

# **DIVISION 8 - DOORS AND WINDOWS**

## **08110 - STEEL DOORS AND FRAMES**

**1. General Requirements:** Door and frame sizes and details shall conform to industry stock standards wherever possible. Custom sizing and detailing shall only be used to match existing conditions or as required for program needs. Doors shall be nominal 3 feet by 7 feet by 1-3/4 inches unless specific use requires other dimensions.

### **2. Frame Construction**

2.1. Steel frame construction shall comply with NCA standards Type level for interior applications, Grade III for exterior applications, and as modified below.

2.1.1. The face width of steel frames for doors, transoms, sidelights and borrowed lights shall be standard 2 inches to permit economical and timely matching for remodeling in the future. Other frame sizes allowed shall match existing condition or as required for program needs.

2.1.2. Minimum gauges for door frames shall be 16 gauge for interior frames and 14 gauge for exterior frames. Exterior frames shall be galvanized.

2.1.3. Frames shall be one-piece unit types. Frame units too large for shipment shall be fabricated with concealed splice connections or field assembly after factory pre-assembly.

2.1.4. Removable glazing stops shall be applied with cadmium-plated, small-head Jackson screws. Removable stops shall be located on the secure side of controlled-access openings.

2.1.5. Frames shall be accurately formed to indicated profiles and assembled with hairline joints. Faces shall be mitered at corners. Rabbet, soffit, and stop joints shall be tightly closed miter or butt joints. Corners shall be completely back-welded. Exposed welds shall be ground smooth. The final assembly shall be square and true, with no evidence of welds on exposed faces.

### **3. Frame Mortises and Reinforcement**

3.1. Frames shall be mortised, reinforced, drilled and tapped for all mortise hardware using templates that the hardware supplier provides. Steel reinforcements, welded to frames, shall be provided as follows:

A. Hinge and pivot reinforcement: 3/16 inch by 1-1/2 inches by 9 inches

- B. Closer and holder: 12 gauge by 14 inches by frame width
- C. Floor clips: 16 gauge by 3-1/2 inches

3.2. Specify mortar-tight, full-enclosure steel cover boxes over all mortises. Rough bucks and head reinforcement shall be 12-gauge steel. Three rubber silencers shall be provided at the strike jamb for all door frames (GJ-64 or of equal make). Secure 1-inch rigid foam insulation at the head of the frame at the closure mounting prior to filling the frame with mortar, so the closures can be installed and maintained.

#### **4. Frame Anchors**

- 4.1. A minimum of three anchors shall be provided at each jamb. The maximum spacing shall not exceed 2 inches to 6 inches on center.
- 4.2. Masonry anchors shall be adjustable, 18 gauge. Jamb anchors for frames in steel stud partitions shall be wired, and twisted for masonry.

#### **5. Door Construction**

- 5.1. Interior door construction shall comply with ANSI/SDI 100, Grade II - Heavy Duty, Model 3 - Seamless Hollow Steel, and as modified in 5.3.
- 5.2. Exterior door construction shall comply with ANSI/SDI 100, Grade III - Extra Heavy Duty, Model 3 - Seamless Hollow hot-dipped A60 galvanized steel, and as modified in 5.3.
- 5.3. Door core construction shall be one of the following:
  - 5.3.1. Construction that consists of vertical 22-gauge, back-to-back, hat-shaped steel stiffeners that are spaced no more than 6 inches apart. All flanges shall be welded to each other and to both faces 6 inches on center, and insulated with mineral or glass fiber.
  - 5.3.2. Construction that consists of 28-gauge truss core welded to both faces 3 inches on center. The end closures shall be the same gauge as the face sheets, and insulated with mineral fiber.
  - 5.3.3. To control heat loss, cores of exterior doors that are not located in vestibules may be constructed with face sheets laminated to a foam core. Such doors shall comply with ANSI/SDI 100, Grade III - Extra Heavy Duty, Model 4 - Seamless Composite, and as modified below.
  - 5.3.4. Doors with large glass or louver openings shall be constructed of 16-gauge, tubular-shaped stiles and rails reinforced and welded at corners.

Hinge reinforcement for heavy doors shall be continuous the full height of the door.

## **6. Door Mortises and Reinforcement**

6.1. Doors shall be mortised, reinforced, drilled and tapped for all mortise hardware using templates that the hardware supplier provides. Steel reinforcements, welded to door, shall be provided as follows:

- A. Hinge and pivot reinforcement: 3/16 inch by 1-1/2 inches by 9 inches
- B. Closer and holder: 12 gauge by 3-1/2 inches by 14 inches. Provide reinforcements as required to receive surface applied hardware. Provide flush watertight top closures for all exterior doors.

6.2. Stops for glass and louver opening for security doors shall be removable from the interior face only.

## **7. Fire Rated Doors and Frames**

7.1. Fire-rated doors and frames shall be constructed in accordance with the requirements of the most current edition of Underwriter's Laboratories, Inc. They also shall bear the appropriate permanent label.

7.2. Only personnel certified to work on labeled doors and frames shall perform field modifications.

**8. Vision Panels:** Where permitted by code, vision panels shall be provided in stair doors and doors serving as corridor separations that are normally closed.

## **9. Cleaning and Shop Priming**

9.1. Doors and frames shall be thoroughly cleaned of rust, dirt, oil and grease. Doors shall be pressure-belt-sanded to remove irregularities.

9.2. Frames shall be shop-painted with a baked-on primer that contains a rust-inhibitor.

9.3. Doors shall be shop-painted with a primer that contains a rust-inhibitor, and sanded after each application to maintain a smooth finish.

**10. Frame Erection:** Frames in concrete and masonry construction shall be filled solid with grout or concrete. Anchors for frames in steel stud partition systems shall be screwed, bolted or welded to both flanges of studs. Floor clips shall be attached to the floor with two bolts or power driven anchors per clip. Conceal exposed fasteners in frames.

## 08200 - WOOD AND PLASTIC DOORS

### 1. General

**1.1. PROHIBITED:** Exterior wood doors for new construction.

**1.2. PROHIBITED:** Mineral core wood veneer faced doors in high traffic areas due to poor hardware anchorage.

1.3. Doors shall be furnished from a single manufacturer.

1.4. Doors requiring a rating of 20 minutes may be wood.

### 2. Industry Standards

2.1. Wood doors shall comply with the Architectural Woodwork Institute (AWI) "Architectural Woodwork Quality Standards," Seventh Edition, Section 1300 as follows:

2.1.1. General: Use AWI Veneer Grade A for transparent finish, and Veneer Grade A for paint-grade finish, PC 5 construction and Type I glue.

2.1.2. Rated Doors: Doors for rated openings shall bear UL or Warnock-Hersey labels. Mineral core doors shall have internal blocking for surface-mounted hardware, 5-1/2 inches top blocking for closers, and 10 inches lock blocking for lock sets and exit devices. Specify additional blocking required for other surface-mounted hardware. Specify Uniform Building Code (UBC), 7.2. This labeling system will minimize the need for asbestos testing of mineral core doors. If there is no label, the university is required to test mineral core doors for asbestos, regardless of the date of installation.

2.1.3. Edge bands: Stile edge bands of doors with a transparent finish shall match the face veneer. Doors to be painted shall have hardwood edge bands.

2.1.4. Face veneers: Plain sliced red oak is the standard veneer for doors to receive a transparent finish. Birch or MDO are the standard veneers for doors to receive opaque finish.

2.1.5. Finish: Doors for new buildings or for major remodeling projects shall be factory finished in compliance with AWI Architectural Woodwork Quality Standards, Seventh Edition, Section 1500, System #TR-6 for transparent and System OP-6 for opaque.

2.1.6. Warranty

2.1.6.1. Interior doors shall be covered by a warranty. The manufacturer and the contractor must sign the warranty, as well as agree to repair or replace doors that have warped, have telegraphed core construction in face veneers or have not conformed to tolerance limitations of referenced quality standards. All such repair and replacement shall be done at no cost to the university for the life of the installation.

2.1.6.2. Exterior doors shall be covered by the same warranty for five years.

2.2. Vision Panels: Where permitted by code, vision panels shall be provided in stair doors and doors serving as corridor separations that are normally closed.

## **08305 - ACCESS DOORS**

### **1. General Requirements**

1.1. All wall and ceiling access door assemblies shall be indicated on the drawings. The drawings shall indicate the locations, physical dimensions, substrate conditions, anchoring and finishes.

1.2. Fire-rated access door assemblies shall comply with National Fire Protection Association (NFPA) 80, and pass American Society for Testing Materials (ASTM) E 152 for vertical installations and ASTM E 119 for horizontal installations. Required fire ratings shall be indicated for each location by class, maximum temperature rise and time. When fire rating is required, provide complete access door assemblies from a single manufacturer with a UL label, as listed in the Underwriters Laboratories, Inc. "Classified Building Materials Index."

### **2. Construction**

2.1. Wall and ceiling access door installations shall be unobtrusive, and set flush with adjacent surfaces. Assemblies shall be manufactured with continuous welds, ground smooth, and include integral galvanized steel drywall or plaster beads. All wet locations shall be all stainless steel assemblies.

2.2. All cold rolled steel shall meet ASTM A 366/A 366M. Galvanized steel shall meet ASTM A 591/A 591M. All stainless steel shall meet ASTM A 167, type 304 with No. 4 finish to meet ASTM A 480/A 480M.

### **3. Materials**

3.1. Door frames shall be 16 gauge (0.0598 steel - 0.0625 S.S.)

3.2. Door panels shall be 14 gauge non-rated (0.0747 steel - 0.0781 S.S.) 20 gauge fire-rated (0.0359 steel - 0.0312 S.S.)

3.3. Hinges shall have a 175-degree opening, and be non-rated with concealed spring hinges and removable pins. Hinges also shall be fire-rated with continuous piano hinge and stainless steel pins, including self-closing/self-latching devices.

3.4. Locks shall be operated by flush key, and self-latching at rated assemblies. Provide one lock per door panel. They shall be able to be released from the interior without a key or a special tool. Specify Best cylinders. The University Key Shop shall specify how the locks are master-keyed. The A/E shall specify the quantity of locks on each access panel.

3.5. Provide a finish on steel doors by baking with a primer that contains a rust-inhibitor. Galvanized steel doors shall have a Class C coating with phosphate treatment. Stainless steel shall have a No. 4 finish.

## **08400 - ALUMINUM ENTRANCES AND STOREFRONTS**

**1. Entrance Types:** Entrance doors and frames shall be heavy duty. Door stiles shall be a minimum of 4-inches wide. Bottom rails shall be a minimum of 10-inches high.

### **2. Door Construction**

2.1. Metal shall be a minimum of 1/8-inch thick for aluminum entrance door and frame sections.

2.2. Entrance doors with large glass openings, as well as all entrance frames, shall have continuous internal 12-gauge steel channel in hinge stile and jamb. The hinge stile and jamb shall be arranged to reinforce mounting hinges.

2.3. Corners of stile and rail doors shall be internally reinforced and welded.

### **3. Hardware**

3.1. Entrance doors and frames shall be mortised, reinforced, drilled and tapped for all mortise hardware per templates that the hardware supplier furnishes. Refer to Section 08110 - Steel Doors and Frames for minimum reinforcement requirements.

3.2. If the entrance supplier furnishes the hardware, it shall comply with the standards indicated in Section 08700 - Finish Hardware.

3.3. Oversized pulls shall be through-bolted.

4. Exterior doors and frames shall be weather-stripped at head, jambs, sill and meeting rails. Weather-strip shall be continuous, vandal-resistant and field-replaceable.

## **08500 - METAL WINDOWS**

### **1. Window Types**

1.1. Fixed windows shall be provided for air-conditioned structures. Operable windows shall be provided in all buildings without air conditioning.

1.2. Windows and curtain wall systems shall facilitate window washing. For existing structures, incorporate an operable or removable sash above the second story. For new construction, provide an exterior window washing system.

**2. Window Materials:** Window materials and curtain wall system materials shall be aluminum because of its minimal maintenance.

### **3. Performance Standards**

3.1. Window and curtain wall systems shall meet the performance requirements of the American Architectural Manufacturers Association (AAMA) GS-001, "Voluntary Guide Specifications for Aluminum Architectural Windows," and the following:

- A. Thermal transfer: AAMA Class U70
- B. Condensation resistance: AAMA CRF Class 50
- C. Deflection test pressure: minimum of 40 psf
- D. Deflection: Shall not exceed 1/175 of span or 3/4 inch, whichever is smaller
- E. Thermally broken construction: Systems that isolate exterior aluminum from interior aluminum with a material of low thermal conductance

3.2. Comply with AAMA/ANSI 101-88, "Voluntary Specifications for Aluminum Prime Windows & Sliding Glass Doors," performance class HC50.

3.3. Greater performance standards shall be established according to the specific needs of the project. The owner's representative may approve of another performance class.

4. All operating sashes shall have continuous-field, replaceable weather-stripping around the perimeter of windows.

**5. Hardware:** Hardware shall be provided for all operable sashes. Provide key-operable windows to facilitate window washing where applicable.

### **6. Screens**

**6.1. PROHIBITED:** Fiberglass screens.

6.2. Insect screens shall be provided for all operable sash required for ventilation.

**7. Storm Sash:** If required, storm sash shall be operable with a maintenance lock.

**8. Glazing and Caulking:** To ensure single responsibility for performance, glazing and caulking of window and curtain wall systems shall be specified as part of the window installation.

**9. Testing:** The A/E shall specify window manufacturers that have had windows tested by an independent laboratory. As part of the submittal process, the university shall retain an independent testing laboratory to test units that are identical to those used on the project. The same testing shall be performed on 2 percent of window openings. The contractor shall be responsible for additional independent tests for each unit that does not pass the test the first time.

**10. Warranty:** The contractor/manufacturer/installer shall sign and furnish the university with a 10-year written warranty for window systems from the date of Substantial Completion. The warranty shall state that the contractor/manufacturer/installer shall correct all deficiencies during the warranty period. The warranty shall cover removal and replacement of window systems, as well as labor for leaks, glass defects, hardware malfunctions, deterioration of finishes, and other deficiencies from defective materials and faulty workmanship, at no cost to the university.

## **08600 - WOOD AND PLASTIC WINDOWS**

### **1. Window Types**

1.1. Wood windows may be used only in historically designated buildings, or as required by the project.

1.2. Wood window units shall require minimal exterior maintenance or warranted factory finish. Aluminum cladding or high-performance paint finished units are acceptable. Windows shall comply with general requirements of ANSI A200-1 and the Window and Door Manufacturers Association (WDMA) "Industry Standards for Wood Window Units."

1.3. Fixed windows shall be provided for air-conditioned structures. Operable windows shall be provided in buildings without air conditioning.

1.4. Windows shall facilitate window washing. For existing structures, incorporate an operating or removable sash above the second story. For new construction, provide an exterior window washing system.

## 2. Performance Standards

- 2.1. Window and curtain wall systems shall meet the performance requirements of ANSI/WDMA I.S.2-87, Grade 60.
  - 2.1.1. Thermal transfer: U-value 0.66 maximum.
  - 2.1.2. Condensation resistance: Factor 47 minimum.
3. All operating sashes shall have continuous-field, replaceable weather-stripping around the perimeter of windows.
4. **Hardware:** Provide heavy-duty hardware made of non-rusting material or steel protected by a rust-resistant finish.

## 5. Screens

- 5.1. **PROHIBITED:** Fiberglass screens.
  - 5.2. Insect screens shall be provided for all operable sash required for ventilation.
6. **Storm Sash:** If required, storm sash shall be operable with a maintenance lock.

## 7. Glazing and Caulking

- 7.1. The glazing rabbet dimensions for window sections shall be at least the size that the glass manufacturer recommends for the type of glass being used.
  - 7.2. To ensure a single source of responsibility for performance, glazing of windows and caulking of openings shall be specified as part of the window installation.
8. **Testing:** The A/E shall specify window manufacturers that have had an independent laboratory test their windows. As part of the submittal process, the university shall retain an independent testing laboratory to test units that are identical to those used on the project. The same testing shall be performed on 2 percent of window openings. The contractor shall be responsible for additional independent testing for each unit that does not pass the test the first time.

9. **Warranty:** The contractor/manufacturer/installer shall sign and furnish the university with a 10-year written warranty for window systems from the date of Substantial Completion. The warranty shall state that the contractor/manufacturer/installer shall correct all deficiencies during the warranty period. The warranty shall cover removal and replacement of window systems, as well as labor for leaks, glass defects, hardware

malfunctions, deterioration of finishes, and other deficiencies from defective materials and faulty workmanship, at no cost to the university.

## **08700 - FINISH HARDWARE**

### **1. General Requirements**

1.1. The following general requirements outline the minimum level of quality for building hardware:

1.1.1. Design, specify and incorporate hardware that functions properly and is suitable and compatible to details and surrounding conditions.  
Electronic Hardware: Provide a description of functions for the intended use. Multiple functions are usually required. Example: Daytime Mode: Night Mode.

1.1.2. The A/E shall specify in the contract documents that the contractor shall advise the A/E of any items that will not remain permanently anchored prior to furnishing hardware.

1.1.3. Provide items, articles, materials and systems listed or scheduled herein and on the drawings in quantities as required to complete the project.

1.1.4. The A/E shall provide Architectural Hardware Consultants (AHC) to meet and review the opening requirements of the project with university representatives.

1.1.5. The A/E shall employ a certified AHC to prepare hardware specifications and review submittals.

### **2. Quality Assurance**

2.1. Manufacturers Qualifications: Prospective firms shall have 10 years of experience in the fabrication and distribution of commercial hardware with a national representation of qualified, well-established distribution/supply network.

2.2. All products shall be manufactured in the United States.

2.3. Distributor Qualifications: Prospective firms shall have five years of experience in the distribution of commercial hardware, employ well-qualified personnel and actively support the manufacturers that they represent.

2.3.1. A distributor shall employ full-time AHCs to schedule and coordinate hardware and wiring diagrams, establish keying schedule, and provide field inspection of installation training and final inspection.

2.3.2. The AHC shall prepare and sign the hardware schedule.

2.3.3. The manufacturer's representative shall attend the pre-installation conference and provide a field inspection of the installed hardware.

2.4. Single Source Responsibility: Except where specified in the hardware schedule, furnish products of only one manufacturer for each type of hardware.

2.5. Regulatory Label Requirements: Provide UL10C label or stamp on hardware for labeled openings.

2.6. Regulatory Installation Requirements: Conform to Minnesota State Building Code, Chapter 1310, Building Security, NFPA 80 and 101, and the Americans with Disabilities Act (ADA).

2.7. Material Requirements

**2.7.1. PROHIBITED:** Functioning hardware having stamped or spun parts.

**2.7.2. PROHIBITED:** Operating hardware that is made of aluminum or low-strength metal and is subject to mechanical wear or stress or is handled frequently.

2.7.3. Finish hardware shall be rated for heavy-duty institutional use.

### 3. Submittals

3.1. Hardware Shop Drawings: The following items are required:

- A. The manufacturer's installation instructions
- B. Wiring diagrams for each electric product specified. Coordinate voltage with electrical group before submitting.
- C. Submit one copy of catalog cuts of each hardware item with the hardware schedule.

3.2. Hardware Schedule

3.2.1. Submit complete copies of a detailed hardware schedule, including the following actions:

3.2.1. List groups in proper sequence.

3.2.2. Completely describe door and list architectural door number.

3.2.3. Provide the name of the manufacturer, the name of the product and the catalog number.

3.2.4. State the size, function, type, style and finish of hardware.

3.2.5. Determine mounting heights.

3.2.6. Explain abbreviations and symbols used in schedule.

3.3. Electronic Hardware: Provide a description of functions for the intended use. Multiple functions are usually required. (Example: Daytime Mode: Night Mode)

#### **4. Lock Cylinders and Keying**

**4.1. PROHIBITED:** Internal lock cylinder set screws. The contractor shall pay for removing internal lock cylinder set screws that have been installed.

4.2. For new buildings, specify seven-pin cylinders with interchangeable core, manufactured by Best Access Systems.

4.3. For remodeling projects, cylinders shall have the same number of pins as existing cylinders.

4.4. The A/E shall set up a planning meeting three months before a building is occupied to determine keying systems.

4.5. The preliminary planning meeting shall include the A/E, a representative from the primary building occupant(s), representatives from the Facilities Management Locksmithing Shop and Zone Office, and a representative from Best Access Systems.

4.6. Cores and keys shall be clearly labeled with the project name, project number and the door number. Cores and keys for projects on the Minneapolis or St. Paul campuses, or other Twin Cities locations shall be shipped directly to the University of Minnesota Locksmithing Shop, Shops Building, 2904 Fairmont Avenue SE, Minneapolis, MN 55414.

4.7. The university shall install the cores. At the contractor's request, the university shall install a limited number of temporary cores during construction with the appropriate cost to the contractor.

4.8. The contractor must request all university keys from the zone office 24 hours in advance of using them. The contractor will be charged for any keys that are not

returned to the university when the project is completed. The charge will be equal to the cost of replacing any locks and keys relevant to the key code for those locks and keys.

## 5. Hinges

**5.1. PROHIBITED:** Hinge butts with plastic sleeve bushings and recessed pins.

5.2. Acceptable manufacturers are Bommer, Hager, McKinney and Stanley.

5.3. Doors up to 7 feet, 6 inches high shall have three butts per leaf. Doors higher than 7 feet, 6 inches shall have four butts per leaf.

5.4. Hinge Sizes: 1-3/4 inch doors, butts shall be 4-1/2 inches by 4-1/2 inches minimum. Doors more than 36 inches wide and heavy doors shall have four, 4-1/2 inch, .180 butts. Hinges shall be wide enough to allow a door to swing fully open without striking the door frame or adjacent wall.

5.5. Extra-heavy, stainless steel hinges with ball bearings and non-removable loose pins shall be used for exterior applications or where the hinges will be exposed to high humidity.

5.6. Wrought steel or stainless steel hinges with ball bearings and flat button tips with non-rising pins shall be used for interior applications. Provide hospital tips for healthcare facilities.

5.7. Provide ball bearing butts for heavy doors, exterior entrance doors, doors with closers and frequently used doors. Provide extra heavy duty, ball bearing butts for doors that are more than 36 inches wide.

5.8. Electric hinges shall be UL10C fire-tested and listed for label doors. Provide eight-wire type, typical. Verify with other hardware and security requirements.

## 6. Locksets

**6.1. PROHIBITED:** Cylindrical locksets due to lack of security and durability.

**6.2. PROHIBITED:** Rose trim due to lack of durability.

6.3. Mortise Locksets: Comply with ANSI A156.13-1994, Series 1000, Grade 1 Operational, Grade 2 Security and A117.1 Accessibility Code. A recognized independent testing agency must verify that the mortise locksets pass the cycle tests by exceeding six million test cycles.

6.4. Acceptable Manufacturers and Products:

- A. Corbin/Ruswin: Series ML2000, Lever Design (LSR) LWM
- B. Sargent: Series 8200, Lever Design LE1J
- C. Schlage: Series L, Lever Design 03L
- D. Yale: Series 8700FL, Lever Design CRE

6.5. Conform to ANSI Series 1000, mortise functions such as F01, F04 and so on. The consultant shall provide written functions per group.

6.6. UL listing shall be three hours.

6.7. Ensure that steel lock case and parts are protected from corrosion.

6.8. The latch bolt shall have a 3/4-inch projection with a standard stainless steel anti-friction tongue or rollers. Provide anti-pick latch.

6.9. The deadbolt shall be made of 1-1/2 inch stainless steel with a minimum projection of 1 inch.

6.10. The lock spindle shall be designed to break away and fracture with a 120-pound load at end of the lever.

6.11. Construct the armor front plate with stainless steel that is adjustable to door bevel. Comply with ANSI 115.1.

6.12. Escutcheons shall be forged or cast in design.

6.13. The lever shall be solid cast with end return.

6.14. Provide a curved lip strike with wrought box. Special strikes are permitted as required.

6.15. Allow transformation from AC voltage to low voltage. Verify low voltage amperage with Division 16 - Electrical.

6.16. Verify with the university building code official if openings are to be fail-secure or failsafe.

6.17. The A/E shall coordinate details with the electrical engineering consultant.

6.18. The hardware supplier shall provide the power supply.

## **7. Exit devices**

7.1. Comply with ANSI A156.3-1994, Grade 1 operational.

7.2. Regulatory Requirements: UL listed for Accident Hazard or Fire Exit Hardware. Exit devices shall be fire-rated to three hours for up to 8 feet high.

7.3. Acceptable Manufacturers and Products:

- A. Corbin/Russwin: Series ED5000, Lever Design Series L900
- B. Sargent: Series 80, Lever Design ETJ
- C. Von Duprin: Series 99, Lever Design 992L x 03
- D. Yale: Series 7000, Lever Design Series CR600

7.4. The case shall be made of extruded aluminum or cold-forged steel chassis.

7.5. Internal components shall be coated to prevent corrosion.

7.6. Provide touchpads with silencing features.

7.6.1. Exterior dogging shall be permitted by keyed cylinder only.

7.7. Exterior Trim

**7.7.1. PROHIBITED:** Exterior thumb pieces.

7.7.2. Match existing exterior trim on building when remodeling.

7.7.3. Match interior lever design of locksets. Provide solid cast levers with cast or forged escutcheons.

7.7.4. Key entry required.

7.8. Provide forged-steel strikes that are designed for proper latching and deadlocking.

7.9. Electronic Access Control: The manufacturer must have a full line of electronic security functions to control access, including but not limited to the following:

- A. Electric latch retraction
- B. Electric strikes
- C. Electric locking
- D. Delayed egress units
- E. Strikes, touchbar or bolt position monitors
- F. Access control keypads
- G. Electronic horns
- H. Key switches
- I. Wall switches

7.10. The A/E shall set up a meeting to coordinate hardware prior to final approval of the submitted hardware. Attendees shall include the A/E, the hardware distributor, zone personnel and others responsible for immediate resources.

7.11. The wiring diagrams that the manufacturer supplies shall be provided with the shop drawings.

## **8. Closers**

**8.1. PROHIBITED:** Concealed floor and concealed overhead closers.

**8.2. PROHIBITED:** Pressure release valves due to lack of safety.

8.3. Comply with ANSI A156.4-1994, Grade 1 Operational standard.

8.4. Barrier Free Capability: Provide fully adjustable sizing from 1-6. Comply with ADA and ANSI A117.1 requirements.

8.5. Acceptable Manufacturers and Products:

- A. LCN: Series 4011/4111EDA
- B. Norton: Series 7500/7500BF
- C. Sargent: Series 281 (omit Pressure Relief Valve)
- D. Yale: Series 4400/4400BF

8.6. The cylinder body shall be made of cast iron or cast aluminum.

8.7. The piston diameter shall be 1-1/2 inches.

8.8. The shaft diameter shall be 11/16 inch or greater with a full compliment of bearings. The shaft shall be double-heat treated.

8.9. Provide a full rack and pinion mechanism with adjustable controls on sweep, latch and backcheck speeds. Include a tamper-proof tool and an independent feature for adjusting the valve key.

8.10. Closer Arms

**8.10.1. PROHIBITED:** Stamped arms.

8.10.2. Main arm and forearm shall be forged.

8.10.3. An extra heavy-duty parallel arm is required.

8.11. Hydraulic fluid shall be of flat viscosity and stable from 120 degrees F to -30 degrees F. The fluid also shall meet the requirements of UL10C.

8.12. The powder coat finish shall exceed 100 hours of salt spray test.

8.13. The product shall carry a 10-year warranty for material replacement.

8.14. Closer Locations

- A. Labeled doors: When required by code
- B. Exterior doors
- C. Public toilet room doors
- D. Heavily used doors that are normally closed
- E. Other doors normally intended to be locked

## **9. Automatic Door Openers**

**9.1. PROHIBITED:** Touch-and-go operation.

9.2. Automatic door openers shall be low energy, swing type, electro-hydraulic or electro-mechanical units. The openers also shall have power open/spring close operation with hydraulic control features, enclosed in an aluminum cover. The unit manufacturer shall provide actuators. Openers shall be field-adjustable. Systems shall be hard-wired.

9.3. Acceptable Manufacturers:

- A. LCN: Series 4630/4640
- B. Gyro-tech: Series GT710

9.4. For safe maintenance, provide a means to disconnect electrical service to the power door operator directly adjacent to the power door operator.

## **10. Kick Plates and Armor Plates**

10.1. Specify a minimum 10-inch-high by 0.05-inch stainless steel kick plates on the stop side of doors with closers. Special height kick plates may be required in patient care areas of healthcare facilities. Provide beveled edges where all four edges and fasteners are to be countersunk.

10.2. Stainless steel armor plates and door edgings may be required on doors that are subject to impact from food carts, stretchers or similar equipment.

## **11. Stops**

11.1. Review the placement of the floor stops with the maintenance staff.

11.2. Specify stops to protect walls and doors.

11.2.1. Wall stops shall be concave or convex.

11.2.2. Specify blocking in stud walls for wall-mounted stops.

11.3. Where wall-mounted stops cannot be used, concealed overhead stops or closers with integral stops may be used.

**12. Hold Open Devices:** Hold open devices shall be wall-mounted and magnetic. Specify blocking in stud walls for wall-mounted hold open devices.

### **13. Finishes**

13.1. The following finishes are typical:

- A. Exterior Hinges: US32D (BHMA 630)
- B. Interior Hinges: US26D (BHMA 652)
- C. Flush Bolts: US26D (BHMA 626)
- D. Interior Locksets: US26D (BHMA 626)
- E. Exterior Locksets: US32D (BHMA 630)
- F. Exit Devices: US32D (BHMA 630), US26D (BHMA 626)
- G. Pulls, Push Plates/Bars: US32D (BHMA 630)
- H. Coordinators: USP on steel (BHMA 600)
- I. Closers: Powder Coat Aluminum (BHMA 689)
- J. Overhead Stops/holders: US32D (BHMA 630)
- K. Kickplate: US32D (BHMA 630)
- L. Door Edge Guards: US32D (BHMA 630)
- M. Armor Plates: US32D (BHMA 630)
- N. Stops, Holders: US26D (BHMA 626)
- O. Thresholds: Mill on aluminum
- P. Miscellaneous: US26D on brass or bronze (BHMA 626)
- Q. Satin Stainless Steel: US32D (BHMA 630)
- R. Satin Chromium Plated: US26D (BHMA 626)

13.2. Match existing finishes that are predominate when remodeling.

13.3. Special finishes may be required for historic buildings.

### **14. Schedule**

14.1. Hardware groups: The A/E shall specify each item to be used in each opening.

14.2. The A/E shall employ a certified AHC to prepare hardware specifications and review submittals.

14.3. The doors and hardware at university facilities are subject to an inordinate level of high frequency use. Hence, the A/E shall specify which openings are considered heavy or of high frequency use. The A/E shall review conditions with maintenance and operations staff.

14.4. The A/E shall provide in the applicable hardware group a written narrative of proposed functioning at openings with electronic controls or devices.

**15. Special Consideration:** In some cases, the differential air pressure can cause the closure function on doors to not function correctly. The A/E, AHC and mechanical engineer shall coordinate the design elements to ensure proper door function.

**16. Electric (Battery) Card Operated Mortise Locks:** Schlage shall be the manufacturer of electric (battery) card-operated mortise locks. **NO SUBSTITUTIONS.** The locks also shall have the following components/capabilities:

16.1. Software that provides the following for each lock:

- A. The ability to handle 1,500 users (cardholders) per lock
- B. One thousand entry audit trail. Unlimited user levels
- C. Master level access
- D. Programmable passage mode, auto unlock, re-lock and lockout
- E. Time zones for weekends and holidays
- F. Automatic updating for access card

16.2. The ability to read and reference university-manufactured, encoded and issued identification cards that adhere to ISO 7811/2 and ISO 7811/4 standards.

16.3. Independently operated locks that are powered by six AA batteries.

16.4. Independent programming of each lock from a 386-notebook computer that operates on MS DOS 5.0 or more recent system. The system shall have two MB RAM and 80-MB hard disk space through an infrared communication adapter.

16.5. The ability to fit into a standard mortise lock opening without altering the fire rating of the door.

16.6. A mechanical key override with interchangeable cylinder.

## **08800 - GLASS AND GLAZING**

**1. Industry Standards:** Glass sizes, glass types, glazing details and methods shall conform to the published recommendations of the glass manufacturer and the “Glazing Manual” and “Sealant Manual” of the Flat Glass Marketing Association. Each type of glass required shall be specified according to current ASTM standards.

**2. Energy Conservation:** Double-glazed insulating units with internal low-emission coatings and inert gas fill shall be used, except in non-insulated areas. Tinted glass and reflective glass shall be selected where appropriate to reduce energy use.

**3. Glazing Compounds and Gaskets:** Compounds, tapes and gasket materials shall have a minimum life expectancy of 20 years.

**4. Warranty:** A manufacturer’s signed warranty is required for insulating units. The warranty shall cover replacement of units that are found defective within 10 years of the date of Substantial Completion. Defects shall include failure of the hermetic seal, deterioration of internal glass coatings and other indications of seal failure or non-performance, except where caused by breakage. Appearance of dirt, moisture, fogging or internal condensation at temperatures above -20 degrees F shall be considered conclusive evidence of defect. Replacement units shall be delivered to the project site without cost to the university.

**End of Division 8 - Doors and Windows**  
**University of Minnesota Facilities Management**  
**November 2002 (Revised: December 2006)**