

PART 1 GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes:
 - 1. Exterior and interior storefront framing.
 - 2. Exterior and interior manual-swing entrance doors.
- B. Related Sections:
 - 1. Division 1 Section "Sustainable Design Requirements".
 - 2. Division 7 Section "Building Insulation" for insulation materials field installed with aluminum-framed systems.
 - 3. Division 7 Section "Joint Sealants" for installation of joint sealants installed with aluminum-framed systems and for sealants to the extent not specified in this Section.
 - 4. Division 8 Section "All-Glass Entrances and Storefronts" for systems without aluminum support framing.
 - 5. Division 8 Section "Revolving Entrance Doors" for revolving entrances.
 - 6. Division 8 Section "Door Hardware" for hardware to the extent not specified in this Section.
 - 7. Division 8 Section "Glazing" for glazing requirements to the extent not specified in this Section.
 - 8. Division 8 Section "Glazed Aluminum Curtain Walls" for curtain-wall systems that mechanically retain glazing on four sides.

1.3 DEFINITIONS

- A. ADA/ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disability Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities."

1.4 QUALITY ASSURANCE

- A. The work of this section shall be performed by a company which specializes in the type of aluminum-framed entrances and storefronts work required for this Project, with a minimum of 10 years of documented successful experience and shall be performed by skilled workmen thoroughly experienced in the necessary crafts.
 - 1. Work shall be performed in compliance with Owner's insurance underwriters' requirements and UL approvals and testing for materials, assemblies and procedures.
- B. Manufacturer shall specialize in manufacturing the type of aluminum-framed entrances and storefronts specified in this section, with a minimum of 10 years of documented successful experience, and have the facilities capable of meeting all requirements of Contract Documents as a single-source responsibility and warranty.
- C. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- D. Testing Agency Qualifications: Qualified according to ASTM E699 for testing indicated.
- E. Engineering Responsibility: Prepare data for aluminum-framed systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project and submission of reports of tests performed on manufacturer's standard assemblies.
- F. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. 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. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
 - 1. Do not revise intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.
- G. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines, Texas Accessibility Standards, and ICC/ANSI A117.1.
- H. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.

- I. Welding Qualifications: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code - Aluminum."
- J. Preinstallation Conference: Conduct conference at Project site.
- K. Manufacturer's identification tags or marks are not acceptable on surfaces which will remain exposed to view after installation.
 - 1. Evidence of "patching" after removal of tags or marks is not acceptable.

1.5 PERFORMANCE REQUIREMENTS

- A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
 - 1. Structural loads.
 - 2. Thermal movements.
 - 3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
 - 4. Dimensional tolerances of building frame and other adjacent construction.
 - 5. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferring to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
 - d. Glazing-to-glazing contact.
 - e. Noise or vibration created by wind and by thermal and structural movements.
 - f. Loosening or weakening of fasteners, attachments, and other components.
 - g. Sealant failure.
 - h. Failure of operating units.
- B. Delegated Design: Design aluminum-framed systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Structural Loads:
 - 1. Wind Loads: Provide entrance and storefront systems, including anchorage, capable of withstanding wind-load design pressures calculated according to Division 8 Section "Glazed Aluminum Curtain Wall" and the Transbay Tower Cladding Wind Load Study.
 - 2. Seismic Loads: As indicated on structural drawings.
- D. Deflection of Framing Members: As specified in Division 8 Section "Glazed Aluminum Curtain Wall".
- E. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E330 as follows:
 - 1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 - 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 - 3. Test Durations: As required by design wind velocity, but not fewer than 10 seconds.
- F. Story Drift: Provide aluminum-framed systems that accommodate design displacement of adjacent stories indicated.
 - 1. Design Displacement: As specified in Division 8 Section "Glazed Aluminum Curtain Wall".
 - 2. Test Performance: Meet criteria for passing, based on building occupancy type, when tested according to AAMA 501.4 at design displacement and 1.5 times design displacement.
- G. Air Infiltration and Exfiltration: As specified in Division 8 Section "Glazed Aluminum Curtain Wall".
- H. Water Penetration under Static Pressure: As specified in Division 8 Section "Glazed Aluminum Curtain Wall".

- I. Water Penetration under Dynamic Pressure: As specified in Division 8 Section "Glazed Aluminum Curtain Wall".
1. Maximum Water Leakage: No uncontrolled water penetrating aluminum-framed systems or water appearing on systems' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters that is drained to exterior and water that cannot damage adjacent materials or finishes.
- J. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
 2. Buckling, opening of joints, glass breakage, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement of components will not be permitted.
 3. Fabrication, assembly and erection procedures shall take into account the ambient temperature range at the time of respective operation.
 4. Thermal performance shall be based on following criteria:

	Dry Bulb	Wet Bulb
a. Summer Outside Air Temperature	98° F	80° F
b. Winter Outside Air Temperature	27° F	--
c. Summer Inside Air Temperature	75° F	62.5° F
d. Winter Inside Air Temperature	73° F	54° F
e. Summer Outside Air Velocity	5 MPH	
f. Winter Outside Air Velocity	15 MPH	
g. Summer and Winter Inside Air Velocity	0 MPH	
- K. Structural-Support Movement: Provide entrance and storefront systems that accommodate structural movements including, but not limited to, sway and deflection.
- L. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 55 when tested according to AAMA 1503.
- M. Thermal Conductance: Provide aluminum-framed thermally broken systems with fixed glazing and framing areas having an average U-factor of not more than 0.57 Btu/sq. ft. x h x deg F (3.23 W/sq. m x K) when tested according to AAMA 1503.

1.6 SUBMITTALS

- A. Submit the following according to Conditions of the Construction Contract and Division 1 Specification Sections.
- B. LEED Submittal:
1. Product Data for Credit EQ 4.1: For adhesives and sealants used inside of the weatherproofing system, including printed statement of VOC content.
 2. Product Data for Credit(s) MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.
 - a. Include statement indicating costs for each product having recycled content.
- C. Shop Drawings for aluminum-framed systems: Shall clearly indicate but not be limited to:
1. Layout and installation details, including relationship to adjacent work.
 2. Elevations at 1/4" scale.
 3. Detail sections of typical composite members.
 4. Anchors and reinforcement.
 5. Types of hardware and mounting heights.
 6. Glazing details and glass types including all weeps and drainage paths.
 7. Type and thickness of metal and finish.
 8. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 9. Include details of provisions for system expansion and contraction and for draining moisture occurring within the system to the exterior.
- D. Hardware Schedule: Submit complete hardware schedule organized into sets based on hardware specified.
1. Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish.

2. Include item name, name of the manufacturer and complete designations of every item required for each door opening.
- E. Product Data: Shall be clearly marked to indicate all technical information which specifies full compliance with requirements of this section and Contract Documents, including manufacturer's published installation recommendations.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.
- F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12-inch (300-mm) lengths of full-size components and showing details of the following:
1. Joinery, including concealed welds.
 2. Anchorage.
 3. Expansion provisions.
 4. Glazing.
 5. Flashing and drainage.
- G. Samples:
- | Item No. | Quantity | Size | Description |
|----------|----------|---------|---|
| S1 | 5 | 6"x6" | Each type of specified finish. |
| S2 | 5 | 8" long | Each type of weathering gasket, glazing gasket, tape, sealant, separator, or other glazing accessory. |
| S3 | 1 | 12"x12" | Corner piece of each door type showing frame construction complete with specified glass and glazing. |
| S4 | 1 | 6" long | Cutaway sample of each vertical-to-horizontal framing intersection of systems showing details of joinery, anchorage, expansion provisions, glazing, flashing, drainage. |
- H. Delegated-Design Submittal: For aluminum-framed systems 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. Detail fabrication and assembly of aluminum-framed systems.
 2. Include design calculations.
- I. Qualification Data: For qualified Installer and testing agency.
- J. Seismic Qualification Certificates: For aluminum-framed systems, accessories, and components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
- K. Welding certificates.
- L. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems, indicating compliance with performance requirements.
- M. Source quality-control reports.
- N. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.
- O. Warranties: Sample of special warranties.
- P. Hazardous Materials Notification: In the event no product or material is available that does not contain asbestos, PCB or other hazardous materials as determined by the Owner, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 shall be submitted for that proposed product or material prior to installation.
- Q. Asbestos and PCB Certification: After completion of installation, but prior to Substantial Completion, Contractor shall certify in writing that products and materials installed, and processes used, do not contain asbestos or polychlorinated biphenyls (PCB), using format in Article 3 of General Conditions.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with General Conditions and Division 1 Section "Product Requirements", including the following:
1. All materials shall be delivered to Project site complete with labels identifying type of material, brand name, and manufacturer's name.
 - a. Assemble doors at factory and delivered to Project site ready for installation.
 2. Factory-finishes shall be protected from abrasion and other damages.
 3. Stacking and storing of components in shop, in transit and at Project site shall be done using softeners and timbers to keep individual members free from contact with the ground, and with each other.
 4. Store materials at Project site under cover in a dry, protected and clean location, off the ground.
 5. Protect components from soiling by adjacent fabrication or construction operations.
 6. Materials which are delivered to Project site disfigured, cracked, chipped, or scratched, or otherwise not suitable for installation shall be removed from Project site and replaced with new materials at no additional cost to Owner.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

1.9 WARRANTY

- A. Comply with General Conditions, except extend to 10 years, agreeing to repair or replace specified materials or Work that has failed within the warranty period. Failures include but are not limited to the following:
1. Defective materials and workmanship.
 2. Abnormal deterioration, aging or weathering of the work.
 3. Structural failure, including failure of anchorage resulting from exposure to pressures and forces up to specified limits or excessive deflections of metals.
 4. Failure of anchorage metals due to oxidation or electrolytical damage.
 5. Loose or missing parts.
 6. Failure of operating and moving parts and components to function properly.
 7. Leakage of water or air exceeding specified limits.
 8. Failure of tapes, gaskets or sealants.
 9. Spontaneous glass breakage.
 10. Failure to conform to profiles, locations, arrangements shown on the drawings.
 11. Failure to conform to manufacturer's recommendations and industry standards as they apply to the various components.
 12. Staining of surfaces caused by incompatibility of adjacent materials.
 13. Objectionable appearance or performance resulting from either defective or nonconforming materials or workmanship.
- B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration caused by thermal movements.
 - c. Deterioration of metals and other materials beyond normal weathering.
 - d. Water leakage through fixed glazing and framing areas.
 - e. Failure of operating components to function properly.
 2. Warranty Period: 10 years from date of Substantial Completion.
- C. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes do not comply with requirements or that fail in materials or workmanship within specified warranty period. Warranty does not include normal weathering.
1. Warranty Period: 20 years from date of Substantial Completion.
- D. Failures in the entrance and storefront systems shall result in an extension of the warranty period until the deficiencies are permanently repaired.
1. The Contractor shall be responsible for continuing corrections to defective work beyond warranty period if initial corrective measures were executed but later found to be inadequate or not acceptable after the specified warranty period.

2. Repair work shall carry same warranty as the initial installation.
3. Repair warranty shall start after all related repair work is completed.
4. Repairs shall not change the design and appearance of interior and exterior face of entrance and storefront systems.

1.10 MAINTENANCE SERVICE

- A. Entrance Door Hardware:
1. Maintenance Tools and Instructions: Furnish a complete set of maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.

PART 2 PRODUCTS

2.1 UNAUTHORIZED MATERIALS

- A. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCB) or other hazardous materials identified by the Owner.

2.2 ACCEPTABLE MANUFACTURERS

- A. Products of the manufacturers specified in this section establish the minimum functional, aesthetic and quality standards required for work of this section.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Kawneer North America; an Alcoa company.
 2. Tubelite.
 3. Vistawall Architectural Products; The Vistawall Group; a Bluescope Steel company.
 4. YKK AP America Inc.
- C. Substitutions: Comply with General Conditions using form in Division 1 Section "Substitution Request Form."

2.3 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
1. Sheet and Plate: ASTM B209 (ASTM B209M).
 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221 (ASTM B221M).
 3. Extruded Structural Pipe and Tubes: ASTM B429.
 4. Structural Profiles: ASTM B308/B 308M.
 5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.
- B. 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.
1. Structural Shapes, Plates, and Bars: ASTM A36/A 36M.
 2. Cold-Rolled Sheet and Strip: ASTM A1008/A 1008M.
 3. Hot-Rolled Sheet and Strip: ASTM A1011/A 1011M.
- C. Recycled Content: For materials containing post-industrial (pre-consumer) and/or post-consumer recycled content, contractor shall document the cost and percentage (by weight) of each material broken out by post-industrial (pre-consumer) and post-consumer content.

2.4 GLAZED ALUMINUM DOORS AND FRAMES

- A. Exterior Frames: Kawneer's "TRI-FAB 451 UT" thermally broken glazed aluminum framing system, 6063-T5 alloy and temper, ASTM B221, insulated glazing.
1. Size: 2" thick x 4 1/2" frame members.
 2. Glass Type/Color:
 - a. Center glazed, Nominal 1" IGU insulated clear glass as required to meet performance requirements and fully tempered, where required, of quality specified in Division 8 Section "Glazing" as Glass Type GL-8.
- B. Exterior Doors: Kawneer's "AA 425" thermally broken swing doors of aluminum and glass construction, insulated glazing units.
1. Door Stiles: 4 1/4" sides, 4 1/4" top, 10" bottom.

2. Glass Type/Color: Nominal 1" clear insulated glass, as required to meet performance requirements and fully tempered, where required of quality specified in Division 8 Section "Glazing" as Glass Type GL-8.
 3. Size: 2-1/4" thick and as scheduled on drawings.
 4. Wall Thickness: 1/8" minimum.
- C. Interior Frames: Kawneer's "TRI-FAB 400" of aluminum and glass construction, single glazing, 6063-T5 alloy and temper, ASTM B221.
1. Size: 1 3/4" thick x 4" frame members.
 2. Glass Type/Color:
 - a. Center glazed, 1/4" minimum and as required to meet performance requirements with clear, fully tempered glass, where required, of quality specified in Division 8 Section "Glazing" as Glass Type GL-9.
- D. Interior Doors: Kawneer's "350 MEDIUMSTILE" swing doors of aluminum and glass construction, single glazing.
1. Door Stiles: 3-1/2" sides, 3-1/2" top, 10" bottom.
 2. Glass Type/Color: 1/4" clear fully tempered glass of quality specified in Division 8 Section "Glazing" as Glass Type GL-9.
 3. Size: 1-3/4" thick and as scheduled on drawings.
 4. Wall Thickness: 1/8" minimum.

2.5 ENTRANCE DOOR HARDWARE

- A. General: Provide heavy-duty units in sizes and types recommended by entrance system and hardware manufacturers for entrances and uses indicated.
1. Opening-Force Requirements:
 - a. Egress Doors: Not more than 15 lbf (67 N) to release the latch and not more than 30 lbf ((133 N)) to set the door in motion and not more than 15 lbf (67 N) to open the door to its minimum required width.
 - b. Accessible Interior Doors: Not more than 5 lbf (22.2 N) to fully open door.
- B. Scheduled Door Hardware: Provide door hardware according to the Door Hardware Schedule at the end of Part 3.

2.6 ACCESSORY MATERIALS

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 7 Section "Joint Sealants."
1. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil (0.762-mm) thickness per coat.
- C. Insulating Materials: As specified in Division 7 Section "Building Insulation."

2.7 METAL PROTECTION MATERIALS

- A. General:
1. Materials used as permanent or temporary protection for metals shall conform with the following standards and coating systems.
 2. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying primer.
- B. Surface Preparation: Perform manufacturer's standard cleaning operations to remove dirt, oil, grease, or other contaminants that could impair paint bond.
1. Remove mill scale and rust, if present, from uncoated steel.
- C. Priming: Apply manufacturer's standard corrosion-resistant primer immediately after surface preparation and pretreatment.
- D. Corrosion-Inhibiting Paint for Carbon Steel:
1. For Concealed Parts Not Subject to Moisture: 2 shop coats minimum 1 mil thickness each coat of zinc chromate primer complying with FS TT-P-645 or zinc-rich paint.
 2. For Exposed Parts Subject to Moisture: Zinc-rich paint conforming to SSPC-PS 1, SSPC-PS 2 or SSPC-PS 3.

- E. Prime Paint:
 - 1. Protection against galvanic action shall be provided wherever dissimilar metals are in contact.
 - 2. Provide minimum dry film thickness of one mil for zinc chromate and 30 mils for bituminous paint.
 - 3. Pretreatment: SSPC-Paint 27 if required for specified painting system.
 - 4. Bituminous Paint: FS TT-C-494.
 - 5. Cold-Applied Asphalt Mastic: SSPC-Paint 12.
 - 6. Zinc-Rich Paint: MIL-P-38336.
 - 7. Zinc-Chromate Primer: FS TT-P-645.
- F. Galvanizing of Carbon Steel:
 - 1. ASTM A653: Hot-dip for steel sheets.
 - 2. ASTM A123: Hot-dip for shapes, plates, bars and strip.
 - 3. ASTM B633: Electro-galvanizing.
- G. Dissimilar Metals: Separate dissimilar metals with bituminous paint, or a suitable sealant, or a nonabsorptive plastic or elastomeric tape, or a gasket between the surfaces.
 - 1. Do not use coatings containing lead.

2.8 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. Framing Members, General: 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. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 6. Provisions for field replacement of glazing from interior.
 - 7. 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. Storefront Framing: Fabricate components for assembly using shear-block system.
 - 1. Provide subframes and reinforcing of types indicated or, if not indicated, as required for a complete system.
 - 2. Factory assemble components to greatest extent possible.
 - 3. Disassemble components only as necessary for shipment and installation.
 - 4. Provide storefront frame sections without exposed seams.
 - 5. Mullion Configurations: Provide pockets at the inside glazing face to receive resilient elastomeric glazing.
 - a. Accomplish glazing without removal of vertical stiles.
- F. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
 - 1. At exterior doors, provide compression weather stripping at fixed stops.
 - 2. At interior doors, provide silencers at stops to prevent metal-to-metal contact. Install three silencers on strike jamb of single-door frames and two silencers on head of frames for pairs of doors.
- G. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
 - 1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
 - 2. At exterior doors, provide weather sweeps applied to door bottoms.
- H. 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.
- I. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

- J. Continuity: Maintain accurate relation of planes and angles with hairline fit of contacting members.
 - 1. Make all joints and connections watertight sealed with metal joint sealant.
 - 2. Uniformity of Metal Finish: Abutting glazed aluminum members shall not have an integral color or texture variation.
 - 3. Remove all fabrication evidence by grinding and polishing to achieve specified finish.

2.9 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Fluoropolymer coating as specified in Division 9 Section "High-Performance Architectural Coating."

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 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.
 - 6. Seal joints watertight unless otherwise indicated.
- B. Metal Protection:
 - 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.
 - 2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
- D. Set continuous sill members and flashing in full sealant bed as specified in Division 7 Section "Joint Sealants" to produce weathertight installation.
- E. Install components plumb and true in alignment with established lines and grades, and without warp or rack.
- F. Install glazing as specified in Division 8 Section "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.
- H. Install perimeter joint sealants as specified in Division 7 Section "Joint Sealants" to produce weathertight installation.

3.3 ERECTION TOLERANCES

- A. Install aluminum-framed systems to comply with the following maximum erection tolerances:
 - 1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.

2. Alignment:
 - a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch (1.5 mm).
 - b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch (0.8 mm).
- B. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).

3.4 ADJUSTING

- A. Adjust operating entrance door hardware to function smoothly as recommended by manufacturer.
 1. For entrance doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches (75 mm) from the latch, measured to the leading door edge.

3.5 ENTRANCE DOOR HARDWARE SETS

- A. General: Refer to Division 8 Section "Door Hardware" for requirements for hardware items other than those indicated to be provided by the glazed aluminum door manufacturer.
- B. Provide heavy-duty hardware units as indicated, scheduled, or required for operation of each door, including the following items of sizes, number, and type recommended by manufacturer for service required; finish to match door.

C.	DOOR NUMBER 111 (P1-P3)		6'-0" x 8'-10 1/2" Parking from Garage Elevator Lobby
	Push Pull	2 each	CRL/Blumcraft DBL 100-F x 630
	Mortise Cylinder	2 each	See Section 08 71 00/Door Hardware
	Overhead Closer	2 each	LCN 1461 CUSH x parallel arm (custom color)
	Intermediate Offset Pivots	8 each	Rixson M-19 (custom color)
	Threshold	1 each	Aluminum (match National Guard 613)
	Weatherstripping	1 set	By Door Manufacturer
	Concealed Overhead Stop	2 each	Glynn-Johnson 100 Series US32D

Refer to Division Section "Door Hardware", Hardware Set Number 111 for Balance of Hardware

END OF SECTION