

SECTION 084113 – ALUMINUM-FRAMED STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum-framed storefront systems.
2. Aluminum-framed entrance door systems.

B. Related Sections:

1. Section 061000 – Rough Carpentry.
2. Section 079200 – Joint Sealants.
3. Section 087111 – Door Hardware (Descriptive Specification).
4. Section 088000 – Glazing.

C. Reference and Industry Standards

1. The following reference standards shall be applicable to this Section:

- a. New York City Energy Conservation Code, **current** edition, as amended.
- b. Accessibility: ICC/ANSI A117.1 **current** edition.
- c. The current Enterprise Green Communities (EGC) Criteria, and the current New York City Overlay.
- d. Industry Standards
 - ASTM (American Society for Testing and Materials)
 - BHMA (Builders Hardware Manufacturers Association)
 - NFRC (National Fenestration Ratings Council)
 - SSPC (Society for Protective Coatings)

D. The current NYC Overlay of the current Enterprise Green Communities Criteria:

1. Mandatory Requirements: See the NYC Overlay of the EGC reference standard for full specifications.
 - a. All projects must achieve compliance with the mandatory criteria measures that are applicable:
 - Criterion 6.4: Healthier Material Selection
 - Criterion 6.10: Construction Waste Management
2. Optional Project Requirements for Certification Points

- a. Additionally, rehab projects are required to achieve **55** optional points. Criteria with optional points related to this Specification Section include, but may not be limited to:

- Criterion 6.1: Ingredient Transparency for Material Health
- Criterion 6.2: Recycled Content and Ingredient Transparency
- Criterion 6.4: Healthier Material Selection
- Criterion 6.7: Regional Materials
- Criterion 6.10: Construction Waste Management

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: For aluminum-framed entrances and storefronts. 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.
 2. Include point-to-point wiring diagrams.
- C. Samples: For each type of 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, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranties.
- C. Documentation for compliance with Enterprise Green Communities Criteria.

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 and that employs a qualified glazing contractor for this Project.

- B. 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.
- C. Source Limitations: Obtain from a single manufacturer all aluminum-framed entrances and storefronts.

1.7 WARRANTY

- A. Special Warranty: **[Manufacturer]** **[Installer]** 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: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. 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, 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.
- B. Structural Loads:
 - 1. Wind Loads: 30 psf minimum.
 - 2. ASTM E330 test method evaluates structural performance of aluminum-framed entrances and storefronts and not structural performance of contiguous construction.
- C. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:
 - 1. Thermal Transmittance (U-factor):

- a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.38 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
 - b. Entrance Doors: U-factor of not more than 0.77 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
- 2. Solar Heat-Gain Coefficient (SHGC):
 - a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.40 as determined in accordance with NFRC 200.
 - b. Entrance Doors: SHGC of not more than 0.40 as determined in accordance with NFRC 200.
- 3. Air Leakage: Shall comply with the New York City Energy Conservation Code, Table C402.5.2 Maximum Air Leakage Rate for Fenestration Assemblies.
 - a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of when tested in accordance with ASTM E283.
 - b. Entrance Doors: Air leakage of not more than 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..
- D. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 STOREFRONT SYSTEMS

- A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - 1. Exterior Framing Construction: Thermally broken.
 - 2. Glazing System: Retained mechanically with gaskets on four sides.
 - 3. Finish: **[Clear anodic finish] [Baked-enamel or powder-coat finish]**.
 - 4. Fabrication Method: Field-fabricated stick system.
 - 5. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 6. Steel Reinforcement: As required by manufacturer.
- 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.

2.3 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.
 - 1. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch-thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply-penetrated and fillet welded or that incorporate concealed tie rods.
 - a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
 - 2. Door Design: Medium stile; 3-1/2-inch nominal width.
 - 3. Glazing Stops and Gaskets: **[Beveled]** **[Square]** **<Insert description>**, snap-on, extruded-aluminum stops and preformed gaskets.
 - a. Provide non-removable glazing stops on outside of door.

2.4 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section is specified in *Section 087111 - Door Hardware (Descriptive Specification)*.
- B. General: Provide entrance door hardware for each entrance door, to comply with requirements in this Section.
 - 1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products complying with BHMA standard referenced.
 - 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
 - 3. Opening-Force Requirements:
 - a. Egress Doors: Not more than 5 lbf to release the latch and not more than 5 lbf to set the door in motion and not more than 5 lbf to open the door to its minimum required width.
- C. Designations: Products are identified by using entrance door hardware designations as follows:
 - 1. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.
- D. Pivot Hinges: BHMA A156.4, Grade 1.
 - 1. Offset-Pivot Hinges: Provide top, bottom, and intermediate offset pivots at each door leaf.
- E. Butt Hinges: BHMA A156.1, Grade 1, radius corner.

1. Non-removable Pins: Provide setscrew in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while entrance door is closed.
 2. Exterior Hinges: Nonferrous.
 3. Quantities:
 - a. For doors up to 87 inches high, provide three hinges per leaf.
- F. Continuous-Gear Hinges: BHMA A156.26.
- G. Mortise Auxiliary Locks: BHMA A156.5, Grade 1.
- H. Manual Flush Bolts: BHMA A156.16, Grade 1.
- I. Automatic and Self-Latching Flush Bolts: BHMA A156.3, Grade 1.
- J. Panic Exit Devices: BHMA A156.3, Grade 1, listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing in accordance with UL 305.
- K. Cylinders:
1. BHMA A156.5, Grade 1.
- L. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.
- M. Operating Trim: BHMA A156.6.
- N. Removable Mullions: BHMA A156.3 extruded aluminum.
- O. Closers: BHMA A156.4, Grade 1, with accessories required for a complete installation, sized as required by door size, exposure to weather, and anticipated frequency of use; adjustable to comply with field conditions and requirements for opening force.
- P. Concealed Overhead Holders and Stops: BHMA A156.8, Grade 1.
- Q. Door Stops: BHMA A156.16, Grade 1, floor or wall mounted, as appropriate for door location indicated, with integral rubber bumper.
- R. Weather Stripping: Manufacturer's standard replaceable components.
- S. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.
- T. Thresholds: BHMA A156.21 raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.
- U. Finger Guards: Manufacturer's standard collapsible neoprene or PVC gasket anchored to frame hinge-jamb at center-pivoted doors.

2.5 GLAZING

- A. Glazing: Comply with *Section 088000 – 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.

2.6 MATERIALS

- A. Sheet and Plate: ASTM B209.
- B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.
- C. Structural Profiles: ASTM B308.
- D. Steel Reinforcement:
 - 1. Structural Shapes, Plates, and Bars: ASTM A36.
 - 2. Cold-Rolled Sheet and Strip: ASTM A1008.
 - 3. Hot-Rolled Sheet and Strip: ASTM A1011.
- E. Steel Reinforcement Primer: 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 in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

2.7 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] [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.
- 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 in accordance with Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, or thicker.
- B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Color and Gloss: **[As selected by Design-Professional-of-Record from manufacturer's full range] [As selected by Owner from full range of industry colors].**

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with manufacturer's written instructions.
- B. Do not install damaged components.
- C. Fit joints to produce hairline joints free of burrs and distortion.
- D. Rigidly secure nonmovement joints.
- E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- F. Seal perimeter and other joints watertight unless otherwise indicated.
- G. 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.
- H. Set continuous sill members and flashing in full sealant bed, as specified in *Section 079200 – Joint Sealants* to produce weathertight installation.

- I. Install joint filler behind sealant as recommended by sealant manufacturer.
- J. Install components plumb and true in alignment with established lines and grades.

3.2 INSTALLATION OF GLAZING

- A. Install glazing as specified in *Section 088000 – Glazing*.

3.3 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE DOORS

- A. Install entrance 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 in accordance with entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will 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]** **[mockups]** **<Insert requirements>**.
 - 1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested in accordance with AAMA 501.2 and shall not evidence water penetration.
 - a. Perform a minimum of **[two]** **[three]** **<Insert number>** tests in areas as directed by Architect.
 - 2. Air Leakage:
 - a. Perform a minimum of **[two]** **[three]** **<Insert number>** tests in areas as directed by Architect.
 - 3. Water Penetration: ASTM E1105 at a minimum **[uniform]** **[and]** **[cyclic]** static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft., and shall not evidence water penetration.
- 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