMBLY ATTACHED TO WOOD SUBSTRATE <sup>8</sup>	96.000	73.302 <sup>1</sup>	91.313 <sup>1</sup>
3-INCH ALUMINUM POSTS AND FASCIA BRACKET ASSEMBLY ATTACHED TO CONCRETE SUBSTRATE <sup>9</sup>	42.000	55.960 <sup>1</sup>	91.313 <sup>1</sup>
ADA 90° BRACKET ASSEMBLY ATTACHED TO WOOD SUBSTRATE <sup>5</sup>	N/A	72.000 <sup>10</sup>	72.000 <sup>10</sup>
ADA 90° BRACKET ASSEMBLY ATTACHED TO 3-INCH ALUMINUM POST WITH BACKER PLATE <sup>6</sup>	N/A	72.000 <sup>10</sup>	72.000 <sup>10</sup>
ADA MIDSPAN BRACKET ASSEMBLY ATTACHED TO 2-INCH ALUMINUM POST <sup>6</sup>	N/A	72.000 <sup>10</sup>	72.000 <sup>10</sup>
<b>INFILL SYSTEMS</b>			
ALUMINUM RAILING SYSTEM	42.000	69.430 <sup>1</sup>	91.313 <sup>1</sup>
ADA HANDRAILS	N/A	72.000 <sup>10</sup>	72.000 <sup>10</sup>
SCREEN RAILING SYSTEM	N/A	73.302 <sup>1</sup>	91.313 <sup>1</sup>
VERTICAL CABLE	42.000	64.000 <sup>10</sup>	91.313 <sup>1</sup>
HORIZONTAL CABLE	42.000	64.000 <sup>10</sup>	91.313 <sup>1</sup>
PRIVACY RAILING SYSTEM	42.000	69.430 <sup>1</sup>	91.313 <sup>1</sup>
MESH PANEL SYSTEM	42.000	69.430 <sup>1</sup>	91.313 <sup>1</sup>

For SI: 1 inch = 25.4 mm

<sup>1</sup>For all Aluminum Railing System types. For Mission Top Rail, the maximum span - IBC based on post and assembly is as noted in [Table 1](#), except the maximum span - IRC is 72 inches. Spans are from inside face of post to inside face of post.

<sup>2</sup>Wood substrate must have a minimum specific gravity of 0.50 where each connection must use either four - 3/8-inch x 6-inch long GRK RSS wood screws for IBC application or four - 5/16-inch x 6 inch-long GRK RSS wood screws for IRC application.

<sup>3</sup>Concrete substrate must have a minimum compressive strength of 3700 psi where each connection must use four - 1/4-inch x 3-inch long concrete anchor bolts supplied by Ultralox.

<sup>4</sup>Connections of stanchion-to-stanchion mount and stanchion mount to the substrate must be designed by a registered design professional.

<sup>5</sup>Wood substrate must have a minimum specific gravity of 0.49 where each connection must use three - 5/16-inch x 4-inch long construction lag screws.

<sup>6</sup>Each connection to aluminum post must use three - No. 10 x 1 1/2-inch long stainless steel TEK screws.

<sup>7</sup>Each connection to aluminum post must use four - No. 8 x 3/4-inch long stainless steel TEK screws.

<sup>8</sup>Wood substrate must have a minimum specific gravity of 0.39 where each connection must use either four - No.9 x 3 1/4-inch SPAX screws for IBC application or four - 1/4-inch x 1 1/4-inch long TAPCON screws for IRC application.

<sup>9</sup>Concrete substrate must have a minimum compressive strength of 3900 psi where each connection must use four - 1/4-inch x 3-inch-long concrete anchor bolts supplied by Ultralox.

<sup>10</sup>Spans are from centerline of post to centerline of post.

TABLE 2-COMPANY NAME AND PRODUCT NAME CORRELATION

COMPANY NAME	ULTRALOX™	WILLIAMS ARCHITECTURAL PRODUCTS™	HARMONY RAILING™
PRODUCT NAME	COLONIAL TOP RAIL	COLONIAL TOP RAIL	VICTORIAN TOP RAIL
	VICTORIAN TOP RAIL	METRO TOP RAIL	MISSION TOP RAIL
	MISSION TOP RAIL	--	IMPRESSIONS TOP RAIL
	IMPRESSIONS TOP RAIL	--	ALTA TOP RAIL
	ALTA TOP RAIL	--	ARIA II TOP RAIL
	ARIA II TOP RAIL	--	METRO TOP RAIL
	METRO TOP RAIL	--	--

DIVISION: 05 00 00—METALS

Section: 05 52 00—Metal Railings

## REPORT HOLDER:

ULTRALOX™

## EVALUATION SUBJECT:

ALUMINUM RAILING SYSTEM, SCREEN RAILING SYSTEM, VERTICAL CABLE SYSTEM, HORIZONTAL CABLE SYSTEM, PRIVACY RAILING SYSTEM, MESH RAILING SYSTEM, ADA HANDRAIL SYSTEM, AND STANCHION SYSTEM

## 1.0 REPORT PURPOSE AND SCOPE

## Purpose:

The purpose of this evaluation report supplement is to indicate that Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System, described in ICC-ES evaluation report [ESR-3485](#), have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

## Applicable code editions:

- 2023 City of Los Angeles Building Code ([LABC](#))
- 2023 City of Los Angeles Residential Code ([LARC](#))

## 2.0 CONCLUSIONS

The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System, described in Sections 2.0 through 7.0 of the evaluation report [ESR-3485](#), comply with the LABC Chapters 10 and 16 and LARC Chapter 3, and are subject to the conditions of use described in this supplement.

## 3.0 CONDITIONS OF USE

The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System, described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-3485](#).
- The design, installation, conditions of use and identification of the Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System are in accordance with the 2021 *International Building Code*® (IBC) and 2021 *Residential Code*® (IRC) provisions, as applicable, noted in the evaluation report [ESR-3485](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 10, 16 and 17, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.

This supplement expires concurrently with the evaluation report, reissued October 2025, and revised December 2025.

# ICC-ES Evaluation Report

# ESR-3485 CA Supplement w/ DSA and OSHPD

Reissued October 2025

Revised December 2025

*This report is subject to renewal October 2027.*

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A Subsidiary of the International Code Council®

**DIVISION: 05 00 00—METALS**  
**Section: 05 52 00—Metal Railings**

## REPORT HOLDER:

ULTRALOX™

## EVALUATION SUBJECT:

**ALUMINUM RAILING SYSTEM, SCREEN RAILING SYSTEM, VERTICAL CABLE SYSTEM, HORIZONTAL CABLE SYSTEM, PRIVACY RAILING SYSTEM, MESH RAILING SYSTEM, ADA HANDRAIL SYSTEM, AND STANCHION SYSTEM**

## 1.0 REPORT PURPOSE AND SCOPE

### Purpose:

The purpose of this evaluation report supplement is to indicate that Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System, described in ICC-ES evaluation report ESR-3485, have also been evaluated for compliance with the codes noted below.

### Applicable code editions:

- 2022 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2022 *California Residential Code* (CRC)

## 2.0 CONCLUSIONS

### 2.1 CBC:

The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System, described in Sections 2.0 through 7.0 of the evaluation report ESR-3485, comply with CBC Chapters 10 and 16, provided the design and installation are in accordance with the 2021 International Building Code® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapter 10, 16 and 17, as applicable.

#### 2.1.1 OSHPD:

The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System, described in Sections 2.0 through 7.0 of the evaluation report ESR-3485, comply with CBC Chapter 10 as amended [OSHPD 1, 1R, 2, 3, 4 and 5], Chapter 16 and amendments [OSHPD 1R, 2, 3, and 5], and CBC Chapters 16A [OSHPD 1 and 4], provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 10, 16, 16A, 17, and 17A, as applicable.

#### 2.1.2 DSA:

The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System, described in Sections 2.0 through 7.0 of the

evaluation report ESR-3485, comply with CBC Chapter 10 adopted section 1014 first paragraph [DSA AC], Chapter 10 [DSA SS and SS/CC], Chapter 11A as amended [DSA AC], Chapter 11B [DSA AC], Chapter 16 as amended [DSA-SS/CC], and CBC Chapter 16A [DSA/SS], provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 10, 11A, 11B, 16, 16A, and 17A, as applicable.

## **2.2 CRC:**

The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System, described in Sections 2.0 through 7.0 of the evaluation report ESR-3485, comply with CRC Chapters 3, provided the design and installation are in accordance with the 2021 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued October 2025 and revised December 2025.

# ICC-ES Evaluation Report

# ESR-3485 FL Supplement

Reissued October 2025

Revised December 2025

This report is subject to renewal October 2027.

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A Subsidiary of the International Code Council®

**DIVISION: 05 00 00—METALS**

**Section: 05 52 00—Metal Railings**

## REPORT HOLDER:

**ULTRALOX™**

## EVALUATION SUBJECT:

**ALUMINUM RAILING SYSTEM, SCREEN RAILING SYSTEM, VERTICAL CABLE SYSTEM, HORIZONTAL CABLE SYSTEM, PRIVACY RAILING SYSTEM, MESH RAILING SYSTEM, ADA HANDRAIL SYSTEM, AND STANCHION SYSTEM**

## 1.0 REPORT PURPOSE AND SCOPE

### Purpose:

The purpose of this evaluation report supplement is to indicate that Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System, described in ICC-ES evaluation report ESR-3485, have also been evaluated for compliance with the codes noted below.

### Applicable code editions:

- 2023 *Florida Building Code—Building*
- 2023 *Florida Building Code—Residential*

## 2.0 CONCLUSIONS

The Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System, described in Sections 2.0 through 7.0 of the evaluation report ESR-3485, comply with the *Florida Building Code—Building* and *Florida Building Code—Residential*. The design requirements must be determined in accordance with the the *Florida Building Code—Building* and *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-3485 for the 2021 *International Building Code*® meet the requirements of the the *Florida Building Code—Building* and *Florida Building Code—Residential*, as applicable.

Use of the Aluminum Railing System, Screen Railing System, Vertical Cable System, Horizontal Cable System, Privacy Railing System, Mesh Railing System, ADA Handrail System, and Stanchion System for compliance with the High-Velocity HurricaneZone provisions of the *Florida Building Code—Building* and *Florida Building Code—Residential* has not been evaluated and is outside the scope of this evaluation report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission). Florida Rule 61G20-3 is applicable to products and/or systems which comprise the building envelope and structural frame for compliance with the structural requirements of the Florida Building Code.

This supplement expires concurrently with the evaluation report, reissued October 2025 and revised December 2025.