

Section 07 4213

ATAS International Inc. InSpire Transpired Solar Collector

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SECTION 07 4213
Transpired Solar Collector
INSPIRE

1.01 SECTION INCLUDES

- A. Transpired Solar Collector (solar thermal air heating wall system) for exterior wall cladding and subgirt framing assembly, with related flashings, summer bypass damper (when required) and accessory components.
- B. For direct air supply into building, fan assembly shall be fully assembled, tested and complete with intake and return air modulating dampers and automatic discharge air temperature control as supplied by ATAS International Inc. or coordinated with Mechanical Contractor. When required, summer bypass louvers have dampers controlled by outdoor thermostats.
- C. In application that transpired solar collector is supplying pre-heated replenishment air into air handler/heating system (HVAC), the HVAC fan is to be specified at (____) cfm at (½") static pressure, complete with (____) HP totally enclosed motor and bearings designed for continuous operation Volts(____) Phase, (____)Hz.

1.02 RELATED REQUIREMENTS

- A. Section 05 4000 - Cold-Formed Metal Framing: Wall panel substrate.
- B. Section 06 1000 - Rough Carpentry: Wall panel substrate.
- C. Section 07 2500 - Weather Barriers: Weather barrier under wall panels.
- D. Section 07 9200 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.
- E. Section 09 2116 - Gypsum Board Assemblies: Wall panel substrate.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.
- B. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.
- C. ICC-SRCC – Solar Rating Certification Corporation
- D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2019a.
- F. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010 (Reapproved 2015).
- G. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- H. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.
- I. RETScreen Clean Energy Management Software
- J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2019b.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
 - 1. Physical characteristics of components shown on shop drawings.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions and recommendations.
- C. Manufacturer Shop Drawings: Indicate dimensions, layout, joints, construction details, _____, and methods of anchorage.
 - a. Include small scale elevations. Show details of fastening and anchorage methods of both panels and subframing.
 - b. HVAC air intake locations shall be indicated for proper coordination with HVAC contractor.
- D. Energy Analysis: Submit detailed report showing projected energy savings and greenhouse gas reduction analysis, based upon the most current RETScreen Expert software providing both input data and the results from analysis.
- E. Samples: Submit two samples of wall panel, 12 inches by 12 inch (305 mm by 305 mm) in size and texture.
- F. Samples: Submit two samples of each color, 3 inch by 3 inch (77 mm by 77 mm) in size illustrating finish, color, and sheen.
- G. Manufacturer's Qualification Statement.
- H. Installer's Qualification Statement.
- I. Warranty: Submit specified manufacturer warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.
 - 1. Manufacturer to be ISO 9001:2015 with design.
 - 2. Manufacturer to provide valid SRCC (Solar Rating and Certification Corporation) certificate. Certificate currently valid with expiration date extending at least one full year beyond the date expected substantial completion.
- B. Installer Qualifications: Company specializing in installing products of the type specified in this section with minimum three years of documented experience.
- C. Pre-Construction meeting: Convene meeting prior to ordering materials to review scope of work and verify construction details, with the following attendees;
 - 1. General Contractor
 - 2. Installing Contractor
 - 3. Owner's Representative
 - 4. Architect
 - 5. Manufacturer's Representative
- D. Source Limitations; Obtain components for the solar collector system from or approved by roofing system manufacturer.

1.06 MOCK-UP

- A. Construct mock-up, _____ feet (_____ m) long by _____ feet (_____ m) wide; include panel and soffit system, glazing, attachments to building frame, associated vapor retarder and air seal materials, weep drainage system, sealants and seals, related insulation, and _____ in mock-up.
- B. Locate where directed by Architect.
- C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- B. Provide strippable plastic protection on prefinished wall panels for removal after installation.
- C. Store prefinished material off the ground and protected from weather as recommended by the manufacturer; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.
- D. Package Metal Panels for protection during transportation and handling.
- E. Prevent contact with materials that may cause discoloration or staining of products.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Manufacturers standard finish warranty to correct defective work within a thirty year period after Date of Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.
- C. Manufacturers standard product warranty to correct within a twenty-year period that panels (the Product) upon delivery are free from defects in material and workmanship.
- D. Special Installers warranty to correct defective work within a five-year period after Date of Substantial Completion, including defects in workmanship and weathertightness for metal wall panels.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design:
 - 1. Metal Wall Panels - Exposed Fasteners: Inspire Series manufactured by ATAS International Inc..
 - a. BWS390
 - b. Substitutions: See Section 01 6000 - Product Requirements
 - 1) Substitutions will be considered only if materials meet the requirements of Basis of Design and are approved by the Architect in writing prior to bid.
 - 2. Coordinate panel, louver, fan, and duct installation for compliance with system specification

2.02 MANUFACTURED METAL PANELS

- A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
 - 1. Provide transpired solar collector to develop specified solar heat gain requirements and provide optimum energy gain and flow to satisfy air intake needs
 - 2. Collector cladding shall be designed to balance air flow passing through it and the air be ducted to nearest intake fan using the most current version of RETScreen Expert to model anticipated heating energy delivered. The capacity of the total wall area between 1 and 10 cfm per sq.ft. of collector area tailored to meet specific project objectives.
 - a. 1 to 3 cfm/sq.ft. for high temperature gain
 - b. 3 to 6 cfm/sq.ft. for standard operation
 - c. 6 to 10 cfm/sq.ft. for high efficiency
 - 2. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
 - 3. Design Pressure: In accordance with applicable codes.
 - 4. Maximum Allowable Deflection of Panel: $L/180$ for length(L) of span.
 - 5. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
 - 6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.

7. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects
 8. Corners: Factory-fabricated in one continuous piece with minimum 2 inch (51 mm) returns.
 9. Provide continuity of air barrier and vapor retarder seal at building enclosure elements in accordance with materials specified in Section 07 2500.
- B. Exterior Wall Panels:
1. Profile: Box Rib Profile, Horizontal; 4 1/2" ribs spaced 7 7/8" apart..
 2. Perforation Pattern: Panels to have precision lanced micro-perforation
 2. Side and Top Seams: Lapped.
 3. Material: Precoated aluminum sheet, 20 gauge, 0.032 inch (0.8 mm) minimum thickness.
 4. Panel Width: Minimum 39 3/8" inches (999 mm).
 5. Panel Height: Maximum 1 1/4" inches (31.75 mm).
 6. Texture: Smooth
 7. Color: As selected by Architect
 - a. ATAS Standard color # _____
 8. Brake-formed panels will not be accepted.
- C. Subgirt Framing Assembly:
1. Provide secondary support framing members as designed by panel manufacturer to meet load requirements
 1. 16 gauge, 0.0598 inch (1.52 mm) thick formed non-precoated steel sheet.
 2. Profile as indicated; to attach panel system to building.
- D. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.
1. Provide mitered internal corners, back braced with 20 gauge, ___ inch (___ mm)thick perforated aluminum sheet to maintain continuity of profile.
- E. Expansion Joints: Same material, thickness and finish as exterior sheets; ___ gauge, ___ inch (___ mm) thick; manufacturer's standard brake formed type, of profile to suit system.
- F. Trim: Same material, thickness and finish as exterior sheets; factory fabricated.
- G. Snap J: Factory formed two piece J channel to be used in trim areas without clip securement to minimize exposed fasteners
- H. Penetration Covers to be supplied by panel manufacturer, factory fabricated in same gauge and finish as metal panels.
- I. Anchors: Galvanized steel or Stainless steel.

2.03 MATERIALS

- A. Precoated Steel Sheet: Aluminum-zinc alloy-coated steel sheet, ASTM A792/A792M, Commercial Steel (CS)) or Forming Steel (FS), with AZ50/AZM150 coating; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.
- B. Precoated Aluminum Sheet: ASTM B209 (ASTM B209M), 3105 alloy, O temper, smooth surface texture; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.
- C. Select materials with surface flatness, smoothness, and lack of surface blemishes where exposed to view in finished system.

2.04 FINISHES

- A. Cleaning and Pretreatment.
 1. Wet Chemistry Technology
 2. Complex Chrome-Oxide pretreatment
 3. Chrome Final Rinse

- B. Panel Backside Finish: Panel manufacturer's standard siliconized polyester wash coat.
- C. Fluoropolymer Coil Coating System: Polyvinylidene fluoride (PVDF) multi-coat superior performing coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, and at least 80 percent of coil coated aluminum surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch
 - 1. Color to be ATAS #_____

2.05 ACCESSORIES

- A. Cladding Support Clips: Thermally-broken, galvanized steel clips for support of cladding z-girts, angles, channels and other framing.
- B. Sheathing Ventilation Shims: ASV Spacer shims- Polyoxymethylene (engineered thermoplastic 3/8" stackable shims.
- C. Miscellaneous Sheet Metal Items: Provide factory formed flashings, moldings, closure strips, caps and cleats of the same material, thickness and finish as used for the wall panel system. Items completely concealed after installation may optionally be made of stainless steel.
 - 1. Fabricate trim and flashing components in a minimum 12'-0 length, or as dictated by project conditions and approved by manufacturer.
- D. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.
- E. Profiled Rib Closures: Provide prefabricated, factory pre-notched closures to match the panel profile close fitting components .032 Aluminum in the same color and finish as the wall panel system.
- F. Sealants:
 - 1. Exposed Sealant: High Performance Elastomeric, clear tri-polymer, as recommended by manufacturer.
 - 2. Concealed Sealant: High Performance Spacer Cubes, to prevent bottoming out of sealant when fasteners are installed encapsulated in non-curing butyl tape.
- G. Fasteners: Manufacturer's standard type to suit application meeting the following characteristics;
 - 1. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws.
 - 2. Metal-to Wood Fasteners; Self-tapping wood screws
 - 3. Carbon steel tread with organic long life coating
 - 4. Exposed Fasteners: type 304 stainless steel cap head
 - a. Encapsulated EPDM Washer
 - b. Baked on High performance compatible, chip resistant finish to match panel color
- H. Field Touch-up Paint: As recommended by panel manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation of wall panel system until substrate has been properly prepared.
 - 1. Verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required
 - 2. Examine roughing-in for components and systems penetrating metal wall panel to verify location of penetrations relative to seam locations.
- B. Verify that weather barrier has been installed over substrate completely and correctly.

- C. If the substrate preparation is the responsibility of another installer, notify Architect and General Contractor of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

- A. Install panels on walls in accordance with manufacturer's instructions and shop drawings, as applicable to specific project conditions..
- B. Remove protective film from surface of wall panels and associated trims immediately prior to installation. Strip film carefully to avoid damage to prefinished surfaces.
- C. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.
- D. Fasten panels to sheathing; aligned, level, and plumb.
- E. Install wall system with concealed clips and fasteners, except as otherwise recommended by manufacturer.
- F. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles.
- G. Use of torches or grinders for field cutting is absolutely prohibited.
- H. Locate joints over supports.
- I. Lap panel ends minimum 3" inches (76.2 mm).
- J. Provide expansion joints where indicated.
- K. Use concealed fasteners unless otherwise approved by Architect.
- L. Accessories: Install all components required for a complete wall assembly.
- M. Wall Panels: Install panels in strict accordance with manufacturer's instructions, minimizing joints except at junction with penetrations.
- N. Seal and place gaskets to prevent weather penetration. Maintaining neat appearance.

3.03 TOLERANCES

- A. Maximum Offset From True Alignment Between Adjacent Members Butting or In Line: 1/16 inch (1.6 mm).
- B. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch (6.4 mm).

3.04 CLEANING

- A. Remove site cuttings from finish surfaces.
- B. Remove protective material from wall panel surfaces.
- C. Remove and replace applications of metal wall panels where inspections indicate that they do not comply with specified requirements,
- D. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
- E. Upon completion of installation, thoroughly clean prefinished aluminum surfaces in accordance with AAMA 609 & 610.

END OF SECTION