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DIVISION: 06—WOOD AND PLASTICS**Section: 06500—Structural Plastics****Section: 06610—Plastic Railings and Guards****REPORT HOLDER:****HOMELAND VINYL PRODUCTS, INC.**

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www.homelandvinyl.comengineering@homelandvinyl.com**EVALUATION SUBJECT:****GORILLA DECK™ AND RECTANGULAR, T-RAIL AND R-RAIL GUARDRAIL SYSTEMS****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2003 *International Building Code®* (IBC)
- 2003 *International Residential Code®* (IRC)

Properties evaluated:

- Structural
- Durability
- Surface-burning characteristics

2.0 USES

The Homeland® Vinyl Products, Inc., Gorilla Deck® described in this report is limited to exterior use as a deck board for balconies, porches and decks of Type V-B construction (IBC) and structures constructed in accordance with the IRC.

The Homeland Vinyl Products, Inc., Rectangular top rail system (Rectangular), Bracketed-Tee top rail system (T-Rail) and Bracketed-Bread Loaf top rail system (R-Rail) described in this report are limited to exterior use as guards for balconies, porches, and decks of structures of Type V-B construction (IBC) and structures constructed in accordance with the IRC.

3.0 DESCRIPTION**3.1 General:**

The Gorilla Deck® and Rectangular, T-Rail and R-Rail systems are poly(vinyl chloride) (PVC) products manufactured by an extrusion process in six colors: beige, tan, light gray, white, adobe and gray.

3.2 Deck Board:

3.2.1 General: The Gorilla Deck® is manufactured with nominal dimensions of $1\frac{1}{4}$ by 7 inches (32 by 178 mm), with the actual measurements being 1.25 by 7.07 inches (32 by 180 mm), and is available in typical lengths of 16, 20 and 24 feet (3658, 4878, 6096 and 7315 mm). The deck board is fabricated with a profile that is designed to interlock during installation and is provided with an alternating groove pattern aligned with the length of the board. See Figure 1 for a typical cross section.

3.2.2 Durability: When subjected to weathering, insect attack, and other decaying elements, material used to manufacture the Gorilla Deck® is equivalent in durability to preservative-treated or naturally durable lumber when used in locations described in Section 2.0. The Gorilla Deck® has been evaluated for structural performance when exposed to a temperature range from -20°F to 125°F (-29°C to 52°C).

3.2.3 Surface-burning Characteristics: When tested in accordance with ASTM E 84, the Gorilla Deck® has a flame-spread index of no greater than 200.

3.3 Guardrail Systems:

3.3.1 General: The Rectangular, T-Rail and R-Rail systems are designed for an installed height of 42 inches (1067 mm) with a maximum length of 96 inches (2438 mm) when measured from the center-of-post to center-of-post. The Rectangular, T-Rail and R-Rail systems are comprised of several different types of interchangeable components. These include a rectangular rail, T-Rail and R-Rail as top rail components, three different sizes of balusters, a bottom rail, a post, and various mounting brackets and architectural components as described in the manufacturer's quality control manual. See Figure 2 for typical component cross sections.

3.3.1.1 Rectangular Rail: The rectangular rail is manufactured with dimensions of 2 by $3\frac{1}{2}$ inches (51 by 89 mm) and a wall thickness of 0.12 inch (3.0 mm). The rail is designed to be installed with a P-channel insert fabricated from 6063-T5 aluminum alloy.

3.3.1.2 T-Rail: The T-Rail is a Tee-shaped component with a width of $3\frac{1}{2}$ inches (89 mm), a depth of $3\frac{1}{2}$ inches (89 mm) and a wall thickness of 0.11 inch (2.8 mm). The T-Rail is designed to be installed with a P-channel insert fabricated from 6063-T5 aluminum alloy.

3.3.1.3 R-Rail: The R-Rail is a bread loaf-shaped component with a width of 3 inches (76 mm), a depth of $3\frac{1}{2}$ inches (89 mm) and a wall thickness of 0.125 inch (3.2 mm). The R-Rail is designed to be installed with a 2.7-by-0.80-inch (69 by 20.3 mm) 6063-T6 aluminum alloy insert.

*Revised October 2007

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3.3.1.4 Baluster: The balusters are fabricated in three distinct sizes: $1\frac{1}{4}$ by $1\frac{1}{4}$ inches (32 by 32 mm) with a wall thickness of 0.07 inch (1.8 mm); $1\frac{3}{8}$ by $1\frac{3}{8}$ inches (35 by 35 mm) with a wall thickness of 0.07 inch (1.8 mm); and $1\frac{1}{2}$ by $1\frac{1}{2}$ inches (38 by 38 mm) with a wall thickness of 0.07 inch (1.8 mm).

3.3.1.5 Post: The post sleeve is a 4-by-4-inch (102 by 102 mm) sleeve with a wall thickness of 0.16 inch (4.1 mm). The post sleeve is designed to be installed over a 3.61-by-3.61-inch (92 by 92 mm) 6063-T6 aluminum alloy post insert.

3.3.2 Durability: When subjected to weathering, insect attack, and other decaying elements, material used to manufacture Rectangular, T-Rail and R-Rail systems are equivalent in durability to preservative-treated or naturally durable lumber when used in locations described in Section 2.0. Gorilla Deck® has been evaluated for structural performance when exposed to a temperature range from -20°F to 125°F (-29°C to 52°C).

3.3.3 Surface-burning Characteristics: When tested in accordance with ASTM E 84, Rectangular, T-Rail and R-Rail systems have a flame-spread index of no greater than 200.

4.0 DESIGN AND INSTALLATION

4.1 General:

Installation of the Gorilla Deck®, Rectangular, T-Rail and R-Rail systems must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions shall be available at the jobsite at all times during installation.

4.2 Deck Boards:

4.2.1 General: When installing the first board of the Gorilla Deck®, a starter strip shall be installed utilizing a No. 8 by $1\frac{1}{2}$ -inch (64 mm) stainless steel pan head screw at each support. The first board is snapped into the starter strip and fastened in the same manner as the starter strip. Each subsequent board is installed by snapping into the previous board and fastening in the same manner. Fasteners shall be installed a minimum of $\frac{3}{4}$ inch (19 mm) from the end of each board. Butt joints shall be supported with a double joist allowing a gap as recommended by the manufacturer's published installation instructions. The deck boards shall not extend past the last support.

4.2.2 Structural: The Gorilla Deck®, when used as a deck board, will have an allowable capacity, when installed at a maximum center-to-center spacing of the supporting construction, as prescribed in Table 1.

4.3 Guardrail:

4.3.1 General: The Rectangular top rail system is permitted to be assembled using either a bracketed component assembly or a routed insert component assembly, while the T-Rail and R-Rail top rail components shall be assembled using only the bracketed component assembly. See Sections 4.3.2 and 4.3.3 for specific descriptions of each of these two methods. The balusters are installed by insertion into a routed opening. The routed openings are fabricated so that a maximum opening of $3\frac{1}{2}$ inches (89 mm) between balusters is maintained. Two $1\frac{1}{2}$ -by- $1\frac{1}{2}$ -inch-square footblocks are installed to the bottom rail at an equal distance between the posts. In all configurations, the bottom rail is installed without any additional reinforcement utilizing the same method as for the top rail. See Figure 3 for a typical guard assembly.

4.3.2 Bracketed Component Assembly: The bracket utilized to attach the R-Rail and T-Rail top rail components shall be attached through the post sleeve into the post insert with four No. 8 by $1\frac{1}{2}$ -inch (38 mm) stainless steel screws. The T-Rail and R-Rail top rail components shall be reinforced

as described in Sections 3.3.1.2 and 3.3.1.3, respectively. When attaching the Rectangular top rail component utilizing a bracketed component assembly, the Rectangular top rail shall be attached in a similar manner as the R-Rail and T-Rail. After the top rail component is inserted into the bracket, two No. 8 by $1\frac{1}{2}$ -inch (38 mm) stainless steel screws are used as attachment and an architectural bracket cover is snapped into place to provide a finished appearance. See Figure 3 for a typical railing assembly.

4.3.3 Routed Component Assembly: In addition to the bracketed component assembly described in Section 4.3.2, the Rectangular top rail is permitted to be installed utilizing a post sleeve that is routed to accept the Rectangular rail. The top rail is reinforced utilizing the aluminum P-channel insert and placed into the routed holes until the tabs lock into place. The rail is fastened with a No. 8 by $1\frac{1}{2}$ -inch-long (38 mm) stainless steel panhead screw in a predrilled hole inside the post through the top of the top rail. The bottom rail is installed in a similar manner except the No. 8 screw is not installed as described for the top rail installation.

4.3.4 Structural: The Rectangular, T-Rail and R-Rail systems will resist the loads specified in the applicable code when installed at a maximum length as prescribed in Table 3. See Figure 4 for a typical post base installation.

5.0 CONDITIONS OF USE

The Gorilla Deck® and Rectangular, T-Rail and R-Rail systems described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The Gorilla Deck® described in this report is limited to exterior use as a deck board for balconies, porches and decks of Type V-B construction (IBC) and structures constructed in accordance with the IRC.
- 5.2 The Rectangular, T-Rail and R-Rail systems described in this report are limited to exterior use as guards for balconies, porches, and decks of structures of Type V-B construction (IBC) and structures constructed in accordance with the IRC.
- 5.3 Installation shall comply with this report, the manufacturer's published installation instructions and the applicable code. Only those fasteners and fastener configurations described in this report have been evaluated for the installation of the Gorilla Deck® and Rectangular, T-Rail and R-Rail systems. When the manufacturer's published installation instructions differ from this report, this report shall govern.
- 5.4 The use of the Gorilla Deck® as a component of a fire-resistance-rated assembly is outside the scope of this report.
- 5.5 The Gorilla Deck® has been evaluated for installation across a minimum of three supports (two-span condition). If installed in a single span condition, the maximum allowable uniform load specified in Table 1 shall be reduced 5 percent.
- 5.6 The use of post inserts other than those described in this report is outside the scope of this report.
- 5.7 The compatibility of the fasteners and other metal hardware with the supporting construction, including chemically treated wood, is outside the scope of this report.
- 5.8 Adjustment factors outlined in the AF&PA *National Design Specification* and applicable codes shall not apply to the allowable capacity and maximum spans for the Gorilla Deck® and Rectangular, T-Rail and R-Rail systems.

- 5.9** The use of the Gorilla Deck® as a stair tread is outside the scope of this report.
- 5.10** The Gorilla Deck® and Rectangular, T-Rail and R-Rail systems shall be fastened directly to supporting construction. Where required by the code official, engineering calculations and construction documents consistent with this report shall be submitted for approval. The calculations shall 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 shall contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.11** The Gorilla Deck® and Rectangular, T-Rail and R-Rail systems are produced in Birmingham, Alabama, under a quality control program with inspections by Architectural Testing, Inc. (AA-676).

6.0 EVIDENCE SUBMITTED

Data establishing compliance of the guard system with the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) (AC174), dated April 2002 (editorially revised July 1, 2004; corrected December 2004).

7.0 IDENTIFICATION

The Gorilla Deck® described in this report is identified on each individual piece by a stamp bearing the manufacturer's name (Homeland Vinyl Products, Inc.); the product name; the date of manufacture; the name of the inspection agency (Architectural Testing, Inc.); and the evaluation report number (ESR-1657).

The Rectangular, T-Rail and R-Rail systems described in this report are identified on each package by a stamp bearing the manufacturer's name (Homeland Vinyl Products, Inc.); the product name; the date of manufacture; the name of the inspection agency (Architectural Testing, Inc.); and the evaluation report number (ESR-1657).

TABLE 1—DECK BOARD SPAN RATING

DECKBOARD	MAXIMUM SPAN (in.)	ALLOWABLE CAPACITY (lbf/ft ²) ^{2,3}
Gorilla Deck®	24	100

For SI: 1 inch = 25.4 mm, 1 lbf/ft² = 47.9 Pa.

¹Maximum span shall be measured center-to-center of the supporting construction.

²Maximum allowable capacity has been adjusted for durability. No further increases are permitted.

³The Gorilla Deck™ has been evaluated for installation across a minimum of three supports (two-span condition). If installed in a single span condition, the maximum allowable uniform load shall be reduced 5 percent.

TABLE 2—MAXIMUM GUARDRAIL SPAN²

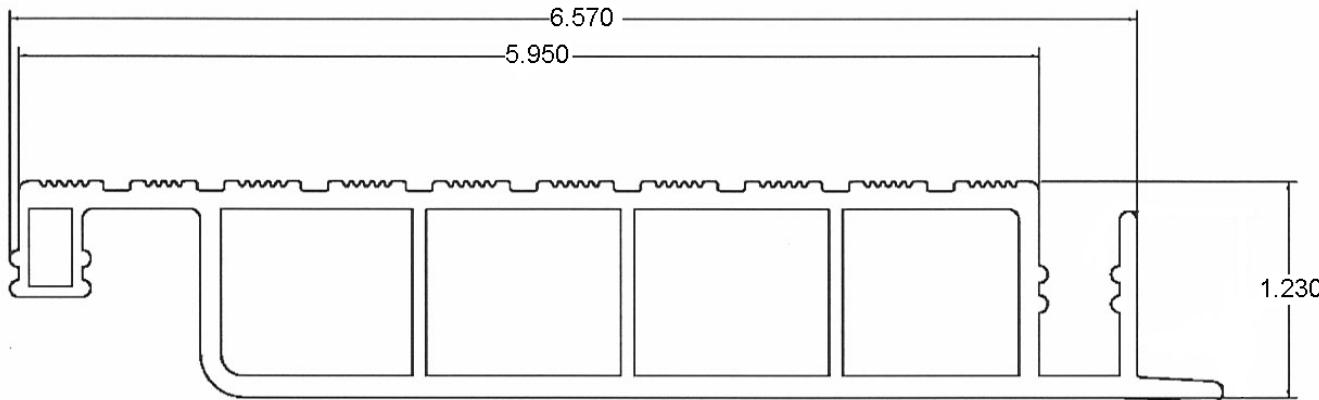
PRODUCT NAME	APPLICABLE BUILDING CODE ³		MAXIMUM SPAN (ft-in) ¹
	IBC	IRC	
Rectangular Rail	Yes	Yes	8' - 0"
T-Rail	Yes	Yes	8' - 0"
R-Rail	Yes	Yes	8' - 0"

For SI: 1 inch = 25.4 mm, 1 ft = 305 mm.

¹Maximum span shall be measured from center-of-post to center-of-post or from center-of-post to edge-of-structure.

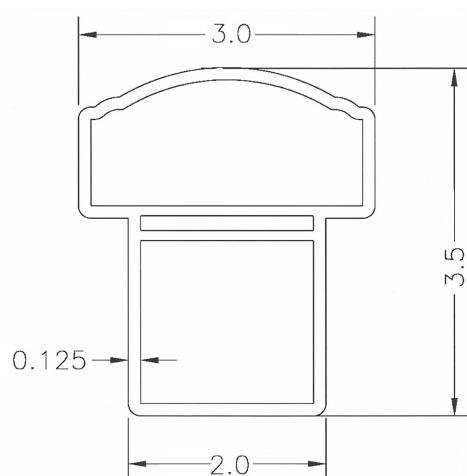
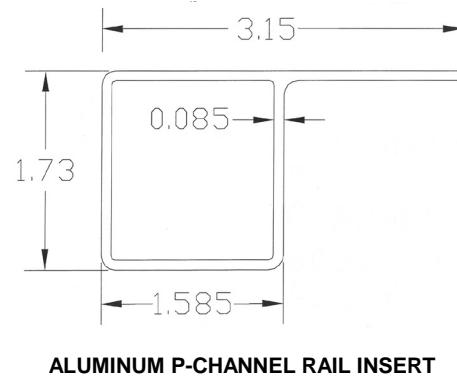
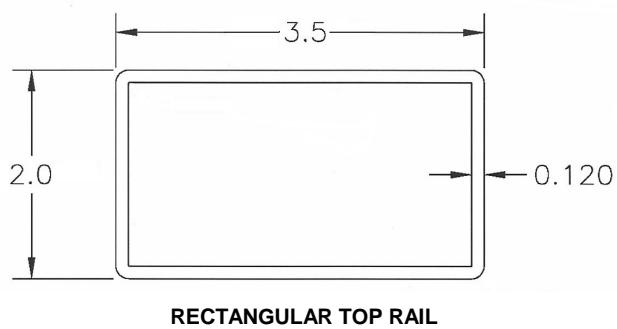
²Maximum allowable span has been adjusted for durability. No further increases are permitted.

³Indicates compliance with the respective building codes.

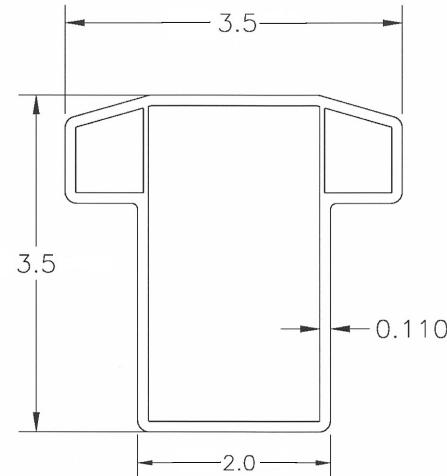


For SI: 1 inch = 25.4 mm.

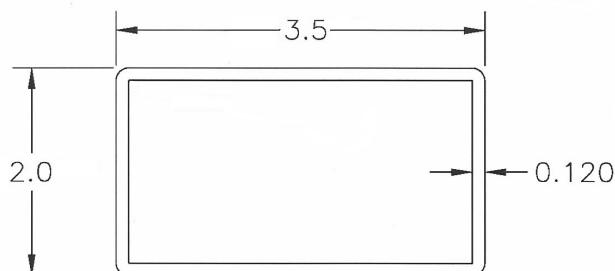
FIGURE 1—GORILLA DECK® CROSS SECTION



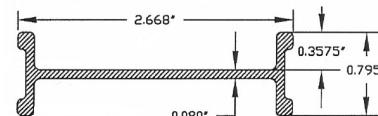
R-RAIL RAIL



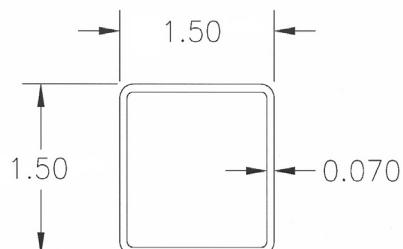
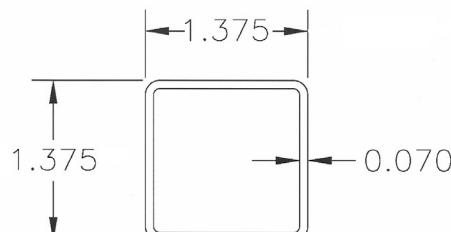
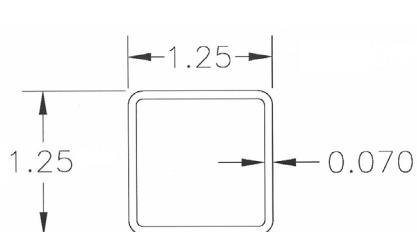
T-RAIL RAIL



BOTTOM RAIL



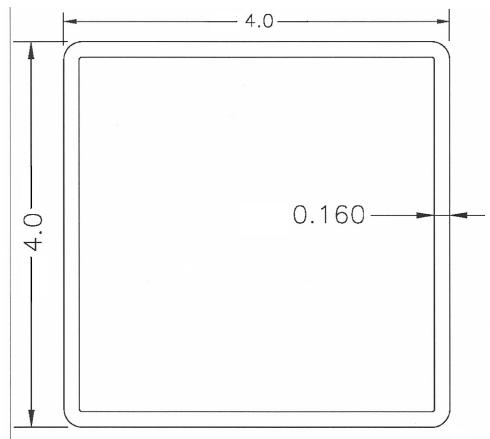
ALUMINUM RAIL INSERT



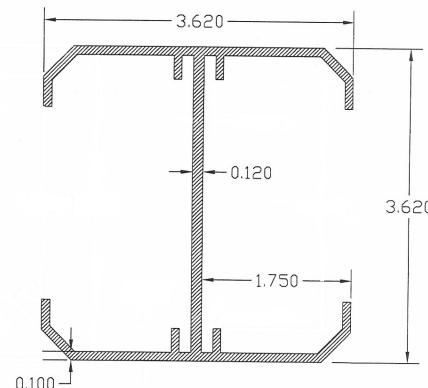
BALUSTERS

For SI: 1 inch = 25.4 mm.

FIGURE 2—GUARDRAIL COMPONENT PROFILES



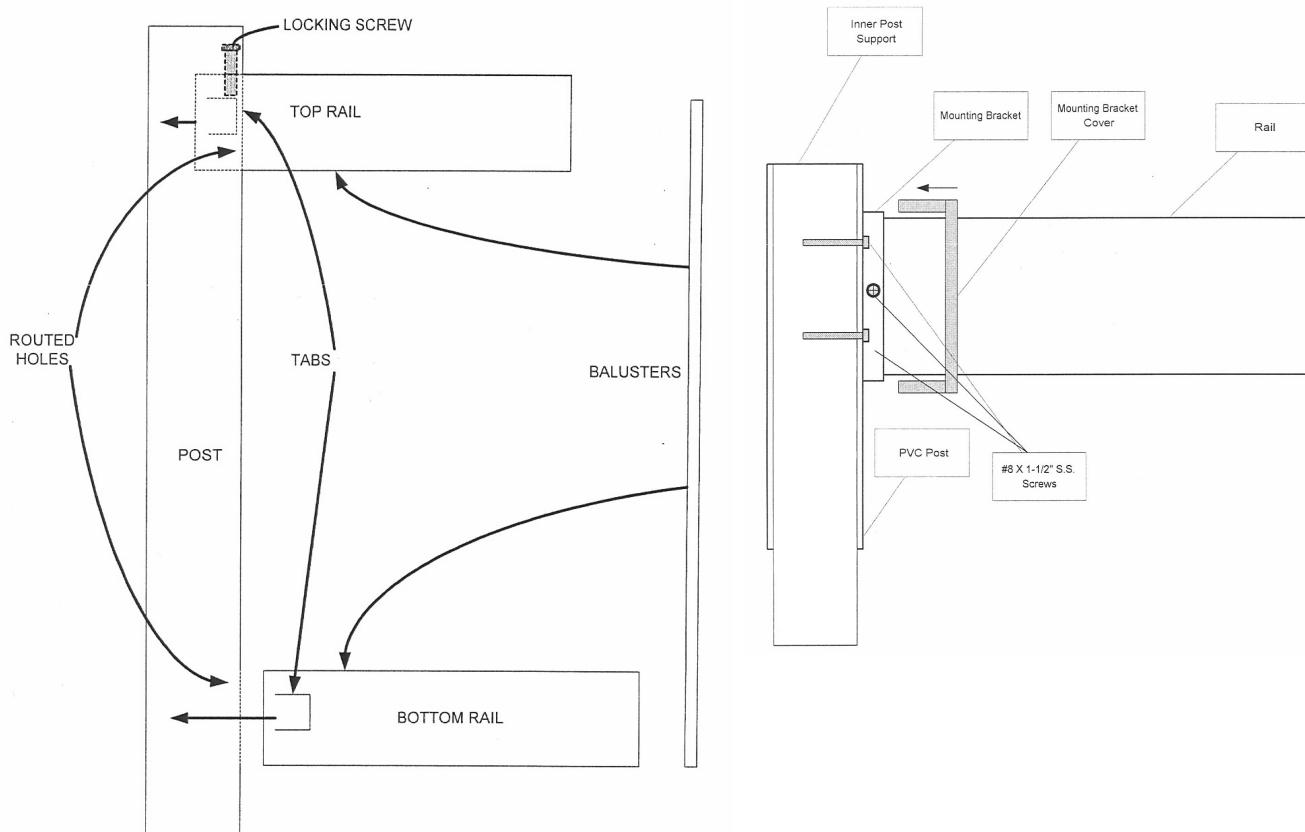
POST SLEEVE



ALUMINUM POST INSERT

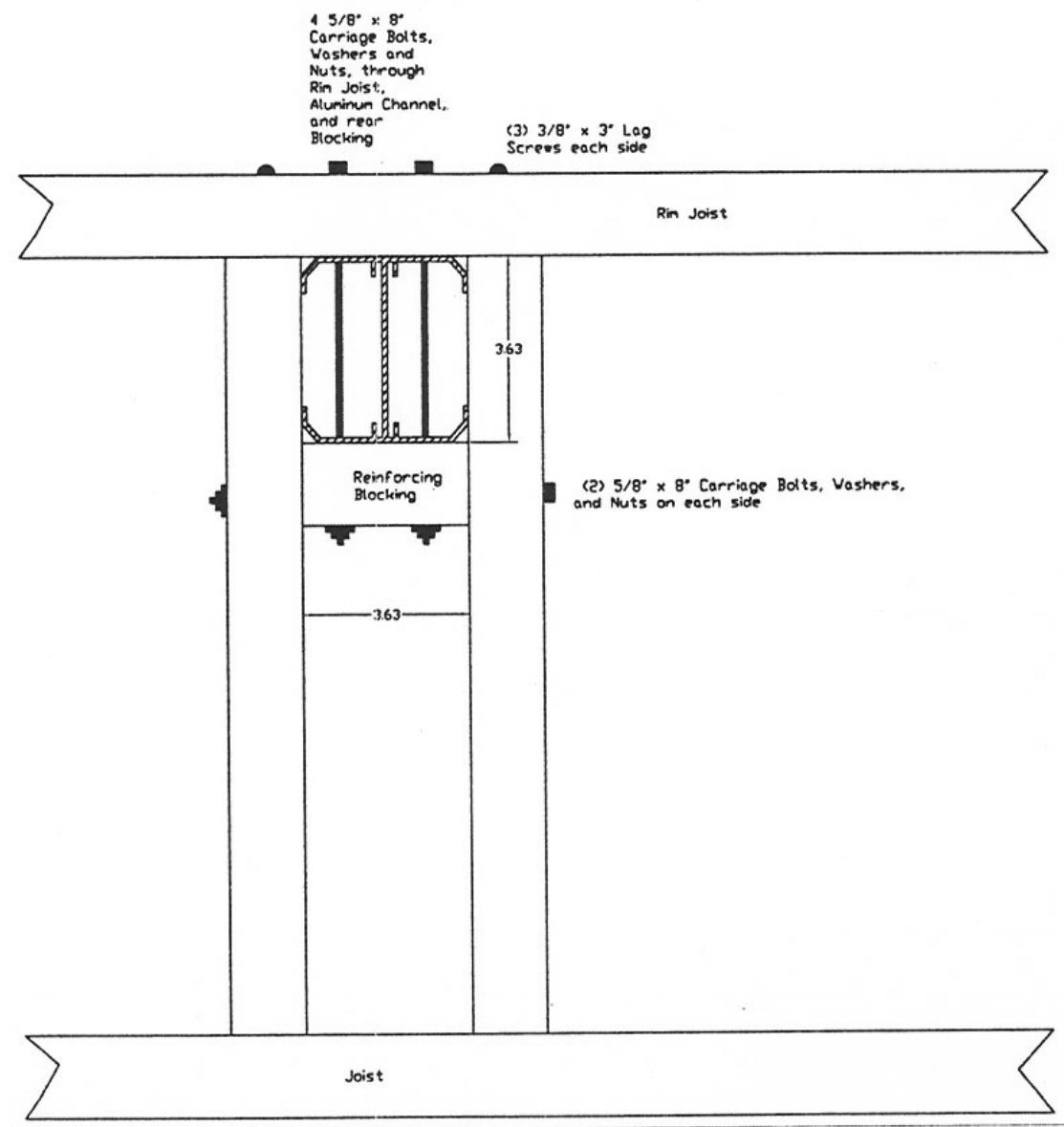
For SI: 1 inch = 25.4 mm.

FIGURE 2—GUARDRAIL COMPONENT PROFILES (Continued)



For SI: 1 inch = 25.4 mm.

FIGURE 3—GUARDRAIL SYSTEM ASSEMBLY



For SI: 1 inch = 25.4 mm.

FIGURE 4—ALUMINUM POST INSERT BASE INSTALLATION