SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hollow metal frames for wood doors.

B. Fire-rated hollow metal doors and frames.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

B. Section 08 71 00 - Finish Hardware.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2017.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.

H. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.

I. ITS (DIR) - Directory of Listed Products; current edition.

J. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

K. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.

L. UL (DIR) - Online Certifications Directory; Current Edition.

M. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.

2. Steelcraft, an Allegion brand; ____: www.allegion.com/#sle.
3. Or approved equal.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gauge, 0.032 inch, minimum.
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
   3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      a. Attach fire rating label to each fire rated unit.
   4. Door Thickness: 1-3/4 inches, nominal.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Door Frames, Fire-Rated: Knock-down type.
   1. Fire Rating: Same as door, labeled.

C. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.06 ACCESSORIES

A. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

B. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Install door hardware as specified in Section 08 71 00.

3.04 TOLERANCES

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

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

B. Adjust sound control doors so that seals are fully engaged when door is closed.

END OF SECTION

SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush and flush glazed configuration; non-rated and acoustical.

1.02 RELATED REQUIREMENTS

A. Section 06 20 00 - Finish Carpentry: Wood door frames.

B. Section 08 11 13 - Hollow Metal Doors and Frames.

C. Section 08 71 00 - Finish Hardware

D. Section 08 80 10 - Wood Storm Windows.

E. Section 09 91 23 - Interior Painting: Field finishing of doors.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2016, with Errata (2017).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

D. Samples: Submit two samples of door construction, 3 by 3 inches in size cut from top corner of door if requested by Director's Representative.

E. Warranty, executed in Director's Representative's name.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:
   1. Construction Specialties, Inc; Acrovyn Flush Doors: www.c-sgroup.com/#sle.
   2. Eggers Industries: www.eggersindustries.com/#sle.
   3. Haley Brothers: www.haleybros.com/#sle.

2.02 DOORS AND PANELS

A. Doors: See drawings for locations and additional requirements.
   1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

B. Sound-Rated Doors: Equivalent to type, with particleboard core (PC) construction as required to achieve STC rating specified; plies and faces as indicated above.

2.04 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Natural birch, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

E. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 1, Lacquer, Nitrocellulose.
      b. Stain: As selected by Director's Representative.
      c. Sheen: Flat.

B. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

A. Hollow Metal Door Frames: See Section 08 11 13.

B. Door Hardware: See Section 08 71 00.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

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

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

SECTION 08 16 13
FIBERGLASS DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass doors.

B. Fiberglass door frames.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Finish Hardware

B. Section 09 91 13 - Exterior Painting: Field painting.

1.03 REFERENCE STANDARDS

A. AAMA 1304 - Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems; 2018.

B. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

C. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010 (Reapproved 2018).

D. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).

E. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2018.

F. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2014.

G. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2016.

H. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of Barcol Impressor; 2013a.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

J. 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; 2004 (Reapproved 2012).

K. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

L. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

M. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2014.

N. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2007 (Reapproved 2016).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Obtain hardware templates from hardware manufacturer prior to starting fabrication.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard details, installation instructions, hardware and anchor recommendations.

C. Shop Drawings: Indicate layout and profiles; include assembly methods.
   1. Indicate product components, including hardware reinforcement locations and preparations, accessories, finish colors, patterns, and textures.
   2. Indicate wall conditions, door and frame elevations, sections, materials, gauges, finishes, location of door hardware by dimension, and details of openings; use same reference numbers indicated on drawings to identify details and openings.

D. Test Reports: Submit certified test reports from qualified independent testing agency indicating doors comply with specified performance requirements.

E. Manufacturer's Qualification Statement.

F. Installer's Qualification Statement.

G. Maintenance Data: Include instructions for repair of minor scratches and damage.

H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Director's Representative's name and registered with manufacturer; include detailed terms of warranty.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

B. Store materials in original packaging, under cover, protected from exposure to harmful weather conditions and from direct contact with water.
   1. Store at temperature and humidity conditions recommended by manufacturer.
   2. Do not use non-vented plastic or canvas shelters.
   3. Immediately remove wet wrappers.

C. Store in position recommended by manufacturer, elevated minimum 4 inches above grade, with minimum 1/4 inch space between doors.

1.08 FIELD CONDITIONS

A. Maintain temperature and humidity at manufacturer's recommended levels during and after installation of doors.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five (5) year manufacturer warranty covering materials and workmanship, including degradation or failure due to chemical contact.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fiberglass Exterior Entrance Doors:
   1. Jeld-Wen Windows and Doors; www.jeld-wen.com/en-us/.
   2. Special Lite; https://special-lite.com/
   3. Or approved equal

2.02 DOOR AND FRAME ASSEMBLIES

A. Door and Frame Assemblies: Factory-fabricated, prepared and machined for hardware.
   1. Screw-Holding Capacity: Tested to 890 pounds, minimum.
   2. Surface Burning Characteristics: Flame spread index (FSI) of 0 to 25, Class A, and smoke developed index (SDI) of 450 or less, when tested in accordance with ASTM E84.
   3. Flammability: Self-extinguishing when tested in accordance with ASTM D635.
   4. Provide products that meet USDA requirements for incidental food contact.
   5. Sizes: As indicated on drawings.
   6. Clearance Between Door and Frame: 1/8 inch, maximum.
   7. Clearance Between Bottom of Door and Finished Floor: 3/4 inch, maximum; not less than 1/4 inch clearance to threshold.

2.03 COMPONENTS

A. Doors: Fiberglass construction with reinforced core.
   1. Basis of Design:
      a. Jeld-Wen - Exterior Aurora Fiberglass, Estate Collection; Model #A432 All Panel.
   2. Thickness: 1-3/4 inch, nominal.
   3. Core Material: Manufacturer's standard core material for application indicated.
   4. Construction:
      a. Engineered sandwich technology. 4 inch laminated veneer lumber stiles and rails banded by 3/4 inch solid hardwood edges. Authentic grain pattern and solid wood door characteristics achieved through silicone mold casting and enhanced by proprietary 2-step gel coat construction. DBM (Double Bias Mat) 1208 with lineal strands running the full height and width of the panel add tensile strength to reduce thermal bow.
   5. Face Sheet Texture: Wood grain.
   6. Door Panel: As indicated on drawings.
   7. Subframe and Reinforcements: Manufacturer's standard materials.
   8. Waterproof Integrity: Provide factory fabricated edges, cut-outs, and hardware preparations of fiberglass reinforced plastic (FRP); provide cut-outs with joints sealed independently of glazing, louver inserts, or trim.
   9. Hardware Preparations: Factory reinforce, machine, and prepare for door hardware including field installed items; provide solid blocking for each item; field cutting, drilling or tapping is not permitted; obtain manufacturer's hardware templates for preparation as necessary.

B. Door Frames: Provide type in compliance with performance requirements specified for doors.
   1. Type: Factory assembled with chemically welded joints.
   2. Profiles: As indicated on drawings.
   3. Non-Fire-Rated:
      a. Fiberglass pultrusions with factory finish.
   4. Corner Joints: Mitered with concealed corner blocks or angles of same material as frame; fiberglass and aluminum joined with screws; steel and stainless steel spot welded; sealed watertight with silicone sealant; field assemble knock-down type frames as required.
   5. Hardware Cut-outs: Provide continuous backing or mortar guards of same material as frame, with watertight seal.
   6. Frame Anchors: Stainless steel, Type 304; provide three anchors in each jamb for heights up to 84 inches with one additional anchor for each additional 24 inches in height.
   7. Reinforcing: Provide manufacturer's standard reinforcing at hinge, strike, and closer locations.

2.04 PERFORMANCE REQUIREMENTS

A. Provide door assemblies that have been designed and fabricated in compliance with specified performance requirements.

B. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, tested by independent agency in accordance with ASTM E1996 and Wind Zone 4 - Additional Protection for Large and Small Missile impact and pressure cycling at design wind pressure.

C. Forced Entry Resistance: Pass in accordance with AAMA 1304 test method.

D. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 7.5 psf.

E. Air Leakage: Maximum of 0.1 cfm per square foot at 6.27 psf differential pressure, when tested in accordance with ASTM E283.

F. Structural Performance: Withstand positive and negative wind loads equal to 1.5 times design wind loads specified by local code without damage or permanent set, when tested in accordance with ASTM E330/E330M, using 10 second duration of maximum load.

G. Thermal Transmittance, Exterior Doors: AAMA 1503, U-value of 0.35, maximum, measured on exterior door in size required for this project.

H. Fiberglass Reinforced Plastic (FRP) Face Sheet Properties:
   1. Izod Impact Resistance: ASTM D256, 7 foot-pound force per inch of width, minimum, with notched izod.
   2. Tensile Strength at Break: ASTM D638, 13,250 psi, minimum.
   3. Water Absorption: ASTM D570, 0.16 percent, maximum, after 24 hours at 74 degrees F.
   4. Flexural Strength: ASTM D790, 27,000 psi, minimum.
   5. Barcol Hardness: ASTM D2583, minimum of 40 units.

2.05 FINISHES

A. Primer: Aliphatic urethane for field finishing.

B. Paint: Refer to section 09 91 13. Color to be chosen by Director's Representative from manufacturer's standard colors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

3.02 PREPARATION

A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

B. Clean and prepare substrate in accordance with manufacturer's directions.

C. Protect adjacent work and finish surfaces from damage during installation.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions; do not penetrate frames with anchors.

B. Install exterior doors in accordance with ASTM E2112.

C. Install door hardware as specified in Section 08 71 00.

D. Set units plumb, level, and true-to-line, without warping or racking doors, and with specified clearances; anchor in place.

E. Separate aluminum and other metal surfaces from sources of corrosion of electrolytic action at points of contact with other materials.

F. Repair or replace damaged installed products.

3.04 ADJUSTING

A. Lubricate, test, and adjust doors to operate easily, free from warp, twist or distortion, and to fit watertight for entire perimeter.

B. Adjust hardware for smooth and quiet operation.

C. Adjust doors to fit snugly and close without sticking or binding.

3.05 CLEANING

A. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.

3.06 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 20 00

WOOD DOOR RESTORATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Construction Drawings apply to this Section.

B. General provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

A. This section includes the following:
   1. Restoration of wood doors and frames, and door transoms including but not limited to the following:
      a. Epoxy consolidation and patching.
      b. Dutchman repair.
      c. Replacement of broken and missing elements.
      d. Reattachment of loose and deteriorated joints.
      e. Restoration of doors to operable condition, including replacement or repair of hardware, and refitting and re-hanging of doors
   2. Fabrication and Installation of wood replica replacement doors
   3. Temporary protection at openings where doors are removed for restoration.

B. Intent of door restoration: The specific intent of this Section is to restore existing doors to a sound and functional condition, while preserving and protecting their original design, configuration, details and profiles, and to replace missing doors with new doors which replicate the original design, configuration, details and profiles.

C. Related Sections:
   1. Section 06 40 00 – Architectural Woodwork
   2. Section 06 31 00 – Wood Restoration Systems
   3. Section 08 60 00 – Window Restoration
   3. Section 08 70 00 – Hardware
   4. Section 09 91 13 – Exterior Painting.

1.3 DEFINITIONS

A. "Consolidate": Solidify friable and decayed wood that still retains its original dimensions and profile through application of a wood epoxy consolidant.

B. "Consolidate and Patch": Replacement of localized areas of rot or decay in a wooden member with a wood epoxy filler. Includes consolidation of adjacent areas of soft or friable wood through application of a wood epoxy consolidant.

C. "Dutchman Repair": Replacement of localized areas of rot or decay in a wooden member with a wood patch.

D. "Partial Replacement": Replacement of a section of a wooden member, encompassing the full width and thickness, with new wood.

1.4 SUBMITTALS

A. Qualification Data: Using the form provided, submit qualifications of the installing contractor and restoration specialist to establish that they meet the requirements specified in the Quality Assurance article.

B. Product Data:
1. Wood epoxy resins.
2. Wood glue.
3. Wood Primer.
4. Weatherstripping.
5. See Section 08 70 00 for Hardware Requirements

C. Shop Drawings:
1. Replacement Doors

D. Certificates: Affidavit required under Quality Assurance Article.

1.6 QUALITY ASSURANCE

A. The Contractor for the Work of this Section shall be regularly engaged in the restoration of historic architectural woodwork and doors, including materials and techniques for epoxy consolidation/repair and fabricating/installing wooden Dutchmen. In the acceptance or rejection of the Work of this Section, no allowance will be given for lack of skill on the part of any worker.

B. Restoration Specialist: Engage a carpenter for the Work of this Section who is specially trained in the restoration of historic doors and who has at least five years experience in the repair, epoxy consolidation and patching and Dutchman repair of architectural woodwork.
1. All disassembly, cutting and patching work shall be performed exclusively by the approved restoration specialist.

C. Source of Materials: Obtain epoxy resins from a single source to ensure compatibility of materials.

D. Certificates: Affidavit by material supplier certifying type and quality of glass furnished.

E. Mill & Producers Label: Lumber shall bear label indicating type, grade, mill and grading agency on unfinished surface or end.
1. In lieu of mill & producers label, supply affidavit from material supplier certifying grade, species and cut of milled lumber and molding products.

F. Reference Standards:
   1. "Architectural Woodwork Quality Standards" by the Architectural Woodwork Institute (AWI).
   2. "American Softwood Lumber Standard" US Department of Commerce Product Standard 20 (DOC PS 20-99).

1.7 QUALITY CONTROL

A. Field Samples (Mock-Ups):
   1. Prepare field sample at a location designated by the Director's Representative. Do not proceed further with the Work of this Section until the field sample is approved.
      a. Engage the approved Restoration Specialist to prepare the field sample.
      b. Utilize only approved materials and methods, and comply with product manufacturer's instructions and other requirements of this Section to prepare field sample.
   2. Approved field sample will be used as quality control standard for acceptance or rejection of the Work of this Section.
      a. Maintain and protect approved field sample from damage, deterioration or alteration for the duration of the Contract.
   3. Field Samples Required:
      a. Door Restoration: One complete door, including frame and related hardware.
      b. Replica Door: One complete door.

B. Material Container Labels: Material containers shall bear the manufacturer’s label indicating manufacturer’s name, trade name of product, lot number, shelf life of product, and mix ratio (if applicable).

1.8 DELIVERY, STORAGE, AND HANDLING

A. Packaged Products:
   1. Deliver materials to the site in manufacturer’s original, sealed containers. Do not deliver materials which have exceeded shelf life limitations set forth by the manufacturer.
   2. Comply with manufacturer’s printed instructions for storing and protecting materials.
   3. Protect packaged products from water, dampness and high humidity.

B. Lumber and Millwork:
   1. Protect from weather during transport.
   2. Store lumber and millwork in a dry, well-ventilated space completely protected from the weather. Comply with temperature and humidity requirements for storage and installation as recommended in the Reference Standards.

C. Discard and remove from the site any damaged or contaminated materials.

1.9 PROJECT CONDITIONS

A. Coordination: Coordinate wood repair with surface preparation and painting to avoid exposure of bare wood to the weather. Protect bare wood surfaces from exposure to rain, snow, ice and frost.

B. Protection: Use all necessary means to protect areas of wood not being consolidated or patched and all other surfaces and building elements from damage, deterioration, or staining caused by Work of this Section.

C. Environmental Conditions: Perform wood consolidation and epoxy repairs only during favorable conditions, including cure times. Comply with the manufacturer's printed instructions and the requirements of this Section. In the event of conflicting instructions or directions, the more stringent requirements shall apply.
   1. Mix and apply epoxy resins only when the epoxy materials, ambient air and surface temperatures are between 50 degrees and 85 degrees F.
   2. Use polyurethane glue only when the glue, ambient air and surface temperatures are between 40 degrees & 100 degrees F.

D. Wood Moisture Content: Verify, using a calibrated wood moisture meter, that the moisture content of wood surfaces to be repaired is within the limits recommended by the manufacturer of the epoxy resins or wood glue.
   1. The maximum moisture content of wood to be repaired with epoxy resins shall not exceed 12%.
   2. If necessary, lightly moisten wood surfaces to be adhered with polyurethane glue when moisture content is below the manufacturer's recommended levels.

E. Temporary Protective Coverings: Provide durable, rigid covers at openings whenever doors, sash or glazing is removed and not reinstalled the same day. Do not fasten temporary covers to sash or frames.
   1. Tarpaulins and polyethylene sheeting are not acceptable materials.

F. Dimensions: Field measure dimensions of all existing and in-place elements before preparing shop drawings or beginning work. Contactor is responsible for all dimensions.

G. Removal of Existing Construction: Where removal of existing construction is required to perform the Work, take all necessary measures to carefully remove and salvage sound materials without damage and without marring finished surfaces.
   1. Tag or otherwise label removed items to facilitate reinstallation at the same location, position and orientation.
   2. Protect and store removed items. Reinstall items as soon as practical.
   3. Doors not scheduled for restoration shall be tagged and stored as instructed by the Director’s Representative. Do not store in direct

contact with the ground or basement floor. Store on wood skids or blocks to prevent moisture damage.

1.10 LEAD CONTAINING PAINT

A. Assume that all existing painted surfaces are coated with lead-containing paints. Handle, transport and dispose of lead-containing paint and residue in accordance with all applicable federal, state, and local laws and regulations including, but not limited to, the regulations referenced herein.
   1. OSHA Regulations, Title 29, CFR Section 1926.62: "Lead Exposure in Construction" and Title 29, CFR Section 1910.1200: "Hazard Communication Standard."
   2. US EPA Regulations, Title 40, CFR Part 262: "Standards Applicable to Generators of Hazardous Waste" and Part 263: "Standards Applicable to Transporters of Hazardous Waste."
   3. US DOT Regulations, Title 49 CFR Parts 172 thru 180 inclusive.
   4. NYS DEC Regulations, Title 6, Part 364, and parts 370-374.

PART 2 PRODUCTS

2.1 WOOD

A. AWI Custom Grade.
   1. Species: Eastern White Pine (Northern White Pine), Bald Cypress or other durable fine-grain softwood complying with AWI 100 for quality grade specified.
      a. Kiln dried to 12% maximum moisture content.
      b. Use clear, solid lumber without wane or warp. Cut out any knots larger than 1/2 inch diameter.
      c. Finger-jointed lumber is not acceptable.
      d. Wood panels over 12 inches wide may be made up of solid boards edge glued or splined and edge glued as approved by the Architect or Director’s Representative.

   2. Dimensions: Suitable for use in matching the actual finished dimensions and profile.

B. Fabricate flat stock with smooth, planned surfaces, S4S. Shape molding stock accurately to required profiles. Machine and sand surfaces in accordance with AWI's requirements for the specified grade.

C. Furnish wood trim and moldings in lengths suitable for installation with the fewest number of joints.

2.2 WOOD EPOXY RESINS

A. Refer to Section 06 31 00 Wood Restoration Systems.

2.3 FASTENERS

A. Nails: Hot-dipped galvanized, size and type to suit application.

B. Screws: For use in attaching hardware and weatherstripping, brass or zinc coated to suit the type of material.
   1. Match existing material, type and size of fastener when necessary to reattach existing hardware.

2.4 GLASS AND GLAZING MATERIALS

A. Refer to Section 08 60 00 Window Restoration for glazed doors and door transoms.

2.5 WEATHERSTRIPPING

A. Coiled spring bronze weatherstripping: .006” bronze, 15/16” wide with 19/32” wide lockstrip.

2.6 MISCELLANEOUS MATERIALS

A. Moisture-activated polyurethane glue:
   1. Gorilla Glue, manufactured by Lutz File and Tool Co., 3929 Virginia Ave., Cincinnati, OH 45227; 800-966-3458.
   2. Titebond Polyurethane by Franklin International.
   3. Excel One by The Ambel Corporation.

B. Wood Primer: Alkyd-based primer formulated to seal unfinished wood, both new and weathered surfaces, and as a base coat for semi-gloss acrylic latex finishes. See Section 09 91 13 painting.

2.7 DOOR HARDWARE

A. Wrought Steel Hardware for replica 18th Century Doors:
   1. Match dimensions and patterns of existing historic wrought iron door hardware.
   2. Material for hinges: (See Section 06 31 00 Architectural Woodwork, Shutter Hardware).

PART 3 EXECUTION

3.1 EXAMINATION

A. Visually inspect and note the condition of door components at areas indicated on the Drawings and at other locations where deterioration may exist. Probe beneath deteriorated surfaces to assess the extent of damage.
   1. Promptly notify Director's Representative of any areas of active insect infestation and obtain instructions before proceeding with Work in those locations.

B. Prepare a door restoration schedule noting the locations and types of wood treatment to include the following:
   1. Rotted or spongy wood that requires consolidation only.
   2. Damaged or decayed wood that requires consolidation and epoxy paste filler to restore original profile/shape or structural integrity.

3. Major decay or damage that requires wood Dutchman repair to restore original profile/shape or structural integrity.
4. Missing wooden members or major decay or damage that encompasses more than 50% of an individual wooden member.

C. Review findings and establish the scope of repairs with the Director's Representative prior to commencing the Work of this Section.

3.2 PREPARATION

A. Temporary Protection: Furnish and install temporary protection in accordance with the requirements of this Section and Section 01 50 00.
1. Coordinate exterior door removal and installation of temporary coverings so that the building is secure and weather-tight throughout the duration of the Work.
2. Reinstall exterior doors as the work progresses. Reinstall all hardware, and verify that door is in proper operating condition.

B. Surface Preparation: Remove loose, peeling, cracked and blistered paint before commencing wood restoration work.
1. Do not use wire brushes or open flames to remove paint. Do not use heat guns to remove paint from doors and frames. Heat guns may be used to remove paint from doors when they have been removed from their frames and from the building.
2. Refer to Section 09 91 13 Painting for general surface preparation requirements and for chemical stripping of woodwork.
2. Do not cut or gouge wood surfaces. Use contoured scrapers on surfaces with molded profiles.
3. Sand edges of firmly adhered coatings to produce smooth, feathered edges. Do not leave scratches in surfaces that will be visible after apply finish paint.
4. Thoroughly wash painted surfaces to remove all traces of dirt, soot, grease, mildew, chalk and stains.
   a. Use 50% solution of "Simple Green" to clean surfaces. Thoroughly rinse with clean water.
   b. Use of power washing equipment is not permitted.

C. Carefully remove trim and other elements where required to perform the Work.
1. Where repairs require removal of hardware or intact sections of trim, carefully remove and tag each piece to allow reinstallation at the same location upon completion of the repair.
2. Do not crush, split or gouge wood that will remain or be reinstalled. Pull heads of finish nails through from concealed surface to avoid splintering wood.
3. Promptly notify Director's Representative of any additional deterioration exposed by removal operations, and obtain instructions before proceeding with repairs.

3.3 DOOR RESTORATION, GENERAL

A. Restore wood doors as shown on drawings, as indicated in Door Schedule, and as specified herein

B. Disassembly: Carefully dissemble doors when required to perform restoration work. Identify and label all parts identifying original locations to ensure that doors can be reassembled with all parts in the same positions and orientations.

C. General Requirements:
   1. Perform repairs in accordance with the approved door restoration schedule and as specified herein.
   2. Replace broken and missing dowels or pins at joints in doors to provide strong, rigid joints. Doors shall not rack when gently pressed on diagonal corners.
   3. Prime (back-prime) all surfaces of new wood elements before installing.
   5. Upon completion of all wood repairs, lightly sand and apply one coat of primer to all bare wood surfaces. Primer shall be in addition to the primer specified in Section 09 91 13.
   6. Prime and paint doors and frames in accordance with the requirements of Section 09 91 13.
   7. Where scheduled, install weatherstripping in jambs and at top and sweep strips at bottom of exterior doors.
   8. Clean and lubricate existing hinges and other hardware to ensure smooth operation.
   9. Prep doors for new hardware according to hardware schedule. Cut neat, sharp openings for mortised hardware and hinges.

D. Reassembly: Reassemble and re-glue all stile and rail joints. Ensure that panels can float freely.
   1. Reinstall existing hardware and install new hardware.
   2. Adjust doors for smooth operation.

3.4 EPOXY CONSOLIDATION

A. Refer to Section 06 31 00 – Wood Restoration Systems.

3.5 EPOXY PATCHING

A. Refer to Section 06 31 00 – Wood Restoration Systems.

3.6 DUTCHMAN REPAIR

A. Refer to Section 06 31 00 – Wood Restoration Systems.

B. Refer to Hardware Schedule for filling in holes from removed hardware.

3.7 MEMBER REPLACEMENT

A. Refer to Section 06 31 00 – Wood Restoration Systems.

3.8 WOOD DOOR FABRICATION

A. Fabricate new paneled doors to match the dimensions, profiles and joinery of existing historic doors. Fabricate mortise and tenon joints to match existing. Fabricate end joints in running or standing trim with scarf joints.

1. All fabrication and installation shall comply with Architectural woodwork Quality Standards (AWI) *Custom Grade*

B. Refer to Hardware Schedule for preparation of doors for hardware.

3.9 GLAZING

A. Refer to Section 08 60 00 Window Restoration for requirements for glazing in wood doors and door transoms.

3.10 ADJUST AND CLEAN

A. Promptly remove any epoxy material that spills onto finished surfaces before it cures.

B. Remove and replace any epoxy patch that is not fully bonded to the wooden member or properly cured.

END OF SECTION

SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted access units.

1.02 RELATED REQUIREMENTS

A. Section 09 91 23 - Interior Painting: Field paint finish.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Shop Drawings: Indicate exact position of each access door and/or panel unit.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

A. Wall-Mounted Units in Wet Areas:
   1. Location: As indicated on drawings.
   2. Panel Material: Steel, hot-dipped zinc, or zinc-aluminum-alloy coated.
   3. Size: 12 by 12 inches.
   4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
   5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
   6. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.

B. Fire-Rated Wall-Mounted Units:
   1. Wall Fire-Rating: Match fire rating of partition as indicated on Life Safety drawings.
   2. Size: 12 by 12 inches.

2.02 WALL AND CEILING MOUNTED ACCESS UNITS

A. Manufacturers:
   1. ACUDOR Products Inc: www.acudor.com/#sle.
      a. Air-Tight, Water-Tight, Wall and Ceiling Mounted Units: ACUDOR ADWT.
      b. Fire-Rated Wall-Mounted Units - 2 Hours or Less: ACUDOR FW-5015.
   2. Or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to proceeding with this work.

3.03 INSTALLATION

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

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

SECTION 08 31 10
FLOOR ACCESS DOORS

PART 1 GENERAL

1.01 SUMMARY

A. Work Included: Provide factory-fabricated floor access doors.

1.02 RELATED SECTIONS

A. Section 05 51 33 - Metal Ladders

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product data.

B. Shop Drawings: Submit shop drawings including profiles, accessories, location, adjacent construction interface, and dimensions.

C. Warranty: Submit executed copy of manufacturer's standard warranty.

1.04 QUALITY ASSURANCE

A. Manufacturer: A minimum of 5 years experience manufacturing similar products.

B. Installer: A minimum of 2 years experience installing similar products.

C. Manufacturer's Quality System: Registered to ISO 9001 Quality Standards including in-house engineering for product design activities.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver products in manufacturer's original packaging. Store materials in a dry, protected, well-vented area. Inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

1.06 WARRANTY

A. Manufacturer's Warranty: Provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Basis-of-Design Manufacturer: Type TER Floor Access Door by The BILCO Company, P.O. Box 1203, New Haven, CT 06505, 1-203-934-6363, Fax: 1-203-535-1582, Web: www.BILCO.com.

2.02 ACCESS DOOR

A. Furnish and install where indicated on plans vault access door TER, size: 42" x 42". Length denotes hinge side. The floor access door shall be single leaf and pre-assembled from the manufacturer.

B. Performance characteristics:
   1. Cover: Shall be reinforced to support a minimum live load of 150 psf (732kg/m2) with a maximum deflection of 1/150th of the span.
   2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
   3. Operation of the cover shall not be affected by temperature.

C. Cover shall have a 1" (25mm) fillable pan to receive concrete or a combination of concrete and pavers. All fill material to be furnished and installed by others in the field.

D. Frame: Shall be extruded aluminum with full anchor flange around the perimeter.

E. Lifting mechanisms: Manufacturer shall provide the required number and size of compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe fastened to a formed 1/4" (6mm) gusset support plate.

F. A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the and the latch release shall be protected by a flush, gasketed, removable screw plug.

G. Hardware:
   1. Hinges: Shall be a continuous heavy duty Type 316 stainless steel hinge that is accessible only when the cover is in the open position.
   2. Cover shall be equipped with an aluminum hold open arm that automatically locks the cover in the open position.
   3. Cover shall be fitted with the required number and size of compression spring operators.
   4. A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.
   5. Provide cylinder lock.
   6. Provide insulation

H. Finishes: Factory finish shall be mill finish aluminum with bituminous coating applied to the exterior of the frame.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
   1. Test units for proper function and adjust until proper operation is achieved.
   2. Repair finishes damaged during installation.
   3. Restore finishes so no evidence remains of corrective work.

3.03 ADJUSTING AND CLEANING

A. Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.

END OF SECTION

SECTION 08 41 13
ALUMINUM – FRAMED ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Furnish and install aluminum architectural storefront system complete with hardware and related components as shown on drawings and specified in this section.

B. All storefront systems shall be EFCO® System 406X Dual-Thermal Flush-Glazed Screw Spline Storefront. Other manufacturers requesting approval to bid their product as an equal must submit the following information fifteen days prior to close of bidding.
   1. A sample storefront system (size and configuration) as per requirements of architect.
   2. Test reports documenting compliance with requirements of Section 1.05.

C. Glass
   1. Reference Section 08 81 00 for Glass and Glazing.

D. Single Source Requirement
   1. All products listed in Section 1.02 shall be by the same manufacturer.

1.02 RELATED WORK

A. Section 08 81 00 - Glazing

1.03 LABORATORY TESTING AND PERFORMANCE REQUIREMENTS

A. Test Units
   1. Air, water, and structural test unit size shall be a minimum of two stories high and three lites wide.
   2. Thermal test unit sizes shall be 80" (2032 mm) wide x 80" (2032 mm) high with one intermediate vertical mullion and two lites of glass.

B. Test Procedures and Performance
   1. Air Infiltration Test
      a. Test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (300 Pa).
      b. Air infiltration shall not exceed .06 cfm/SF (.30 l/s•m²) of unit.
   2. Water Resistance Test
      a. Test unit in accordance with ASTM E 331.
      b. There shall be no uncontrolled water leakage at a static test pressure of 12.0 psf
      c. (479 Pa).
   3. Uniform Load Deflection Test
      a. Test in accordance with ASTM E 330.
      b. Deflection under design load shall not exceed L/175 of the clear span.
   4. Uniform Load Structural Test
      a. Test in accordance with ASTM E 330 at a pressure 1.5 times the design wind pressure in 1.05.B.3.b.
      b. At conclusion of the test, there shall be no glass breakage, permanent damage to fasteners, storefront parts, or any other damage that would cause the storefront to be defective.
   5. Condensation Resistance Test (CRF)
      a. Test unit in accordance with AAMA 1503.1.
      b. Condensation Resistance Factor (CRF) shall not be less than ___ (frame) when glazed with ___ center of glass U-Factor. (See chart at end of section).
   6. Condensation Resistance (CR)
      a. With ventilators closed and locked, test unit in accordance with NFRC 500-2010.

b. Condensation Resistance (CR) shall not be less than ___ when glazed with ___ center of glass U-Factor. (See chart at end of section).

7. Thermal Transmittance Test (Conductive U-Factor)
   a. With ventilators closed and locked, test unit in accordance with NFRC 100-2010.
   b. Conductive thermal transmittance (U-Factor) shall not be more than ___ BTU/hr•ft2•°F (___ W/m²•K) when glazed with ___ center of glass U-Factor. (See chart at end of section).

Glass Comparison Chart

Glass	C.O.G.2 U-Factor	U-Factor1	Frame CRF 3	CR1
1" IG	0.48	0.53 BTU/hr•ft²•ºF (3.01 W/m²•K)	69	*
1" IG	0.30	0.38 BTU/hr•ft²•ºF (2.16 W/m²•K)	69	51
1" IG	0.24	0.33 BTU/hr•ft²•ºF (1.87 W/m²•K)	69	54
1" IG	0.20	0.30 BTU/hr•ft²•ºF (1.70 W/m²•K)	69	56

C. Project Wind Loads
   1. The system shall be designed to withstand the following loads normal to the plane of the wall:
      a. Positive pressure of 35 psf at non-corner zones.
      b. Negative pressure of 35 psf at non-corner zones.
      c. Negative pressure of 35 psf at corner zones.

1.04 FIELD TESTING AND PERFORMANCE REQUIREMENTS

A. Test in accordance with AAMA 501.2 for spray test only or AAMA 503.92 for pressurized test.

1.05 QUALITY ASSURANCE

A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.

B. Test reports shall be accompanied by the storefront manufacturer's letter of certification stating that the tested storefront meets or exceeds the referenced criteria for the appropriate storefront type.

1.06 REFERENCES

1.07 SUBMITTALS

A. Contractor shall submit shop drawings; finish samples, test reports, and warranties.
   1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

B. An NFRC Component Modeling Approach (CMA) generated label certificate shall be provided by the manufacturer. The label certificate shall be project specific and will contain the thermal performance ratings of the manufacturer's framing combined with the specified glass, and the glass spacer used in the fabrication of the glass, at NFRC standard test size as defined in table 4-3 in NFRC 100-2010.

1.08 WARRANTIES

A. Total Storefront Installation
   1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total storefront installation. This includes the glass

(including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water and structural adequacy as called for in the specifications and approved shop drawings.

2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.

B. Window Material and Workmanship
   1. Provide written guarantee against defects in material and workmanship for 3 years from the date of final shipment.

C. Glass
   1. Provide written warranty for insulated glass units that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
   2. Warranty period shall be for 10 (ten) years.

D. Finish
   1. Warranty period shall be for 10 years from the date of final shipment.
   2. Warranty period shall be for 10 years from the date of final shipment.
   3. Provide organic finish warranty based on AAMA standard 2605.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aluminum
   1. Extruded aluminum shall be 6063-T6 alloy and temper.

B. Receptor
   1. Thermally broken receptor at all head and jamb conditions, refer to drawings.

C. U-Factor shall not be less than 0.33

D. Glass: Refer to Section 08 81 00.

E. Storm Doors
   1. Basis of Design - EFCO Durastile D300 Medium Stile Doors
   2. Door stiles shall be no less than 4" (127mm) wide (not including glass stops).
   3. Door stiles and rails shall have hairline joints at corners. Heavy concealed reinforcement brackets shall be secured with screws and shall be of deep penetration and fillet welded.
   4. Weather stripping shall be wool pile and shall be installed in one stile of door pairs and in jamb stiles of center pivoted doors.
   5. Major portions of the door sections shall have .188" (5mm) wall thickness. Glazing stop sections shall have .050" (1.2mm) wall thickness.
   6. Bottom rail to have a smooth surface a minimum of 10"
   7. Hardware Listed for doors per 087100 Finish Hardware.

F. Entrance Doors
   1. Basis of Design - EFCO Durastile D518 Wide Stile Doors
   2. Door stiles shall be no less than 5" (127mm) wide (not including glass stops).
   3. Door stiles and rails shall have hairline joints at corners. Heavy concealed reinforcement brackets shall be secured with screws and shall be of deep penetration and fillet welded.
   4. Weather stripping shall be wool pile and shall be installed in one stile of door pairs and in jamb stiles of center pivoted doors.
   5. Major portions of the door sections shall have .188" (5mm) wall thickness. Glazing stop sections shall have .050" (1.2mm) wall thicness.
   6. Bottom rail to have a smooth surface a minimum of 10"
   7. Hardware Listed for doors per 087100 Finish Hardware.

G. Thermal Barrier

1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
2. Barrier material shall be poured-in-place, two-part polyurethane. A nonstructural thermal barrier is unacceptable.

2.02 FABRICATION

A. General
   1. All aluminum frame extrusions shall have a minimum wall thickness of .080" (2 mm).
   2. All exposed work shall be carefully matched to produce continuity of line and design with all joints. System design shall be such that raw edges will not be visible at joints.

B. Frame
   1. Depth of frame shall not be less than 6 1/2" (165 mm).
   2. Face dimension shall not be less than 2" (50 mm).
   3. Frame components shall be screw spline construction.

C. Glazing
   1. All units shall be “dry glazed" with gaskets on both exterior and interior of the glass.

2.03 FINISHES

A. Organic
   1. Finish all exposed areas of aluminum windows and components with 70% 3-Coat Kynar. Color shall be as selected by the architect

AA Description	Description	AAMA Guide Spec.
AA-M12-C42-R1X	70% PVDF Ultrapon™	2605-98

PART 3 EXECUTION

3.01 INSPECTION

A. Job Conditions
   1. All openings shall be prepared by others to the proper size and shall be plumb, level and in the proper location and alignment as shown on the architect's drawings.
      a. Insert at discretion of specifier
      b. Provide for manufacturer representation to conduct pre-installation site meeting.

3.02 INSTALLATION

A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.

B. Storefront system shall be erected plumb and true, in proper alignment and relation to established lines and grades.

C. Entrance doors shall be securely anchored in place to a straight, plumb and level condition, without distortion. Weather stripping contact and hardware movement shall be checked and final adjustments made for proper operation and performance of units.

D. Furnish and apply sealing materials to provide a weather tight installation at all joints and intersections and at opening perimeters.

E. Sealing materials specified shall be used in strict accordance with the manufacturer‘s printed instructions, and shall be applied only by mechanics specially trained or experienced in their use. All surfaces must be clean and free of foreign matter before applying sealing materials. Sealing compounds shall be tooled to fill the joint and provide a smooth finished surface.

3.03 ANCHORAGE

A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 PROTECTION AND CLEANING

A. The general contractor shall protect the aluminum materials and finish against damage from construction activities and harmful substances. The general contractor shall remove any protective coatings as directed by the architect, and shall clean the aluminum surfaces as recommended for the type of finish applied.

B. A bi-annual sweetwater rinse is recommended to prohibit dirt, dust, and debris from accumulation on the surface of the coating and to help maintain the aesthetic of the coating.

END OF SECTION

SECTION 08 60 00

WINDOW RESTORATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Construction Drawings apply to this Section.

B. General provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

1.2 SUMMARY

A. This section includes the following:
   1. Restoration of wood window sash, window frames and glazing, including, but not limited to:
      a. Epoxy consolidation and patching.
      b. Dutchman repair.
      c. Replacement of broken and missing elements.
      d. Reattachment of loose and deteriorated joints.
      e. Replacement of deteriorated glazing putty.
      f. Replacement of broken and cracked glass.
   2. Temporary protection at openings where sash are removed for restoration.

B. Intent of window restoration: The specific intent of this Section is to restore existing windows to a sound, weather tight condition while preserving and protecting their original design, configuration, details and profiles.

C. Related Sections:
   1. Section 06 31 00 – Wood Restoration Systems
   2. Section 06 40 00 – Architectural woodwork
   3. Section 07 90 00 – Joint Sealers
   4. Section 09 91 13 – Exterior Painting
   5. Section 09 13 23 – Interior Painting
   6. Window Schedule

1.3 DEFINITIONS

A. "Consolidate": Solidify friable and decayed wood that still retains its original dimensions and profile through application of a wood epoxy consolidant.

B. "Consolidate and Patch": Replacement of localized areas of rot or decay in a wooden member with a wood epoxy filler. Includes consolidation of adjacent areas of soft or friable wood through application of a wood epoxy consolidant.

C. "Dutchman Repair": Replacement of localized areas of rot or decay in a wooden member with a wood patch.

D. "Partial Replacement": Replacement of a section of a wooden member, encompassing the full width and thickness, with new wood.

1.4 SUBMITTALS

A. Qualification Data: Submit qualifications of the installing contractor and restoration specialist to establish that they meet the requirements specified in the Quality Assurance article.

B. Product Data:
1. Wood epoxy resins (per Section 06 31 00).
2. Wood glue. (per Section 06 31 00)
3. Glazing putty.
4. Joint Sealant (per Section 07 90 00)
4. Wood Primer (see Section 09 91 13)

C. Samples:
1. Window Glass: Submit one (1) sample of each type to be replaced.

D. Shop Drawings: Show materials and methods for providing temporary protection at window openings.

E. Certificates: Affidavit required under Quality Assurance Article.

1.5 QUALITY ASSURANCE

A. Installing Contractor: The Contractor for the Work of this Section shall be regularly engaged in the restoration of historic architectural woodwork and windows, including materials and techniques for epoxy consolidation/repair and fabricating/installing wooden Dutchmen. In the acceptance or rejection of the Work of this Section, no allowance will be given for lack of skill on the part of any worker.

B. Restoration Specialist: Engage a carpenter for the Work of this Section who is specially trained in the restoration of historic windows and who has at least five years experience in epoxy consolidation and patching and Dutchman repair of architectural woodwork.
1. All disassembly, cutting and patching work shall be performed exclusively by the approved restoration specialist.

C. Source of Materials: Obtain epoxy resins from a single source to ensure compatibility of materials.

D. Certificates: Affidavit by material supplier certifying type and quality of glass furnished.

E. Mill & Producers Label: Lumber shall bear label indicating type, grade, mill and grading agency on unfinished surface or end.
   1. In lieu of mill & producers label, supply affidavit from material supplier certifying grade, species and cut of milled lumber and molding products.

F. Reference Standards:
   1. "Architectural Woodwork Quality Standards" by the Architectural Woodwork Institute (AWI).
   2. "American Softwood Lumber Standard" US Department of Commerce Product Standard 20 (DOC PS 20-99).

1.6 QUALITY CONTROL

A. Field Samples (Mock-Ups):
   1. Prepare field sample at a location designated by the Director's Representative. Do not proceed further with the Work of this Section until the field sample is approved.
      a. Engage the approved Restoration Specialist to prepare the field sample.
      b. Utilize only approved materials and methods and comply with product manufacturer's instructions and other requirements of this Section to prepare field sample.
   2. Approved field sample will be used as quality control standard for acceptance or rejection of the Work of this Section.
      a. Maintain and protect approved field sample from damage, deterioration, or alteration for the duration of the Contract.
   3. Field Samples Required:
      a. One complete window including sash and frame

B. Material Container Labels: Material containers shall bear the manufacturer’s label indicating manufacturer’s name, trade name of product, lot number, shelf life of product, and mix ratio (if applicable).

1.7 DELIVERY, STORAGE, AND HANDLING

A. Packaged Products:
   1. Deliver materials to the site in manufacturer’s original, sealed containers. Do not deliver materials which have exceeded shelf life limitations set forth by the manufacturer.
   2. Comply with manufacturer’s printed instructions for storing and protecting materials.
   3. Protect packaged products from water, dampness and high humidity.

B. Lumber and Millwork:
   1. Protect from weather during transport.
   2. Store lumber and millwork in a dry, well-ventilated space completely protected from the weather. Comply with temperature and humidity requirements for storage and installation as recommended in the Reference Standards.

C. Discard and remove from the site any damaged or contaminated materials.

1.8 PROJECT CONDITIONS

A. Coordination: Coordinate wood repair with surface preparation and painting to avoid exposure of bare wood to the weather. Protect bare wood surfaces from exposure to rain, snow, ice and frost.

B. Protection: Use all necessary means to protect areas of wood not being consolidated or patched and all other surfaces and building elements from damage, deterioration, or staining caused by Work of this Section.

C. Environmental Conditions: Perform wood consolidation and epoxy repairs only during favorable conditions, including cure times. Comply with the manufacturer's printed instructions and the requirements of this Section. In the event of conflicting instructions or directions, the more stringent requirements shall apply.
   1. Mix and apply epoxy resins only when the epoxy materials, ambient air and surface temperatures are between 50 degrees and 85 degrees F.
   2. Use polyurethane glue only when the glue, ambient air and surface temperatures are between 40 degrees and 100 degrees F.

D. Wood Moisture Content: Verify, through the use of calibrated wood moisture meters, that the moisture content of wood surfaces to be repaired is within the limits recommended by the manufacturer of the epoxy resins or wood glue.
   1. The maximum moisture content of wood to be repaired with epoxy resins shall not exceed 12%.
   2. If necessary, lightly moisten wood surfaces to be adhered with polyurethane glue when moisture content is below the manufacturer's recommended levels.

E. Temporary Protective Coverings: Provide durable, rigid covers at openings whenever doors, sash or glazing is removed and not reinstalled the same day. Do not fasten temporary covers to sash or frames.
   1. Tarpaulins and polyethylene sheeting are not acceptable materials.

F. Dimensions: Field measure dimensions of all existing and in-place elements before preparing shop drawings or beginning work. Contactor is responsible for all dimensions.

G. Removal of Existing Construction: Where removal of existing construction is required to perform the Work, take all necessary measures to carefully remove and salvage sound materials without damage and without marring finished surfaces.
   1. Tag or otherwise label removed items to facilitate reinstallation at the same location, position and orientation.

2. Protect and store removed items. Reinstall items as soon as practical.
3. Items removed, but not scheduled for reinstallation shall be affixed with a tag indicating opening number and location and turned over to the Director's Representative.

1.10 LEAD CONTAINING PAINT

A. Assume that all existing painted surfaces are coated with lead-containing paints. Handle, transport and dispose of lead-containing paint and residue in accordance with all applicable federal, state, and local laws and regulations including, but not limited to, the regulations referenced herein.
   1. OSHA Regulations, Title 29, CFR Section 1926.62: "Lead Exposure in Construction" and Title 29, CFR Section 1910.1200: "Hazard Communication Standard."
   2. US EPA Regulations, Title 40, CFR Part 262: "Standards Applicable to Generators of Hazardous Waste" and Part 263: "Standards Applicable to Transporters of Hazardous Waste."
   3. US DOT Regulations, Title 49 CFR Parts 172 thru 180 inclusive.
   4. NYS DEC Regulations, Title 6, Part 364, and parts 370-374.

PART 2 PRODUCTS

2.1 WOOD

A. AWI Custom Grade.
   1. Species: Eastern White Pine (Northern White Pine), Bald Cypress or other durable fine-grain softwood complying with AWI 100 for quality grade specified.
      a. Kiln dried to 12% maximum moisture content.
      b. Use clear, solid lumber without wane or warp. Cut out any knots larger than 1/2 inch diameter.
      c. Finger-jointed lumber is not acceptable.
   2. Dimensions: Suitable for use in matching the actual finished dimensions and profile.

B. Fabricate flat stock with smooth, planned surfaces, S4S. Shape molding stock accurately to required profiles. Machine and sand surfaces in accordance with AWI's requirements for the specified grade.

C. Furnish wood trim and moldings in lengths suitable for installation with the fewest number of joints.

2.2 WOOD EPOXY RESINS

A. Comply with Section 06 31 00 Wood Restoration

2.3 FASTENERS

A. Nails: Hot-dipped galvanized, size and type to suit application.

B. Screws: For use in attaching hardware and weatherstripping, brass or zinc coated to suit the type of material.
   1. Match existing material, type and size of fastener when necessary to reattach existing hardware.

2.4 GLASS AND GLAZING MATERIALS

A. Window Glass (20th Century/modern): Transparent float glass conforming to ASTM C 1036, Type I, Class 1, quality q3. *Includes all storm windows*.
   1. Thickness; 1/8 inch.

B. Window Glass (historic – for original Manor Hall windows): Clear, hand-blown glass replicating historic glass, 3/32" to 1/8" thick. Provide "Light Restoration" glass by S.A. Benheim, Ltd. (www.restorationglass.com) or equal. Matching salvaged glass will be acceptable.

C. Glazing Compound: Linseed oil based glazing compound formulated specifically for glazing wood windows.
   2. Allback linseed oil glazing putty: www.sloventfreepaint.com
   3. Sarco Multi-Glaze type "M" - vegetable oil based (soybean and linseed oil) compound: www.smithrestorationsash.com
   4. Elastic Glazing Compound (Linseed Oil Putty) by Sterling-Clark-Lurton Corp, PO Box 130, Norwood, MA 02062 Telephone: (800) 225-9872 Fax: (781) 762-1095 info:info@sclsterling.com <mailto:info@sclsterling.com

D. Glazing Points: Zinc coated or nonferrous push points suitable for use intended. Provide points that can be installed without extending beyond interior ridge or glazing rabbet.

2.5 MISCELLANEOUS MATERIALS

A. Moisture-activated polyurethane glue: Gorilla Glue, manufactured by Lutz File and Tool Co., 3929 Virginia Ave., Cincinnati, OH 45227; 800-966-3458.

B. Wood Primer: Alkyd-based primer formulated to seal unfinished wood, both new and weathered surfaces, and as a base coat for semi-gloss acrylic latex finishes.
   1. Benjamin Moore – Fresh Start Multi-Purpose Oil Based Primer (024)
   2. California Paint – Trouble Shooter Alkyd/Linseed Oil Wood Primer (22700)
   3. Pratt & Lambert – Multi-Surface Oil Base Primer (P1100/F2101)

PART 3 EXECUTION

3.1 EXAMINATION

A. Visually inspect and note the condition of window components at areas indicated on the Drawings and at other locations where deterioration may exist. Probe beneath deteriorated surfaces to assess the extent of damage.
   1. Promptly notify Director's Representative of any areas of active insect infestation and obtain instructions before proceeding with Work in those locations.

B. Prepare a window restoration schedule noting the locations and types of wood treatment to include the following:
   1. Rotted or spongy wood that requires consolidation only.
   2. Damaged or decayed wood that requires consolidation and epoxy paste filler to restore original profile/shape or structural integrity.
   3. Major decay or damage that requires wood Dutchman repair to restore original profile/shape or structural integrity.
   4. Missing wooden members or major decay or damage that encompasses more than 70% of an individual wooden member.

C. Review findings and establish the scope of repairs with the Director's Representative prior to commencing the Work of this Section.

3.2 PREPARATION

A. Temporary Protection: Furnish and install temporary protection in accordance with the requirements of this Section and Section 01 50 00.
   1. If window sash removal is required for repairs, do not remove window sash before obtaining approval of submittals for temporary protection.
   2. Coordinate sash removal and installation of temporary coverings so that the building is secure and weather-tight throughout the duration of the Work.
      a. Limit removal of sash to no more than 50% of the window openings within any single room at a time.
      b. Double-hung windows are fastened shut with security screws which must be removed to paint window sills and underside of sash, where removed, security screws shall be re-installed at the end of each work shift.
   4. Reinstall window sash as the work progresses. Reinstall all hardware and verify that sash is in proper operating condition.

B. Surface Preparation: Remove loose, peeling, cracked and blistered paint before commencing wood restoration work.
   1. Do not use wire brushes or open flames to remove paint. Do not use heat guns to remove paint from window frames. Heat guns may be used to remove paint from window sash when they have been removed from their frames.

2. Do not cut or gouge wood surfaces. Use contoured scrapers on surfaces with molded profiles.
3. Sand edges of firmly adhered coatings to produce smooth, feathered edges. Do not leave scratches in surfaces that will be visible after apply finish paint.
4. Thoroughly wash painted surfaces to remove all traces of dirt, soot, grease, mildew, chalk and stains.
   a. Use 50% solution of "Simple Green" to clean surfaces. Thoroughly rinse with clean water.
   b. Use of power washing equipment is not permitted.

C. Carefully remove trim and other elements where required to perform the Work.
1. Where repairs require removal of hardware or intact sections of trim, carefully remove and tag each piece to allow reinstallation at the same location upon completion of the repair.
2. Do not crush, split or gouge wood that will remain or be reinstalled. Pull heads of finish nails through from concealed surface to avoid splintering wood.
3. Promptly notify Director's Representative of any additional deterioration exposed by removal operations and obtain instructions before proceeding with repairs.

3.3 WINDOW RESTORATION, GENERAL

A. Restore wood windows as shown on drawings, and as specified herein

B. Disassembly: Carefully dissemble window sash when required to perform restoration work. Identify and label all parts (including glass panes) identifying original locations to ensure that windows can be reassembled with all parts in the same positions and orientations.

C. General Requirements:
1. Perform repairs in accordance with the approved window restoration schedule and as specified herein.
2. Replace broken and missing dowels or pins at joints in sash to provide strong, rigid joints. Sash shall not rack when gently pressed on diagonal corners.
3. Remove all loose and deteriorated glazing putty. Do not disturb sound glazing putty except where glass is cracked or broken.
   a. On lights that require NO glass replacement, remove loose and deteriorated glazing putty that can be removed by use of a putty knife. In locations from which putty is removed, clean glass and wood substrate thoroughly.
4. Prime (back-prime) all surfaces of new wood elements before installing.
5. Upon completion of all wood repairs, lightly sand and apply one coat of primer to all bare wood surfaces. Primer shall be in addition to the primer specified in Section 09 91 13.
6. Prime and paint window sash and frames in accordance with the requirements of Section 09 91 13.

7. Clean and lubricate sash pulleys, sash pins and other hardware to ensure smooth operation.
8. Apply backer rod and sealant around perimeter of window frame in accordance with the requirements of Section 07 90 00.

D. Reassembly:
1. Reinstall sash, parting strips, and stops in original locations.
2. Reinstall hardware.
3. Adjust windows for smooth operation.

3.4 EPOXY CONSOLIDATION

A. Comply with Section 06 31 00 Wood Restoration Systems.

3.5 EPOXY PATCHING

A. Comply with Section 06 31 00 Wood Restoration Systems.

3.6 DUTCHMAN REPAIR

A. Comply with Section 06 31 00 Wood Restoration Systems.

3.7 MEMBER REPLACEMENT

A. Comply with Section 06 31 00 Wood Restoration Systems.

3.8 GLAZING

A. Glazing Light with Existing Glass: Clean glass and glazing rabbet to remove all traces of old glazing putty, dirt and debris. Apply one coat of oil-base primer to glazing rabbet before applying glazing putty.
1. Install glazing putty firmly against glass and wood member being glazed. Apply putty with enough pressure to eliminate voids and ensure a complete bond of putty to glass and wood substrate.
2. Tool smooth. Line of putty shall extend slightly shy of line of wood member on interior of glass pane to allow paint to extend slightly onto glass.

B. Glazing Light with Replacement Glass: Remove old glazing putty, clean and prime glazing rabbit as specified above.
1. Provide full, even bed of glazing putty on glazing rabbet.
2. Gently place glass pane in frame and press firmly into putty to provide full continuous seal.
3. Install glazing points to secure glass. Space points a maximum of 8” inches on center with one on either side of each corner.
4. Install glazing putty firmly against glass and wood member being glazed. Apply putty with enough pressure to eliminate voids and ensure a complete bond of putty to glass and wood substrate.
5. Tool smooth. Line of putty shall extend slightly shy of line of wood member on interior of glass pane to allow paint to extend slightly onto glass.

C. Cleaning: Clean excess sealant from glass surface.

3.9 ADJUST AND CLEAN

A. Promptly remove any epoxy material that spills onto finished surfaces before it cures.

B. Remove and replace any epoxy patch that is not fully bonded to the wooden member or properly cured.

END OF SECTION

SECTION 08 71 00
FINISH HARDWARE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware for:
   a. Swinging doors.
2. Electronic access control system components, including:
   a. Electronic access control devices.
3. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 Section "Alternates" for alternates affecting this section.
2. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
3. Division 26 sections for connections to electrical power system and for low-voltage wiring.
4. Division 28 sections for coordination with other components of electronic access control system.

1.03 REFERENCES

A. UL - Underwriters Laboratories

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Key Systems and Nomenclature

C. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

1.04 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.
2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “EXAMINATION” article, herein.

B. Action Submittals:

1. Product Data: Technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:

    a. Wiring Diagrams: For power, signal, and control wiring and including:
        1) Details of interface of electrified door hardware and building safety and security systems.
        2) Schematic diagram of systems that interface with electrified door hardware.
        3) Point-to-point wiring.
        4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated, and tagged with full description for coordination with schedule.

a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:

    a. Door Index; include door number, heading number, and Architects hardware set number.
    b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
    c. Quantity, type, style, function, size, and finish of each hardware item.
    d. Name and manufacturer of each item.
    e. Fastenings and other pertinent information.
    f. Location of each hardware set cross-referenced to indications on Drawings.
    g. Explanation of all abbreviations, symbols, and codes contained in schedule.
    h. Mounting locations for hardware.
    i. Door and frame sizes and materials.
    j. Name and phone number for local manufacturer's representative for each product.
    k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include operational descriptions for: egress, ingress (access), and fire/smoke alarm connections.
        1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.

5. Key Schedule:

    a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
    b. Use ANSI/BHMA A156.28 “Recommended Practices for Keying Systems” as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
    c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
    d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
    e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
        1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory or shop prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
2. Product data for electrified door hardware:

   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

3. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:

   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.
   c. Factory order acknowledgement numbers (for warranty and service)
   d. Name, address, and phone number of local representative for each manufacturer.
   e. Parts list for each product.
   f. Final approved hardware schedule, edited to reflect conditions as-installed.
   g. Final keying schedule
   h. Copies of floor plans with keying nomenclature
   i. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
   j. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.05 QUALITY ASSURANCE

A. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of

manufacturer's standard units in assemblies similar to those indicated for this Project.

4. Coordination Responsibility: Assist in coordinating installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.

    a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

B. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:

1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC).
2. Can provide installation and technical data to Architect and other related subcontractors.
3. Can inspect and verify components are in working order upon completion of installation.
4. Capable of producing wiring diagrams.
5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.

C. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

D. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

E. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

F. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.

G. Keying Conference

1. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:

    a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
    b. Preliminary key system schematic diagram.
    c. Requirements for key control system.

d. Requirements for access control.
e. Address for delivery of keys.

H. Pre-installation Conference

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.
5. Review required testing, inspecting, and certifying procedures.

I. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1. Deliver each article of hardware in manufacturer’s original packaging.

C. Project Conditions:

1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
2. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:

1. Promptly replace products damaged during shipping.
2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

1.07 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.08 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Beginning from date of Substantial Completion, for durations indicated.

    a. Closers:
        1) Mechanical: 10 years.

    b. Exit Devices:
        1) Mechanical: 3 years.

    c. Locksets:
        1) Mechanical: 3 years.

    d. Continuous Hinges: Lifetime warranty.
    Key Blanks: Lifetime

2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.09 MAINTENANCE

A. Maintenance Tools: Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Approval of manufacturers and/or products other than those listed as “Scheduled Manufacturer” or “Acceptable Manufacturers” in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

B. Approval of products from manufacturers indicated in “Acceptable Manufacturers” is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer’s product.

C. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
4. Install hardware with fasteners provided by hardware manufacturer.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Ives 5BB series.
2. Acceptable Manufacturers and Products: Hager BB series, Stanley FBB Series or approved equal.

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:

    a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
    b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:

    a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
    b. Interior: Heavy weight, steel, 5 inches (127 mm) high

4. 2 inches or thicker doors:

    a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
    b. Interior: Heavy weight, steel, 5 inches (127 mm) high

5. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
6. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

    a. Steel Hinges: Steel pins
    b. Non-Ferrous Hinges: Stainless steel pins
    c. Out-Swinging Exterior Doors: Non-removable pins
    d. Out-Swinging Interior Lockable Doors: Non-removable pins
    e. Interior Non-lockable Doors: Non-rising pins

7. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.

2.04 CONTINUOUS HINGES

A. Aluminum Geared

1. Manufacturers:

    a. Scheduled Manufacturer: Ives.
    b. Acceptable Manufacturers: Select, Hager (Rton) or approved equal.

2. Requirements:

    a. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
    b. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
    c. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
    d. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.

e. On fire-rated doors, provide aluminum geared continuous hinges that are classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
f. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware.
g. Install hinges with fasteners supplied by manufacturer.
h. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage L series or approved equal.
2. Acceptable Manufacturers and Products: Falcon MA series, Sargent 8200 series.

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3 hour fire doors.
2. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
3. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to “KEYING” article, herein.
4. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
5. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
6. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.

    a. Lever Design: Schlage 06 with N escutcheon.

2.06 TOUCHBAR EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Falcon 24/25 series.
2. Acceptable Manufacturers and Products: Detex Advantex, Von Duprin 98 series or approved equal.

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to “KEYING” article, herein.

3. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide flush end caps for exit devices.
7. Provide exit devices with manufacturer's approved strikes.
8. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
9. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
10. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
11. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
12. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
13. Provide electrified options as scheduled.
14. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

2.07 EXIT DEVICES – BAR TYPE

A. Manufacturer and Product:

1. Scheduled Manufacturer: Von Duprin 88 series or approved equal.
2. Acceptable Manufacturers and Products: No Substitute

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide bar type exit devices, cast or forged of brass, bronze, or stainless steel, plated to standard architectural finishes to match balance of the door hardware.
4. Latch Bolt Throw: 3/4 inch (19 mm) for rim and mortise devices, 5/8 inch (16 mm) for surface and concealed vertical rod devices.
5. Mechanism Case: One piece without cover plate. Mount flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
6. Provide UL labeled fire exit devices for fire rated openings.
7. Provide manufacturer's standard strikes.
8. Provide exit devices cut to door width and height. Locate exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.

9. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
10. Provide electrified options as scheduled in the hardware sets.
11. Furnish all necessary wood door kits and cover plates, for proper installation of exit device.

2.08 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Best.
2. Acceptable Manufacturers: Schlage, Sargent or approved equal.

B. Requirements:

1. Provide small format interchangeable cylinders (SFIC) compliant with Owner's existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Permanent Best cores by Owner.

C. Construction Keying:

1. Replaceable Construction Cores.

   a. Provide temporary keyed construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
      1) 3 construction control keys
      2) 12 construction change (day) keys.

   b. Owner or Owner's Representative will replace temporary construction cores with permanent cores.

2.09 KEYING

A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Owner to provide permanent cores keyed into Owner's existing factory registered keying system.

C. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

D. Requirements:

1. Owner to provide permanent cores keyed by the manufacturer according to the following key system.

   a. Master Keying system as directed by the Owner.

2. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.

2.10 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Falcon SC70A series.
2. Acceptable Manufacturers and Products: Norton 7500 series, LCN 4050 series.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
3. Closer Body: 1-1/2 inch (38 mm) diameter with 11/16 inch (17 mm) diameter heat-treated pinion journal and full complement bearings.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and all weather requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and back check.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide stick on templates, special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

C. Requirements:

1. Provide single-point or multi-point hold-open electro-mechanical closer/holders as specified. Coordinate voltage requirements and provide transformer if necessary.
2. Provide multi-point electro-mechanical closer/holders with swing free arms.
3. Provide closer/holders that function as full rack and pinion door closer when current is interrupted or continuous hold-open is not engaged.
4. Provide door closers with fully hydraulic, full rack and pinion action with high strength cylinder and full complement bearings at shaft.
5. Cylinder Body: 1-1/2 inch (38 mm) diameter with 5/8 inch (16 mm) diameter double heat-treated pinion journal.
6. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
7. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.

8. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
9. Pressure Relief Valve (PRV) Technology: Not permitted.
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.11 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Falcon SC80A series.
2. Acceptable Manufacturers and Products: Norton 8500 series, LCN 1450 series.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
2. Provide door closers with fully hydraulic, full rack and pinion action with aluminum cylinder.
3. Closer Body: 1-1/4 inch (32 mm) diameter, with 5/8 inch (16 mm) diameter heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.12 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.

3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide flush pulls as scheduled. Where required, provide back-to-back mounted model.
5. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
6. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
7. Provide wire pulls of solid bar stock, diameter and length as scheduled.
8. Provide decorative pulls as scheduled. Where required, mount back to back with pull.

2.13 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:
    a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
    b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
    c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.14 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.15 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International.
2. Acceptable Manufacturers: National Guard, KN Crowder.

B. Requirements:

1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Size of thresholds:
    a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
    b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width
4. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.16 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives.
2. Acceptable Manufacturers: Burns, Rockwood.

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

PART 3 - EXECUTION

2.01 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

2.02 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each hardware item in compliance with manufacturer’s instructions and recommendations, using only fasteners provided by manufacturer.

C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

H. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Owner to replace construction cores with permanent cores as indicated in keying section.

I. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

J. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

K. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

L. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

M. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

N. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

O. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

P. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

2.03 FIELD QUALITY CONTROL

A. Engage qualified manufacturer trained representative to perform inspections and to prepare inspection reports.

1. Representative will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

2.04 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, Installer's Architectural Hardware Consultant must examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

2.05 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

2.06 DOOR HARDWARE SCHEDULE

A. Hardware items are referenced in the following hardware. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.

B. Hardware Sets:

Hardware Group No. 01
For use on Door #(s):

101A	101D	203A	203B	1011	1021
1022	1023	1031	1034	1041	1042
1051	2011	2031	2032	2041	D-1011
D-1012	D-1021	D-1031			

Each To Have:

1	EA	HARDWARE	EXISTING TO REMAIN

Hardware Group No. 02
For use on Door #(s):

101B	101C	1032	1052	1053	2012
2013	2033				

Each To Have:

1	EA	HARDWARE	EXISTING TO REMAIN

Hardware Group No. 03
For use on Door #(s):

1061	1062

Each To Have:

3	EA	CONT. HINGE	112HD		313AN	IVE
1	EA	PANIC HARDWARE	88-L-06		WPC	VON
1	EA	MORTISE CYLINDER	1E74		613	BES
1	EA	SURFACE CLOSER	SC71A SSHO		695	FAL
1	EA	GASKETING	BY DOOR MANUFACTURER			
1	EA	DOOR SWEEP	8192D		D	ZER

Hardware Group No. 04
For use on Door #(s):
1071
Each To Have:

1	EA	CONT. HINGE	112HD		313AN	IVE
1	EA	PANIC HARDWARE	25-R-NL-OP		313	FAL
	EA	RIM CYLINDER	12E72 S2 RP3		613	BES
1	EA	DOOR PULL, 1" ROUND	8103EZHD 10" O		643E/716	IVE
1	EA	SURFACE CLOSER	SC71A SS		695	FAL
1	EA	GASKETING	BY DOOR MANUFACTURER			
1	EA	DOOR SWEEP	8198D		D	ZER
1	EA	THRESHOLD	655A-223		A	ZER

Hardware Group No. 05
For use on Door #(s):
1081 1091 2071 2081
Each To Have:

3	EA	HINGE	5BB1 4.5 X 4.5		640	IVE
1	EA	PRIVACY W/DEADBOLT	L9440 06N 09-544 L283-722		643e	SCH
1	EA	SURFACE CLOSER	SC81A RW/PA		695	FAL
1	EA	KICK PLATE	8400 8" X 1 1/2" LDW B-CS		613	IVE
1	EA	WALL STOP	WS406/407CVX		643E/716	IVE
1	EA	SILENCER	SR64/65		GRY	IVE

Hardware Group No. 06
For use on Door #(s):
1101
Each To Have:

3	EA	HINGE	5BB1 4.5 X 4.5		640	IVE
1	EA	STOREROOM LOCK	L9080L 06N		643e	SCH
1	EA	MORTISE CYLINDER	1E74		613	BES
1	EA	SURFACE CLOSER	SC81A RW/PA		695	FAL
1	EA	SILENCER	SR64/65		GRY	IVE

Hardware Group No. 07
For use on Door #(s):
2051
Each To Have:

2	EA	WALL STOP/HOLDER	FS495		613	IVE
		NOTE	BALANCE OF EXISTING HARDWARE TO REMAIN			

Hardware Group No. 08
For use on Door #(s):
2052
Each To Have:

1	EA	PANIC HARDWARE	880-NL-880-NL		613	VON
	EA	RIM CYLINDER	12E72 S2 RP3		613	BES
1	EA	SURFACE CLOSER	SC71A SS		695	FAL
		NOTE	BALANCE OF EXISTING HARDWARE TO REMAIN			

Hardware Group No. 09
For use on Door #(s):
2061
Each To Have:

3	EA	HINGE	5BB1 4.5 X 4.5		640	IVE
1	EA	PUSH/PULL BAR	9103EZHD-10"-NO		643E/716	IVE
1	EA	SURFACE CLOSER	4021		695	LCN
1	EA	WALL STOP	WS406/407CVX		643E/716	IVE

Hardware Group No. 10
For use on Door #(s):
B61
Each To Have:

3	EA	HINGE	5BB1 4.5 X 4.5 NRP		640	IVE
1	EA	STOREROOM LOCK	L9080L 06N		643e	SCH
1	EA	MORTISE CYLINDER	1E74		613	BES
1	EA	SURFACE CLOSER	SC81A DS		695	FAL
1	EA	KICK PLATE	8400 8" X 1 1/2" LDW B-CS		613	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER

Hardware Group No. 12
For use on Door #(s):
B71
Each To Have:

3	EA	HINGE	5BB1 4.5 X 4.5		640	IVE
1	EA	STOREROOM LOCK	L9080L 06N		643e	SCH
1	EA	MORTISE CYLINDER	1E74		613	BES
1	EA	SURFACE CLOSER	SC81A RW/PA		695	FAL
1	EA	KICK PLATE	8400 8" X 1 1/2" LDW B-CS		613	IVE
1	EA	FLOOR STOP	FS436		643E/716	IVE
1	EA	SILENCER	SR64/65		GRY	IVE

Hardware Group No. 13
For use on Door #(s):
D-1032
Each To Have:

3	EA	HINGE	5BB1 4.5 X 4.5		640	IVE
1	EA	PRIVACY W/DEADBOLT	L9440 06N 09-544 L283-722		643e	SCH
1	EA	OH STOP & HOLDER	450F		613	GLY
1	EA	SILENCER	SR64/65		GRY	IVE

Hardware Group No. 14
For use on Door #(s):
D-1033 D-1062
Each To Have:

3	EA	HINGE	5BB1 4.5 X 4.5 NRP		613	IVE
1	EA	CORRIDOR LOCK	L9456HD 06N 09-544		643e	SCH
1	EA	PERMANENT CORE	BY OWNER		613	BES
1	EA	SURFACE CLOSER	SC71A SSHO		695	FAL
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	DOOR SWEEP	8192D		D	ZER
1	EA	THRESHOLD	655A-223		A	ZER

INTEGRAL GASKETING BY FRAME MFR.

Hardware Group No. 15
For use on Door #(s):
D-1034
Each To Have:

3	EA	HINGE	5BB1 4.5 X 4.5		640	IVE
1	EA	CLASSROOM LOCK	L9070BD 06N		643e	SCH
1	EA	PERMANENT CORE	BY OWNER		613	BES
1	EA	SURFACE CLOSER	SC81A DSHO		695	FAL
1	EA	SILENCER	SR64/65		GRY	IVE

Hardware Group No. 16
For use on Door #(s):
D-1061
Each To Have:

3	EA	HINGE	5BB1 4.5 X 4.5		640	IVE
1	EA	PASSAGE SET	L9010 06N		643e	SCH
1	EA	SURFACE CLOSER	SC81A RW/PA		695	FAL
1	EA	KICK PLATE	8400 8" X 1 1/2" LDW B-CS		613	IVE
1	EA	WALL STOP	WS406/407CVX		643E/716	IVE
1	EA	SILENCER	SR64/65		GRY	IVE

END OF SECTION

SECTION 08 80 10
WOOD STORM WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Section includes furnishing and installing window attachment of Wood Storm Windows.

1.02 RELATED REQUIREMENTS

A. Section 07 62 00 - Flashing and Sheet Metal

B. Section 07 92 00 - Joint Sealants: Sealants for other than glazing purposes.

1.03 REFERENCE STANDARDS

A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.

B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2020.

D. National Association of Architectural Metal Manufacturers (NAAMM): NAAMM MFM - Metal Finishes Manual.

1.04 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. C. Shop Drawings: Submit elevations of each individual existing window with proposed wood storm window.

D. Samples: Submit two samples 8x8 inch in size of glass units, showing coloration, thickness and finished edges.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer certified, licensed or otherwise qualified by manufacturer as having the necessary experience, staff, and training to install manufacturer's products according to specified requirements.

B. Source Limitations: Obtain wood storm window through one source from a single manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver wood strom windows to project site ready for installation.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Protect components and accessories from corrosion, deformation, damage and deterioration when stored at job site. Keep materials free from dirt and foreign matter.

1.07 FIELD CONDITIONS

A. Field Measurements: Contractor is to verify location and dimensions of existing windows by field measurements before fabrication and indicate measurements on shop drawings. Follow manufacturer guidelines for measurement of proper "daylight size" and open area Measure at both top and bottom sashes.
   1. Established Dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating Slim Line Insulating Panes (SLIP)

without field measurements. Contractor is responsible to coordinate elevations with any interferences with or attachments to abutting structures.

1.08 WARRANTY

A. See Closeout Submittals, for additional warranty requirements.

B. Warranty: Provide manufacturer's standard limited warranty.
   1. Warranty Period: 1 year.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN

A. Basis of Design: Adams Architectural Millwork

B. Location: Install as indicated in the drawings

C. Components
   1. Frame: 1-1/8" thick, Northern White Pine
      a. Top Rail and Stiles: 2-1/8" wide
      b. Bottom Rail: 3-1/2" wide
      c. Cross Bar: 1-1/4" wide
   2. Glazing: Single pane 0.125" glass with putty glaze, Low-E on surface #2
   3.
   4.

D. Accessories
   1. Gasket: Self-adhering [rubber] [cork] [neoprene] roll with a pressure sensitive adhesive (glazing tape).
      a. Dimensions: 1/32" x 1/2" wide roll.
   2. Fasteners: Stainless steel flat head Phillips tap screw #6 x ¾".
      a. Finish: [Stainless Steel] [custom color as selected by Architect].
   3. Silicone sealants as referenced in Division 07 Section "Joint Sealants".
   4. Felt

E. Finishes
   1. Color: As selected by Director's Representative from manufacturer's standard range of colors.
   2. Performance: Per AAMA Specifications for shop-applied coatings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates with installer present for compliance with manufacturer's requirements, including installation tolerances and other conditions affecting performance of this work.

B. Verify that substrates are ready to receive this work.

C. If preparation is responsibility of another installer, notify Architect of unsatisfactory conditions prior to proceeding with this work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean areas of supporting foundation thoroughly prior to installation.

B. Prepare substrate surfaces using methods as recommended by manufacturer under project conditions.

3.03 INSTALLATION

A. Install Wood Storm Windows in accordance with manufacturer's instructions, and in proper relationship with adjacent construction.

B. Set Wood Storm Window plumb and aligned, anchor level and true to plane with full bearing on window sash.

C. Test for proper operation and adjust until satisfactory results are achieved.

D. Securely fasten to Slim Line Insulating Pane (SLIP) window sash with fasteners at pre-drilled openings.

3.04 ADJUSTING

A. Adjust window balance system to compensate for weight of Wood Storm Window.

3.05 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

C. Monitor and report installation procedures and unacceptable conditions.

3.06 CLEANING

A. On completion of installation, clean all Wood Storm Window surfaces so they are free of foreign matter.
   1. Remove sealant residue or smears.
   2. Do not caulk or paint heavily around the storm window. Build up of caulking or paint can block ventilation and cause the glass to fog and sweat.
   3. Use only cleaners recommended for tempered glass. Use mild soap and a soft cloth. Do not use abrasive or rough products of any kind that will scratch glass.

B. Touch-up, repair or replace damaged components or exposed finishes prior to Date of Substantial Completion

C. Remove labels after Work is complete.

D. Clean glass and adjacent surfaces.

3.07 PROTECTION

A. Protect installed storm window from subsequent construction operations.

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

3.08 MAINTENANCE

A. Proper maintenance measures shall be taken to ensure a long life for the storm windows.

END OF SECTION

SECTION 08 81 00
GLAZING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Glass including, heat-treated glass, insulating glass units, silk-screened glass, spandrel glass, laminated glass and decorative glass.

B. Related Sections:
   1. Drawings, General and Supplementary Conditions of the Contract, Division 1 and the following specifications sections apply to this section.
   2. Section 08 41 13 – Aluminum-Framed Entrances and Storefronts

1.02 REFERENCES

A. United States
   1. ANSI Z97.1 – American National Standard for Glazing Materials Used in Buildings – Safety Performance and Methods Test.
   2. CSPC 16 CFR 1201– Safety Standard for Architectural Glazing Materials.
   3. ASTM C1036-16 – Standard Specification for Flat Glass.
   4. ASTM C1048 – Standard Specification for Heat-Treated Glass – Kind HS, Kind FT Coated and Uncoated Glass.
   5. ASTM C1172 – Standard Specification for Laminated Architectural Flat Glass.
   6. ASTM E1300 – Standard Practice for Determining the Minimum Thickness and Type of Glass Required to Resist a Specified Load.
   7. ASTM C1651 – Standard Test Measurement of Roll Wave Optical Distortion in Heat-Treated Flat Glass.
   8. ASTM C1376 – 15 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass
   9. NGA Glazing Manual: Glass Association of North America.
   10. NGA Sealant Manual: Glass Association of North America.
   11. NGA Laminated Glass Design Guide: Glass Association of North America
   12. ISO 9001:2015 Certification.
   13. US Green Building Council – LEED Pilot Credit 55: Bird Collision Deterrence

1.03 SYSTEM DESCRIPTION

A. Design Requirements
   1. Provide glazing systems capable of withstanding normal thermal movements, wind loads and impact loads, without failure, including loss due to ineffective manufacture, fabrication and installation, deterioration of glazing materials and other defects in construction.
   2. Provide glass thickness and strengths (annealed, heat-strengthened, tempered) required to meet or exceed the following criteria based on project loads and in-service conditions per ASTM E1300.
   3. Minimum thickness of annealed or heat-treated glass products is selected, so that worst-case probability of failure does not exceed the following:
   4. 8 breaks per 1000 for glass installed vertically or not over 15 degrees from the vertical pane and under wind action.
   5. 5 breaks per 1000 for glass installed 15 degrees from the vertical plane and under action of snow and/or wind.

1.04 SUBMITTALS

A. Submit 12-inch (305 mm) square samples of each type of glass indicated and 12-inch (305 mm) long samples of each color required for each type of sealant or gasket exposed to view.

B. Submit Gloss Measurement reading for specified acid-etched finish. Measurements should be obtained with a BYK Gloss micro gloss 60° meter.

C. Submit manufacturer's product sheet and glazing instructions.

D. Submit compatibility and adhesion test reports from sealant manufacturer, indicating materials were tested for compatibility and adhesion with glazing sealant, as well as other glazing materials including insulating units.

E. Submit reports from fabricated glass manufacturer indicating that the glass meets the requirements of any security test. Reports specified on the drawings.

F. Mock-ups – Refer to Division 8, Section "Aluminum Framed Curtain Walls", "Aluminum Entrances and Storefronts", "Aluminum Windows", "All-Glass Entrances and Storefronts", "Roof, and Skylight" and "Glazed Curtainwalls" for requirements applicable to mock-ups.

1.05 QUALITY ASSURANCE

A. Acid etched glass properties must comply with Walker's Textures® properties for Opaque, Velour, Satin or Satinlite acid etched glass products.

B. Minimum to maximum gloss ranges must comply with Walker's Textures® gloss range for Opaque, Velour, Satin or Satinlite acid etched glass products.

C. Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section or referenced standards.
   1. NGA Publications
   2. FGIA Publications

D. Safety glass products in the United States comply with CPSC 16 CFR 1201 for Category II materials.

E. Insulating glass products are to be permanently marked either on spacers or at least one insulating unit component with appropriate label of inspecting and testing agency listed below:
   1. United States – Insulating Glass Certification Council (IGCC)

F. Manufacturer to be ISO 9001:2015 Certified.

1.06 HANDLING, FABRICATION AND INSTALLATION

A. Comply with manufacturer's instructions. (To include current Handling, Fabrication and Installation guidelines go to

   http://walkerglass.com/pdf-page-guidelines-for-handling/ and to http://walkerglass.com/pdf-page-bird-friendly-booklet/ for current version).

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

D. Exercise care to prevent damage to glass and damage/deterioration to coating on glass.

1.07 PROJECT SITE CONDITIONS

A. Field Measurement: When construction schedule permits, verify field measurements with drawing dimensions prior to fabrication of glass products.

1.08 WARRANTY

A. To include warranty specifications please go to http://walkerglass.com/pdf-page-warranty/ or to http://walkerglass.com/pdf-page-bird-friendly-booklet/

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer is used in the section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standards.

2.02 MATERIALS

A. Acid-etched glass only. Simulated acid-etched, ceramic frit or other forms of coatings on the glass are not allowed.

B. MONOLITHIC ACID ETCHED GLASS

(Note: Select Acid Etched Finish(es) and corresponding thickness(es) as required for the project. Delete all other selections)

C. Glass Type: Walker Textures®, Montreal, Canada

D. Insulating Coated Glass:
   1. 1" (25mm) VE1-2M Insulating Coated Glass as manufactured by Viracon.
      a. Exterior Glass Ply: 1/4" (6mm) Clear Heat Treatment - AN, HS or FT
      b. Coating: VE-2M on #2 Surface
      c. Airspace: 1/2" (13.2mm) airspace finish - mill finish, black painted or stainless steel
      d. Silicone: gray or black
      e. Interior Glass Ply: 1/4" (6mm) Clear Heat Treatment - AN, HS or FT
   2. Performance Requirements
      a. Visible Light Transmittance: 70%
      b. Exterior (Vis-Out) Reflectance: 11%
      c. Winter U-Value: 0.29
      d. Summer U-Value: 0.26
      e. Shading Coefficient: 0.44
      f. Solar Heat Gain Coefficient: 0.38
      g. Light to Solar Gain Ratio: 1.84
   3. Velour Finish
      a. Clear [3mm] [4mm] [5mm] [6mm] [8mm][10mm][12mm][15mm][19mm] Bronze [3mm] [5mm] [6mm][10mm][12mm]
      b. Grey [3mm][5mm][6mm][10mm][12mm] Blue [6mm]
      c. Black [5mm][6mm]
      d. Low iron [3mm][5mm][6mm][8mm][10mm][12mm][15mm][19mm]
   4. Satin Finish
      a. Clear [3mm] [4mm] [5mm] [6mm] [8mm][10mm][12mm][15mm][19mm] Bronze [3mm] [5mm] [6mm][10mm][12mm]
      b. Grey [3mm][5mm][6mm][10mm][12mm] Blue [6mm]
      c. Black [5mm][6mm]
      d. Low iron [3mm][5mm][6mm][8mm][10mm][12mm][15mm][19mm]
   5. Opaque Finish
      a. Clear [3mm] [4mm] [5mm] [6mm] [8mm][10mm][12mm][15mm][19mm]
      b. Bronze [3mm] [5mm] [6mm][10mm][12mm]
      c. Grey [3mm][5mm][6mm][10mm][12mm]
      d. Blue [6mm]
      e. Black [5mm][6mm]
      f. Low iron [3mm][5mm][6mm][8mm][10mm][12mm][15mm][19mm]
   6. Satinlite Finish
      a. Clear [3mm] [5mm] [6mm] [10mm][12mm]
      b. Low iron [3mm] [5mm] [6mm] [10mm][12mm]

c. Gloss Range: Minimum _____° to Maximum _____°
Go to http://walkerglass.com/pdf-page-gloss-range/ for gloss measurements.
d. Acid Etched Glass Properties
1) To include properties on wear, stain or scratch resistance, go to: http://walkerglass.com/pdf-page-product-specifications/
2) To include properties on daylight transmittance and diffusion go to: http://walkerglass.com/pdf-page-product-specifications/
e. Glass Strength: (Annealed, Heat-Strengthened, Tempered)
f. Etch Orientation: Position [1] (all finishes), [2] (all finishes), [1 & 2] (based on current offering)
g. Monolithic Glass Performance: To include current performance data go to: http://walkerglass.com/pdf-page-product-specifications/
h. United States Requirements
1) Annealed float glass shall comply with ASTM C1036 Type I, Class 1 (clear), Class 2 (tinted), Quality Q3.
2) Heat-Strengthened (HS) float glass and Tempered (FT) float glass shall comply with ASTM C1048, Type I, Class 1 (clear), Class 2 (tinted), Quality Q3.

7. MONOLITHIC PATTERNED ACID-ETCHED GLASS
(Note: Select corresponding glass types as required for the project. Delete all other selections)
a. Glass Type: Walker Textures® Nuance, Montreal, Canada
b. Pattern number (select from current offering)
1) Clear [3mm] [4mm] [5mm] [6mm] [8mm][10mm][12mm][15mm][19mm] Low iron [3mm][5mm][6mm][8mm][10mm][12mm][15mm][19mm]
2) Custom pattern, including gradient option as per drawing
3) Clear [3mm] [4mm] [5mm] [6mm] [8mm][10mm][12mm][15mm][19mm] Low iron [3mm][5mm][6mm][8mm][10mm][12mm][15mm][19mm]

8. MONOLITHIC BIRD FRIENDLY ACID-ETCHED GLASS
a. (Note: Select Acid Etched Finish(es) or patterns and corresponding glass types as required for the project. Delete all other selections)
b. Glass Type: Walker Textures® AviProtek®, Montreal, Canada (Acid-etched markers)
1) Patterns [211] [213] [214] [215] [216] [217] [219] [220] [221] on [position 1]
c. Full surface etching: [position 1] [position 2]
d. [Clear glass 6mm] [Low Iron glass 6mm]
e. Threat factors based on the American Bird Conservancy tunnel experiment:
1) Threat factor: [Pattern 211 on position 1: 23] [Pattern 213 on position 1: 29.8] [Pattern
2) 214 on position 1: 30]
3) Full surface: [5 on position 1] [25 on position 2]
f. Glass Type: Walker Textures® AviProtek® T, Montreal, Canada (Transparent UV markers on position 1)
1) Patterns [701] [713] [714] [717] on [position 1]
2) [Clear glass 6mm] [Optiwhite glass 6mm]
3) Threat factor based on Dr. Daniel Klem's field experiment: 31 (Pattern 713)

E. LOW-E COATED ACID-ETCHED GLASS

(Note: Select Acid Etched Finish(es) or patterns and corresponding glass types as required for the project. Delete all other selections)

1. Position 1 - Glass Type: Walker Textures® Montreal, Canada
a. Full surface acid-etched glass: select from section A. above (except Satinlite)
b. Patterned acid-etched glass: select from section B. 1.
c. Bird-friendly acid-etched glass: select from section C. 1. Above

2. Position 2 - Glass Type: Solarban® Solar Control Low-E Glass by Vitro Glass
    a. [Solarban® 60 VT] [Solarban® 70 VT] [Solarban® 67 VT] [Solarban® 72 VT] [Solarban® 90 VT]
    b. Monolithic Glass Performance: The Walker Textures® acid-etched finishes do not have any significant impact on solar performance values. Therefore, values will be similar to glass without acid-etched glass.
    c. For complete specifications on Solarban® Solar Control Low-E Glass please contact the customer service department at Vitro Glass

F. HEAT-TREATED FLOAT GLASS
1. Glass to be heat-treated by horizontal (roller hearth) process with inherent roller-wave distortion parallel to the bottom edge of the glass as installed when specified.

G. INSULATING GLASS (IG) UNITS
1. (Please contact Walker Glass to verify corresponding product availability for appropriate acid etched finish, glass substrate and thickness).

H. MONOLITHIC TWO-PLY LAMINATED GLASS

I. (Please contact Walker Glass to verify corresponding product availability for appropriate acid etched finish, glass substrate and thickness).

PART 3 - EXECUTION

3.01 PREPARATION

A. Protection
1. Handle and store product according to manufacturer’s recommendations.

3.02 INSTALLATION

A. Install products using the recommendations of the manufacturers of glass, sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those in the “NGA Glazing Manual.”

3.03 CLEANING

A. POST INSTALLATION CLEANING AND MAINTENANCE

B. To prevent permanent damage and maintain visual and aesthetic quality, acid-etched glass products should be protected during construction and must be properly cleaned after installation and as part of routine maintenance.

END OF SECTION