



Elk Composite Building Products, Inc
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1.0 Subject

Elk Composite Building Products, Inc

Railways[®] Traditional Series Guardrail System

2.0 Research Scope

2.1. Building codes:

2006 International Building Code (IBC)

2006 International Residential Code (IRC)

1997 Uniform Building Code (UBC)

2.2. Properties:

Structural performance

Durability

Surface Burning

3.0 Description

3.1. General – *Elk Building Product, Inc., Railways*[™] Traditional Guard System is a guard or guardrail under the definitions of the referenced codes. It is intended for use at or near the open sides of elevated walking areas of buildings and walkways as required by the codes.

3.2. *Railways*[™] Traditional Guard System is a level guard with rail lengths up to 6 ft (72-inches) in length and a maximum installed height of 42 inches.

3.3. *Railways*[™] Traditional System is an assemblage of extruded components made of PVC resin and natural fiber composite material and a .015 in thick white PVC capstock.

3.4. The guard system includes two identical rails used as both the top and bottom rail, vertical balusters, non-structural 4 x 4 post sleeves, Uni-Ball[™] baluster connectors, rail to post brackets, support block, decorative moldings and post caps.

3.4.1. An extruded composite rail having an overall sectional dimension of 3.00 in wide by 2.25 in tall is used for both the upper and lower rails. See Figure 1.

3.4.2. *Railways*[™] Traditional Series baluster is extruded with a 1.38 in square sectional profile and 0.172 in wall thickness with chamfered corners. See Figure 2.

3.4.2.1. *Railways*[™] Traditional Series balusters are secured to the top and bottom rail with 1.20 in diameter Uni-Ball[™] connectors. See Figure 4.

3.4.3. The baluster spacing resulting from assemblies recognized in this report should provide spacing such that a 4 in diameter sphere cannot pass through the opening between balusters.

3.4.4. Top and bottom rails are attached to a 4x4 wood post sleeved with a 5x5 composite/PVC post sleeve via 0.122 in (3mm) Stainless Steel angle brackets. See Figures 3 and 5

3.4.5. A support block is installed between the lower rail and the deck surface, and midway between support posts. The single support block consist of a 1.38 in square composite/PVC baluster cut to the appropriate length. It is attached to the bottom of the lower rail with a Uni-Ball[™] connector.

3.4.6. A 5x5 non-structural post sleeve consisting of a 0.275" thick extruded composite/PVC material with ribs is utilized. See Figure 6.

4.0 Performance Characteristics

4.1. The *Railways*[™] Traditional Series Guardrail System described in this report have demonstrated the capacity to resist the design loadings specified in Chapter 16 of the IBC, Section R301 of IRC and UBC Chapter 16, when tested in accordance with ICC-ES AC174.

4.2. Structural performance has been demonstrated for a temperature range from -20°F to 125°F.

4.3. Materials used are deemed equivalent to preservative treated or naturally durable wood for resistance to weathering effects, decay, and attack from termites.



4.4. The composite/pvc material used in the *Railways™ Traditional Series* Guardrail system has a flame spread index of 40 when tested according to ASTM E84. The referenced criteria within AC174, requires the material to have a flame spread index not greater than 200 when tested according to ASTM E84.

5.0 Installation

The guard system shall be installed in accordance with the manufacturer's installation instructions and this report. Where differences occur between this report and the manufacturer's installation instructions, this report shall govern.

5.1. The rail used for both the top and bottom rails are attached to the structural 4 x 4 composite post utilizing stainless steel angle brackets

5.2. Level stainless steel rail attachment brackets are shown in Figure 5. The brackets utilize two (2) #14 by 2-1/2" stainless steel truss head mounting screws for attachment to the posts and two (2) #14 by 1 3/4" long stainless steel truss head mounting screws to secure each rail section to each bracket.

5.3. The baluster connections to both the top and bottom rails are made utilizing a Uni-ball™ connector at each attachment point. Each Uni-Ball connector is secured to the rail with a #8 by 2-1/4" long stainless steel self tapping flat head screw.

5.4. A single support block consist of a 1.38 inch square composite/PVC baluster cut to the appropriate length. It is attached to the lower rail with a #8 by 2-1/4" long stainless steel self tapping flat head screw passing thru the Uni-Ball connector and threaded into the underside of the lower rail.

5.5. Each 4x4 southern yellow pine post (See Section 5.5) is covered by a 5x5 non-structural composite post sleeve (See Figure x) with decorative caps and moldings.

5.6. The wood in the supporting structure shall have a specific gravity of 0.50 (southern yellow pine) or greater.

6.0 Supporting Evidence

6.1. Drawings and installation instructions submitted by the manufacturer.

6.2. The reports of testing and engineering analysis demonstrating compliance with the performance requirements of ICC-ES Acceptance Criteria for Deck Board Span ratings and Guardrail Systems (Guards and Handrails), AC174 approved February 2007, effective March 1, 2007.

6.3. A quality control manual that is in accordance with the ICC-ES AC10, "Acceptance Criteria for Quality Documentation", approved February 2007, effective March 1, 2007.

7.0 Conditions of Use

The guard assemblies identified in this report are deemed to comply with the intent of the provisions of the referenced building codes subject to the following conditions.

7.1. The *Railways™ Traditional Series* Guards recognized in this report and regulated by the IBC or IRC are limited to exterior use in one and two family dwellings as regulated by the IRC and residential use groups R3 and R4 of the IBC.

7.2. Guards recognized in this report are limited to use in construction types III, IV and V of the UBC.

7.3. Uni-Ball™ connectors shall not be reused in the event that balusters or foot blocks are assembled over the Uni-Ball™ connectors and are then separated for any reason.

7.4. Conventional wood supports for guards are not within the scope of this report and are subject to evaluation and approval by the building official. Supports must satisfy the design load requirements specified in Chapter 16 of the IBC and must provide suitable material for anchorage of the rail brackets. Where required by the building official, engineering calculations and details shall be provided.

7.5. Compatibility of fasteners and other metallic components with the supporting structure, including chemically treated wood, is not within the scope of this report

7.6. *Railways™ Traditional Series* guard systems are manufactured by Elk Composite Building Products Inc., in Lenexa, Kansas. Manufacturing is in accordance with an approved quality control system and inspections by Architectural Testing, Inc (AA-676).



8.0 Identification

The guard assemblies produced by Elk Composite Building Products Inc., identified in this report, shall be identified with labeling on the individual components or the packaging that includes the name and/or trademark of Elk Composite Building Products Inc, the name or identifying mark of the independent inspection agency, and the ATI Code Compliance Research Report Number (CCRR-0120) and mark.

9.0 Code Compliance Research Report Use

9.1. 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.

9.2. Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by ATI.

9.3. Reference to the Architectural Testing internet web site address at www.archtest.com is recommended to ascertain the current version and status of this report.

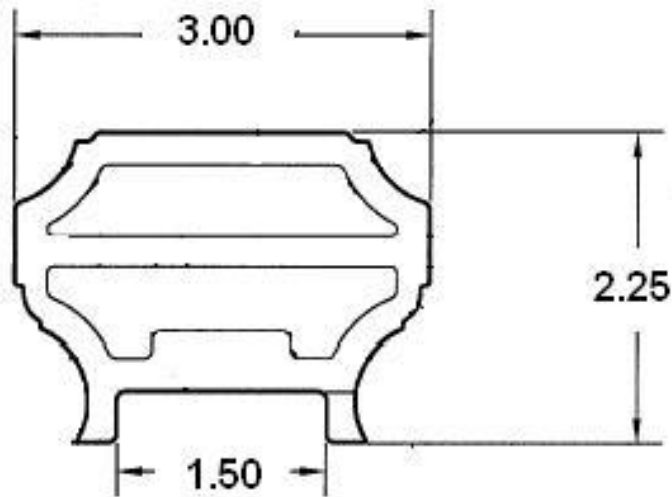


Figure 1
Rail Profile
Traditional Series

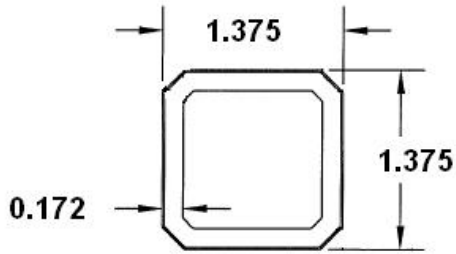


Figure 2
Composite Baluster Profile
Traditional Series

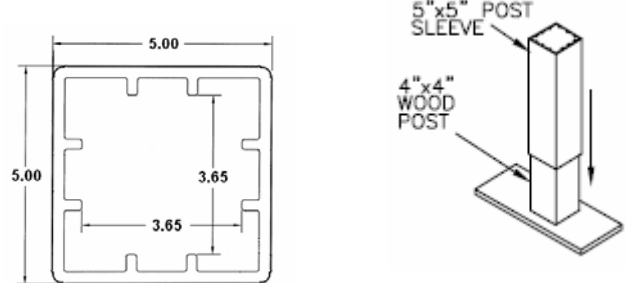
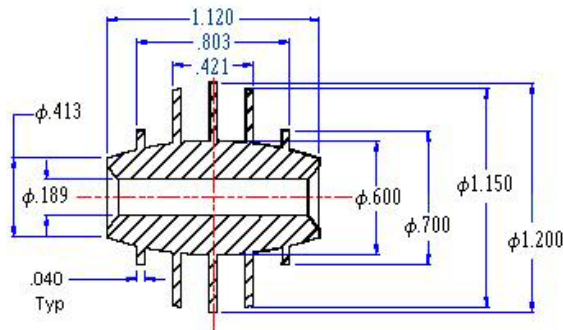
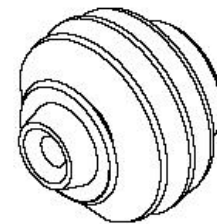


Figure 3
5X5 PVC/Composite Post Sleeve
Traditional Series



Sectional View



Isometric View

Figure 4 – Uni-Ball® Baluster Connector

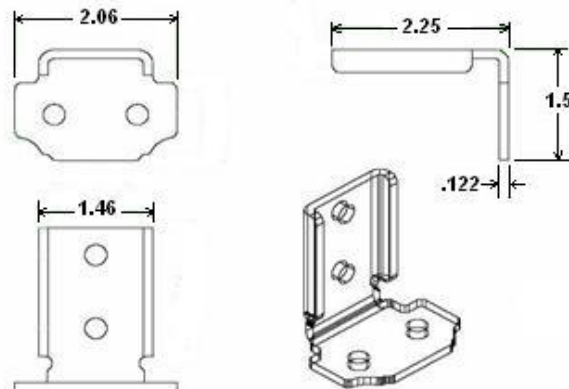


Figure 5– Level Rail Bracket