GUIDE SPECFICIATIONS – SECTION 084313
ALUMINUM-FRAMED STOREFRONTS (2450 Series)

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Aluminum-framed storefront.

1.02 RELATED REQUIREMENTS
A. Section 084413 - Glazed Aluminum Curtain Walls.
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, glass and infill, door hardware, and internal drainage details.
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. Samples: Submit samples illustrating finished aluminum surface, glass, infill panels, glazing materials.
E. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
F. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
G. Installer's qualification statement.
H. Warranty: Submit manufacturer's sample warranty for framing systems being used.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than five (5) years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three (3) years of documented experience.

1.07 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.

1.08 FIELD CONDITIONS

A. Install sealants per sealant manufacturer's recommendations.

1.09 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. Aluminum-Framed Storefronts:
    1. Manko Window Systems, Inc; www.mankowindowsystems.com

2.02 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

A. Center-Set Style, Thermally-Broken:
    1. Basis of Design: Manko Window Systems, Inc; 2450 Series, Center Glazed - 2" x 4-1/2" – Thermal Storefront
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 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
    1. Glazing Rabbet: For 1 inch (25 mm) insulating glazing.
    2. Finish: Class I Color Anodized or AAMA 2605 Fluoropolymer Paint: _____ (Specify)
        a. Factory finish all surfaces that will be exposed in completed assemblies.
    3. 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.
    4. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
    5. 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.
    6. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.

7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Performance Requirements

1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
    a. Positive Design Wind Load: ____lbf/sq ft (_____Pa). (Specify)
    b. Negative Design Wind Load: ____lbf/sq ft (_____Pa). (Specify)
    c. Member Deflection: Limit member deflection to 1/175 in any direction, 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. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf (390 Pa).
3. Air Leakage: 0.06 cfm/sq ft (0.3 L/sec sq m) maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf (75 Pa) pressure difference.
4. Overall U-Value Including Glazing (0.29 COG): 0.38 maximum, or project specific _____ (Specify) Btu/(hr sq ft deg F), when tested in accordance with NFRC 2010 standards.

2.04 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.
    1. Glazing Stops: Flush.
B. Glazing: See Section 088000.
C. Infill Panels: See Section 088000. (Optional)

2.05 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).
B. Sheet Aluminum: ASTM B209/B209M.
C. Fasteners: Stainless steel, type as required or recommended by storefront manufacturer.
D. Concealed Flashings: Stainless steel, 26 gauge, 0.0187 inch (0.48 mm) minimum thickness.
E. Concealed Flashings: Sheet aluminum, 26 gauge, 0.017 inch (0.43 mm) minimum thickness.
F. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.
G. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements supplied by manufacturer.
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 II Natural Anodized Finish: AAMA 611 AA-M12C22A31 Clear anodic coating not less than 0.4 mils (0.01 mm) thick.
C. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils (0.018 mm) thick.
D. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils (0.018 mm) thick.
E. 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.
F. Color: As selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.
B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install 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, aligning with adjacent work.
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.
G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
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.

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 storefront 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