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ESR-1904

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

SECTION: 06 53 00—PLASTIC DECKING

SECTION: 06 63 00—PLASTIC RAILINGS

REPORT HOLDER:

GENOVA PRODUCTS, INC.

**7034 EAST COURT STREET
DAVISON, MICHIGAN 48423**

EVALUATION SUBJECT:

GENOVA (GENOVATIONS®) DECK BOARD AND GUARDRAIL SYSTEMS



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Section: 06 53 00—Plastic Decking

Section: 06 63 00—Plastic Railings

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GENOVA (GENOVATIONS®) DECK BOARD AND GUARDRAIL SYSTEMS

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2012, 2009, and 2006 *International Building Code*® (IBC)
- 2012, 2009, and 2006 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Properties evaluated:

- Structural
- Durability
- Surface-burning characteristics

1.2 Evaluation to the following green code(s) and/or standards:

- 2013 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2012 and ICC 700-2008)

Attributes verified:

- See Section 3.1

2.0 USES

The Genova deck boards described in this report are recognized for exterior use as deck boards for balconies, porches, decks, and stair treads in buildings of Type V-B (IBC) construction or buildings constructed in accordance with the IRC. The Genova guardrail systems described in

this report are limited to exterior use in buildings of Type V-B (IBC) construction and other types of construction in applications where untreated wood is permitted by IBC Section 1406.3, or buildings constructed in accordance with the IRC.

3.0 DESCRIPTION

3.1 General:

The Genova deck board and guardrail systems are composed of polyvinyl chloride (PVC), which is extruded, in accordance with the approved quality control manual, into prefinished deck and railing system components. The system components are available in the following colors: white, tan, grey, cedar, birchwood, sandalwood, driftwood, walnut, chestnut, sandstone, brownstone, redwood, weathered wood, and dark oak. The exposed surfaces of the components in white, tan, and grey are capped with a weatherable grade of PVC. The exposed surfaces of the components in all other colors are capped with an acrylate-styrene-acrylonitrile (ASA) polymer coating.

The attributes of the composite deck boards have been verified as conforming to the provisions of (i) CALGreen Section A5.406.1.2 for reduced maintenance; (ii) ICC 700-2012 Sections 602.1.6 and 11.602.1.6 for termite-resistant materials and Sections 601.7, 11.601.7, and 12.1(A).601.7 for site-applied finishing materials; and (iii) ICC 700-2008 Section 602.8 for termite-resistant materials and Section 601.7 for site-applied finishing materials. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.2 Deck Boards:

3.2.1 General: The deck boards have a hollow core and a textured finish. The deck boards are available in two thicknesses: 1 inch (25.4 mm) and 1.5 inches (38.1 mm); are 5.5 inches (140 mm) wide; and are interlocking, with tongue-and-groove edges and a screw flange running the length for mechanical fastening. See Figure 1 for typical cross sections.

3.2.2 Durability: When subjected to weathering, insect attack and other decaying elements, the material used to manufacture the Genova deck boards is equivalent to preservative-treated or naturally durable lumber when used in locations described in Section 2.0 of this report. The Genova deck boards have been evaluated for a temperature range of -20°F to 125°F (-29°C to 52°C).

3.2.3 Surface-burning Characteristics: When tested in accordance with ASTM E84, Genova deck boards have a flame-spread index of no greater than 200.

3.3 Guardrail Systems:

3.3.1 General: The Genova guardrail systems are composed of post sleeves and caps, top and bottom rails with aluminum inserts, and either square- or colonial-shaped balusters. The inserts are ASTM B221, 6063 alloy, T6 aluminum. Three models of Genova guardrail systems are available: the Square system includes square balusters and uncapped top rail; the Deluxe system includes square balusters and capped decorative top rail; the Colonial system includes colonial balusters and capped decorative top rail. The Genova guardrail systems are recognized for guardrails having maximum heights as shown in Table 3 and provide for 3¹/₄-inch-wide (83 mm) openings between the 1¹/₂-inch (38.1 mm) square sections of the balusters. The guardrail system components are manufactured from the same material as the Genova deck boards. See Figure 2 for typical component cross sections. The attachment system is designed for mounting the railing to a fixed wall surface or braced column.

3.3.2 Durability: When subjected to weathering, insect attack and other decaying elements, material used to manufacture the Genova guardrail systems is equivalent to preservative-treated or naturally durable lumber when used in locations described in Section 2.0 of this report. The Genova guardrail systems have been evaluated for a temperature range of -20°F to 125°F (-29°C to 52°C).

3.3.3 Surface-burning Characteristics: When tested in accordance with ASTM E84, the Genova guardrail systems have a flame-spread index of no greater than 200.

4.0 DESIGN AND INSTALLATION

4.1 General:

Installation of the Genova deck board and guardrail systems must comply with this report and the manufacturer's published installation instructions. A copy of the manufacturer's published installation instructions must be available on the jobsite at all times during installation. When the manufacturer's published installation instructions differ from this report, this report governs.

4.2 Deck Boards:

4.2.1 General:

The Genova deck boards must be installed perpendicular to the supporting structural members, with edge spacing (gap between the sides of the boards) and end spacing in accordance with the manufacturer's published installation instructions. Deck boards must be fastened at each supporting structural member in accordance with manufacturer's published installation instructions using the fasteners described in Table 1 of this report.

4.2.2 Structural:

4.2.2.1 Deck Boards: The Genova deck boards, when used as deck boards, have an allowable capacity and maximum span as prescribed in Table 1.

4.2.2.2 Deck Boards Used as Stair Treads: The Genova deck boards, when used as stair treads, support the code-prescribed concentrated load of 300 lbf (1.33 kN) and have a maximum span as shown in Table 2.

4.3 Guardrail System:

4.3.1 General: The Genova guardrail systems have been evaluated for installation between two fixed points, such as

walls or columns. The top rails must be reinforced with aluminum p-channels. The bottom rails must be reinforced with aluminum step-profile channels for rail lengths of 91⁷/₈ inches (2334 mm) and shorter, or with aluminum p-channels for rails longer than 91⁷/₈ inches. The rail reinforcing channels are provided by Genova Products. Mounting brackets must be installed on the wall or column at the appropriate height, with two corrosion-resistant lag screws per bracket. The mounting brackets for use with rails 91⁷/₈ inches (2334 mm) long and shorter (BDW421) are configured for installation using 1/4-inch-diameter-by-1¹/₂-inch-long (6.35 mm by 38.1 mm) lag screws; the brackets for the longer rails (BDW440) are configured for installation using 3/8-inch-diameter-by-2-inch-long (9.53 mm by 50.1 mm) lag screws. The rail reinforcement channels must be secured to the mounting brackets with two, No. 10 by 3/4-inch (19.1 mm) stainless steel, pan head, self-tapping screws per bracket. At stairs, the mounting bracket and stair adapter must be fastened to supports with two 1/4-inch (6.35 mm) lag screws—one 3 inches (76 mm) long and one 4 inches (102 mm) long. The attachment method described above is for fasteners embedded full length into preservative-treated Southern pine. Additional attachment methods are outside the scope of this report and are required to be submitted to the code official for approval. See Figure 3 for typical railing system installation.

4.3.2 Structural: The Genova guardrail systems are satisfactory to resist the loads specified in 2012 IBC Section 1607.8.1, 2009 and 2006 IBC Section 1607.7.1 and IRC Table R301.5 when installed at a maximum edge-of-structure-to-edge-of-structure spacing as prescribed in Table 3 of this report.

5.0 CONDITIONS OF USE

The Genova deck board and guardrail 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 Genova deck boards are limited to exterior use as deck boards for balconies, porches, decks, and stair treads in buildings of Type V-B (IBC) construction or buildings constructed in accordance with the IRC. Deck boards used as stair treads must be installed over two spans, minimum.
- 5.2** The Genova guardrail systems described in this report are limited to exterior use in buildings of Type V-B (IBC) construction and other types of construction in applications where untreated wood is permitted by IBC Section 1406.3, or in buildings constructed in accordance with the IRC.
- 5.3** Installation must 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 Genova deck board and guardrail systems. When the manufacturer's published installation instructions differ from this report, this report governs.
- 5.4** The use of Genova deck boards as components of a fire-resistance-rated assembly is outside the scope of this report.
- 5.5** The determination of compatibility of the fasteners, metal post mount components and other metal hardware with the supporting construction, including chemically treated wood, is subject to approval by the code official.

- 5.6 Adjustment factors outlined in the AF&PA *National Design Standard* and applicable codes must not apply to the allowable capacity and maximum spans for the Genova deck board and guardrail systems.
- 5.7 The Genova deck board and guardrail systems must be fastened directly to supporting construction. Where required by the code official, engineering calculations and construction documents consistent with this report must be submitted for approval. The calculations must verify that the supporting construction complies with applicable building code requirements and is adequate to resist the loads imparted upon it by the products and systems discussed in this report. The documents must contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents must 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 top rails of the Genova guardrail systems must not be permitted to be used as handrails for stairways or ramps.

5.9 Posts are outside the scope of this report.

5.10 The Genova deck board and guardrail system components are produced in Faribault, Minnesota, under a quality control program with inspections by ICC-ES.

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), dated January 2012.

7.0 IDENTIFICATION

The Genova deck board and guardrail system components described in this report are identified by a stamp on the packaging, bearing the manufacturer's name (Genova Products); the product description; and the ICC-ES evaluation report number (ESR-1904).

TABLE 1—DECK BOARD SPANS: DECK BOARDS USED AS DECK BOARDS

PRODUCT	FASTENERS	MAXIMUM SPAN (in) ¹	ALLOWABLE CAPACITY (lbf/ft ²) ²
1-inch-thick by 5 1/2-inch-wide Genova Deck Boards	No.8 x 1 1/4-inch pan head screws	16	100
	No.8 x 1 1/4-inch washer-head screws		100
	No.8 x 1 5/8-inch pancake head screws		100
1 1/2-inch-thick by 5 1/2-inch-wide Genova Deck Boards	No.8 x 1 1/4-inch pan head screws	24	80 ³
	No.8 x 1 1/4-inch washer-head screws		100
	No.8 x 1 5/8-inch pancake head screws		80 ³

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

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

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

³Allowable capacity limited by fastening for wind uplift.

TABLE 2—MAXIMUM STAIR TREAD SPANS: DECK BOARDS USED AS STAIR TREADS¹

PRODUCT	MAXIMUM SPAN (in) ²
1-inch-thick and 1 1/2-inch-thick Genova Deck Boards	16

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

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

²Capacity of deck boards used as stair treads is based on a minimum 2-span installation.

TABLE 3—MAXIMUM GUARDRAIL SYSTEM SPANS¹

GUARDRAIL SYSTEM	APPLICABLE BUILDING CODE ^{2,5}		MAXIMUM SPAN (inches) ^{2,3,4}
	IBC	IRC	
Square (42-inch-high system with uncapped rails and square balusters)	Yes	Yes	115 7/8 ⁶
Deluxe (42 1/2-inch-high system with capped rails and square balusters)	Yes	Yes	115 7/8 ⁶
Colonial (42 1/2-inch-high system with capped rails and colonial balusters)	Yes	Yes	115 7/8 ⁶

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

¹The ability of the supporting construction to resist the reaction from guardrail loads must be justified to the satisfaction of the code official.

²Indicates compliance with the respective building codes.

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

⁴Maximum span is measured from edge-of-support-to-edge-of-support.

⁵Angled adapters used in stair areas add 3 inches to the allowable length.

⁶Top rails must be reinforced with p-profile inserts. Step-profile inserts are used for bottom rails 91 7/8 inches (2334 mm) or less in length; p-profiles are used for bottom rails longer than 91 7/8 inches.

⁷36-inch-high guard rails are limited to use in R-2 and R-3 occupancies in accordance with Section 1013.3, Exception 1, of the 2012 IBC and to assemblies built under the IRC.

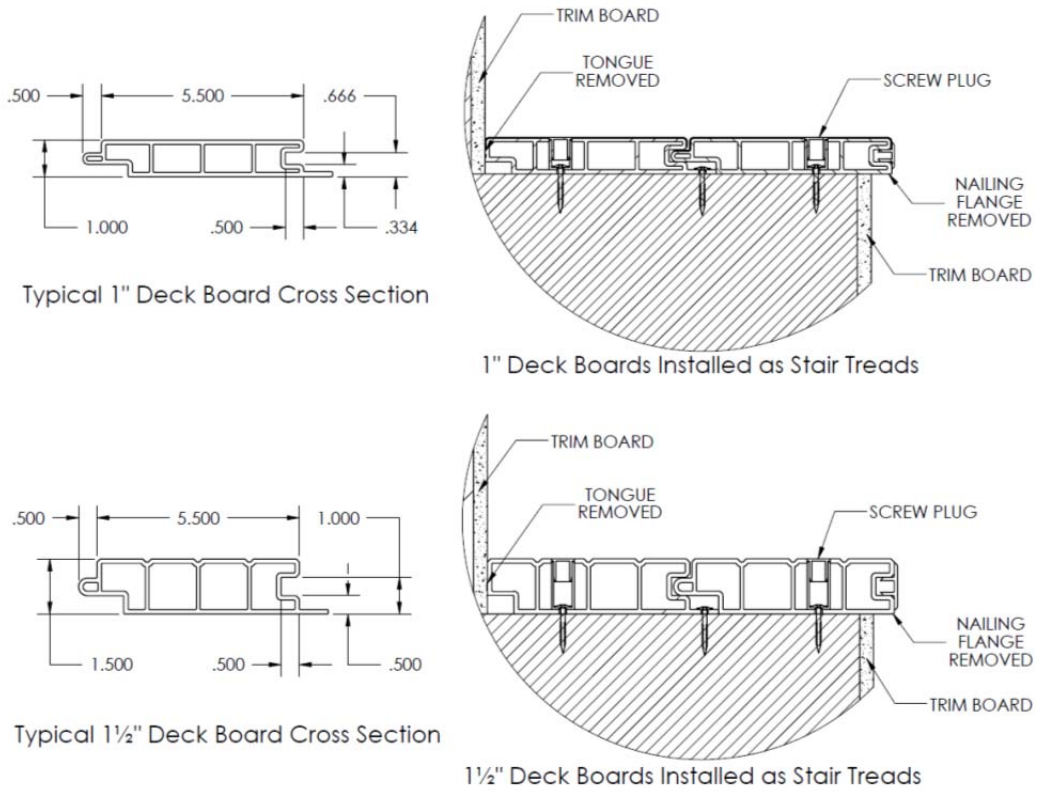


FIGURE 1—TYPICAL DECK BOARD CROSS SECTIONS

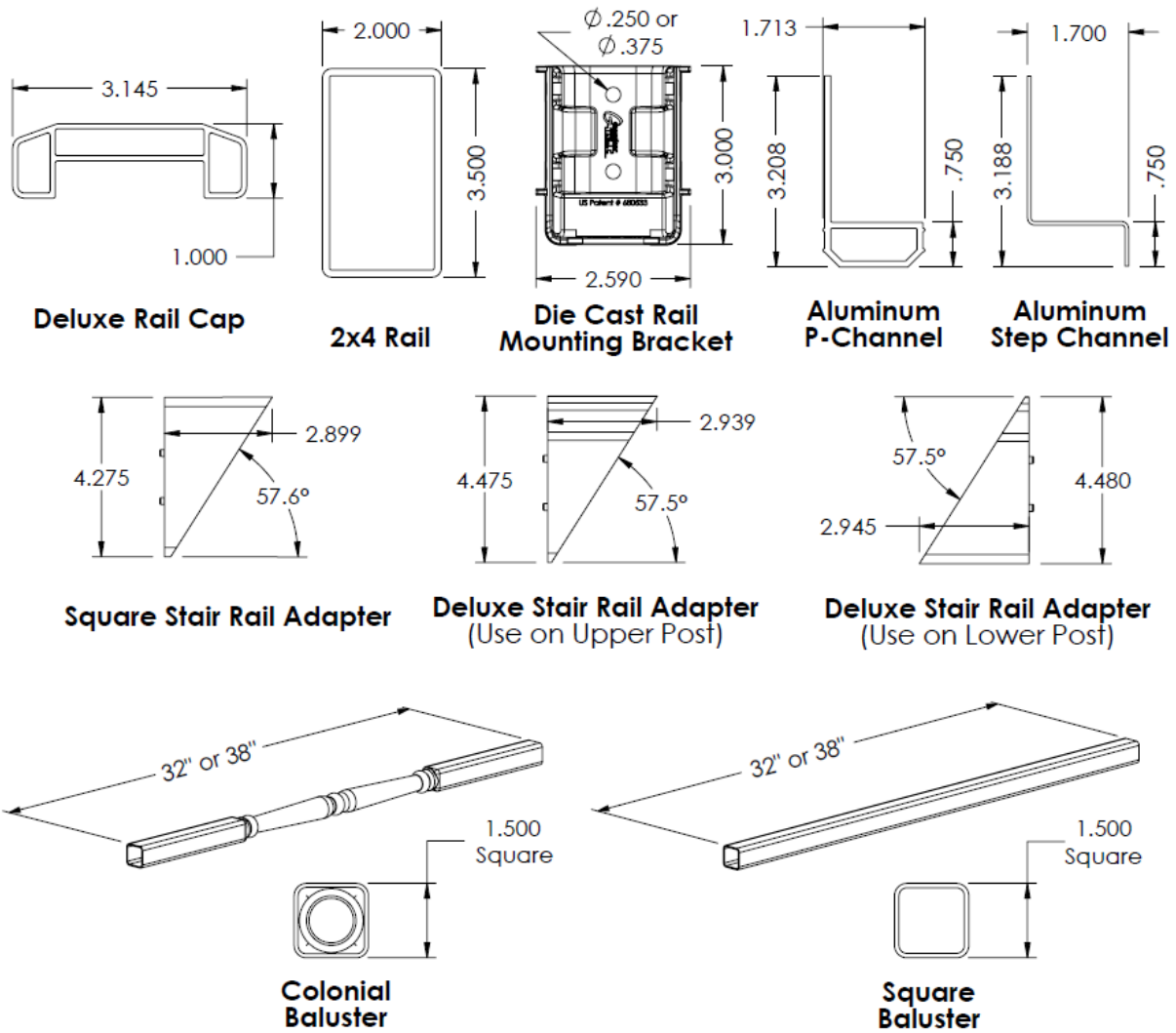
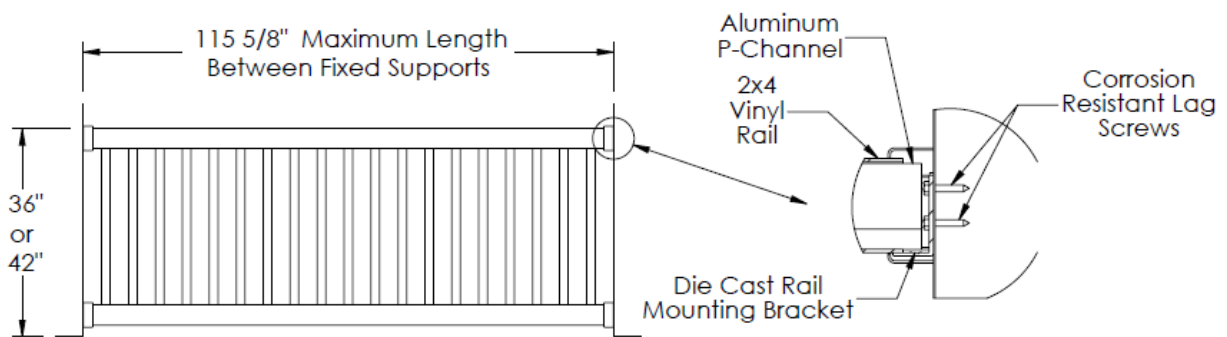


FIGURE 2—TYPICAL GUARDRAIL SYSTEM COMPONENT PROFILES



For SI: 1 Inch = 25.4 mm.

FIGURE 3—TYPICAL GUARDRAIL SYSTEM INSTALLATION