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Legacy report on the 2000 International Building Code®, the 2000 International Residential Code®, the BOCA® National Building Code/1999, the 1999 Standard Building Code®, the 1997 Uniform Building Code™ and the 1998 International One- and Two-Family Dwelling Code®

DIVISION: 06—WOOD AND PLASTICS
Section: 06500—Structural Plastics
Section: 06610—Plastic Railings and Guards

REPORT HOLDER:

WESTECH® BUILDING PRODUCTS, INC.
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EVALUATION SUBJECT:

VINYL GUARDRAIL SYSTEMS (SENTINEL™ AND RELIANT™) AND PRESIDIO™ PVC DECK SYSTEMS

1.0 SUBJECT

Vinyl Guardrail Systems (Sentinel™ and Reliant™) and Presidio™ PVC Railing and Deck Systems.

2.0 PROPERTY FOR WHICH EVALUATION IS SOUGHT

- 2.1 Structural Performance
2.2 Durability
2.3 Surface-Burning Characteristics

3.0 DESCRIPTION

Westech® Building Products, Inc. Vinyl Guardrail Systems and Presidio™ PVC Deck Systems are extruded utilizing PVC material complying with ASTM F 964, Cell Class 11333 construction, into guard rails, interlocking floor plank (deck board), and stair tread components.

3.1 Guard

The Westech® Building Products, Inc. Vinyl Guardrail Systems are available in two different types of profile kits and are intended to serve as 36-inch (914 mm) and 42-inch (1067 mm) high guards for exterior balconies, porches, decks and similar appendages on structures of combustible construction. The 8 and 10 foot (2440 and 3050 mm) Sentinel™ Rail kit is provided with the reinforced Alzar profile top rail and an unreinforced rectangular bottom rail. The 8

and 10 foot (2440 and 3050 mm) Reliant™ Rail kit is provided with a reinforced rectangular top rail and an unreinforced rectangular bottom rail. In addition, a 6-foot (1830 mm) unreinforced top rail is manufactured in both the Alzar and webbed rail profiles. The guardrail systems are comprised of the following components; see Figure 4 of this report for details:

- A 3 1/2 x 3 1/2-inch (89 x 89 mm) Alzar top rail only profile manufactured in maximum 10 foot (3050 mm) lengths.
A 4 x 4 inch (102 x 102 mm) square post sleeve with a wall thickness of 0.160 inches (4.1 mm)
A 2 x 3 1/2-inch (51 x 89 mm) rectangular top/bottom webbed rail profile with a wall thickness of 0.110 inches (2.8 mm) manufactured in maximum 10 foot (3050 mm) lengths.
1 1/2 x 1 1/2-inch (38 x 38 mm) square balusters with a minimum wall thickness of 0.080 inches (2.0 mm).
(Alternate baluster sections include a 1 1/2 x 1 1/2-inch (38 x 38 mm) colonial balusters with a minimum wall thickness of 0.080 inches (3.1 mm) and a 1 1/2-inch (38 mm) maximum diameter fluted baluster with a minimum wall thickness of 0.080 inches (2.0 mm)).
A 3.588 x 3.588-inch (91 x 91 mm) T6061 internally braced C-shaped aluminum post insert with a wall thickness of 0.10 inches (2.5 mm).
A 1.7 x 1.9-inch (43 x 48 mm) U-shaped T6061 aluminum rail insert (for 8 and 10 foot (2440 and 3050 mm) Reliant™ rail kits only) with a wall thickness of 0.080 inches (2.0 mm).
A 3.23 x 0.6-inch (82 x 15.2 mm) T6061 aluminum top rail insert (for 8 and 10 foot (2440 and 3050 mm) Sentinel™ rail kits only) with a wall thickness of 0.125 inches (3.2 mm).
An optional 32-inch high steel post surface mount.

3.2 Deck boards

Westech® Building Products, Inc. Presidio™ PVC Deck Systems are utilized as an alternative flooring surface for exterior use on balconies, porches, decks, stair treads and similar appendages for residential buildings of combustible construction where the floor/ceiling assemblies are permitted to be unprotected construction. The deck boards are manufactured with a grooved and textured walking

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surface. The Westech® Building Products, Inc. Presidio™ PVC Deck Systems are manufactured with a hollow core profile with exposed surface widths of 6 and 12-inch (152 and 305 mm) nominal dimensions and lengths of 16, 20, and 24-feet (4890, 6100, and 7310 mm).

The actual width dimensions are 5.68 inches (144 mm) and 11⁷/₈ inches (302 mm), respectively. Both profiles have an actual thickness of 1¹/₂ inches (38 mm). The 6-inch (152 mm) floor plank profile has four ribbed cell openings and is designed to interlock with the adjacent floor plank. The 12-inch (305 mm) floor plank is manufactured with six ribbed cell openings and is also designed to interlock with the adjacent planks, see Figure 1 of this report.

3.3 Structural Performance

3.3.1 Load

3.3.1.1 Guards

The Westech® Building Products, Inc. Vinyl Guardrail Systems, when installed as outlined in Section 4.1 of this report with a maximum center-to-center post spacing of 10-feet (3050 mm), have been determined to meet the respective loading requirements specified in the corresponding sections of the codes listed in Section 7.0 of this report. See Section 7.4 of this report for post installation limitations.

3.3.1.2 Deck boards

Westech® Building Products, Inc. Presidio™ PVC Deck Systems, when used as flooring, shall be limited to applications with a maximum span of 24 inches (610 mm) on center between support construction and a maximum uniformly distributed live loads of 100 lbf/ft² (4.8 kPa). See Section 4.2 of this report for specific fastener installation requirements.

3.3.1.3 Stair Treads

Westech® Building Products, Inc. Presidio™ PVC Deck Systems used as stair treads shall be limited to applications with a maximum span of 16 inches (406 mm) on center between supporting construction in a minimum of a two span condition. See Section 4.2 of this report for specific fastener installation requirements.

3.3.2 Uplift

Uplift capacity of the Westech® Building Products, Inc. Presidio™ PVC Deck Systems is limited to 79 lbf/ft² (3.8 kPa) based on a maximum support spacing of 24 inches (610 mm) on center or the normal withdrawal values of the decking supports as calculated in accordance with the applicable code-referenced design methods consistent with the support material, whichever is the lesser value. See Section 4.2 of this report for fastener installation requirements.

3.4 Durability

Westech® Building Products, Inc. Vinyl Guardrail Systems and Presidio™ PVC Deck Systems material is equivalent in durability to preservative-treated or naturally durable lumber when subjected to weathering, insect attack, and other decaying elements. As such, the Westech® Building Products, Inc. Vinyl Guardrail Systems and Presidio™ PVC Deck Systems material are permitted to be used as an alternative to preservative-treated or naturally durable lumber in accordance with the applicable code for decking and/or guard applications. Additionally, they are permitted to be used in direct contact with the ground.

3.5 Surface Burning Characteristics

The Westech® Building Products, Inc. Vinyl Guardrail Systems and Presidio™ PVC Deck Systems material exhibited a flame spread index (FSI) not more than 75 when tested in accordance with ASTM E 84.

4.0 INSTALLATION

Westech® Building Products, Inc. Vinyl Guardrail Systems and Presidio™ PVC Deck Systems shall be installed in accordance with the manufacturers published installation instructions and this report. A copy of these instructions shall be provided to the job site and made available at the request of the building official. Installation instructions contained in the manufacturer's published installation instructions that differ from this report have not been evaluated and are outside the scope of this report.

4.1 Guards

The aluminum line post stiffener or Standard Grade pressure treated Southern Yellow Pine nominal 4 × 4 inch (102 × 102 mm) post reinforcement is inserted into the vinyl post, then attached to the support substrate utilizing four 1/2 inch (12.7 mm) diameter galvanized carriage bolts, washers and nuts as shown in one of the two attachment methods indicated in Figure 2 of this report. Alternatively, a reinforced galvanized and powder coated steel surface mount is permitted to be bolted directly to concrete with a minimum 28 day strength of 4000 lbf/in² (28 mPa) utilizing four 1/2-inch (12.7 mm) diameter by 3-inch (76 mm) long sleeve anchors as shown in Figure 3 of this report. Note: the actual design strength and installation of the concrete anchorage is to be provided in accordance with Section 7.6 of this report. Bottom brackets are attached to the post using four stainless steel screws. The vinyl top and bottom rail is installed between the posts by inserting the ends into the bracket openings. The top and bottom rails are manufactured with routed openings to accept the vertical balusters. An aluminum insert is installed in the top rails of all 8 and 10-foot (2440 and 3050 mm) lengths prior to installation.

4.2 Deck boards & Stair treads

Westech® Building Products, Inc. Presidio™ PVC deck boards and stair treads are fastened to each support with a #8 × 1 1/2-inch (38 mm) long self-tapping wood screws through the flange located on one side of each deck board. Fasteners shall be stainless steel, hot-dipped zinc coated galvanized, or other approved corrosion resistant coating. Fasteners shall maintain a minimum end distance of 1/2-inch (12.7 mm). Installation of the fasteners in the supporting construction shall follow the requirements associated with the design procedures outlined the 1997 edition of *AF&PA National Design Standard*.

Each end of each Presidio™ PVC Deckboard shall bear on the supporting construction a minimum of 1 1/2 inches (38 mm). The maximum allowable overhang shall be 1 1/2 inches (38 mm). The unfastened edge is installed by interlocking with the adjacent deck board. End gaps between abutting planks shall allow 1/8-inch (3.2 mm) for every 20° F (11.1° C) difference in installation temperature and the highest anticipated ambient temperature. The deck boards shall not cantilever past the end of the last support more than 1 1/2 inches (38 mm).

5.0 IDENTIFICATION

Westech® Building Products, Inc. Vinyl Guardrail Systems and Presidio™ PVC Deck Systems, manufactured in accordance with this report shall bear the following identification:

- 5.1 "See ICC-ES Legacy Report No. NER-710."
- 5.2 Additionally, each piece of Westech® Building Products, Inc. Vinyl Guardrail Systems and Presidio™ PVC Deck Systems, or packaging, shall have a permanent label containing the mark of the third-party inspection agency, Architectural Testing Inc. (ATI).

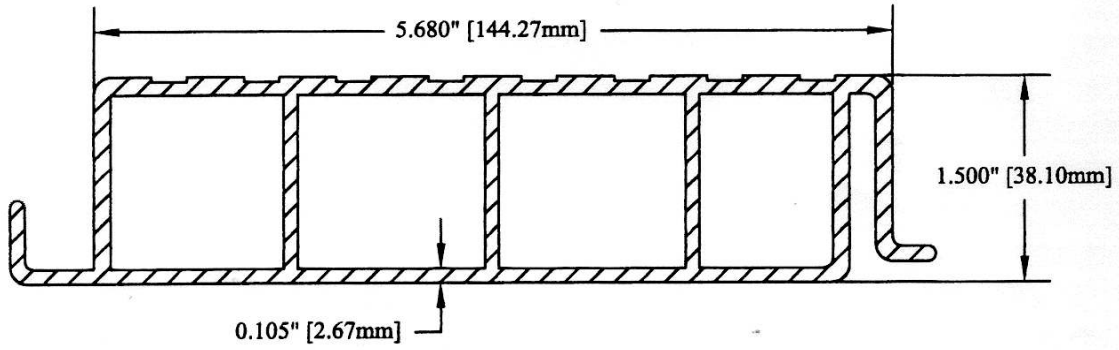
6.0 EVIDENCE SUBMITTED

- 6.1 A signed Third Party Inspection agreement between ATI and Westech® Building Products, Inc. for the Evansville, Indiana manufacturing facility, dated May 14, 2004.
- 6.2 Metals and Materials Engineers, Test report No. 10078, titled *Performance Testing on Several Sections of Guardrail at Varying Lengths and Heights*, dated December 25, 2001, containing structural test data for the Alzar rail section.
- 6.3 Metals and Materials Engineers, Test report No. 10192, titled *Performance Testing on Several Sections of Guardrail at Varying Lengths and Heights*, dated February 11, 2002, containing structural test data for the rectangular rail section and mildew resistance and flame-spread test data for the Westech® Building Products, Inc. Vinyl Guardrail Systems material.
- 6.4 Metals and Materials Engineers, Test report No. 10916, titled *Report of Polymer decking Characterization for Accreditation Through Various Evaluation Services*, dated November 18, 2002, containing structural, temperature effects, fastener withdrawal, termite resistance, mildew and mold resistance, accelerated weathering, moisture resistance, flame spread and uplift resistance test data for the Presidio™ PVC Deck Systems material.
- 6.5 Technical drawings of the Alzar rail, the 2 × 3½ inch (51 × 89 mm) webbed rectangular rail, the fluted spindle and the square spindle profiles, dated November, 2002.
- 6.6 The Presidio™ PVC Deck Systems and the Westech® Building Products, Inc. Vinyl Guardrail Systems (Sentinel™ Rail and the Reliant™ Rail) installation instructions and mechanical drawings, dated July 2002.
- 6.7 Quality Control Manual dated May 11, 2004, signed by Glenn Syowitz of Westech Building Products, Inc. and David Moyer of Architectural Testing Inc.
- 6.8 Metals and Materials Engineers, Test report No. 11570r, titled *Performance Testing of Guardrail and Decking Sections*, dated October 30, 2003, containing structural test data for the guardrail, step and deck board products for the Westech® Building Products, Inc. Vinyl Guardrail Systems and Presidio™ PVC Deck Systems.
- 6.9 Westech® Building Products, Inc. Vinyl Guardrail Systems post base installation instructions, dated November 2003.

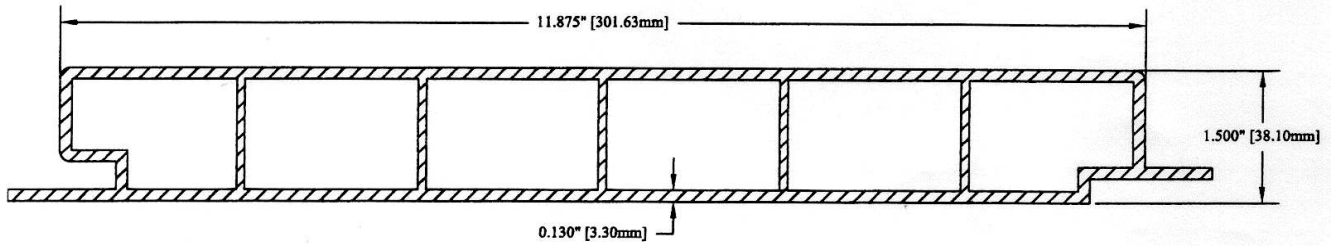
7.0 CONDITIONS OF USE

The ICC-ES Subcommittee for the National Evaluation Service finds that the Westech® Building Products, Inc. Vinyl Guardrail Systems and Presidio™ PVC Deck Systems, described in this report, comply with or are suitable alternatives to the systems specified in the 2000 *International Building Code*®, the 2000 *International Residential Code*®, the BOCA® *National Building Code/1999*, the 1999 *Standard Building Code*®, the 1997 *Uniform Building Code*™ and the 1998 *International One- and Two-Family Dwelling Code*®, subject to the following conditions:

- 7.1 Only those fasteners and fastening methods described in this report have been evaluated for the installation of the Westech® Building Products, Inc. Presidio™ PVC Deck Systems.
- 7.2 The Westech® Building Products, Inc. Presidio™ PVC Deck Systems and Vinyl Guardrail Systems shall be installed with the manufacturer's published installation instructions and this report. When the installation instructions differ from this report, the evaluation of the product is outside the scope of this report.
- 7.3 Westech® Building Products, Inc. Presidio™ PVC Deck Systems has only been evaluated for installation in a direction perpendicular to the supporting construction.
- 7.4 The use of the Westech® Building Products, Inc. post base attachment when fastened to concrete is limited to a guard span of 10-feet (3050 mm) center to center.
- 7.5 The use of Westech® Building Products, Inc. Presidio™ PVC Deck Systems as a component of a fire-resistance-rated assembly is outside the scope of this report.
- 7.6 The compatibility of the fasteners, metal post mount components and other metal hardware components with the supporting construction material is subject to the specific approval of the code official.
- 7.7 Westech® Building Products, Inc. Presidio™ PVC Deck Systems shall be directly fastened to supporting construction having adequate strength and stiffness. Engineering calculations and construction documents consistent with this report shall be submitted to the local code official for approval. The calculations shall verify that the supporting construction complies with building code requirements and the building plans shall show the method of attachment. The individual preparing such documents shall possess the necessary credentials regarding competency and qualifications as required by the applicable code and the professional registration laws of the state where the construction is undertaken.
- 7.8 Adjustment factors outlined in the AFPA 1997 *National Design Standard* and applicable codes shall not apply to the allowable design values and spans for Westech® Building Products, Inc. Presidio™ PVC Deck Systems.
- 7.9 The Westech® Building Products, Inc. Vinyl Guardrail Systems were not evaluated for a use as a handrail.
- 7.10 This report is subject to periodic re-examination. For information on the current status of this report contact ICC-ES.



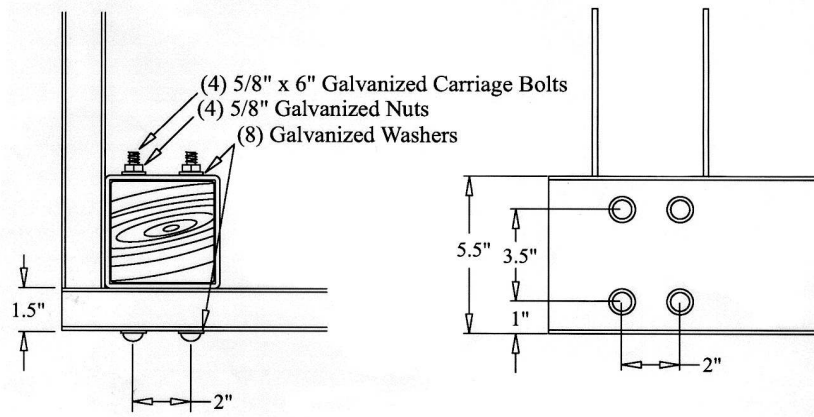
6-Inch Wide Deckboard Profile



12-Inch Wide Deckboard Profile

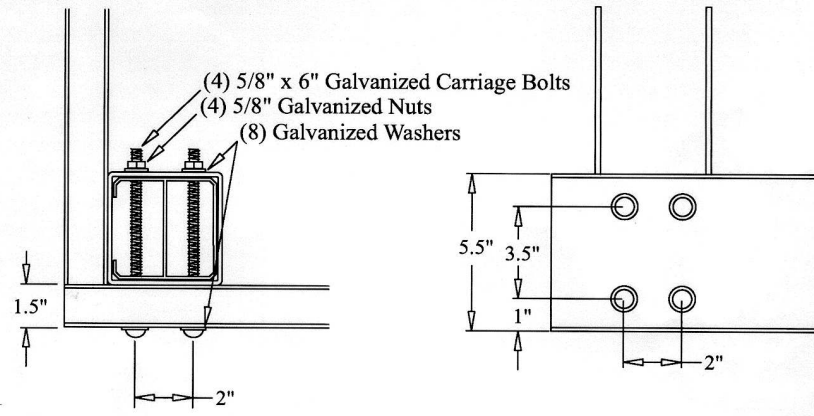
FIGURE 1*—DECKING CROSS SECTIONS

SI Units: 1 inch = 25.4 mm



(Bottom View)

(Side View)

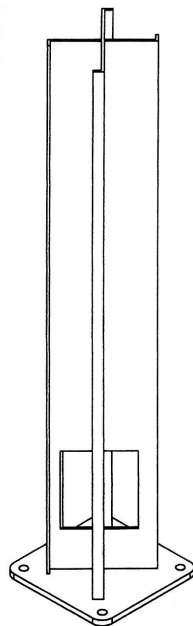


(Bottom View)

(Side View)

FIGURE 2*—POST BASE ATTACHMENT TO WOOD SUPPORTS

Steel Surface Mount



Post size 4 " Mount Height 32"

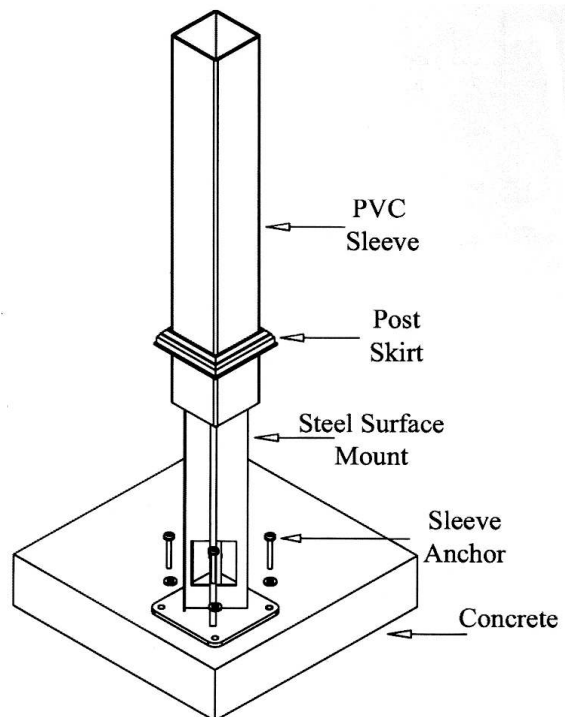
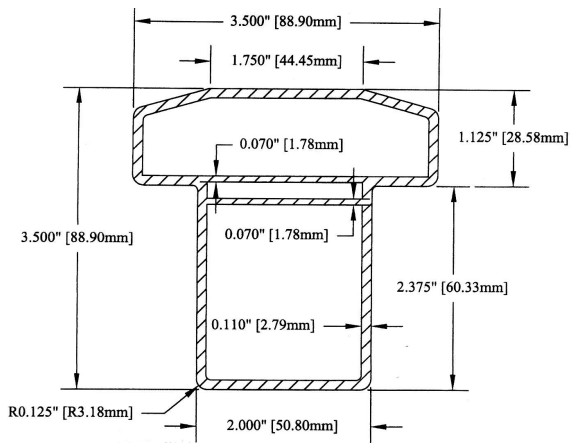
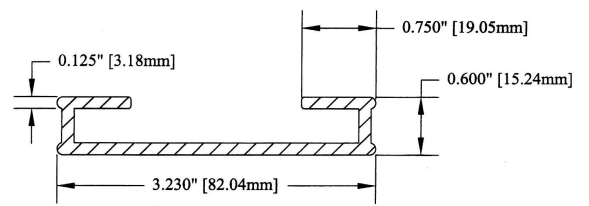


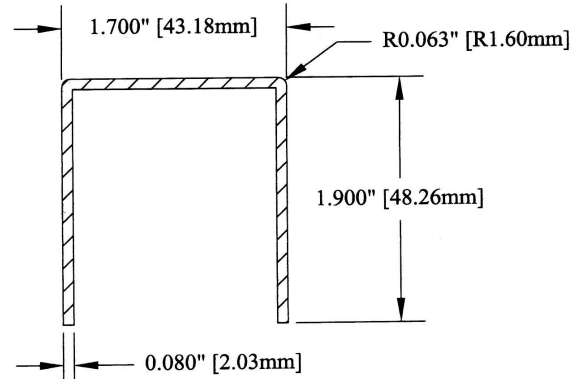
FIGURE 3*—POST BASE AND STEEL SURFACE MOUNT ATTACHMENT TO CONCRETE SUPPORT



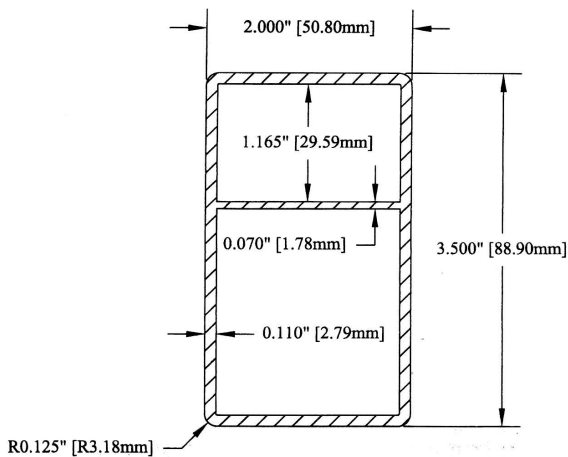
2 x 3.5 Alzar Rail



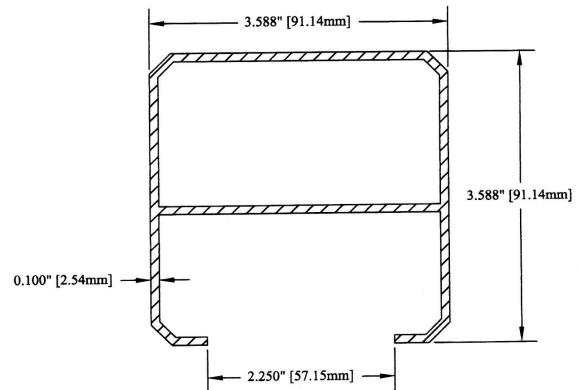
3.23 x .60 Aluminum - Rail Insert



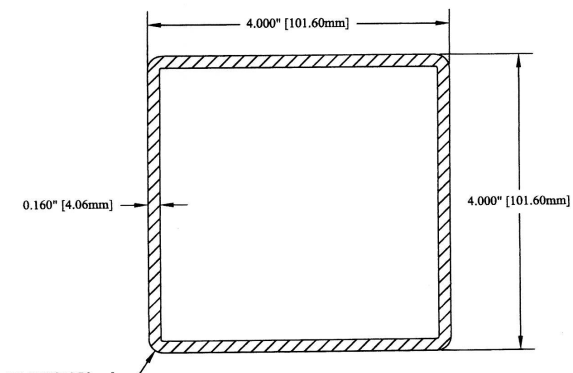
1.7 x 1.9 Aluminum - Rail Insert



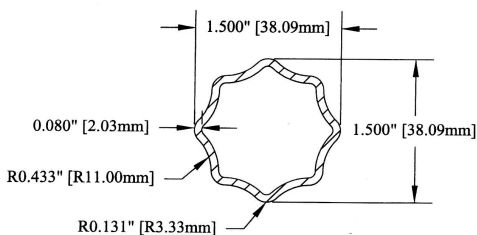
2 x 3.5 Webbed



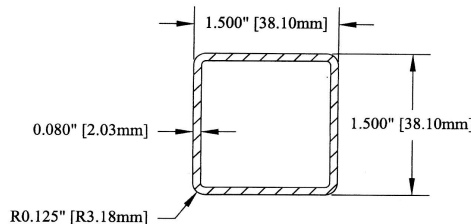
Aluminum Post Insert Gate for 4" Post



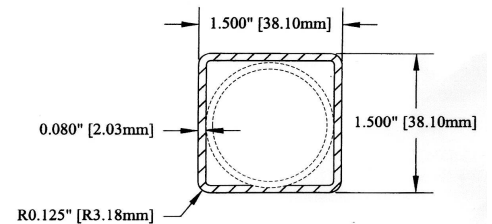
4 x 4 Post



1.5 x 1.5 Fluted Picket



1.5 x 1.5 Square Picket



1.5 x 1.5 Colonial Picket

**FIGURE 4*—WESTECH® BUILDING PRODUCTS, INC.
VINYL GUARDRAIL SYSTEMS AND PRESIDIO™ PVC DECK SYSTEM PROFILES**

*THESE DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY. THEY ARE NOT INTENDED FOR USE AS CONSTRUCTION DOCUMENTS FOR THE PURPOSE OF DESIGN, FABRICATION OR ERECTION.