SECTION 084413 - GLAZED ALUMINUM CURTAIN WALLS

PART 1  GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed curtain wall, with vision glazing and glass.
B. Suncontrol brackets for installation of custom exterior grid by others.
C. Design, engineering, fabrication and erection of the aluminum framing system for glazed curtain wall.
D. Related aluminum extrusions and sheets for sills, filler, trim, and other items required for complete water and weather tight assembly.
E. Flashing, counterflashings, clips, brackets, fasteners, and related accessories.
F. Perimeter sealant.

1.02 RELATED REQUIREMENTS

A. Section 07 9005 - Joint Sealers:  Perimeter sealant and back-up materials.  Installed but not specified under Section 084413.
B. Section 08 4313 - Aluminum-Framed Storefronts:  Entrance framing and doors.
C. Section 08 8000 - Glazing.  Installed but not specified under Section 084413.

1.03 REFERENCE STANDARDS

A. AAMA MCWM-1 - Metal Curtainwall Manual; References and Industry Standards.
B. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association.

1.04 ADMINISTRATIVE REQUIREMENTS

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

1.05 PROJECT CONDITIONS.

A. All design load requirements are as indicated on the Drawings, sheet S001.  Design Wind Loads:  Comply with requirements of IBC.
B. Thermal Design  
1. Base thermal movement on a temperature differential of not less than 180 degrees Fahrenheit.  
2. Thermal and differential movement within the assemblies in both axes of the glazing plane.  
3. Thermal and differential movement between the assemblies and adjacent construction.  

C. Design conditions.  
1. Interior: 67 to 73 degrees, 25 to 35% RH.  
2. Outside: -25 degrees, 30% RH.  

D. Design, engineer, fabricate and erect the curtainwall assemblies to accommodate the anticipated movements listed below without damage to or deterioration of the glazing or gasket systems, without buckling or opening of joints and without glass breakage. Vibration harmonics, harmonics, wind whistle, noise caused by thermal movement to other systems, and loosening, weakening, or fracturing of fasteners or anchors or other components of the system due to these movements shall not be permitted.  

1.06 SUBMITTALS  
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.  
B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glazing and infill, 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 two samples 24x24 inches in size illustrating finished aluminum surface, glazing, glazing materials.  
E. Components: Submit samples of anchors, fasteners, hardware, assembled corner sections and other materials and components as requested by Architect.  
F. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.  
G. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations.  
H. Structural Glazing Adhesive: Submit product data and calculations showing compliance with performance requirements.  
I. Manufacturer’s Certificate: Certify that the products supplied meet or exceed the specified requirements.  
J. Report of field testing for water leakage.  
1. Submit certified independent laboratory test reports verifying compliance with all test requirements  
K. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner’s name and registered with manufacturer.  

1.07 QUALITY ASSURANCE  
A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at North Dakota.  
B. Full-Size Mock-up Testing: Have a specimen representative of project conditions tested by an independent testing agency for compliance with specified structural criteria.  
C. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum six years of documented experience.  
1. Installer shall be acceptable to the manufacturer.  

1.08 DELIVERY, STORAGE, AND HANDLING  
A. Handle products of this section in accordance with AAMA CW-10.  
B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.
1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Submit a written warranty, executed by the curtainwall manufacturer, for a period of 10 years from the date of manufacture, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which result in premature failure of the curtainwall, finish, or parts, outside of normal wear.
   1. In the event that curtainwall 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 pro-rated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.

C. Submit a written warranty, executed by the curtainwall installer, for a period of up to 5 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 curtainwall or components is found to be defective, installer will repair or provide replacements without charge at the installer's option

D. Provide ten year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

E. Provide twenty year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tubelite; Product Basis of Design - 400 Series. Assumed member 2-1/2 inches x 5 inches plus glazing, pressure plate and trim: 7 inches overall (at ALUM-1, ALUM-2 and ALUM-7) and 2-1/2 inches x 6 inches plus glazing, pressure plate and trim: 8 inches overall (at ALUM-3)

B. Other Acceptable Manufacturers:
   1. YKK AP America Inc; Product YCW 750: www.ykkap.com.
   3. EFCO; Product 5900.
   4. CMI, Product 6600.
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 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.
   2. Finish: High Performance Color 70% PVDF coating
      a. Color shall be equal to Tubelite Charcoal Gray XP, LT605-70.
      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.
   3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; 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. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line
with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.

7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing 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 requirements of the requirements of IBC code. Provide steel reinforcing where necessary, verify locations indicated on drawing A402.
   2. Movement: Accommodate the following movement without damage to components or deterioration of seals:
      a. Expansion and contraction caused by 180 degrees F surface temperature.
      b. Expansion and contraction caused by cycling temperature range of 170 degrees F over a 12 hour period.
      c. Movement of curtain wall relative to perimeter framing.
      d. Deflection of structural support framing, under permanent and dynamic loads.

C. Water Penetration Performance Requirements: No uncontrolled water on indoor face when tested as follows:
   2. Test Pressure Differential: 15 lbf/sq ft.

D. Air Infiltration Performance Requirements:
   1. Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area or less, measured in accordance with ASTM E 283.
   2. Air Infiltration Test Pressure Differential: 6.24 pounds per square inch.

E. Thermal Performance Requirements:
   1. Condensation Resistance Factor: 63, minimum, measured in accordance with AAMA 1503, using clear 1 inch thick sealed insulating glass.

2.03 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. Cross-Section: 2 x 7 inch nominal dimension.
   2. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
      a. As required by Curtainwall Manufacturer's Engineering.

B. Sun Screen brackets: Shop fabricated, shop finished, extruded aluminum outriggers, free of defects impairing strength, durability or appearance.
   1. Configuration: As indicated on drawings.
   5. Design Criteria: Design and fabricate to resist the same loads as curtain wall system as well as the following loads without failure, damage, or permanent deflection:
      a. In accordance with IBC and as indicated on S001
   6. Shop fabricate to the greatest extent possible; disassemble if necessary for shipping.

2.04 MATERIALS


C. Structural Steel Sections: ASTM A 36/A 36M; galvanized in accordance with requirements of ASTM A 123/A 123M.

D. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.

E. Fasteners: Stainless steel.

F. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.

G. Concealed Flashings: 0.018 inch thick galvanized steel.

H. Perimeter Sealant: Type specified in Section 07 9005.

I. Glazing: As specified in Section 08 8000.
1. Glass in Exterior Framing: Type as shown on Drawings.

J. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

K. Glazing Accessories: As specified in Section 08 8000.

L. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.05 FINISHES

A. Finish: High Performance Color 70% PVDF coating

B. Touch-Up Materials: As recommended by coating manufacturer for field application.

C. Provide brackets to provide for the furnishing and installation of aluminum grid.
   1. Grid is specified under Section 05 5000, Furnished by Section 05 5000, and installed by Section 06 1000 at locations where the grid devices are connected to the Curtainwall Assembly.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor 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 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. Coordinate attachment and seal of perimeter air and vapor barrier materials.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Pressure Plate Framing: Install glazing and infill panels in accordance with Section 08 8000, using exterior dry glazing method.

J. Install perimeter sealant in accordance with Section 07 9005.

K. 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 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

3.04 FIELD QUALITY CONTROL

A. Provide the services of the manufacturer’s field representative to observe installation and make report.

B. Testing installed curtain wall as indicted in Part 1 of this Section shall be provided by the Owner’s Independent
Testing Laboratory. This Contractor shall cooperate fully with the Independent Testing Lab.

3.05 MANUFACTURER’S FIELD SERVICES

A. See Section 01 4000 - Quality Requirements, for general requirements for manufacturer observation of installation.

B. Provide curtain wall manufacturer’s field surveillance of the installation. Monitor and report installation procedures, unacceptable conditions.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

3.07 PROTECTION

A. Protect installed products from damage during subsequent construction.

END OF SECTION