ICC EVALUATION SERVICE®

ICC-ES Evaluation Report

ESR-4747

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 50 00—Structural Plastics
Section: 06 63 00—Plastic Railings

REPORT HOLDER:

NEWTECHWOOD AMERICA, INC.

EVALUATION SUBJECT:

NEWTECHWOOD ULTRASHIELD HEMISPHERE COMPOSITE GUARDRAILS

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2015 and 2012 *International Building Code®* (IBC)
- 2015 and 2012 *International Residential Code®* (IRC)

Properties evaluated:

- Structural
- Durability
- Surface-burning characteristics

2.0 USES

The NewTechWood Ultrashield Hemisphere Composite Guardrails described in this evaluation report are limited to exterior use as guardrails for balconies, porches, and decks.

3.0 DESCRIPTION

3.1 Ultrashield Hemisphere Composite Guardrails:

The Ultrashield Hemisphere composite guardrails are designed in 42 inches (1067 mm) in height above the walking surface when used in both IBC and IRC applications. The Ultrashield Hemisphere composite guardrails consist of the following components and accessories, and are shown in Figure 3:

3.1.1 Top and Bottom Rails (UR02): The top and bottom rails are made from manufactured composite products consisting of rice hull powders, high-density polyethylene (HDPE), and other processing additives. The top and bottom rails are available in A-shape with length of 72 inches (1829 mm). The top and bottom rails are precut for installations of balusters and fabricated in accordance with the materials and specifications in the approved manufacturer's quality manual.

3.1.2 Steel Insert (LV-0209): The steel insert for top rails is made from steel, having a minimum tensile yield strength of 49,320 psi (340 MPa) with G60 galvanization and actual thickness of 0.085 inch (2.16 mm). The steel insert is available in C-shape with the length of 72 inches (1829 mm) and fabricated in accordance with the materials and specifications in the approved manufacturer's quality manual.

3.1.3 Balusters (R0218): The balusters are aluminum round tubing, and are fabricated from ASTM B221 6063-T5 aluminum alloy, in accordance with the materials and specifications in the approved manufacturer's quality manual. The outer diameter of the aluminum round tubing is 0.748 inches (19 mm).

3.1.4 Post Base (R0215): The post mounts are square tubes fabricated from steel having a minimum tensile yield strength of 49,320 psi (340 MPa) with G60 galvanization. The actual width of the steel tubing is 2.75 inches (70 mm) with an actual wall thickness of 0.085 inch (2.16 mm). The length of the post mounts is 46.9 inches (1190 mm) for 42-inch-tall guardrails. The post mounts are fabricated in accordance with the materials and specifications in the approved manufacturer's quality manual.

3.1.5 Post Sleeves (UH35): The end post sleeves are square tubes made from manufactured composite products consisting of rice hull powders, high-density polyethylene (HDPE), and other processing additives. The actual width of the tubing is 3.5 inches (89 mm) with a minimum wall thickness of 0.26 inch (6.6 mm). The length of the end posts is 45 inches (1143 mm) for 42-inch-tall guardrails. The post sleeves are fabricated in accordance with the materials and specifications in the approved manufacturer's quality control manual.

3.1.6 Accessories: The accessories contain top rail caps, upper and lower post brackets for top and bottom rails, adaptors for top rail insert, foot blocks, and fasteners. The accessories are made in accordance with the materials and specifications in the approved manufacturer's quality control manual.

3.2 Durability:

When subjected to weathering, insect attacks, and other decaying elements, the deck boards and the top and bottom rails of guardrails are equivalent in durability to preservative-treated or naturally durable lumber when used in locations described in Section 2.0 of this report. The deck boards and the top and bottom rails of railings have been evaluated for structural capacity when exposed to temperatures from 20°F to 125°F (-29°C to 52°C).

3.3 Surface-burning Characteristics:

When tested in accordance with ASTM E84, the top and bottom rails of guardrails have a flame spread index no greater than 200.

4.0 DESIGN AND INSTALLATION

4.1 General:

Installation of the Ultrashield Hemisphere composite guardrails must comply with this report and the

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manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation. When the manufacturer's published installation instructions differ from this report, this report governs.

4.2 Design:

The Ultrashield Hemisphere composite guardrails are satisfactory to resist the loads specified in Section 1607.8.1 of the 2015 and 2012 IBC and in Table R301.5 of the IRC, when installed at the maximum span noted in Table 3. The maximum span is the clear distance between the inside faces of the end posts.

4.3 Installation:

4.3.1 Guardrails: The Ultrashield Hemisphere composite guardrails are assembled using the components and accessories described in Section 3.2 of this evaluation report. See Figure 3 for an installation illustration of TruOrganics composite guardrail systems.

5.0 CONDITIONS OF USE

The Ultrashield Hemisphere composite guardrails 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 Ultrashield Hemisphere composite guardrails are limited to exterior use as deck boards for balconies, porches, decks and stair treads of Type V-B (IBC) construction and dwellings constructed in accordance with the IRC.

5.2 Installation must comply with this evaluation report, the manufacturer's published installation instructions and the applicable code. Only those components described in this evaluation report have been evaluated for the installation of the Ultrashield Hemisphere composite guardrails. When the manufacturer's published installation instructions differ from this report, this report governs.

5.3 The use of Ultrashield Hemisphere composite guardrails as a component of a fire-resistance-rated assembly is outside the scope of this report.

5.4 The compatibility of the fasteners, metal post mount components and other metal hardware with the supporting structure, including chemically treated wood, is outside the scope of this report.

5.5 Adjustment factors outlined in the AWC *National Design Specification® for Wood Construction* (NDS®) and applicable codes must not be applied to the allowable capacity and maximum spans for the Ultrashield Hemisphere composite guardrail systems.

5.6 The Ultrashield Hemisphere composite guardrails must be directly fastened to the supporting structure. 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 structure 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 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.

5.7 The Ultrashield Hemisphere composite guardrails are produced in Huidong County, Guangdong Province, China, under an approved 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 (editorially revised December 2019).

7.0 IDENTIFICATION

7.1 The NewTechWood Ultrashield Hemisphere composite guardrails must be identified by a stamp, on each individual component or on the packaging, bearing the report holder's name (NewTechWood America, Inc.) and address, the product name (Ultrashield Hemisphere Composite Guardrails), the allowable span, and the ICC-ES evaluation report number (ESR-4747).

7.2 Each package of accessories for NewTechWood Ultrashield Hemisphere composite guardrails must be labeled with the product name (Ultrashield Hemisphere Composite Guardrails) and the ICC-ES evaluation report number (ESR-4747).

7.3 The report holder's contact information is the following:

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HOUSTON, TEXAS 77032
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TABLE 1—MAXIMUM GUARDRAIL SPAN[1,2]

PRODUCT NAME	HEIGHT (inches)	APPLICABLE BUIDLING CODE[3]		MAXIMUM SPAN (inches)
		IBC	IRC	
Ultrashield Hemisphere Composite Guardrails	42	Yes	Yes	72

For **SI:** 1 inch = 25.4 mm.

[1]Maximum span is the clear distance between the inside faces for the end posts.
[2]Maximum span has been adjusted for durability. No further increases are permitted.
[3]Indicates compliance with the respective building codes.

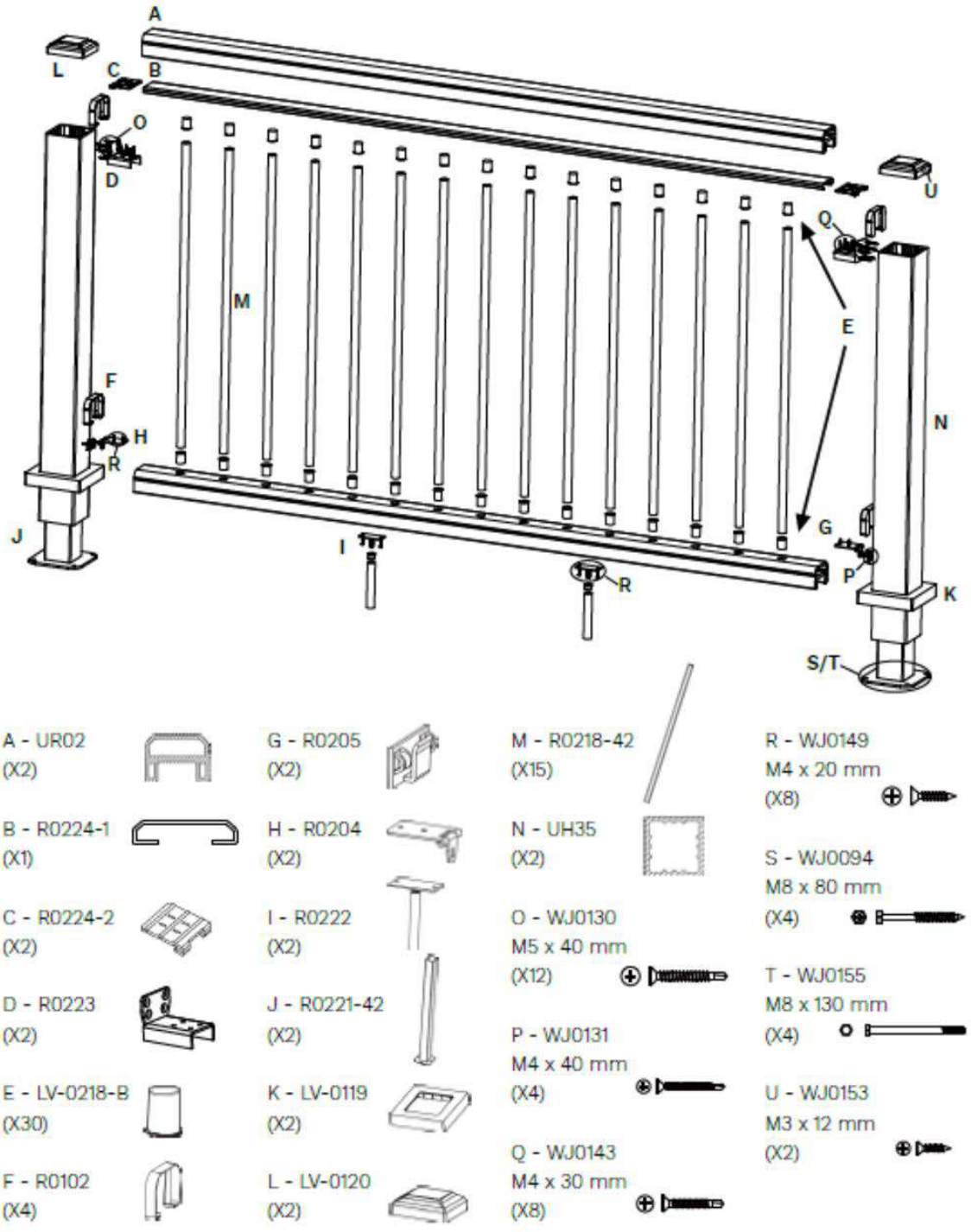

FIGURE 1—NEWTECHWOOD ULTRASHIELD HEMISPHERE COMPOSITE GUARDRAIL WITH COMPONENTS AND TYPICAL INSTALLATIONS