



## BULLETIN 7

### 1. INTRODUCTION

Bulletins are issued as supplemental directions as necessary between complete Design Guideline revisions. Revisions made by bulletin will be incorporated into the next revised issue of the Guidelines.

### 2. DIRECTIONS

Bulletin 7 is issued to revise the Aluminum Storefront and Door Hardware requirements as outlined in Section 8. These revisions are to take effect immediately for all projects.

Items deleted by this revision are struck through, ~~ITEM~~ and new items will be underlined, ITEM. A new Guideline issue will remove struck through items and remove underlines from the previous issue. The new issue will then follow the strike through, underline process listed above.

### 3. ATTACHMENT(S)

Section 08 41 13

Section 08 71 00



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SECTION 08 41 13  
ALUMINUM STOREFRONT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum storefronts.

1.2 RELATED SECTIONS

- A. Section 05 52 17 - Roof Fall Protection.
- B. Section 08 43 26 - All-Glass Storefronts.
- C. Section 08 43 33 - Folding Glass Wall System.
- D. Section 08 71 00 – Door Hardware
- E. Section 08 81 00 - Glass Glazing.
- F. Section 08 44 13 - Glazed Aluminum Curtain Walls.

1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 2. ASTM E 283 - Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
  - 3. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
  - 4. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Configuration and details for installation, maintenance and operation.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.



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### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
- B. Installer Qualifications: Minimum 2 year experience installing similar products.
- C. Mock-Up: Provide a mock-up upon request of owner for evaluation of surface preparation techniques and application workmanship. Mock up coordinated prior to contract documents sign off.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship is approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.

### 1.6 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section with owners representative, material supplier and material installer.

### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Handling: Handle materials to avoid damage.

### 1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

### 1.9 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Submit manufacturer who meets design guidelines designated in construction documents
- B. Substitutions: Submit for approval.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

### 2.2 DOORS

- A. Rail and Wide Stile:
  - 1. 5 inches stile with 8 inches top rail.
- B. Accessories:
  - 1. ADA Bottom Rail: 10-1/2 inches (267 mm) high.
  - 2. Threshold: 4 inches (102 mm) extruded aluminum



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- a. Finish: Clear anodized.
- 3. Threshold: 5 inches (127 mm) extruded aluminum
  - a. Finish: Clear anodized.
- 4. Threshold: 5 inches (127 mm) extruded aluminum with bulb seal.
  - a. Finish: Clear anodized.
- 5. Threshold: 7 inches (178 mm) extruded aluminum.
  - a. Finish: Clear anodized.
- C. Hardware:
  - 1. Refer to Section 08 71 00 - Door Hardware. For approved Hardware.
- D. Texas department of Insurance (TDI) Requirements – When required all hurricane rated openings will comply with TDI assembly testing for wind storm or hurricane rated systems.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

#### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### 3.3 INSTALLATION

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

#### 3.4 FIELD QUALITY CONTROL

- A. All joints between metal and masonry shall be fully caulked and field tested to resist water leakage with provisions taken to drain infiltrated water.

#### 3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION



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### SECTION 08 71 00

#### DOOR HARDWARE

##### GENERAL

- 1.1 The architect should include in this section: commercial door hardware for swinging and other doors, cylinders for doors specified in other sections, electrified hardware and products furnished, but not installed, under this Section. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.
- 1.2 RECOMMENDED SUBMITTALS
  - A. Require LEED (Leadership in Energy and Environmental Design) product information and applicable program credits that are available to contribute towards a LEED Certified Level project certification.
    1. Credit MR 4.1 and 4.2: Manufacturer's or fabricator's certificate indicating percentage of post-consumer recycled content by weight and pre-consumer recycled content by weight for each Product specified under this Section.
  - B. Call for details of electrified and access control hardware, indicating the following:
    1. System Block Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring. Include the following for each unique electrified opening:
      - a. Point-to-point system wiring and riser diagrams.
      - b. Elevation diagram of each door.
      - c. Operational description.
  - C. Request a door hardware schedule prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
    1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
    2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
      - a. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3.
    3. Content: Include the following information:
      - a. Type, style, function, size, label, hand, and finish of each door hardware item.
      - b. Manufacturer of each item.
      - c. Fastenings and other pertinent information.
      - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
      - e. Explanation of abbreviations, symbols, and codes contained in schedule.
      - f. Mounting locations for door hardware.
      - g. Door and frame sizes and materials.
      - h. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
        - 1) Sequence of Operation: Include description of component functions including, but not limited to, the following situations: normal secured/unsecured state of door; authorized access; authorized egress; unauthorized access; unauthorized egress; fire alarm and loss of power conditions.
    4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must



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precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

- D. Require a keying schedule prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- E. Request maintenance data for each type of door hardware to include in maintenance manuals. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items:
  - 1. Approved hardware schedule, catalog cuts and keying schedule.
  - 2. Provide keying bitting list in paper and electronic format by registered mail directly to facility manager owner.
  - 3. Hardware installation and adjustment instructions.
  - 4. Manufacturer's written warranty information.
  - 5. Wiring diagrams, elevation drawings and operational descriptions for all electronic openings.

### 1.3 REQUIRE QUALITY ASSURANCE

- A. Door Hardware Installer Qualifications: An experienced and factory trained Installer who has completed both standard and electrified builders hardware and integrated access control installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Door Hardware Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity which is not more than a half day of travel from the jobsite and who employs a qualified Architectural Hardware Consultant or equivalent experience available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying. Supplier recognized by manufacturers to be a direct factory-authorized distributor of the specified hardware products. Supplier is required to be available for onsite meetings with one days notice regarding issues that arise with opening functions, installation, keying, on-site warehousing, trouble shooting of products, and final punch out related issues.
  - 1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- C. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant (AHC) and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- D. Source Limitations: Obtain each type and variety of aluminum, steel and wood door hardware from the same single source manufacturer and supplier, unless otherwise indicated.
  - 1. Provide electrified door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
  - 2. Provide standard door hardware, electrified door hardware and access control door hardware as a single sourced package from the same qualified supplier.
  - 3. Provide exterior door hardware from the same manufactures as the interior door hardware, HISD Lock department to approve and will be based on the performance of existing hardware.



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- E. Regulatory Requirements: Comply with provisions of the following:
  - 1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
    - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
    - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
      - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
      - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
    - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
  - 2. NFPA 101: Comply with the following for means of egress doors:
    - a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
    - b. Thresholds: Not more than 1/2 inch high.
  - 3. International Building Code (2003).
- F. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
  - 1. Test Pressure: Positive pressure labeling.
- G. Wind Load : Where they are required, Provide door hardware with hollow metal or aluminum assemblies approved by the Texas Department of Insurance, including anchorage, capable of withstanding windload design pressures which are calculated for this project by a registered architect or engineer and is part of the construction documents per the Texas Department of Insurance, authorities having jurisdiction and the International Building Code Design Loads per section 1609.
- H. Hurricane-Resistance Test Performance:Where they are required Provide door hardware with hollow metal or aluminum approved assemblies that pass large missile-impact tests, as required by 'Texas Department of Insurance systems' location above grade, and cyclic-pressure tests according to testing requirements of authorities having jurisdiction.
  - 1. Impact Resistance:Where they are required Door Hardware approved assemblies must satisfy the Texas Department of Insurance's criteria for protection from windborne debris in both the Inland I zone and the Seaward zone. The assemblies must have passed the large missile impact test (which equates to Missile Level D specified in ASTM E 1996-02). The assemblies may be installed at any height on the structure as long as the design pressure rating for the assemblies is not exceeded. These assemblies will and do not need to be protected with an impact protective system when installed in areas where windborne debris protection is required.

### 1.4 REQUIRE CONTRACTOR TO COORDINATE

- A. Templates: Door Hardware Supplier, shall provide and distribute (to the parties involved) templates for doors, frames, and other work specified to be factory prepared for installing standard, electrified and, access control door hardware and gate hardware
- B. Access Control and Electrical Connections: **Door Hardware supplier to coordinate with door and frame supplier to coordinate the layout and installation of scheduled**



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**electrified door hardware with required connections to source power junction boxes, power supplies and security products.**

- C. Keying Conference: Door Hardware Supplier to conduct Keying conference, to incorporate the following criteria into the final keying schedule document:
1. Function of building, purpose of each area and degree of security required.
  2. Plans for existing and future key system expansion.
  3. Review all lock and exit device functions when reviewing keying requirements.
  4. Requirements for key control system.
  5. Installation of permanent keys and cylinder cores.
  6. Address the requirements for delivery of keys.
  7. Address keying and cylinder stamping (identification) as required by owner or owner representative.
  8. Establish method of submitting electronic format of keying systems and diagram and to be produced and provided by Hardware Supplier.
  9. Gate Hardware : Coordinate exit device requirements with Section 32 31 19 Ornamental Fence and Gates .

### 1.5 REQUIRED WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of standard, electrified hardware and access control hardware that fails in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
1. Structural failures including excessive deflection, cracking, or breakage.
  2. Faulty operation of the hardware.
  3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Warranty Period: Two year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
1. Ten years for cylindrical locksets.
  2. Life of Installation for mortise locks.
  3. Five years for exit devices.
  4. Ten years for manual door closers.
  5. Two years for electromechanical door hardware.
  6. Five years for Thresholds, Door Sweeps, Gasketing, Perimeter Weatherstripping.
- E. Extended Warranty: As requested by the Owner, provide a separate optional extended warranty and maintenance contract as required for the access control system and power assist operated openings. Version upgrades and "fix" releases to the software, beyond the general warranty time period, are available at no extra charge only if the end user is under a valid extended warranty and maintenance contract.
- F. 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.
- G. Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of door hardware and integrated access control systems suppliers and installers. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as





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required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

### PRODUCTS

#### 2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in this Section.
  - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated for named products listed in Hardware Sets.
  - 2. Sequence of Operation: Provide electrified and access control hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule.
- C. Finish:
  - 1. Generally BHMA 626 Satin Chromium
    - a. Areas using BHMA 626 to have push plates, pulls, exit devices, vandal trim, and protection plates of BHMA 630 Satin Stainless Steel, unless otherwise noted.
  - 2. Door Closers: Factory powder coated to match other hardware, unless otherwise noted.
  - 3. Aluminum Items: Match predominant adjacent material. Seals to coordinate with frame color.

#### 2.2 HINGES AND PIVOTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Pivot Hinges: NOT ALLOWED.
  - 2. Concealed rods: NOT ALLOWED.
  - 3. Surface Rods: NOT ALLOWED.
  - 4. Hinges: McKinney or Stanley
    - a. Conventional Hinges: Steel or stainless steel pins and concealed ball bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.
    - b. Three hinges per leaf to 7 foot, 6 inch height. Add one hinge for each additional 30 inches in height, or any fraction thereof.
    - c. Extra heavy weight hinges on doors over 3 foot, 5 inches in width.
    - d. Extra heavy weight hinges on doors with panic hardware or fire exit devices.
    - e. Extra heavy weight hinges on restroom, locker, gym, and other high frequency openings.
    - f. Outswinging exterior doors: non-ferrous with non-removable (NRP) pins.
    - g. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.
    - h. Five inch tall hinge at openings over 36 inches in width.
  - 5. Continuous Hinges :McKinney, Stanley or Select.
    - a. Continuous Hinges: Geared-type Heavy Duty reat type.
- B. Standards: BHMA Certified products complying with the following:
  - 1. Butts and Hinges: BHMA A156.1.
  - 2. Continuous Geared Hinges: BHMA A156.26.
  - 3. Template Hinge Dimensions: BHMA A156.7.
  - 4. Self-Closing Hinges: BHMA A156.17.
  - 5. Floor Hinges: BHMA A156.4.
- C. Quantity: Provide the following, unless otherwise indicated:
  - 1. Two Hinges: For doors with heights up to 60 inches.



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2. Three Hinges: For doors with heights 61 to 90 inches.
  3. Four Hinges: For doors with heights 91 to 120 inches.
  4. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches (of door height greater than 120 inches).
- D. Flush Floor Plates and Thresholds: Provide finish cover plates or thresholds as indicated in door hardware sets for floor hinges. Match door hardware finish, unless otherwise indicated.
- E. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

Maximum Door Size (inches)	Hinge Height (inches)	Metal Thickness (inches)	
		Standard Weight	Heavy Weight
36-in by 86-in by 1-3/4	4-1/2	0.134	0.180
< 36-in by 120-in by 1-3/4	5	0.146	0.190

- F. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
1. Exterior Doors: Heavy weight, non-ferrous, ball bearing hinges.
  2. Interior Doors: Heavy weight, ball bearing hinges unless Hardware Sets indicate standard weight.
- G. Hinge Height Clarifications: Where uneven door leafs occur, the widest door leaf should be used to determine the height of the hinges on the inactive and active door leafs; to ensure equal size hinges on opening.
- H. Hinge Weight Clarification: If heavy weight hinges are specified in hardware sets for aluminum frames then standard weight hinges can be used. If aluminum frame openings are 42 inches and greater then an additional hinge should be used in lieu of heavy weight hinges.
- I. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:
1. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
    - a. Out-swinging exterior doors.
    - b. Out-swinging access controlled doors.
  2. Electric Hinges: Provide electric transfer hinges with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Wire nut connections are not acceptable.
- J. Provide mortar guard enclosure on frames at each electrical hinge location specified.

### 2.3 SCHEDULED DOOR HARDWARE/DOOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following: Surface Bolts: Flush Bolts and Coordinators
1. McKinney Products (MC).
  2. Rockwood Manufacturing (RO).
  3. Trimco Manufacturing (TR).
  4. Standards: Comply with the following:
    3. Surface Bolts: BHMA A156.16.
    4. Automatic and Self-Latching Flush Bolts: BHMA A156.3.
    5. Manual Flush Bolts: BHMA A156.16.
- B. Surface Bolts and Flush Bolts: BHMA Certified Grade 1.
- C. Provide bolts with top rod of sufficient length to allow bolt location approximately six feet from the floor regardless if detailed as such in hardware sets. Furnish dust proof strikes



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for bottom bolts. Surface bolts to be 8" in length, unless otherwise noted and U.L. listed for labeled fire doors.

- D. Bolt Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
1. Mortise Flush Bolts: Minimum 3/4-inch throw.

### 2.4 LOCKS AND LATCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Mechanical Mortise Locks and Latches:
    - a. **Sargent Manufacturing (SA) - 8200 Series w/ LNL Trim.**
    - b. **Best (BE) – 45H Series w/ 15H Trim.**
  2. Mechanical Bored Locks and Latches:
    - a. **Best (BE) – 93K Series w/ D Trim – Only for temp Buildings and Pres box.**
  3. Auxiliary Cylindrical Deadbolts:
    - a. **Best (BE) – T Series.**
    - b. **Sargent Manufacturing (SA) - 480 Series.**
  4. Auxiliary Mortise Deadbolts:
    - a. **Best (BE) – 48H Series.**
    - b. **Sargent Manufacturing (SA) - 4870 Series.**
- B. Standards: Comply with the following:
1. Mortise Locks and Latches: BHMA A156.13.
  2. Bored Locks and Latches: BHMA A156.2.
  3. Auxiliary Locks: BHMA A156.5.
- C. Mortise Locks: BHMA Certified Grade 1,
- D. Bored Locks: BHMA Certified Grade 1,
- E. Auxiliary Locks: BHMA Certified Grade 1.
- F. Lock Trim: Match the following design style:
1. Levers:
    - a. **Sargent Manufacturing (SA) – LNL/LL**
    - b. **Best (BE ) – 15 H /15 D**
- G. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:
1. Mortise Locks: BHMA A156.13.
  2. Bored Locks: BHMA A156.2.
  3. Interconnected Locks: BHMA A156.12.

<u>Lock Functions</u>	<u>Room Type</u>
AT (F04) w/VIT	Classroom/Office
D (F07)	Storage
N (F01)	Passage Pre-School Restrooms
TD w/VIB	Faculty Restrooms in Public Area
L w/VIB (F19)	Privacy Restroom in Non-Public Area

- H. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
1. Mortise Locks: Minimum 3/4-inch latchbolt throw.



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2. Bored Locks: Minimum 1/2-inch latchbolt throw.
3. Deadbolts: Minimum 1-inch bolt throw.
- I. Backset: 2-3/4 inches unless otherwise indicated.

### 2.5 ELECTRIFIED LOCKS

- A. Manufacturers: Subject to same compliance standards and requirements as mechanical locksets, provide products by one of the following:
  1. Electromechanical Mortise Locks:
    - a. **Best (BE) – 45HW.**
    - b. **Sargent Manufacturing (SA) - 8270 Series.**
  2. Electromechanical Cylindrical Locks:
    - a. **Best (BE) – 93K EL/EU Series**
  3. Electrified Options: As indicated in hardware sets, provide electrified lock options including: outside door trim control, and request-to-exit signaling. Unless otherwise indicated, provide electrified locksets standard as fail secure.

### 2.6 CYLINDERS AND KEYING

- A. Provide Patented, High, Security cylinders utilizing a unique factory code pattern that is both geographically and time zoned protected. A letter of authorization under the letterhead of the End User must accompany purchases of any products which involve patented cylinders, keys and accessories. Manufacturers of patented security cylinders to allow the ability for both security and conventional cylinders to be used together under the same facility master or grandmaster key system. The End User is required to have the ability for on-site cylinder pinning and original key cutting.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Patented Cylinders:
    - a. **Best (BE) - CORMAX Patented Cylinders and Cores.**
  2. Keying Requirements:
    - a. Keying : General Contractor to arrange key meeting with HISD LOCK DEPT ,core Manufacture representative,hardware supplier ,and principal to ensure locksets ,and Keying System layout conform to HISD standards . Manufacture to provide copy of keying and programing schedules to general contractor and Owner .The Door Hardware supplier shall supply inclusive pricing ,with The hardware bid ,for installation of permanent cores by the core Manufactures installation technician . Manufacturers technican to install permanent cores under supervision of HISD representative and return construction cores to the General Contractor . Key System: Existing small format cylinders with interchangeable core. For estimating purposes use factory GMK charge. Initiate and conduct meeting(s) with Owner to determine system structure and keybow styles.
    - b. Construction Keying: Furnish keyed-alike temporary cores plus 10 operating keys. Temporary cores and keys remain property of hardware supplier.
    - c. Interchangeable Cores: 7-pin solid brass construction. Six-pin should be converted to 7 pin to accept I/C core.
    - d. Permanent Cores: Furnish factory-keyed.
    - e. Match the existing keyway for the school district.
    - f. Permanent Keys and Cores: Use secured shipment direct from point of origination to Owner.
    - g. Biting List: Provide a key-biting schedule. Use secured shipment direct from point of origination to Owner upon completion.



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- h. Key Cabinet: Provide a key cabinet. Confirm mounting location in a secure area..
- C. Standards: Comply with the following:
  - 1. IC Core: BHMA A156.5.
  - 2. Key Control System: BHMA A156.5.
- D. Cylinder Grade: BHMA Certified Grade 1.
- E. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
  - 1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.
- F. Construction Keying: Comply with the following:
  - 1. Construction Master keying: Provide temporary construction master keyed cores that are replaceable by permanent cores.
- G. Keying System: Unless otherwise indicated, provide for a keying system complying with the following requirements:
  - 1. New Grand Master Key System: Cylinders are factory keyed operated by a change key, master key, and a grand master key. Conduct keying meeting with End User to define and document keying system instructions and requirements.
- H. Keys: Provide nickel-silver keys complying with the following:
  - 1. Stamping: Permanently inscribe each key with a visual key control number and as directed by Owner.
  - 2. Quantity: Supply as designated on HISD key system set up per school level (ES, MS, HS).
    - a. Extra Keyed Permanent Cores: Ten.
    - b. Extra Blank Keys: Fifty.
- I. Key Registration List: Provide keying transcript list to Owner's representative for lock cylinders.
- J. Key Control System: Provide one lockable cabinet for key control and storage for up to 150 percent capacity, type and model to be determined in the keying meeting with the owner.
- K. Key Cabinets: TelKee, Lund, or Owners Standard.

### 2.7 STRIKES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Electric Strikes: BHMA Certified Grade 1.
    - a. Hes (HE) – 1000, 5000, 9600 9400 Series.
- B. Standards: Comply with the following:
  - 1. Strikes for Bored Locks and Latches: BHMA A156.2.
  - 2. Strikes for Mortise Locks and Latches: BHMA A156.13.
  - 3. Strikes for Auxiliary Deadlocks: BHMA A156.5.
  - 4. Dustproof Strikes: BHMA A156.16.
  - 5. Electric Strikes: BHMA A156.5.
- C. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
  - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
  - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
  - 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
- D. Provide electrified products with an in-line power controller that enables the hardware to operate from 12 to 32 volts. On board safety features shall include an in-line fuse to



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protect the hardware and host system from any possible reverse current surges. The controller shall regulate current to provide continuous duty operation without the typical head build up. Adding the in-line power controller with electrified products provides unlimited lifetime warranty of electrified products.

### 2.8 EXIT DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. **Exit Devices:**
    - a. **Sargent Manufacturing (SA) - 80 Series,**
    - b. **Precision (PHI) – Precision Apex Series**
  - 2. **Exit Device Trim, Pull/Lever:**
    - a. **Sargent (SA) – FSW/ETL Interior; 826-821 Exterior as required**
    - b. **Precision (PHI) V 4900A Interior; 1097 Trimco Exterior as required**
  - 3. Electrified Options: As indicated in hardware sets, provide electrified exit device options including: Motorize latch power retraction, exit alarm, and request-to-exit signaling. Unless otherwise indicated, provide electrified exit devices standard as fail secure.
  - 4. **Lockdown: Classroom function with Indicator thumb turn required on classroom and office corridor doors.**
- B. Standard: BHMA A156.3.
- C. Exit Devices: BHMA Certified Grade 1.
- D. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.
- E. Fire Exit Devices: Complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.
- F. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
- G. Outside Trim: Match design for locksets and latchsets, unless otherwise indicated.
- H. Through Bolt Installation: For exit devices and trim as required for ALL Doors and Gates .

### 2.9 ACCESSORIES FOR PAIRS OF DOORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Coordinators:
    - a. McKinney Products (MC).
    - b. Rockwood Manufacturing (RO).
    - c. Trimco
  - 2. Keyed Removable Mullions:
    - a. Sargent Manufacturing (SA) L980 Series.
    - b. Precision KR 822
    - c. Mullion Stabilizers are required for all Exterior Doors .
- B. Standards: Comply with the following:
  - 1. Coordinators: BHMA A156.3.
  - 2. Removable Mullions: BHMA A156.3.
- C. Fire-Exit Removable Mullions: Provide keyed removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions shall be used with exit devices for which they have been tested.

### 2.10 CLOSERS and POWER OPERATORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one the following:





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1. Surface-Mounted Closers (Heavy Duty): BHMA Certified Grade 1.
  - a. Norton Door Controls (NO) - 7500 Series with heavy duty arms.
  - b. Sargent Manufacturing (SA) - 351 Series with heavy duty arms.
  - c. Best (BE) – HD8000 Series with heavy duty arms.
2. Surface-Mounted Closers (Standard Duty): BHMA Certified Grade 1.
  - a. Norton Door Controls (NO) - 8501 BF Series.
  - b. Sargent Manufacturing (SA) - 1431 Series.
  - c. Best (BE) – HD7000 Series.
3. Closer Holder Release (Detector) Devices: BHMA Certified Grade 1.
  - a. Norton Door Controls (NO) - 7700PT(D) Series.
  - b. Sargent Manufacturing (SA) -351 EHT(D) Series
  - c. Best (BE) – HD8000 EMF Series.
4. Power Assist Operators: BHMA Certified Grade 1.
  - a. Besam Manufacturing (BM) – SW-100 Series.
  - b. Norton Door Controls (NO) – 6000 Series
  - c. Dormakaba (DM) – ED900 Series
  - d. Stanley (ST) – Magic Force Series.
- B. Standards: Comply with the following:
  1. Closers: BHMA A156.4.
  2. Power Operators: BHMA A156.19. Power operators to comply with TAS 404.3.
- C. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide non-handed, factory-sized closers adjustable to meet field conditions and requirements for opening force.
- D. Closer Options: As indicated in hardware sets, provide door closer options including: delayed action, hold open arms, extra duty parallel arms, positive stop/hold open arms, compression stop/hold open arms, special mounting brackets, spacers and drop plates. Through bolt type mounting is required as indicated in the door hardware sets.
- E. Power assist operators as surface mounted, electric low energy type conforming to ANSI A156.19 requirements and capable of meeting ANSI A117.1 guidelines. Outputs and relays required to be on board in the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.
  1. Outputs and relays on board the operator allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.
  2. Electronic Controls to be microprocessor controlled unit shall control the operation and switching of the swing power operator. The electronic control provides low voltage power supply for all means of actuation. Electronic encoder to determine absolute open and close position.
  3. All electrified locks should be fail secure unless required to be failed safe .

### 2.11 OPERATING and PROTECTIVE TRIM UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Metal Protective Trim Units:
    - a. McKinney Products (MC).
    - b. Rockwood Manufacturing (RO).
    - c. Trimco (TR)
- B. Standard: Comply with BHMA A156.6.
- C. Materials: Fabricate protection plates from the following:
  1. Brass/Bronze and Stainless Steel: .050 inches thick, beveled four sides (B4E) with countersunk screw holes.
- D. Push-Pull Design: 1" Round with 10" Centers.



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- E. Fasteners: Provide manufacturer's designated fastener type as indicated in door hardware sets.
- F. Furnish protection plates sized 1 1/2 inches less than door width (LDW) on push side and 1 inch less door width on pull side by height specified in door hardware sets.

### 2.12 STOPS AND HOLDERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Stops and Holders:
    - a. McKinney Products (MC).
    - b. Rockwood Manufacturing (RO).
    - c. Hager
    - d. Trimco Manufacturing (TR) 1201, 1209, & 1277.
    - e. Ives FS448, FS18S, & 407B
- B. Standards: Comply with the following:
  - 1. Stops and Bumpers: BHMA A156.16.
  - 2. Electromagnetic Door Holders: BHMA A156.15.
  - 3. Combination Overhead Holders and Stops: BHMA A156.8.
  - 4. Door Silencers: BHMA A156.16.
- C. Stops and Bumpers: BHMA Certified Grade 1.
- D. Electromagnetic Door Holders for Labeled Fire Door Assemblies: Coordinate with fire detectors and interface with fire alarm system. Magnetic door holders shall meet or exceed ANSI A156.15 and be UL listed 228 for Door Closer and Holders, with or without integral smoke detectors. Holding force shall be 25 to 40 pounds and shall be fail-safe. Pushpin release that eliminates residual magnetism shall be standard. Provide magnetic hold-opens with triple-voltage coil that can receive 12 VDC, 24 VAC/DC, or 120VAC; or coordinate required voltage with electrical. Subject to compliance with requirements, provide products by one of the following:
  - 1. Rixson Hardware (RX) - 980 Series.
  - 2. Sargent Manufacturing (SA) - 1560 Series.
  - 3. LCN (LC) – SEM7800 Series.
  - 4. A.B.H. Series .
- E. Combination Overhead Stops and Holders: Certified BHMA Grade 1.
  - 1. Glynn-Johnson (GJ) – 100 Concealed and 90 Surface Series
  - 2. ABH.
  - 3. Sargent Hardware (SA) – 600 Concealed and 500 Surface Series.
- F. Floor Stops: For doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic.
  - 1. Where stops are not appropriate, provide overhead stops.
  - 2. Floor shall be furnished and allow maximum of doors and will not preset a tripping hazard .
- G. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch fabricated for drilled-in application to frame. Provide (3) per single door and (2) per paired door frame if applied gasketing is not specified in Hardware Sets.

### 2.13 DOOR THRESHOLDS, WEATHERSTRIPPING AND GASKETING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Door Thresholds, Weatherstripping and Gasket Seals:
    - a. McKinney Weatherstripping Products (MW).
    - b. NGP Manufacturing (NG)
    - c. Pemko Manufacturing (PE).
    - d. Reese
- B. Standard: Comply with BHMA A156.22.





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- C. General: Provide continuous weatherstrip seal on exterior doors and smoke, light, or sound gasketing on interior doors where specified. Provide non-corrosive fasteners for exterior applications.
  - 1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame. Install header seal before mounting door closer arms.
  - 2. Meeting Stile Astragals: Fasten to meeting stiles, forming seal when doors are closed.
  - 3. Door Sweep: Apply to bottom of door, forming seal with threshold when door is closed.
- D. Basic Sound Seal Requirement: Whether indicated on the drawings or not, provide gasketing MCKS88BL at sound rated wall types and at the following areas for limiting of sound transmission: private offices, exams, conference, private toilets, corridor openings, rooms and similar sound sensitive area.
- E. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
  - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- F. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
  - 1. Intumescent Seals and Gasketing: Provide concealed, Category A type gasketing systems on assemblies where an intumescent seal is required to meet IBC and UL-10C positive pressure labeling.

### 2.14 SLIDING DOOR HARDWARE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. P. C. Henderson, Inc. (PC).
  - 2. Haefele Manufacturing (HF).
  - 3. Hager Manufacturing (HA).
  - 4. Richards-Wilcox, Inc. (RW).
- B. Standard: Comply with BHMA A156.14.
- C. Sliding Bi-Passing Pocket Door Hardware: Provide complete sets consisting of track, hangers, stops, bumpers, floor channel, guides, and accessories indicated.
- D. Bi-folding Door Hardware: Rated for door panels weighing up to 125 lb.
- E. Pocket Sliding Door Hardware: Rated for doors weighing up to 200 lb.
- F. No Barn style Allowed .

### 2.15 POWER SUPPLIES

- A. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Modular unit in NEMA ICS 6, Type 4 enclosure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment. Third party listed and labeled for use with fire alarm systems. Power supply shall be furnished with a minimum of four (4) 4 Amp/hour batteries providing battery back up. An integral battery charging circuit shall be standard. Provide key locking cover to prevent tampering. Provide all control boards and relay panels to sufficiently operate the opening as described and intended per hardware sets. Subject to compliance with requirements, provide products by one of the following:
  - 1. **Boxed Power Supplies:**
    - a. AI 1024 ULACMCV Power .



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### 2.16 ELECTRIC DOOR CORDS

Electric Door Hardware Cords: Furnish electric transfer wiring with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and another one for hinge to junction box above the opening. Wire nut connections are not acceptable at low voltage electrified hardware. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified door:

- A. Sargent devices
  - 1. McKinney Connect Harness.
- B. Best Devices
  - 1. Stanley Quick Connect Harness.

### 2.17 ELECTRIC WALL MOUNT KEYSWITCHES

- A. Keyswitches shall be furnished on a stainless steel single gang face plate with a 12/24VDC bi-color LED and an integral backing bracket that shall permit integration with any 1.25" or 1.125" mortise cylinder. Keyswitches shall be available for momentary or maintained action and in narrow stile designs. Subject to compliance with requirements, provide products by one of the following:
  - 1. Electric Wall Mount Keyswitches : (ALL) Key switches should be Best IC Compatible .
    - a. Securitron Door Controls (SE) – MK Series
    - b. Folger Adam EDC (FO) - FAMK Series.
    - c. Locknetics (LO) – 650 Series.

### 2.18 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

### 2.19 FINISHES

- A. Standard: Comply with BHMA A156.18.
- B. 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.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable and temporary protective covering before shipping to jobsite.
- D. Provide clear powder coat finish at exit devices located on exterior openings such as gates and at pool exit doors.
- E. BHMA Designations: Comply with base material and finish requirements indicated by the following:
  - 1. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
  - 2. BHMA 630: Satin stainless steel, over stainless-steel base metal.



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### EXECUTION

- 3.1 The architect should include the following requirements in their specification and include additional directives as necessary for the project.
- 3.2 ***The architect should coordinate with the lock department upon substantial completion a core installation and keying meeting. Lock department to participate in walk through and sign off on lock hardware and lock core install.***
- 3.3 EXAMINATION
  - A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
  - B. Examine roughing-in for electrical source power to verify actual locations of wiring connections before electrified door hardware installation.
  - C. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.4 PREPARATION
  - A. Steel Doors and Frames: Comply with ANSI/DHI A115 series.
  - B. Wood Doors: Comply with ANSI/DHI A115-W series.
  - C. Electrified Openings: Provide steel doors and frames and wood doors prepared to receive electrified hardware connections specified in Door Hardware Sets without additional modification.
- 3.5 INSTALLATION
  - A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
    1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
    2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
    3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
  - B. Provide and coordinate concealed wood blocking for wall mount stops as detailed in Door Hardware Schedule.
  - C. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- 3.6 FIELD QUALITY CONTROL
  - A. Field Inspection: Supplier and Door Hardware Manufacturer will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.
    1. Access Control System Consultant will inspect integrated electronic and access control hardware and state in report whether installed work complies with or deviates from requirements, including whether electronic and access control hardware is properly installed and performing according to system operational descriptions.
      - a. Inspection: Verify that units and controls are properly installed, connected, and labeled and that interconnecting wires and terminals are identified.



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- b. Pre-testing: Program and adjust the system and pretest all components, wiring, and functions to verify they conform to specified requirements. Replace malfunctioning or damaged items with new items.
- c. Acceptance Test Schedule: Schedule tests after pre-testing has been successfully completed and system has been in normal functional operation for at least 2 weeks.
- d. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

### 3.7 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
  1. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.
- B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:
  1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
  2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
  3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

**END OF SECTION**