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

DIVISION: 08—DOORS AND WINDOWS
Section: 08950—Translucent Wall and Roof Assemblies

GUARDIAN 275® TRANSLUCENT WALL, SKYLIGHT AND ROOF PANELS

MAJOR INDUSTRIES, INC.
7120 STEWART AVENUE
WAUSAU, WISCONSIN 54401

1.0 SUBJECT

Guardian 275® Translucent Wall, Skylight and Roof Panels.

2.0 DESCRIPTION

2.1 General:

The Major Industries 2 3/4-inch-thick (70 mm) standard translucent panel features sandwich-type construction that consists of a perimeter frame and grid-core, composed of extruded, 6063-T6, 6005-T5 or 6061-T6 grade aluminum I-beams covered on both sides with flat, fiberglass-reinforced, polymer (FRP) facings. The panels are supplied in 5-foot (1524 mm) widths with a nominal maximum 8-inch-by-20-inch (203 by 508 mm) grid-core configuration, and in 4-foot (1219 mm) widths with a nominal maximum 12-inch-by-24-inch (305 by 610 mm) grid-core configuration. Panels are available in lengths up to 20 feet (6096 mm). The I-beams that form the perimeter frame and grid-core are 2.63 inches (67 mm) high, with a flange width of 0.46 inch (11.7 mm) and a web and flange thickness of 0.05 inch (1.27 mm). The maximum nominal 8-inch-by-20-inch (203 by 508 mm) grid-core pattern consists of continuous I-beams, spaced a maximum of 8 inches (203 mm) on center, that run across the width of the panel. Intermediate I-beams, spaced a maximum of 20 inches (508 mm) on center, complete the grid-core pattern and run, lengthwise, between the continuous I-beams. The maximum nominal 12-inch-by-24-inch (305 mm by 610 mm) grid-core pattern consists of continuous I-beams, spaced a maximum of 12 inches (305 mm) on center, that run across the width of the panel. Intermediate I-beams, spaced a maximum of 24 inches (610 mm) on center, complete the grid-core pattern and run, lengthwise, between the continuous I-beams. The panel facings are bonded to the aluminum grid-core using a proprietary rubber-phenolic adhesive. The exterior panel facing is LASCOCrystal Exterior (FR), and the interior panel facing is LASCOCrystal Interior UL25. See Table 1 for facing descriptions. The panels are interconnected by rafters or mullions that consist of extruded, 6063-T6, 6005-T5 or 6061-

T6 grade aluminum. The panels may be used as wall, skylight and roof panels under the 1997 Uniform Building Code™ (UBC), the 2000 International Building Code® (IBC) and the 2000 International Residential Code® (IRC). See Table 2 for recognized roof panel spans for given rafters and I-beams, grid-core patterns and transverse loads. See Table 3 for recognized wall panel spans for given mullions and I-beams, grid-core patterns and transverse loads.

2.2 Class A Roof Panels:

Major Industries Class A roof panels are manufactured, as described in Section 2.1, with fiberglass insulation placed in the cavity between the two facings. These panels comply with UBC Section 1504.1, IBC Section 1505.1 and IRC Section R902.1, as Class A roofing assemblies. The white fiberglass insulation is nominally 2 3/4 inches (70 mm) thick, and has a nominal weight of 1 ounce per square foot (305 g/m²).

2.3 Uses:

Major industries panels are used for canopies, walkways, skylights, windows, curtain walls, interior/exterior nonload-bearing walls and interior partitions, roof coverings and ceilings. Details indicating compliance with appropriate code sections, as installed, must be submitted to the building official for approval.

2.4 Allowable Spans:

Allowable spans for recognized panel configurations, based on aluminum member physical properties, are shown in Tables 2 and 3.

2.5 Installation:

The roof and wall panels are interconnected with one of a variety of aluminum rafters and mullions, respectively, the actual type depending on the loading requirements. The panels must be installed in accordance with UBC Section 2603 or IBC Section 2606 (for areas enforcing the IBC or IRC), as applicable; the manufacturer's instructions; and this report. Class A roof panels must be installed in accordance with UBC Chapter 15, IBC Chapter 15 or IRC Chapter 9, as applicable; the manufacturer's instructions; and this report. Design and details must be submitted to the building official for acceptance. See Figure 2 for typical installation details.

2.5.1 Roof Panels: Roof panels require a minimum slope of two units vertical in twelve units horizontal (16.7%). Ends are placed at structural supports and are attached through the panel frame. Vertical edges are installed in the rafter. Neoprene gasket material is factory-installed in an extruded

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groove of the interior rafter section. Butyl tape, with an integral backer rod, is applied to the bottom of the rafter pressure plate.

2.5.2 Wall Panels: Neoprene gasket material is factory-installed in an extruded groove of both the interior and exterior sections of the perimeter framing, and in the interior and exterior sections of the mullions. Butyl tape, with integral backer rods, is applied to the interior side of the mullion pressure plate.

2.6 Identification:

The panels are identified by a stamp on the perimeter that features the Major Industries, Inc., name and address, the type designation, the facing material classification, the evaluation report number (PFC-5620) and the name of the inspection agency (Intertek Testing Services, Middleton, Wisconsin). Labels on the Class A roof panels, described in Section 2.2, also bear the designation "Class A." The containers of rafters and mullions are identified by a stamp or label that includes the Major Industries, Inc., name and address, the part number, the aluminum type (alloy and temper), and the evaluation report number (PFC-5620).

3.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Sandwich Panels (AC04), dated July 2001, the Acceptance Criteria for Special Roofing Systems (AC07), dated January 2002, and the Acceptance Criteria for Plastic Skylights (AC16), dated July 2002; reports of tests for water penetration, surface burning characteristics (ASTM E 84), and approved plastics (UBC Standards 26-5, 26-6 and 26-7); and a quality control manual.

4.0 FINDINGS

That the Guardian 275[®] Translucent Wall, Skylight and 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 installed in accordance with UBC Section 2603 or IBC Section 2606 (for areas enforcing the IBC or IRC), as applicable; the manufacturer's instructions; and this report.
- 4.2 Class A roof panels are installed in accordance with UBC Chapter 15, IBC Chapter 15 or IRC Chapter 9, as applicable; the manufacturer's instructions; and this report.
- 4.3 Maximum allowable spans for Guardian 275[®] wall, skylight and roof panels comply with Table 2 or Table 3 of this report, as applicable.
- 4.4 Calculations justifying panel supports must be submitted to the building official for approval.
- 4.5 No diaphragm values are assigned to panels. A roof or wall bracing system must be provided in the plane of the roof or wall for resistance to in-plane wind and seismic loads.
- 4.6 When panels are exposed to the building interior, the flame-spread classification described in Section 2.1 must comply with UBC Section 804.1, IBC Section 803.4 or IRC Section R319.1, as applicable.
- 4.7 Details establishing weather protection at joints or portions adjacent to dissimilar materials, in accordance with UBC Section 1402 or 1508, IBC Chapter 14 or 15, or IRC Sections R703.8 or R903, must be submitted to the building official for approval.
- 4.8 The panels are manufactured in Wausau, Wisconsin, under a quality control program with inspections by Intertek Testing Services, Middleton, Wisconsin (AA-690).

This report is subject to re-examination in two years.

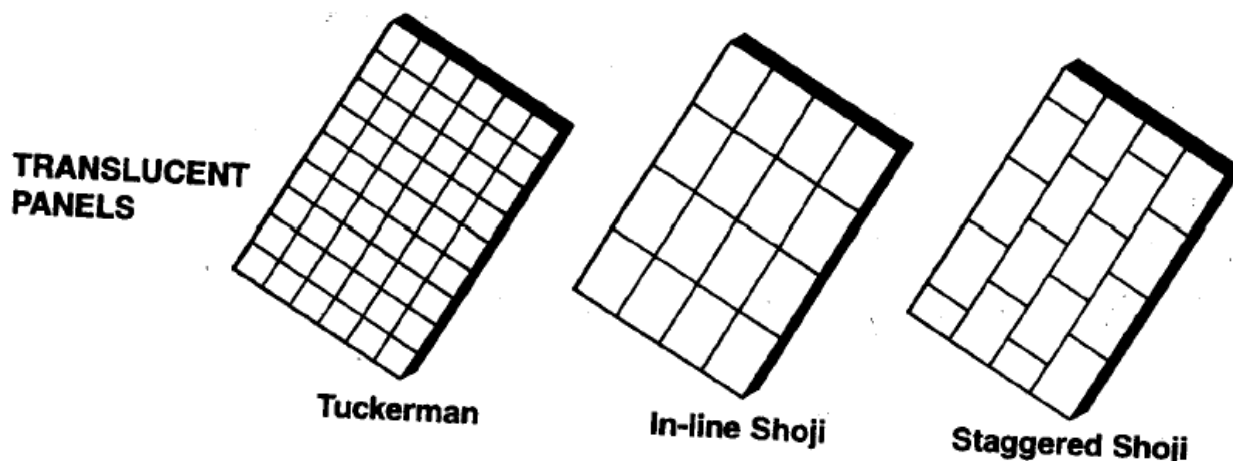


FIGURE 1

TABLE 1—PANEL FACING DESCRIPTIONS

PANEL FACING	THICKNESS (in)	PLASTIC CLASSIFICATION ¹	FLAME-SPREAD CLASSIFICATION ²	
			UBC	IBC
LASCO Crystal Interior UL25	0.045	CC-1	Class I	Class A
LASCO Crystal Exterior FR	0.070	CC-1	Class I	Class A

For SI: 1 inch = 25.4 mm.

¹Plastic classification established in accordance with UBC Section 217 or IBC Section 2606.4, as applicable.

²Flame-spread classification established in accordance with UBC Section 802, IBC Section 803.1 or IRC Section R319, as applicable.

TABLE 2—ROOF PANEL SPANS FOR PANELS WITH STANDARD, 2³/₄-INCH I-BEAMS (PART NO.1242)^{1,2,3,4,5,6}

DEFLECTION RATIO LIMIT = $l/180$ (For installation in areas governed by the UBC, IBC and IRC)										
Panel Configuration	Rafter, I-beam Aluminum Type	Load (psf)								
		20	30	40	50	60	70	80	90	100
		Allowable Roof Panel Span (ft)								
12-inch-by-24-inch grid with light rafter (Part No. 1294)	6063-T6	7.30	6.34	5.72	---	---	---	---	---	---
	6005-T5 & 6061-T6	7.53	6.54	---	---	---	---	---	---	---
8-inch-by-20-inch grid with light rafter (Part No. 1294)	6063-T6	6.71	5.83	---	---	---	---	---	---	---
	6005-T5 & 6061-T6	6.93	6.02	---	---	---	---	---	---	---
12-inch-by-24-inch grid with heavy rafter (Part No. 1295)	6063-T6	9.90	8.63	7.80	7.21	6.75	6.38	---	---	---
	6005-T5 & 6061-T6	10.22	8.90	8.05	7.44	6.97	6.59	---	---	---
8-inch-by-20-inch grid with heavy rafter (Part No. 1295)	6063-T6	9.11	7.93	7.17	6.63	---	---	---	---	---
	6005-T5 & 6061-T6	9.40	8.19	7.40	6.84	---	---	---	---	---
DEFLECTION RATIO LIMIT = $l/60$ (For installation in areas governed by the UBC)										
12-inch-by-24-inch grid with light rafter (Part No. 1294)	6063-T6	9.61	8.34	7.53	6.95	6.51	6.15	5.86	---	---
	6005-T5 & 6061-T6	9.91	8.61	7.77	7.17	6.71	6.35	6.05	5.79	5.57
8-inch-by-20-inch grid with light rafter (Part No. 1294)	6063-T6	8.84	7.367	6.93	6.39	5.98	5.66	5.39	---	---
	6005-T5 & 6061-T6	9.12	7.92	7.15	6.60	6.18	5.84	5.56	5.33	5.12
12-inch-by-24-inch grid with heavy rafter (Part No. 1295)	6063-T6	13.02	11.35	10.27	9.48	8.88	8.40	8.00	---	---
	6005-T5 & 6061-T6	13.45	11.71	10.59	9.79	9.17	8.67	8.26	7.91	7.61
8-inch-by-20-inch grid with heavy rafter (Part No. 1295)	6063-T6	11.98	10.44	9.44	8.72	8.17	7.73	---	---	---
	6005-T5 & 6061-T6	12.37	10.77	9.74	9.00	8.43	7.97	7.60	7.28	7.00

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 psf = 47.88 Pa.

¹Panels with 12-inch-by-24-inch grids have rafters spaced at 4 feet on center.

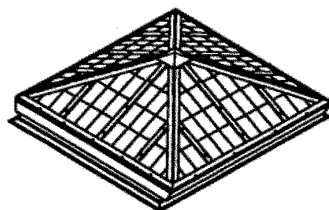
²Panels with 8-inch-by-20-inch grids have rafters spaced at 5 feet on center.

³Loads include 1.9 psf or 2.5 psf panel dead load for panels with light or heavy rafters, respectively.

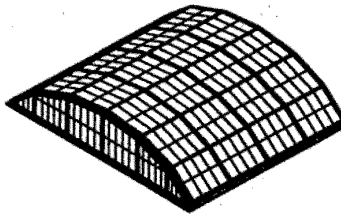
⁴Grid-core I-beam spans are continuous perpendicular to rafter span (I-beam spans = 4 or 5 feet).

⁵12-inch-by-24-inch and 8-inch-by-20-inch grid-cores are maximum nominal sizes.

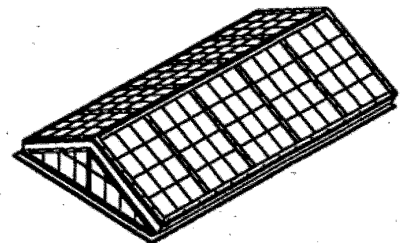
⁶Figure 4 illustrates the rafters.



PYRAMID



SEGMENTED BARREL VAULT WITH END WALLS



RIDGE WITH END WALLS

FIGURE 2—EXAMPLES OF ROOF PANEL INSTRUCTIONS

TABLE 3—WALL PANEL SPANS FOR PANELS WITH STANDARD, 2³/₄-INCH I-BEAMS (PART NO. 1242)^{1,2,3,4,5,6}

DEFLECTION RATIO LIMIT = $L/180$ (For installation in areas governed by the UBC, IBC and IRC)										
Panel Configuration	Aluminum Type	Load (psf)								
		20	30	40	50	60	70	80	90	100
		Allowable Wall Panel Span (ft)								
12-inch-by-24-inch grid with light mullion (Part No. 1219)	6063-T6	6.57	5.64	5.06	---	---	---	---	---	---
	6005-T5 & 6061-T6	6.78	5.82	---	---	---	---	---	---	---
8-inch-by-20-inch grid with light mullion (Part No. 1219)	6063-T6	6.04	5.19	---	---	---	---	---	---	---
	6005-T5 & 6061-T6	6.23	5.19	---	---	---	---	---	---	---
12-inch-by-24-inch grid with heavy mullion (Part No. 1295)	6063-T6	10.35	8.89	7.98	7.34	6.85	6.47	6.15	---	---
	6005-T5 & 6061-T6	10.68	9.17	8.23	7.57	7.07	6.68	6.35	---	---
8-inch-by-20-inch grid with heavy mullion (Part No. 1295)	6063-T6	9.52	8.17	7.34	6.75	---	---	---	---	---
	6005-T5 & 6061-T6	9.82	8.44	7.57	6.97	---	---	---	---	---
DEFLECTION RATIO LIMIT = $L/120$ (For installation in areas governed by the UBC, IBC and IRC)										
12-inch-by-24-inch grid with light mullion (Part No. 1219)	6063-T6	7.27	6.24	5.60	5.15	4.81	---	---	---	---
	6005-T5 & 6061-T6	7.50	6.44	5.78	5.32	4.97	---	---	---	---
8-inch-by-20-inch grid with light mullion (Part No. 1219)	6063-T6	6.68	5.74	5.15	4.74	---	---	---	---	---
	6005-T5 & 6061-T6	6.90	5.92	5.32	4.89	---	---	---	---	---
12-inch-by-24-inch grid with heavy mullion (Part No. 1295)	6063-T6	11.45	9.84	8.83	8.12	7.58	7.16	6.81	---	---
	6005-T5 & 6061-T6	11.82	10.15	9.11	8.38	7.83	7.39	7.03	6.72	6.46
8-inch-by-20-inch grid with heavy mullion (Part No. 1295)	6063-T6	10.53	9.05	8.12	7.47	6.98	6.58	6.26	---	---
	6005-T5 & 6061-T6	10.87	9.34	8.38	7.71	7.20	6.79	6.46	---	---
DEFLECTION RATIO LIMIT = $L/60$ (For installation in areas governed by the UBC)										
12-inch-by-24-inch grid with light mullion (Part No. 1219)	6063-T6	8.64	7.42	6.66	6.13	5.72	5.40	5.14	---	---
	6005-T5 & 6061-T6	8.92	7.66	6.88	6.32	5.91	5.58	5.30	5.07	4.88
8-inch-by-20-inch grid with light mullion (Part No. 1219)	6063-T6	7.18	6.17	5.54	5.09	4.76	4.47	4.29	---	---
	6005-T5 & 6061-T6	8.20	7.05	6.32	5.82	5.43	5.13	4.88	4.67	4.49
12-inch-by-24-inch grid with heavy mullion (Part No. 1295)	6063-T6	13.62	11.70	10.50	9.66	7.02	8.51	8.10	---	---
	6005-T5 & 6061-T6	14.05	12.07	10.84	9.97	9.31	8.79	8.36	8.00	7.69
8-inch-by-20-inch grid with heavy mullion (Part No. 1295)	6063-T6	12.53	10.76	9.66	8.88	8.30	7.83	7.45	---	---
	6005-T5 & 6061-T6	12.93	11.10	9.97	9.17	8.56	8.08	7.69	7.35	7.07

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 psf = 47.88 Pa.

¹12-inch-by-24-inch grids have mullions spaced at 4 feet on center.

²8-inch-by-20-inch grids have mullions spaced at 5 feet on center.

³Loads limited to short-term sources, such as wind or earthquake.

⁴Grid-core I-beam spans are continuous perpendicular to mullion span (I-beam spans = 4 or 5 feet).

⁵12-inch-by-24-inch and 8-inch-by-20-inch grid-cores are maximum nominal sizes.

⁶Figure 3 illustrates the mullions.

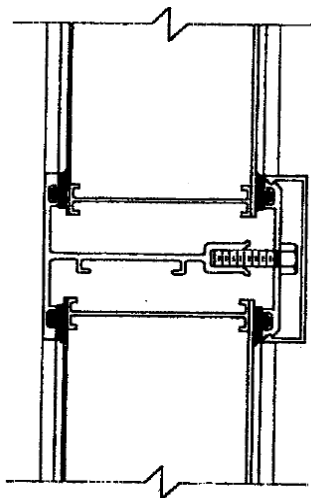


FIGURE 3—TYPICAL WALL SECTION (MULLION-I-BEAM)

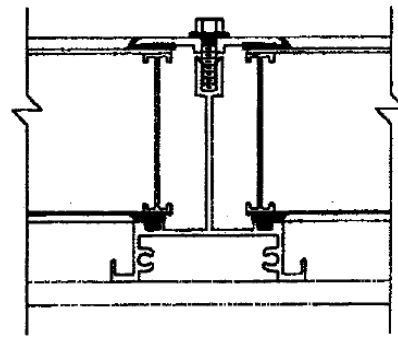


FIGURE 4—TYPICAL ROOF SECTION (RAFTER-I-BEAM)