

## SECTION 08 11 13

### HOLLOW METAL DOORS AND FRAMES

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section Includes:

1. Standard hollow metal doors and frames.
2. Special Doors including hardware.

###### B. Related Sections:

1. Division 08 Section "Door Hardware" for door hardware.
2. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

##### 1.2 DEFINITIONS

###### A. Minimum Thickness: Minimum thickness of base metal without coatings.

###### B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

##### 1.3 SUBMITTALS

###### A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions and finishes.

###### B. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.

###### C. Samples for Verification:

1. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 125 mm).

D. Other Action Submittals:

1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
  1. Provide additional protection to prevent damage to finish of factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.
  1. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Amweld Building Products, LLC.
  2. Benchmark; a division of Therma-Tru Corporation.
  3. Ceco Door Products; an Assa Abloy Group company, as the basis of design.
  4. Curries Company; an Assa Abloy Group company.
  5. Kewanee Corporation (The).
  6. Steelcraft; an Ingersoll-Rand company.

### 2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. (96- to 192-kg/cu. m) density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
1. Spray or foam insulation is also acceptable.

- I. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

## 2.3 STANDARD HOLLOW METAL DOORS

- A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
  1. Design: Flush panel.
  2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.
    - a. Thermal-Rated (Insulated) Doors: Where indicated, provide doors fabricated with thermal-resistance value (R-value) of not less than 6.0 deg F x h x sq. ft./Btu (1.057 K x sq. m/W) when tested according to ASTM C 1363.
      - 1) Locations: Exterior doors.
  3. Vertical Edges for Single-Acting Doors: Manufacturer's standard.
- B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
  1. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 1 (Full Flush)
- C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- D. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

## 2.4 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Exterior Frames: Fabricated from metallic-coated steel sheet.
  1. Fabricate frames with mitered or coped corners.
  2. Fabricate frames as full profile welded.
  3. 14 gage steel sheet.
  4. Ceco Door "Series SQW Gasketed" steel frames, as the basis of design.
- C. Interior Frames: Fabricated from cold-rolled steel sheet.
  1. Fabricate frames with mitered or coped corners.
  2. Fabricate frames as full profile welded.
  3. 16 gage steel sheet.
  4. Ceco Door "Series SQW Gasketed" steel frames, as the basis of design.

- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

## 2.5 SPECIAL DOORS

- A. Exterior “Storm Sentry”, hurricane rated doors, frames and hardware by Total Door, 800-852-6660, as the basis of design.
- B. Frames: Steel to be factory finished.
- C. Continuous hinge and locking channels: Two-part polyurethane coated of color to be selected by the Architect and factory finished.
- D. Door Bodies:
  - 1. 16 gage continuous hinge and latch stiles.
  - 2. Solid polyurethane foam core continuously bonded to door skins.
  - 3. Minimum 18 gage door skins.
- E. Door Finishes:
  - 1. Exterior: Factory finished with two-part catalyzed polyurethane of custom color selected by the Architect.
  - 2. Interior: Wood to be selected by the Architect.
- F. Hardware:
  - 1. Grip 52, with cylinder lock, on exterior, with dark bronze finish.
  - 2. Exit Devices on Interior: Wood finish to match door panel.
  - 3. Concealed closers.

## 2.6 FRAME ANCHORS

- A. Jamb Anchors:
  - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick or to accommodate existing conditions.
  - 2. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:
  - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

## 2.7 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. 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.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
  - 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- C. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
  - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  - 3. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
  - 4. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Masonry Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
      - 1) Two anchors per jamb up to 60 inches (1524 mm) high.
      - 2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
      - 3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
      - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
    - b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
      - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
      - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
      - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
      - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
      - 5) Two anchors per head for frames above 42 inches (1066 mm) wide and mounted in metal-stud partitions.
    - c. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
  - 5. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.
    - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

- D. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
  - 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
  - 2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
  - 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

## 2.8 STEEL FINISHES

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
  - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
  - 1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  - 2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
  - 3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.
- C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

### 3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11
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. Install door silencers in frames before grouting.
    - b. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    - c. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
  2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
  4. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  5. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  6. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
  7. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Standard Steel Doors:

- a. Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
- b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
- c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
- d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).

### 3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION



## SECTION 08 14 16

### FLUSH WOOD DOORS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

A. This Section includes the following:

1. Interior solid-core doors with medium-density overlay faces.
2. Shop priming and field finishing of interior solid-core doors with medium-density overlay faces.
3. Exterior type solid-core entrance doors and transom panels with wood-veneer faces.
4. Shop finishing of exterior type solid-core entrance doors and transom panels with wood-veneer faces.
5. Exterior type solid-core wood doors for opaque painting.
6. Shop priming and field finishing of exterior type solid-core wood doors for opaque painting.
7. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Sections include the following:

1. Division 6 Section "Interior Architectural Woodwork" for fabrication of wood veneer wall panels.
2. Division 8 Section "Hollow Metal Doors and Frames" for hollow metal frames.
3. Division 8 Section "Door Hardware".

##### 1.2 SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction and trim for openings.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.

##### 1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.

B. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated."

1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom edge with opening number used on Shop Drawings.

#### 1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

#### 1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
    - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.
  2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
  3. Warranty Period for Solid-Core Exterior Doors: Two years from date of Substantial Completion.
  4. Warranty Period for Solid-Core Interior Doors: Life of installation.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. Flush Wood Doors:
    - a. Algoma Hardwoods Inc.
    - b. Buell Door Company.
    - c. Eagle Plywood & Door Manufacturing, Inc.
    - d. Eggers Industries; Architectural Door Division.

- e. GRAHAM Manufacturing Corp.
- f. IPIK Door Company.

## 2.2 SOLID-CORE DOORS

### A. Particleboard Cores: Comply with the following requirements:

- 1. Particleboard: ANSI A208.1, Grade LD-2.
- 2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware as follows:
  - a. 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.
  - b. 5-inch (125-mm) bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
  - c. 5-inch (125-mm) midrail blocking, in doors indicated to have exit devices.

## 2.3 INTERIOR DOORS FOR OPAQUE PAINT FINISH

### A. Interior Solid-Core Doors For Opaque Finish:

- 1. Grade: Premium.
- 2. Faces: Medium-density overlay.
  - a. MDF Faces: ANSI A208.2, Grade 150 or 160.
- 3. Exposed Vertical and Top Edges: Any closed-grain hardwood.
- 4. Core: Particleboard
- 5. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering. Faces are bonded to core using a hot press.
- 6. Adhesives: Type I per WDMA TM-6.

## 2.4 VENEERED-FACED DOORS FOR TRANSPARENT FINISH

### A. Exterior Solid-Core Entrance Doors and Transom Panels:

- 1. Grade: Premium, with Grade AA faces.
- 2. Species: American Walnut.
- 3. Cut: Plain sliced to match wall panels specified in Division 6 Section "Interior Architectural Woodwork".
- 4. Match between Veneer Leaves: Book match to match wall panels.
- 5. Assembly of Veneer Leaves on Door Faces: Center-balance match.
- 6. Pair and Set Match: Provide for doors hung in same opening.
- 7. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering. Faces are bonded to core using a hot press.
- 8. Adhesives: Type I per WDMA TM-6.
- 9. WDMA I.S.1-A Performance Grade: Extra Heavy Duty.

## 2.5 EXTERIOR DOORS FOR OPAQUE PAINT FINISH

### A. Exterior Solid-Core Doors For Opaque Finish:

1. Grade: Premium.
2. Faces: Medium-density overlay.
  - a. MDF Faces: ANSI A208.2, Grade 150 or 160.
3. Exposed Vertical and Top Edges: Any closed-grain hardwood.
4. Core: Particleboard
5. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering. Faces are bonded to core using a hot press.
6. Adhesives: Type I per WDMA TM-6.

## 2.6 FABRICATION

- ### A. Fabricate doors in sizes indicated for Project-site fitting.

## 2.7 SHOP PRIMING

- ### A. Doors for Opaque Finish: Shop prime faces and edges of doors, including cutouts, with one coat of wood primer specified in Division 9 Section "Interior Painting."
- ### B. Doors for Transparent Finish: Shop finish as specified in Division 09 Section "Exterior Painting".

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- #### A. Examine doors and installed door frames before hanging doors.
1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
  2. Reject doors with defects.
- #### B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- #### A. Hardware: For installation, see Division 8 Section "Door Hardware."
- #### B. Manufacturer's Written Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.

- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
  - 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold.
  - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
- D. Field-Finished Doors: Refer to the following for finishing requirements:
  - 1. Division 9 Sections "Exterior Painting" and "Interior Painting."

### 3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION



## SECTION 08 71 00

### DOOR HARDWARE

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
- B. This Section includes the following:
  - 1. Hinges
  - 2. Pivots
  - 3. Key control system
  - 4. Lock cylinders and keys
  - 5. Lock and latch sets
  - 6. Bolts
  - 7. Exit devices
  - 8. Push/Pull units
  - 9. Closers
  - 10. Overhead holders
  - 11. Miscellaneous door control devices
  - 12. Weatherstripping for exterior doors
  - 13. Meeting seals on pairs of doors
  - 14. Thresholds
- C. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Section 08 11 13: Hollow Metal Doors and Frames
  - 2. Section 08 14 16: Flush Wood Doors
- D. Products furnished but not installed under this Section to include:
  - 1. Cylinders for locks on entrance doors.
  - 2. Final replacement cores and keys to be coordinated with Owner.

##### 1.2 REFERENCES

- A. Standards of the following as referenced:
  - 1. American National Standards Institute (ANSI)
  - 2. Door and Hardware Institute (DHI)
  - 3. Factory Mutual (FM)
  - 4. National Fire Protection Association (NFPA)
  - 5. Underwriters' Laboratories, Inc. (UL)
    - a. UL 10C - Fire Tests Door Assemblies
  - 6. Warnock Hersey

- B. Regulatory standards of the following as referenced:
  - 1. Department of Justice, Office of the Attorney General, *Americans with Disabilities Act*, Public Law 101-336 (ADA).
  - 2. CABO/ANSI A117.1: *Providing Accessibility and Usability for Physically Handicap People*, 1992 edition.

### 1.3 SYSTEM DESCRIPTION

- A. Refer to applicable “Headings“ for system description for electric and electro-pneumatic hardware products.

### 1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
- B. Product data including manufacturers' 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. For items other than those scheduled in the “Headings” of Section 3, provide catalog information for the specified items and for those submitted.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  - 1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into vertical format “hardware sets” indicating complete designations of every item required for each door or opening. Use specification Heading numbers with any variations suffixed a, b, etc. Include the following information:
    - a. Type, style, function, size, and finish of each hardware item.
    - b. Name and manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of each hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
    - e. Explanation of all abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for hardware.
    - g. Door and frame sizes and materials.
    - h. Keying information.
    - i. Cross-reference numbers used within schedule deviating from those specified.
      - 1) Column 1: State specified item and manufacturer.
      - 2) Column 2: State prior approved substituted item and its manufacturer.
  - 2. Submittal Sequence: Submit final 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. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.

3. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.
- D. Samples of each type of exposed hardware unit in finish indicated and tagged with full description for coordination with schedule. Submit samples prior to submission of final hardware 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. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
  - F. Contract closeout submittals:
    1. Operation and maintenance data: Complete information for installed door hardware.
    2. Warranty: Completed and executed warranty forms.

#### 1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of hardware (latch and locksets, hinges, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.
  1. Require supplier to meet with Owner to finalize keying requirements and to obtain final instructions in writing.
  2. Required supplier to meet with installer prior to beginning of installation of door hardware. (Pre-installation conference)
- C. The hardware manufacturer's representative(s) shall conduct a pre-installation conference with the Contractor's installer, a representative of the county planning and/or maintenance department, and a representative of the hardware supplier, to demonstrate product installation and adjustment in accordance with manufacturer's recommendations and Owner's requirements.
- D. Hardware manufacturers' representative shall inspect hardware installation to confirm that all products are installed and adjusted according to manufacturers recommendations. A certificate of compliance shall be submitted with the project closeout documents.

- E. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not. All hardware shall comply with standards UBC 702 (1997) and UL 10C.
  - 1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

#### 1.6 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).
- E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

#### 1.7 WARRANTY

- A. Special warranties:
  - 1. Door Closers: Ten year period
  - 2. Exit Devices: Three year period
  - 3. Automatic Door Operators: Two year period
  - 4. Locks and Cylinders: Three year period

#### 1.8 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Parts kits: Furnish manufacturers' standard parts kits for locksets, exit devices, and door closers.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURED UNITS

(\*Denotes manufacturer referenced in the Hardware Headings)

#### A. Hinges:

1. Acceptable manufacturers:
  - a. Hager Hinge Company
  - b. Stanley Works
  - c. Ives
  - d. Bommer\*
  - e. McKinney
2. Characteristics:
  - a. Templates: Provide only template-produced units.
  - b. Screws: Provide Phillips flat-head screws complying with the following requirements:
    - 1) For metal doors and frames install machine screws into drilled and tapped holes.
    - 2) For wood doors and frames install threaded-to-the-head wood screws.
    - 3) For fire-rated wood doors install #12 x 1-1/4 inch, threaded-to-the-head steel wood screws.
    - 4) Finish screw heads to match surface of hinges or pivots.
  - c. Hinge pins: Except as otherwise indicated, provide hinge pins as follows:
    - 1) Out-Swing Exterior Doors: Non-removable pins.
    - 2) Out-Swing Corridor Doors with Locks: Non-removable pins.
    - 3) Interior Doors: Non-rising pins.
    - 4) Tips: Flat button and matching plug. Finished to match leafs.
  - d. Size: Size hinges in accordance with specified manufacturer's published recommendations.
  - e. Quantity: Furnish one pair of hinges for all doors up to 5'0" high. Furnish one hinge for each additional 2-1/2 feet or fraction thereof.

#### B. Pivot Sets:

1. Acceptable manufacturers:
  - a. E.R. Butler
  - b. Rixson
  - c. Ives\*
2. Characteristics:
  - a. Pivots to be high strength forged bronze.

#### C. Cylinders:

1. Acceptable manufacturers:
  - a. Best
  - b. Sargent
  - c. Schlage\*

2. Characteristics:
    - a. Standard System: Except as otherwise indicated, provide new master key system for Project.
    - b. Multiple-Building System: Except as otherwise indicated, provide new grand master key system for Project.
    - c. Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster), either new
    - d. Equip locksets with interchangeable core cylinders featuring
    - e. Furnish temporary cores during construction phase.
    - f. Furnish final cores and keys for installation by Owner.
    - g. Equip locks with high-security cylinders that comply with performance requirements for Grade 1 cylinders as listed in ANSI/BHMA A156.5 and that have been tested for pick and drill resistance requirements of UL 437 and are UL listed.
    - h. Metals: Construct lock cylinder parts from brass or bronze, stainless steel, or nickel silver.
    - i. Comply with Owner's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.
      - 1) Permanently inscribe each key with number of lock that identifies cylinder manufacturer's key symbol, and notation, "DO NOT DUPLICATE."
    - j. Key Material: Provide keys of nickel silver only.
    - k. Key Quantity: Furnish 3 change keys for each lock, 5 master keys for each master system, 5 grandmaster keys for each grandmaster system, and 3 control keys for interchangeable core series, 10 construction masters and 2 construction control keys.
      - 1) Furnish one extra blank for each lock.
      - 2) Deliver keys to Owner.
- D. Locksets, Latchsets, Deadbolts:
1. Acceptable manufacturers:
    - a. Best
    - b. Sargent
    - c. Schlage\*
  2. Mortise Locksets and Latchsets: as scheduled.
    - a. Chassis: cold-rolled steel, handing field-changeable without disassembly.
    - b. Latchbolts: 3/4-inch throw stainless steel anti-friction type.
    - c. Lever Trim: through-bolted, accessible design, cast or solid rod lever as scheduled. Spindles: independent break-away.
    - d. Thumbturns: accessible design not requiring pinching or twisting motions to operate.
    - e. Deadbolts: stainless steel 1-inch throw.
    - f. Electric operation: Manufacturer-installed continuous duty solenoid.
    - g. Strikes: 16 gage curved stainless steel, bronze or brass with 1" deep box construction, lips of sufficient length to clear trim and protect clothing.
    - h. Scheduled Lock Series and Design: Schlage L series, 17A design.

- i. Certifications:
  - 1) ANSI A156.13, 1994, Grade 1 Operational, Grade 1 Security.
  - 2) ANSI/ASTM F476-84 Grade 30 UL Listed.

E. Exit Devices:

- 1. Acceptable manufacturers:
  - a. Von Duprin\* 98 Series
  - b. Sargent 80 Series
  - c. Precision Apex Series
- 2. Characteristics:
  - a. Exit devices shall be "UL" listed for life safety. All exit devices for fire rated openings shall have "UL" labels for "Fire Exit Hardware."
  - b. All exit devices mounted on labeled wood doors shall be mounted on the door per the door manufacturer's requirements.
  - c. All trim shall be thru-bolted to the lock stile case. Lever design to match locksets.
  - d. All exit devices shall be made of brass, bronze, stainless steel, or aluminum material, powder coated, anodized, or plated to the standard architectural finishes to match the balance of the door hardware.
  - e. Provide glass bead conversion kits to shim exit devices on doors with raised glass heads.
  - f. All exit devices shall be one manufacturer. No deviation will be considered.
  - g. All series exit devices shall incorporate a fluid damper, which decelerates the touchpad on its return stroke and eliminates noise associated with exit device operation. All exit devices shall be non-handed. Plastic touchpads are not acceptable. All latchbolts to be the deadlocking type. Latchbolts shall have a self-lubricating coating to reduce wear. Plated or plastic coated latchbolts are not acceptable. Plastic linkage and "dogging" components are not acceptable.
  - h. Lever trim shall be solid case material with a break-away feature to limit damage to the unit from vandalism.
  - i. Surface vertical rod devices shall be UL labeled for fire door applications without the use of bottom rod assemblies. Where bottom rods are required for security applications, the devices shall be UL labeled for fire doors applications with rod and latch guards by the device manufacturer.

F. Closers and Door Control Devices:

- 1. Acceptable manufacturers:
  - a. LCN Closers\* 4010/4110 Series, 2030 Series
  - b. Sargent 281 Series
- 2. Characteristics:
  - a. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder.

- b. All closers shall utilize a stable fluid withstanding temperature range of 120°F to -30°F without seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with standards UBC 7-2 (1997) and UL 10C.
- c. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for the physically handicapped. Spring power adjustment (LCN Fast™ Power Adjust) allows for quick and accurate power adjustment and visually shows closer power size settings by way of dial adjustment gauge located on closer spring tube. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed and back check.
- d. All closers shall have solid forged steel main arms (and forearms for parallel arm closers) and where specified shall have a cast-in solid stop on the closer shoe (“CNS”). Where door travel on out-swing doors must be limited, use “CNS” or “S-CNS” type closers. Auxiliary stops are not required when cush type closers are used.
- e. Overhead concealed closers shall have spring power adjustable for 50% increase in closing power and fully mortised door tracks.
- f. All closers (overhead, surface and concealed) shall be of one manufacturer and carry manufacturer's ten year warranty (electric closers to have two year warranty).
- g. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped provide adjustable units complying with ADA and ANSI A-117.1 provisions for door opening force.
- h. Closers to be installed to allow door swing as shown on plans. Doors swinging into exit corridors shall provide for corridor clear width as required by code. Where possible, mount closers inside rooms.
- i. Powder coating finish to be certified to exceed 100 hours salt spray testing by ETL, an independent testing laboratory used by BHMA for ANSI certification.
- j. Combination Door Closers and Holders: Provide units designed to hold door in open position under normal usage and to release and automatically close door under fire conditions. Incorporate an integral electromagnetic holder mechanism designed for use with UL listed fire detectors, provided with normally closed switching contacts.

G. Overhead Door Holders:

- 1. Acceptable manufacturers:
  - a. Glynn Johnson\*
  - b. Rixson Firemark
  - c. Sargent

2. Characteristics:
  - a. Provide heavy duty door holders for surface mounting of brass, bronze or stainless steel.
  - b. Surface holders to be installed with the jamb bracket mounted on the stop.
  
- H. Floor Stops and Wall Bumpers:
  1. Acceptable manufacturers:
    - a. Trimco
    - b. Ives\*
    - c. Rockwood Manufacturing
  2. Characteristics: Refer to Hardware Headings.
  
- I. Door Bolts/Coordinators:
  1. Acceptable manufacturers:
    - a. Trimco
    - b. Ives\*
    - c. Rockwood Manufacturing
  2. Characteristics:
    - a. Flush bolts to be forged brass 6-3/4" x 1", with 1/2" diameter bolts. Plunger to be supplied with milled surface one side that fits into a matching guide.
    - b. Automatic flush bolts to be UL listed as top and bottom bolts on a pair of classified fire doors. Bolt construction to be of rugged steel and brass components.
    - c. Self-latching flush bolts to be UL listed as top and bottom bolts on a pair of classified fire doors. Bolt construction to be of rugged steel and brass components.
    - d. Automatic flush bolts and self-latching flush bolts shall be UL listed for fire door application without bottom bolts (LBB).
    - e. Coordinator to be soffit mounted non-handed fully automatic UL listed coordinating device for sequential closing of paired doors with or without astragals.
    - f. Provide filler pieced to close the header. Provide brackets as required for mounting of soffit applied hardware.
  
- J. Push Plates:
  1. Acceptable manufacturers:
    - a. Trimco
    - b. Ives\*
    - c. Rockwood Manufacturing
  2. Characteristics:
    - a. Exposed Fasteners: Provide manufacturers standard exposed fasteners.
    - b. Material to be wrought/extruded/forged, brass/ bronze /aluminum/stainless steel, per the Hardware Headings.
    - c. Provide plates sized as shown in Hardware Headings.

- K. Door Pulls & Pull Plates:
  - 1. Acceptable manufacturers:
    - a. Trimco
    - b. Ives
    - c. Rockwood Manufacturing\*
    - d. Forms and Surfaces\*
  - 2. Characteristics:
    - a. Provide concealed thru-bolted trim on back to back mounted pulls, but not for single units.
    - b. Material to be extruded forged/ cast, brass/ bronze/ aluminum/ stainless steel.
    - c. Provide units sized as shown in Hardware Headings.
  
- L. Thresholds:
  - 1. Acceptable manufacturers:
    - a. National Guard Products, Inc.\*
    - b. Reese Industries
    - c. Zero Weatherstripping Co., Inc.
  - 2. Types: Indicated in Hardware Headings.
  
- M. Door Seals/Gasketing:
  - 1. Acceptable manufacturers:
    - a. National Guard Products, Inc.\*
    - b. Reese Industries
    - c. Zero Weatherstripping Co., Inc.
  - 2. Types: Indicated in Hardware Headings.
  
- N. Silencers:
  - 1. Acceptable manufacturers:
    - a. Hager
    - b. Ives\*
    - c. Rockwood Manufacturing
  - 2. Three for each single doors; four for pairs of doors.
  
- O. Key Cabinet and System:
  - 1. Acceptable manufacturers:
    - a. Telkee, Inc.
  - 2. Provide a key control system including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150 percent of the number of locks required for the Project.
    - a. Provide complete cross index system set up by key control distributor, and place keys on markers and hooks in the cabinet as determined by the final key schedule.
    - b. Provide hinged-panel type cabinet for wall mounting.

## 2.2 MATERIALS AND FABRICATION

- A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise acceptable to Architect.
  - 1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- B. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
- C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
  - 1. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
  - 2. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. 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 as closely as possible including "prepared for paint" surfaces to receive painted finish.
  - 3. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners.
  - 4. Do not use thru-bolts or sex bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of adequately fastening the hardware, or otherwise found in Headings. Coordinate with wood doors and metal doors and frames where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.

## 2.3 HARDWARE FINISHES

- A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets (or push-pull units if no latch or lock sets).
- B. Provide finishes that match those established by ANSI or, if none established, match the Architect's sample.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- D. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze, and aluminum, except as otherwise indicated. The suffix "-NL" is used with standard finish designations to indicate "no lacquer."

- E. The designations used to indicate hardware finishes are those listed in ANSI/BHMA A156.18, "Materials and Finishes," including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.
  - 1. Hinges (Exterior): 613 (US10B) Oil Rubbed Bronze
  - 2. Hinges (Interior doors): 643 (US10B) Plated Steel
  - 3. Pivots: 613 (US10B) Oil Rubbed Bronze
  - 4. Flush Bolts: 613 (US10B) Oil Rubbed Bronze
  - 5. Locks: 613 (US10B) Oil Rubbed Bronze
  - 6. Exit Devices: 313AN or 613 Dark Bronze Anodized or Oil Rubbed Bronze
  - 7. Door Closers: 695 Powder Coat Dark Bronze
  - 8. Push Plates: 613 (US10B) Oil Rubbed Bronze
  - 9. Pulls: 613 (US10B) Oil Rubbed Bronze
  - 10. Protective Plates: 613 (US10B) Oil Rubbed Bronze
  - 11. Door Stops: 613 (US10B) Oil Rubbed Bronze
  - 12. Overhead Holders: 613 (US10B) Oil Rubbed Bronze
  - 13. Thresholds/Weatherstripping: US10B/ DKB

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
  - 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
  - 2. "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute.
  - 3. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors."
- B. 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 specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- E. 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".

- F. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

3.2 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating 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.
  - 1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make 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 function properly with final operation of heating and ventilating equipment.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Door Hardware Supplier's Field Service
  - 1. Inspect door hardware items for correct installation and adjustment after complete installation of door hardware.
  - 2. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.
  - 3. File written report of this inspection to Architect.
- D. Prior to project completion, representatives of the lock, exit device and overhead closer manufacturers shall inspect and adjust all units and certify that all units are installed in accordance with the manufacturer's instructions, and are regulated properly and functioning correctly. A written report shall be provided to the Architect as to the inspection and shall include appropriate certificates.

3.3 HARDWARE SETS

Hardware Sets such as HW1, HW2, etc., appear on the Drawings for each door or opening and are clarified in the following hardware schedule.

HW SET: 1

EACH TO HAVE:

8	EA	HINGES	BB5005 NRP	613
1	EA	DEADLOCK	462T	613
2	EA	CORES	23-030	613
2	EA	DOOR CLOSERS	2030 X ST2211	695
2	EA	OVERHEAD STOPS	904S	613
1	EA	FLUSH BOLT	FB458 – 36"	613
1	EA	FLUSH BOLT	FB458 – 12"	613
2	EA	PUSH PLATES	71RCG	613
2	EA	FORMS & SURFACE PULLS	HDCMT1212	613
1	EA	THRESHOLD	896 V	BR-DKB
1	SET	GASKETING	2525B	BRN
1	EA	ADJUSTABLE ASTRAGAL	354-PK	D

NOTE: MOUNT HOLD OPEN OVERHEAD STOPS ON CENTER PAIR OF DOORS

HW SET: 2

EACH TO HAVE:

ALL HARDWARE BY DOOR MFG.

HW SET: 3

EACH TO HAVE:

3	EA	HINGES	BB5001 NRP	613
1	EA	ENTRY LOCK	9456T X 17A	613
1	EA	CORE	23-030	613
1	EA	DOOR CLOSER	4111 CUSH	695
1	EA	THRESHOLD	896 V	DKB
1	SET	GASKETING	2525B	BRN

HW SET: 3A

EACH TO HAVE:

3	EA	HINGES	BB5001 NRP	613
1	EA	EXIT DEVICE	98NL-OP	613
1	EA	RIM CYLINDER	20-057	613
1	EA	CONSTRUCTION CORE	23-030 ICX	
1	EA	DOOR CLOSER	4111 CUSH	695
1	EA	NIGHT/LATCH PULL	98NL	613
1	EA	THRESHOLD	896 V	BR-DKB
1	SET	GASKETING	2525B	BRN

HW SET: 4

EACH TO HAVE:

3	EA	HINGES	BB5001 NRP	613
1	EA	ENTRY LOCK	L9453T X 17A	613
1	EA	CORE	23-030	613
1	EA	DOOR CLOSER	4111	695
1	EA	DOOR STOP	FS18S	BLK
1	EA	THRESHOLD	896 V	DKB
1	SET	GASKETING	2525B	BRN

HW SET: 5 NOT USED

HW SET: 6

EACH TO HAVE:

3	EA	HINGES	BB5000	643
1	EA	CLASSROOM LOCK	L9070TX17A	613
1	EA	CORE	23-030	613
1	EA	DOOR CLOSER	4110	613
1	EA	FLOOR STOP	1211	613
3	EA	SILENCERS	SR66	GRY

HW SET: 7

EACH TO HAVE:

3	EA	HINGES	BB5000	643
1	EA	PRIVACY W/TURNS BOTH SIDES	L9040TX17A	613
1	EA	CORE	23-030	612
1	EA	DOOR STOP	1211	613
3	EA	DOOR SILENCERS	SR64	GRY

HW SET: 8

EACH TO HAVE:

1	EA	MORTISE CYLINDER	AS REQUIRED	613
1	EA	CONSTRUCTION CORE	23-030 ICX	
1	EA	CORE	23-030	613
2	EA	PULLS	RM3340 36"CTC X 13HD MTG	613

HW SET: 9

EACH TO HAVE:

3	EA	HINGES	BB5000	643
1	EA	CLASSROOM LOCK	L9070T X 17A	613
1	EA	CORE	23-030	613
1	EA	DOOR CLOSER	4011 OR 4111 AS REQ.	695
1	EA	DOOR STOP	1211 OR WS407CVX AS REQ	613
3	EA	DOOR SILENCERS	SR64	GRY

HW SET: 9A

EACH TO HAVE:

3	EA	HINGES	BB5000	643
1	EA	PASSAGE	L9010 X 17A	613
1	EA	DOOR CLOSER	4011 OR 4111 AS REQ.	695
1	EA	DOOR STOP	1211 OR WS407CVX AS REQ	613
3	EA	DOOR SILENCERS	SR64	GRY

HW SET: 10

EACH TO HAVE:

3	EA	HINGES	BB5000	643
1	EA	INDICATOR PRIVACY	L9496T X 17A	613
1	EA	CORE	23-030	613
1	EA	DOOR CLOSER	4011	695
1	EA	FLOOR STOP	1211	613
3	EA	DOOR SILENCERS	SR64	GRY

HW SET: 11 NOT USED

HW SET: 12 NOT USED

HW SET: 13

EACH TO HAVE:

1	EA	PIVOT SET 3/4 INCH OFFSET	E.R. BUTLER M4+PI	613
1	EA	CABINET LOCK	511 3/4 INCH	613
1	EA	ANGLE STRIKE	511S	613

END OF SECTION

## SECTION 08 80 00

### GLAZING

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
  - 1. Interior fixed panels in wall between Sanctuary and Chapel.
  - 2. Interior all-glass door at wall between Sanctuary and Chapel.
  - 3. Exterior replacement glazing.
- B. Related Sections include the following:
  - 1. Division 1 Section "Alternates" for description of work under this Section affected by alternates.

##### 1.2 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.

#### PART 2 - PRODUCTS

##### 2.1 MANUFACTURERS AND PRODUCTS

- A. Ultraclear Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I, complying with other requirements specified and with visible light transmission not less than 91 percent.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. AFG Industries, Inc.; Krystal Klear.
    - b. Guardian Industries Corp.; Ultrawhite.
    - c. Pilkington North America; Optiwhite.
    - d. PPG Industries, Inc.; Starphire.
- B. All-Glass Entrance Doors:
  - 1. Manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. ACI Distribution.
    - b. Arch Aluminum & Glass Co., Inc.

- c. Blumcraft of Pittsburgh.
  - d. Guardian Industries Corp./Float Glass Division.
  - e. Virginia Glass Products Corp., 800-368-3011, as the basis of design.
2. Glass, indicated as MG-1 on the Drawings and as specified in this Section.
  3. Exposed Edges: Flat polished.
  4. Butt Edges: Flat ground.
  5. Butt glazing/sealant not required.
  6. Patch Fittings: Dark Bronze fittings in locations indicated on the Drawings to create a “balanced type” single acting, all-glass door.
  7. Style “AGA”, with “Lock Patch”; Virginia Glass, as the basis of design.
  8. Aluminum Sidelight Channels: 1 inch by 1 inch channel surface mounted on floor, recessed in side partition and 1 inch wide by 2 inch high channel recessed in wall.
  9. Heavy-duty hardware units in sizes, quantities, and types recommended by manufacturer for all-glass entrances indicated. For exposed parts, match fitting metal and finish.
  10. Recessed floor closer and top mounted pivots, including cases, bottom arms, plates, and accessories required for complete installation.
  11. Push-Pull Set, lock, core and pulls: Refer to Division 8 Section “Door Hardware”.

## 2.2 GLAZING SYSTEM FOR MG-2 ( Interior fixed panels in wall between Sanctuary and Chapel)

### A. Basis of Design Manufacturer and Product: Craftsman Fabricated Glass, 800-238-3548.

1. Available Local Contact: DeGeorge Glass, Rob Haidler, 504-831-7738.
2. Channel Frame: 1-3/4 inch by 3 inch steel channels clad with aluminum or stainless steel.
3. Horizontal Joint Between Panels: 1/4 inch space with 1/4 inch thick by 3/4 inch wide by 2 inch long lexan at each side of glass panels.
4. Attachment of Glass to Frame: Flat-Head stud screws with 5/8 inch diameter by 3/4 inch grommets thru 7/8 inch “cut-outs” in glass.

## 2.3 GLAZING GASKETS - GENERAL

### A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:

1. EPDM, ASTM C 864.
2. Silicone, ASTM C 1115.
3. Thermoplastic polyolefin rubber, ASTM C 1115.
4. Any material indicated above.

## 2.4 GLAZING TAPES - GENERAL

### A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
  2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
  3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:
1. Type 1, for glazing applications in which tape acts as the primary sealant.
  2. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.
- 2.5 MG-1 ULTRACLEAR FLOAT GLASS:
- A. 1/2 inch thick, tempered, ultraclear glass.
  - B. Location: Fixed panels and entry door at floor level of wall between Sanctuary and Chapel.
- 2.6 MG-2 ULTRACLEAR FLOAT GLASS:
- A. 1/2 inch thick, ultraclear glass.
  - B. Location: Fixed panels at upper level of wall between Sanctuary and Chapel.
- 2.7 EG-1 CLEAR FULLY TEMPERED FLOAT GLASS:
- A. Match existing glazing thickness.
  - B. Location: Clerestory window replacement as indicated on Drawings.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
  1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  2. Presence and functioning of weep system.
  3. Minimum required face or edge clearances.
  4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

### 3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches as follows:
  - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  - 2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- J. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

### 3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

### 3.5 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- C. Install gaskets so they protrude past face of glazing stops.

### 3.6 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.

- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION