PART 1: GENERAL

1.01 Summary:
   A. Provide hollow metal door frames.

1.02 Submittals:
   A. Submit for approval samples, shop drawings, product data.

1.03 Quality Assurance:
   A. Comply with all governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2: PRODUCTS

2.01 Materials:
   A. Frames: Reinforced, knockdown construction with mitered corners with snap lock corner clips.
   B. Interior frames: 16 ga. up to 5 feet wide, 14 ga. over 5' wide. Rebate stop for 1-3/4" door doors.
   C. Door frames that have lead coating shall be 14 ga. refer to plan and door schedule for locations.
   D. Finish: Rust inhibiting primer.

PART 3: EXECUTION

3.01 Installation:
   A. Install doors and frames in compliance with SDI-100, NFPA 80, and requirements of authorities having jurisdiction.
   B. Touch-up damaged coatings and leave ready to receive finish pairing.
PART 1: GENERAL

1.01 Summary:
   A. Provide pre machined wood doors as scheduled.

1.02 Submittals:
   A. Submit for approval product data.

1.03 Quality Assurance:
   A. Comply with all governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
   B. Submit written agreement on door manufacturer's standard form signed by manufacturer, Installer, and Contractor, agreeing to replace, or repair defective doors which have warped (bow, twist, or cup) or which show telegraphing of core construction in face veneer, or do not conform to tolerance limitations of AWI.
   C. Solid core flush interior doors: Life of insulation.

PART 2: PRODUCTS

2.01 Materials:
   A. Wood doors for transparent finish: solid core flush wood door with particleboard core for interior use, AWI premium grade.
   B. Face: Rift cut red oak veneer, book matched.

PART 3: EXECUTION

3.01 Preparation:
   A. Comply with AWI quality standard pre-fit doors to frames. Pre-machine doors for hardware listed on hardware schedules.

3.02 Installation:
   A. Install doors with not more than 1/8” clearance at top and sides, 1/4” above finish floors at bottoms.
   B. Shop finish: comply with AWI section 1500 requirements.
1. Grade AWI premium.
2. Finish: #5 catalyzed polyurethane.
4. Effect: Open grain finish.

C. Adjust, clean and protect.

- - - E N D - - -
08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies aluminum entrance work including storefront construction, hung doors, interior ICU sliding doors, and other components to make a complete assembly.

1.2 RELATED WORK:

A. Glass and Glazing: Section 08 80 00, GLAZING.
B. Aluminum Windows: Section 08 51 13, ALUMINUM WINDOWS.
C. Texture and color of finish: Section 09 06 00, SCHEDULE FOR FINISHES.

1.3 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
B. Shop Drawings: (1/2 full scale) showing construction, anchorage, reinforcement, and installation details.
C. Manufacturer's Literature and Data:
   1. Doors, each type.
   2. Entrance and Storefront construction.
D. Samples:
E. Manufacturer's Certificates:
   1. Stating that aluminum has been given specified thickness of anodizing.
   2. Indicating manufacturer's qualifications specified.

1.4 QUALITY ASSURANCE:

A. Approval by Contracting Officer is required of products of proposed manufacturer, or supplier, and will be based upon submission by Contractor certification.
B. Certify manufacturer regularly and presently manufactures aluminum entrances and storefronts as one of their principal products.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver aluminum entrance and storefront material to the site in packages or containers; labeled for identification with the manufacturer's name, brand and contents.
B. Store aluminum entrance and storefront material in weather-tight and dry storage facility.
C. Protect from damage from handling, weather and construction operations before, during and after installation.

1.6 APPLICABLE PUBLICATIONS:

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):
   B209-06 ......................... Aluminum and Aluminum-Alloy Sheet and Plate
   B221-05 ......................... Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
   E283-04 ......................... Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
   E331-00 ......................... Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
   F468-06 ......................... Nonferrous Bolts, Hex Cap Screws, and Studs for General Use
   F593-04 ......................... Stainless Steel Bolts, Hex Cap Screws, and Studs

C. National Association of Architectural Metal Manufacturers (NAAMM):
   AMP 500 Series ................... Metal Finishes Manual

D. American Architectural Manufacturer's Association (AAMA):
   2604-05 ......................... High Performance Organic Coatings on Architectural Aluminum Extrusions and Panels

E. American Welding Society (AWS):
   D1.2-03 ......................... Structural Welding Code Aluminum

1.7 PERFORMANCE REQUIREMENTS:

A. Shapes and thickness of framing members shall be sufficient to withstand a design wind load of not less than [1.4] kilopascals ([30] pounds per square foot of supported area with a deflection of not more than 1/175 times the length of the member and a safety factor of not less than 1.65 (applied to overall load failure of the unit). Provide glazing beads, moldings, and trim of not less than 1.25 mm (0.050 inch) nominal thickness.

B. Air Infiltration: When tested in accordance with ASTM E 283, air infiltration shall not exceed 2.63 x 10-50 cm per square meter (0.06 cubic feet per minute per square foot) of fixed area at a test pressure of 0.30 kPa (6.24 pounds per square foot) 80 kilometers (50 mile) per hour wind.

C. Water Penetration: When tested in accordance with ASTM E 331, there shall be no water penetration at a pressure of 0.38 kPa (8 pounds per square foot) of fixed area.

PART 2 - PRODUCTS
2.1 MATERIALS:

A. Aluminum, ASTM B209 and B221:
   1. Alloy 6063 temper T5 for fixed glass storefronts
   2. Alloy 6061 temper T6 for guide tracks for sliding doors and other extruded structural members.
   3. For color anodized finish, use aluminum alloy as required to produce specified color.

B. Thermal Break: Manufacturer standard low conductive material retarding heat flow in the framework, where insulating glass is scheduled.

C. Fasteners:
   2. Stainless Steel: ASTM F593, Alloy Groups 1, 2 and 3.

2.2 FABRICATION:

A. Fabricate doors, of extruded aluminum sections not less than 3 mm (0.125 inch) thick. Fabricate glazing beads of aluminum not less than 1.0 mm (0.050 inch) thick.

B. Accurately form metal parts and accurately fit and rigidly assemble joints, except those joints designed to accommodate movement. Seal joints to prevent leakage of both air and water.

C. Make welds in aluminum in accordance with the recommended practice AWA D1.2. Use electrodes and methods recommended by the manufacturers of the metals and alloys being welded. Make welds behind finished surfaces so as to cause no distortion or discoloration of the exposed side. Clean welded joints of welding flux and dress exposed and contact surfaces.

D. Make provisions in doors and frames to receive the specified hardware and accessories. Coordinate schedule and template for hardware specified under Section 08 71 00, DOOR HARDWARE. Where concealed closers or other mechanisms are required, provide the necessary space, cutouts, and reinforcement for secure fastening.

E. Fit and assemble the work at the manufacturer's plant. Mark work that cannot be permanently plant-assembled to assure proper assembly in the field.

2.3 PROTECTION OF ALUMINUM:

A. Isolate aluminum from contact with dissimilar metals other than stainless steel, white bronze, or zinc by any of the following:
   1. Coat the dissimilar metal with two coats of heavy-bodied alkali resistant bituminous paint.
   2. Place caulking compound, or non-absorptive tape, or gasket between the aluminum and the dissimilar metal.
   3. Paint aluminum in contact with mortar, concrete and plaster, with a coat of aluminum paint primer.
2.4 FRAMES:

A. Fabricate doors, frames, Mullions, transoms, frames for fixed glass and similar members from extruded aluminum not less than 3 mm (0.125 inch) thick.
B. Provide integral stops and glass rebates and applied snap-on type trim.
C. Use concealed screws, bolts and other fasteners. Secure cover boxes to frames in back of all lock strike cutouts.
D. Fabricate framework with thermal breaks in frames where insulating glass is scheduled and specified under Section 08 80 00, GLAZING.

2.5 STILE AND RAIL DOORS: NA

2.6 FLUSH PANEL DOORS: NA

2.7 REINFORCEMENT FOR BUILDERS HARDWARE: NA

2.8 COLUMN COVERS AND TRIM: NA

2.9 FINISH

A. In accordance with NAAMM AMP 500 series.
B. Anodized Aluminum:
   1. Clear Finish: Chemically etched medium matte, with clear anodic coating, Class I Architectural, 7 mils thick.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Allowable Installation Tolerances: Install work plumb and true, in alignment and in relation to lines and grades shown. Variation of 3 mm (1/8 inch) in 2400 mm (eight feet), non-accumulative, is maximum permissible for plumb, level, warp, bow and alignment.
B. Anchor aluminum frames to adjoining construction at heads, jambs and bottom and to steel supports, and bracing. Anchor frames with stainless steel or aluminum countersunk flathead, expansion bolts or machine screws, as applicable. Use aluminum clips for internal connections of adjoining frame sections.
C. Where work is installed within masonry or concrete openings, place no parts other than built-in anchors and provision for operating devices located in the floor, until after the masonry or concrete work is completed.
3.2 ADJUSTING:

After installation of entrance and storefront work is completed, adjust and lubricate operating mechanisms to insure proper performance.

3.3 PROTECTION, CLEANING AND REPAIRING:

Remove all mastic smears and other unsightly marks, and repair any damaged or disfigurement of the work.
Protect the installed work against damage or abuse.

- - - E N D - - -
PART 1 - GENERAL

1.01 Summary

A. Section Includes: Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of curtain wall framing.

B. Related Sections:
   1. Division 08 32 13 “Sliding Aluminum-Framed Glass Doors”
   2. Division 08 41 13 “Aluminum-Framed Entrances and Storefronts”
   3. Division 08 43 13 “Aluminum-Framed Storefronts”
   4. Division 08 43 29 “Sliding Storefronts”
   5. Division 08 44 33 “Sloped Glazing Assemblies”
   6. Division 08 51 13 “Aluminum Windows”
   7. Division 08 63 00 “Metal-Framed Skylights”
   8. Division 08 70 00 “Hardware”
   9. Division 08 80 00 “Glazing”

1.02 References (Industry Standards)

1.03 System Description

A. Curtain Wall System Performance Requirements:
   1. Wind loads: Provide Curtain Wall system; include anchorage, capable of withstanding wind load design pressures as required by local building codes.
   2. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft² (0.3 l/s · m²) at a static air pressure differential of 6.24 psf (300 Pa).
   3. Water Resistance, (static): The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a static air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.
4. Water Resistance, (dynamic): The test specimen shall be tested in accordance with AAMA 501.1. There shall be no leakage at an air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.

5. Uniform Load: A static air design load of 40 psf (1915 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member at design load. At structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

6. Seismic: When tested to AAMA 501.4, system must meet design displacement of 0.010 x the story height and ultimate displacement of 1.5 x the design displacement.

7. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.66 (clear) BTU/hr/ft²/°F. per AAMA 507

8. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 66frame and 60glass (clear), or Condensation Index (I): when tested to CSA-A440-00, the Condensation Index shall not be less than 68frame and 54glass (clear).

9. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.43 (HP glass) or BTU/hr/ft²/°F. per AAMA 507

10. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 71frame and 71glass (HP glass).

11. Sound Transmission Loss: When tested to ASTM E90 and ASTM E1425, the Sound Transmission Class (STC) and Outdoor/Indoor Transmission Class (OITC) shall not be less than:
   - STC 31 or OITC 26 based upon 1” insulating glass (1/4”, 1/2” AS, 1/4”),
   - STC 37 or OITC 30 based upon 1” laminated glass (1/4” laminated, 1/2” AS, 1/4” laminated).
   
1.04 Submittals

A. General: Prepare, review, approve, and submit specified submittals in accordance with “Conditions of the Contract” and Submittals Sections. Product data, shop drawings, samples, and similar submittals are defined in “Conditions of the Contract.”

B. Quality Assurance/Control Submittals:
   1. Test Reports: Submit certified test reports showing compliance with specified performance characteristics.

1.05 Warranty
A. Project Warranty: Refer to “Conditions of the Contract” for project warranty provisions.

B. Manufacturer’s Product Warranty: Submit, for Owner’s acceptance, manufacturer’s warranty for curtain wall system as follows:

1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment.

1.06 Quality Assurance

A. Qualifications:

1. Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to product manufacturer.

2. Manufacturer Qualifications: Manufacturer capable of providing structural calculations, applicable independent product test reports, installation instructions, a review of the application method, customer approval and periodic field service representation during construction.

B. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer’s installation instructions, and manufacturer’s warranty requirements.

1.07 Delivery, Storage, and Handling

A. Ordering: Comply with manufacturer’s ordering instructions and lead time requirements to avoid construction delays.

B. Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle material and components to avoid damage. Protect curtain wall material against damage from elements, construction activities, and other hazards before, during and after curtain wall installation.

PART 2 - PRODUCTS

2.01 Manufacturers (Acceptable Manufacturers/Products)

A. Acceptable Manufacturers:

1. Address: Kawneer Company, Inc.
2. Proprietary Product(s)/System(s): Kawneer Aluminum Curtain Wall
   a. 1600 Wall System® - 2-1/2” x 6” (63.5 x 152.4) or 7-1/2” (63.5 x 190.5), outside glazed pressure plate format.
   b. Finish/Color: (See 2.06 Finishes)

B. Or approved substitute.

C. Substitutions:

1. General: Refer to Substitutions Section for procedures and submission requirements.
   a. Pre-Contract (Bidding Period) Substitutions: Submit written requests ten (10) days prior to bid date.
   b. Post-Contract (Construction Period) Substitutions: Submit written request in order to avoid curtain wall installation and construction delays.

2. Substitution Documentation
   a. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
   b. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for curtain wall system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum curtain wall for a period of not less than ten (10) years. (Company Name)
   c. Test Reports: Submit test reports verifying compliance with each test requirement for curtain wall required by the project.
   d. Product Sample and Finish: Submit product sample, representative of curtain wall for the project, with specified finish and color.

3. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.02 Materials
A. Aluminum (Curtain Wall and Components):
   2. Member Wall Thickness: Each framing member shall have a wall thickness sufficient to meet the specified structural requirements.
   3. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

2.03 Accessories
   A. Fasteners: Where exposed, shall be Stainless Steel.
   B. Gaskets: Glazing gaskets shall comply with ASTM C 864 and be extruded of a silicone compatible EPDM rubber that provides for silicone adhesion.
   C. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
   D. Thermal Barrier: Thermal separator shall be extruded of a silicone compatible elastomer that provides for silicone adhesion.

2.04 Related Materials
   A. Sealants: Refer to Joint Treatment (Sealants) Section.
   B. Glass: Refer to Glass and Glazing Section.

2.05 Fabrication
   A. General:
      1. Fabricate components per manufacturer's installation instructions and with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
      2. Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.
      4. Arrange fasteners and attachments to conceal from view.
A. Shop Finishing:


2.07 Source Quality Control

A. Source Quality: Provide aluminum curtain walls specified herein from a single source.

1. Building Enclosure System: When aluminum curtain wall are part of a building enclosure system, including entrances, entrance hardware, windows, storefront framing and related products, provide building enclosure system products from a single source manufacturer.

PART 3 - EXECUTION

3.01 Examination

A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer’s instructions. Verify openings are sized to receive curtain wall system and sill plate is level in accordance with manufacturer’s acceptable tolerances.

1. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

3.02 Installation

A. General: Install curtain wall systems plumb, level, and true to line, without warp or rack of frames with manufacturer’s prescribed tolerances and installation instructions. Provide support and anchor in place.

1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.

2. Glazing: Glass shall be outside glazed and held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners spaced no greater than 9” on center.

3. Water Drainage: Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.

B. Related Products Installation Requirements:

1. Sealants (Perimeter): Refer to Joint Treatment (Sealants) Section.
2. Glass: Refer to Glass and Glazing Section.

3.03 Field Quality Control

A. Field Tests: Architect shall select curtain wall units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer’s representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.

1. Testing: Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements.
   a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft², which ever is greater.
   b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 8 psf (383 Pa).

B. Manufacturer’s Field Services: Upon Owner’s written request, provide periodic site visit by manufacturer’s field service representative.

3.04 Protection and Cleaning

A. Protection: Protect installed product’s finish surfaces from damage during construction. Protect aluminum curtain wall system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

B. Cleaning: Repair or replace damaged installed products. Clean installed products in accordance with manufacturer’s instructions prior to owner’s acceptance. Remove construction debris from project site and legally dispose of debris.
08 51 13 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 DESCRIPTION
A. Aluminum windows of type and size shown, complete with hardware, related components and accessories.
B. Types:
   1. Fixed

1.2 DEFINITIONS
A. Accessories: Mullions, staff beads, casings, closures, trim, moldings, panning systems, sub-sills, clips anchors, fasteners, weather-stripping, insect screens and other necessary components required for fabrication and installation of window units.
B. Uncontrolled Water: Water not drained to the exterior, or water appearing on the room side of the window.

1.3 RELATED WORK
A. Steel subframes: Section 05 50 00, METAL FABRICATIONS.
B. Storefront: Section 08 41 13, ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.
C. Glazing: Section 08 80 00, GLAZING.
E. Color of finish: Section 09 06 00, SCHEDULE FOR FINISHES.

1.4 DELIVERY, STORAGE AND HANDLING
A. Protect windows from damage during handling and construction operations before, during and after installation.
B. Store windows under cover, setting upright.
C. Do not stack windows flat.
D. Do not lay building materials or equipment on windows.

1.5 QUALITY ASSURANCE
A. Approval by Architect & Owner is required of products or service of proposed manufacturers and installers.
B. Approval will be based on submission of certification by Contractor that:
   1. Manufacturer regularly and presently manufactures the specified windows as one of its principal products.
2. Installer has technical qualifications, experience, trained personnel and facilities to install specified items.

C. Provide each type of window produced from one source of manufacture.

D. Quality Certified Labels or certificate:
   1. Architectural Aluminum Manufacturers Association, "AAMA label" affixed to each window indicating compliance with specification.
   2. Certificates in lieu of label with copy of recent test report (not more than 4 years old) from an independent testing laboratory and certificate signed by window manufacturer stating that windows provided comply with specified requirements and AAMA 101/1.S.2 for type of window specified.

1.6 SUBMITTAL

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings:
   1. Minimum of 1/2 full scale for all types of windows on project.
   2. Identifying parts of window units by name and kind of metal or material, show construction, locking systems, mechanical operators, trim, installation and anchorages.
   3. Include glazing details and standards for factory glazed units.

C. Manufacturer’s Literature and Data:
   Window.
   Sash locks, keepers, and key.

D. Certificates:
   1. Certificates as specified in paragraph QUALITY ASSURANCE.
   2. Indicating manufacturers and installers qualifications.
   3. Manufacturer’s Certification that windows delivered to project are identical to windows tested.

E. Test Reports:
   Copies of test reports as specified in paragraph QUALITY ASSURANCE.

1.7 WARRANTY

Warrant windows against malfunctions due to defects in thermal breaks, hardware, materials and workmanship, subject to the terms of Article “WARRANTY OF CONSTRUCTION”, FAR clause 52.246-21, except provide 10 year warranty period.

1.8 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
   90.1-04................................. Energy Standard of Buildings
C. American Architectural Manufacturers Association (AAMA):
   101/1.S.2/A440-05 ...................... Windows, Doors, and Unit Skylights
   505-98 .................................. Dry Shrinkage and Composite Performance Thermal Cycling Test
      Procedures
   2605-05 ................................. Superior Performing Organic Coatings on Architectural Aluminum
      Extrusions and Panels
   TIR-A8-04 ............................... Structural Performance of Poured and Debrided Framing Systems

D. American Society for Testing and Materials (ASTM):
   A653/A653M-07 ........................ Steel Sheet, Zinc Coated (Galvanized), Zinc-Iron Alloy-Coated
      (Galvannealed) by the Hot-dip Process
   E 90-04 .................................. Test Method for Laboratory Measurement of Airborne Sound
      Transmission Loss of Building Partitions

E. National Fenestration Rating Council (NFRC):
   NFRC 100-04 ......................... Determining Fenestration Product U-Factors
   NFRC 200-04 ......................... Determining Fenestration Product Solar Heat Gain Coefficient and
      Visible Transmittance at Normal Incidence

F. National Association of Architectural Metal Manufacturers (NAAMM):
   AMP 500 Series ....................... Metal Finishes Manual

PART 2- PRODUCTS

2.1 MATERIALS

A. Aluminum Extrusions; Sheet and Plate: AAMA 101/1.S.2.
B. Sheet Steel, Galvanized: ASTM A653; G90 galvanized coating.
C. Weather-strips: AAMA 101/1.S.2; except leaf type weather-stripping is not permitted.
D. Insect Screening: NA
E. Fasteners: AAMA 101/1.S.2. Screws, bolts, nuts, rivets and other fastening devices to be non-magnetic
      stainless steel.
   1. Fasteners to be concealed when window is closed. Where wall thickness is less than 3 mm (0.125
      inch) thick, provide backup plates or similar reinforcements for fasteners.
   2. Stainless steel self tapping screws may be used to secure Venetian blind hanger clips, vent guide
      blocks, friction adjuster, and limit opening device.
   3. Attach locking and hold-open devices to windows with concealed fasteners. Provide reinforcing plates
      where wall thickness is less than 3 mm (0.125 inch) thick.
G. Hardware: NA
H. Pole Operators: NA
2.2 THERMAL AND CONDENSATION PERFORMANCE

A. Condensation Resistance Factor (CRF): Minimum CRF of C 45

B. Thermal Transmittance:
   1. Maximum U value class for insulating glass windows: 50 (U=0.50).
   2. Maximum U value class for dual glazed windows: 70 (U=0.70), or as required by ASHRAE 90.1.

C. Solar Heat Gain Coefficient (SHGC): SHGC shall comply with State or local energy code requirement.

2.3 FABRICATION

A. Fabrication to exceed or meet requirements of Physical Load Tests, Air Infiltration Test, and Water Resistance Test of AAMA 101/I.S.2.

B. Glazing:
   1. Factory or field glazing optional.
   2. Glaze in accordance with Section 08 80 00, GLAZING.
   3. Windows reglazable without dismantling sash framing.
   4. Design rabbet to suit glass thickness and glazing method specified. Increase rabbet depths for plastic glazing when used; minimum, depth of 25 mm (1-inch).
   5. Glaze from interior except where not accessible.
   6. Provide removable fin type glazing beads.

C. Trim:
   1. Trim includes casings, closures, and panning.
   2. Fabricate to shapes shown of aluminum not less than 1.6 mm (0.062 inch) thick
   3. Extruded or formed sections, straight, true, and smooth on exposed surfaces. // Curved sections true to line. //
   4. Exposed external corners mitered and internal corners coped; fitted with hairline joints.
   5. Reinforce 1.6 mm (0.062 inch) thick members with not less than 3 mm (1/8-inch) thick aluminum.
   6. Except for strap anchors, provide reinforcing for fastening near ends and at intervals not more than 305 mm (12 inches) between ends.
   7. Design to allow unrestricted expansion and contraction of members and window frames.
   8. Secure to window frames with machine screws or expansion rivets.
   9. Exposed screws, fasteners or pop rivets are not acceptable on exterior of the casing or trim cover system.

D. Thermal-Break Construction:
   1. Manufacturer’s Standard.
   2. Low conductance thermal barrier.
   3. Capable of structurally holding sash in position and together.
   4. All Thermal Break Assemblies (Pour & Debridge, Insulbar or others) shall be tested as per AAMA TIR A8 and AAMA 505 for Dry Shrinkage and Composite Performance.
5. Location of thermal barrier and design of window shall be such that, in closed position, outside air shall not come in direct contact with interior frame of the window.

E. Mullions: AAMA 101.

F. Subsills and Stools:
1. Fabricate to shapes shown of not less than 2 mm (0.080 inch) thick extruded aluminum.
2. One piece full length of opening with concealed anchors.
3. Sills turned up back edge not less than 6 mm (1/4 inch). Front edge provide with drip.
4. Sill back edge behind face of window frame. Do not extend to interior surface or bridge thermal breaks.
5. Do not perforate for anchorage, clip screws, or other requirements.

2.4 DOUBLE HUNG WINDOWS: NA

2.5 CASEMENT WINDOWS: NA

2.6 PROJECTED WINDOWS: NA

2.7 DUAL HORIZONTAL SLIDING WINDOWS: NA

2.8 SINGLE SASH HORIZONTAL SLIDING WINDOWS: NA

2.9 FIXED WINDOWS
   A. AMMA 101/I.S.2; Type HC25 & F-AW65.
   B. AAMA certified product to the AAMA 101/I.S.2. - 97 standard.

2.10 FINISH
   A. In accordance with NAAMM AMP 500 series.
   B. Finish exposed aluminum surfaces as follows:
      1. Anodized Aluminum:
         a. Finish in accordance with AMP 501 letters and numbers.
         b. Clear anodized Finish: AA-C22A41 Medium matte, clear anodic coating, Class 1 Architectural, 0.7 mils thick.

PART 3 - EXECUTION

3.2 INSTALLATION, GENERAL

A. Install window units in accordance with manufacturer’s specifications and recommendations for installation of window units, hardware, operators and other components of work.

B. Where type, size or spacing of fastenings for securing window accessories or equipment to building construction is not shown or specified, use expansion or toggle bolts or screws, as best suited to construction material.
   1. Provide bolts or screws minimum 6 mm (1/4-inch) in diameter.
   2. Sized and spaced to resist the tensile and shear loads imposed.
   3. Do not use exposed fasteners on exterior, except when unavoidable for application of hardware.
   4. Provide non-magnetic stainless steel Phillips flat-head machine screws for exposed fasteners, where required, or special tamper-proof fasteners.
   5. Locate fasteners to not disturb the thermal break construction of windows.

C. Set windows plumb, level, true, and in alignment; without warp or rack of frames or sash.

D. Anchor windows on four sides with anchor clips or fin trim.
   1. Do not allow anchor clips to bridge thermal breaks.
   2. Use separate clips for each side of thermal breaks.
   3. Make connections to allow for thermal and other movements.
   4. Do not allow building load to bear on windows.
   5. Use manufacturer’s standard clips at corners and not over 600 mm (24 inches) on center.
   6. Where fin trim anchorage is shown build into adjacent construction, anchoring at corners and not over 600 mm (24 inches) on center.

E. Sills and Stools:
   1. Set in bed of mortar or other compound to fully support, true to line shown.
   2. Do not extend sill to inside window surface or past thermal break.
   3. Leave space for sealants at ends and to window frame unless shown otherwise.

3.3 MULLIONS CLOSURES, TRIM, AND PANNING

A. Cut mullion full height of opening and anchor directly to window frame on each side.

B. Closures, Trim, and Panning: External corners mitered and internal corners coped, fitted with hairline, tightly closed joints.

C. Secure to concrete or solid masonry with expansion bolts, expansion rivets, split shank drive bolts, or powder actuated drive pins.

D. Toggle bolt to hollow masonry units. Screwed to wood or metal.

E. Fasten except for strap anchors, near ends and corners and at intervals not more than 300 mm (12 inches) between.

F. Seal units following installation to provide weathertight system.
3.4 ADJUST AND CLEAN

A. Adjust ventilating sash and hardware to provide tight fit at contact points, and at weather-stripping 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.

C. Remove excess glazing and sealant compounds, dirt, and other substances.

D. Lubricate hardware and moving parts.

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

F. Except when a window is being adjusted or tested, keep locked in the closed position during the progress of work on the project.
PART 1 - GENERAL

1.01 SUMMARY
A. Provide finish hardware as scheduled.
B. G.C. is to provide as part of the Base Bid an allowance for $10,000.00 for additional door hardware replacement at existing doors. This is to be used at the Owner’s discretion throughout the Project. Any remaining amount at Project Substantial Completion is to be returned in full to the Owner.

1.02 SUBMITTALS
A. Submit for approval, samples as requested, product data and hardware schedule.

1.03 QUALITY ASSURANCE
A. Unless otherwise specified, all products of a similar nature shall be the product(s) of a single manufacturer.
B. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer’s instructions.
C. Comply with regulatory codes and requirements:
   2. NFPA 80, Fire Doors and Windows.
   3. Building Code of New York State

PART 2 - PRODUCTS

2.01 MATERIALS
A. Hinges and butts: Full-mortise, 5 knuckle ball-bearing type, standard weight at doors up to and including 3’0” in width, heavy weight at doors over 3’0” in width: Hager or approved equal by McKinney or Stanley.
B. Continuous hinges: Edge mounted, heavy duty pin and barrel type of stainless steel base material, finished as scheduled: At lead lined doors, modify door edge screw hole locations to accommodate Lead lining. Hager or approved equal by Gallery, Markar, Stanley or Zero.
C. Rescue hardware: Center hung pivot set with combination strike and rescue stop: Hager or approved equal by McKinney or Stanley.
D. By-Pass Set: Furnish with track for full width of opening and with all necessary parts and accessories for a complete and proper installation. Units shall be rated for a minimum weight of 250 pounds per panel. Furnish with one flush pull per panel similar to Hager 16N. Hager or approved equal by Henderson or Stanley.
E. Locks and latchsets:
   1. Heavy duty mortise type (Grade 1): Sargent 8200 series, LW1L design:
      a. Thru-bolted trim.
b. Independent spindles, outside and inside.

c. Reversible without removal from the door.

2. Deadlocks shall be Sargent 4870 series.

3. Hospital latches shall be Sargent 115P series with handle positions of push-up and pull-down.

4. Provide lead lining where indicated.

5. Roller latches shall be Hager 318D or approved equal by Baldwin or Trimco.

F. Lock cylinders and keying: 6 pin tumbler cylinders and nickel silver keys; keyed to the existing Sargent master key system. Furnish three (3) keys per lock and six (6) of each new master key level created.

G. Exit devices: Touch bar type, “UL” listed for panic and fire. Provide cylinder dogging at all non-rated devices: Sargent 80 series.

H. Stops: Hager or approved equal by Baldwin or Ives.

I. Overhead stops: Of brass, bronze or stainless steel base material. Degree of opening to be maximum allowed by adjacent construction: Sargent or approved equal by ABH, Glynn-Johnson or Rixson.

J. Closers: Sargent 1430 series.

1. Forged steel arms.

2. Arms with built-in stop or stop and holder shall be furnished with a compression stop fitting for shock absorbing action, mounted on a cast iron shoe. Delete compression stop at units utilized for hold open only.

3. Delayed action where indicated.

4. Full cover.

K. Kick and armor plates: Burns or approved equal by Baldwin, Ives or Rockwood.

1. Furnish with countersunk screws.

2. Color as selected by the Architect.

3. Adjust scheduled height as required to suit door conditions.

L. Push and pull plates: Burns or approved equal by Baldwin, Ives or Rockwood.

M. Wire pulls: Hager or approved equal by Ives, Rockwood or Stanley.

N. Flush bolts - manual and automatic, dust proof strikes and coordinators: Hager, Door Controls International or approved equal.

O. Silencers: Furnish three for each single opening and two for each double opening. Not required at gasketed frames: Hager or approved equal.

P. Gasketing and soundproofing: Pemko or approved equal by National Guard or Reese.

Q. Finish: US26D, satin chrome and US32D, satin stainless steel and as selected by the Architect at kick and armor plates.

PART 3 - EXECUTION
3.01 INSTALLATION
   A. Provide plated finish indicated on all hardware except closers. Provide powder coat or lacquer finish for closers.
   B. Follow guidelines of DHI “Recommended Locations for Builder’s Hardware for Standard Steel Doors and Frames” and hardware manufacturer’s instructions.
   C. Install materials and systems in accordance with manufacturer’s instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other systems.
   D. Adjust operation, clean and protect.

3.03 SCHEDULE (Items subject to change & are to be verified by Owner & Architect prior to installation)

HW-01 - Each to have:
   3 Hinges    Hager    BB1279 4.5" x 4.5"    US26D
   1 Lock      Sargent  8205 LW1L      US26D
   1 Kick Plate Burns 12" x 2"LWOD x .125" x CSK US26D
   1 Stop      Hager    232W or 241F/243F US32D/26D
   3 Silencers Hager    307D         Gray

HW-02 - Each to have:
   3 Hinges    Hager    BB1279 4.5" x 4.5"    US26D
   1 Exit Service Sargent 12-8813 x ETL US32D
   1 Closer    Sargent  1431-O        EN
   1 Kick Plate Burns 12" x 2"LWOD x .125" x CSK US32D
   1 Stop      Hager    232W or 241F/243F US32D/26D
   3 Silencers Hager    307D         Gray

HW-03 - Each to have:
   3 Hinges    Hager    BB1279 4.5" x 4.5"    US26D
   1 Privacy   Sargent  8265 LW1L      US26D
   1 Closer    Sargent  1431-CPS      EN
   1 Kick Plate Burns 12" x 2"LWOD x .125" x CSK US26D
   1 Stop      Hager    232W or 241F/243F US32D/26D
   3 Silencers Hager    307D         Gray

HW-04 - Each to have:
   2 Continuous Hinges Hager    790-905 1"LHOD US32D
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<th>Model/Size</th>
<th>Finish</th>
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<td>1 Lock</td>
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<td>2 Armor Plates</td>
<td>Burns</td>
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<td>CAS</td>
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<tr>
<td>2 Stops</td>
<td>Hager</td>
<td>232W or 241F/243F</td>
<td>US32D/26D</td>
</tr>
<tr>
<td>1 H &amp; J Seal</td>
<td>Pemko</td>
<td>S88C</td>
<td>Clear</td>
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<tr>
<td>1 Asatragal</td>
<td>Pemko</td>
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| HW-05 - Each to have: |
|-----------------------|--------------|------------|---------|
| 1 Continuous Hinge    | Hager        | 790-905 1"LHOD | US32D   |
| 1 Lock                | Sargent      | 8205 LW1L  | US32D   |
| 1 Closer              | Sargent      | 1431-CPSDA | EN      |
| 1 Armor Plate         | Burns        | 35" x 2"LWOD x .125" x CSK | CAS |
| 1 H & J Seal          | Pemko        | S88C       | Clear   |
| 3 Silencers           | Hager        | 307D       | Gray    |

| HW-06 - Each to have: |
|-----------------------|--------------|------------|---------|
| 1 Continuous Hinge    | Hager        | 790-905 LL 1"LHOD | US32D   |
| 1 Deadlock            | Sargent      | 74-4875    | US26D   |
| 1 Hospital Latch      | Sargent      | 74-115P    | US26D   |
| 1 Closer              | Sargent      | 1431-CPSH  | EN      |
| 1 Armor Plate         | Burns        | 35" x 2"LWOD x .125" x CSK | CAS |
| 3 Silencers           | Hager        | 307D       | Gray    |

<p>| HW-07 - Each to have: (vendor to coordinate w/ Owner &amp; Architect) |
|-----------------------|--------------|------------|---------|
| 2 Continuous Hinges   | As per Manufacturer’s Recommendations |
| 1 Lock                | As per Manufacturer’s Recommendations |
| 1 Set Flush Bolts     | As per Manufacturer’s Recommendations |
| 1 D.P.Strike          | As per Manufacturer’s Recommendations |
| 1 Coordinator         | As per Manufacturer’s Recommendations |
| 2 Closers             | As per Manufacturer’s Recommendations |
| 2 Stops               | As per Manufacturer’s Recommendations |
| Weather Seal          | As per Manufacturer’s Recommendations |
| 1 Asatragal           | As per Manufacturer’s Recommendations |</p>
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<td>1 Armor Plate</td>
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<td>Pemko</td>
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<td>Clear</td>
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<tr>
<td>3 Silencers</td>
<td>Hager</td>
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<tr>
<td>HW-04 - Each to have:</td>
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08 71 15 - AUTOMATIC DOOR OPERATORS:

PART 1 - GENERAL

1.1 DESCRIPTION
This section specifies equipment, controls and accessories for automatic operation of swing and sliding doors.

1.2 RELATED WORK
A. Aluminum frames entrance work; Section 08 41 13, ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.
B. Door hardware; Section 08 71 00, DOOR HARDWARE.
C. Section 28 13 00, ACCESS CONTROL.
D. Glass and glazing of doors and frames; Section 08 80 00, GLAZING.
E. Electric general wiring, connections and equipment requirements; Division 26, ELECTRICAL.
F. Section 28 31 00, FIRE DETECTION AND ALARM.

1.3 QUALITY ASSURANCE
A. Automatic door operators, controls and other equipment shall be products of a manufacturer regularly engaged in manufacturing such equipment for a minimum of three years.
B. One type of automatic door equipment shall be used throughout the building.
C. Equipment installer shall have specialized experience and shall be approved by the manufacturer.

1.4 WARRANTY
Automatic door operators shall be subject to the terms of the "Warranty of Construction", FAR clause 52.246-21, except that the Warranty period shall be two years in lieu of one year.

1.5 MAINTENANCE MANUALS
In accordance with Section 01 00 00, GENERAL REQUIREMENTS Article titled "INSTRUCTIONS", furnish maintenance manuals and instructions on automatic door operators.

1.6 SUBMITTALS
A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
B. Manufacturer's literature and data describing operators, power units, controls, door hardware and safety devices.
C. Shop Drawings:
   1. Showing location of controls and safety devices in relationship to each automatically operated door.
   2. Showing layout, profiles, product components, including anchorage, accessories, as applicable.
   3. Submit templates, wiring diagrams, fabrication details and other information to coordinate the proper installation of the automatic door operators.
D. Submit in writing to Architect that items listed in Article 1.3 are in compliance.
1.7 DESIGN CRITERIA

A. As a minimum automatic door equipment shall comply with the requirements of BHMA 156.10. Except as otherwise noted on drawings, provide operators which will move the doors from the fully closed to fully opened position in three seconds maximum time interval, when speed adjustment is at maximum setting.

B. Equipment: Conforming to UL 325. Provide key operated power disconnect wall switch for each door installation.

C. Electrical Wiring, Connections and Equipment: Provide all motor, starter, controls, associated devices, and interconnecting wiring required for the installation. Equipment and wiring shall be as specified in Division 26, ELECTRICAL.

1.8 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. Builders Hardware Manufacturers Association, Inc. (BHMA):
   A156.10-05 .................................. Power Operated Pedestrian Doors (BHMA 1601)

C. National Fire Protection Association (NFPA):
   101-05 .................................. Life Safety Code

D. Underwriters Laboratory (UL):
   325-02 .................................. Door, Drapery, Gate, Louver, and Window Operators and Systems

1.9 DELIVERY AND STORAGE

Delivery shall be in factory's original, unopened, undamaged container with identification labels attached.

PART 2 - PRODUCTS

2.1 SWING DOOR OPERATORS

A. General: Swing door operators shall be of institutional type, door panel size 600 mm to 1250 mm (2'-0" to 5'-0") width, weight not to exceed 300 kg (600 pounds), electric operated for overhead mounting within the header or transom. Furnish metal mounting supports, brackets and other accessories necessary for the installation of operators at the head of the door frames. The motor on automatic door operator shall be provided with an interlock so that the motor will not operate when doors are magnetically locked.

B. Operators shall have checking mechanism providing cushioning action at last part of door travel, in both opening and closing cycle. Operators shall be capable of recycling doors instantaneously to full open position from any point in the closing cycle when control switch is activated. Operators shall, when automatic power is interrupted or shut-off, permit doors to easily open manually without damage to automatic operator system.
C. Operator, enclosed in housing, shall open door by energizing motor and shall stop by electrically reducing voltage and stalling motor against mechanical stop. Door shall close by means of spring energy, and close force shall be controlled by gear system and motor being used as dynamic break without power. System shall operate as manual door control in event of power failure. Opening and closing speeds shall be adjustable:

1. Operator Housing: Housing shall be a minimum of 112 mm (4-1/2 inches) wide by 140 mm (5.5 inches) high aluminum extrusions with enclosed end caps for application to 100 mm (4 inches) and larger frame systems. All structural sections shall have a minimum thickness of 3.2 mm (0.125 inch) and be fabricated of a minimum of 6063-T5 aluminum alloy.

2. Power Operator: Completely assembled and sealed unit which shall include gear drive transmission, mechanical spring and bearings, all located in aluminum case and filled with special lubricant for extreme temperature conditions. A minimum 1/8 Hp "DC" shunt-wound permanent magnet motor with sealed ball bearings shall be attached to transmission system. Complete unit shall be rubber mounted with provisions for easy maintenance and replacement, without removing door from pivots or frame.

3. Connecting hardware shall have drive arm attached to door with a pin linkage rotating in a self-lubricating bearing. Door shall not pivot on shaft of operator.

4. Electrical Control: Operator shall have a self contained electrical control unit, including necessary transformers, relays, rectifiers, and other electronic components for proper operation and switching of power operator. All connecting harnesses shall have interlocking plugs.

2.2 MICROPROCESSOR CONTROLS

A. The system shall include a multi-function microprocessor control providing adjustable hold open time (1-30 seconds), LED indications for sensor input signals and operator status and power assist close options. Control shall be capable of receiving activation signals from any device with normally open dry contact output. All activation modes shall provide fully adjustable opening speed:

1. With push-to-operate function enabled, the control shall provide a means of initiating a self-start activation circuit by slightly pushing the door open at any point in the door swing.

2. Power assist shall provide a two second impulse in the close direction to overcome restrictions with locking devices of pressure differentials, allowing the unit to operate in standard time delay mode, and permitting the door to close from the full open position after the hold time is satisfied.

B. The door shall be held open by low voltage applied to the continuous duty motor. The control shall include an adjustable safety circuit that monitors door operation and stops the opening direction of the door if an obstruction is sensed. The motor shall include a recycle feature that reopens the door if an obstruction is sensed at any point during the closing cycle. The control shall include a standard three position toggle switch with functions for ON, OFF, and HOLD OPEN.
2.3 SLIDING DOOR OPERATORS

A. General: Sliding doors shall have electric operators, conforming to BHMA A156.10 and the following requirements as applicable. Assembly shall be single or bi-parting sliding doors as shown on drawings.

B. Door Operation: Doors shall be opened by electric motor pulling door from closed to open position and shall stop door by electrically reducing voltage and stalling door against mechanical stop. System shall permit manual control of door in event of power failure. Opening and closing speeds shall be adjustable. In compliance with NFPA-101, all door panels shall allow “breakout” to the full open position to provide instant egress at any point in the door’s movement.

C. Operators: Completely assembled and sealed electromechanical operating unit, all located in cast aluminum housing and filled with special lubricant for extreme conditions. Attached to transmission system shall be a minimum 1/8 Hp "DC" shunt-wound permanent magnet motor with sealed ball bearings. Complete unit shall be rubber mounted with provisions for easy maintenance and replacement. Operators shall have adjustable opening and closing cycle. Housing shall be minimum 6063T-5 alloy aluminum not less than .005 mm (125 inch) minimum thickness, 150 mm by 200 mm (6 inch wide by 8 inch high).

D. Sliding Door Hardware Guide Rollers, Door Carrier: Top door carriers shall ride on steel or delrin rollers incorporating sealed bearings with each door having two support rollers and one anti-rise roller. Each roller shall have a minimum of 9 mm (3/8-inch) of vertical adjustment with positive mechanical locks.

2.4 POWER UNITS

Each power unit shall be self-contained, electric operated and independent of the door operator. Capacity and size of power circuits shall be in accordance with automatic door operator manufacturer’s specifications and Division 26 - ELECTRICAL.

2.5 DOOR CONTROLS

A. Opening and closing actions of doors shall be actuated by controls and safety devices specified, and conform to ANSI 156.10. Controls shall cause doors to open instantly when control device is actuated; hold doors in open positions; then, cause doors to close, unless safety device or reactivated control interrupts operation.

B. Manual Controls:

  Push Plate Wall Switch: Recess type, cast aluminum or stainless steel push plate minimum 100 mm by 100 mm (four-inch by four-inch), with 13 mm (l/2-inch) high letters “To Operate Door--Push” engraved on face of plate.

C. NA

D. NA
E. Motion Detector: The motion detector may be surface mounted or concealed, to provide a signal to actuate the door operator, and monitor the immediate zone, to detect intrusion by persons, carts or similar objects. The zone which the detector monitors shall be 1500 mm (five feet) deep and 1500 mm (five feet) across, plus or minus 150 mm (six inches) on all dimensions. The maximum response time shall be no less than 25 milliseconds. Unit shall be designed to operate on 24 volts AC. The control shall not be affected by cleaning material, solvents, dust, dirt and outdoor weather conditions.

2.6 SAFETY DEVICES
A. General: Area over which doors swing or slide shall be a safety section and anyone standing in path of door's movement shall be protected by a safety device, except where push controls are shown.
B. At sliding doors, provide two photoelectric beams mounted at heights of 600 mm (24 inches) and 1200 mm (48 inches) in the door frame on sliding doors. Beams shall parallel door openings to prevent doors from closing when anyone is in the center of the door or doors. When beams are activated, doors shall recycle to full open position. Actuation shall include a motion detector mounted on each side of the door for detection of traffic in each direction.
C. Each swing door shall have installed on the pull side a presence sensor to detect any person standing in the door swing path and prevent the door from opening.
D. Time delay switches shall be adjustable between 3 to 60 seconds and shall control closing cycle of doors.
E. Decals with sign “In” or “Do Not Enter” shall be installed on both faces of each door where shown.

PART 3 - EXECUTION

3.1 INSTALLATION
A. Coordinate installation of equipment with other related work. Manual controls and power disconnect switches shall be recessed or semi-flush mounted in partitions. Secure operator components to adjacent construction with suitable fastenings. Conceal conduits, piping, and electric equipment, in finish work.
B. Install power units in locations shown. Where units are to be mounted on walls, provide metal supports or shelves for the units. All equipment, including time delay switches, shall be accessible for maintenance and adjustment.
C. Operators shall be adjusted and must function properly for the type of traffic (pedestrians, carts, stretchers and wheelchairs) expected to pass through doors. Each door leaf of pairs of doors shall open and close in synchronization. On pairs of doors, operators shall allow either door to be opened manually without the other door opening.
D. Install controls at positions shown and make them convenient for particular traffic expected to pass through openings. Maximum height of push plate wall switches from finished floors shall be 40 inches unless otherwise approved by the Resident Engineer.
3.2 INSTRUCTIONS

A. Following the installation and final adjustments of the door operators, the installer shall fully instruct Owner personnel for 2 hours on the operating, servicing and safety requirements for the swing and sliding automatic door operators.

B. Coordinate instruction to Owner personnel with Owner.

- - - E N D - - -
08 95 00 - CLAY PANEL WALL CLADDING SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section includes, but shall not be limited to, unitized (panelized) cladding system, a component of the exterior cladding system, consisting of the following:
   1. Aluminum vertical track and clip (secondary support) system.
   2. Extruded hollow clay panels.
   3. Silicon gaskets and isolators.
   4. Anchors, fasteners, flashings, weatherseals, cover plates and formed metal trim through and at the perimeter of the clay panel cladding system and other accessories required for a complete installation.

B. Related work:
   1. Division 3, Cast-in-place and precast concrete.
   2. Division 5, Cold-formed metal framing.
   3. Division 6, Exterior sheathing, Rough Carpentry.
   4. Division 7, Insulation, flashings, firestop systems, air and vapor barriers, and joint sealers.
   5. Division 8, Exterior aluminum curtain wall framing, windows, and glass and glazing.

1.2 SYSTEM DESCRIPTION

A. Extruded hollow core clay (terra cotta) panels hung on a pre-engineered aluminum track system with aluminum clip supports, gaskets, and trim.
   1. The system shall consist of clay panels supported by extruded aluminum clips attached to aluminum vertical track.
   2. Terra cotta panels, which can only be removed on purpose, shall be attached to vertical track at base channels and head grooves with extruded aluminum clips wrapped with a silicone isolator.
   3. Silicone gaskets inserted into vertical track and silicone isolators wrapped around clips provide color consistent or shadow line at vertical joint (custom color or standard black) and compression bubbles in each maintain panel position across the façade and prevent wind induced rattle.
   4. Track to be attached to specified portion of wall assembly structurally sufficient to carry
the clay panel wall cladding system and associated loads.

B. System shall be designed as a “rain screen” to allow for the following:
   1. Pressure equalization in the air space behind the clay panel.
   2. Movements within the structure, as specified in 1.3 Performance Requirements of this Section, and to fit within the space allotted without projections into adjacent finished space.

C. Flatness: System shall be flat with no noticeable warp, buckling, deflections or other surface irregularities within manufacturer’s specified tolerances.

D. Design Criteria: Clay panel wall cladding system to be based on architect’s drawings and specifications, (contract documents), which indicate sizes, profiles, finishes, and dimensional requirements of the exterior clay panel wall cladding system and are based on specified types/models.

1.3 PERFORMANCE REQUIREMENTS

A. General: Design, fabricate and install components so that the completed exterior wall system will withstand live loads, the inward and outward pressures specified, and loads stipulated by the Building Code in effect for this Project. Geographic regions prone to specific hydrologic, geologic, seismic, wind or other natural events may require project specific testing and design.
   1. The system shall have a design load of positive and negative pressures up to 45 psf when tested in accordance with ASTM E330.
   2. Deflections within the system are to be limited to L/175 of their clear span or 5/8”, whichever is less when tested in accordance with ASTM E 330.

B. Movement: Design, fabricate and install system to withstand building seismic and thermal movements including deflections, temperature change without buckling, distortion, joint failure, panel fallout or breakage or undue stress on system components, anchors or permanent deformation of any kind in accordance with AAMA 501.4 for Static Seismic and Wind Induced Interstory Drifts, and AAMA 501.6 for Dynamic Seismic Drift.

C. Infiltration/Penetration: The work of this Section shall be constructed to prevent air and water infiltration as outlined below:
   1. Air Infiltration: ASTM E 283. Allowable air infiltration will be 0.06 cfm or less per square foot when tested under a constant pressure of 6.24 psf.
   2. Water Penetration: ASTM E 331. No uncontrolled water penetration shall occur when tested in static and dynamic modes, under a constant pressure of 15 psf with 5 gallons of water per hour applied per square foot for a period of 15 minutes.
3. The complete system is to be designed to evacuate any moisture which penetrates beyond the outside surface materials and to weather proof with membrane flashing around all perimeters and openings through the system.

1.4 SUBMITTALS

A. Shop Drawings shall be submitted for approval prior to fabrication including:
   1. One drawing for each panel, baguette, louver or other terra cotta unit type indicating profile, schedule of lengths, thickness, finish, color and color of any adjacent, visible gasket.
   2. Elevations for each condition indicating clay panel and vertical track locations.
   3. Section drawings, if necessary, to convey proper fabrication/installation for terra cotta unit types (panel, baguette, louver, etc.).
   4. Shop drawings for wall assembly to receive clay panel wall cladding system to be coordinated with clay panel wall cladding system shop drawings.

B. Samples: 3 sets of the following samples in the selected finishes and color.
   1. Initial color, texture selection, if custom, will be submitted on a 6”x 6”x 5/8” tile. Standard colors may be selected from manufacturer’s color board.
   2. One 12” long by full size profile of each type of panel. Samples shall represent the full range of color and texture proposed for the Work.
   3. 12-inch long by full profile sample of each type sheet metal trim and closure piece.

C. Product Data: Manufacturer’s latest published literature describing each product selection.

D. Project Specific Tests: If Project Specific Test are required:
   1. Manufacturer and fabricator to certify that performance tests specified have been performed and that products or systems, including finishes, comply with specified requirements.
   2. Submit 2 copies of test reports, prepared by the testing agency, for each specified test showing required performance criteria and test results. Include reports of failures and remedial actions taken in test reports. Arrange with the testing agency to prepare test reports in accordance with reporting procedures described in the Project Specified Test Standards.

1.5 QUALITY ASSURANCE

A. Installer/Fabricator Qualifications: Engage an experienced Installer/Fabricator, who has specialized in the erection and installation of types of systems similar to that required for this
Project, to erect the exterior clay panel wall cladding system.

1. Installer/Fabricator shall be an approved company as recommended by the manufacturer who has engaged in similar work for a period of no less than 5 years.

B. Manufacturer's qualifications: Engage a Manufacturer experienced in the manufacture of clay panel wall cladding system similar to those indicated for the Project, and with a record of successful in-service performance.

C. Single responsibility:
   1. The clay panel wall cladding system, including panels, vertical track, clips, related gaskets/isolators, shall be provided by the same firm unless otherwise noted by the architect.
   2. The clay panel wall cladding system, with all its components, shall have been in use for at least 5 years.
   3. Clay panel wall cladding system shall be installed by a qualified panelizing company, or other clay panel wall cladding manufacturer approved installer.

D. Mock Up: Provide one completely assembled wall area, as directed by the Architect/Owner, installed with all related accessories, in composite configurations designed to fulfill the performance criteria, and representative of the design as shown on the Drawings.

   1. Extent of mock-up shall be the same as that which will be provided in the final work.
   2. Mock-up shall be installed simulating actual construction conditions, including actual structural supports and connections. Use means, methods and techniques proposed for final installation.
   3. Locate mock-up in location as directed by the Architect.
   4. Personnel assembling mock-up shall be the same personnel that will perform the actual work at the project site.
   5. Mock-up shall be subjected to testing criteria specified for final installation.

E. Pre-Construction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers samples of material that will contact or affect joint sealants for compatibility and adhesion testing as indicated below:

   1. Use test methods standard with manufacturer to determine if priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
      A. Perform tests under normal environmental conditions that will exist during actual installation.

F. Pre-Installation Inspection. Installer to contact manufacturer of clay panel wall cladding system, Owner and Architect, prior to installation of clay panel wall cladding system if site conditions adverse to proper installation of the system exist.
1.6 HANDLING

A. Protect components from adverse job conditions prior to installation.
B. Protect components from other trades after installation.
C. Storage:
   1. Store components on platforms or pallets, covered with tarpaulins or other suitable weather-tight ventilated covering. Store components so that water accumulations will drain freely.
   2. Do not store clay panels in contact with other materials that might cause staining, surface damage, or other deleterious effect.
   3. Do not stack platforms or pallets one on top of another.

1.7 SPECIAL WARRANTY

A. Manufacturer shall warrant the material of this Section for a period of 10 years from date of Substantial Completion against possible material defects.
B. Installer shall warrant the workmanship of this Section for a period of 2 years from date of Substantial Completion against defects in Workmanship.
C. The installation warranty shall provide that the exterior wall system will remain weather tight during the warranty period and that if any leaks occur due to faulty installation practices, that the system will be repaired or replaced as required to render the system weather-tight, at no cost to the Owner. The warranty shall cover labor and materials.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER/INSTALLER

A. Subject to compliance with requirements, manufacturer offering exterior clay wall cladding system that may be incorporated in the work include the following:
   2. Or approved equal.
B. Subject to compliance with requirements, installers offering exterior wall system that may incorporate the clay panel wall cladding system into the work include the following:
2.2 MATERIALS

A. Hollow clay panel units complying with the following:
   1. Finish: Standard.
   2. Size: As indicated on the Drawings.
   3. Color: To be selected.

B. Fasteners, clips, and vertical track: In accordance with manufacturer's recommendations to meet performance criteria specified.

C. Vertical track:
   1. Aluminum alloy 6105 T5, mill finished.

D. Flashing, Trim and other Accessories: Shop-fabricated, corrosion-resistant type capable of complying with the performance criteria specified and designed to allow adjustments of system prior to being permanently fastened.

E. Supporting system fastening method: Complete, pre-engineered aluminum track, clip, complying with the following.
   1. Panels fastened at head grooves and base channels using aluminum clips inserted into vertical track.
   2. The aluminum vertical track is fastened to the building wall system as shown on the Construction Documents or Installation Contractor's Shop Drawings.
   3. The replacement of damaged panels, particularly in the field, must be possible using simple methods and shall not require special tools nor damage the surrounding panels.
   4. Silicone gaskets, where visible and required, shall be colored to match the panel or as specified by the architect.

2.3 MISCELLANEOUS MATERIALS

A. Touchup material: As furnished by the clay panel manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Clay Panel Wall Cladding installer to examine conditions affecting the work of this Section at site.
If any conditions exist that would be detrimental to proper installation of clay panel wall cladding system, installer is to notify Architect and General Contractor / Construction Manager in writing.

B. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

3.2 INSTALLATION

A. Do no install broken, chipped or cracked units.

B. Apply coat of bituminous paint on concealed aluminum surfaces to be in contact with steel, cementitious, and dissimilar materials.

C. Install clay panel cladding system to wall assembly specified in accordance with the approved shop drawings and their manufacturer's instructions.

D. Conceal fasteners.

E. Place clay panel units in stack bond to lines and levels, plumb, with uniform, parallel joints, in accordance with their manufacturer's instructions.
   1. Use caution to prevent damage to clay panel units.
   2. When field-cutting, use caution to ensure that cuttings do not remain on exposed surfaces. Cut edges shall be sharp, without spalling.
   3. Cutting shall be performed with a diamond tipped wet saw.

F. Ensure that assembly is plumb, level and free of warp or twist; maintain dimensional tolerances and alignment with adjacent work.

G. Built-in work:
   1. As work progresses, build in flashing and other items.
   2. Where applicable, remove protective film from finished aluminum surfaces.

H. Tolerances: Accurately align and locate components to column lines and floor levels; adjust work to conform to the following tolerances.
   1. Plumb: 1/8-inch in 10 feet; 1/4-inch in 40 feet; non-cumulative.
   2. Level: 1/8-inch in 20 feet; 1/4-inch in 40 feet; non-cumulative.
   3. Alignment: Limit offset to 1/16-inch where surfaces are flush or less than 1/2-inch out of flush, and separated by less than 2 inches (by reveal or protruding work); otherwise limit offsets to 1/8 inch.
   4. Location: 3/8-inch maximum deviation from measured theoretical location (any member, and location).
   5. Lipping between units: 1/16 inch maximum.
3.3 CLEANING

A. Clean soiled surfaces using materials which will not harm clay panel units or adjacent materials, as recommended by the clay panel manufacturer (clean with mild detergent using a natural bristle brush, starting from top of building to the bottom). Use non-metallic tools in cleaning operations. Pressure washer not to exceed 1200 psi.

B. Upon completion of installation, remove protective coatings or coverings and clean aluminum surfaces, exercising care to avoid damage of finish.

C. Remove excess sealant compounds, dirt or other foreign substances.

D. Remove and replace clay panel units that are broken, chipped, cracked, abraded or damaged during construction period. Reinstall in accordance with their manufacturer's instructions.

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