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Legacy report on the 1997 Uniform Building Code™, the 2000 International Building Code® and the 2000 International Residential Code®

DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07410—Metal Roof and Wall Panels

TITAN INSULATED FOAM ROOF PANELS

C-THRU INDUSTRIES, INC.
2285 FLEETWOOD DRIVE
RIVERSIDE, CALIFORNIA 92509

1.0 SUBJECT

Titan Insulated Foam Roof Panels.

2.0 DESCRIPTION

2.1 General: The Titan Insulated Foam Roof Panels are used as structural roof panels for patio covers. The roof panel span shall be continuous in the direction of its slope, with no transverse joints. Panels are confined to structures recognized under Appendix Chapter 31, Division III, of the 1997 Uniform Building Code™, Appendix I of the 2000 International Building Code®, and Appendix H of the 2000 International Residential Code®. The panels are factory-assembled, 3-, 4- and 6-inch-thick (76, 102, and 152 mm) sandwich panels with a foam plastic core and aluminum facings. The panels are available in maximum 48-inch (1219 mm) widths, and in lengths of up to 24 feet (7315 mm).

2.2 Materials:

2.2.1 Exterior and Interior Facing Materials: The facings are minimum 0.024-inch-thick (0.61 mm) 3004-H254 aluminum, described in the approved quality control manual.

2.2.2 Core: The core is expanded polystyrene foam plastic with a nominal density of 1.5 pcf (24 kg/m³) for the 3-inch thick panels and 2.0 pcf (32 kg/m³) for the 4- and 6-inch thick panels. The foam plastic core complies with Type II and IX requirements of ASTM C 578-01, and is described in the approved quality control manual.

2.2.3 Adhesive: The facings are bonded to the panel core with adhesives as described in the quality control manual that are classified as Type II, Class 2, in accordance with the ICC-ES Acceptance Criteria for Sandwich Panel Adhesives (AC05).

2.3 Design:

Maximum allowable loads, based on gravity loads and wind uplift considerations, for the 3-, 4- and 6-inch-thick (76, 102, and 152 mm) panels are set forth in Tables 1, 2, and 3,

respectively. The support and attachment of panels shall be substantiated by calculations submitted to the building official for approval. Metal fasteners shall be stainless steel or equivalent. The minimum bearing length for the panel is 1 inch (25 mm).

2.4 Installation:

All panel edges are protected from the weather with aluminum extrusions or metal flashings. The roof panels are to be installed at a minimum slope of 1/4 inch per foot or 1/2 inch per foot (2.1 or 4.2 percent slope) for panels subject to live loads and snow loads, respectively.

2.5 Identification:

Each panel is identified with a permanent decal at one end, bearing the name and address of the manufacturer (C-Thru Industries, Inc.), the evaluation report number (PFC-1968), and the name of the quality control agency (CI Professional Services, Inc).

3.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Interim Criteria for Foam Plastic Insulation (AC12), dated July 2002, and the ICC-ES Interim Criteria for Sandwich Panels (AC04), dated October 2003; and quality control manuals.

4.0 FINDINGS

That the Titan Insulated Foam Roof Panels described in this report comply with the 1997 Uniform Building Code™ (UBC), the 2000 International Building Code® (IBC), and the 2000 International Residential Code® (IRC), subject to the following conditions:

- 4.1 The panels are for use only with patio covers regulated by Appendix Chapter 31, Division III, of the UBC, Appendix I of the IBC, and Appendix H of the IRC.
4.2 The panels are fabricated at the plant located at 2285 Fleetwood Drive, Riverside, California, with quality control inspections by CI Professional Services, Inc. (AA-656).
4.3 Panel fabrication and installation comply with this report and the manufacturer's instructions.
4.4 For each project, engineering calculations on the panels' connections to the supporting structure shall be submitted to the building official for approval.

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4.5 The remaining portions of the structure are designed and constructed in accordance with the applicable code. This report is subject to re-examination in one year.

TABLE 1—3-INCH-THICK TITAN INSULATED FOAM ROOF PANELS, ALLOWABLE SPANS AND FASTENER SPACING^{1,2,3}

WIND UPLIFT LOAD (psf)	ALLOWABLE PANEL SPANS (feet)													MAXIMUM FASTENER SPACING ² (inches)
	Live Load (psf)						Snow Load (psf)							
	Minimum 1/4:12 Slope ⁴						Minimum 1/2:12 Slope ⁴							
	10	15	20	25	30	20	25	30	35	40	45	50	55	
10														10
15	18'-1"	15'-8"	14'-1"	13'-0"	12'-0"	12'-5"	11'-2"	10'-4"	9'-7"	8'-11"	8'-5"	7'-11"	7'-6"	7
20	18'-0"													6
25	16'-0"													5
30	14'-7"	14'-7"												5
35	13'-2"	13'-2"	13'-2"											4
40	11'-7"	11'-7"	11'-7"	11'-7"	11'-7"	11'-7"								4
45	10'-2"	10'-2"	10'-2"	10'-2"	10'-2"	10'-2"	10'-2"	10'-2"						4
50	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"	9'-2"					4
55	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"			4

For SI: 1 inch = 25.4 mm, 1 ft = 304.8 mm, 1 pcf = 16.018 kg/m³, 1 psf = 47.9 Pa.

¹The panels are confined solely to patio cover structures permitted under Appendix Chapter 31, Division III, of the UBC; Appendix I of the 2000 IBC; or Appendix H of the 2000 IRC.

²To resist wind uplift forces, fasteners shall be minimum 4-inch-long, No. 14 self-drilling, self-tapping sheet metal screws, complying with ANSI/ASME B18.6.4, with a 1-inch-diameter plate washer and neoprene insert. The fasteners shall be installed at the fastener spacing specified in the table, attaching the panels to support members that are minimum 0.065-inch thick, 6063-T6 aluminum. The maximum panel overhang at the support is 24 inches.

³ Panel spans are based on a maximum temperature differential between the two panel facings of 10° F (-12° C).

⁴ Minimum panel slopes are based on panel deflection only. Increased slopes may be required where panel accessories, such as mullions or flashing, increase ponding caused by irregularities in the water flow path.

TABLE 2—4-INCH-THICK TITAN INSULATED FOAM ROOF PANELS, ALLOWABLE SPANS AND FASTENER SPACING^{1,2,3}

WIND UPLIFT LOAD (psf)	ALLOWABLE PANEL SPANS (feet)													MAXIMUM FASTENER SPACING ² (inches)
	Live Load (psf)						Snow Load (psf)							
	Minimum 1/4:12 Slope ⁴						Minimum 1/2:12 Slope ⁴							
	10	15	20	25	30	20	25	30	35	40	45	50	55	
10														10
15	21'-10"	19'-0"	17'-2"	15'-10"	14'-8"	15'-5"	14'-1"	13'-0"	12'-2"	11'-5"	10'-10"	10'-4"	9'-10"	7
20	20'-7"													5
25	18'-4"	18'-4"												5
30	16'-8"	16'-8"	16'-8"											4
35	15'-5"	15'-5"	15'-5"	15'-5"										4
40	13'-9"	13'-9"	13'-9"	13'-9"	13'-9"	13'-9"	13'-9"							4
45	12'-2"	12'-2"	12'-2"	12'-2"	12'-2"	12'-2"	12'-2"	12'-2"						3
50	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"	11'-0"				3
55	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	3

For SI: 1 inch = 25.4 mm, 1 ft = 304.8 mm, 1 pcf = 16.018 kg/m³, 1 psf = 47.9 Pa

¹The panels are confined solely to patio cover structures permitted under Appendix Chapter 31, Division III, of the UBC; Appendix I of the 2000 IBC; or Appendix H of the 2000 IRC.

²To resist wind uplift forces, fasteners shall be minimum 5-inch-long, No. 14 self-drilling, self-tapping sheet metal screws, complying with ANSI/ASME B18.6.4, with a 1-inch-diameter plate washer and neoprene insert. The fasteners shall be installed at the fastener spacing specified in the table, attaching the panels to support members that are minimum 0.065-inch thick, 6063-T6 aluminum. The maximum panel overhang at the support is 24 inches.

³ Panel spans are based on a maximum temperature differential between the two panel facings of 10° F (-12° C).

⁴ Minimum panel slopes are based on panel deflection only. Increased slopes may be required where panel accessories, such as mullions or flashing, increase ponding caused by irregularities in the water flow path.

TABLE 3—6-INCH-THICK TITAN INSULATED FOAM ROOF PANELS, ALLOWABLE SPANS AND FASTENER SPACING^{1,2,3}

WIND UPLIFT LOAD (psf)	ALLOWABLE PANEL SPANS (feet)												MAXIMUM FASTENER SPACING ² (inches)		
	Live Load (psf)					Snow Load (psf)								Patio Cover Height, H, up to 12 feet	
	Minimum 1/4:12 Slope ⁴					Minimum 1/2:12 Slope ⁴									
	10	15	20	25	30	20	25	30	35	40	45	50			55
10	23'-0"	23'-0"	22'-0"	19'-10"	18'-2"	19'-7"	17'-8"	16'-2"	15'-1"	14'-2"	13'-4"	12'-8"	12'-1"	10	
15														7	
20														5	
25	21'-0"	21'-0"	21'-0"	19'-1"	18'-2"	19'-1"	17'-7"	16'-2"	15'-1"	14'-2"	13'-4"	12'-8"	12'-1"	4	
30	19'-1"	19'-1"	19'-1"											19'-1"	4
35	17'-7"	17'-7"	17'-7"											17'-7"	3
40	16'-6"	16'-6"	16'-6"	16'-6"	16'-6"	16'-6"	16'-6"	15'-6"	15'-1"	14'-2"	13'-4"	12'-8"	12'-1"	3	
45	15'-6"	15'-6"	15'-6"	15'-6"	15'-6"	15'-6"	15'-6"							3	
50	14'-2"	14'-2"	14'-2"	14'-2"	14'-2"	14'-2"	14'-2"							3	
55	12'-11"	12'-11"	12'-11"	12'-11"	12'-11"	12'-11"	12'-11"	12'-11"	12'-11"	12'-11"	12'-11"	12'-11"	12'-11"	3	

For SI: 1 inch = 25.4 mm, 1 ft = 304.8 mm, 1 pcf = 16.018 kg/m³, 1 psf = 47.9 Pa.

¹The panels are confined solely to patio cover structures permitted under Appendix Chapter 31, Division III, of the UBC; Appendix I of the 2000 IBC; or Appendix H of the 2000 IRC.

²To resist wind uplift forces, fasteners shall be minimum 7-inch-long, No. 14 self-drilling, self-tapping sheet metal screws, complying with ANSI/ASME B18.6.4, with a 1-inch-diameter plate washer and neoprene insert. The fasteners shall be installed at the fastener spacing specified in the table, attaching the panels to support members that are minimum 0.065-inch thick, 6063-T6 aluminum. The maximum panel overhang at the support is 24 inches.

³Panel spans are based on a maximum temperature differential between the two panel facings of 10° F (-12° C).

⁴Minimum panel slopes are based on panel deflection only. Increased slopes may be required where panel accessories, such as mullions or flashing, increase ponding caused by irregularities in the water flow path.