GUIDE SPECFICIATIONS – SECTION 084413
GLAZED ALUMINUM CURTAIN WALLS (200x Series)

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Aluminum-framed curtain wall, with vision glazing and infill panels.
B. Associated louvers and operable sashes

1.02 RELATED REQUIREMENTS
A. Section 084313 - Aluminum-Framed Storefronts: Entrance framing and doors.
B. Section 085113 - Aluminum Windows: Operable sash within glazing system.
C. Section 088000 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS
A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.
C. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.
D. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
E. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
F. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
H. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
I. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
J. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
K. ASTM E547 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference; 2000 (Reapproved 2024).
L. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors; 2002 (Reapproved 2018).
M. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015 (Reapproved 2023).

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate with installation of other components that comprise the exterior enclosure.
B. Preinstallation Meeting: Conduct a preinstallation meeting before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.
C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
D. Shop Drawings: Provide details of proposed structural sealant glazing (SSG) and weather sealant joints indicating dimensions, materials, bite, thicknesses, profile, and support framing, when applicable.
E. Samples: Submit samples illustrating finished aluminum surface, glass, infill panels, glazing materials.
F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
G. Test Reports: Submit certified test reports for framing systems being used on project.
H. Installer's qualification statement.
I. Warranty: Submit manufacturer's sample warranty for framing systems being used on project.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than five years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.07 MOCK-UPS

A. See Section 014000 - Quality Requirements for additional requirements.

B. Construct mock-up, _____ feet (_____mm) long by _____ feet (_____mm) wide, containing each component being used on the project. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.09 FIELD CONDITIONS

A. Install sealants per sealant manufacturer's recommendations.

1.10 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Product: Submit a written warranty, executed by the window manufacturer, for a period of 2 years from the date of manufacture, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which results in premature failure of the storefronts, finish, glass, or parts, outside of normal wear.

1. In the event that storefronts or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.
2. Warranty for all components must be direct from the manufacturer (non-pass through) and non-prorated for the entire term. In non-residential occupancy, this warranty may be extended directly to the owner in its entirety and passed on to the first subsequent owner, only through its length.

C. Installation: Submit a written warranty, executed by the window installer, for a period of 2 years from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.

1. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

D. See product limited warranty and remedy document for additional information.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glazed Aluminum Curtain Walls Manufacturers:

1. Manko Window Systems, Inc; www.mankowindowsystems.com

2.02 BASIS OF DESIGN – CURTAIN WALL SYSTEMS

A. Pressure Cap at Four Sides:

1. Basis of Design: Manko Window Systems, Inc; 200x Series, 2-inch (64mm) wide face, Outside Glazed Curtain Wall: www.mankowindowsystems.com

B. Substitutions: See Section 016000 - Product Requirements.

1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.03 CURTAIN WALL

A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.

1. Outside glazed, with pressure plate and mullion cover, where indicated on drawings.
2. Glazing Method: Field glazed system.
3. Standard Back Member Depths for 1" Glazing: 4" or 5 1/2". _____ (Specify)
4. Optional Back Member Depth for 1 3/4" Glazing: 5 1/2". (Optional)
5. Finish: Class I Color Anodized or AAMA 2605 Fluoropolymer Paint: _____ (Specify)
6. Finish Color: _____ (Specify)
    a. Factory finish surfaces that will be exposed in completed assemblies.

b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies including joint edges.
c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.

6. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
7. Construction: Eliminate noises caused by wind and thermal movement, and prevent "stack effect" in internal spaces.
8. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
9. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel.
10. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing for expected movement.

B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.

1. Design Wind Loads: Comply with the following:
   a. Positive Design Wind Load: ____lbf/sq ft (_____Pa). (Specify)
   b. Negative Design Wind Load: ____lbf/sq ft (_____Pa). (Specify)
   c. Measure performance by testing in accordance with ASTM E330/E330M, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.
   d. Member Deflection: For spans less than 13 feet 6 inches (4115 mm), limit member deflection to flexure limit of glass in any direction, and maximum of 1/175 of span or 3/4 inch (19 mm), whichever is less and with full recovery of glazing materials.
   e. Member Deflection: For spans over 13 feet 6 inches (4115 mm) and less than 40 feet (12.2 m), limit member deflection to flexure limit of glass in any direction, and maximum of 1/240 of span plus 1/4 inch (1/240 of span plus 6.4 mm), with full recovery of glazing materials.

[Determination of design load(s) is the sole responsibility of the building's Engineer of Record, considering code interpretation issues and/or prescriptive requirements not included in contract documents. Manko Window Systems, Inc. strongly recommends that design loads (in PSF of Pa) specific to all relevant areas of the building be provided by the specifier.]

2. Movement: Accommodate the following movement without damage to components or deterioration of seals.
   a. Expansion and contraction caused by 180 degrees F (82 degrees C) surface temperature.
   b. Movement of curtain wall relative to perimeter framing.
   c. Deflection of structural support framing, under permanent and dynamic loads.
2. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
   a. Test Pressure Differential: 12 psf
   b. Test Method: ASTM E331
   c. Test Method: ASTM E547
3. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283 at 1.57 psf pressure difference.
4. Overall U-Value Including Glazing (0.29 COG): 0.36 Btu/(hr sq ft deg F) maximum , or project specific _____ (Specify), when tested in accordance with NFRC 2010 standards.

2.04 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weeps.
B. Glazing: See Section 088000.
C. Infill Panels: See Section 088000. (Optional)
D. Operable Sash: See Section 085113. (Optional)
E. Sun Shades: Manufacturer's standard shop fabricated, shop finished, extruded aluminum outriggers, louvers, and fascia, free of defects impairing strength, durability or appearance, see sunshade specific section. (Optional)

2.05 MATERIALS

A. Extruded Aluminum: ASTM B221/B221M.
B. Sheet Aluminum: ASTM B209/B209M.
C. Fasteners: Stainless steel, type as required or recommended by curtain wall manufacturer.
D. Glazing Gaskets: Manufacturer's standard to fit glass thickness.
H. Glazing Accessories: See Section 088000.

2.06 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.
B. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils (0.018 mm) thick.
C. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils (0.018 mm) thick.
D. Fluoroethylene Vinyl Ether (FEVE) Coating: Superior performing resin-based organic powder coatings system complying with AAMA 2605; single coat applications when applied to aluminum with dry film thickness (DFT) of 2 to 3 mil, 0.002 to 0.003 inch (0.051 to 0.076 mm); color and gloss as scheduled.
    1. Apply coating to exposed metal surfaces with proper preparation and pretreatment in accordance with resin manufacturer's instructions.
E. Color: As selected by Architect from manufacturer's standard range.
F. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.
B. Verify that curtain wall openings and adjoining water-resistive and air barrier seal materials are ready to receive work of this section.
C. Verify that anchorage devices have been properly installed and located.

3.02 INSTALLATION

A. Install curtain wall system in accordance with manufacturer's instructions.
B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
C. Provide alignment attachments and shims to permanently fasten system to building structure.
D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances.
E. Provide thermal isolation where components penetrate or disrupt building insulation.
F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
I. Install glass and infill panels using glazing method required to achieve performance criteria; see Section 088000.
J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm per m) non-cumulative.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/16 inch.
C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Minimum of 3/8 inch. Maximum not to exceed sealant manufacturers recommendations.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for general testing and inspection requirements.
B. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
    1. Perform a minimum of two tests in each designated area as indicated on drawings.
    2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
C. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.
B. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

END OF SECTION