DIVISION 8

DOORS AND WINDOWS

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PART 1 GENERAL

1.1 SUMMARY

A. Section includes steel doors, panels and frames; non-rated and fire rated, and interior borrowed light frames.

1.2 SUBMITTALS

A. Shop Drawings: Indicate door and frame elevations, internal reinforcement, cut-outs for glazing, louvers, jamb and door selections and finishes.

B. Product Data: Submit door and frame configurations, location of cut-outs for hardware reinforcement.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with the following:
   1. ANSI 250.8 - Recommended Specifications for Standard Steel Doors and Frames.
   2. DHI - Door Hardware Institute - The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

B. Fire Rated Door and Panel Construction: Conform to NFPA 252.

C. Fire Rated Stair Doors: Rate of rise of 450 degrees F across door thickness.

D. Installed Fire Rated Door and Panel Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings.

E. Attach label from agency approved by authority having jurisdiction to identify each fire rated door.
   1. Indicate temperature rise rating for stair doors.

F. Surface Burning Characteristics:
   1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84 and NFPA 255.

G. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation material.

PART 2 PRODUCTS

2.1 STEEL DOORS AND FRAMES

A. Manufacturers:
   1. Amweld Building Products, Inc.
   2. Ceco Door Products.
   3. Pioneer Industries.
   4. Republic Builders Products.
   5. Steelcraft.
   6. Substitutions: Permitted in accordance with Section 01600.

B. Product Description: Standard shop fabricated steel doors, door panels, and frames; fire rated and non-rated types; flush face or stile and rail design, and door louvers.

2.2 COMPONENTS

A. Exterior Doors (Insulated): SDI 108, 1-3/4 inch thick.
1. Level 3 - Extra heavy Duty, Model 2, seamless design. - galvanized.

B. Exterior Frames:
1. Level 3 for Door Models 2 nominal 16 gage/0.053 inch thick material, base metal thickness. - galvanized

C. Door Core: Polystyrene foam and steel channel grid.

D. End Closure: Channel, 0.04 inch thick, inverted.

E. Thermal Insulated Door: Total insulation R-Value of 4, measured in accordance with ASTM C1363.

F. Sound Rated Door: STC of 32, measured in accordance with ASTM E413.

2.3 ACCESSORIES

A. Door Louvers: Roll formed material; Inverted Y blade, sight proof; prime painted.

B. Silencers: Resilient vinyl fitted into drilled hole.

C. Removable Stops: Rolled steel channel shape.

D. Astragals for Double Doors: Steel, T shaped, specifically for double doors.

E. Bituminous Coating: Fibered asphalt emulsion.

F. Primer: ANSI A250.10 rust inhibitive type.

G. Weatherstripping: Specified in Section 08710.

2.4 FABRICATION

A. Fabricate doors and frames with hardware reinforcement welded in place. Protect frame hardware preparations with mortar guard boxes.

B. Attach astragal to one leaf of pairs of doors.

C. Fabricate frames as face welded units.

D. Fabricate frames to suit masonry wall coursing with head member as detailed.

E. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.

F. Prepare interior frames for silencers and install.

G. Frame Mullions for Double Doors: Removable type, with profile matching jambs.

H. Frame Transom Bars: Fixed type, with profile matching jamb and head.

I. Attach fire rating label to each fire rated door and frame.

2.5 SHOP FINISHING

A. Steel Sheet: Galvanized to ASTM A653/A653M A60.

B. Primer: Baked.

C. Coat inside of frame profile with bituminous coating.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

A. Install doors and frames in accordance with ANSI A250.8.

B. Coordinate installation of doors and frames with installation of hardware.

C. Coordinate door frames with masonry, gypsum board wall construction for frame anchor placement.

D. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

E. Install door louvers plumb and level.

F. Adjust door for smooth and balanced door movement.

G. Tolerances:
1. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. The Conditions of the Contract, and all Sections of Division 1, are hereby made a part of this Section.

B. Section Includes: Factory glazed thermally broken, aluminum sliding glass doors complete with necessary mullions, panning, trim, expanders, operating hardware, installation hardware and all other accessories as required.

C. Related Sections:
1. Section 07900 – Joint Sealants.
2. Section 08800 – Glazing.

D. Coordinate work with that of all construction contractors affecting or affected by work of this Contract. Cooperate with such contractors to assure the steady progress of the Work.

E. Conduct field testing of doors when specified in Division 1 by an independent lab using AAMA field test procedures.

1.2 SYSTEM DESCRIPTION

A. General: In addition to requirements shown or specified comply with applicable provisions of AAMA/WDMA/CSA 101/I.S.2/A440-08 for design, materials, fabrication and installation of component parts.

B. Door Replacement Requirements:
1. Work Included: Provide labor, materials and equipment necessary to complete the work of the Replacement Sliding Glass Door Contract, and without limiting the generality thereof include:
2. Removal of existing sash, fixed glazing, frames and other accessories as required by the proposed replacement system.
3. Removal of other existing work as required for the proper installation and operation of the new units.
4. Removal from site and legal disposal of all removed materials, debris, packaging, banding and all other surplus materials and equipment.
5. Insulated panels and frames as required in selected transoms and other locations.
6. Treated wood blocking, fillers and nailers as required for secure installation. Bidders shall survey conditions of existing sills and jambs prior to bidding. Contractor shall be responsible for providing new blocking for portions of same that are deteriorated.
7. Fiberglass insulation between door frames and adjacent construction.
8. Sealing of all joints within each sliding glass door assembly.
9. Sealing of entire exterior perimeter of door units after installation.
10. Field observations and measurements of existing openings and conditions.
11. Furnishing and delivering of extra materials as specified.

C. New Construction:
1. Coordinate with the Architect and the general contractor that the opening dimensions will be maintained in accordance with the documents.
2. It is the responsibility of the sub-contractor to allow proper clearance for the type of installation in accordance with the manufacturer's standard procedures.

D. Design Requirements:
1. Manufacturer/subcontractor is responsible for designing system, including installation instructions and necessary modifications to meet specified requirements and maintain visual design concepts.
2. Requirements shown by details are intended to establish basic dimension of unit, sight lines and profiles of members.

3. Provide assemblies free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.
4. Installation instructions are to take into account specified site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening or fracturing connection between units and building structure or between units themselves.
5. Provide for expansion and contraction due to structural movement without detriment to appearance or performance.
6. Evacuate water without infiltration to interior from exterior face of wall, water entering joints, and condensation occurring within doors, by drain holes and gutters of adequate size or other acceptable method.
7. Provide concealed fastening wherever possible.

E. Performance Requirements: Requirements for aluminum doors, terminology and standards of performance, and fabrication and workmanship are those specified and recommended in AAMA/WDMA/CSA 101/I.S.2/A440-08 and applicable general recommendations published by AAMA. Conform to more stringent of specified AAMA standards and following:
1. Air Infiltration Test: Not exceed 0.25 cubic feet per minute per foot of crack length when tested at a pressure of 6.24 psf. Perform tests in accordance with ASTM E 283 with the sash in a closed and locked position. Adjust sash to operate in either direction with a force not exceeding 25 pounds after the door sash is in motion. The maximum force to open shall not exceed 40 pounds.
2. Water Resistance Test: Subject door unit to a water resistance test in accordance with ASTM E 331 with no water passing the interior face of the door frame and no leakage as defined in the test method. Mount the glazed unit in its vertical position continuously supported around the perimeter and the door sash placed in the fully closed and locked position. When a static pressure of 12.0 pounds per square foot has been stabilized, apply five gallons of water per square foot of window area to the exterior face of the unit for a period of 15 minutes.
3. Uniform Load Deflection Test: ASTM E 330 at 65 pounds per square foot: No member deflection more than 1/175 of its span. Maintain test load for a period of 10 seconds resulting in no glass breakage, permanent damage of fasteners, hardware parts, support arms, actuating mechanisms or any other damage causing the window to be inoperable.
4. Uniform Load Structural Test: Apply a minimum exterior and interior uniform load of 97.5 pounds per square foot to the entire outside surface of the test unit. Maintain this test load for a period of 10 seconds. Results: No glass breakage, permanent damage of fasteners, hardware parts, support arms, actuating mechanisms, or any other damage causing the door to be inoperable. And no permanent deformation of any frame or vent member in excess of 0.2 percent of its span.
5. Condensation Resistance Factor: Test in accordance with AAMA 1503 standards and tests of thermal performance resulting in a CRF of no less than 45 for the frame using Clear-Clear insulating glass.
6. "U" Value Tests: (Co-efficient of Heat Transfer): Thermal Transmittance of Conduction with a 15 mph perpendicular dynamic wind: 0.62 BTU/hr/ft^2/F with clear-clear glass and 0.44 BTU/hr/ft^2/F using one sheet low-E glass.
7. Acoustic Performance: Range between STC 31 and STC 38, depending upon specific glazing arrangements and project requirements.
8. Testing: Where manufacturer's standard door units comply with requirements and have been tested in accordance with specified AAMA/WDMA/CSA 101/I.S.2/A440-08 tests, provide certification by AAMA certified independent laboratory showing compliance with such tests. Submit copy of the test report signed by the independent laboratory.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications, recommendations and standard details for aluminum sliding glass doors.

B. Shop Drawings: Submit shop drawings, including location floor plans or exterior wall elevations showing all sliding glass door openings, typical unit elevations at 1/4 inch scale, and half size detail sections of every typical composite member. Show anchors, hardware, operators and other components as appropriate if not included in manufacturer's standard data. Include glazing details and standards for factory glazed units.

C. Samples:
   1. Submit one sample of each required aluminum finish, on 3 x 3 inch long sections of extrusion shapes or aluminum sheets as required for door units.
   2. Submit additional samples, if and as directed by Architect, to show fabrication techniques, workmanship of component parts, and design of hardware and other exposed auxiliary items.

D. Certifications: Submit certified test laboratory reports by independent laboratory substantiating performance of system.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Store and handle doors, mullions, panels, hardware and all pertinent items in strict compliance with the manufacturer's instructions.

B. Protect units adequately against damage from the elements, construction activities and other hazards before, during and after installation.

1.5 WARRANTY

A. Manufacturer's Warrantees: Submit written warrantees from manufacturer for the following:
   1. Sliding Glass Doors: Sliding glass doors furnished are certified as fully warranted against any defects in material or workmanship under normal use and service for a period of one (1) year from date of fabrication.
   2. Finish: The pigmented organic finishes on exposed surfaces of doors and component parts (such as trim, mullions and the like) are certified as complying fully with requirements of AAMA 2605 for pigmented organic coating and fully warranted against chipping, peeling, cracking or blistering for a period of five (5) years from date of installation. Warrant finishes meeting AAMA 2604 and 2605 against fading beyond AAMA standards.
   3. Insulated Glass: Warranted from visual obstruction due to internal moisture for a period of ten (10) years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Series 0900 Sliding Glass Door as manufactured by Graham Architectural Products, York, PA.

B. Thermal Barrier: Provides a continuous uninterrupted thermal barrier around the entire perimeter of the frame and all sash and not be bridged by any metal conductors at any point. Provide manufacturer's standard construction which has been in use on similar window units for a period of not less than three years, has been tested to demonstrate resistance to thermal conductance and condensation and has been tested to show adequate strength per AAMA 505.

C. Stating this product in no way prohibits other manufacturers from submitting alternate products of approved quality under the provisions of Division 1 Section “Substitutions.” Architect will record time required for evaluating substitutions proposed by Contractor after receipt of bids, and for making changes in the Contract Documents. Whether or not Architect accepts Contractor proposed substitution, Contractor shall reimburse Owner for charges of Architect and Architect’s consultants for evaluating each proposed substitution.

D. Document each request with supporting data substantiating compliance of proposed substitution with Contract Documents, including:
   1. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, sight lines and other pertinent characteristics.
   2. Net change to Contract Sum if substitution is accepted.
   3. Changes required in other Work.
   4. AAMA certified test data and reports to show compliance with performance characteristics specified.
   5. Samples of product, finishes, and glazing when applicable.

6. Additional supporting information as necessary or requested.

E. A request for substitution constitutes a representation that Contractor:
1. Has investigated proposed product and determined that it is equal or superior in all respects to specified product.
2. Will provide identical warranty as required for specified product.
3. Will coordinate installation and make changes to other Work which may be required.
4. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Certifies that proposed product will not affect or delay Construction Progress Schedule.
6. Will pay for changes to building design, including architectural or engineering design, detailing, and construction costs caused by the requested substitution.

F. Pre-Bid Qualifications:
1. All bids must be based on pre-qualified products. To qualify, the bidder must furnish one complete typical project size sliding glass door unit 10 days prior to the time set for bids. Accompanying the sample will be certified test reports from an accredited AAMA Laboratory verifying that the performance of the product meets or exceeds the AW60 classification.
2. This sample must be a true and accurate representation of the sliding glass door the bid is based on with the finish being the only exception. No verbal approvals will be given. Each submitter will be notified in writing of acceptance or rejection.
3. The manufacturer must verify that it has been engaged in the manufacturing of the product in their production facility for a period of five (5) years.
4. Maintenance manuals accompany the product sample being submitted for approval.
5. Sight lines to match the base product specified.
6. The qualified bidder must verify that the bidder has been involved with the installation of this type of product in a minimum of 5 projects of similar scope and quality.

2.2 MATERIALS

A. Aluminum Extrusions: Alloy and temper recommended by door manufacturer for strength, corrosion resistance and application of required finish, but not less than 22,000 psi ultimate tensile strength, a yield of 16,000 psi. Comply with ASTM B 221.

B. Fasteners: Aluminum, stainless steel, or other materials warranted by manufacturer to be non-corrosive and compatible with aluminum door members, trim, hardware, anchors and other components of sliding glass door units.
1. Do not use exposed fasteners on exterior except where unavoidable for application of hardware. Match finish of adjoining metal.
2. Provide non-magnetic stainless steel, Phillips flat-head machine screws for exposed fasteners, where required, or special tamper-proof fasteners.
3. Locate fasteners so as not to disturb the thermal barrier construction of doors.

C. Anchors, Clips And Door Accessories: Depending on strength and corrosion-inhibiting requirements, fabricate units of aluminum, non-magnetic stainless steel or hot-dip zinc coated steel or iron complying with ASTM A 123.

D. Compression Glazing Strips And Weatherstripping: At manufacturer's option, provide neoprene gaskets, PVC gaskets, or expanded neoprene gaskets.

E. Sliding Weatherstripping: Provide double weatherstripping using silicone coated woven pile with a polypropylene center fin.

F. Sealant:
1. Unless otherwise indicated for sealants required within fabricated door units, provide elastomeric type as recommended by door manufacturer for joint size and movement, to remain permanently elastic, non-shrinking and non-migrating.
2. Refer to Division 7 for perimeter sealants between door units and surrounding construction.

2.3 SLIDING GLASS DOOR TYPES (OPERATION)

A. General: Except as otherwise indicated, provide sliding glass door units complying with requirements of AAMA Classification "AW" grade windows. Sliding glass doors for this project will be rated a minimum of AW65 for full size test units per AAMA/WDMA/CSA 101/I.S.2/A440-05 to withstand a design pressure of 60 psf minimum.

B. Fixed Aluminum Door Panel Frames (F): Except for special provisions as indicated for maintenance, cleaning, and removal, no operating hardware or equipment is required.

C. Aluminum Sliding Glass Doors (SD):
1. Units: One operable sliding panel capable of full travel within the main frame. Panel shall roll on a minimum of two stainless steel tandem mounted, ball bearing rollers and be adjustable for ease of operation.
2. Provide units which have “lift-out” feature permitting easy removal of the panel from inside without special tools.

2.4 FABRICATION AND ACCESSORIES

A. General: Provide manufacturer's standard fabrication and accessories which comply with specifications. Include complete system for assembly of components and anchorage of door units and provide complete pre-glazing at the factory.

B. Sliding Glass Door Material:
1. Door Members and Muntin Bars: Aluminum.
2. Secondary Members (friction tabs, shoes, weatherstripping guides, etc.): Aluminum or a material compatible with aluminum.
3. Main Frame and Sash: Nominal thickness of not less than 0.062 inches, except for fin trim either integral or applied.
4. Frame Sill: Nominal thickness of not less than 0.062 inches.
5. Standard wall thickness tolerance: In accordance with the Aluminum Association.

C. Master Frame: Not less than 4 inches in depth.

D. Sash: Not less than 1-1/2 inches in depth.

E. Hardware:
1. Material: Aluminum, stainless steel or other non-corrosive materials compatible with aluminum for hardware having component parts which are exposed.
2. Adams heavy duty locking device.
3. Dead lock night latch; supply in addition to other specified locks.
4. Stainless steel track cover.
5. High performance sill provided for 10 psf or 12 psf water test pressure.

F. Thermal Barrier: Provides a continuous uninterrupted thermal barrier around the entire perimeter of the frame and all sash and shall not be bridged by any metal conductors at any point.

G. Construction:
1. Assembly: Fabricate butt joints of the main frame and the sash, coped and joined neatly and secured by means of screws anchored in integral ports. Seal main frame from the back with a narrow joint sealant meeting AAMA 803 specification for narrow joint sealants.
2. Sash: Screwed together construction so that they may be easily repaired.
3. Meeting Rail Interlock: Two separate and distinct metal interlocks. Weatherstrip the meeting rail with fin-seal.
4. Insect Screen: Design top hung for easy operation.

H. Mullions - Other structural members: When mullion units occur, whether they are joined by integral mullions, independent mullions or by a combination of frame members, the resulting members must be capable of withstanding the load outlined under Uniform Load specified load requirements, without deflecting more than 1/175th of its span. When independent or integral mullions are used to join doors, the mullions shall contain a thermal barrier as specified. Evidence of compliance may be by mathematical calculations.

I. Sash:
   1. Join at the corners with screws in integral screw ports.
   2. The sash must be easily removed from the frame for either cleaning or repair.

J. Glazing:
   1. Pre-glaze all units (except insulated panels as required for installation) at the factory with an exterior continuous uniform silicone bead with an interior snap on aluminum bead containing a rigid back bulb gasket installed at the factory with the specified glazing material as follows:
      a. Typical Insulated Glass: Overall thickness of 5/8 inch – 1 inch with two lites of 1/8 inch or 3/16 inch or 1/4 inch as size and loading require.
         (1) Primary Sealant: Polyisobutylene applied to the edge of the spacer.
         (2) Secondary Sealant: Silicone.
         (3) Air Spacer: Continuous metal spacer with formed corners and an in-line connector, containing desiccant.
   2. Provide setting blocks on all four sides of the glass at 1/4 point.
   3. Glaze units to allow for glass replacement without the use of special tools.
   4. Use of tapes, vinyl, or other types of sealant not specified is not allowed.

K. Weather Protection:
   1. Provide means of drainage for water and condensation which may accumulate in members of door units.
   2. Weatherstripping: Provide sliding weatherstripping for operating sash panels.

2.5 TRIMS AND MULLION COVERS

A. Exterior mullion covers: Extruded aluminum shape to provide rigidity, no less than nominal 0.062 inch wall thickness. Seal against the casing cover sections with continuous bulbous vinyl weatherstrip interlocked within the mullion cover.

B. Interior trim:
   1. Interior Trim, Closures and Angles: As detailed, of extruded shapes no less than 0.062 inch nominal wall thickness.
   2. Snap Trim: Apply in full length without splices and attach with clips spaced no more than 18 inches on center. Clips shall be no less than 3 inches long. No exposed screws will be allowed on interior trim.

2.6 ALUMINUM DOOR FINISHES

A. Provide manufacturer's standard 2 coat Fluoropolymer 70% Kynar baked on, electrostatically applied enamel coating. Color to be selected from manufacturer's standard colors [custom non-exotic color] [custom exotic color] as selected by the Architect, applied over manufacturer's standard substrate preparation including cleaning, degreasing, and chromate conversion coating. Finish shall meet or exceed AAMA 2605.
   1. Color: Bone White.

PART 3 - EXECUTION

3.1 PREPARATION

A. Existing Construction:
   1. Do not remove existing door until new replacement is available and ready for immediate installation. Do not leave any openings uncovered at end of working day, during wind-driven precipitation or during excessively cold weather.
   2. Remove existing work carefully; avoid damage to existing work to remain.

B. Perform operations as necessary to prepare openings for proper installation and operation of new units.

C. Verify openings are in accordance with shop drawings and Architects Drawings.

3.2 INSTALLATION

A. Comply with manufacturer's specifications and recommendations for installation of door units, hardware, operators and other components of work. In no case shall attachment to structure or to components of the door system be through or affect the thermal barriers of the doors.

B. Set units plumb, level and true to line, without warp or rack of frames or sash. Anchor securely in place. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action.

C. Wedge fiberglass insulation between frames of units and construction, or between frames and blocking as applicable. Compress fiberglass to no less than 50 percent of original thickness.

D. Set sill members and other members in bed of compound as shown, or with joint fillers or gaskets as shown, to provide weathertight construction. Seal units following installation and as required to provide weathertight system.

3.3 ADJUST AND CLEAN

A. Adjust operating sash and hardware to provide tight fit at contact points and at weatherstripping, for smooth operation and weathertight closure.

B. Clean aluminum surfaces promptly after installation of doors, exercising care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and moving parts.

C. Clean glass promptly after installation of doors. Remove glazing and sealant compound, dirt and other substances.

D. Existing doors and other materials removed from site become property of the Contractor who shall promptly remove same and legally dispose of at no additional cost to the Owner.

E. Comply with all applicable laws, rules and regulations.

3.4 PROTECTION

A. Initiate all protection and other precautions required to ensure that door units will be without damage or deterioration (other than normal weathering) at time of acceptance.

B. Send to Architect, with copy to Owner, written recommendations for maintenance and protection of sliding glass doors following Substantial Completion of Sliding Glass Door Contract.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes aluminum-framed storefronts including aluminum and glass doors.

B. Related Sections:
1. Section 07900 - Joint Sealers: System perimeter sealant and back-up materials.
2. Section 08710 - Finish Hardware: Mortised hardware reinforcement requirements affecting framing members; hardware items other than specified in this section.
3. Section 08800 - Glazing.

1.2 REFERENCES

A. Aluminum Association:
1. AA ADM 1 - Aluminum Design Manual.

B. American Architectural Manufacturers Association:
1. AAMA 501 - Methods of Test for Exterior Walls.
2. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Glass Doors.
3. AAMA 503 - Voluntary Specification for Field Testing of Metal Storefronts. Curtain Wall and Sloped Glazing Systems.
4. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
5. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
6. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
7. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
8. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
9. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.
10. AAMA MCWM-1 - Metal Curtain Wall Manual.
11. AAMA SFM-1 - Aluminum Store Front and Entrance Manual.

C. American Society of Civil Engineers:
1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

D. ASTM International:
1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

3. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
4. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
5. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
7. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
8. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
9. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
10. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
11. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls, and Doors by Uniform or Cyclic Static Air Pressure Difference.

E. National Fenestration Rating Council Incorporated:
1. NFRC 100 - Procedures for Determining Fenestration Product U-Factors.

F. National Fire Protection Association:
1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

G. SSPC: The Society for Protective Coatings:
1. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).
2. SSPC Paint 25 - Red Iron Oxide, Zinc Oxide, Raw Linseed Oil, and Alkyd Primer.

H. Underwriters Laboratories Inc.:
1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 SYSTEM DESCRIPTION

A. Aluminum-framed storefront system includes tubular aluminum sections with supplementary internal support framing, aluminum and glass entrances, shop fabricated, factory finished, glass and glazing, related flashings, anchorage and attachment devices.

B. System Assembly: Site assembled.

1.4 PERFORMANCE REQUIREMENTS

A. System Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall, including building corners.
   1. To design pressure of 25 lb/sq ft, as tested in accordance with ASTM E330.

B. Deflection: Limit mullion deflection to flexure limit of glass of span; with full recovery of glazing materials.

C. System Assembly: Accommodate without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.

D. Air Infiltration: Limit air leakage through assembly to 0.06 cfm/min/sq ft of wall area, measured at reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E283.

E. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and inner sheet of infill panel and heel bead of glazing compound.

F. Water Leakage: None, when measured in accordance with ASTM E331 with test pressure difference of 20 percent of design pressure, with minimum differential of 2.86 lbf/sq ft and maximum of 12.00 lbf/sq ft.

G. Thermal Transmittance of Assembly (Excluding Entrances): Maximum U Value of 0.45 Btu/sq ft per hour per deg F when measured in accordance with AAMA 1503 and NFRC 100.

H. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over 12 hour period without causing detrimental effect to system components and anchorage.

I. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.

1.5 SUBMITTALS

A. Section 01330 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

C. Product Data: Submit component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, and internal drainage details.

D. Samples: Submit two samples 12 x 12 inches in size illustrating finished aluminum surface, infill panels, glazing materials.

E. Design Data: Indicate framing member structural and physical characteristics, calculations, dimensional limitations.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with AAMA SFM-1 and AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

B. Surface Burning Characteristics:
1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

C. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.

1.7 QUALIFICATIONS

A. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum ten years documented experience, and with service facilities within 100 miles of Project.

B. Design structural support framing components under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of Maryland.

1.8 PRE-INSTALLATION MEETINGS

A. Section 01300 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.9 DELIVERY, STORAGE, AND PROTECTION

A. Section 01600 - Product Requirements: Product storage and handling requirements.

B. Handle Products of this section in accordance with AAMA MCWM-1 - Curtain Wall Manual #10.

C. Protect finished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Section 01600 - Product Requirements.

B. Do not install sealants nor glazing materials when ambient temperature is less than 40 degrees F during and 48 hours after installation.

1.11 COORDINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

1.12 WARRANTY

A. Section 01700 - Execution Requirements: Product warranties and product bonds.

B. Furnish five year manufacturer warranty for glazed units.

PART 2 PRODUCTS

2.1 ALUMINUM-FRAMED STOREFRONTS

A. Manufacturers:
   1. YKK AP America Model YES 45 FS - Basis of Design.
   2. EFCO Corp.
   3. Kawneer Co., Inc.
   4. Traco.
   5. Substitutions: Section 01600 - Product Requirements.

B. Product Description:
   1. Aluminum Frame: Thermally broken; applied glazing stops; drainage holes; internal weep drainage system. Frames for interior glazing need not to be thermally broken. Nominal 2"w x 4 ½" d.
   2. Mullions: Profile of extruded aluminum with internal reinforcement of aluminum or shaped steel structural section.
   3. Doors: Aluminum framed thermally broken, insulated (Megatherm 50XT) glass doors; 1-3/4 inches thick, nominal 6 inch wide top rail and vertical stiles, nominal 10 inch wide bottom rail (medium stile) with; square glazing stops.

2.2 COMPONENTS

A. Extruded Aluminum: ASTM B221; 6063 alloy, T5 temper typical, 6061 alloy, T6 temper for extruded structural members.

B. Sheet Aluminum: ASTM B209, 5005 alloy, H15 or H34 temper.

C. Sheet Steel: ASTM A653/A653M; galvanized to minimum G90.

D. Steel Sections: ASTM A36/A36M; shaped to suit mullion sections, galvanized.

E. Glass: Specified in Section 08800.

F. Glazing Materials: As specified in Section 08800.

G. Hardware: Furnish manufacturer's standard door hardware for types of doors and applications indicated, and as specified below.
   1. Weather Stripping: Polypropylene pile, continuous and replaceable.
   2. Sill Sweep Strips: Resilient seal type, of neoprene compound.
   3. Threshold: Specified in Section 08710.
   4. Hinges: Specified in Section 08710.
   5. Push/Pull: Specified in Section 08710.
   6. Panic Device: Specified in Section 08710.
   7. Closer: Specified in Section 08710.

8. Finish: Exposed hardware to match hardware finishes specified in Section 08710.
9. Lock Cylinders: Specified in Section 08710.

H. Flashings: Minimum 0.032 inch thick aluminum to match mullion sections where exposed.

I. Sealant and Backing Materials:
1. Sealant Used Within System (Not Used for Glazing): Manufacturer's standard materials to achieve weather, moisture, and air infiltration requirements.
2. Perimeter Sealant: Specified in Section 07900.

J. Fasteners: Stainless steel.

2.3 FABRICATION

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

C. Prepare components to receive anchor devices. Fabricate anchors.

D. Arrange fasteners and attachments to conceal from view.

E. Reinforce interior horizontal head rail to receive drapery track brackets and attachments.

F. Prepare components with internal reinforcement for door hardware.

G. Reinforce framing members for imposed loads.

2.4 SHOP FINISHING

A. Clear Anodized Aluminum Surfaces: AAMA 611, AA-M12C22A41 non-specular as fabricated mechanical finish, medium matte chemical finish, and Architectural Class I 0.7 mils clear anodized coating.

B. Concealed Steel Items: Galvanized to ASTM A123/A123M; minimum 2.0 oz/sq ft coating thickness; galvanize after fabrication. Unfinished.

C. Apply bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar metals.

D. Shop and Touch-Up Primer for Steel Components: SSPC Paint 25 red oxide.

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

F. Extent of Finish:
1. Apply factory coating to surfaces exposed at completed assemblies.
2. Apply finish to surfaces cut during fabrication so no natural aluminum is visible in completed assemblies, including joint edges.

3. Apply touch-up materials recommended by coating manufacturer for field application to cut ends and minor damage to factory applied finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01300 - Administrative Requirements: Coordination and project conditions.

B. Verify dimensions, tolerances, and method of attachment with other Work.

C. Verify wall openings and adjoining air and vapor seal materials are ready to receive Work of this Section.

3.2 INSTALLATION

A. Install wall system in accordance with AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

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.

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 retarder materials.

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

I. Install integral flashings and integral joint sealers.

J. Set thresholds in bed of mastic and secure.

K. Install hardware using templates provided. Refer to Section 08710 for installation requirements.

L. Install infill panels using method required to achieve performance criteria.

M. Coordinate installation of glass with Section 08800; separate glass from metal surfaces.

N. Coordinate installation of perimeter sealants with Section 07900.

3.3 ERECTION TOLERANCES

A. Section 01400 - Quality Requirements: Tolerances.

B. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.

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

3.4 FIELD QUALITY CONTROL

A. Section 01400 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspection to monitor quality of installation and glazing.

C. Test to ASTM E1105.

3.5 ADJUSTING

A. Section 01700 - Execution Requirements: Testing, adjusting and balancing.

B. Adjust operating hardware for smooth operation.

3.6 CLEANING

A. Section 01700 - Execution Requirements: Final cleaning.

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

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

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

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01700 - Execution Requirements: Protecting installed construction.

B. Protect finished Work from damage.

3.8 SCHEDULES

A. Refer to Drawings.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. The Conditions of the Contract, and all Sections of Division 1, are hereby made a part of this Section.

B. Section Includes: Factory glazed windows complete with insect screens, reinforcing, shims, anchors, and attachment devices.

C. Related Sections:
   1. Section 07900 - Joint Sealants.

D. Coordinate work with that of all construction contractors affecting or affected by work of this Contract. Cooperate with such contractors to assure the steady progress of the Work.

E. Conduct field testing of windows when specified in Division 1 by an independent lab using AAMA field test procedures.

1.2 SYSTEM DESCRIPTION

A. General: In addition to requirements shown or specified comply with applicable provisions of AAMA/NWWDA 101/I.S.2-97 for design, materials, fabrication and installation of component parts.

B. Window Replacement Requirements:
   1. Work Included: Provide labor, materials and equipment necessary to complete the work of the Replacement Window Contract, and without limiting the generality thereof include:
   2. Removal of existing sash, fixed glazing, frames and other accessories as required by the proposed replacement system.
   3. Removal of other existing work as required for the proper installation and operation of the new units.
   4. Removal from site and legal disposal of all removed materials, debris, packaging, banding and all other surplus materials and equipment.
   5. Provide new factory glazed, thermally broken, aluminum windows, types as specified herein, together with necessary mullions, panning, trim, expanders, operating hardware, installation hardware and all other accessories as required.
   6. Insulated panels and frames as required in selected transoms and other locations.
   7. Treated wood blocking, fillers and nailers as required for secure installation. Bidders shall survey conditions of existing sills and jambs prior to bidding. Contractor shall be responsible for providing new blocking for portions of same that are deteriorated.
   8. Fiberglass insulation between window frames and adjacent construction.
   9. Sealing of all joints within each window assembly.
   10. Sealing of entire exterior perimeter of window units after installation.
   11. Field observations and measurements of existing openings and conditions.
   12. Furnishing and delivering of extra materials as specified.

C. Design Requirements:
   1. Manufacturer/subcontractor is responsible for designing system, including installation instructions and necessary modifications to meet specified requirements and maintain visual design concepts.
   2. Requirements shown by details are intended to establish basic dimension of unit, sight lines and profiles of members.

3. Provide assemblies free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.
4. Installation instructions are to take into account specified site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening or fracturing connection between units and building structure or between units themselves.
5. Provide for expansion and contraction due to structural movement without detriment to appearance or performance.
6. Evacuate water without infiltration to interior from exterior face of wall, water entering joints, and condensation occurring within windows, by drain holes and gutters of adequate size or other acceptable method.
7. Provide concealed fastening wherever possible.

D. Performance Requirements: Requirements for aluminum windows, terminology and standards of performance, and fabrication and workmanship are those specified and recommended in AAMA/NWWDA 101/I.S.2-97 and applicable general recommendations published by AAMA. Test size shall be 5' 0" x 8' 0". Conform to more stringent of specified AAMA standards and following:
1. Air Infiltration Test: Not exceed 0.10 cubic feet per minute per foot of crack length when tested at a pressure of 6.24 psf. Perform tests in accordance with ASTM E 283 with the sash in a closed and locked position.
2. Water Resistance Test: Subject window unit to a water resistance test in accordance with ASTM E 331 and E547 with no water passing the interior face of the window frame and no leakage as defined in the test method. Mount the glazed unit in its vertical position continuously supported around the. When a static pressure of 12 pounds per square foot has been stabilized, apply five gallons of water per square foot of window area to the exterior face of the unit for a period of 15 minutes.
3. Uniform Load Deflection Test: ASTM E 330 at 130 pounds per square foot: No member deflection more than 1/175 of its span. Maintain test load for a period of 10 seconds resulting in no glass breakage, permanent damage of fasteners, hardware parts, support arms, actuating mechanisms or any other damage causing the window to be inoperable.
4. Uniform Load Structural Test: Apply a minimum exterior and interior uniform load of 142.5 pounds per square foot to the entire outside surface of the test unit. Maintain this test load for a period of 10 seconds. Results: No glass breakage, permanent damage of fasteners, hardware parts, support arms, actuating mechanisms, or any other damage causing the window to be inoperable. And no permanent deformation of any frame or vent member in excess of 0.4 percent of its span.
5. Condensation Resistance Factor: Test in accordance with AAMA 1502 standards and tests of thermal performance resulting in a CRF of no less than 57.
6. "U" Value Tests: (Co-efficient of Heat Transfer): Thermal Transmittance of Conduction with a 15 mph perpendicular dynamic wind: 0.55 BTU/hr/ft^2/F with clear-clear glass and 0.33 BTU/hr/ft^2/F using clear-Low E insulating glass.
7. Testing: Where manufacturer's standard window units comply with the above performance requirements and have been tested by an AAMA certified independent laboratory showing compliance with such tests. Submit copy of the test report signed by the independent laboratory.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications, recommendations and standard details for aluminum window units.

B. Shop Drawings: Submit shop drawings, including location floor plans or exterior wall elevations showing all window openings, typical unit elevations at 1/4 inch scale, and half size detail sections of every typical composite member. Show anchors, hardware, operators and other components as appropriate if not included in manufacturer's standard data. Include glazing details and standards for factory glazed units.

C. Samples:
   1. Submit one sample of each required aluminum finish, on 3 x 3 inch long sections of extrusion shapes or aluminum sheets as required for window units.
   2. Submit additional samples, if and as directed by Architect, to show fabrication techniques, workmanship of component parts, and design of hardware and other exposed auxiliary items.

D. Certifications: Submit certified test laboratory reports by independent laboratory substantiating performance of system. Include other supportive data as required or as necessary.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Store and handle windows, mullions, panels, hardware and all pertinent items in strict compliance with the manufacturer's instructions.

B. Protect units adequately against damage from the elements, construction activities and other hazards before, during and after installation.

1.5 WARRANTY

A. Manufacturer's Warrantees: Submit written warrantees from window manufacturer for the following:
   1. Windows: Windows furnished are certified as fully warranted against any defects in material or workmanship under normal use and service for a period of one (1) year from date of fabrication.
   2. Finish: The pigmented organic finishes on exposed surfaces of windows and component parts (such as panning, trim, mullions and the like) are certified as complying fully with requirements of AAMA 2605 for pigmented organic coating and fully warranted against chipping, peeling, cracking or blistering for a period of five (5) years from date of installation. Warrant finishes meeting AAMA 2605 against fading beyond AAMA standards.
   3. Insulated Glass: Warranted from visual obstruction due to internal moisture for a period of ten (10) years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Series 6700 Fixed windows as manufactured by Graham Architectural Products, York, PA.
   1. Substitutions in accordance with Section 01600.

B. Thermal Barrier: Provides a continuous uninterrupted thermal barrier around the entire perimeter of the frame and all sash and not be bridged by any metal conductors at any point. Provide manufacturer's standard construction which has been in use on similar window units for a period of not less than three years, has been tested to demonstrate resistance to thermal conductance and condensation and has been tested to show adequate strength per AAMA 505.

C. Stating this product in no way prohibits other manufacturers from submitting alternate products of approved quality under the provisions of Division 1 Section “Substitutions.” Architect will record time required for evaluating substitutions proposed by Contractor after receipt of bids, and for making changes in the Contract Documents. Whether or not Architect accepts Contractor proposed substitution, Contractor shall reimburse Owner for charges of Architect and Architect’s consultants for evaluating each proposed substitution.

D. Document each request with supporting data substantiating compliance of proposed substitution with Contract Documents, including:
   1. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, sight lines and other pertinent characteristics.
   2. Net change to Contract Sum if substitution is accepted.
   3. Changes required in other Work.
   4. AAMA Certified test data and reports to show compliance with performance characteristics specified.
   5. Samples of product, finishes, and glazing when applicable.
   6. Additional supporting information as necessary or requested.

E. A request for substitution constitutes a representation that Contractor:
   1. Has investigated proposed product and determined that it is equal or superior in all respects to specified product.
   2. Will provide identical warranty as required for specified product.
   3. Will coordinate installation and make changes to other Work which may be required.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.
   5. Certifies that proposed product will not affect or delay Construction Progress Schedule.
   6. Will pay for changes to building design, including architectural or engineering design, detailing, and construction costs caused by the requested substitution.

F. Pre-Bid Qualifications:
   1. All bids must be based on pre-qualified products. To qualify, the bidder must furnish one complete typical project size window unit 10 days prior to the time set for bids. Accompanying the sample will be certified test reports from an accredited AAMA Laboratory verifying that the performance of the product meets or exceeds the AW125 classification.
   2. This sample must be a true and accurate representation of the window the bid is based on with the finish being the only exception. No verbal approvals will be given. Each submitter will be notified in writing of acceptance or rejection.
   3. The manufacturer must verify that it has been engaged in the manufacturing of the product in their production facility for a period of five (5) years.
   4. Maintenance manuals accompany the product sample being submitted for approval.
   5. Sight lines to match the base product specified.
   6. The qualified bidder must verify that the bidder has been involved with the installation of this type of product in a minimum of 5 projects of similar scope and quality.

2.2 MATERIALS

A. Aluminum Extrusions: Alloy and temper recommended by window manufacturer for strength, corrosion resistance and application of required finish, but not less than 22,000 psi ultimate tensile strength, a yield of 16,000 psi. Comply with ASTM B 221.

B. Fasteners: Aluminum, stainless steel, or other materials warranted by manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors and other components of window units.
   1. Do not use exposed fasteners on exterior except where unavoidable for application of hardware. Match finish of adjoining metal.
   2. Provide non-magnetic stainless steel, tamper-proof screws for exposed fasteners, where required, or special tamper-proof fasteners.
   3. Locate fasteners so as not to disturb the thermal barrier construction of windows.

C. Anchors, Clips and Window Accessories: Depending on strength and corrosion-inhibiting requirements, fabricate units of aluminum, non-magnetic stainless steel or hot-dip zinc coated steel or iron complying with ASTM A 123.

D. Compression Glazing Strips And Weatherstripping: At manufacturer's option, provide neoprene gaskets complying with ASTM D 2000 Designation 2BC415 to 3BC415, PVC gaskets complying with ASTM D2287, or expanded neoprene gaskets complying with ASTM C 509, Grade 4.

E. Sealant:
   1. Unless otherwise indicated for sealants required within fabricated window units, provide elastomeric type as recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking and non-migrating. Provide product complying with AAMA Specification 803 and 808.
   2. Refer to Division 7 for perimeter sealants between window units and surrounding construction.

2.3 WINDOW TYPES

A. General: Except as otherwise indicated, provide window units complying with requirements of AAMA Classification "AW" for "Architectural Window" type windows. Windows for this project will meet the performance requirements specified of F-AW95 for full size test units per AAMA/NWWDA 101/I.S.2-97 to withstand a design pressure of 95 psf minimum.

B. Fixed Aluminum Windows or Panel Frames (F): Base Bid
   1. No special hardware required.
   2. Minimum Wall Thickness: 0.125 inches.
   3. Minimum Frame Depth: 2.250 inches.

C. Operable Aluminum Windows: Alternate.

D. Accomplish combinations of simulated operable and fixed units by providing continuous jamb construction. Splicing is not permitted along entire length of the jamb. Sightlines and profiles shall match drawings.

2.4 FABRICATION AND ACCESSORIES

A. General: Provide manufacturer's standard fabrication and accessories which comply with specifications. Include complete system for assembly of components and anchorage of window units and provide complete pre-glazing at the factory.

B. Window Material:
   1. Windows and Muntin Bars: Aluminum.
   2. Secondary Members (friction tabs, shoes, weatherstripping guides, etc.): Aluminum or a material compatible with aluminum.
   3. Main Frame: Nominal thickness of not less than 0.125 inches, except for fin trim either integral or applied.

C. Master Frame: Not less than 2.250 inches in depth.

D. Hardware:
   1. Material: Aluminum, stainless steel or other non-corrosive materials compatible with aluminum for hardware having component parts which are exposed. Cadmium or zinc-plated steel where used must be in accordance with ASTM Specification B 766 or B 633.

E. Thermal Barrier: Provides a continuous uninterrupted thermal barrier around the entire perimeter of the frame and all sash and shall not be bridged by any metal conductors at any point.

F. Construction:
   1. Cope corners of the frame with two screws per corner into screw ports and back seal, forming a water-tight joint.

G. Mullions and other structural members: When mullion units occur, whether they are joined by integral mullions, independent mullions or by a combination of frame members, the resulting members must be capable of withstanding specified wind load or building requirements, without deflecting more than 1/175th of its span. When independent or integral mullions are used to join windows, the mullions shall contain a thermal barrier as specified. Evidence of compliance may be by mathematical calculations.

H. Glazing:
1. Pre-glaze all units (except insulated panels as required for installation) at the factory with insulated glass as follows:
a. Typical Insulated Glass: Overall thickness of 1 inch with two lites of 1/8 inch or 3/16 inch or 1/4 inch as size and loading require.
(1) Primary Sealant: Polyisobutylene applied to the edge of the spacer.
(2) Secondary Sealant: Silicone.
(3) Air Spacer: Continuous metal spacer with formed corners and an in-line connector, containing desiccant.
2. Glaze units to allow for glass replacement without the use of special tools.
3. Select quality complying with ASTM C 1036. Insulating glass SIGMA/IGCC certified to performance level CBA when tested in accordance with ASTM C 2190.
4. Glazing Method: Insulated glass (Altitude adjusted).
5. Type: LowE-366 Low SHGC, High Performance Low-E4, Titanium Dioxide and Silicone Dioxide hydrophilic low-emissivity coated, with Argon glass blend fill and a translucent protective film.
a. Low-Emissivity Coating: Three layers of silver Magentron sputtering vapor deposition (MSVD) type applied to No. 2 surface.
b. Performance at Center of Glass. MFRC validated.
(1) Thermal Transmission: U-value of 0.24.
(2) Solar Heat Gain Coefficient (SHGC): 0.27.
(3) Visible Light Transmittance (Vtc): .66 percent.
(4) Ultraviolet Transmittane (Tuv): 5 percent.
(5) Krochmann Damage Weighted Fading Function (Tdw): 43 percent.
(6) ISO-CIE Damage Weighted Transmission (300 to 700 nm): 43 percent.
6. Tint: Equal to Cardinal #272
7. Glazing Seal: Silicone bedding on interior; acrylic foam adhesive tape on exterior.

I. External (Historical) Muntins: Hollow extruded aluminum, finish to match the window system. Profile to match profiles indicated on contract documents. Machine and mechanically fasten the intersections of muntin grids. Fasten the grid to the sloped perimeter vent at each contact point.

2.5 CASING COVER SYSTEM: (Panning, Trims, Receptors, Mullions, Sills etc.)

A. Exterior Casing Covers (Panning, Receptors, Subsills, Sills): Provide extruded prime alloy aluminum 6063-T5 no less than nominal 0.078 inch wall thickness. Casing covers of less than 2 inches in depth from the window frame may be of 0.062 inch wall thickness. Provide aluminum sections of one piece designed to lock around the entire window frame for a weathertight connection.
1. Secure the casing cover section at the corners with stainless steel screws in integral screw ports with the joints back sealed using a compatible sealant.
2. Exposed screws, fasteners or pop rivets are not acceptable on the exterior of the casing cover system.

B. Exterior mullion covers: Extruded aluminum shape to provide rigidity, no less than nominal 0.062 inch wall thickness. Seal against the casing cover sections with continuous bulbous vinyl weatherstrip interlocked within the mullion cover.

C. Interior trim:
   1. Interior Trim, Closures and Angles: As detailed, of extruded shapes no less than 0.062 inch nominal wall thickness.
   2. Snap Trim: Apply in full length without splices and attach with clips spaced no more than 18 inches on center. Clips shall be no less than 3 inches long. No exposed screws will be allowed on interior trim.

2.6 ALUMINUM WINDOW FINISHES

A. Provide manufacturer's standard 2 coat Fluoropolymer 70% Kynar baked on, electrostatically applied enamel coating. Color to be applied over manufacturer's standard substrate preparation including cleaning, degreasing, and chromate conversion coating. Finish shall meet or exceed AAMA 2605.
   1. Color: Bone White

PART 3 - EXECUTION

3.1 PREPARATION

A. Existing Construction:
   1. Do not remove existing windows until new replacements are available and ready for immediate installation. Do not leave any openings uncovered at end of working day, during wind-driven precipitation or during excessively cold weather.
   2. Remove existing work carefully; avoid damage to existing work to remain.

B. Perform operations as necessary to prepare openings for proper installation and operation of new retrofit units or new construction units.

C. Verify openings are in accordance with shop drawings and Architects Drawings.

3.2 INSTALLATION

A. Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators and other components of work. In no case shall attachment to structure or to components of the window system be through or affect the thermal barriers of the window units.

B. Set units plumb, level and true to line, without warp or rack of frames or sash. Anchor securely in place. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action.

C. Wedge fiberglass insulation between frames of new windows and construction to remain, or between frames and new receptor as applicable. Compress fiberglass to no less than 50 percent of original thickness.

D. Set sill members and other members in bed of compound as shown, or with joint fillers or gaskets as shown, to provide weathertight construction. Seal units following installation and as required to provide weathertight system.

3.3 ADJUST AND CLEAN

A. Adjust operating vent and hardware to provide tight fit at contact points and at weatherstripping, for smooth operation and weathertight closure.

B. Clean aluminum surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and moving parts.

C. Clean glass promptly after installation of windows. Remove glazing and sealant compound, dirt and other substances.

D. Existing windows and other materials removed from site become property of the Contractor who shall promptly remove same and legally dispose of at no additional cost to the Owner.

E. Comply with all applicable laws, rules and regulations.

3.4 PROTECTION

A. Initiate all protection and other precautions required to ensure that window units will be without damage or deterioration (other than normal weathering) at time of acceptance.

B. Send to Architect, with copy to Owner, written recommendations for maintenance and protection of windows following Substantial Completion of Window Contract.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hardware for wood and hollow steel doors.

B. Thresholds.

C. Weather-stripping, seals and door gaskets.

1.2 RELATED SECTIONS

A. Section 01200 – Price and Payment Procedures: Alternates.

B. Section 08110 - Steel Doors and Frames.

1.3 REFERENCES

A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.

B. NFPA 80 - Fire Doors and Windows.

C. AWI - Architectural Woodwork Institute - Quality Standards.

D. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures.

E. NFPA 252 - Fire Tests of Door Assemblies.

F. UL 10B - Fire Tests of Door Assemblies.

G. UL 305 - Panic Hardware.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings: Indicate locations and mounting heights of each type of hardware.

C. Product Data: Submit catalog cuts for each type of hardware to be supplied.

D. Submit manufacturer's parts lists, and templates.

E. Samples: Submit 1 sample of hinge, latch set, door closer, illustrating style, color, and finish.

F. Samples: Will be incorporated into the Work.

G. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.5 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01700.

B. Record actual locations of installed cylinders and their master key code.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 01700.

B. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.7 QUALITY ASSURANCE

A. Perform work in accordance with the following requirements:
1. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
2. NFPA 101.
3. ANSI A117.1.
4. NFPA 80.
5. NFPA 252.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum ten (10) years documented experience.

B. Hardware Supplier: Company specializing in supplying institutional door hardware with ten (10) years documented experience and approved by manufacturer.

C. Hardware Supplier Personnel: Employ a qualified person to assist in the work of this section.

1.9 REGULATORY REQUIREMENTS

A. Conform to applicable code for requirements applicable to fire rated doors and frames.

1.10 PRE-INSTALLATION CONFERENCE

A. Convene four weeks prior to commencing work of this section, under provisions of Section 01041 to discuss hardware and keying system with Owner and Architect. Each door and its related hardware shall be reviewed.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 01600.

B. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

C. Deliver keys to Owner by security shipment direct from hardware supplier.

1.12 COORDINATION

A. Coordinate work under provisions of Section 01039.

B. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware.

C. Prior to submitting the hardware schedule for review, the Hardware Supplier shall meet with the Owner and Architect to coordinate hardware functions at each door.

1.13 WARRANTY

A. Provide ten year warranty for closers two year warranty for power assist closers under provisions of Section 01740. All other products shall have manufacturer's standard warranty.

B. Warranty: Include coverage for door closers and locksets and panic devices.

1.14 MAINTENANCE MATERIALS

A. Provide maintenance materials under provisions of 01700.

B. Provide special wrenches and tools applicable to each different or special hardware component.

C. Provide maintenance tools and accessories supplied by hardware component manufacturer.

1.15 EXTRA MATERIALS

A. Furnish under provisions of Section 01700.

B. Provide ten (10) extra key lock cylinders for each keyed group.

PART 2 PRODUCTS

2.1 SUPPLIERS

A. Hagerstown Paint and Glass, Hagerstown, MD

B. Allegany Door and Hardware Co., Hagerstown, MD

C. Builders Hardware Corp., Rockville and Owings Mills, MD

2.2 ACCEPTABLE MANUFACTURERS

A. Hinges: Stanley; No substitute.

B. Mechanical Locks: Schlage "L" series mortise locks with 6 pin removable core master keyed into existing system - No substitutions.

C. Push/Pulls, Kick, & Armor Plates: BM as specified. No substitutions.

D. Exit Devices: Von Duprin (as listed)

E. Closers: LCN - Closers as listed. All door closers shall be mounted on the inside of exterior doors and non-public side of interior doors - No substitutions.

F. Manual and Automatic Bolts: DCI as specified - No substitutions.

G. Thresholds and Weather-stripping: National Guard Products - No substitutions.

H. Door Stops, Door Holders: BM as listed.

I. Substitutions: Not permitted.

2.3 KEYING

A. Door Locks: Grand master keyed and master locks and cylinders to the existing system. All cylinders shall be removable core.

B. Supply keys in the following quantities:
1. Master Keys - 4 each set
2. Change Keys - 3 each locking device
3. Control Keys - 2
4. Construction Master Keys - 10

C. Supplier shall review with Owner & Architect keying system prior to submission of hardware schedule.

D. Furnish key removable core cylinders as required for all locking devices, alarms and key switches on this job.

2.4 FINISHES

A. Finishes: US26D and 626 - Satin chrome. US32D and 630 - Satin stainless steel AL - Aluminum Lacquer (door closers only).

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Section 01041.

B. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings and instructed by the manufacturer.

3.2 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions.

B. Use templates provided by hardware item manufacturer.

3.3 FIELD QUALITY CONTROL

A. Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.4 ADJUSTING

A. Adjust work under provisions of Section 01700.

B. Adjust hardware for smooth operation.

3.5 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Section 01500.

B. Do not permit adjacent work to damage hardware or finish.

3.6 SCHEDULE

HARDWARE SET #1

6 Hinges	CB179 4.5 x 4.5	US26D
2 Panic Device	ELXP98EO	626
1 Mullion	KR4954 x 154 Stabilizers	689
2 Door Pull	BF157	US32D
1 Closer	4040	689
1 Operator	9553 RF REG 2	628
1 Power Supply	PS 873-2 x AD	
2 Actuator (Wall Mount)	8310-856T	
1 Jamb Seals	1605	AL
1 Head Seals	700SA	AL
1 Threshold	8425	AL
2 Door Sweep	C627A	AL

HARDWARE SET #2

3 Hinges	CB179 4.5 x 4.5	US62D
1 Panic Device	ELXP98EO	626
1 Door Pull	BF157	US32D
1 Closer	4040	689
1 Jamb Seals	1605	AL
1 Head Seal	700SA	AL
1 Threshold	8425	AL
1 Door Sweep	C627A	AL

HARDWARE SET #3

3 Hinges	CB179 4.5 x 4.5	US26D
1 Lockset- Store room	L9080 x 06 Lever	US26D
1 Permanent Core	US1547	US26D
1 Closer	4040	689
3 Door Silencers	608	
1 Jamb Seals	1605	AL
1 Head Seal	700SA	AL
1 Threshold	8425	AL
1 Door Sweep	C627A	AL

HARDWARE SET #3

(By Door Manufacturer)

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Glass and glazing for Sections referencing this Section for products and installation.

1.2 RELATED SECTIONS

A. Section 08110 - Steel Doors and Frames: Glazed doors and frames.

1.3 REFERENCES

A. ANSI/ASTM E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

B. ANSI A97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.

C. ASTM C1036 - Flat Glass.

D. ASTM C1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.

E. ASTM E546 - Test Method For Frost Point of Sealed Insulating Glass Units.

F. ASTM E576 - Test Method For Dew/Frost Point of Sealed Insulating Glass Units in Vertical Position.

G. ASTM E773 - Test Method for Seal Durability of Sealed Insulating Glass Units.

H. ASTM E774 - Sealed Insulating Glass Units.

I. FGMA - Glazing Manual.

J. FGMA - Sealant Manual.

K. FS TT-C-00598 - Caulking Compound, Oil and Resin Base Type.

L. FS TT-S-001657 - Sealing Compound, Single Component, Butyl Rubber Based, Solvent Release Type.

M. FS TT-S-00227 - Sealing Compound, Rubber Base, Two Component.

N. FS TT-S-00230 - Sealing Compounds, Synthetic-Rubber Base, Single Component, Chemically Curing.

O. FS TT-S-01543 - Sealing Compound, Silicone Rubber Base.

P. FS TT-G-410 - Glazing Compound, Sash (Metal) for Back Bedding and Face Glazing (Not for Channel or Stop Glazing).

Q. Laminators Safety Glass Association - Standards Manual.

R. SIGMA - Sealed Insulated Glass Manufacturers Association.

1.4 PERFORMANCE REQUIREMENTS

A. Glass and glazing materials of this Section shall provide continuity of building enclosure vapor and air barrier:
   1. In conjunction with materials described in Section 07900.
   2. To utilize the inner pane of multiple pane sealed units for the continuity of the air and vapor seal.
   3. Maintain continuous air and vapor barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.

B. Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as calculated in accordance with code and as measured in accordance with ANSI/ASTM E330.

C. Limit glass deflection to flexure limit of glass with full recovery of glazing materials, whichever is less.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data on Glass Types Specified: Provide structural, physical and environmental characteristics, size limitations, and special handling or installation requirements.

C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

D. Samples: Submit two samples, 12 x 12 inch in size, illustrating glass units, coloration and design.

E. Manufacturer's Installation Instructions: Indicate special precautions required.

F. Manufacturer's Certificate: Certify that sealed insulated glass, meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with FGMA Glazing Manual, FGMA Sealant Manual, SIGMA and Laminators Safety Glass Association - Standards Manual for glazing installation methods.

B. Maintain one copy of each document on site.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not install glazing when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.8 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop Drawings instructed by the manufacturer.

1.9 COORDINATION

A. Coordinate Work prior to start of work.

B. Coordinate the Work with glazing frames, wall openings, and perimeter air and vapor seal to adjacent Work.

1.10 WARRANTY

A. Provide five year manufacturer's warranty under provisions of Section 01700.

B. Warranty: Include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

PART 2 PRODUCTS

2.1 MANUFACTURERS/FABRICATORS - FLAT GLASS MATERIALS

A. AFG Glass

B. Pilkington

C. Viro-Con

D. PPG.

E. Substitutions: Under provisions of Section 01300.

2.2 FLAT GLASS MATERIALS

A. Safety Glass (Type G-4): Clear; fully tempered; conforming to ANSI A97.1 and CPSC 96 CFR (1201); 1/4 inch thick minimum.

B. Safety Glass (Type G-2): Frosted; fully tempered; conforming to ANSI A97.1 and CPSC 96 CFR (1201); 1/4 inch thick minimum.

C. Float Glass (Type G-3): ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select; 1/4 inch thick minimum.

D. Laminated Acoustic Glass (Type G-1): Two lites of clear ¼" thick annealed glass with clear Saflex silent glass interlayer by Solutia. Laminate shall comply with CPSC 16 CFR 1201 Category I and Safety Glazing Test Standard and ANSI A-97.1-1984. Minimum standards specified in ASTM C1036-85 or C1048-85.

2.3 GLAZING COMPOUNDS

A. Silicone Sealant (Type GC-F): Single component, solvent curing; capable of water immersion without loss of properties; non-bleeding non-staining; cured Shore A hardness of 15-25.

2.4 GLAZING ACCESSORIES

A. Setting Blocks: Silicone, 80 - 90 Shore A durometer hardness, length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Silicone, 50 - 60 Shore A durometer hardness, minimum 4 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 - 15 Shore A durometer hardness; coiled on release paper; black color.

D. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify prepared openings under provisions of Section 01300.

B. Verify that openings for glazing are correctly sized and within tolerance.

C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.2 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

3.3 EXTERIOR - DRY METHOD (PREFORMED GLAZING)

A. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.

B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.

C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

D. Install removable stops without displacing glazing tape. Exert pressure for full continuous contact.

E. Trim protruding tape edge.

3.4 INTERIOR - DRY METHOD (TAPE AND TAPE)

A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.

B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.

C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.

D. Place glazing tape on free perimeter of glazing in same manner described above.

E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

F. Knife trim protruding tape.

3.5 INSTALLATION - MIRRORS

A. Set mirrors with adhesive, applied in accordance with adhesive manufacturer's instructions.

B. Place plumb and level.

3.6 CLEANING

A. Clean work under provisions of 01700.

B. Remove glazing materials from finish surfaces.

C. Remove labels after work is complete.

D. Clean glass and mirrors.

3.7 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Section 01500.

B. After installation, mark pane with an 'X' by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

END OF SECTION