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Legacy Report on the BOCA® National Building Code/1999 and the 1998 International One- and Two-Family Dwelling Code®**DIVISION: 06—WOOD AND PLASTICS****Section: 06500—Structural Plastics****REPORT HOLDER:**

PLASTIQUES CASCADES - RE-PLAST
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NOTRE DAME DU BON CONSEIL, QUÉBEC J0C 1A0
CANADA
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REPORT SUBJECT:**PERMA-DECK DECKING BOARDS****EVALUATION SCOPE:****Compliance with the following codes:**

BOCA® National Building Code/1999

- Section 106.4 Alternative materials and equipment
- Section 1604.5.4 Floors
- Section 1606.1 Design live load
- Section 1609.1.4 Uplift resistance
- Section 1710.1 General
- Section 1710.3.1 Test procedure
- Section 2305.14 Flooring
- Section 1704.3 Label
- Section 1705.2 Inspection of fabricators
- Section 106.4 Alternative materials and equipment
- Section 2601.2 Durability

1998 International One- and Two-Family Dwelling Code®

- Section 108.1 Alternative materials, methods, and equipment
- Section 301. 4 Live load
- Section 301.6 Deflection
- Section 108.1 Alternative materials, methods, and equipment
- Section 301. 2 Climatic and geographic design criteria

DESCRIPTION

Perma-Deck is manufactured from recycled thermoplastic polymers which are extruded into solid plastic profiles. Perma-Deck is used as flooring for exterior balconies, porches, decks, and similar appendages on structures of combustible construction to support a maximum uniform load of 100 lbf/ft² (4788 Pa) at the maximum spans outlined in this report.

Perma-Deck is manufactured in ⁵/₄-by-6 inches (32 × 152 mm), 2-by-6 inches (51 × 152 mm), and 1-by-6 inches (25 × 152 mm). The actual dimension of the ⁵/₄-by-6 inch (32 × 152 mm) profile is 1³/₁₆-by-5¹/₂ inches (30 × 140 mm). The 2-by-6 inch (51 × 152 mm) profile is 1⁷/₁₆-by-5⁷/₁₆ inches (37 × 138 mm). The 1-by-6 inch (25 × 152 mm) profile is manufactured with the actual dimensions of 1-by-6 inches (25 × 152 mm) with an approximate sized ⁵/₈ inch (16 mm) groove on one side with a matching tongue on the other side.

The 2-by-6 inch (51 × 152 mm) profile is manufactured in lengths of 8, 10, and 12 feet (2 438, 3 048, 3 658 mm). The ⁵/₄ inch (32 mm) plank is manufactured in lengths of 12 feet (3 658 mm). The tongue and groove plank is manufactured in even lengths from 4 to 12 feet (1 219 × 3 658 mm).

The ⁵/₄-by-6 inch (32 × 152 mm) and 2-by-6 inch (51 × 152 mm) Perma-Deck is also used as a stairway tread to support a maximum uniform load of 100 lbf/ft² (4788 Pa) and a concentrated (applied over 4 square inches (101 sq mm)) load of 300 lbf (1334 N) for the maximum spans outlined in this report. The 1-inch-thick (25 mm) tongue and groove Perma-Deck plank is outside the scope of this report for use as a stair tread.

CONDITIONS OF USE

This report is limited to the applications and products as stated in this report. The ICC-ES Subcommittee on National Codes intends that the report be used by the code official to determine that the report subject complies with the code requirements specifically addressed, provided that this product is installed in accordance with the following conditions:

- Perma-Deck shall be limited to use as a floor decking and stair treads for exterior balconies, porches, decks and similar appendages, as described in this report and the manufacturer's published installation manual, for buildings of combustible construction where the floor/ceiling assemblies are permitted to be unprotected construction.

Exception: The use of the 1-inch-thick (25 mm) tongue and groove deck planking in a stair tread application is outside the scope of this report.

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- Installation of Perma-Deck shall comply with this report and the manufacturer's published installation instructions. Where the manufacturer's published installation instructions differ from this report, this report shall be null and void.
 - Perma-Deck planks, when used as flooring, shall be limited to applications requiring a maximum uniformly distributed live load of 100 lbf/ft² (4.8 kPa). Other loading conditions are outside the scope of this report.
 - Uplift capacity of the Perma-Deck planks is 460 pounds (2.0 kN) per screw, when installed with #10-by-2¹/₂ inch (64 mm) stainless steel deck screws. Uplift capacity of the Perma-Deck planks for all other applications is limited to normal withdrawal values of the decking supports as calculated in accordance with design methods outlined in the 1997 edition of *AF&PA National Design Standard*.
 - Fasteners used for the installation of the Perma-Deck shall be as described in this report. Other methods of fastening are outside the scope of this report.
 - Perma-Deck shall be fastened to the supporting construction by one of the following methods:
 - For ⁵/₄-by-6 inch (32 × 152 mm) and 2-by-6 inch (51 × 152 mm) planks, pre-drill ¹/₄ inch (6.4 mm) holes through the deckboard, including surface countersink for the tapered screw head. Install two (2) #10-by-2¹/₂-inch-long (64 mm) stainless steel wood screws at each end support and one (1) screw per each intermediate support alternating from one edge of the deckboard to the other. Install deck planking with a ¹/₈ inch (3.2 mm) gap between each plank. The deck screws are also permitted to be installed into a ¹/₂-inch-diameter-by-¹/₂-inch-deep (12.7 × 12.7 mm) countersink. Screw caps are available to hide screw heads.
 - For the 1-by-6 inch (25 × 152 mm) tongue and groove planks, install deck planking with a ¹/₃₂ inch (0.8 mm) gap between each plank. Attach boards to supports through tongue with two (2) attachments at each end support and one (1) attachment alternating from one edge to the other at each intermediate support by one of the following methods:

Pre-drill ⁷/₃₂-inch-diameter (5.6 mm) holes, countersink holes and use a 2-inch-long (51 mm) #8 stainless steel screws at approximately a 45 degree angle in the corner of the tongue through to each supports below.

Pre-drill ³/₃₂-inch-diameter (2.4 mm) holes, use a 2¹/₂-inch-long (64 mm) galvanized finishing nail at approximately a 45 degree angle in the corner of the tongue through to each supports below.
 - Perma-Deck has not been evaluated for slip-resistance. Data to indicate compliance with the slip-resistance requirements within Section 1005.4 of *The BOCA National Building Code/1999* shall be submitted to, and specifically approved by the code official.
 - The use of Perma-Deck as a component of a fire-resistance rated assembly is outside the scope of this report.
 - Maximum allowable support spacing shall be as follows:
 - 16 inches (305 mm) for 1-inch-thick (25 mm) tongue and groove deck planking.
 - 16 inches (406 mm) for the ⁵/₄-inch-thick (32 mm) deck planking.

12 inches (305 mm) for the ⁵/₄-inch-thick (32 mm) deck planking installed as a stair tread.
 - 16 inches (406 mm) for the 2-by-6 inch (51 × 152 mm) deck planking.

12 inches (305 mm) for the 2-by-6 inch (51 × 152 mm) thick deck planking installed as a stair tread.
 - Each end of each Perma-Deck plank shall be supported by a minimum of 1¹/₂ inches (38 mm) of bearing. A minimum of 3 inches (76 mm) of bearing is required where plank ends abut.
- ### ITEMS REQUIRING VERIFICATION
- The following items are related to the use of the report subject, but not within the scope of this evaluation. However, these items are related to the determination of code compliance:
- ✓ Construction documents indicating compliance with this report.
 - ✓ Determination of the requirements for slip resistance for the specific application.
 - ✓ The design and construction of the supporting construction for Perma-Deck.
 - ✓ Wind load calculations determining the uplift requirements shall be submitted in order to determine compliance with the allowable loads specified in this report. In addition, the supporting construction shall be analyzed to ensure its capacity to provide satisfactory resistance to uplift loads as determined by the AFPA 1997 *National Design Standard* and all other applicable codes. These documents shall be prepared by an individual qualified in the application of the structural design principles involved. The individual preparing such documents shall possess the registration or license in accordance with the professional registration laws of the state in which the project is constructed.
- ### INFORMATION SUBMITTED
- Perma-Deck Installation Considerations and Instructions, Cascades Re-Plast, Division of Plastiques Cascades, Inc.
 - Underwriter's Laboratories of Canada report file # C204, dated November 7, 2001, titled *Report on Surface Burning Characteristics*.
 - *Cascades Re-Plast Manuel de Qualite*, prepared by Intertek Testing Services NA, Ltd., signed by Jean-Gut De Charrette and Paul Martineau on April 12, 2002.
 - Bodycote Materials Testing report BBI file # 19050584, dated April 8, 2002, titled *Perma-Deck Deckboard Products, Tested for Weatherability, Durability, Impact, Flexural Property Determinations per ASTM Standard Test Methods*.
 - Technical Data Sheet, Perma-Deck Decking Boards
 - Centre De Recherche Industrielle Du Quebec report file # 670-24221, dated November 2, 2001, titled *Mechanical Properties of Recycled Plastic Boards*.
 - Centre De Recherche Industrielle Du Quebec calculations of maximum span / File No. 30564, dated August 20, 2002, signed and sealed by Claude Sauvageau, P. E.
 - Cambridge Materials Testing, Ltd report file # 304152-02A, dated April 9, 2002, titled *Perma-Deck by Cascades Re-Plast, ASTM D 6109 - Flexural Property Determination*.
 - Cambridge Materials Testing, Ltd report file # 304152-02B, dated April 9, 2002, titled *Perma-Deck by Cascades Re-Plast, Water Absorption and Thickness Swell - ASTM D 1037*.
 - Cambridge Materials Testing, Ltd report file # 304152-02F, dated April 9, 2002, titled *Perma-Deck by Cascades Re-Plast, Compressive Properties of Plastic Lumber - ASTM D 6108*.
 - Cambridge Materials Testing, Ltd report file # 304152-02D, dated April 9, 2002, titled *Perma-Deck by Cascades Re-Plast, Coefficient of Linear Thermal Expansion (CLTE) - ASTM D 6341*.

- Cambridge Materials Testing, Ltd report file # 304152-02C, dated April 9, 2002, titled *Perma-Deck by Cascades Re-Plast, Bulk Density and Specific Gravity of Plastic Lumber*.
- Cambridge Materials Testing, Ltd report file # 304152-02E, dated April 9, 2002, titled *Perma-Deck by Cascades Re-Plast, Screw Withdrawal Testing*.
- *Cascade Re-plast Quality Control Guide*, with revisions dated April 8, 2002, signed by Jean Guy De Charette of Cascade Re-Plast and Paul Martineau of Intertek Testing Services NA, Ltd.

APPLICATION FOR PERMIT

To aid in the determination of compliance with this research report, the following represents the minimum level of information to accompany the application for permit:

- The language “See ICC-ES Legacy Report No. 21-91.”
- Construction documents consistent with this report shall be provided with permit applications. The following items, at a minimum, shall be provided on the construction documents:
 - The manufacturer’s decking member designation.
 - The on center spacing of the supporting construction.
 - The design live load imposed on Perma-Deck.
 - Type and location of fasteners to secure Perma-Deck to the supporting construction.
 - For projects utilizing the BOCA® *National Building Code/1999*, design calculations and details verifying the ability of the construction supporting Perma-Deck, including but not limited to the posts, beams, joists and

associated connections to carry all superimposed loads placed upon them shall be provided. These documents shall be prepared by an individual qualified in the application of the structural design principles involved. The individual preparing such documents shall possess the registration or license in accordance with the professional registration laws of the state in which the project is constructed and;

- For projects utilizing the 1998 *International One- and Two-Family Dwelling Code*®, design calculations and details verifying the ability of the construction supporting Perma-Deck, including but not limited to the posts, beams, joists and associated connections to carry all superimposed loads placed upon them shall be provided. These documents shall be prepared by an individual qualified in the application of the structural design principles involved. The individual preparing such documents shall possess the registration or license in accordance with the professional registration laws of the state in which the project is constructed.

PRODUCT IDENTIFICATION

Perma-Deck, manufactured in accordance with this research report, shall bear the following identification:

- “See ICC-ES Legacy Report No. 21-91.”
- Additionally, each piece of Perma-Deck or the product packaging shall bear a permanent label that identifies the product and company name, manufacturing plant location or number, the third-party inspection agency name or logo (ITS), and a means for establishing a date of manufacture.