

## SECTION 08111

# STANDARD STEEL DOORS AND FRAMES

### PART 1 – GENERAL

#### 1.01 REFERENCES

- A. ASTM A525 – Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- B. ASTM A525M – Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- C. ASTM C236 – Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot-Box.
- D. ASTM E152 – Methods of Fire Tests of Door Assemblies.
- E. ASTM E413 – Classification for Determination of Sound Transmission Class.
- F. DHI (Door Hardware Institute) – The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder’s Hardware.
- G. NFPA 80 – Fire Doors and Windows.
- H. NFPA 252 - Fire Tests for Door Assemblies.
- I. ANSI A250.8-SDI-100 – Recommended Specifications for Standard Steel Doors and Frames.
- J. SDI-105 – Recommended Erection Instructions for Steel Frames.
- K. UL 10B – Fire Tests of Door Assemblies.

#### 1.02 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01330 – Submittals.
- B. Indicate frame configuration, anchor types and spacings, location of cutouts for hardware, reinforcement and finish.

### 1.03 **QUALITY ASSURANCE**

- A. Conform to requirements of ANSI A250.8.
- B. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three (3) years documented experience.

### 1.04 **REGULATORY REQUIREMENTS**

- A. Fire Rated Door and Panel Construction: Conform to UL 10B.
- B. Installed Door and Frame Assembly: Conform to NFPA 80 for fire rated class as indicated on drawings.

### 1.05 **DELIVERY, STORAGE, AND PROTECTION**

- A. Section 01600 – Product Requirements: Transport, handle, store, and protect products.
- B. Protect doors and frames as recommended by manufacturer.
- C. Break seal on-site to permit ventilation, store doors and frames in protected area. Stack doors and frames minimum of 6 inches off floor and provide space between each.

### 1.06 **ALTERNATES**

- A. See Section 01230 for bidding alternates affecting the Work of this Section.

### 1.07 **COLORS**

- A. Colors are specified in Colors/Materials Schedule.

### 1.08 **SUSTAINABLE BUILDING REQUIREMENTS**

- A. See Section 01011 for sustainable building requirements affecting the Work of this Section.

## PART 2 – PRODUCTS

### 2.01 **ACCEPTABLE MANUFACTURERS**

- A. Ceco Door Products.

- B. Curries Company.
- C. Steelcraft Manufacturing Co.
- D. SDI or NAAMM members that conform to the specific requirements of this Specification.
- E. Republic.
- F. Stiles Custom Hollow Metal, Inc.
- G. Essex Industries.
- H. Substitutions: Under provisions of Section 01600.

**2.02 DOORS**

- A. General: Provide hollow metal doors of the best commercial quality meeting SDI (Steel Door Institute) recommended specifications/standards and these Specifications.
- B. Hollow metal doors shall be 1-3/4" thick, flush type, reinforced and sound deadened.
- C. All doors and frames shall be factory cut, drilled and tapped for hardware with openings reinforced. Door frame corners shall be welded. Frames shall have floor anchors.
- D. Metal gauges for door frames shall be:
 

Doors 3' wide and 7' high or less	16 gauge
Over 3' wide or 7' high	14 gauge
Exterior and UL labeled	14 gauge
- E. Exterior hollow metal doors shall conform to the Washington State Energy Code and have closed tops. Exterior frames and doors shall be galvanized, factory "bonderized" and prime coat baked on. Exterior hollow metal frames shall have a thermal break and be weather-stripped.
- F. All wood doors shall be solid core, 1-3/4" thick, flush type, oak or other approved veneer and factory finished.
- G. All doors must meet LEED requirements.

### 2.03 **FRAMES**

- A. General: Provide hollow metal frames of the best commercial quality, meeting SDI (Steel Door Institute) recommended specifications/standards and these Specifications.
- B. Exterior Frames: SDI-100, 16 gauge, galvanized, welded frames. Provide 14 gauge for frames wider than 8 – ¾ inches. See special requirements under “Fabrication”.
- C. Interior Frames: SDI-100, 16 gauge, welded frames. Provide 14 gauge for frames wider than 8 – ¾ inches. See special requirements under “Fabrication”.

### 2.04 **DOOR CORE**

- A. Exterior Doors: Polyurethane insulation or polystyrene insulation with insulation value of R-4.10 or better.

### 2.05 **ACCESSORIES**

- A. Rubber Silencers: Resilient rubber.
- B. Glazing Stops:
  - 1. Painted Steel: Rolled steel channel shape, minimum 18 gauge, mitered corners; prepared for oval head, countersunk tamper-proof screws; size as shown on Drawings. Prime paint for field finish selected by Architect.
- C. Mortar Guard Boxes: Minimum 22 gauge welded in place.

### 2.06 **PROTECTIVE COATINGS**

- A. Galvanizing: Hot-dipped galvanized, 0.6 oz/sq. ft.
- B. Primer: Baked on rust inhibiting shop primer.
- C. Finish: Field paint under Specification Section 09900 – Painting.
- D. Bituminous Coating: Waterproof, fibrated asphalt emulsion, thickness of 1/16 inch.

## 2.07 FABRICATION

- A. Construction: Fabricate frames as welded unit type, exposed welds shall be ground smooth and flush. Conform with SDI-100.
- B. Hardware Provisions: Mortise and reinforce doors and frames to accommodate hardware specified in Section 08710.
- C. Hinge Reinforcement: Hinge reinforcement in frames shall be minimum 7 gauge. Fabricate frames and doors with hardware reinforcement plates securely welded in place. At exterior frames, provide hinge reinforcement full width of doorframe. In addition to manufacturer's standard weld attachment, provide full fillet weld at top and bottom of frame hinge reinforcement. Provide mortar guard boxes. Coordinate with Section 08710.
- D. Security Electronics Provisions: Mortise and reinforce door and frames to accommodate security electronics specified in Division 16.
- E. Hardware Reinforcement: All reinforcement shall be securely welded to door/frame (spot welding not acceptable). Provide closer reinforcement "sleeve" the full width of doorframes. Reinforcement minimum 7 gauge.
- F. Wide Frames: Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
- G. Door Edges: Edge seams shall be continuously welded full length and ground flush and smooth.
- H. Door Silencers: Prepare frame for silencers. Provide three (3) single rubber silencers for single doors and mullions of double doors on strike side, and two (2) single silencers on frame head at double doors without mullions where continuous smoke weather seals are not specified.
- I. Fire Door Labels: Attach metal fire rating label to each fire-rated frame and door unit.
- J. Door Tops: Close top edge of exterior doors flush with inverted steel channel closure. Seal joints watertight.
- K. Floor Anchors: Provide 16 gauge (minimum) steel angle floor anchors securely welded to frame with two (2) holes for anchoring frame to floor. Provide 12 gauge stirrup floor anchor at mullions.

- L. Jamb Anchors: Provide jamb anchors to suit wall condition and meet fire-rating requirements of frame. Jamb anchors shall be concealed type except punch and dimpled frame with countersunk anchor bolt attachment to concrete wall on painted metal frames is acceptable; patching head is specified in Part 3.
- M. Relite Stops: Mount stops for relites on interior side of room or building.
- N. Door Undercuts: Provide under cuts to accommodate door hardware clearance requirements and code requirements. (UBC Standard 43-2 specifies 3/8 inches on single doors, 1/4 inches on double doors.) Coordinate with Section 08710.

## 2.08 FINISH

- A. Interior Painted Units: Prime paint.
- B. Exterior Units: Galvanized with prime paint. Apply bituminous coating to interior surfaces of all exterior frames and frames mounted in masonry walls.
- C. Primer Adhesion: Must pass the ASTM D3359 Cross Hatch Test, Method A, X-Cut.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Section 01310 – Coordination and Meetings: Verification of existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

### 3.02 INSTALLATION

- A. Install frames in accordance with SDI-105; installed tolerances for squareness, alignment, twist, and plumbness shall not exceed 1/16 inch total. Maintain proper door perimeter clearances.
- B. Install doors in accordance with SDI-100 and DHI.
- C. Coordinate installation of glass and glazing.
- D. Install door louvers, plumb and level.
- E. Coordinate installation of doors with installation of hardware specified in Section 08710.

- F. Coordinate with wall construction for anchor placement and throat widths.
- G. Fill all voids in all interior and exterior hollow metal frames with grout.
- H. Secure all doorframe floor anchors to floor with steel concrete anchors, two (2) concrete anchors per jamb or mullion.
- I. Fasten concealed jamb anchors to 16 gauge jamb stud wall framing with minimum four (4) case-hardened, self-drilling steel screws at each anchor. Weld to steel angle anchors where shown on the drawings.
- J. Grind head of exposed anchor bolt fasteners flush with face of frame and fill with polyester metal patching compound; sand flush and smooth to hide bolt head from view.

### 3.03 **ERECTION TOLERANCES**

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

### 3.04 **ADJUSTING**

- A. Adjust door and hardware for smooth and balance door movement.

END OF SECTION

## SECTION 08211

# FLUSH WOOD DOORS

### PART 1 – GENERAL

#### 1.01 REFERENCES

- A. ANSI A135.4 – Basic Hardboard.
- B. ASTM E152 – Methods of Fire Tests of Door Assemblies.
- C. ASTM E413 – Classification for Determination of Sound Transmission Class.
- D. AWI – Quality Standards of the Architectural Woodwork Institute (seventh edition).
- E. HPMA HP – Hardwood and Decorative Plywood.
- F. NEMA (National Electric Manufacturers Association) LD3 – High Pressure Decorative Laminates.
- G. NFPA 80 – Fire Doors and Windows.
- H. NFPA 252 – Standard Method of Fire Tests for Door Assemblies.
- I. UL 10B – Fire Tests of Door Assemblies.
- J. Warnock Hersey – Certification Listings for Fire Doors.

#### 1.02 SUBMITTALS

- A. Submit product data under provisions of Section 01330.
- B. Indicate door elevations, stile and rail reinforcement, internal blocking for hardware attachment, and cutouts for glazing.

#### 1.03 QUALITY ASSURANCE

- A. Perform work in accordance with AWI Quality Standard Section 1300, Premium Grade.



- B. Finish doors in accordance with AWI Quality Standard Section 1500.
- C. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three (3) years documented experience.

**1.04 REGULATORY REQUIREMENTS**

- A. Conform to applicable code for fire rated doors.

**1.05 DELIVERY, STORAGE, AND PROTECTION**

- A. Section 01600 – Product Requirements: Transport, handle, store, and protect products.
- B. Package, deliver, and store doors in accordance with AWI Section 1300.

**1.06 WARRANTY**

- A. Provide five (5) year manufacturer’s warranty against material defects and warpage under provisions of Section 01700.

**1.07 ALTERNATES**

- A. See Section 01230 for bidding alternates affecting the Work of this Section.

**1.08 COLORS**

- A. Colors are specified in Colors/Materials Schedule.

**1.09 SUSTAINABLE BUILDING REQUIREMENTS**

- A. See Section 01011 for sustainable building requirements affecting the Work of this Section.

**PART 2 – PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURERS**

- A. VT Industries, Inc.
- B. Vancouver Door Company, Puyallup, Washington.
- C. Marshfield DoorSystems, Inc.

- D. Lynden Door, Lynden, Washington.
- E. Substitutions: Under provisions of Section 01600.

## 2.02 DOOR TYPES

- A. Flush Interior Doors: 1 –  $\frac{3}{4}$  inches thick; solid core construction; wood veneer of overlay faces, fire rated as indicated.

## 2.03 DOOR CONSTRUCTION (INTERIOR DOORS)

- A. Solid Non-Rated, Non-Rated Core: AWI Section 1300, type PC – Particleboard.
- B. Solid, Fire Rated Core: AWI Section 1300, Type FD Series as scheduled on drawings.
- C. Solid, Fire Rated Core (20 Minute): AWI Section 1300, Type FPC-7.

## 2.04 FLUSH DOOR FACING (INTERIOR DOORS) FACTORY FINISH

- A. Facing Quality: AWI premium grade. Plain sliced; book matched leaves for transparent finish.
- B. Flush Interior Door Veneer: Select white maple veneer to receive transparent finish.
- C. Provide factory finish conforming to AWI Section 1500, System #5 catalyzed polyurethane finish over stain, premium grade.

## 2.08 ACCESSORIES

- A. Glass Stops:
  - 1. Wood stops with concealed fasteners to match door face.

## 2.09 FABRICATION

- A. Fabricate non-rated doors in accordance with AWI Quality Standards requirements.
- B. Fabricate fire rated doors in accordance with AWI Quality Standards and to UL requirement. Attach fire-rating label to door.

- C. Sound Rating For Single Door Leaf and Frame Assembly: ASTM E413, minimum STC (35).
- D. Provide lock blocks for hardware reinforcement.
- E. Bond edge banding to cores.
- F. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Provide solid blocking for through bolted hardware.
- G. Factory fit doors for frame opening dimensions identified on shop drawings.
- H. Cut and configure exterior door edge to receive recessed weather stripping devices.
- I. Provide edge clearances in accordance with AWI 1600.
- J. Coordinate with Section 08710. Undercut doors as scheduled. Undercuts are measured from top of finish floor covering or threshold.

## PART 3 – EXECUTION

### 3.01 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions.
- B. Install fire rated doors in accordance with AWI Quality Standard and NFPA 80.
- C. Trim non-rated door width by cutting equally on both jamb edges.
- D. Trim door height by cutting bottom edges to a maximum of ¼ inch (19mm). Trim fire door height at bottom edge only, in accordance with fire rating requirements.
- E. Machine cut for hardware.
- F. Coordinate installation of doors with installation of hardware specified in Section 08710.
- G. Coordinate installation of glass and glazing.
- H. Install door louvers plumb and level.

3.02 **INSTALLATION TOLERANCES**

- A. Conform to AWI requirements for fit and clearance tolerances.

3.03 **ADJUSTING**

- A. Adjust door for smooth and balanced door movement.

END OF SECTION

## SECTION 08305

### ACCESS PANELS

#### PART 1 – GENERAL

##### 1.01 QUALITY ASSURANCE

- A. Manufacture fire rated access doors and frames to conform to UL requirements.
- B. Provide labels indicating rating.

##### 1.02 SUBMITTALS

- A. Submit product data under provisions of Section 01330.
- B. Include sizes, types, finishes, scheduled locations, and details of adjoining work.

##### 1.03 ALTERNATES

- A. See Section 01230 for bidding alternates affecting the Work of this Section.

##### 1.04 COLORS

- A. Colors are specified in Colors/Materials Schedule.

##### 1.05 SUSTAINABLE BUILDING REQUIREMENTS

- A. See Section 01011 for sustainable building requirements affecting the Work of this Section.

#### PART 2 – PRODUCTS

##### 2.01 MANUFACTURERS

- A. Access Panel:
  - 1. J.L. Industries Type FDWB, Fire Rated Panel.
  - 2. Substitutions: Under provisions of Section 01600.
- B. Locks:

1. Corbin Russwin Cylinder Lock.

## 2.02 ACCESS PANEL

- A. Construction: Hinged lockable steel access door with 16-gauge frame and 14-gauge door, concealed hinge, lock, and adjustable anchor straps. Provide steel construction with prime coated finish.
- B. Size: As noted on drawings.
- C. Fire Rating: Door shall maintain fire rating of system installed in.
- D. Access door shall be keyed to the building key system.

## 2.03 MECHANICAL ACCESS DOORS

- A. Meet requirements of this Section. Provide by Division 15.

## 2.04 FINISH

- A. Prime coat with baked on primer.
- B. Field paint per Section 09900.

## PART 3 – EXECUTION

### 3.01 INSPECTION

- A. Verify rough openings for door and frame are correctly sized and located for coordination with access to concealed work and adjoining systems at access points.
- B. Beginning of installation means acceptance of existing conditions.
- C. Coordinate with Section 09260 for gypsum wallboard insert.
- D. Coordinate with Section 06112 for opening requirements.

### 3.02 INSTALLATION

- A. Secure rigidly in place in accordance with manufacturer's instructions.

END OF SECTION

## SECTION 08346

# SOUND-CONTROL DOOR ASSEMBLIES

### PART 1 – GENERAL

#### 1.01 SUMMARY

- A. This Section includes sound-control door assemblies consisting of swinging steel doors, steel frames, sound-control seals, and related accessories to achieve STC ratings indicated.
- B. Related Sections include the following:
  - 1. Division 8 Section “Steel Frames”; Non-sound-control, hollow-metal doors and frames.
  - 2. Division 8 Section “Flush Wood Doors”; Sound-control wood doors.
  - 3. Division 8 Section “Door Hardware”; Hardware to the extent not specified in this Section.
  - 4. Division 8 Section “Glazing”; Requirements for glazed lites in sound-control doors.
  - 5. Division 9 Section “Paints and Coatings”; Field painting sound-control door assemblies.

#### 1.02 PERFORMANCE REQUIREMENTS

- A. Sound Rating: Provide sound-control door assemblies that have been fabricated and tested as sound-retardant units, are identical to assemblies tested according to ASTM E 90 by an independent testing agency, and have the following minimum certified STC rating according to ASTM E 413:
  - 1. STC Rating: 53

#### 1.03 SUBMITTALS

- A. Product Data: Include sound ratings, construction and hardware preparation details, material and gasketing descriptions, core descriptions, label compliance,

dimensions of individual components and profiles, and finishes for sound-control door assemblies.

- B. Shop Drawings: In addition to requirements below, provide a schedule of doors and frames using same reference numbers for details and openings as those on Drawings.
  - 1. Elevations of each door design.
  - 2. Details of sound-control seals, door bottoms, and thresholds.
  - 3. Details of doors including vertical and horizontal edge details.
  - 4. Frame details for each frame type including dimensioned profiles.
  - 5. Details and locations of reinforcement and preparations for hardware.
  - 6. Details of each different wall opening condition.
  - 7. Details of anchorages, accessories, joints, and connections.
  - 8. Details of glazing frames and stops showing glazing.

#### 1.04 **QUALITY ASSURANCE**

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

#### 1.05 **PRODUCT HANDLING**

- A. Deliver doors and frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.
- B. Deliver frames with two (2) removable spreader bars across bottom of frames, tack welded to jams and mullions. Maintain integrity of spreader bars and door frame as works progresses.
- C. Store doors and frames under cover at Project site. Place units in a vertical position with heads up, spaced by blocking, on minimum 4 inch high, wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber.



1. If wrappers on doors become wet, remove cartons immediately. Provide minimum ¼ inch space between each stacked door to permit air circulation.

#### 1.06 **PROJECT CONDITIONS**

- A. Environmental Limitations: Do not deliver or install sound-control wood doors until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

#### 1.07 **SUSTAINABLE BUILDING REQUIREMENTS**

- A. See Section 01011 for sustainable building requirements affecting the Work of this Section.

### PART 2 – PRODUCTS

#### 2.01 **MANUFACTURERS**

- A. Basis-of-Design Product: Industrial Acoustics Co., Inc.; Noise-Lock.

#### 2.02 **STEEL DOORS**

- A. General: Provide flush-design doors, 2 – ¼ inches thick, of seamless hollow construction, unless otherwise indicated. Construct doors with smooth, flush surfaces without visible joints or seams on exposed faces or stile edges.
  1. Visible joints or seams around glazed lites are permitted.
  2. Bevel both vertical edges 1/8 inch in 2 inches.
  3. Core: Manufacturer's standard as required to provide STC rating indicated.
- B. Door Face Sheets: Fabricated from minimum 0.067 inch thick (14 gage), metallic-coated steel sheet.
- C. Glazing: As required by sound-control door assembly manufacturer to comply with sound-control requirements.

### 2.03 STEEL FRAMES

- A. General: Fabricate sound-control door frames of full-welded unit construction, with corners mitered, reinforced, and continuously welded full depth and width of frame. Knocked-down frames are not acceptable.
  - 1. Frames: Formed from minimum 0.067 inch thick (14 gage), cold-rolled steel sheet; split into two (2) pieces that are welded and mitered together.

### 2.04 DOOR HARDWARE

- A. General: Provide manufacturer's standard sound-control system, including head and jamb seals, door bottoms, cam-lift hinges, and thresholds, as required by testing to achieve STC rating indicated.
- B. Magnetic Seals: One-piece units; consisting of closed-cell sponge neoprene seal and resiliently mounted magnet held in place by metal retainer; with retainer cover of same material as door frame; attached to door frame with concealed screws.
- C. Automatic Door Bottoms: Neoprene or silicone gasket, held in place by metal housing that automatically drops to form seal when door is closed; mounted to bottom edge of door with screws.
- D. Push Pull Hardware: See Door Schedule for details.

### 2.05 FABRICATION

- A. General: Fabricate sound-control door assemblies to be rigid and free of defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
  - 1. Glazed Lites: Factory cut openings in sound-control doors.
- B. Steel Doors: Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Fabricate doors with faces joined at vertical edges by welding; welds shall be ground, filled, and dressed to make them invisible and to provide a smooth, flush surface.

C. Steel Frames: Accurately form metal to required sized and profiles, with minimum radius for thickness of metal. Weld exposed joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

1. Provide countersunk, flat or oval-head exposed screws and bolts for exposed fasteners, unless otherwise indicated.
2. Plaster Guards: Weld guards to frame at back of hardware cutouts and glazing-stop screw and sound-control seal preparations to close off interior of openings and prevent mortar or other materials from obstructing hardware operation or installation.
3. Jamb Anchors: Provide number and spacing of anchors as follows:
  - a. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
    - 1) Three (3) anchors per jamb up to 60 inches in height.
    - 2) Four (4) anchors per jamb from 60 up to 90 inches in height.
    - 3) Five (5) anchors per jamb from 90 up to 96 inches in height.
    - 4) Five (5) anchors per jamb plus one (1) additional anchor per jamb for each 24 inches or fraction thereof more than 96 inches in height.
    - 5) Two (2) anchors per head for frames more than 42 inches wide and mounted in metal stud partitions.

D. Hardware Preparation:

1. Steel Doors and Frames: Factory prepared sound-control doors and frames to receive template mortised hardware, including providing cutouts, reinforcement, mortising, drilling, and tapping, according to the Door Hardware Schedule and templates furnished as specified in Division 8 Section "Door Hardware."
  - a. Reinforce doors and frames to receive non-template mortised and surface-mounted door hardware.

- b. Comply with HMMA 830, "Hardware Preparation and Locations for Custom Hollow Metal Doors and Frames."
  - c. Locate door hardware as indicated, or if not indicated, according to HMMA 831, "Recommended Hardware Locations for Custom Hollow Metal Doors and Frames."
- E. Glazing: Factory install glazed lites according to requirements of tested assembly to achieve STC rating indicated.

## 2.06 STEEL FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
  - 1. Finish sound-control steel door assemblies after assembly.
- B. Metallic-Coated Steel Surface Preparation: Clean surfaces with non-petroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
  - 1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
- C. Factory Priming for Field-Painted Finish: Apply shop primer specified below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mils.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of sound-control door assemblies.
  - 1. Examine roughing-in for embedded and built-in anchors to verify actual locations of sound-control door frame connections before frame installation.

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

### 3.02 INSTALLATION

- A. General: Install sound-control door assemblies plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Frames: Install sound-control door frames in sizes and profiles indicated. NOTE: we strongly recommend door be installed by a manufacturer certified installer. At a minimum the door manufacturer provide on-site inspection and training.
  1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. Where frames are fabricated in sections due to shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, make splice smooth, flush, and invisible on exposed faces.
    - b. Remove temporary braces only after frames or bucks have been properly set and secure.
    - c. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    - d. Apply bituminous coating to backs of frames that are filled with mortar, grout, and plaster containing anti-freezing agents.
    - e. Floor anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with post-installed expansion anchors.
    - f. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
  2. Installation Tolerances: Adjust sound-control door frames for squareness, alignment to twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

- b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
  - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel line, and perpendicular to plane of wall.
  - d. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
- C. Doors: Fit sound-control doors accurately in frames, within clearances indicated below. Shim as necessary.
  - 1. Jambs: 1/8 inch.
  - 2. Head with Butt Hinges: 1/8 inch.
  - 3. Head with Cam-Lift Hinges: As required by manufacturer, but not more than 3/8 inch.
  - 4. Sill: Manufacturer's standard.
- D. Sound-Control Seals: Where seals have been pre-fit and pre-installed in the factory and subsequently removed for shipping reinstall seals and adjust according to manufacturer's written instructions.
- E. Cam-Lift Hinges: Install hinges according to manufacturer's written instructions.

### 3.03 **ADJUSTING AND CLEANING**

- A. Final Adjustments: Check and adjust operating hardware items just before final inspection. Leave work in complete and proper operating condition.
- B. Remove and replace defective work, including defective or damaged sound seals and doors and frames that are warped, bowed, or otherwise unacceptable.
  - 1. Adjust gaskets, gasket retainers, and retainer covers to provide contact required to achieve STC rating.

END OF SECTION

## SECTION 08410

# ALUMINUM ENTRANCES AND STOREFRONTS

### PART 1 – GENERAL

#### 1.01 REFERENCES

- A. AA (Aluminum Association) – Designation System for Aluminum Finishes.
- B. AAMA – Metal Curtain Wall, Window, Store Front and Entrance – Guide Specifications Manual.
- C. AAMA 501.2 – Methods of Test for Metal Curtain Walls.
- D. AAMA 603.8 – Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum.
- E. AAMA 605.2 – Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
- F. AAMA 606.1 – Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum.
- G. AAMA 607.1 – Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
- H. AAMA SFM-1 – Aluminum Storefront and Entrance Manual.
- I. ASTM A36/A36M – Structural Steel
- J. ASTM B209 – Aluminum and Aluminum – Alloy Sheet and Plate.
- K. STM B221 – Aluminum – Alloy Extruded Bar, rod, Wire, Shape, and Tube.
- L. ASTM E283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
- M. ASTM E330 – Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

## 1.02 PERFORMANCE REQUIREMENTS

- A. Window components to provide for expansion and contraction caused by a cycling temperature range of 170 degrees F without causing detrimental effects to components.
- B. Design and size members to withstand dead loads and live loads caused by pressure and suction of wind as calculated in accordance with structural notes and applicable codes.
- C. Limit mullion deflection to 1/175, or flexure limit of glass with full recovery of glazing materials, whichever is less.
- D. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior.
- E. Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of assembly surface area. Water infiltration shall be tested in accordance with ASTM E331. No water penetration at a test pressure of 6.24 psf.

## 1.03 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01330.
- B. Include wall opening and component dimensions; wall opening tolerances required; anchorage and fasteners; affected related work; installation requirements.
- C. Submit manufacturer's installation instructions under provisions of Section 01330.
- D. Submit samples under provisions of Section 01330.

## 1.04 QUALITY ASSURANCE

- A. Perform work in accordance with AAMA – Metal Curtain Wall, Window, Store Front and Entrance – Guide Specification Manual.
- B. Manufacturer: Company specializing in manufacturing aluminum glazing systems with minimum three (3) year documented experience.



1.05 **DELIVERY, STORAGE AND PROTECTION**

- A. Section 01600 – Product Requirements: Transport, handle, store and protect products.
- B. Protect finished aluminum surfaces. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.06 **WARRANTY**

- A. Provide five (5) year manufacturer warranty for glazed units, under provisions of Section 01700.
- B. Warranty: Include coverage for complete system for failure to meet specified requirements.

1.07 **COLORS**

- A. Colors are specified in Colors/Materials Schedule.

1.08 **ALTERNATES**

- A. See Section 01230 for bidding alternates affecting the Work of this Section.

1.09 **SUSTAINABLE BUILDING REQUIREMENTS**

- A. See Section 01011 for sustainable building requirements affecting the Work of this Section.

PART 2 – PRODUCTS

2.01 **MANUFACTURERS**

- A. General: The following manufacturers are acceptable provided they supply products meeting the requirements of this specification and specification standard:
  - 1. U.S. Aluminum
  - 2. Arch Aluminum & Glass Co.
  - 3. Kawneer

- B. Substitutions: Under provisions of Section 01600.

## 2.02 MATERIALS

- A. Extruded Aluminum: ANSI/ASTM B221; 6063-T5 alloy and temper.
- B. Steel Sections: ANSI/ASTM A36; shapes to suit mullion sections.
- C. Primer: FS TT-P-31; red; for shop application and field touch-up.
- D. Touch-up Primer for Galvanized Surfaces: FS TT-P-641.

## 2.03 ALUMINUM WINDOW WALL SYSTEM WINDOWS AND ENTRANCES

- A. Specification Standard: U.S. Aluminum, Window Wall – SB 525.
- B. Framing System: 2 – ¼” x 5 – ¼” thermally broken aluminum framing system to accept 1” glazing.
- C. Doors: Medium stile, center hung, to accept 1 “insulated glazing.
  - 1. Provide all necessary hardware not identified in hardware schedule Section 08210.
- D. Windows: U.S. aluminum, Series 7400. Operable windows.
- E. Storefront Extensions: Provide aluminum storefront extensions as shown on drawings.
- F. Utilize manufacturer’s 90 degree outside corner, 90 degree inside corner at corners.
- G. Provide doorjamb and head frame section similar to TJ450 with continuous vinyl thermal break. Provide all accessories necessary to accept hollow metal door with butt hinges into aluminum storefront system. Provide steel reinforcement for door hinge attachment.
- H. Glazing Gaskets: Elastomeric extrusions of manufacturer’s standard.
- I. Fasteners: Stainless steel.
- J. Sealant: Single component urethane – See Section 07900 for acceptable manufacturer’s products.

- K. Reinforcement: As recommended by manufacturer to achieve deflection limits specified herein.
- L. Factory Finish:
  - 1. Clear anodized aluminum finish conforming to: AA-M12-C22-A31.
  - 2. Fluoropon paint coating conforming to AAMA 2605.
- M. Flashing: 0.032 inch aluminum sheet, shape as shown on drawings. Finish to match adjacent storefront framing.
- N. Filler: Provide manufacturer's standard filler pieces for open backs of jamb, sill, and head framing.
- O. Subsill: Provide manufacturer's standard subsill and subsill end closures to form a continuous flashing pan at the bottom of exterior storefront framing.
- P. Accessories: Provide all clips, fasteners, connectors, etc., required for a complete installation and as recommended by manufacturer.

#### 2.04 **GLASS AND GLAZING MATERIALS**

- A. Glass and Glazing Materials: As specified in Section 08800.
- B. Butt Glazed Glazing System: Refer to Section 10999.
- C. Glass: Provide all clips, fasteners, connectors, etc., required for a complete installation and as recommended by manufacturer.

#### 2.05 **FABRICATION**

- A. Fabricate components with minimum clearance and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corner. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.

- E. Prepare components with internal reinforcement for door hardware and door operator hinge hardware.
- F. Reinforce framing members for imposed loads.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify wall openings and adjoining air and vapor seal materials are ready to receive Work of this Section.
- C. Beginning of installation means acceptance of existing conditions.

### 3.02 INSTALLATION

- A. Install storefront framing system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, *aligning with adjacent work*.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- H. Install hardware specified in this Section and in Section 08710 in accordance with hardware and entrance manufacturer's instructions and Section 08710. Adjust for proper operation. Install thresholds on top of finish flooring.
- I. Install glass and infill panels in accordance with Section 08800, to exterior dry method of glazing.

J. Install perimeter sealant in accordance with Section 07900.

**3.03 ADJUSTING**

A. Adjust operating hardware for smooth operation.

**3.04 CLEANING**

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

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

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

**3.05 FIELD TESTING**

A. Perform leak testing per ASTM E1105 at the specified 6.24 psf. Tests should be performed on the first installed unit (mock-up) including perimeter seals and at 1 to 2 other random locations during construction.

(INSERT WINDOW – TYPICAL DETAILS DRAWING)

END OF SECTION

## **SECTION 08710**

### **FINISH HARDWARE**

#### **PART 1 – GENERAL**

##### **1.01 SUMMARY**

Pacific Lutheran University expects quality finish hardware that remains functional, flexible, reliable, and serviceable over many years with a minimum amount of maintenance.

##### **1.02 SCOPE OF STANDARD**

- A. This standard includes all commercial “Finish or ‘Builders’ Hardware” which is required for swing type doors. Under no circumstances must a door need to be removed from its hinges in order to perform maintenance on the hardware. Also, these standards are to include keying system requirements and, in specific cases, card access systems.
- B. Types of finish hardware covered by this standard include the following:
  - 1. Hanging devices.
  - 2. Securing Devices (inactive leaf of paired openings)
  - 3. Securing Devices (active leaf of paired openings and single doors)
  - 4. Non-Mechanical Trim
  - 5. Accessories for Pairs of Doors Only
  - 6. Door Control Devices.
  - 7. Protective Plates.
  - 8. Stops and Holders.
  - 9. Accessories.
  - 10. Miscellaneous Hardware.
  - 11. Electrified Hardware.
  - 12. Key Control System

##### **1.03 STANDARD OF CERTIFICATION**

- A. All locksets shall be certified by ANSI, UFAS, ADA, and UL. Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and local building code requirements.

#### 1.04 **JOB CONDITIONS**

- A. Coordination: Coordinate hardware with other work. Tag each item or package separately, with identification related to the final hardware schedule, and include basic installation instruction in the package. Furnish hardware items of proper design for used on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project area) for installation.
- B. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check the shop drawings of such other work, to confirm that adequate provisions are made for the proper installation of hardware (especially as it relates to fire rating of door assemblies and electrically activated hardware).

#### 1.05 **MAINTENANCE**

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

#### **RELATED DOCUMENTS**

- A. The drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Section 1 requirements apply to the Work of this Section.

#### 1.06 **MATERIAL INCLUDED**

- A. Provide all items of finish hardware for the project as shown on the drawings or included herein, including appropriate fasteners and miscellaneous materials as required to complete the Work of the Section and provide a proper installation.
- B. Except as noted herein, Hardware items listed elsewhere in this specification shall not be a requirement of this division.

#### 1.07 **QUALITY ASSURANCE**

- A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from only one manufacturer offering products complying with these specifications.

- B. Supplier Qualifications: A recognized builders hardware supplier who has been furnishing hardware in the Project's vicinity for a period of two years, and who is or employs a registered architectural hardware consultant (AHC) who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements to Owner, Architect, and Contractor.
- C. Warranty: Door Closers – 10 years, Exit Devices – 5 years. The remainder of door hardware shall have a 1 year warranty.

#### 1.08 Codes and Standards

- A. All work shall conform to the following codes, regulations and standards of latest issue.
  - 1. The Uniform Building Code – 2001  
ANSI/NFPA – NO. 80 FIRE DOORS AND WINDOWS  
ANSI/NFPA – NO. 101 LIFE SAFETY CODE  
UL – BUILDING MATERIALS LIST  
Department Of Justice Public Law 101-336 – Americans with Disabilities Act.
  - 2. Fire rated Openings: All hardware for fire rated openings shall be listed by recognized testing laboratory and approved for use in that application.
- B. Supplier Qualifications
  - 1. A recognized distributor who has been furnishing hardware in the same area as the project for a period of not less than five (5) years and has successfully completed projects similar in type and scope. The distributors' organization shall employ certified Architectural Hardware Consultants and locksmiths who are available at all reasonable times during the course of construction to meet with the Owner, Architect or Contractor for hardware of keying consultation.
  - 2. The Hardware supplier shall be a factory authorized distributor of the material provided and shall maintain a stock and parts inventory of all standard items supplied on the Project for future service to the Owner.

#### 1.09 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information for each item of hardware. Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish. Schedule in vertical format.
- B. Submittal Sequence: Submit Hardware schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule (e.g., pressed metal frames). Include with schedule the product date, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.



- C. Keying Schedule: Submit separate detailed schedule indicating clearly how the Pacific Lutheran University Lock Shop's final instructions on keying of locks has been fulfilled.
- D. Samples: Prior to submittal of the final hardware schedule and prior to final ordering of hardware, submit one sample of each type of exposed hardware unit, finish as required, and tagged with full description for coordination with schedule.
  - 1. Samples will be returned to the supplier. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated in the Work, within limitations of keying coordination requirements.
- E. Submit the following in accordance with the Conditions of the Contract and Division 1 Specification Sections.
  - 1. Finish Hardware Schedule:
    - a. At the earliest possible date after receipt of purchase order submit six (6) copies of the completely detailed hardware schedule. List hardware schedule for each door opening separately, using a vertical format. Schedule is to include all quantities, part numbers, sizes and finishes. Provide four (4) copies of catalog cuts for each item proposed for use on this Project. Provide physical samples when requested by the Architect.
    - b. Upon receipt of reviewed schedule, promptly incorporate any corrections and changes in the reviewed submittal and return two (2) copies of the revised schedule and complete sets of templates to the Contractor for his use. These schedules shall be kept current throughout the Project with new pages being issued to reflect any changes that may occur.
    - c. Acceptance of the hardware schedule does not relieve the supplier of responsibility for errors or omissions.
    - d. The hardware schedule shall include a Keying Schedule showing all keyed items or hardware for the Owners use.
  - B. Templates: Upon receipt of reviewed schedule supply templates or physical hardware to fabricator of factory prepared doors, frames, and other work affected. Upon request, check the associated shop drawings to confirm that adequate provisions are made for proper installations.
  - C. Special Tools: The Contractor is to provide to the Owner two (2) sets of any special tools shipped with the finish hardware products required for maintenance and installation. Deliver to Owner at completion of Work.

- D. Warranty: The finish hardware shall carry a limited warranty against defects in workmanship and operation for a period of one (1) year from date of substantial completion. Door Closers shall have a ten (10) year limited warranty. Electrical components are to have a two (2) year warranty.

**1.10 DELIVER, STORAGE, AND HANDLING**

- A. Tag each item or package to clearly identify the item and its intended location. Provide a packing list which clearly indicates the carton location of each item.
- B. Inventory hardware jointly with Contractor and hardware supplier's representative until both parties are satisfied that the count is correct. A dry, locked storage space shall be provided for the checking, sorting and storage of the hardware.
- C. Substitutions: To assure a uniformly high quality of materials for the Project it is intended that only specified items be furnished.

Material by other manufacturers listed as acceptable may be submitted subject to the acceptance of the Architect that they are equal to the specified item in quality, design, finish and function.

**PART 2 – PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURERS**

- A. Provide products listed in the Hardware Schedule in sufficient quantities to complete the job requirements. No requests for substitution will be accepted prior to bidding. Manufacturers used in the hardware groups are listed in bold.

Butts & Hinges:	Mckiney, Hager, Bommer
Locks and cylinders:	Best (No Sub)
Exit Devices:	Precision, Von Duprin
Power supplies:	Presicion, Von Duprin
Overhead Closers:	LCN
Automatic Operators:	Keene Monroe
Electric Strikes:	HES, Folgar Adams
Overhead Stops & Holders:	Glynn Johnson, ABH
Flat goods & trims:	Trimco, Ives
Thresholds & Gasket:	Pemko, National Guard

- B. Any item occurring in the Hardware Schedule but not listed in this Section shall be furnished as shown in the schedule.

**2.02 HARDWARE FINISH**

- A. Finish of Locksets will be US26D (626) Satin Chrome. Except as noted otherwise in the schedule, other items of finished hardware shall be of a finish and texture to match the

lockset finish. Closures will have manufacturer's standard finish system unless plated closures are specified. Kick-plates to be 630 Stainless Steel. The designations used for the hardware finishes are those listed in ANSI/BHMA A156.18, "Materials and Finishes".

1. Finishes for hardware units at each door or opening, to the greatest extent possible shall be US10 or US26D. In general, match all hardware items to a standard finish for a singular building. US26D is recommended for new buildings using US32D for exterior door and interior doors that will be exposed to high moisture or caustic conditions.

## 2.03 BUTTS

- A. Type: as scheduled.
- B. Size: 3'4" wide and under – 4 – ½" x 4 – 1/2". 3"4" wide and over – 4 – ½" x 4 – ½" heavy weight. Provide wide throw hinges where required due to trim applications or other conditions. Provide heavy duty hinges for heavily used locations.
- C. Quantity: Three (3) each up to and including 90" in height. Add one (1) additional hinge for every additional 30" or fraction thereof. Dutch doors will have a minimum two (2) pair of hinges. For unusual size or weight doors, furnish type, size, and quantity recommended by manufacturer.
- D. All exterior outswinging doors to have non-removable pins.

## 2.04 LOCKSETS

- A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.
  1. Provide flat lip strikes for locks with one-piece, anti-friction latch bolts as recommended by manufacturer.
  2. Provide recess type top strikes for bolts locking into head frames, unless otherwise indicated.
  3. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.
  4. Provide mud boxes and conduits in frames and doors at locations for electronic or security hardware.
- B. Lock Throw: Provide ¾" minimum throw of latch and 1" minimum throw of deadbolt used on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

- C. Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze, or stainless steel with minimum 12" long rod.
- D. Locksets: All locksets and latches shall be the product of one manufacturer with functions as indicated in the hardware groups. All locksets shall be U.L. listed for use on fire doors.
- E. Backset: 2 – 3/4"
- F. Locksets and latches shall be furnished with strikes having a sufficient strike lip to protect trim.

#### 2.05 LOCK BOXES

- A. To comply with local ordinance requirements, Cornell University requires the provision of exterior lock boxes for emergency rapid entry. All new and existing buildings that have fire alarm and/or fire detection systems which interconnect with the fire department are to be covered by this standard. Alarm system interconnects include, but are not limited to, municipal fire alarm, radio, telephone leased line, telephone dialer, or central station systems.
- B. Lock box for the storage of building keys shall be as follows:
  - 1. Manufacturer: The Knox Company, 846 Production Place, Newport Beach, CA. 92663
- C. Model and location of lock box shall be prescribed and established by the fire department with jurisdiction. Lock boxes shall be installed and affixed to the structure in accordance with the manufacturer's detailed instructions.

#### 2.06 KEYING

- A. The Pacific Lutheran University Lock Shop will specify all keying systems for coordination and integration with the campus keying program. Contact the Pacific Lutheran University Facilities Management Department at 253-535-7380 for keying instructions.
- B. Definitions:
  - 1. Construction Key: Key used during construction before occupancy by construction personnel.
  - 2. Master Key: operates all locks in portion of system assigned to it.
  - 3. Grand Master Key: Operates all locks in system, including possibly several master keyed systems.
  - 4. Great Grand Master Key: Operates all locks in an area or college, including master and grand master keyed systems.

- C. All keying and key orders shall be placed with the approval of Pacific Lutheran University Lock Shop Supervisor.
- D. Lock manufacturer shall forward master keys, grand master keys, and great grand master keys to the Pacific Lutheran University Lock Shop.
- E. Keys and cylinders shall be stamped with the keyset number as directed by the Pacific Lutheran University Lock Shop.
- F. Construction Keying:
  - 1. Required on all Pacific Lutheran University projects. The final keys and cylinders shall not be used during construction.
- G. Keys to be forwarded to the Pacific Lutheran University Lock Shop for distribution:
  - 1. Cylinder locks: Three (3) each.
  - 2. Master keys: Six (6) each.
  - 3. Grand master keys: Two (2) total.
  - 4. Great grand master keys: Two (2) total.
  - 5. Uncut Change Key Blanks: Fifty (50) for each different key way.
- H. All cylinders are to be keyed into existing PLU system as directed by the Owner. Provide:
  - 1. Master keys
  - 2. Construction Keys
  - 3. Change Keys per KA group or KD lock
  - 4. Control Keys
- I. Stamp all keys with keyset symbols.

## 2.07 EXIT DEVICES

- A. Provide low profile push pad type devices with opposing lever handles. Lever handles to match lever handles on locksets.
- B. Exit Devices shall be "UL" listed for life safety. All exit devices for fire rated openings shall have "UL" labels for "Fire Exit Hardware."

- C. All exit devices mounted on labeled wood doors shall be thru-bolted mounted on the door per the door manufacturer's requirements.
- D. All trim shall be thru-bolted to the lock stile case.
- E. Exit Device Dogging: Except on fire-rated doors, where closers are provided on doors equipped with exit devices, equip the units with keyed cylinder dogging device to keep the latch bolt retracted, when engaged.
- F. Provide trim with through-bolted mounting. Where levers are specified provide in a design compatible with the Locksets.

#### 2.08 **SILENCERS**

- A. Provide three (3) silencers for each single door. Provide two (2) silencers for each pair of doors.

#### 2.09 **PUSHES & PULLS, KICK PLATES**

- A. Concealed Fasteners: Provide manufacturer's special concealed fastener system for installation, thru-bolted for matched pairs but not for single units.

#### 2.10 **MANUAL FLUSH BOLTS**

- A. Provide as specified in hardware groups.

#### 2.11 **AUTOMATIC FLUSH BOLTS & COORDINATORS**

- A. Provide as specified in hardware groups.

#### 2.12 **DOOR TRIM UNITS**

- A. Fasteners: Provide manufacturers' standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units) of either machine screws or self-tapping screws.
- B. Protection Plates: Fabricate protection plates (armor, kick or mop) not more than 2" less than door width by the height indicated.

#### 2.13 **DOOR CLOSERS, SURFACE**

- A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit depending on size of door, exposure to weather, and anticipated frequency of use.

- B. Closers to be mounted on door rather than on frame and should be mounted away from view of general public.
- C. Access-Free Manual Closers: Where manual closers are indicated for doors, provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing.
- D. Electric Door Holders: Provide units designated to hold door in open position under normal usage and to release door automatically under fire conditions.
- E. Closers to have full rack and pinion hydraulic operation with separate controls for closing and latching speeds.
- F. Furnish drop plates or other mounting plates where required. Provide Closer of proper size and mounting style for each opening.
- G. Furnish sex nuts and bolts for all doors.
- H. Provide as specified in hardware groups.

#### 2.14 THRESHOLDS

- A. Thresholds shall not exceed 1/2" (one half inch) in height, typically, at any accessible entrance.
- B. Cope thresholds tightly around frames. Seal around edges to close all gaps between thresholds and frames.

#### 2.15 OVERHEAD STOPS

- A. Concealed holders to be installed with the jamb bracket mortised flush with the bottom of the jamb. The arm and channel to be mortised into the door. Construction of channel shall be formed stainless steel with stainless steel end caps.
- B. Surface mounted holders to be installed with the jamb bracket mounted on the stop.
- C. Provide proper size overhead stop for door width.
- D. All surface overhead stops shall be through-bolted with sex nuts and bolts.

#### 2.16 HINGES AND PIVOTS

- A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- B. Screws: Furnish Phillips flat-head screws. Use all-purpose or machine screws for installation of units in hollow metal. Use wood screw for installation of units in wood. Finish screw heads to match surface of hinges or pivots.

- C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  - 1. Type: a. Steel Hinges: Steel pins b. Non-ferrous Hinges: Stainless steel pins
  - 2. Exterior Doors: Non-removable pins.
  - 3. Interior Doors: Non-rising pins.
  - 4. Lockable Door with hinge on Key Side: Non removable pins.
- D. Number of Hinges: Provide number of hinges indicated, but not less than three (3) hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.
- E. Size of Hinges: 4 1/2" x 4 1/2" unless noted otherwise in schedule.
- F. Continuous Hinges
  - 1. Continuous hinges to be manufactured of extruded 6063-T6 aluminum alloy with anodized finish (painted gear cap only).
  - 2. All hinges shall be manufactured to template. Uncut hinges shall be non-handed and shall be a pinless assembly of three interlocking extrusions applied to the full length of the door and frame without mortising.

#### 2.17 PROTECTION PLATES

- A. Size: All plates shall be 2" less than door width on push side except pairs of doors shall be 1" less than door width where the application permits. All plates shall be 1" less than door width on pull side except where metal door edges are used. When any plates are used in conjunction with vertical rod exit devices, modify width as necessary. Kick plates shall be 10" in height. Mop plates shall be 4" in height. Armor plates shall be 36" in height.

#### 2.18 GASKET, THRESHOLD & INTUMESCENT SEALS

- A. Type as specified in hardware groups.
- B. Provide material of proper size and configuration for the specified.
- C. Fire assemblies will comply with the requirement of UBC Standard 7-2.



## PART 3 – EXECUTION

### 3.01 HARDWARE INSTALLATION

- A. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted, or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- B. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- C. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with American National Standards Institute (ANSI) standards.
- D. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.
- E. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.
- F. Installation shall be by skilled craftsmen experienced in the installation of commercial builders' hardware, and shall be in accordance with the approved shop drawings of Section 08110, Hollow Metal and 08210, Wood Doors. Manufacturers' standard locations shall apply except as otherwise directed by the Architect or as required to meet applicable code requirements. Where cutting and fitting are required to install hardware onto or into surfaces that are later to be finished, coordinate removal, storage and reinstallation with the finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- G. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- H. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- I. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 7 Section "Joint Sealers".
- J. Weather-stripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

### 3.02 ADJUSTING, CLEANING AND DEMONSTRATING

- A. Adjust and check each operation item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate

freely and smoothly or as intended for the application made. Where hardware is installed more than one (1) month prior to the acceptance or occupancy of a space or area, the installer is to return to the installation during the week prior to the acceptance or occupancy and make a final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for the final operation of the heating, ventilating, and air conditioning (HVAC) equipment. Clean any adjacent surfaces soiled by hardware operation.

- B. Clean adjacent surfaces soiled by hardware installation. Remove all temporary labels, construction marks, and soil from door hardware.
- C. Instruct the Pacific Lutheran University Lock Shop personnel in the proper adjustment and maintenance of door hardware and hardware finishes.
- D. Approximately six (6) months after acceptance of hardware in each area, Installer shall return to the Project and make any necessary adjustments to the hardware to restore properly operating functions of the door and hardware. Consult with and instruct Owner's personnel in any recommended additions or maintenance procedures. Replace hardware items that have deteriorated or failed due to faulty design or installation. Prepare a written report of current or predictable problem (of a substantial nature) in the hardware performance. If there is a hardware problem the installer can not resolve, the finish hardware supplier and a representative of the manufacturer of the product concerned shall be contacted. At a mutually convenient time the installer, the hardware supplier and the manufacturer's representative shall meet at the jobsite to review and try to resolve the problem. This meeting shall be at no charge to the Owner or Contractor unless the problem is determined to be the result of faulty installation.
  - 1. Re-adjust each item of door hardware, as per a list to be compiled by the Installer and agreed to by the Pacific Lutheran University Lock Shop, to restore function of doors and hardware to comply with specified requirements.
  - 2. Consult with and instruct Pacific Lutheran University Lock Shop personnel in recommended additions to the maintenance procedures.
  - 3. Replace hardware items that have deteriorated or failed due to faulty design, materials, or installation of hardware units.
  - 4. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.
  - 5. All exterior doors that are a set of two require center lockable mullion with key. No rods are to be used.
  - 6. Both doors are to be activated when swiped and have retractable latches.
  - 7. Doors shall be electric strike vs. electrified crash bar.

8. Matching color of FRP Pad is to be located under card swipe to prevent gouging of wall.

### 3.03 **HARDWARE SCHEDULE**

- A. Refer to door schedule and related information concerning the following hardware groups. Quantities indicated in any instance are for supplier convenience only and are not guaranteed.

END OF SECTION

## SECTION 08800

### GLAZING

#### PART 1 – GENERAL

##### 1.01 REFERENCES

- A. ANSI Z97.1 – Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.
- B. ASTM E774 – Sealed Insulating Glass Units.
- C. ASTM E84 – Surface Burning Characteristics of Building Materials.
- D. ASTM E163 – (UL9) Fire Resistive-Rated Wire Glass.
- E. SIGMA – Selected Insulated Glass Manufacturers Association.
- F. FGMA – Glazing Manual and Glazing Sealing Systems Manual.
- G. U.S. Consumer Product Safety Commission Standard CFR 1201 C1 and C11.
- H. IBC – International Building Code.

##### 1.02 QUALITY ASSURANCE

- A. Conform to Flat Glass Marketing Association (FGMA) Glazing Manual and Glazing Sealing Systems Manual and SIGMA for glazing installation methods.
- B. Insulating glass unit shall be manufactured by a SIGMA member.
- C. Provide safety glazing where required by the IBC.

##### 1.03 SUBMITTALS

- A. Submit product data and samples under provisions of Section 01340.
- B. Product Data: Provide manufacturer's product description for each type of glass and product specified.

- C. Samples: Submit two (2) 12" x 12" samples of each glass type specified. Identify glass manufacturer and glass type clearly on each sample.

**1.04 DELIVERY, STORAGE AND PROTECTION**

- A. Protect glass materials during delivery, storage, and handling to comply with manufacturer's direction and as required to prevent edge damage.

**1.05 WARRANTY**

- A. Provide ten (10) year manufacturer's warranty to sealed insulating glass. Include coverage for sealed glass units from seal failure, inter-pane dusting to misting, and replacement of same.
- B. Replace any units failing to comply at no additional cost to the Owner within 45 days after receipt of written notice.

**1.06 ALTERNATES**

- A. See Section 01230 for bidding alternates affecting the Work of this Section.

**1.07 COLORS**

- A. Colors are specified in Colors/Materials Schedule.

**1.08 SUSTAINABLE BUILDING REQUIREMENTS**

- A. See Section 01011 for sustainable building requirements affecting the Work of this Section.

**PART 2 – PRODUCTS**

**2.01 ACCEPTABLE GLASS MANUFACTURERS**

- A. The following manufacturers may provide products equal to products specified.
  - 1. Pilkington
  - 2. Guardian Industries Corporation
  - 3. P.P.G. Industries
- B. Substitutions: Under provisions of Section 01640.

## 2.02 GLASS MATERIALS

- A. Float Glass: FS DD-G-451; Type 1, Class 1, clear quality; ¼ inch thick minimum.
- B. Safety Glass: Fully tempered with horizontal tempering conforming to ANSI Z97.1. Provide permanent etched mark on corner of each panel indicating safety glass. Provide clear, tinted, and mirror glass types; ¼ inch thick minimum.
- C. Firelite Glass: ASTM E2074 and ASTM E2010, fire resistive rated glass, clear, polished both sides; ¼ inch thick minimum.
- D. Tinted Glass: Float and safety, light-green color, visible light transmittance of 64% and shading coefficient of 0.51; (values based on ¼ inch thick glass); PPG Sungate Solexia or equal ¼ inch thick minimum.
- E. Etched Glazing: Float glazing, acid etched on one face for translucent appearance. ¼ inch minimum thickness.
- F. Mirror Glass: Clear tempered safety glass with copper and silver coating; organic over coating, edges ground smooth, ¼ inch thick minimum.
- G. Insulating Glass Units: ASTM E774 Class CB, double pane hermetically sealed unit, ½ inch minimum air space, conform to SIGMA Specifications, five (5) year minimum warranty. Low-E coating on insulating units to side #2. U-value: 0.35 for winter nighttime. Aluminum spacer to be clear anodized.
- H. Studio Windows: Laminated Tempered Glazing Units with polyvinyl butyral interlayer.

## 2.03 GLAZING TYPES

- A. Type A: (At Fire-Rated Openings) Single pane of Firelite glass.
- B. Type B: (At locations noted on drawings) Single pane of clear safety glass.
- C. Type C: (Exterior WindoWall and Doors) Insulating glass unit with tinted float or safety glass exterior pane and clear float or safety glass interior pane (Low-E coating on side #3)
- D. Type D: (Exterior WindoWall and Doors) Insulating glass unit with tinted float or safety glass exterior pane and clear float or safety glass interior pane (Reflective Coating on side #2) (Low-E coating on side #3).

- E. Type E: (Exterior WindowWall and Doors) Insulating glass unit with tinted float or safety glass exterior pane and clear float or safety glass interior pane. (Reflective Coating on side #2) (Low-E coating on side #3) (Etched Coating on side #4).
- F. Type F: (Exterior WindowWall) Insulating glass unit with tinted float glass exterior pane and clear float glass interior pane. (Low-E coating on side #2) (Etched coating on side #3)
- G. Type G: (Interior Location) Single pane of mirror glass.
- H. Type H: (Interior Location) Single pane of clear float glass.

#### 2.04 **GLAZING ACCESSORIES**

- A. Setting Blocks: Neoprene; 70-90 Shore A durometer hardness.
- B. Spacer Shims: Neoprene; 50 Shore A durometer hardness.
- C. Glazing Tape: closed cell polyvinyl chloride foam, black color, coiled on release paper over adhesive on two (2) sides (or one side where noted), maximum water absorption by volume of two percent, designed for compression of 25% to effect an air and vapor seal; size as required to suit condition.
- D. Glazing Splines: Resilient neoprene extruded shape to suit glazing channel retaining slot; type recommended by aluminum storefront and curtain wall manufacturer.
- E. Glazing Clips: Manufacturer's standard type.
- F. Silicone Sealant: FS TT-S-1543; Class A; single component; solvent curing; capable of water immersion without loss of properties; cured Shore A hardness of 15-25; stock color selected by Design Consultant.

### PART 3 – EXECUTION

#### 3.01 **INSPECTION**

- A. Verify surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.
- B. Beginning of installation means acceptance of substrate.

### 3.02 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses.
- C. Prime surfaces scheduled to receive sealant.

### 3.03 EXTERIOR GLAZING – WET METHOD (SEALANT AND SEALANT)

- A. *Install glazing in doors and windows per manufacturer's recommendations.*

### 3.04 INTERIOR GLAZING – DRY METHOD (TAPE AND TAPE)

- A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
- B. Place setting blocks at ¼ points with edge block no more than 6 inches from corners.
- C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- D. Place glazing tape on free perimeter of glazing in same manner described above.
- E. Install removable stops without displacement of tape. Exert pressure on tape for full continuous contact.
- F. Knife trim protruding tape.
- G. Fire-Rated Wire Glass: Install as recommended by glass manufacturer to achieve fire rating.
- H. Mirrors: Install mirrors with glazing tape compatible with mirror coatings (adhesive one side only) applied horizontally to wall construction behind mirror at 10 inches (maximum) on center and at wood trim retainers.

### 3.05 CURE, PROTECTION AND CLEANING

- A. Protect exterior glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove non-permanent labels and clean surfaces. Cure sealants for high early strength and durability.



- B. Remove and replace which is broken, chipped, cracked, abraded, or damaged in other ways during construction period; including natural causes, accidents, and vandalism.
  
- C. Wash and polish glass on both faces not more than four (4) days prior to date scheduled for inspections intended to establish date of completion in each area of project. Comply with glass product manufacturer's recommendations for final cleaning.

END OF SECTION