# SECTION 08 44 13

# GLAZED ALUMINUM WINDOW WALL ASSEMBLY

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section Includes:
   1. Glazed aluminum window walls Ultra Thermal.

### 1.2 ACTION SUBMITTALS

A. Combined Submittals: Combine submittals for exterior window wall, curtainwall, and storefronts into a single submission. Submit combined shop drawing which has been reviewed, annotated, and coordinated by each of the principal exterior cladding subcontractors.
   1. As an indication of review, and as a condition of acceptance by the Architect, provide combined submittal with a cover sheet clearly indicating the signatures of the Contractor and each exterior cladding subcontractor.
   2. Coordinate curtainwall, storefronts and entrances, windows, ACM, and window wall submittals.

B. Product Data: Technical data identifying type of curtainwall assembly including construction details, framing methods, material descriptions, identification and dimensions of individual components and profiles, and finishes.

C. Shop Drawings: Submit plans, elevations, sections, full size details, and attachments to other work.
   1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
   2. Include full size isometric details of each vertical-to-horizontal intersection of glazed aluminum curtain walls, showing the following:
      a. Joinery, including concealed welds.
      b. Anchorage.
      c. Expansion provisions.
      d. Glazing.
      e. Flashing and drainage.
   3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

D. Samples: Submit samples for each type of exposed finish required in standard sizes.

E. Fabrication Sample: Prepare fabrication samples of each vertical to horizontal intersection of assemblies, made from 12 inch (305 mm) lengths of full size components and showing details of the following:
   1. Joinery, including concealed welds.
   2. Anchorage.
   3. Expansion provisions.
   4. Glazing.
   5. Flashing and drainage.

F. Delegated Design Submittal: Submit documentation indicating compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

## 1.3 INFORMATIONAL SUBMITTALS

A. Preconstruction Laboratory Mockup Testing Submittals:
   1. Testing Program: Developed specifically for Project.
   2. Test Reports: Prepared by a qualified preconstruction testing agency for each mockup test.
   3. Record Drawings: As built drawings of preconstruction laboratory mockups showing changes made during preconstruction laboratory mockup testing.

B. Qualification Data: Submit data for Installer.

C. Energy Performance Certificates: For glazed aluminum curtain walls, accessories, and components from manufacturer.
   1. Basis for Certification: NFRC certified energy performance values for each glazed aluminum curtain wall.

D. Product Test Reports: Submit reports for glazed aluminum curtain walls, for tests performed by manufacturer and witnessed by a qualified testing agency or a qualified testing agency.

E. Quality Control Program: Developed specifically for Project, including fabrication and installation, according to recommendations in ASTM C 1401. Include periodic quality control reports.

F. Source quality control reports.

G. Field quality control reports.

## 1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: Submit data for glazed aluminum curtain walls to include in maintenance manuals.

B. Maintenance Data for Structural Sealant: Submit data for structural sealant glazed curtain walls to include in maintenance manuals. Include ASTM C 1401 recommendations for post installation phase quality control program.

## 1.5 QUALITY ASSURANCE

A. Manufacturer/Fabricator Qualifications: Fabricator specializing in the fabrication of aluminum framed curtainwall window systems and components, having minimum 10 years documented experience, and with sufficient production capacity, organized quality control and testing procedures, and published written and illustrated installation manuals, to produce and install the assemblies required.

B. Installer Qualifications: Firm that specializes in the erection of aluminum curtain wall,storefront, and window systems, having minimum 10 years documented experience, and approved or certified by manufacturer/fabricator.

1. Engineering Responsibility: Prepare data for curtainwall, storefront, and window systems, including Shop Drawings, based on testing and engineering analysis of manufactured units in systems similar to those indicated.

a. Professional Engineer Qualifications: A professional engineer who is legally licensed to practice in the State in which the project is located experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of heavy glass storefront and entrance system similar to those indicated in material, design, and extent.

C. Source Limitations: Obtain curtain wall assembly components, storefront system and windows including framing spandrel panels windows entrances and accessories, from single manufacturer.

D. Welding Standards: Welding shall be performed by skilled and qualified mechanics. Welding shall be performed in accordance with the applicable provisions of AWS D1.1 *Structural Welding Code - Steel* and AWS D1.2 *Structural Welding Code - Aluminum*.

E. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC 17025.

F. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies related to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

G. Structural Sealant Glazing: Comply with ASTM C 1401 for design and installation of curtain wall assemblies.

H. Mockups: Build mockups of each curtain wall Type and window type to verify selections and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical wall area as shown on Drawings or area as selected by the Architect.
2. Testing shall be performed on mockups according to specified requirements.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed work if undisturbed at time of Substantial Completion.

I. Preinstallation Conference: Conduct conference at site.

## 1.6 DELIVERY, STORAGE, AND HANDLING

A. Identify components of curtainwall work after fabrication by marks clearly indicating location in the building. Package components to protect from damage during shipping and handling.

B. Storage on Site: Store units, components, and materials in clean, dry location, away from uncured concrete, masonry work, sprayed on fireproofing work, and construction activities. Cover with nonstaining waterproof paper, tarpaulin, or polyethylene sheeting to permit circulation of air inside the covering.

C. Keep handling on site to a minimum. Exercise care to avoid damage to finishes of metals or breakage of glass.

## 1.7 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions of supporting structure by field measurements before fabrication so curtainwall work is accurately designed, fabricated, and fitted to the structure. Indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work. Use Contractor’s lines and benchmarks as a basis for measurements.

1. Established Dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating curtainwalls without field measurements. Coordinate supporting structure construction to ensure actual dimensions correspond to established dimensions.

## 1.8 WARRANTY

A. Assembly Warranty: Written warranty signed by manufacturer and installer in which the manufacturer agrees to repair or replace components of glazed aluminum curtain wall that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including, but not limited to, excessive deflection.

b. Noise or vibration created by wind and thermal and structural movements.
c. Deterioration of metals and other materials beyond normal weathering.
d. Water penetration through fixed glazing and framing areas.
e. Failure of operating components.

2. Warranty Period: Five years from date of Substantial Completion.

B. Finish Warranty: Written warranty signed by manufacturer in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory applied finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:
a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period:
a. 20 years from date of Substantial Completion for Organic finishes where organic finishes are indicated.
b. 10 years from date of Substantial Completion for anodic finishes where anodic finishes are indicated.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer with experience in the design of curtainwalls and aluminum storefronts to design glazed aluminum curtain walls using performance requirements and design criteria indicated.

B. Where custom extrusion shapes and pressure caps are indicated, design all connections and anchorages to meet all Performance Requirements. All such connections shall be fully engineered under the delegated design requirements of this Section.

C. Where curtain wall mounted sun control louvers are indicated, incorporate all loading into the delegated design requirements of this Section.

D. Comply with performance requirements specified as determined by testing of glazed aluminum curtain walls representing those indicated without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.

2. Failure also includes the following:
a. Thermal stresses transferring to building structure.
b. Glass breakage.
c. Noise or vibration created by wind and thermal and structural movements.
d. Loosening or weakening of fasteners, attachments, and other components.

e. Failure of operating units.

E. Structural Loads:

1. Wind Loads: Design and size components of curtain wall assembly and windows to withstand loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with SEI/ASCE 7 to establish wind pressure based on the following criteria:
   a. Wind Loads: Indicated on Drawings.
   b. Ultimate Design Wind Speed ($V_{ult}$): As derived.
   c. Nominal Design Wind Speed ($V_{asd}$): Indicated on Drawings.
   d. Occupancy Category: II.
   e. Exposure Category: B
   f. Internal Pressure Coefficient (GCPI): Plus/minus 0.18.
2. Special Wind Load Exception: Wall cladding systems and components on the AIRSIDE of Airport Terminal buildings shall be designed to resist a minimum of 50 lbf/sq. ft. applied over any 15 sq. ft. area of cladding per FAA AC 150/5300-13, Chapter 8, “The Effects and Treatment of Jet Blast,” regardless of minimum wind loads determined per SEI/ASCE 7.
3. Other Design Loads: Indicated on Drawings.

F. Deflection of Framing Members: At design wind pressure:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.
   a. Operable Units: Provide a minimum 1/16 inch (1.6 mm) clearance between framing members and operable units.
3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:
   a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4 inch (6. 35 mm) for spans greater than 11 feet 8-1/4 inches (3.6 m) or 1/175 times span, for spans less than 11 feet 8-1/4 inches (3.6 m).

G. Structural: Test according to ASTM E 330:

1. When tested at positive and negative wind load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative windload design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

H. Air Infiltration: Test according to ASTM E 283 for infiltration:

1. Fixed Framing and Glass Area:

a. Maximum air leakage of 0.06 cfm/sq. ft. (0.30 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa) and 6.24 lbf/sq. ft. (300 Pa).

I. Water Penetration under Static Pressure: Test according to ASTM E 331:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 10 lbf/sq. ft. (480 Pa).

J. Water Penetration under Dynamic Pressure: Test according to AAMA 501.1:

1. No evidence of water penetration through fixed glazing and framing areas when tested at dynamic pressure equal to 20 percent of positive windload design pressure, but not less than 12 lbs/ sq. ft..
2. Maximum Water Leakage: No uncontrolled water penetrating assemblies or water appearing on assemblies' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters, or water that is drained to exterior.

K. Interstory Drift: Accommodate design displacement of adjacent stories indicated.

1. Design Displacement: Indicated on Drawings.
2. Test Performance: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.4 at design displacement and 1.5 times the design displacement.

L. Seismic Performance: Glazed aluminum curtain walls shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. Seismic Drift Causing Glass Fallout: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.6 at design displacement and 1.5 times the design displacement.
2. Vertical Interstory Movement: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.7 at design displacement and 1.5 times the design displacement.

M. Federal Standard 16 CFR 1201, Consumer Product Safety Commission (CPSC): *Safety Standard for Architectural Glazing Materials*, published in Code of Federal Regulations (CFR).

1. Comply with applicable requirements of authorities having jurisdiction, wherever requirements conflict the more stringent shall be required. Obtain approvals from authorities.
2. As a minimum, provide safety glazing complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.

N. Energy Performance: Certify and label energy performance according to NFRC as follows:

1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.45 Btu/sq. ft. x h x degrees F (2.55 W/sq. m x K) as determined according to NFRC 100.

2. Condensation Resistance Factor (CRF): Frame Value of 79 minimum when combined with 1 inch insulated glazing and aluminum pressure plates tested in accordance with AAMA 1503.

O. Noise Reduction: Test according to ASTM E 90, with ratings determined by ASTM E 1332:

1. Outdoor-Indoor Transmission Class: Minimum 26.

P. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 degrees F (67 degrees C), ambient; 180 degrees F (100 degrees C), material surfaces.
2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
   a. High Exterior Ambient-Air Temperature: That which produces an exterior metal surface temperature of [180 degrees F (82 degrees C).
   b. Low Exterior Ambient-Air Temperature: 0 degrees F (minus 18 degrees C).
   c. Interior Ambient-Air Temperature: 75 degrees F.

Q. Structural Sealant Joints:

1. Designed to carry gravity loads of glazing.
2. Designed to produce tensile or shear stress of less than 20 psi (138 kPa).

R. Structural Sealant: Capable of withstanding tensile and shear stresses imposed by structural sealant glazed curtain walls without failing adhesively or cohesively. When tested for preconstruction adhesion and compatibility, cohesive failure of sealant shall occur before adhesive failure.

1. Adhesive failure occurs when sealant pulls away from substrate cleanly, leaving no sealant material behind.
2. Cohesive failure occurs when sealant breaks or tears within itself but does not separate from each substrate because sealant to substrate bond strength exceeds sealant’s internal strength.

S. Provide curtain wall assembly, storefront system, and windows by a single source and tested as a combined single assembly.

2.2 ’FRAMING (CW-1) SYSTEM:

A. Basis of Design Product 1600 Wall System 1 Curtain Wall by Kawneer North America Subject to compliance with requirements, provide Basis of Design or comparable product by one of the following.
1. Arcadia, Inc.
2. Oldcastle, Inc.
3. U.S. Aluminum; a brand of C.R. Laurence.
4. Wausau Window and Wall Systems; Apogee Wausau Group, Inc.
5. YKK

B. Framing Members: Extruded or formed aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction: Thermally broken.
2. Glazing System: Retained mechanically with gaskets on four sides.
3. Glazing Plane: Front.
4. Finish: High performance organic finish.
5. Fabrication Method: Either factory or field fabricated system Factory fabricated unitized system.

C. Pressure Caps: Aluminum components that mechanically retain glazing. Include snap on aluminum trim that conceals fasteners.

1. Provide custom extrusion pressure cap assemblies where indicated for sun control and aesthetic banding.

D. Brackets and Reinforcements: High strength aluminum with nonstaining, nonferrous shims for aligning system components.

E. Materials:

1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
   a. Sheet and Plate: ASTM B 209 (ASTM B 209M).
   b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
   c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
   d. Structural Profiles: ASTM B 308/B 308M.
2. Steel Reinforcement: Zinc rich, 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.
   a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
   b. Cold Rolled Sheet and Strip: ASTM A 1008/A 1008M.
   c. Hot Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.3 FRAMING (CW-2) SYSTEM:

A. Basis of Design Product 1600 Wall System 2 Curtain Wall by Kawneer North America. Subject to compliance with requirements, provide Basis of Design or comparable product by one of the following.

1. Arcadia, Inc.
2. Oldcastle, Inc.
3. Tubelite Inc.
4. U.S. Aluminum; a brand of C.R. Laurence.
5. Wausau Window and Wall Systems; Apogee Wausau Group, Inc.
6. YKK

B. Framing Members: Extruded or formed aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction: Thermally broken.
2. Glazing System: Retained mechanically with gaskets on two sides and structural sealant on two sides.
3. Glazing Plane: Front.
4. Finish: High performance organic finish.
5. Fabrication Method: Either factory or field fabricated system.

C. Pressure Caps: Aluminum components that mechanically retain glazing. Include snap on aluminum trim that conceals fasteners.
   1. Provide custom extrusion pressure cap assemblies where indicated for sun control and aesthetic banding.

D. Brackets and Reinforcements: High strength aluminum with nonstaining, nonferrous shims for aligning system components.

E. Materials:
   1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
      a. Sheet and Plate: ASTM B 209 (ASTM B 209M).
      b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
      c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
      d. Structural Profiles: ASTM B 308/B 308M.
   2. Steel Reinforcement: Zinc rich, 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.
      a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
      b. Cold Rolled Sheet and Strip: ASTM A 1008/A 1008M.
      c. Hot Rolled Sheet and Strip: ASTM A 1011/A 1011M.

## 2.4 INSULATED SPANDREL PANELS

A. Insulated Spandrel Panels: Laminated, metal-faced flat panels with no deviations in plane exceeding 0.8 percent of panel dimension in width or length.
   1. Overall Panel Thickness: As indicated 1 inch (25.4 mm) minimum.
   2. Exterior Skin: Aluminum.
      a. Thickness: Standard for finish and texture indicated.
      b. Finish: Match framing system.
      c. Texture: Smooth.
      d. Backing Sheet: 1/8 inch (3.2 mm) thick, tempered hardboard.
   3. Interior Skin: Aluminum.
      a. Thickness: Standard for finish and texture indicated.
      b. Finish: Matching curtain wall framing.
      c. Texture: Smooth.
      d. Backing Sheet: 1/8 inch (3.2 mm) thick, tempered hardboard.

4. Thermal Insulation Core: Rigid, closed cell, polyisocyanurate board.

B. Surface Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame Spread Index: 25 or less.
   2. Smoke Developed Index: 50 or less.

## 2.5 ENTRANCES

A. Storefront and Entrances: Comply with Section 08 41 13.

## 2.6 GLAZING

A. Glazing: Comply with Section 08 80 00.

B. Glazing Gaskets: Sealed corner pressure glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers. Comply with Section 08 80 00.

C. Glazing Sealants: Comply with Section 08 80 00.

D. Structural Glazing Sealants: ASTM C 1184, chemically curing silicone formulation that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by structural sealant manufacturer for use in curtain wall assembly indicated.
   1. Color: As selected by the Architect from the manufacturer’s standard range.

E. Weatherseal Sealants: ASTM C 920 for Type S; Grade NS; Class 25; Uses NT, G, A, and O; chemically curing silicone formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural sealant, weatherseal sealant, and structural sealant glazed curtain wall manufacturers for this use.
   1. Color: Match structural sealant.

## 2.7 ACCESSORIES

A. Fasteners and Accessories: Corrosion resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
   1. Use self locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
   2. Reinforce members as required to receive fastener threads.
   3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

B. Anchors: Three way adjustable anchors with minimum adjustment of 1 inch (25.4 mm) that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry 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.

C. Concealed Flashing: Dead soft, 0.018 inch (0.457 mm) thick stainless steel, ASTM A 240/A 240M of type recommended by manufacturer.

D. Bituminous Paint: Cold applied asphalt mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30 mil (0.762 mm) thickness per coat.

## 2.8 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. 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.

C. Fabricate components that, when assembled, have the following characteristics:
1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from exterior interior for vision glass and exterior for spandrel glazing or metal panels.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
7. Components curved to indicated radii.

D. Fabricate components to resist water penetration:
1. Internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
2. Pressure equalized system or double barrier design with primary air and vapor barrier at interior side of glazed aluminum curtain wall and secondary seal weeped and vented to exterior.

E. Curtain Wall Framing: Fabricate components for assembly using shear block system.

F. Factory Assembled Frame Units:
1. Rigidly secure nonmovement joints.
2. Prepare surfaces that are in contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion.
3. Preparation includes, but is not limited to, cleaning and priming surfaces.
4. Seal joints watertight unless otherwise indicated.

5. Install glazing to comply with requirements in Section 08 80 00.

G. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## 2.9 ALUMINUM FINISHES

A. High Performance Organic Finish: Three coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: Selected by Architect.

## 2.10 SOURCE QUALITY CONTROL

A. Structural Sealant: Perform quality control procedures complying with ASTM C 1401 recommendations including, but not limited to, assembly material qualification procedures, sealant testing, and assembly fabrication reviews and checks.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine areas for compliance with requirements for installation tolerances and conditions affecting performance of the work. Proceed with installation after correcting unsatisfactory conditions.

## 3.2 PREPARATION

A. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

## 3.3 INSTALLATION

A. Comply with manufacturer's written instructions.

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 pressure caps in accordance with approved submittals with engineering support and in accordance with the manufacturer’s recommendations.
    a. Where custom extrusion caps are indicated ensure all anchorages are in compliance with Performance Requirements of this Section and with fully engineered anchorages and attachments indicated in approved submittals. Anchorages for all custom extrusion pressure cap sun shades shall be fully engineered to meet all Performance Requirements.

5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
7. Seal joints watertight unless otherwise indicated.

B. Metal Protection:
1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum is in contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section 08 80 00.
1. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

G. Install weatherseal sealant according to Section 07 92 00 and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.

## 3.4 ERECTION TOLERANCES

A. Erection Tolerances: Install glazed aluminum curtain walls to comply with the following maximum tolerances:
1. Plumb: 1/8 inch in 10 feet (3.2 mm in 3 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
2. Level: 1/8 inch in 20 feet (3.2 mm in 6 m); 1/4 inch in 40 feet (6.35 mm in 12.2 m).
3. Alignment:
a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.7 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (12.7 to 25.4 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
c. Where surfaces are separated by reveal or protruding element of 1 inch (25.4 mm) wide or more, limit offset from true alignment to 1/4 inch (6 mm).

4. Location: Limit variation from plane to 1/8 inch in 12 feet (3.2 mm in 3.6 m); 1/2 inch (12.7 mm) over total length.

## 3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Test Area: Perform tests on one bay at least 30 feet (9.1 m), by one story as selected by the Architect.

C. Field Quality Control Testing: Perform the following test on representative areas of glazed aluminum curtain walls.

1. Water Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
    a. Perform a minimum of two tests in areas as directed by Architect.
2. Air Infiltration: ASTM E 783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. (0.45 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).
    a. Perform a minimum of two tests in areas as directed by Architect.
3. Water Penetration: ASTM E 1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing, but not less than 6.24 lbf/sq. ft. (300 Pa), and shall not evidence water penetration.

D. Structural Sealant Adhesion: Test structural sealant according to recommendations in ASTM C 1401, Destructive Test Method A Hand Pull Tab (Destructive), Appendix X2.

1. Test a minimum of four areas on each building facade.
2. Repair installation areas damaged by testing.

E. Glazed aluminum curtain walls will be considered defective if they do not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION

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