Code Compliance Research Report
CCRR-0570

Issue Date: 07-22-2025
Renewal Date: 07-31-2026

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

REPORT HOLDER:
Feeney Inc.
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Oakland, CA 94607
510-893-9473
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REPORT SUBJECT:
DesignRail® Aluminum Railing Systems

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2021 *International Building Code®* (IBC)
- 2021 *International Residential Code®* (IRC)

NOTE: This report references the most recent Code editions noted. Section numbers in earlier editions may differ.

1.2 DesignRail® railings have been evaluated for the following properties (see Table 1):

- Materials
- Structural performance

1.3 DesignRail® railings have been evaluated for the following uses (see Table 1):

- DesignRail® railings are Guards under the definitions of the referenced codes intended for use at or near the open sides of elevated walking areas of buildings and walkways as required by the codes.
- DesignRail® railings have been evaluated for use in all construction types under the IBC and IRC.

2.0 STATEMENT OF COMPLIANCE

DesignRail® railings comply 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.

3.0 DESCRIPTION

3.1 DesignRail® railing systems are an assemblage of extruded aluminum top and bottom rails attached to structural aluminum support posts with rail-to-post brackets. Available infill elements below the top rail include the following:

- Square aluminum pickets.
- Vertical or horizontal spaced cables.
- 1/4" Tempered glass panel
- 1/4" Translucent Polymer resin panel
- 3/16” Aluminum panel with various laser cut decorative patterns.
- Wire mesh panels.

3.2 Railings are provided in rail lengths and installed heights as identified in Table 2.

4.0 PERFORMANCE CHARACTERISTICS

4.1 Materials: DesignRail® railing system materials conform with the following:

4.1.1 Aluminum components conform with the material requirements of the Aluminum Design Manual (ADM) in accordance with IBC Section 2002.1.

4.1.2 Glass infill panels are 1/4" thick tempered glass that comply with Category II of CPSC 16 CFR Part 1201 or Class A of ANSI Z97.1 in accordance with IBC Section 2407.1.

4.1.3 Polymer infill panels are 1/4" Varia Ecoresin co-polyester plastic panels conforming to ICC-ES ESR-3676 with the following properties:

- Plastic classification CC1 in accordance with IBC Section 2606.4.
- Class B interior finish classification when tested in accordance with ASTM E84 (IBC Section 803.1.1).

4.1.4 Steel wire mesh infill is 316 stainless steel wire.

4.2 Structural: The DesignRail® railing systems described in this report meet the design load requirements specified in Section 1607.9 of the IBC and Section R301.5 of the IRC. See Table 2 for lengths and heights of railing assemblies.

4.2.1 For glass panel railing, the ASD wind load design pressure determined in accordance with IBC Section 1609 shall not exceed 25 psf.

5.0 INSTALLATION

5.1 General:

DesignRail® 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 job site during installation.

5.2 Installation in wood-framed decks shall be in accordance with one of the installation methods shown in Table 3 and Figures 18, 20 and, 22. The structural wood framing for the specified post anchorage shall have a specific gravity of 0.43 or greater (Hem Fir or better) and a minimum thickness to allow full penetration of the specified fasteners. Fastening through decking shall not be included in required fastener penetration.

5.3 Installation in a concrete supporting structure shall be in accordance with one of the installation methods shown in Table 3 and Figures 19 and 21. The structural concrete shall be min. 3000 psi (f'c) compressive strength.

6.0 CONDITIONS OF USE

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 The DesignRail® railing systems with Polymer resin infill panels are limited to interior use.

6.3 For installations under the IBC, the DesignRail® railing systems with glass infill panels are limited, in accordance with Section 2407.1, to applications where there is no walking surface beneath them, or the walking surface is permanently protected from the risk of falling glass.

6.4 The supporting structure (structural wood framing or concrete) is not within the scope of this evaluation. The supporting structure must satisfy the design load requirements specified in Chapter 16 of the IBC including suitable material and design capacity for anchorage of the rail support posts specified herein. Where required by the building official, engineering calculations and details shall be provided.

6.5 The DesignRail® railing systems are manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Reports of engineering in accordance with the Aluminum Association, Aluminum Design Manual, ADM-2020 and the National Design Specification for Wood Construction, ANSI/NDS-2018.

7.2 Data in accordance with the ICC-ES Acceptance Criteria for Handrails and Guards, AC273 approved June 2017.

8.0 IDENTIFICATION

The products are identified with the manufacturer's name (Feeney, Inc.), the product name (DesignRail® Aluminum Railing Systems), the Intertek Mark as shown below, the Intertek Control Number and the Code Compliance Research Report number (CCRR-0570).

9.0 OTHER CODES

This section is not applicable.

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.

TABLE 1 - PROPERTIES EVALUATED

PROPERTY	APPLICABLE CODE SECTIONS	
	2021 IBC	2021 IRC
Structural	1607.9	R301.5
Materials	2002.1 (ADM-2020)	Ref. IBC[1]

1. Not specifically addressed in IRC. IBC requirements are applied.

TABLE 2 – DesignRail® Systems

DesignRail® Top Rail Series	Infill Options	Posts	Length and Height[3]	Use / Code
Series 100 Series 150 Series 200 Series 300 Series 350 Series 450	• 3/4" Square aluminum picket. • Vertical cables. • Horizontal cables with bottom rail.[2] • Horizontal cables without bottom rail.[2] • 1/4" Tempered glass panel[4] • 1/4" Translucent Polymer panel[1] • 3/16" Aluminum panel with various laser cut decorative patterns (See Figure 15). • Steel wire mesh with various patterns (See Figure 16).	• 2-3/8" Square Post (4-Chase) • 2-3/8", 45 degree Post	Height: 36 inches. Length: Up to 6 ft.	Limited to IRC
		• 2-3/8" Square Post (6-Chase) • 2-3/8", 45 degree Post • 2-3/8" Heavy Duty Square Post[2]	Height: 42 inches. Length: Up to 5 ft.	IBC all use groups and, IRC

1. Polymer resin panels are limited to interior use.
2. Heavy Duty Post is required with horizontal cable rail (end posts) and fascia mounting method (see Table 3).
3. Height is top of deck or slab to top of top rail. Length is center-to-center of posts (max. post spacing).
4. See Paragraph 6.3 for glass panel conditions of use.

TABLE 3 – DesignRail® Post Mounting Methods

Post Mounting Method	Wood Deck[1,2,3]	Concrete (f'c ≥ 3000 psi)	Use / Code
Base (Surface) Mount See Figure 18 & 19	(4) 3/8" Lag Screws w/min. thread penetration[2] as follows: 3.43" for IRC 5.03" for IBC. Or, (4) 3/8" Thru-Bolts	(4) 3/8" x 4" Kwik HUS-EZ concrete screw anchors w/min. 4-1/4" edge distance. (4) 3/8" x 3-3/4" Kwikbolt – TZ concrete anchors w/min. 2-5/8" edge distance.	IRC and IBC
Fascia Mount 2-3/8" Heavy Duty Square Post See Figure 20 & 21.	2x8 rim joist: (4) 3/8" Lag Screws w/min. thread penetration[2] as follows: 3.15" for IRC 4.39" for IBC. 2x10 rim joist: (3) 3/8" Lag Screws w/min. thread penetration[2] as follows: 2.76" for IRC 3.81" for IBC Or, (2) 3/8" Thru-bolts w/2" dia. washer on wood face.	(2) 3/8" x 3.75" ITW Red Head Trubolt wedge anchors.	IRC and IBC
Fascia Bracket See Figure 22 See Note 4.	5" Bracket, (6) 3/8" Lag Screws w/min. thread penetration[2] as follows: 2.91" for IRC 4.05" for IBC. 7" Bracket, (4) 3/8" Lag Screws w/min. thread penetration[2] as follows: 2.87" for IRC 3.91" for IBC. Or, (4) 3/8" Thru-bolts w/2" dia. washer on wood face.	N.A.	IRC and IBC

1. For wood deck installation with thru-bolts, specified anchorage shall be to structural wood framing (joists or blocking). Framing shall be Hem Fir or other structural wood with a specific gravity (G) of 0.43 or greater.
2. For wood deck installation with lag screws, specified anchorage shall be to structural wood framing (joists or blocking). Framing shall be Hem Fir or other structural wood with a specific gravity (G) of 0.43 or greater. Required penetration is threaded portion of the shank excluding the tip.
3. Structural framing including blocking must be designed and constructed for the applied design loads in accordance with applicable code.
4. Post is secured to fascia bracket with four (4) #14 x 1" stainless steel, hex head, self-tapping screws placed in the pre-drilled holes of the bracket.

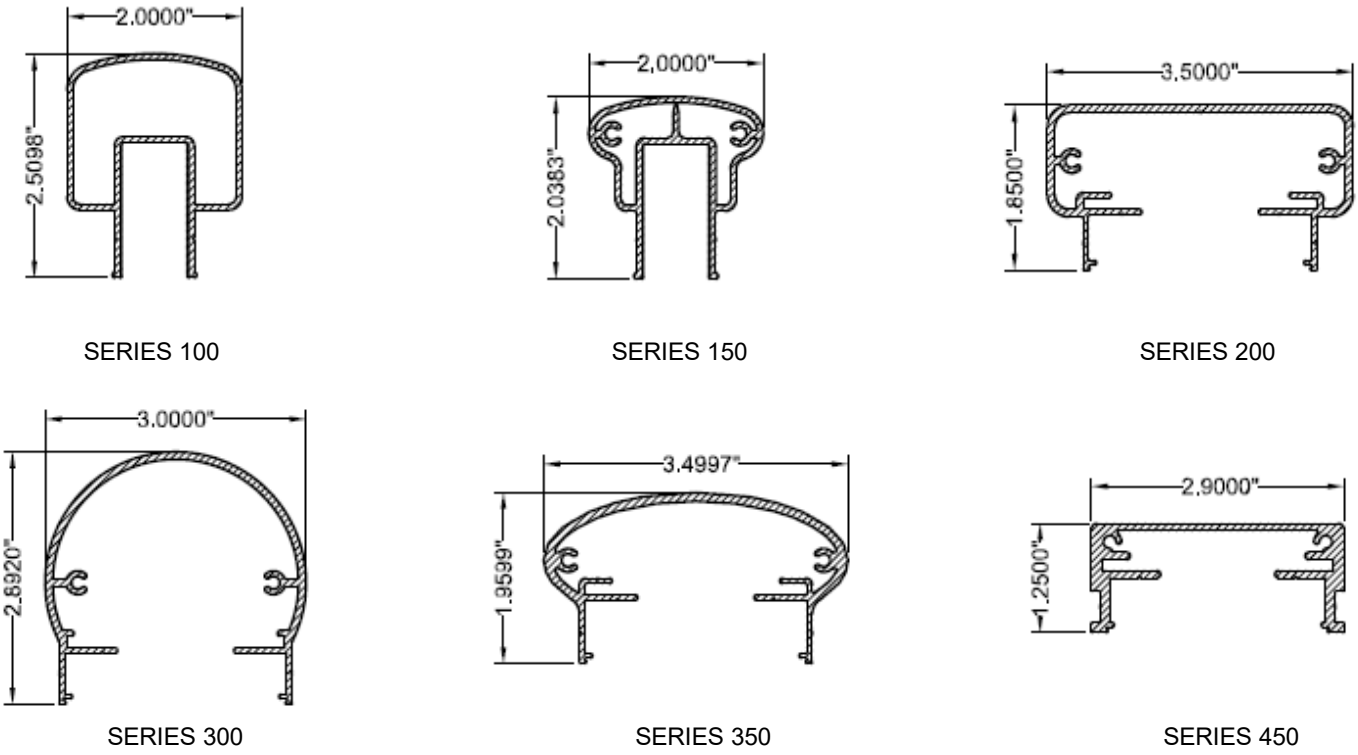
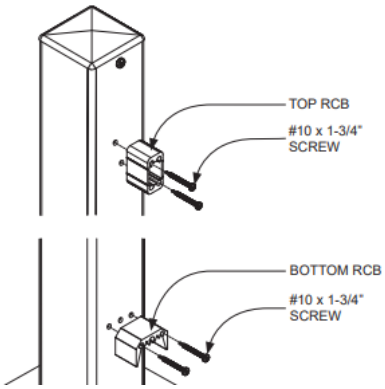
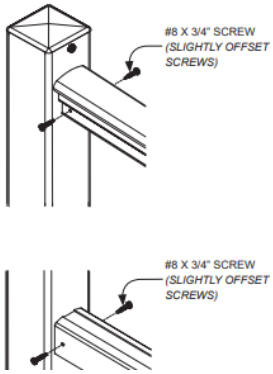


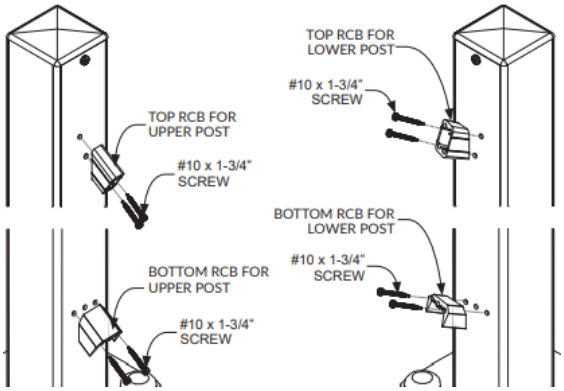
Figure 1 – Top Rail Profiles



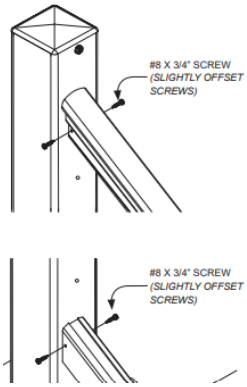
Level Brackets to Post



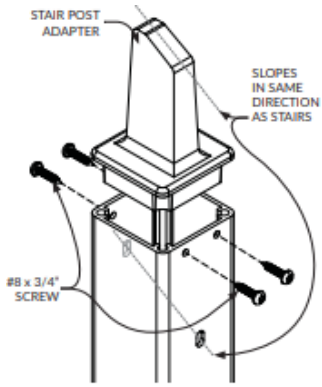
Level Rail to Bracket



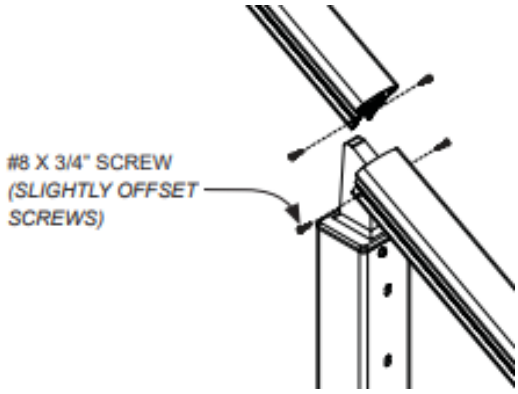
Stair Brackets to Post



Stair Rail to Bracket

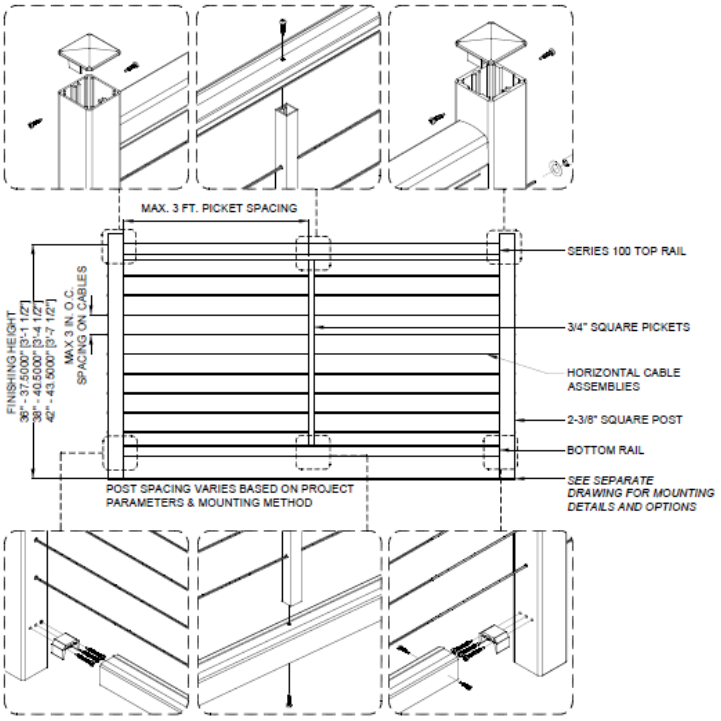


Stair Intermediate Post



Stair Rail to Intermediate Bracket

Figure 2 – Series 100 and 150 Bracket Connections



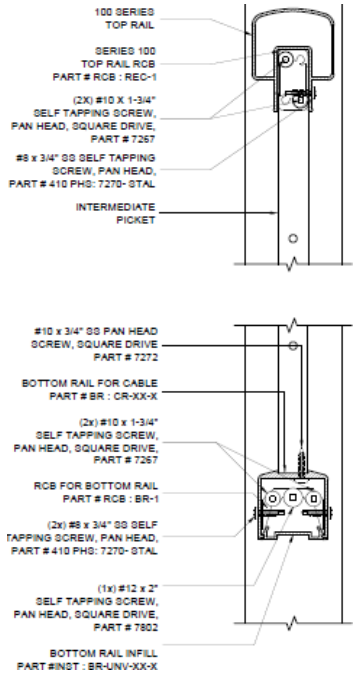
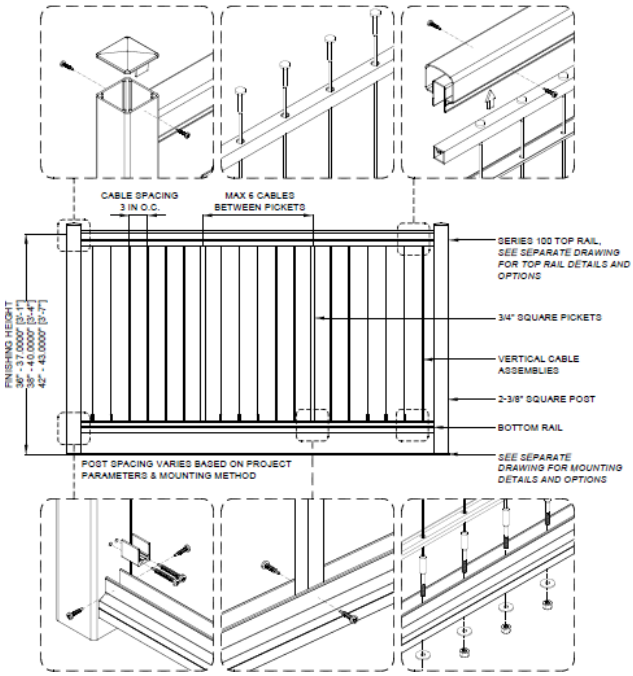


Figure 3 - Series 100 and 150 Picket Infill Assembly (Series 100 shown)



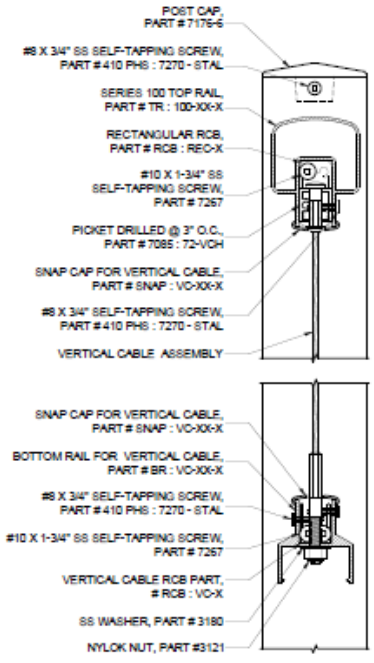


Figure 4 – Series 100 and 150 Vertical Cable Infill Assembly (Series 100 shown)

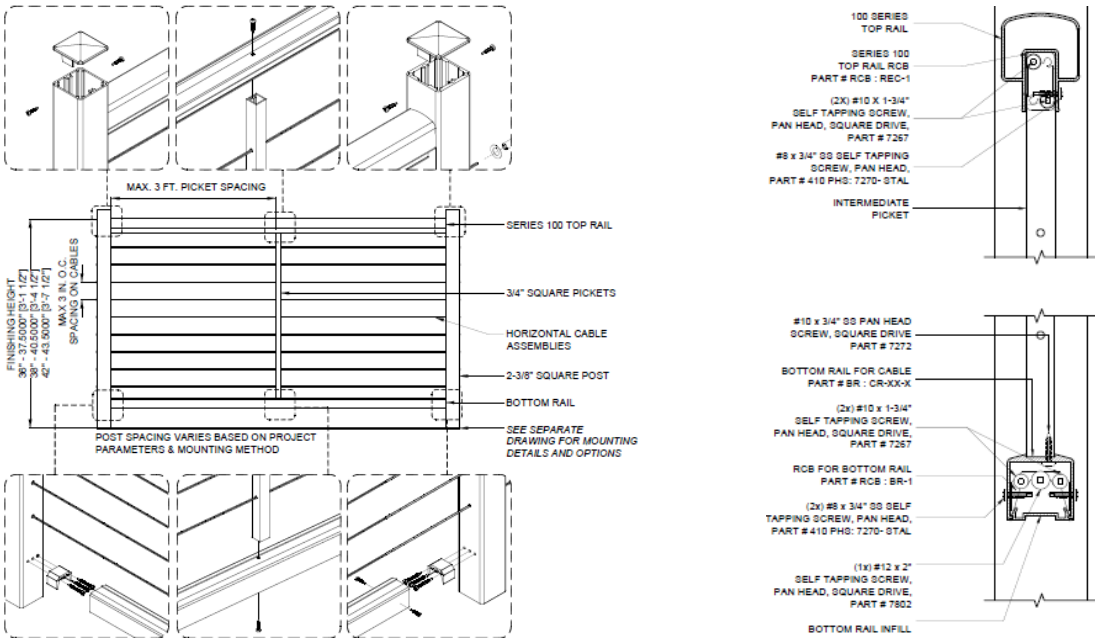


Figure 5 – Series 100 and 150 Horizontal Cable Assembly (Series 100 shown with bottom rail)

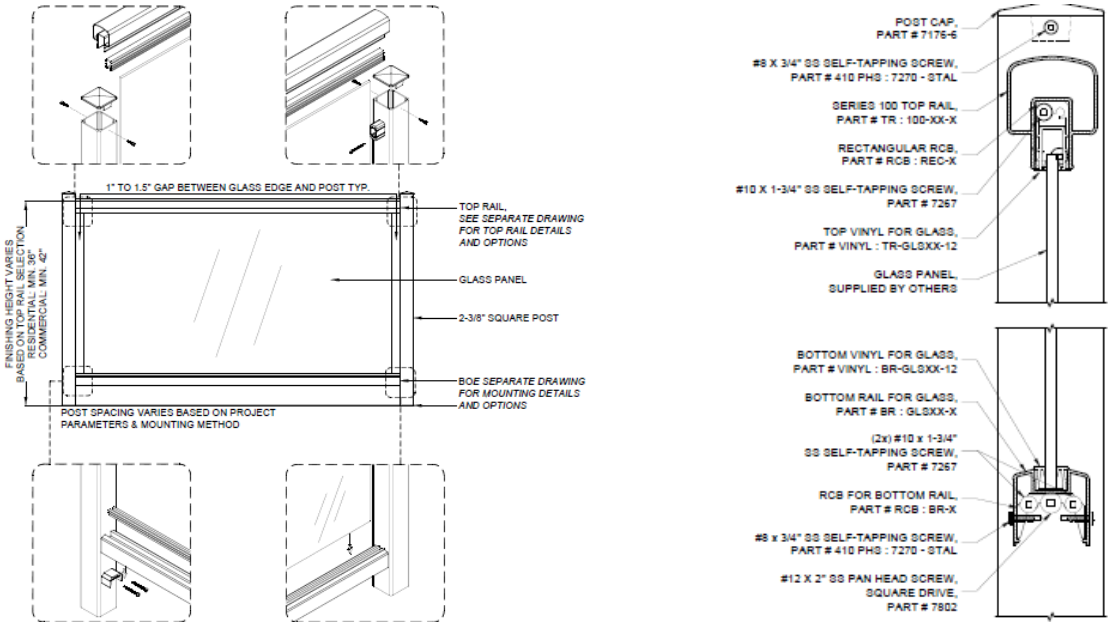


Figure 6 – Series 100 and 150 Glass Panel Infill (Series 100 shown)

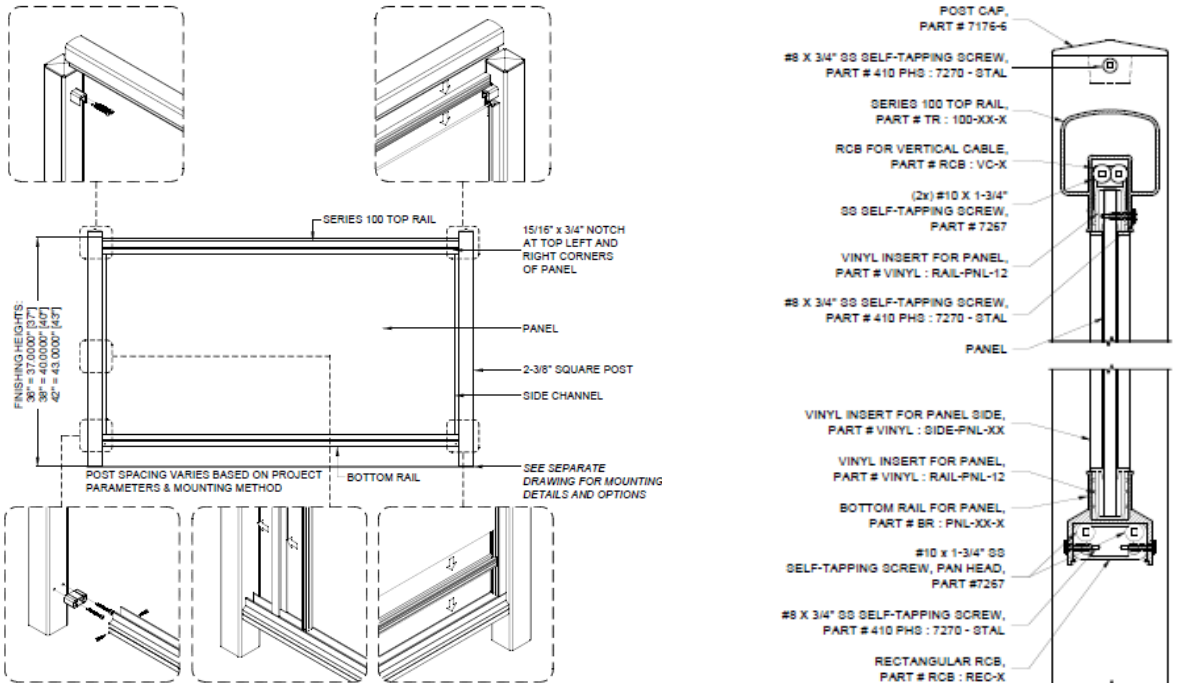


Figure 7 – Series 100 and 150 Panel Infill - Resin, Alum, or Mesh (Series 100 shown)

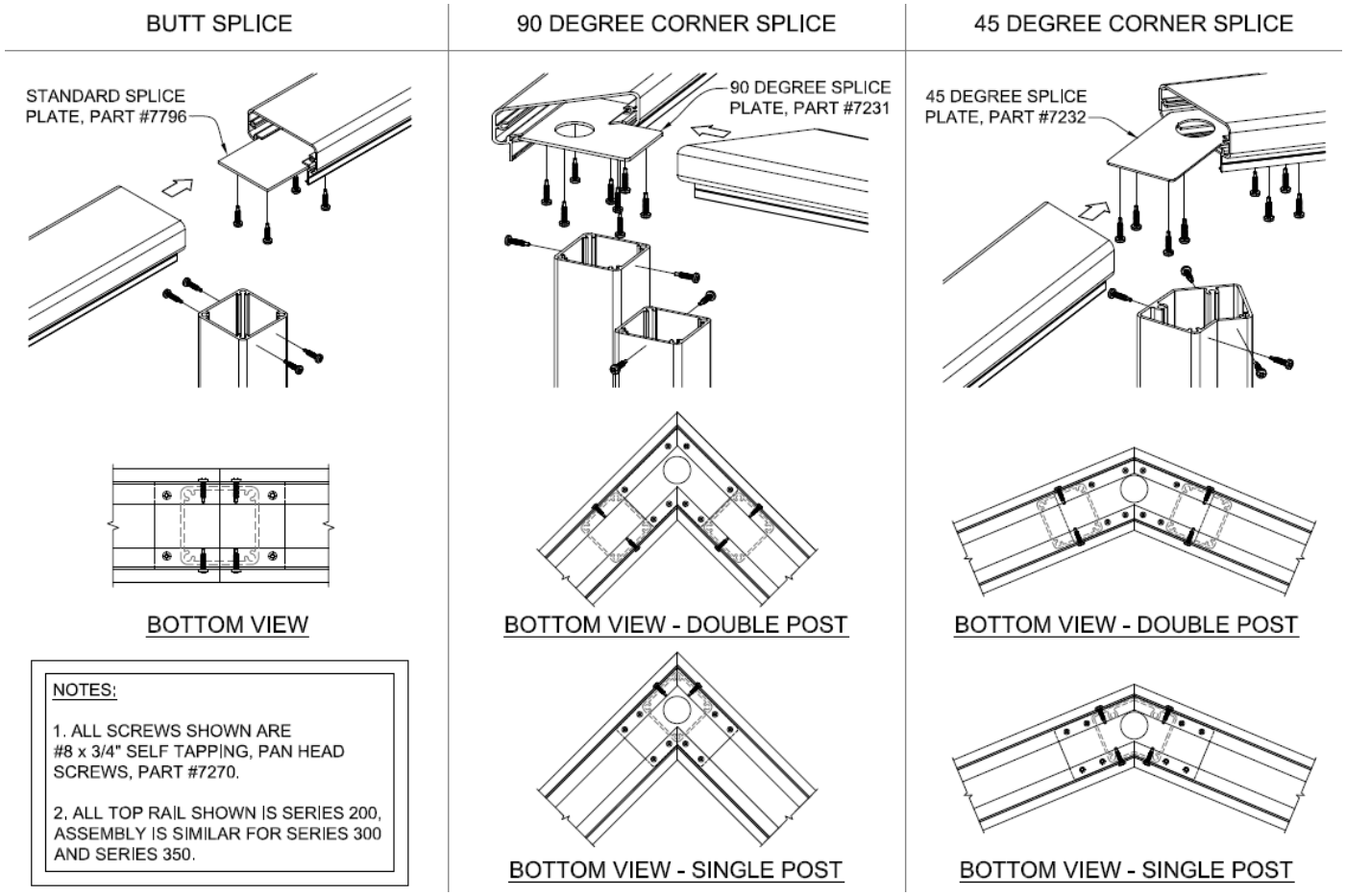


Figure 8 – Series 200, 300, 350, and 450 Top Rail Splices (Series 200 Shown)

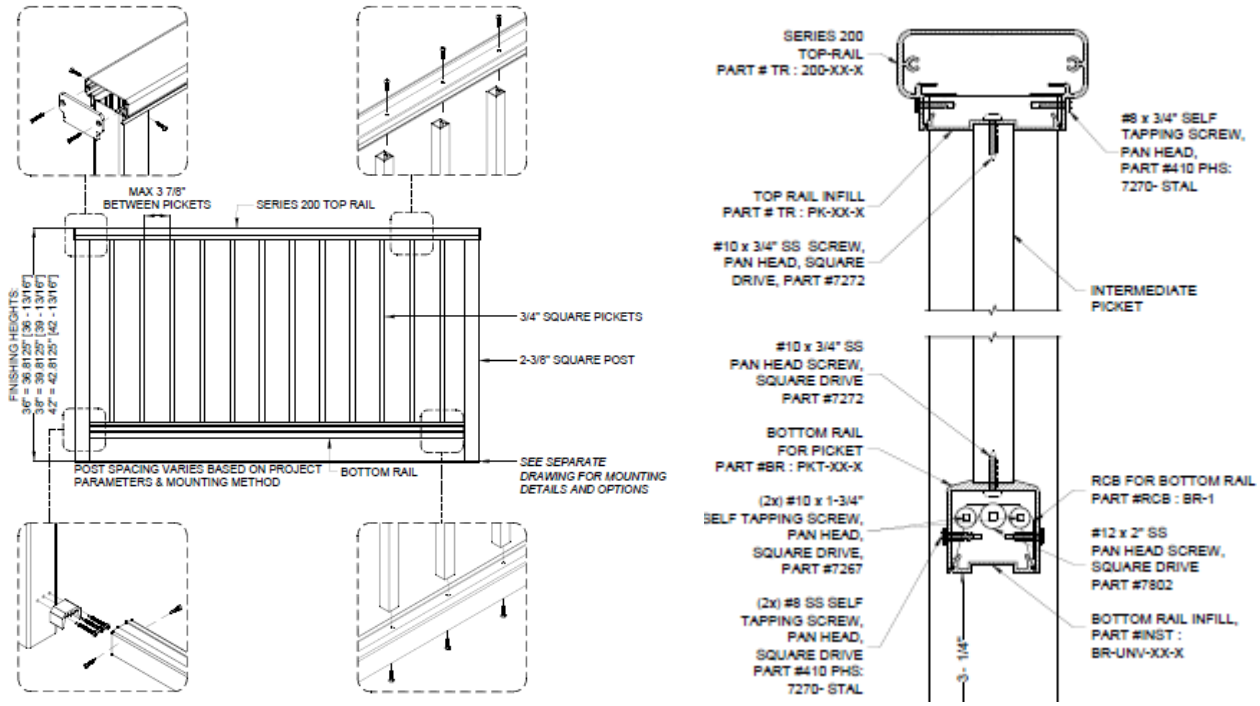


Figure 9 – Series 200, 300, 350, and 450 Picket Infill Assembly (Series 200 shown)

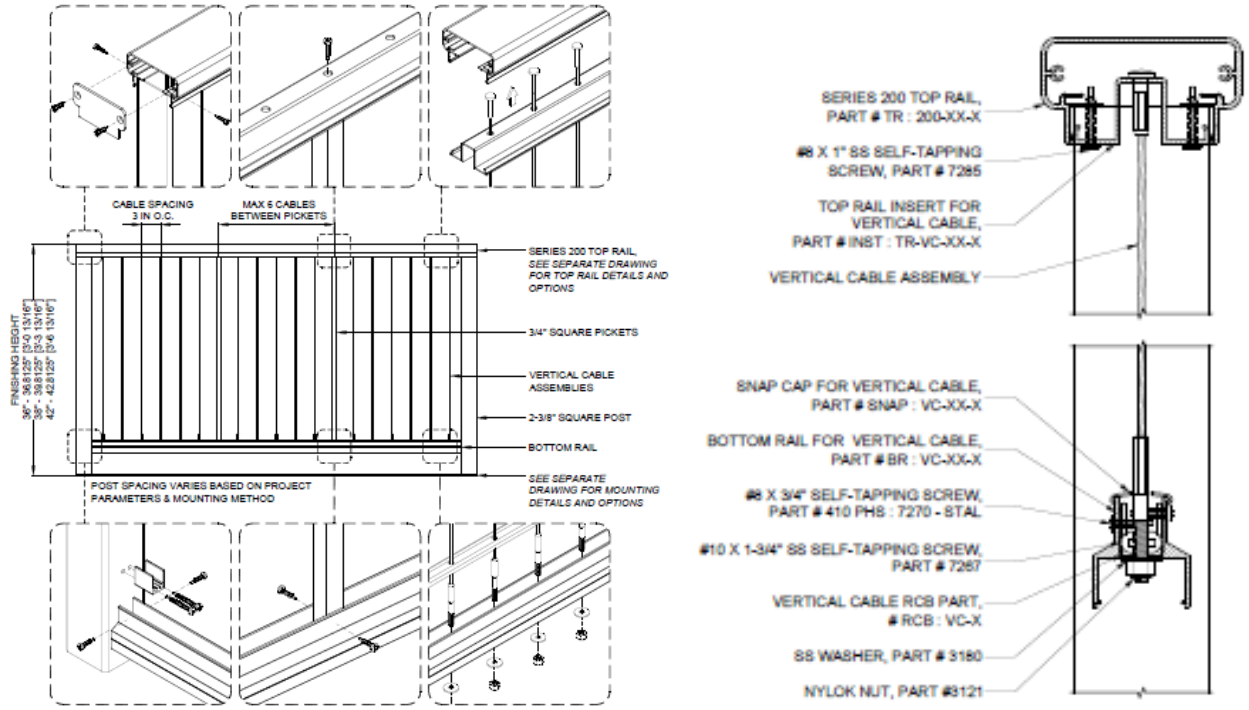


Figure 10 – Series 200, 300, 350, and 450 Vertical Cable Assembly (Series 200 shown)

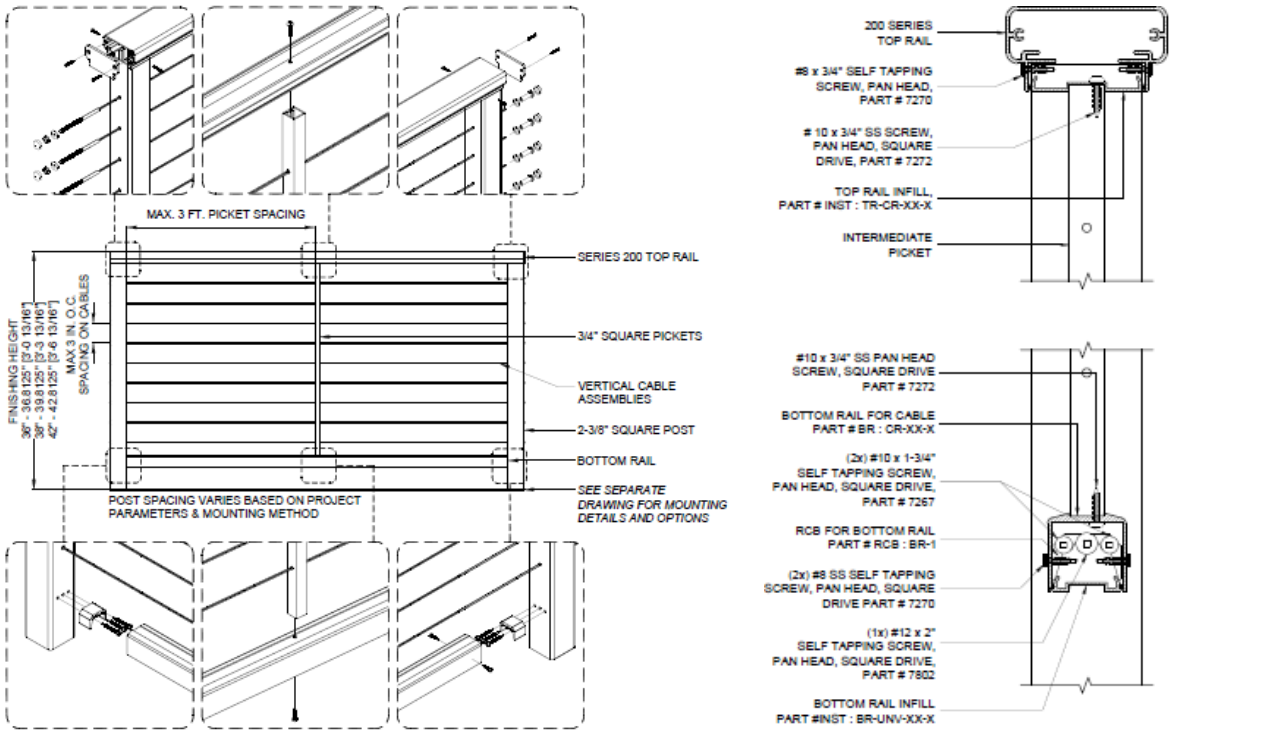


Figure 11 – Series 200, 300, 350 and 450 Horizontal Cable Assembly (Series 200 shown with bottom rail)

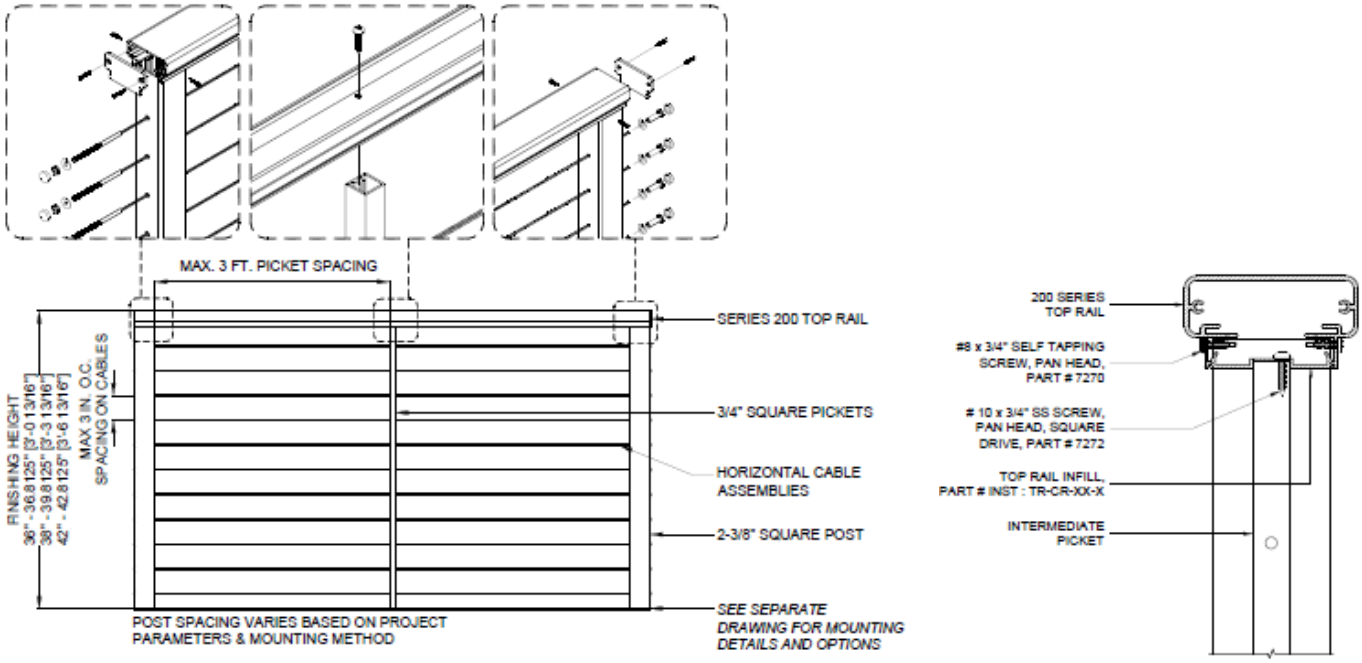


Figure 12 – Series 200, 300, 350 and 450 Horizontal Cable Rail Assembly (Series 200 shown without bottom rail)

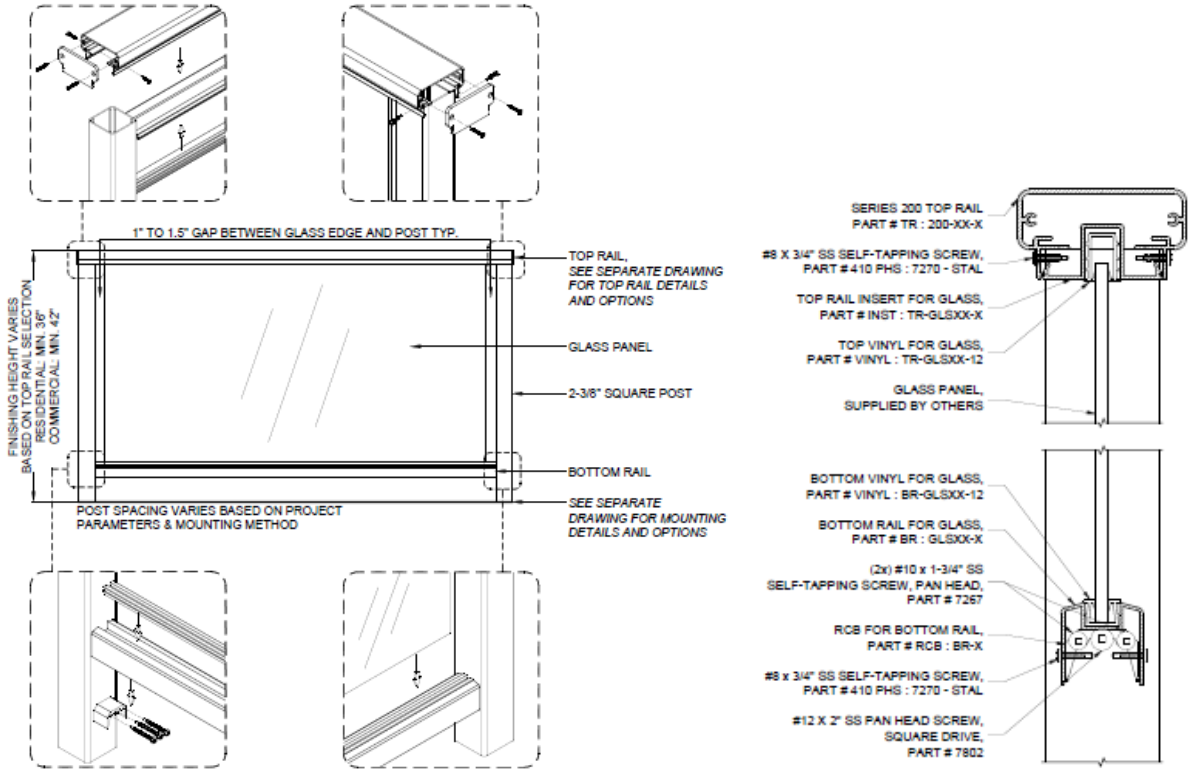


Figure 13 – Series 200, 300, 350 and 450 Glass Panel Infill (Series 200 shown)

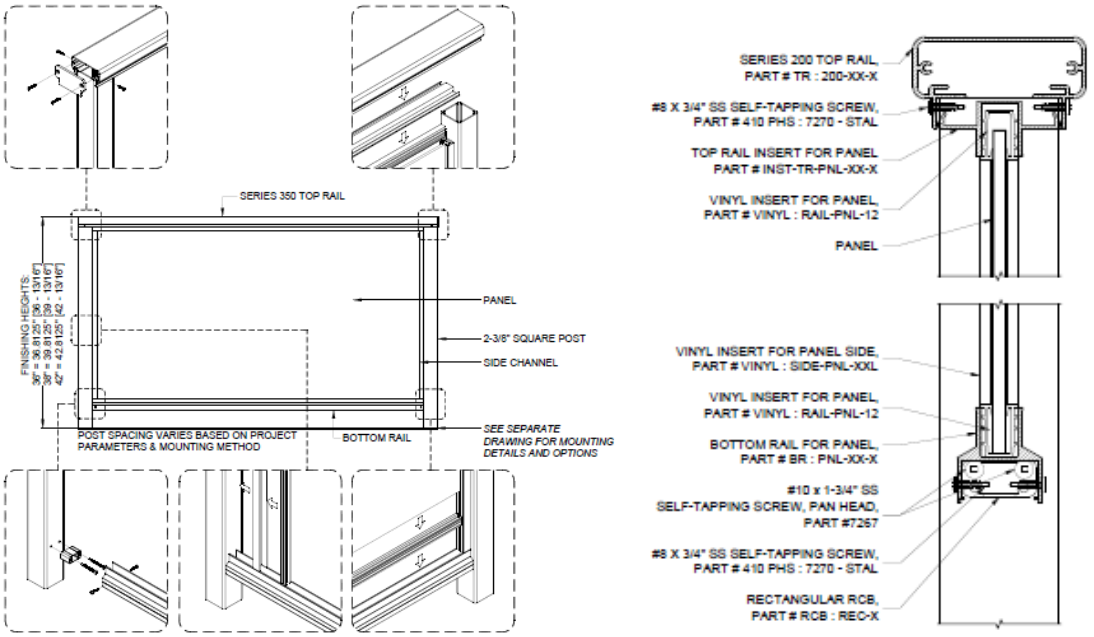


Figure 14 – Series 200, 300, 350 and 450 Panel Infill - Resin, Alum or, Mesh (Series 200 shown)

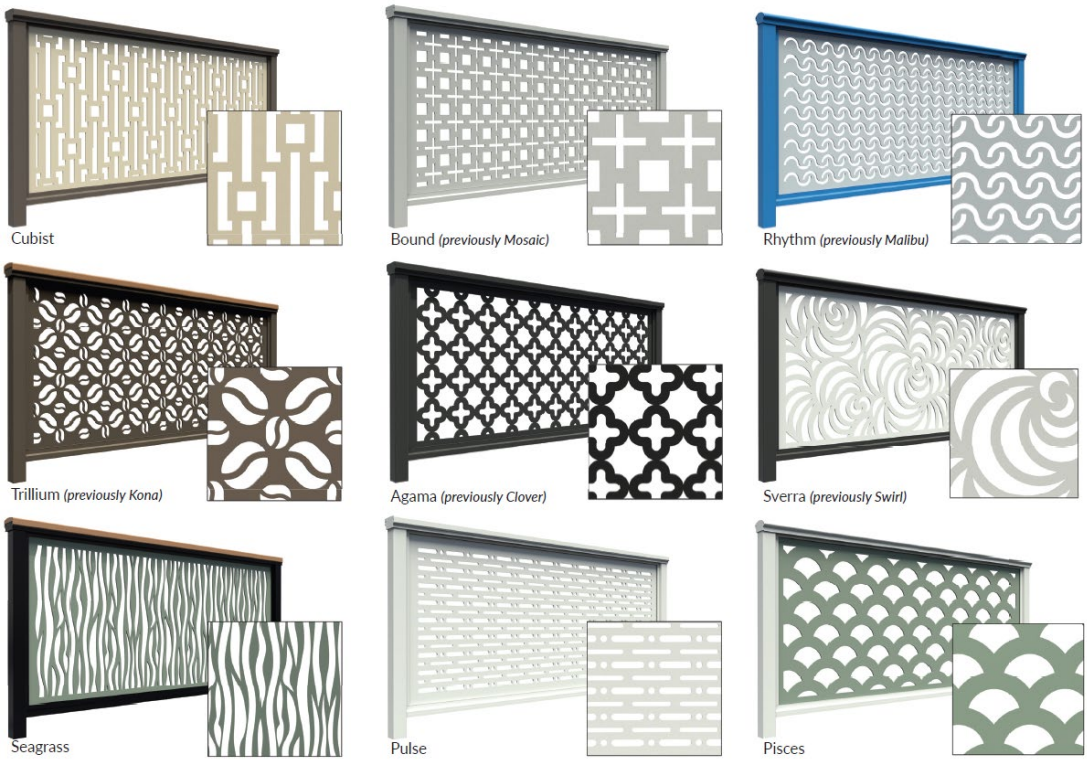


Figure 15 - Laser Cut Aluminum Panel Infill

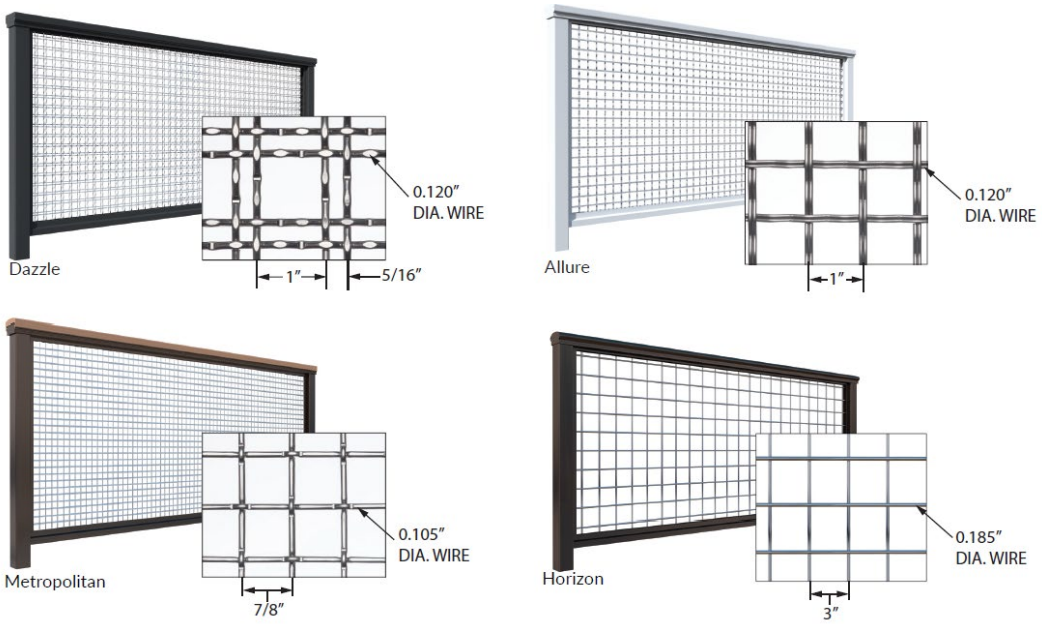
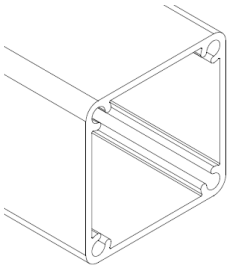
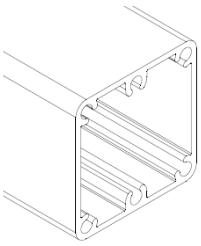


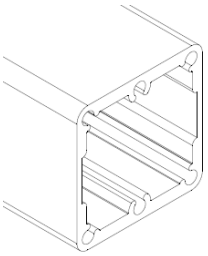
Figure 16 - Stainless Steel Wire Mesh Infill



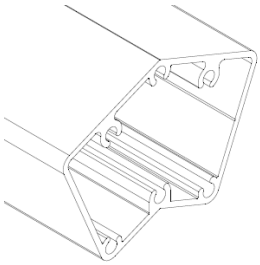
2-3/8" Square Post (4-chase)



2-3/8" Square Post (6-chase)

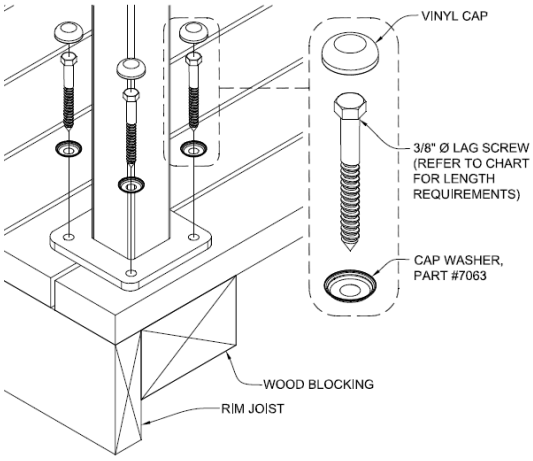


2-3/8" Heavy Duty Square Post



2-3/8" 45 Degree Post

Figure 17 – Railing Support Posts



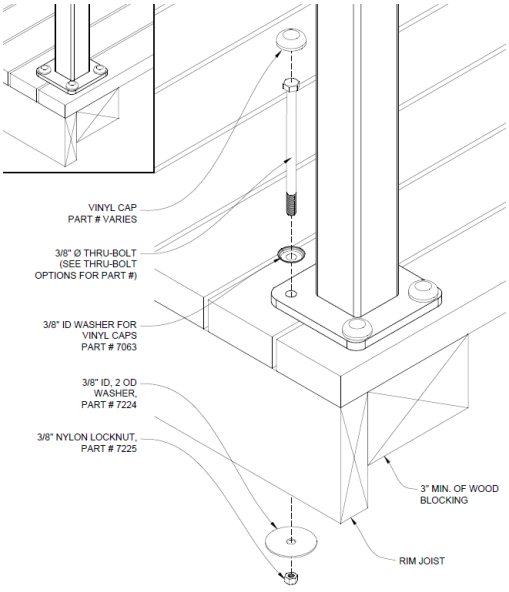


Figure 18 - Base (Surface) Mount on Wood Deck

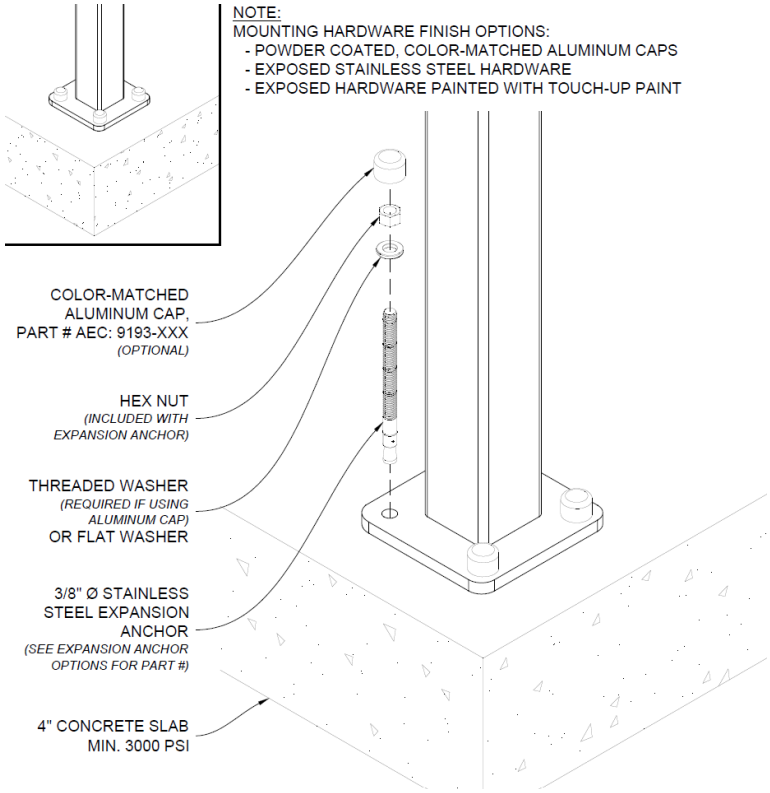


Figure 19 - Base (Surface) Mount to Concrete

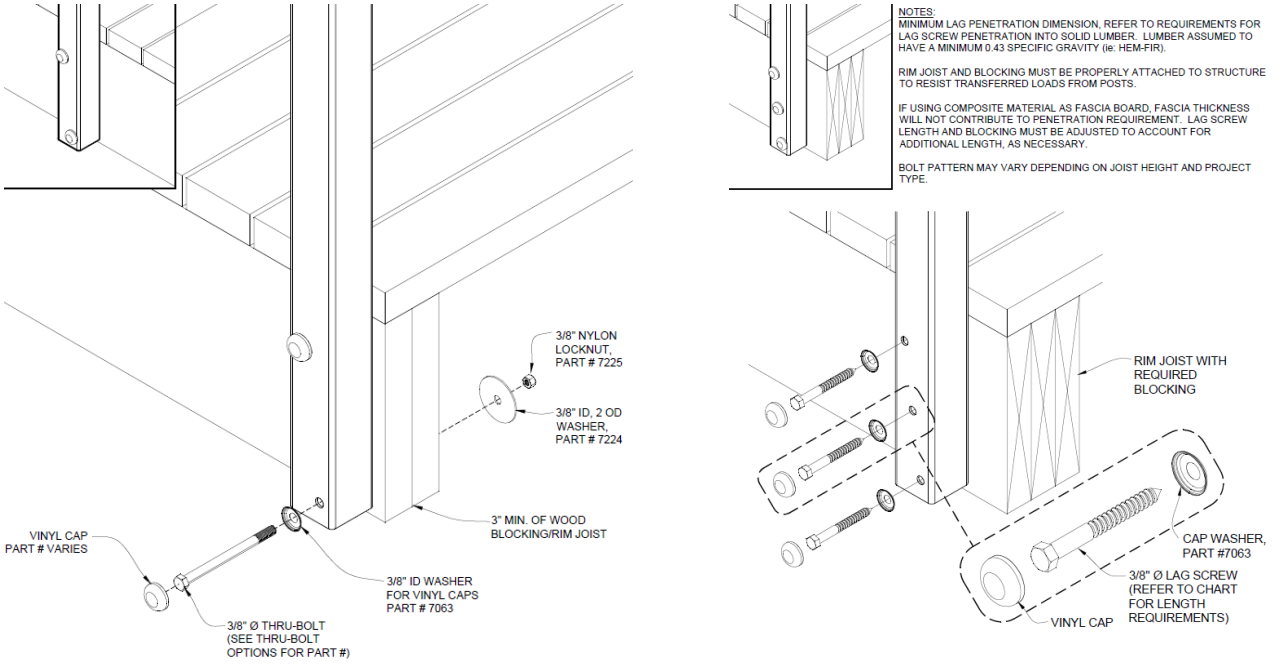


Figure 20 - Fascia Mount to Wood (2-3/8" Heavy Duty Post Only)

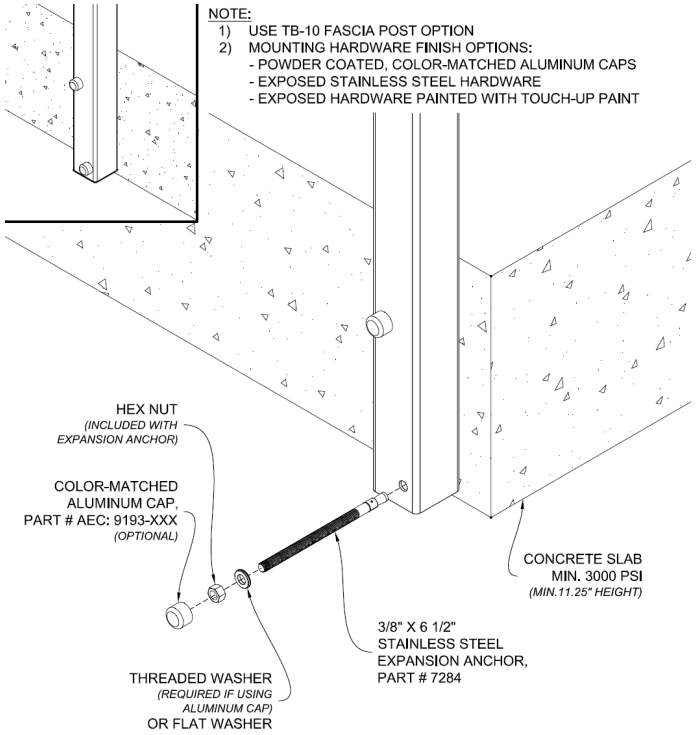


Figure 21 - Fascia Mount to Concrete (2-3/8" Heavy Duty Post Only)

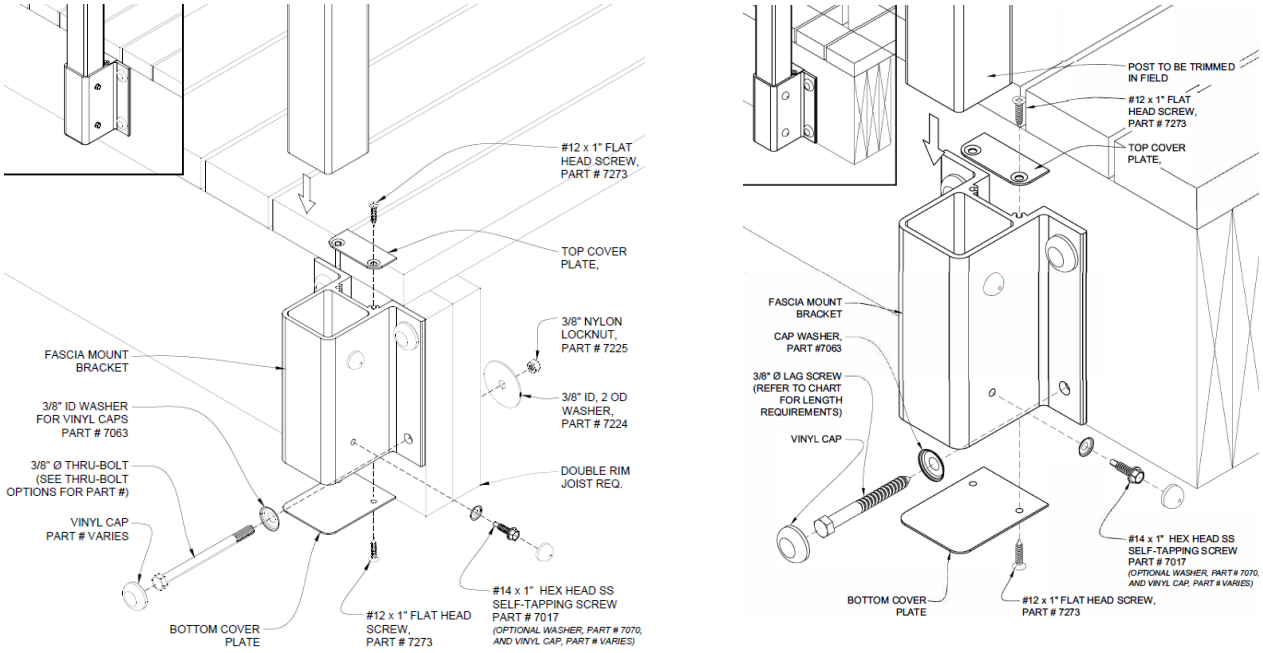


Figure 22 - Fascia Bracket Mount to Wood
(7" Bracket, 4-Bolt Shown. 5" Bracket, 6-Bolt Similar)