



DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 50 00—Structural Plastics

Section: 06-53 00—Plastic Decking

Section: 06 63 00—Plastic Railings

REPORT HOLDER:

CALI BAMBOO, LLC

EVALUATION SUBJECT:

CALI BAMBOO TRUORGANICS® 3G, 3G WIDE AND SQUARE EDGE COMPOSITE DECK BOARDS

CALI BAMBOO TRUORGANICS® COMPOSITE GUARDRAILS

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2021, 2018, 2015 and 2012 *International Building Code®* (IBC)
- 2021, 2018, 2015 and 2012 *International Residential Code®* (IRC)

Properties evaluated:

- Structural
- Durability
- Surface-burning characteristics

1.2 Evaluation to the following green standards:

- 2022 and 2019 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2020, 2015, 2012 and 2008 ICC 700 *National Green Building Standard™* (ICC 700-2020, ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

See Section 3.1

2.0 USES

The Cali Bamboo TruOrganics® 3G, 3G Wide (3GW) and Square Edge composite deck boards and TruOrganics® composite guardrails described in this evaluation report are limited to exterior use as deck boards and guardrails for balconies, porches, and decks. TruOrganics® Square Edge deck boards can also be used as stair treads of buildings of Type V-B (IBC) construction and dwellings constructed in accordance with the IRC.

3.0 DESCRIPTION

3.1 TruOrganics® Composite Deck Boards:

The TruOrganics® 3G, 3GW, and Square Edge deck boards are manufactured composite products consisting of rice hull powders, high-density polyethylene (HDPE), and other processing additives. The deck boards are manufactured by a co-extrusion process with an integrated shell heat-pressed onto the core of the deck boards in accordance with the approved quality control manual. The deck boards are available in solid and hollow profiles with and without grooves at board edges, various colors, and sizes per each product as described in Sections 3.1.1, 3.1.2 and 3.1.3. The hidden fastening systems used for installation of TruOrganics® deck boards with grooves at board edges are described in Section 3.1.4.

The attributes of the Cali Bamboo TruOrganics® products have been verified as conforming to the provisions of (i) CALGreen Section A5.406.1.2 for reduced maintenance; (ii) ICC 700-2020 Sections 602.1.6 and 11.602.1.6 for termite-resistance materials and Sections 601.7 and 11.601.7 for site-applied finishing materials; (iii) ICC 700-2015 and ICC 700-2012 Section 602.1.6 and 11.602.1.6 for termite-resistance materials and Section 601.7, 11.601.7, and 12.1(A).601.7 for site-applied finishing materials; and (iv) ICC 700-2008 Section 6.2.8 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. See Section 3.2 for limitations on termite-resistance use.

3.1.1 The TruOrganics® 3G Deck Boards: The 3G deck boards are 1-inch-thick-by-5⁷/₁₆-inch-wide [actually 0.845 inch (21.5 mm) thick by 5.456 inches (138.6 mm wide)]. The 3G deck boards are available in a hollow profile with grooves at board edges; have a wood grain texture; and are available in Denali, Yosemite, Sedona, and Tahoe colors. See Figure 1 for typical cross section of the 3G deck board profile.

3.1.2 The TruOrganics® 3GW Deck Boards: The 3GW deck boards are nominally 1-inch-thick-by-8¹/₄-inch-wide [actually 0.839 inch (21.3 mm) thick by 8.296 inch (211 mm) wide]. The 3GW deck boards are available in a hollow profile with grooves at board edges; have a wood grain texture; and are available in Denali, Yosemite, Sedona and, Tahoe colors. See Figure 1 for typical cross section profile.

3.1.3 The TruOrganics® Square Edge Deck Boards:

The Square Edge deck boards are nominally 1-inch-thick-by-5⁷/₁₆-inch-wide [actually 0.847 inch (21.5 mm) thick by 5.432 inches (138 mm) wide]. The deck boards available in a solid profile without grooves at the board edges; and are available in Denali, Yosemite, Sedona and, Tahoe colors. See Figure 1 for typical cross section profile.

3.1.4 Hidden Fastening System: Cali Bamboo universal hidden fastening systems are designed specifically for installing TruOrganics® composite deck boards having edge grooves to the supporting joists. The universal hidden fastening systems contain a stainless steel clip and one of the three corrosion-resistance screws below:

3.1.4.1 CB1-1 Hand-driven: #7 by 1⁵/₈ inches (41.3 mm) long (10 TPI, 1.629 inches overall length, 0.164 inch and 0.108 inch major and minor diameter, respectively, 0.121 inch shank diameter, 0.236 inch head diameter, with square drive trim head and type 17 point).

3.1.4.2 CB1-1 Pneumatic-driven: #6 by 1¹/₂ inches (38.1 mm) long (17 TPI, 1.482 inches overall length, 0.128 inch and 0.117 inch major and minor diameter, respectively, 0.269 inch head diameter, with Philips drive trim head and sharp point).

3.1.4.3 TC-G Hand-driven: #7 by 1.61 inches 40.9 mm long (11 TPI 1.61 inches overall length, 0.165 and 0.108 inch major and minor diameter, respectively, 0.121 shank diameter, 0.278 head diameter, with square drive trim head and type 17 point).

See Figure 2 for hidden fastening systems and typical installations.

3.2 TruOrganics® Composite Guardrails:

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

3.2.1 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.

3.2.2 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.

3.2.3 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).

3.2.4 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.

3.2.5 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.

3.2.6 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.

3.3 Durability:

When subjected to weathering, insect attack, 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).

3.4 Surface-burning Characteristics:

When tested in accordance with ASTM E84, the deck boards and 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 TruOrganics® 3G, 3GW, and Square Edge composite deck boards and TruOrganics composite guardrails must comply with this report and the 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 TruOrganics® 3G, 3GW, and Square Edge composite deck boards have an allowable capacity of 100 psf (4.79 MPa) when installed at a maximum center-to-center spacing of the supporting joists as prescribed in Table 1.

The TruOrganics 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 Deck Boards: The TruOrganics® 3G and 3GW composite deck boards must be installed perpendicular to the supporting joists with the use of hidden fastening systems described in Section 3.1.4 of the evaluation report. A minimum 1/4-inch (6.35 mm) gap must be left between deck boards. See Figure 2 for an illustration of installation.

The TruOrganics® Square Edge composite deck boards must be installed perpendicular to the supporting joists with two TrapEase® 3 No. 10 by 2 1/2-inch-long (63.5 mm) corrosion-resistant carbon steel screws per supporting joist. The screws must be placed through the solid part of the TruOrganics® Square Edge deck boards at a minimum

distance of 1½ inch (38.1 mm) from the edge and a minimum of 1 inch (25.4 mm) from the end of each TruOrganics® Square Edge deck board. A minimum 3/16 inch (4.8 mm) gap must be left between ends of TruOrganics® deck boards at butt joints. Multiple joists or blocking must be used to provide adequate surface for fastener embedment of board ends. Screws located within 1½ inches (38.1 mm) of board ends must be predrilled. A minimum ¼-inch (6.35 mm) gap must be left between deck boards. See Figure 2 for an illustration of installation.

4.3.2 Deck Boards Used as Stair Treads: The TruOrganics® Square Edge composite deck boards, when used as stair treads at a maximum center-to-center spacing of the supporting joists as shown in Table 2, are satisfactory to resist the code-prescribed concentrated load of 300 lbf (1.33 kN).

4.3.3 Deck Board Fasteners: The TruOrganics® 3G and 3GW composite deck boards, when installed perpendicular to the supporting joists with the hidden fastening systems described in Section 3.1.4, have an uplift rating range of 108 psf (5.18 MPa) for CB1-1 Pneumatic to 130 psf (6.23 MPa) for CB1-1 Hand Driven at a maximum span of 16 inches (406 mm) when installed at each support. When the TruOrganics® Square Edge composite deck boards are installed in accordance with Section 4.3.1 with two TrapEase 3 No. 10 by 2½-inch-long (63.5 mm) corrosion-resistant carbon steel screws at ends to each support, the allowable uplift rating is 200 psf (9.55 MPa).

4.3.4 Guardrails: The TruOrganics® 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 Cali Bamboo TruOrganics® 3G, 3GW, and Square Edge composite deck boards and TruOrganics® 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 Cali Bamboo TruOrganics® composite deck boards and TruOrganics® 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 Cali Bamboo TruOrganics® composite deck boards and TruOrganics® composite guardrails. When the manufacturer's published installation instructions differ from this report, this report governs.
- 5.3** The use of TruOrganics® deck boards or TruOrganics® 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 Cali Bamboo TruOrganics® composite deck boards and TruOrganics® composite guardrail systems.

- 5.6** The TruOrganics® composite deck boards and TruOrganics® 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 TruOrganics® 3G, 3GW, and Square Edge composite deck boards and TruOrganics® 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 April 2021).

7.0 IDENTIFICATION

- 7.1** The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-4197) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.
- 7.2** The Cali Bamboo TruOrganics® 3G, 3GW, and Square Edge composite deck boards described in this report must be identified by a product label on each individual piece, or on the packaging, bearing the product name (TruOrganics® 3G, 3GW, or Square Edge Composite Decking), the date of manufacturing, and the span rating for use as a deck board or stair tread.
- 7.3** Each package of Cali Bamboo universal hidden fastening systems must bear a product label with the product name (CB1-1 Hand Driven, CB1-1 Pneumatic, or TC-G Hand Driven).
- 7.4** The Cali Bamboo TruOrganics® composite guardrails must be identified by a product label on each individual component or on the packaging, bearing the product name (TruOrganics® Composite Guardrails) and the allowable span.
- 7.5** Each package of accessories for Cali Bamboo TruOrganics® composite guardrails must bear a label with the product name (TruOrganics® Composite Guardrails).
- 7.6** The report holder's contact information is the following:

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TABLE 1—DECK BOARD SPAN RATINGS

PRODUCT NAME	MAXIMUM SPAN (inches) ¹	ALLOWABLE LIVE LOAD CAPACITY (lbf/ft ²) ²
TruOrganics® 3G	16	100
TruOrganics® 3GW	16	100
TruOrganics® Square Edge	16	100

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 has been adjusted for durability. No further increases are permitted.

TABLE 2—MAXIMUM STAIR TREAD SPANS^{1, 2}

PRODUCT NAME	MAXIMUM SPAN (inches)
TruOrganics® Square Edge	12

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

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

²Based on a single-span installation.

TABLE 3—MAXIMUM GUARDRAIL SPAN^{1, 2}

PRODUCT NAME	HEIGHT (inches)	APPLICABLE BUILDING CODE ³		MAXIMUM SPAN (inches)
		IBC	IRC	
TruOrganics® Composite Guardrails	42	Yes	Yes	72

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

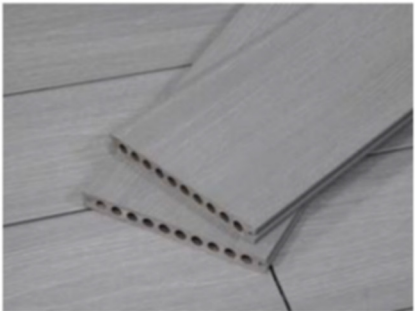
¹Maximum span is the clear distance between the inside faces for the end posts.

²Maximum span has been adjusted for durability. No further increases are permitted.

³Indicates compliance with the respective building codes.



TRUORGANICS 3G



TRUORGANICS 3G WIDE



TRUORGANICS SQUARE EDGE

FIGURE 1—CALI BAMBOO TRUORGANICS® COMPOSITE DECK BOARD PROFILES



FIGURE 2—HIDDEN FASTENING SYSTEMS AND TYPICAL INSTALLATIONS

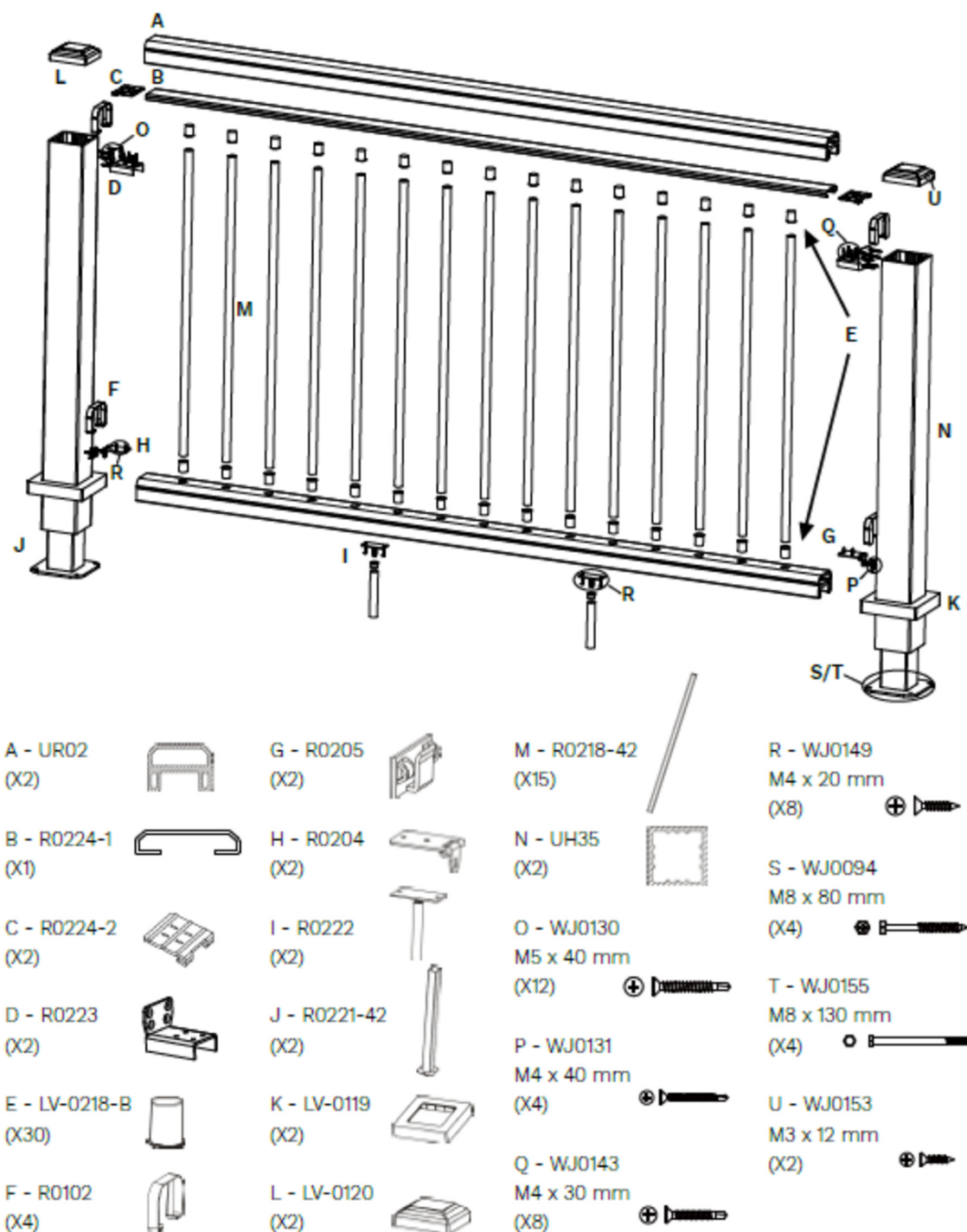


FIGURE 3—CALI BAMBOO TRUORGANICS® COMPOSITE GUARDRAIL WITH COMPONENTS AND TYPICAL INSTALLATIONS