

## SECTION 08911 - GLAZED ALUMINUM CURTAIN WALLS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Conventionally glazed aluminum curtain walls installed as stick systems.
  - 2. Break metal in conjunction with frames.
  - 3. Sealant at interior and exterior perimeter of curtain wall.
- B. Related Sections include the following:
  - 1. Division 7 Section "Joint Sealants" for installation of joint sealants installed with glazed aluminum curtain-wall systems and for sealants to the extent not specified in this Section.
  - 2. Division 8 Section "Aluminum-Framed Entrances and Storefronts" for entrance and storefront systems.
  - 3. Division 8 Section "Glazing" for insulating-glass requirements.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide glazed aluminum curtain-wall systems, including anchorage, capable of withstanding, without failure, the effects of the following:
  - 1. Structural loads.
  - 2. Thermal movements.
  - 3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
  - 4. Dimensional tolerances of building frame and other adjacent construction.
  - 5. Failure includes the following:
    - a. Air infiltration and water penetration exceeding specified limits.
    - b. Deflection exceeding specified limits.
    - c. Thermal stresses transferred to building structure.
    - d. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
    - e. Noise or vibration created by wind and thermal and structural movements.
    - f. Loosening or weakening of fasteners, attachments, and other components.
    - g. Sealant failure.
- B. Glazing is physically and thermally isolated from framing members.
- C. System is pressure equalized at its interior face.
- D. System is reglazable from the exterior.
- E. Structural Loads:
  - 1. Wind Loads: As indicated on Drawings.

2. Seismic Loads: As indicated on Drawings.
  3. Code: IBC 2003.
- F. Structural-Test Performance: Provide glazed aluminum curtain-wall systems tested according to ASTM E 330 as follows:
1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
  2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
  3. Test Duration: As required by design wind velocity but not less than 10 seconds.
- G. Deflection of Framing Members:
1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to **13 feet 6 inches**, and to 1/240 of clear span plus **1/4 inch**, for spans greater than **13 feet 6 inches** or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
  2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or **1/8 inch**, whichever is smaller.
- H. Thermal Movements: Provide glazed aluminum curtain-wall systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): **120 deg F**, ambient; **180 deg F**, material surfaces.
- I. Air Infiltration: Provide glazed aluminum curtain-wall systems with maximum air leakage of **0.06 cfm/sq. ft.** of fixed wall area when tested according to ASTM E 283 at a minimum static- air-pressure differential of **6.24 lbf/sq. ft.**
- J. Water Penetration Under Static Pressure: Provide aluminum glazed curtain-wall systems that do not evidence water penetration when tested according to ASTM E 331 at a minimum differential static pressure of 20 percent of positive design wind load, but not less than 10 lbf/sq. ft..
- K. Water Penetration Under Dynamic Pressure: Provide glazed aluminum curtain-wall systems that do not evidence water leakage when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive design wind load, but not less than **10 lbf/sq. ft.**
1. Maximum Water Leakage: No uncontrolled water penetrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained to exterior and cannot damage adjacent materials or finishes is not considered water leakage.
- L. Condensation Resistance: Provide glazed aluminum curtain-wall systems with condensation- resistance factor (CRF) of not less than 70 when tested according to AAMA 1503.
- M. Average Thermal Conductance: Provide glazed aluminum curtain-wall systems with average U-factor of not more than **0.48 Btu/sq. ft. x h x deg F** when tested according to AAMA 1503.

#### 1.4 SUBMITTALS

- A. General: Submit in accordance with Section 01330.
- B. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated. Include manufacturer's installation instructions for system specified.
- C. Shop Drawings: Show fabrication and installation of glazed aluminum curtain wall system including plans, elevations, sections, details of components, rough openings, flashing, and attachments to other units of Work.
- D. Samples for Sealants: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Capable of performing Work of this Section and who is acceptable to manufacturer.
- B. Source Limitations: Obtain glazed aluminum curtain wall system from one source and by a single manufacturer. Glazed aluminum curtain wall systems specified in this Section and aluminum entrances and storefront systems specified in Division 8 Section "Aluminum-Framed Entrances and Storefronts" shall be from same manufacturer.
- C. Welding: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code--Aluminum."

#### 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for glazed aluminum curtain-wall systems by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate submittal and fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating glazed aluminum curtain-wall systems without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Kawneer Company, Inc.; 1600 Wall System.
  - 2. Vistawall Architectural Products; 2600 Thermal Curtain Wall System.

#### 2.2 FRAMING SYSTEMS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  - 1. Sheet and Plate: ASTM B 209.
  - 2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221.

3. Extruded Structural Pipe and Tubes: ASTM B429.
  4. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.
- B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
  2. Cold-Rolled Sheet and Strip: ASTM A 611.
  3. Hot-Rolled Sheet and Strip: ASTM A 570/A 570M.
- C. System Components:
1. System Depth: Extruded aluminum, thermally isolated, 6 inch by 2-1/2 inch.
  2. Flashing: Minimum 0.063-inch thick aluminum brake material, unless otherwise noted; factory formed to detail; finish to match curtain wall.
- D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
1. Where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
  2. At pressure caps, use ASTM A 193 stainless steel screws.
  3. Reinforce members as required to receive fastener threads.
  4. Use exposed fasteners with countersunk Phillips screw heads finished to match framing members, unless otherwise indicated. Exposed fasteners shall be stainless steel.
  5. Finish exposed portions to match framing system.
  6. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.
- F. Anchors: Three-way adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
1. Concrete Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- G. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- H. Framing Gaskets: As recommended by manufacturer for joint type.
- I. Framing Sealants: As specified in Division 7 Section "Joint Sealants."

## 2.3 GLAZING SYSTEMS

- A. Glazing: As specified in Division 8 Section "Glazing."
- B. Glazing Gaskets: Manufacturer's standard pressure-glazing system of black, glazing gaskets, complying with ASTM C 864, extruded of a silicone compatible EPDM rubber that provides for silicone adhesion. Provide setting blocks, and shims or spacers; in

hardness recommended by manufacturer.

## 2.4 ACCESSORY MATERIALS

- A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

## 2.5 FABRICATION

- A. General: Fabricate glazed aluminum curtain wall system according to Shop Drawings. Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.
- B. Fabricate components that, when assembled, have the following characteristics:
  - 1. Sharp profiles, straight and free of defects or deformations.
  - 2. Accurately fitted joints with ends coped or mitered.
  - 3. Internal guttering systems or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
  - 4. Physical and thermal isolation of glazing from framing members.
  - 5. Accommodations for thermal and mechanical movements of glazing and framing to prevent glazing-to-glazing contact and to maintain required glazing edge clearances.
  - 6. Provisions for reglazing from exterior.
- C. Welding: Weld components to comply with referenced standard and Shop Drawings, unless otherwise indicated. Weld before finishing components. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- D. Prepare components to receive concealed fasteners, anchors, and connection devices.
- E. Fabricate components to drain water passing joints, condensation occurring in glazing channels, condensation occurring within framing members, and moisture migrating within system to exterior.
- F. Glazing Pockets: Provide minimum clearances for thickness and type of glass indicated according to FGMA's "Glazing Manual."
- G. Metal Protection: Where aluminum contacts dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum contacts concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## 2.6 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

- C. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural ClassII, clear coating 0.010 mm or thicker) complying with AAMA 611.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected or accommodations acceptable to Architect have been made.

### 3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions for protecting, handling, and installing glazed aluminum curtain wall system and the following:
  - 1. Do not install damaged components.
  - 2. Fit joints to produce hairline joints free of burrs and distortion.
  - 3. Rigidly secure nonmovement joints.
  - 4. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
  - 5. Weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
  - 6. Seal joints watertight, unless otherwise indicated.
  - 7. Provide means to drain water to the exterior to produce a permanently weatherproof system.
- B. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Set continuous sill members and flashing in a full sealant bed as specified in Division 7 Section "Joint Sealants" and to provide weathertight construction, unless otherwise indicated. Install sills in one piece, full width of opening except where opening exceeds available manufactured lengths. Provide sealed metal end dams at ends of sills. Sills shall turn up on backside to form pan, directing water to the exterior.
- D. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
- E. Install components plumb and true in alignment with established lines and grades.
- F. Anchorage: After system components are positioned, fix connections to building structure as indicated on Shop Drawings.
  - 1. Provide separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

2. Arrange fasteners and attachments to conceal from view.
- G. Welding: Weld components to comply with referenced standard and Shop Drawings, unless otherwise indicated. Weld in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
- H. Glazing: Install in accordance with Shop Drawings and complying with requirements as specified Division 8 Section "Glazing."
- I. Install weatherseal sealants in accordance with Shop Drawings and complying with requirements as specified in Division 7 Section "Joint Sealants," unless otherwise indicated.
1. Install backer rod and sealant around exterior of opening, back from cover plate, sealing perimeter weather tight. Install backer rod and sealant around rear of curtain wall frame to inside of rough opening between frame and air/vapor barrier. The intention is to provide a double seal to reduce the chance of water infiltration due to interior negative pressure.
  2. Color of sealant shall match aluminum finish.
- J. Erection Tolerances: Install glazed aluminum curtain-wall systems to comply with the following maximum tolerances:
1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
  2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
  3. Alignment:
    - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
    - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
    - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or greater, limit offset from true alignment to 1/4 inch.
  4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

### 3.3 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure glazed aluminum curtain wall system is without damage or deterioration at time of Substantial Completion. Protect finish, seals, and other components from damage.

END OF SECTION 08911

