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DIVISION: 06—WOOD AND PLASTICS
Section: 06610—Plastic Railings and Guards

REPORT HOLDER:

GSW BUILDING PRODUCTS
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EVALUATION SUBJECT:

YARDCRAFTERS™ RAILING 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 Yardcrafters™ Railing Systems described in this report are limited to exterior use as guardrail systems for balconies, porches, and decks of Group R Occupancy buildings of Type V-B construction (IBC) and structures constructed in accordance with the IRC.

3.0 DESCRIPTION

3.1 General:

The Yardcrafters™ Railing Systems are fabricated and assembled from poly(vinyl-chloride) (PVC) components, stainless steel fasteners, injection-molded components, and galvanized steel post and rail inserts. The Yardcrafters™ Railing Systems are manufactured in three colors: white, clay and sand. The Yardcrafters™ Railing Systems are manufactured with a system height of 42 inches (1067 mm) and center-of-post to center-of-post length as listed in Table 1. The top rail is a combination of a five-sided, 3-by-1½-inch (76 by 38 mm), bread loaf-shaped PVC cover with a wall thickness of 0.10 inch (2.5 mm) and a G90 galvanized, U-shaped, ASTM A 500 grade 50, steel insert. The steel thicknesses are No. 16 gage [base-metal thickness of 0.060 inch (1.52 mm)] for the 6-foot-long (1828 mm) and No.12 gage [base-metal thickness of 0.108 inch (2.74 mm)] for the 8- and 10-foot-long (2438 and 3048 mm, respectively) railing systems. The bottom rail is comprised of a 1.695-by-3.245-

inch PVC cover with a wall thickness of 0.10 inch (2.5 mm) and a G90 galvanized, U-shaped, ASTM A 500 grade 50, steel insert with a steel thickness of No. 18 gage [base-metal thickness of 0.047 inch (1.19 mm)] for all three rail lengths. The PVC balusters are 1½-inch-square (38 mm) with a wall thickness of 0.090 inch (2.3 mm). The ends of the baluster are fabricated with angular clips which provide positive attachment to the top and bottom rails. The post is comprised of a 4-by-4-inch (102 by 102 mm) square PVC cover with a wall thickness of 0.140 inch (3.6 mm) combined with a post-insert assembly fabricated from G90 galvanized steel components as described in the manufacturer's quality control manual. See Figure 1 for typical component cross sections.

3.2 Durability:

When subjected to weathering, insect attack, and other decaying elements, material used to manufacture the Yardcrafters™ Railing System is equivalent in durability to preservative-treated or naturally durable lumber when used in locations described in Section 2.0 of this report. The Yardcrafters™ Railing System 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 Surface-burning Characteristics:

When tested in accordance with ASTM E 84, the Yardcrafters™ Railing System has a flame-spread index of no greater than 200.

4.0 INSTALLATION AND DESIGN

4.1 Installation:

Installation of the Yardcrafters™ Railing System shall comply with this report and the manufacturer's published installation instructions. If the instructions differ from this report, this report shall govern. The manufacturer's published installation instructions shall be available at the jobsite at all times during installation. See Figure 3 for typical post base installation requirements. The steel top rail insert is inserted into the PVC top rail sleeve with the legs of the U-shape pointing downward. The top rail is inserted into an injection-molded bracket and attached to the bracket by drilling a ⅛-inch-diameter (3.2 mm) pilot hole through the midpoint of the bottom of the bracket and inserting a No. 8 by ¾-inch-long (19.1 mm) screw. The bracket is fastened to the PVC post sleeve with four ¼-by-¾-inch (6.4 by 19.1 mm) hex bolts with a washer and nut on each bolt. The bottom rail insert and bottom rail are fastened in a similar manner except the rail insert is installed with the legs of the U-shaped section pointing upwards. The balusters are pushed into the routed openings in the top and bottom rail sleeves. The angular locking tabs with which the balusters are fabricated provide the method for positive attachment to the rails and are spaced to provide a maximum gap, between balusters, of approximately 3½ inches (89 mm). The post sleeve is

installed over the steel post anchor where four leveling screws are provided at the top of the insert for system alignment. The steel post base is attached to concrete utilizing four $\frac{3}{8}$ -by-3-inch (9.5 by 76 mm) stainless steel concrete anchors provided by the railing manufacturer. See Figure 2 for a typical guard assembly detail.

4.2 Structural:

The Yardcrafters™ Railing System will resist the loads specified in the applicable codes when installed at a maximum center-to-center post spacing as prescribed in Table 1. When a guardrail is supported on one or both ends by the supporting construction other than a post with the galvanized steel insert, the maximum distance shall be measured from edge-of-structure to edge-of-structure at a maximum distance as indicated in Table 1.

5.0 CONDITIONS OF USE

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

- 5.1 The use of the Yardcrafters™ Railing System shall be limited to exterior use as a guardrail system for balconies, porches and decks of Group R Occupancy buildings of Type V-B (IBC) and structures constructed in accordance with the IRC.
- 5.2 Installation complies 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 Yardcrafters™ Railing System. When the manufacturer's published installation instructions differ from this report, this report shall govern.
- 5.3 The compatibility of the fasteners, metal post mount components and other metal hardware with the supporting construction, including chemically treated wood, is outside the scope of this report.
- 5.4 The use of the PVC post sleeve installed over inserts other than those described in this report, or the use of the PVC post sleeve in guardrails where the post-to-post spacing is greater than 8 feet (2438 mm), is outside the scope of this report.
- 5.5 The use of the Yardcrafters™ Railing System as a handrail is outside the scope of this report.
- 5.6 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 Yardcrafters™ Railing System.
- 5.7 The Yardcrafters™ Railing System shall be directly fastened 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.
- 5.8 The Yardcrafters™ Railing System is fabricated and packaged in Barrie, Ontario, under a quality control program with inspections by Intertek Testing Services NA Ltd. (AA-691).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) (AC174), approved April 2002 (editorially updated July 1, 2004; corrected December 2004).

7.0 IDENTIFICATION

The Yardcrafters™ Railing System described in this report shall be identified on each package by a stamp bearing the manufacturer's name (GSW Building Products), the product type, the name of the inspection agency [Intertek Testing Services NA Ltd. (Warnock-Hersey)] and the ICC-ES evaluation report number (ESR-1738).

TABLE 1—MAXIMUM GUARDRAIL SYSTEM SPANS^{3,4}

PRODUCT NAME	APPLICABLE BUILDING CODE ⁵		MAXIMUM SPAN (ft-in) ¹	
	IBC	IRC	W/POST ¹	W/O POST ²
Yardcrafters™ Railing System (6')	Yes	Yes	6-0	5-8
Yardcrafters™ Railing System (8')	Yes	Yes	8-0	7-8
Yardcrafters™ Railing System (10')	Yes	Yes	N/A	10-0

For SI: 1 inch = 25.4 mm; 1 foot = 305 mm.

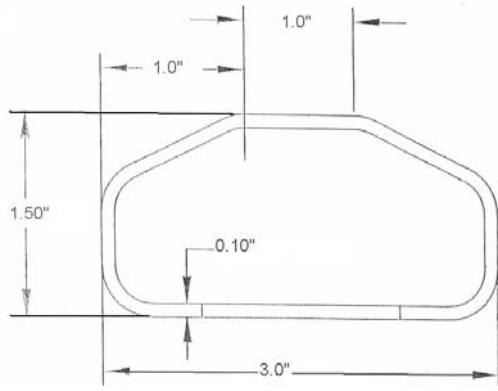
¹Maximum span is measured center-to-center of the posts or from edge-of-building to center-of-post or where the rail is supported.

²Maximum span is measured from edge-of-structure to edge-of-structure.

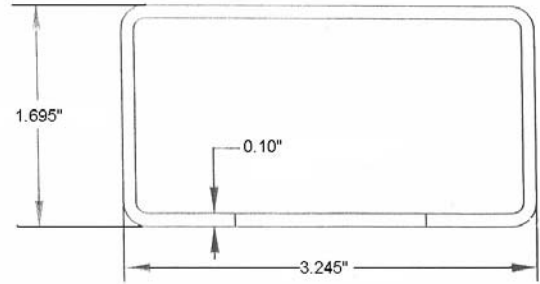
³Maximum allowable span is adjusted for durability. No further increases are permitted.

⁴The ability of the supporting construction to resist the reactionary loads shall be confirmed by the code official.

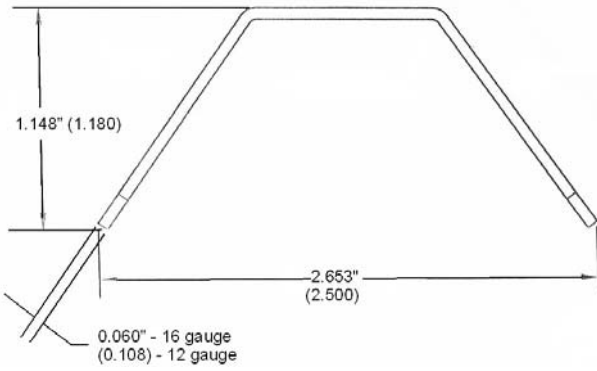
⁵Indicates compliance with the respective building codes.



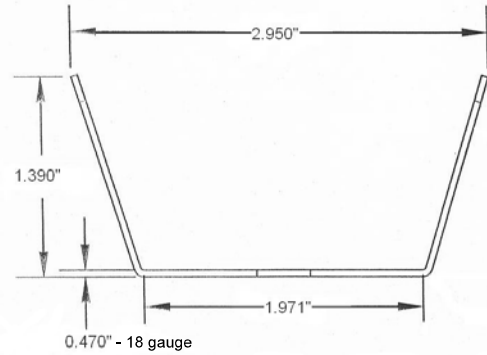
TOP RAIL



BOTTOM RAIL

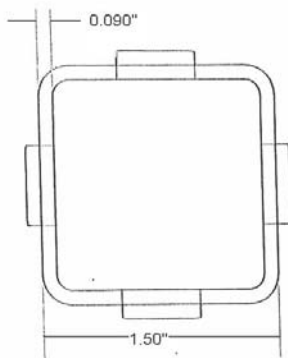


TOP RAIL INSERT

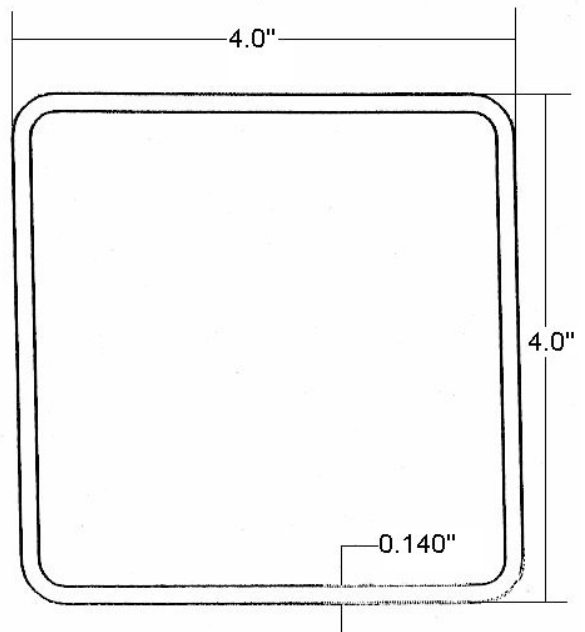


BOTTOM RAIL INSERT

Values shown in brackets are for 8' and 10' rail reinforcement.



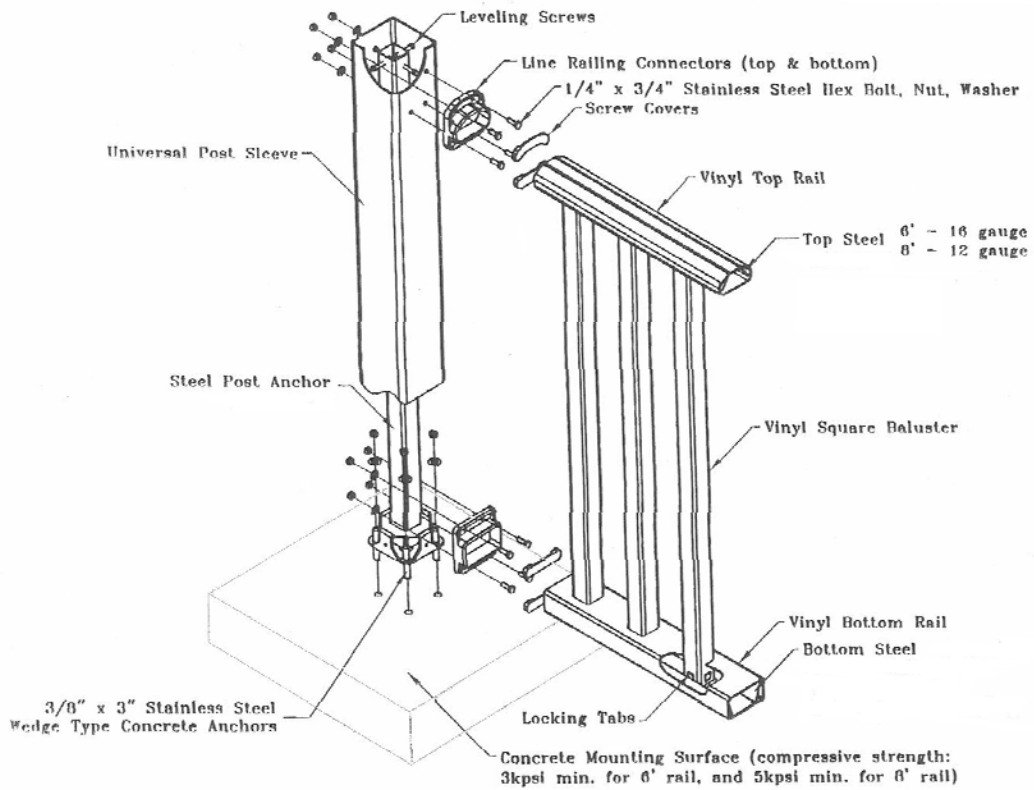
BALUSTER



POST SLEEVE

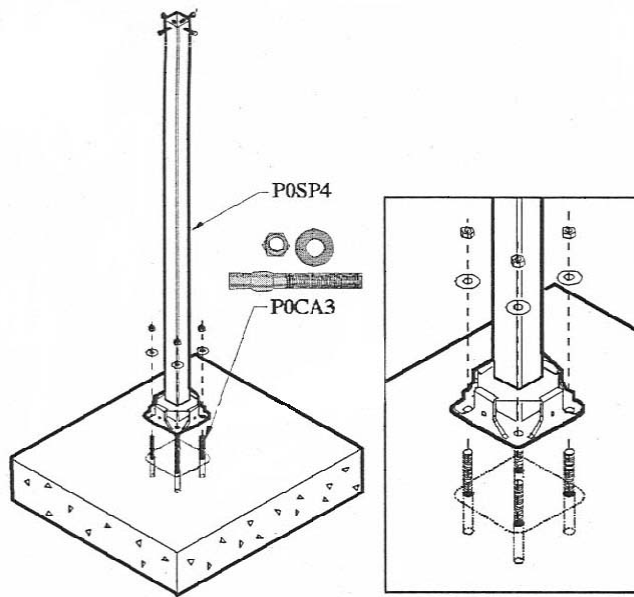
For SI: 1 inch = 25.4 mm.

FIGURE 1—YARDCRAFTERS™ RAILING SYSTEM COMPONENT PROFILES



For SI: 1 inch = 25.4 mm.

FIGURE 2—YARDCRAFTERS™ RAILING SYSTEM ASSEMBLY



For SI: 1 inch = 25.4 mm.

FIGURE 3—YARDCRAFTERS™ POST BASE ASSEMBLY