Solarium Technical Data 200

Engineering Manual Table of Contents

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PRODUCT ENGINEERING MANUAL ON SOLARIUMS
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Note: Sections 300-2000 is on file at PEI Corporate Headquarters and is available upon request as needed.

Information in Section 500 is also in PEI Engineering - Section 17

PROFESSIONAL ENGINEERING REGISTRATIONS

STATE	STATE
Alabama	Nebraska
Colorado	New Hampshire
Connecticut	New Jersey
Washington, D.C.	New York
Delaware	North Carolina
Florida	Ohio
Georgia	Pennsylvania
Indiana (WM)	Rhode Island
Illinois	South Carolina
Iowa	Tennessee
Kansas	Texas
Kentucky	Virginia
Maryland	Vermont
Massachusetts	Wisconsin
Michigan	West Virginia
Minnesota	
Mississippi	
Missouri	

LIST OF REFERENCES ENGINEERING ANALYSIS & DESIGN

BUILDING CODE COMPLIANCE FOR LOADS

1. “International Building Code”, International Code Council (ICC), 2003 Edition
2. “Uniform Building Code” International Conference of Building Officials (ICBO), 1991 Edition
3. “National Building Code” Building Officials & Code Administrators (BOCA), 1990 Edition
4. “Standard Building Code”, Southern Building Code Congress International (SBCCI), 1991 Edition

DESIGN LOADS

1. "International Building Code”, ICC
2. "Uniform Building Code”, ICBO
3. “National Building Code”, BOCA
4. “ASCE –7 – 02” American Society of Civil Engineers (ASCE)

DESIGN LOAD COMBINATIONS

1. “International Building Code”, ICC
2. “Uniform Building Code”, ICBO
3. “National Building Code”, BOCA
4. “Standard Building Code”, SBCCI

SOLARIUM SPECIFICATIONS

SOLARIUMS 13120 / SLOPED GLAZING 08960
SKYLIGHT STRUCTURES 08630

Part 1 General

1.1 SECTION INCLUDES
A. Preparation of existing structure to receive solarium addition.
B. Structural design, engineering, fabrication and finishing of metal solarium framing system.
C. Glass and glazing.
D. Fasteners, anchors, reinforcement, and flashings.
E. Installation of entire solarium.

1.2 RELATED SECTIONS
A. Section 07620 - Sheet Metal Flashing and Trim: Counter flashing.
B. Section 07900 - Joint Sealers.
C. Section 08630 - Metal-Framed Skylights.

1.3 REFERENCES
A. AAMA 501.1 - Standard Test Method for Metal Curtain Walls for Water Penetration Using Dynamic Pressure; 1994.
B. AAMA 1504 - Voluntary Standard for Thermal Performance of Windows, Doors, and Glazed Wall Sections; 1997.
C. AAMA 2603 - Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum and Panels; 1998.
D. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 1998. (Formerly ANSI A 58.1)
E. ASTM A 276 - Standard Specification for Stainless Steel Bars and Shapes; 2000a.
F. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2000.
G. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 1998.
H. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 1991 (Reapproved 1999).
I. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls, by Uniform Static Air Pressure Difference; 2000.

SOLARIUM SPECIFICATIONS

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.
B. Shop Drawings: Include pertinent details for installation, anchorage of framing members, glazing, sealing, flashing, and adaptation of system for specific project conditions; include engineering calculations stamped and certified by a registered structural engineer, attesting to adequacy of system to meet required loading conditions.
C. Verification Samples: Submit samples, not less than 12 by 12 inches (305 by 305 mm) in size, illustrating appearance of prefinished aluminum and specified glazing system, including glazing bar and corner.

1.5 DELIVERY, STORAGE, AND PROTECTION

A. Transport, handle, store, and protect products so that they are in undamaged condition when installed.
B. Provide wrapping or packaging to protect prefinished aluminum surfaces.
C. Store components off the ground in a dry covered area, protected from adverse weather conditions.

1.6 WARRANTY

A. Provide manufacturer's warranty covering replacement or repair of defective materials within a ten-year period and including labor for one year after date of completion.

SOLARIUM SPECIFICATIONS

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Patio Enclosures, Inc; Commercial Division; Macedonia, OH 44056. ASD. Tel: (800) 468-0720. Quick Quote Fax: (330) 467-4297. www.patioenc.com. Email: csp@patioenc.com
B. Substitutions: Not permitted.

2.2 MATERIALS

A. Solarium: Glazed, aluminum framed, of configuration shown on the drawings, with the following characteristics:
    1. Structural Performance:
        a. Design and size components to withstand loads based on ASCE 7 criteria.
        b. Design and size components to withstand loads indicated on drawings.
        c. Design and size components to withstand loads required by _____Building Code.
        d. Design and size components to withstand following loads:
            1. Roof Snow Load: ___ lbf/sq ft (___ kPa).
            2. Positive Wind Load: ___ lbf/sq ft (___ kPa).
            3. Negative Wind Load: ___ lbf/sq ft (___ kPa).
        e. Maximum Allowable Deflection of Any Glazing Support Member: 1/180 of clear span.
    2. Thermal Transmittance: Comply with U-Class of U70, as defined in AAMA 1504.
    3. Condensation Resistance: Comply with CRF Class C55, as defined in AAMA 1504.
    4. Air Infiltration Resistance: Maximum of 0.14 cu ft per square ft per minute (.043cu m/sq m/min) when tested in accordance with ASTM E 283.
    5. Static Water Resistance: No failure when tested in accordance with ASTM E 331 at default test pressure.
    6. Dynamic Water Resistance: No leakage when tested at pressure difference of 6.24 lbf/sq ft (.299kPa) in accordance with AAMA ASTM 502.
    7. Thermal Movement: Fabricate components to allow for expansion and contraction with minimum clearance and shim spacing around perimeter of assembly.
    8. Drainage: Design so water entering exterior joints and condensation occurring in glazing channels drains to exterior via weep holes pre-drilled in factory.
    9. Construction: Rigid joints and corners with connections that are flush, hairline, and weatherproof, and with concealed anchorage devices.
    10. Finish: Pigmented organic coating on all visible aluminum surfaces.
    11. Color: Quaker Bronze.
    12. Color: White.
    13. Color: Sandstone.
    14. Color: Custom color, as directed by Architect.

SOLARIUM SPECIFICATIONS

B. Pigmented Organic Coating System: PPG Duracron or Polycron paint finish; or equal complying with AAMA 2603; electro statically applied and baked.

C. Framing Members: Aluminum extrusions of 6060, 6061, 6063, 6005 or 6105 alloy, temper T5 or T6, complying with ASTM B 221.
   1. Member Width: 2 inches (51 mm).
   2. Member Depth: As required by structural design.
   3. Member Depth: 3.2 inches (81 mm).
   4. Member Depth: 4.2 inches (107 mm).
   5. Member Depth: 5.2 inches (132 mm).
   6. Member Depth: 8.6 inches (218 mm).

D. Fasteners:
   1. Component Fasteners: Stainless steel, complying with ASTM A 276.
   2. Lag Screws: Hot-dip galvanized low carbon steel.

E. Roof Glazing: Sealed insulating glass units, 1 inch (25 mm) thick overall, IGCC CBA rating, and:
   1. Tint: None (clear).
   2. Tint: PPG Solar bronze.
   3. Tint: PPG Azuria.
   4. Tint: PPG Solar cool Bronze.
   5. Type: Clear glass inboard lite, standard air space.
   6. Type: Pyrolytic low-e inboard lite, argon gas fill.
   7. Type: Soft coat low-e inboard lite, argon gas fill.
   8. Outboard Lite: Fully-tempered glass, 1/8 inch (3 mm) thick
   9. Air space: 3/4 inch (19 mm), dual-sealed.
   10. Inboard Lite: Fully tempered glass, 1/8 inch (3 mm) thick.
   11. Inboard Lite: 1/4 inch (6 mm) laminated glass.

F. Wall Glazing: Sealed insulating glass units, 1 inch (25 mm) thick overall, IGCC CBA rating, and:
   1. Tint: Same as roof glazing.
   2. Tint: None (clear).
   3. Tint: PPG Solar bronze.
   4. Tint: PPG Azuria.
   5. Tint: PPG Solar cool Bronze.
   6. Type: Same as roof glazing.
   7. Type: Clear glass inboard lite, standard air space.
   8. Type: Pyrolytic low-e inboard lite, argon gas fill.
   9. Type: Soft coat low-e inboard lite, argon gas fill.
   10. Outboard Lite: Fully tempered glass, 1/8 inch (3 mm) thick.
   11. Air space: 3/4 inch (19 mm), dual-sealed.
   12. Inboard Lite: Fully tempered glass, 1/8 inch (3 mm) thick.

G. Bent Glass: Same as wall glazing.

H. Gaskets: Extruded EPDM, compatible with all system components.

I. Sealant: Silicone sealant meeting requirements of ASTM C 920, Grade NS, Use G, or FS TT-S-001543A.

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Part 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work. Do not proceed until unsatisfactory conditions are corrected in manner acceptable to installer.
B. Verify that foundation, basewall and adjacent construction are ready to receive solarium system, and are level, plumb and square within tolerances acceptable to manufacturer.

3.2 INSTALLATION

A. Comply with manufacturer's installation instructions.
B. Set solarium structure plumb, level, and true to line, without warp or rack of frames. Anchor securely in place, in accordance with approved shop drawings.
C. Maintain assembly dimensional tolerances, aligning with adjacent work.
D. Install sill flashings and flashings to adjacent construction, in accordance with approved shop drawings.
E. Install glazing in accordance with glazing manufacturer's recommended procedures.

3.3 CLEANING

A. At end of each workday, leave immediate work area neat.
B. Remove excess sealant promptly, using methods recommended by solarium manufacturer.
C. Touch up scratched surfaces using materials recommended by solarium manufacturer. Match touchup paint color to framing finish as closely as possible.