SECTION 084113 - ALUMINUM-FRAMED STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior and interior storefront framing.
2. Storefront framing for punched openings.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, elevations, sections, full-size details, and attachments to other work.

1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

C. Samples: For each exposed finish required.

D. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.

E. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: NFRC-certified energy performance values from manufacturer.

B. Product test reports.

C. Field quality-control reports.

D. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. 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.

C. 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 as they relate 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.

D. System Performance. Provide exterior entrance and storefront assemblies that have been designed and fabricated to comply with system performance characteristics listed below as demonstrated by testing systems according to test methods designated.

1. Wind Loading. Provide capacity to withstand loading specified by structural design, tested in accordance with ASTM E 330.

E. Provide transmission characteristics of fixed framing to comply with requirements indicated below.

1. Air infiltration shall be not more than 0.06 CMF per square foot of fixed area in accordance with ASTM E 283.
2. No uncontrolled water penetration shall occur at pressure differential of 6.24 psf in accordance with ASTM E 331 (excluding operable door edges).
3. Condensation resistance shall be not less than 51 CRF in accordance with AAMA 1502.7.
4. The specified thermal transmittance U-value shall comply with the currently enforced International Energy Conservation Code requirements.

F. Provide transmission characteristics of entrances (doors with jamb and head frames) to comply with requirements indicated below.

1. Air infiltration per linear foot of perimeter crack shall be not more than 0.50 CFM for single doors and 1.0 CFM for pairs of doors at pressure differential of 1.567 psf in accordance with ASTM E 283.
2. Condensation resistance shall be not less than 48 CRF in accordance with

AAMA 1502.7.

3. The specified thermal transmittance U-value shall comply with the currently enforced International Energy Conservation Code requirements.

G. Installer Qualifications: The contractor to engage a firm who can provide evidence to indicate successful experience in the installation of work specified herein.

H. Welding Qualifications: Welding to comply with requirements of AWS D1.1 Structural Welding Code, for welding design, workmanship, techniques, inspection, and qualification of welding operators.

I. Provide separation between aluminum surfaces and sources of corrosion or electrolytic action, such as copper or untreated steel, by coating area of dissimilar metals with heavy-bodied bituminous paint.

J. For aluminum surfaces in contact with lime mortar or concrete, paint with alkali-resistant coating.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

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

B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design aluminum-framed entrances and storefronts.

B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrances and storefronts 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. Where indicated on drawings provide "heavy duty/reinforced storefront". Coordinate these units with Delegated design requirements.
3. 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.

C. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

D. Deflection of Framing Members: At design wind pressure, as follows:

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, whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.

E. Structural: Test according to ASTM E 330 as follows:

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 wind-load 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.

F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:

    a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft.

G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

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 6.24 lbf/sq. ft.

H. 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 0.35 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.30 as determined according to NFRC 200.
3. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 35 as determined according to NFRC 500.

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

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 MANUFACTURERS

A. Basis-of-Design Product (Exterior): Subject to compliance with requirements, provide **Oldcastle, Series 3000 Thermal MultiPlane** or a comparable product by one of the following:

1. YKK AP America Inc
2. EFCO Corporation
3. Tubelite Inc.
4. Approved equal prior to bid.

B. Basis-of-Design Product (Interior): Subject to compliance with requirements, provide **Oldcastle, Series 3000 Thermal MultiPlane** Framing System or a comparable product by one of the following:

1. YKK AP America Inc
2. EFCO Corporation
3. Tubelite Inc.
4. Approved equal prior to bid.

2.3 FRAMING

A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction Exterior: Thermally broken.
2. Construction Interior: Nonthermal.
3. Glazing System: Retained mechanically with gaskets on four sides.
4. Glazing Plane(Exterior): Front Set.
5. Glazing Plane(Interior): Center Set.

6. Finish: High-performance organic finish.
7. Fabrication Method: Field-fabricated stick system.

B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

D. Materials:

1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

    a. Sheet and Plate: ASTM B 209.
    b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
    c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
    d. Structural Profiles: ASTM B 308/B 308M.

2. Steel Reinforcement: Manufacturer's standard 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 GLAZING

A. Glazing: Comply with Section 08 80 00 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

2.5 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 interior.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

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

2.6 ALUMINUM FINISHES

A. AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

Finish: **Refer to Exterior Material Keynote Schedule on Drawing A520 for color selection.**

2.7 FURTHER REQUIREMENTS

A. SOURCE QUALITY CONTROL
A single manufacturer or source shall provide materials of each type to ensure matching of quality, color, pattern and texture. Source or brands shall not be changed during the course of construction.

B. MATERIALS

1. The basis of design of aluminum storefront system doors and frames shall be Standard Flush Glaze System as manufactured by Oldcastle. Frames and door stiles shall be tubular extrusions with 1/8 inch minimum wall thickness.
2. Other approved manufacturers:
   a. YKK
   b. Vista Wall Series 3000
3. Swinging doors shall be wide stile (6") doors.
4. Glazing stops shall be square type.
5. All exposed surfaces shall be free of scratches and other serious blemishes and shall receive Kynar 500 or be anodized.
6. Extrusions shall be 6063-T5 alloy and temper (ASTM B 221 alloy G.S. 10AT5). Fasteners, where exposed, shall be aluminum, stainless, steel, or plated steel in accordance with ASTM A 164. Perimeter anchors shall be aluminum or steel, providing the steel is property isolated from the aluminum. Glazing gaskets shall be elastomeric extrusions.
   a. The framing system shall provide for flush glazing on all sides

with no projecting stops. Vertical and horizontal framing members shall have a nominal face dimension of 2". Overall depth shall be 4 ½". Entrance framing members shall be compatible with glass framing in appearance. All single acting entrance frames shall include the Sealair positive barrier weathering.

C. FABRICATION

1. Provide the following requirements for shop assembly: Perform fitting and assembly of the work in the shop to the greatest extent possible. Work that cannot be permanently shop-assembled shall be completely assembled, marked, and disassembled before shipment, to assure assembly in the field. Require the following:
   a. Preglazing: Preglaze door and frame units to greatest extent possible, in coordination with installation and hardware requirements.
   b. Surface Mounted Hardware: Do not drill and tap for surface mounted hardware items until time of installation.
   c. Welding: Comply with AWS recommendations.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other 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 materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed as specified in Section 07 92 00 "Joint Sealants" to produce weathertight installation.

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 "Glazing."

G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.2 FIELD QUALITY CONTROL

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

B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances and storefronts.

1. Water-Spray Test(exterior only): 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.

C. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 084113