

08710 DOOR HARDWARE

SPECIFIER: This section replaces both 08710 and 08711 (2004).

It can be used for new construction, remodeling, or a combination of the two. The development of this Spec Guide and the Hardware Schedule will proceed with much interaction between the A/E and the MDCPS Central Lock Dept.

During design, and before the Phase III – 100 % submittal, consult with MDCPS Facilities Operations and Maintenance – Central Lock Dept. as well as MDCPS School Police for the locations of any card access control systems, security cameras, intrusion detectors, motion detectors, and other security measures. Submit drawings, specifications, and preliminary door hardware schedule to Central Lock Dept. at least 4 weeks before the Phase III – 100% submittal.

Resubmit a revised, corrected hardware schedule to Central Lock Dept. before issuing the final Phase III – 100% Construction Documents for pricing/bidding or for building permit review.

CSI MasterFormat 2004 number: 08 71 00.

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

A. Coordinate door hardware with work before and after. See especially,

SPECIFIER: Refer to wood doors, aluminum entrance doors, and to card ONLY if they are programmed to be a part of the Work

1. Architectural casework hardware and keys	06400
2. Steel doors and frames	08110
3. Locks and keys at wall and ceiling access doors and panels	08305
4. Aluminum entrance doors, hardware and keys	08411
5. Toilet compartment hardware	10170
6. Toilet accessory locks and keys	10281
7. Laboratory casework finish hardware and keys	11600
8. Access control system	13860
9. Elevator hall stations and elevator keys	Div 14
10. Special security systems at doors	Electrical and telecommunications sections
11. Fire alarm and detection	16721

B. Definitions.

1. Central Lock Dept.: The MDCPS Central Lock Dept. (which includes the Lock Shop) (305 995-4027)

SPECIFIER: "designated quiet area" below refers to any room or space that must comply with STC limits set in the Design Standards for this Project. "Sound control" refers to sound or odor control as applicable.

2. Sound control areas:
 - a. Auditorium / cafetorium area: Perimeter of entire stage and seating area;
 - b. Auditorium lobby: Doors leading to auditorium;
 - c. CCTV production room and CCTV studio: Perimeter;
 - d. Control rooms: To each control room or booth in or adjoining an auditorium / cafetorium, a CCTV room, little theater, or other area served by control room equipment;
 - e. Band room, vocal music room, piano lab, and music lab: Perimeter and internal practice and ensemble rooms;

- f. Media center: Perimeter and any designated quiet area within.
 - g. Vocational labs / shops: Doors (interior) to rooms that produce noise or odor.
 - h. Mechanical rooms; electrical rooms with transformers: Interior perimeter doors.
 - i. Other areas designated on the Drawings for sound or odor control.
3. Smoke doors: Fire rated or non-fire rated doors in corridors, other than classroom doors, that compartmentalize the corridors for safe egress when there is smoke.
 4. Automatic door bottom: Door bottom in which the sweep weatherstrip lifts when the door opens and drops when the door closes.
 5. FS: Fail / safe.
 6. OIB: Oil-impregnated bearings.
 7. VWP: Verify with producer.
 8. CHSS: Case-hardened stainless steel screw anchors, for seating in drilled hole in concrete or masonry.
 9. SMS: Sheet metal screws.
 10. SSMS: Stainless steel sheet metal screws.
 11. BHMA A156.18 finish codes specified herein / former Fed Spec designations:

600	Steel, primed for painting	/	600
626	Satin chromium on brass or bronze	/	626
630	Satin stainless steel	/	630
689	Painted aluminum		

1.2 OVERALL STANDARDS

- A. American Society of Civil Engineers (ASCE).
 1. ASCE 7, Minimum Design Loads for Buildings and Other Structures, has been followed in the A/E's calculation of required positive and negative wind load resistance requirements which are shown in the wind pressure diagrams that are a part of these Construction Documents.
 2. Select hardware at exterior doors to resist the wind load resistance forces and missile impact resistance requirements in the Construction Documents.
- B. National Fire Protection Association (NFPA) standards:
 1. 80 Fire Doors and Windows.
 2. 252 Positive Pressure Fire Tests of Door Assemblies
- C. American National Standards Association / Builders Hardware Manufacturers Association:
 1. Series 158 ANSI/BMHA Door Hardware Standards

SPECIFIER: Transfer the approved Hardware Set numbers described below to the Door Schedule in the Drawings before Construction Documents are printed for bidding/pricing.

1.3 DOOR HARDWARE SCHEDULE FORMAT

- A. Use the following format (sequence of hardware items, topics, terminology, and abbreviated descriptions) in preparing each hardware set for the Hardware Schedule.
 1. Sample format for a typical set is shown. Names of hardware items not used in this sample are inserted (in parentheses) to show their sequence in any schedule.
 2. Define abbreviations that are rare, obscure, confusing or ambiguous.
 3. Do not include the following groups of doors within a single Hardware Set:
 - a. Labeled and unlabeled doors

- b. Exterior and interior doors
- c. Single doors and pairs of doors
- d. Doors with and without card readers or astragals
- 4. Add an Additional Requirements column to the schedule format shown below (after Finish). In it note at least the following requirements as needed:
 - a. CAC (with card access control),
 - b. KAC (with keypad access control)
 - c. S-SW (with security switch),
 - d. ID (with intrusion detector)
 - e. FD (with labeled fire damper on louver),
 - f. IR (on an impact resistant door).
 - g. UL (provide UL rated hardware item at fire rated openings)
- 5. Example of format for a typical set in the Hardware Schedule:

Hardware Set 12

<u>Key Set</u>	<u>Qty / Leaf(s)</u>	<u>Door Mark</u>	<u>Door Location</u>	<u>Hand</u>	<u>Label</u>	<u>Deg Opg</u>
	1 Pair	5100A-1	Ext from Stair 1 5100A	RHRA/LHR		100
	1 Pair	5100B-1	Ext from Stair 2 5100B	RHRA/LHR		180
	<u>1 Pair</u>	5100C-1	Ext from Stair 3 5100C	RHRA/LHR		180
	3 Pair					
	Door Leaf Size 3-6 x 8-0 x 1-3/4					
	Door Elevation detail no. _____ and frame detail no. _____ (from Drawings)					
	Flush galv.steel door x galv.steel frame					

<u>Totl Qty</u>	<u>Qty / Opg</u>	<u>Producer</u>	<u>Hdw Item</u>	<u>Item Series / Description</u>	<u>Finish</u>	
24	8 ea	HHC	Hinges	BB1199 4.5" x 4.5" x NRP	600	
3	1 ea	PHJ	Mullion	FLHC822 x 96"	600	
3	1 ea	SCH	Cylinder	20-022 WTSR	626	
			(Cylinders for alum entrance door exit device locks)			
			(Lockset)			
			(Deadbolt lock)			
			(Auxiliary lock)			
3	1 ea	PHI	Exit device	FLHC2101 SNB x less trim	626	Inactive
3	1 ea	PHI	Exit device	FLHC2108 SNB x V4908A	626	Active
			(Electromagnetic holder / release)			
			(Electric strike)			
5	1 ea	SSC	Closer	D-4550 AVB EDA x SN	689	
2	1 ea	HHC	(Wall door stop) 230W		626	
			(Floor door stop – only where use of a wall stop is not possible)			
			(Wall door stop & hold)			
			(Head & foot bolts, surface)			
			(Door pull, push plate; kick plate, door armor)			
3	1 ea	HHC	Threshold	520SV 84" x 5" x 1/4"	Alum	
			(Door bottom)			
3	1 ea	HHC	Weatherstrips	891SV 42" x 96" x vinyl	Alum	
			(Astragal)			
			(Viewport / peephole)			
			(Overhead rain drip)			
6	2 ea		Silencers			
			(Key cabinet)			

1.4 SUBMITTALS

Follow 01330

- A. Note to Contractor. Whether the Project is contracted as Lump Sum, CM At-Risk or Design-Build, the A/E will, during its Design Phase III, consult with Central Lock Dept. to obtain specific hardware requirements, such as lock producer, series, design, and finish, and will have submitted plans, specifications, and tentative hardware schedule to the Central Lock Shop at least 4 weeks before its Design Phase 3 submittal in order to obtain pre-bidding/pricing approval from the Board.
 - 1. This approved hardware design information is now a part of these Construction Documents, which shall be the basis for the Contractor's full Hardware Schedule.
 - 2. The submittal requirements that follow apply to the Contractor as it develops its producer-specific full Hardware Schedule for use in the Work.

- B. Certification for Door Hardware at Exterior Door Assemblies: Submit a list of Miami-Dade County product approvals for each exterior door / door frame / door hardware assembly in the Construction Documents, showing compliance with impact and cyclical pressure resistance requirements.

- C. Hardware Schedule, Index and Cuts:
 - 1. Prepare a draft Hardware Schedule for this Work following the requirements of the Construction Documents and in the format specified herein.
 - a. Identify producer of each item along with its name, feature and finish symbols, and catalog number.
 - b. Submit 2 sets of catalog cuts or other product data / shop drawing information for each hardware item to be supplied. Highlight cuts to indicate items for this Work.
 - c. Include all information specified in Hardware Set format example shown above.
 - d. Indicate doors that have card readers or other access control features.
 - e. Do not submit schedules in horizontal format (computer "landscape format").
 - 2. Prepare a separate index, listing all doors in the Work sorted by mark and with appropriate hardware set number next to each door number, with building numbers.
 - 3. Submit the draft Schedule and index to Board's Central Lock Dept. and to A/E. Revise the draft Hardware Schedule as directed by Board to obtain approval.
 - 4. Four weeks before ordering hardware, submit 2 copies of revised, approved Hardware Schedule, with index, covering all items required for entire Work to the Central Lock Dept. and to A/E.

- D. Templates: Provide suitable templates, with the approved Hardware Schedule, to each door fabricator, hardware supplier and installing trade as needed to ensure accurate setting, reinforcing, and fitting of door hardware.

1.5 BITTING AND KEYWAY SELECTION PROCEDURE

- 1. Before ordering the cylinders and locksets, the Contractor's door hardware producer shall, directly through the Board's Project Manager, request a Keying Schedule and Bitting List from the Central Lock Dept.
- 2. Keyway selection. The special keyway for the lock cylinders to be used on this Work shall be as selected by Central Lock Dept.
 - a. Restricted keyways will be required by the Board.
 - b. The special keyway may be from a producer different from the lockset producer.
- 3. Maintain keying / bitting security as specified in SECURITY below.
- 4. Other keying requirements are specified in PART 3 of this section.

1.6 SECURITY

- A. Confidential Information. Keying requirements for this Work shall be handled solely by the Board's Central Lock Dept. and the Contractor's lockset cylinder producer.
 - 1. Provide permanent cylinders, CMK-keyed, with all locks that are supplied to the Work.
 - 2. Do not pack permanent keys, or keying information with the locksets.
 - 3. Keying information and keys shall never be in the hands of the Contractor or any of his forces except the lockset cylinder producer.
- B. Keying of Permanent Cylinders. Only the Central Lock Dept. and the Contractor's lockset producer are permitted to rekey and to handle keys for the permanent cylinders.
- C. Delivery of Keys. Deliver lockset keys, keying information, Keying Schedules and Bitting Lists, directly from the Board-approved lockset cylinder producer to the Central Lock Dept. (305 995-4027), through no other hands or entities in the Contractor's organization.
 - 1. Deliver padlock keys and key cabinet keys the same way.
- D. Breach of Security. If these security requirements are violated, the Board will require full rekeying. The cost of rekeying the entire Work shall be borne entirely by the Contractor. Rekeying will be done entirely by the Central Lock Dept. to maintain facility security.

1.7 SPECIAL WARRANTY

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- A. Door Hardware.
 - 1. Scope: Adjust, repair, or replace defective hinges, cylinders, locksets, deadbolt and auxiliary locks, exit devices, electromagnetic holder / releases, electric strikes, overhead stop & holds, and door bottoms to smooth, quiet, dependable operating condition during the Special Warranty period. If operating door hardware items cannot be kept in smooth, quiet, dependable operating condition after 3 adjustments or repairs, replace with new items matching the defective items.
 - 2. Defects:
 - a. Door hardware items that get out of adjustment under normal operating conditions (not abuse or vandalism);
 - b. Door hardware items that repeatedly (3 or more times) get out of adjustment under normal operating conditions.
 - c. Door hardware items that require repair rather than mere adjustment.
 - d. Door hardware items that, after attempts to adjust or repair, still do not operate smoothly, quietly or dependably and for which replacement is the only remedy.
 - e. If operating door hardware items cannot be kept in smooth, quiet, dependable operating condition after 3 adjustments or repairs, replace with new items matching the defective items.
 - f. Door pulls, door stops, thresholds and weatherstrips that break or come loose are considered defective and shall be reinstalled.
 - g. Other non-operating door hardware such as stops, plates and viewers are not part of this special warranty.
 - 3. Duration of special warranty: From time of installing door hardware until 2 years after date of Substantial Completion of the Work.
 - 4. Response time: Within 5 days after Contractor has been notified of 5 or more hardware items that need adjustment, repair or replacement, except defective work that threatens safety or life.
 - 5. Adjust, repair or replace within 48 hours any defective hardware item that threatens safety or life.

6. Limit of door hardware producers' and installers' responsibility: No dollar limit; no deductible amount.

PART 2 PRODUCTS

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2.1 HINGES

- A. Description. Full mortise ball-bearing butt hinges.
 1. Outswinging exterior doors and exterior gates: Oil-impregnated stainless steel hinges with stainless steel bearings and non-removable pins:
 2. All other doors: Steel hinges with ball bearings and stainless steel pins.
- B. Examples of format for specifying required hinge qualities for Hardware Schedule:
For outswinging exterior doors: Hager BB1199 x ss x OIB x 4-1/2 x 4-1/2 x 630 x NRP
For exterior gates: Hager BB1199 x ss x OIB x 4-1/2 x 4-1/2 x 630 x NRP
For all other doors: Hager BB1168 x ss pin x 4-1/2 x 4-1/2 x 600
- C. Standard. ANSI/BHMA A156.1, or A156.7 for template hinges.
- D. Product / Producer.
 1. Outswinging exterior doors BB1199, by Hager.
 2. Inswinging exterior doors BB1168, by Hager.
 3. Equal products by Ives.
 4. Equal products by McKinney /ASSA ABLOY.
 5. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.2 MULLION

- A. Description. Removable hollow steel hardware mullion, 2 x 3 in. x 11 ga, grout-filled, with head cap- and sill-fittings, and bolts for easy removal and replacement.
 1. Finish to match zinc-and-paint factory coats on each steel door frame.

SPECIFIER: Door pairs serving interior mechanical and electrical spaces shall not have mullions unless required in Design Criteria or Educational Specifications.

- B. Location.
 1. Provide at exterior pairs of doors.
- C. Product / Producer.
 1. Labeled openings: FL822, by Precision / Stanley.
 2. Non-labeled openings: 822, by Precision / Stanley.
 3. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

SPECIFIER: Special restricted keyways are required by the Board. These will often be required from a producer other than the lockset producer. Obtain a letter of authorization from the Board before ordering restricted materials for this Project. Contact Central Lock Dept. for this authorization.

2.3 CYLINDERS

- A. Description: Provide 6-pin, single-ring type, high security lock cylinders with restricted keyway as selected by Central Lock Dept.
 - 1. Maintain lockset and keying security as specified in PART 1 SECURITY.
- B. Standard. ANSI/BHMA 156.30, Level A.
- C. Producer / Product. As directed by Board's Central Lock Dept.; no substitutions.

SPECIFIER: During the design phase of this Project consult with Central Lock Dept. before making Phase 3 submittal to obtain specific hardware requirements, such as lockset and exit device producers, series, design, and finish. Submit floor plans, door and frame details, door schedule, edited door hardware specifications section, and tentative hardware schedule to Central Lock Shop at least 4 weeks before making the Phase 3 submittal.
Resubmit corrected Phase 3 hardware schedules following Board review.

2.4 LOCKSETS

- A. Description. Provide locksets with strikes, CMK-keyed. Label locksets with door tag number and key symbol from door hardware lockset supplier.
 - 1. Quality: Heavy duty.
 - 2. Handles: Lever.
 - 3. Knurling: Provide knurled outside lever handles for hazardous areas as well as for mechanical, electrical, and custodial storerooms.
 - 4. Fastening: Thru-bolts at steel, aluminum and wood doors, regardless of any producer's recommendations.

- B. Examples of format for specifying lockset functions (by location or extent) for Hardware Schedule:

<u>Function</u>	<u>Location, Extent, or Use</u>
Classroom	Student occupied spaces
Office	Individual administration offices
Exit Lock	Exit only
Storeroom	Mechanical rooms, electrical rooms, and custodial storerooms
Hotel	Individual staff toilets
Privacy	Individual classroom toilets
Passage	Passage only; no locking
Communicating	Communicating (restricted use as determined by Board and A/E)
Institutional	Key both sides for doors that are always locked (use only when approved by Board)

- C. Examples of format for specifying required lockset qualities for Hardware Schedule:
 - Schlage D Series, Rhodes: Heavy-duty, lever handle locksets,
"Vandgard" design x 626 x thru-bolts.
 - Marks 195 Survivor Series: Heavy-duty, lever handle locksets,
"American" design x 626 x thru-bolts.
 - Best Varsity 9K-ATB, Alternate: Thru-bolt Pattern, heavy-duty lever handle,
"Lost Motion" design x 626
 - Yale 5400 LN Series, Augusta (AU), heavy-duty handle locksets x 626 x thru-bolts.

D. Standard. ANSI/BHMA 156.2, Grade 1.

E. Product / Producer: Specify one of these producers as directed by the Board's Central Lock Dept. No substitution.

1. D Series, Rhodes Vandigard by Schlage./Ingersoll Rand.
2. 195, Survivor Series American by MarksUSA / NAPCO Security
3. Varsity 9K-ATB, Alternate Lost Motion by Best Access / Stanley.
4. AU5400LN, Free Wheeling Lever by Yale / ASSA ABLOY.

2.5 DEADBOLT LOCKS

A. Description.

1. Double cylinder deadbolt locks: Provide only at Institutional function lock locations, or other locations, each as directed by Central Lock Dept.
2. Thumbturn deadbolt locks: Provide only on secure side of door-within-a-door leafs, with no access (cylinder or thumbturn) on public side.

B. Product / Producer.

1. B662 Double Cylinder Deadbolt, by Schlage.
2. B680 Thumb Deadbolt, by Schlage.
3. Central Lock Dept.-approved equal.

2.6 EXIT DEVICES

A. Description. Rim type, without vertical rod, with 3/4 in. deadlocking latchbolt and strike.

1. Mount producer's cylinders in the door and not through the body of the exit device.
2. At non-labeled doors: For pairs of doors provide outside door pull on RHR door only; provide exit-only device on LHR door.
3. At labeled doors: Interior labeled doors requiring exit devices, provide outside lever trim on RHR door; provide an exit-only device on LHR door.

B. Examples of format for specifying required exit device qualities for Hardware Schedule.:

1. Exterior openings:
 - a. Entry Doors:
Precision 2103-CD x 626 x SNB x less trim x cylinder x door pull x SNB.
 - b. Exit Only Doors:
Precision 2101 x less dogging x 626 x SNB x less trim x less cylinder.
 - c. Card Access Doors, double cylinder rim exit device:
Precision FL2110 x V4908A x SNB x 626 x less trim x cylinder x door pull x SNB.
2. Interior, exterior, and courtyard labeled openings:
 - a. Entry Doors:
Precision FL2108 x V4908A x cylinder.
 - b. Exit Only Doors:
Precision FL2101 x 626 x less trim x less cylinder.
3. Specially labeled exterior entry doors.
 - a. Pairs of doors at flammable storage rooms used for storage of lawn equipment:
Precision FL2103 x 626 x less trim x SNB x door pull x cylinder x removable mullion x head & foot bolts, surface mounted
 - b. Single leaf doors at flammable storage rooms for chemicals used in instruction.
Precision FL2103 x 626 x less trim x SNB x door pull x cylinder

SPECIFIER: Provide and locate exit devices that follow MDCPS Design Criteria and Central Lock Dept. requirements for openings that require them. Show locations on Drawings by noting in Door Schedule.

- C. Location. Provide as shown on Drawings.
- D. Standard. ANSI/BHMA 156.3, Grade 1.
- E. Product / Producer. One of the following:
 - 1. 2100 Series, by Precision / Stanley.
 - 2. HC-19-8800 Series, by Sargent / ASSA ABLOY.
 - 3. 99 Series, by Von Duprin / Ingersoll Rand.
 - 4. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.7 EXIT DEVICES, VERTICAL ROD

- A. Description. Do not use concealed or exposed vertical rod exit devices.
- B. Exception. If the Work contains aluminum entrance doors, their concealed rod exit devices shall be part of the hardware set provided by the producer of the aluminum doors.
 - 1. Cylinders and keying: As part of the work of this section, provide cylinders to Contractor for delivery to aluminum entrance door producer.
 - 2. Following the requirements of this section, show cylinders and keying for aluminum entrance doors as sets the in Hardware Schedule and Keying and Bitting Schedule.

SPECIFIER: Specify electric strikes ONLY when a card access system at particular doors is required in Design Criteria or Educational Specifications.

2.8 ELECTRIC STRIKE

- A. Description. Dual-locking electro-mechanical strike, of heavy duty stainless steel construction, for use with rim-mounted exit device.
- B. Example of format for specifying required electric strike qualities for Hardware Schedule:
HES 9600 Genesis x 24V x 630 x FS.
- C. Location. Provide at designated openings, both labeled and non-labeled.
- D. Standard: ANSI/BHMA 156.31.
- E. Product / Producer.
 - 1. HES 9600 Genesis, by Hanchett Entry Systems / ASSA ABLOY.
 - 2. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.9 CLOSERS

- A. Description. Full rack and pinion door closer with steel spring and hydraulic fluid, with controls to regulate closing, latching, speeds and back-checking.
- B. Examples of format for specifying required door closer qualities for Hardware Schedule:

- LCN 4111-N AVB x EDA x TB, parallel arm only, or
Stanley D-4550 x AVB x EDA x SN x 689.
- LCN 4111-N Spring Cush AVB x AL x EDA x 689 x TB, or
Stanley D-4550 Spring Cushion x AVB x EDA x SN x 689
- LCN 4116-N AVB x AL x EDA x 689 x TB (oversize doors only; VWP)
Stanley D-4551 x AVB x EDA x SN x 689 (oversize doors only, VWP)

C. Locations.

1. Provide at all doors except at interior doors to staff offices located within the Administration and Student Services suites.
2. Provide closers for both leafs at pairs of doors.
3. Provide spring cushion closers for doors that cannot be fitted with wall or floor stops.

D. Standard. ANSI/BHMA 156.4.

E. Product. / Producer.

1. 4111-N and 4116-N, by LCN / Ingersoll Rand.
2. D-4550 and D-4551, by Stanley.
3. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.10 WALL DOOR STOPS

A. Description. Cast brass stops with resilient bumpers, suitable for installing by screws and adhesive at lockset height on concrete or masonry walls, as well as at gypsum wallboard and plaster walls that have studs and backing/reinforcement sufficient to withstand a door being flung open.

1. Provide concave design for doors that have office-function locksets or that have lockset push-buttons on wall side of door.
2. Provide convex design for other doors.

B. Examples of format for specifying required wall door stop qualities for Hardware Schedule.

- Concave wall door stop Hager 234W x 626 x CHSS
- Convex wall door stop Hager 230W x 626 x CHSS

C. Selection and Location.

1. Provide wall mounted door stops at all doors unless otherwise specified after ascertaining that there is sturdy structural backing to withstand force of door impact.
2. If suitable structural backing is not present, protect walls with floor mounted doorstops that do not create trip hazard or difficulty in maintaining clean and in-place.
3. If neither wall mounting or floor mounting meets these selection and location criteria, provide closers of the specified spring-cushion design

D. Product / Producer.

1. Concave design: 234W, by Hager.
2. Convex design: 230W, by Hager.
3. Equals to each of the above as reviewed and approved by the A/E and the Board's Central Lock Dept.

2.11 FLOOR DOOR STOPS

A. Description. Dome type, with rubber pad but no hook for holding, 3-screw fastening.

1. Do not use floor screws provided by producer. Instead, fasten to floor slab using 3 case-hardened stainless steel screws of the largest practicable size.
- B. Example of format for specifying required floor door stop qualities for Hardware Schedule.:
Hager 258F x CHSS x 626.
- C. Standard; ANSI/BHMA 156.16.
- D. Location. Use only if wall mounted stops cannot be used because sturdy structural backing is not present or feasible in wall.
- E. Product/Producer.
 1. 259F, by Hager.
 2. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.12 ELECTROMAGNETIC HOLDER / RELEASE

- A. Description. Wall-mounted and wired to the fire alarm system – to release during fire.
- B. Location. Provide at the following locations:
 1. Interior doors to stairwells;
 2. Smoke doors in corridors. (See definition of smoke doors in RELATED REQUIREMENTS / Definitions in this section)
- C. Standard. ANSI/BHMA 156.15.
- D. Product / Producer.
 1. 900 Series by Firemark / ASSA ABLOY.
 2. 2210-US28 Mag Holder Recessed Wall Mount, by American Builders Hardware (ABH)
 3. Equal as approved by the Board's Central Lock Dept. Central Lock Dept. will not approve other producers unless the mounting and the mounting-hole patterns are identical to Firemark. However, hole patterns will not be the sole criterion for approval of a substitute as an equal product.

2.13 DOOR STOP & HOLD

- A. Description. Door stop with keeper, cast brass, for wall mounting by screw and adhesive.
 1. Ensure that wall-mounted stop & holds are mounted on walls that have adequate reinforcement in back of gypsum wallboard or plaster wall finish.
- B. Example of format for required door stop & hold qualities for Hardware Schedule.
Wall mounted stop & hold: Hager 254S x 626 x CHSS
- C. Location.
 1. Wall-mounted, at non-labeled openings. Use at custodial, electrical, and mechanical spaces and exterior access to corridors.
- D. Standard: ANSI 156.16.
- E. Product / Producer.
 1. 254S or 254W as appropriate to wall construction, by Hager.
 2. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.14 HEAD & FOOT BOLTS

- A. Description. Provide a set of:
 - 1. Surface-mounted sliding head & foot bolts at inactive leaf of exterior door pairs;
 - 2. Flush sliding head & foot bolts at inactive leaf of interior door pairs.
- B. Locations. Mount flush head & foot bolts on LHR leaf at labeled door pairs, where there is an exit or locking device on opposite leaf:
 - 1. Exterior: Provide at pairs of doors.
 - 2. Interior: Provide at pairs of doors at such locations as telephone closets, mechanical rooms, electrical rooms, and at interior storage rooms.
 - a. Do not use at student occupied areas.
 - b. Provide head & foot bolts with UL label at fire-rated openings.
- C. Examples of format for required head & foot bolt qualities for Hardware Schedule.

Head & foot bolts (exterior)	Hager 275D & 282D at LHR leaf
Head & foot bolts (interior, labeled)	Hager 275D x UL & 282D x UL at LHR leaf
- D. Standard: NFPA 80, 2.8 – 2.5.
- E. Producer.
 - 1. 275D or 276D (surface mounted), by Hager.
 - 2. 282D (UL) (flush mounted), by Hager
 - 3. Equal product by Baldwin, Ives / Ingersoll Rand, Quality, or Rockwood.
 - 4. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.15 DOOR PULLS

- A. Description. Cast aluminum, satin anodized finish, with thru-bolts.
- B. Standard: ANSI/BHMA 156.6.
- C. Producer / Product:
 - 1. H4G, by Hager.
 - 2. Central Lock Dept.-approved equal.

2.16 PUSH PLATES AND KICK PLATES,

- A. Description. Screw mounted, with beveled edges.
 - 1. Material: Hard black plastic with beveled edges. Do not use metal or clear plastic.
 - 2. Push plate size: 16 x 16 x 1/8 in.
 - a. Exception: Doors with vision lites, for which provide 4 x 16 x 1/8.
 - 3. Kick plate size: 16 in. x 2 in. less-than-width-of-door x 1/8 in. thick.
 - a. Exception: Less than 16 in. high if needed to clear an opening in door leaf.
- B. Location.
 - 1. Push plates: Provide on the kick side at:
 - a. Non-labeled doors that have exit devices or Institutional function locksets.
 - b. Toilet room doors that have no locksets.
 - 2. Do not use push-plates on:
 - a. Labeled doors.
 - b. Doors that have lever handle cylindrical locksets.
 - 3. Kick plates: Provide at all doors without armor, unless otherwise shown.

4. At double-acting door leafs: Provide push plate and kick plate on each side

C. Standard: ANSI/BHMA 156.8.

D. Product / Producer.

1. 60S PK, by Hager (push plates)
2. 214S BL, by Hager (kick plates)
3. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.17 DOOR ARMOR

A. Description. Screw-mounted stainless steel in No. 4 finish, with eased edges and corners that will not catch or cut clothing or flesh. Armor, where used, takes the place of kick plate

1. Armor size: 48 in. x door width less 2 in. x 16 ga.
2. Labeled door armor: Provide at labeled doors.

B. Example of format for specifying required door armor qualities for Hardware Schedule:
Door armor: 48 in. x 2 in. less-than-width-of-door x 16 ga x No. 4 finish x SSMS

C. Location: At both sides of doors in food service area.

D. Standard: ANSI/BHMA 156.8.

E. Product / Producer.

1. As reviewed and approved by the A/E and the Board's Central Lock Dept.

SPECIFIER: Do not use metal thresholds at toilet rooms, wet-mop areas adjacent to other spaces, and at sink or mop receptor-equipped custodial closets. Use beveled edge marble thresholds instead, specified in appropriate sections in Division 09. No threshold, metal or stone, may be higher than the 1/2 in. permitted by ADA, as measured from the lower adjacent floor surface.

2.18 THRESHOLDS

A. Description. Aluminum body, grooved top, of 1/2 / 1/4 in. high bumper design or 1/4 in. high saddle design, 5 in. wide unless door & frame configuration favors a narrower or wider dimension.

1. With bumper design only, provide 1-piece neoprene or EPDM gland seal.
2. Provide thresholds in one piece across entire jamb-to-jamb width of each opening.

B. Examples of format for specifying required threshold qualities for Hardware Schedule.:

- Bumper type threshold: Hager 520SA 5 in. wide x CHSS x alum
 Saddle type threshold: Hager 413SA 5 in. wide x CHSS x alum

C. Location.

1. Provide bumper design at exterior doors. Exception: Do not provide at kitchen receiving door.
2. Provide saddle design (for use with a door bottom) for each interior area that requires sound control as defined in RELATED REQUIREMENTS / Definitions in this section. Exception: Provide bumper design at each mechanical room and each electrical room with transformers, either of which is accessed from an interior corridor

3. Check and coordinate with the following spaces where marble thresholds are usually shown to make sure that a proper threshold is provided: Single-use toilet rooms, vestibules to toilet rooms, sink or mop-receptor equipped custodial closets.

D. Standard. ANSI/BHMA 156.21.

E. Product / Producer.

1. 520SA (bumper type), by Hager.
2. 413SA (saddle type), by Hager.
3. Equal products by National Guard, Pemko, Reese, or Zero Intl.
4. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.19 DOOR BOTTOMS

A. Description. Aluminum door bottoms, surface mounted, in 2 types:

1. Fixed (not retracting) neoprene or EPDM (not silicone) sweep strip.
2. Automatic-operating, with sponge neoprene or EPDM drop seals (with drop from 1/16 in. up to 3/4 in. as needed for seal to rest snugly against full length of threshold).
3. Door bottoms on fire rated doors: UL-rated pressure-resistant fire gaskets; NFPA 252.

B. Examples of format for specifying required door bottom qualities for Hardware Schedule.

Fixed sweep strip door bottom Hager 750S x SSMS x alum
Automatic drop seal door bottom, fire rated Hager 747S x SSMS x UL x alum

C. Location. Provide door bottom types as follows:

1. Fixed sweep strips, at kitchen receiving door and at interior perimeter doors to food service areas (no thresholds)
2. Automatic drop seals at doors (for use with saddle thresholds) for interior areas requiring sound control (except most mechanical rooms, see 3. following) as defined in RELATED REQUIREMENTS / Definitions in this section.
3. Automatic drop seals at doors (for use with saddle thresholds) to mechanical rooms that are within sound control areas. Do not provide door bottoms of any kind at other mechanical rooms

D. Product / Producer.

1. 750S (fixed sweep strip), by Hager.
2. 747S (automatic with drop seals), by Hager.
3. Equal products by the producers specified for Thresholds.
4. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.20 WEATHERSTRIPS

A. Description. Neoprene, EPDM or silicone weatherstrips, compressible bulb design, in aluminum holders 5/16 in. thick or less, to seal against either weather (exterior) or sound transmission (interior).

1. Weatherstrips on fire rated doors: UL-rated pressure-resistant fire gaskets, NFPA 252.

B. Examples of format for specifying required weatherstrip qualities for Hardware Schedule.

Weatherstrips: Hager 891SAS x alum
Weatherstrips, fire rated: Hager 891SAS x UL x alum

- C. Locations. Provide rigid, bulb type weatherstrips:
 1. At heads and jambs of exterior doors
 2. At heads and jambs of interior doors for areas requiring sound control as defined in RELATED REQUIREMENTS / Definitions above.:
- D. Standards.
 1. NFPA 252.
 2. ANSI/BHMA 156.22.
- E. Product / Producer.
 1. 891SAS, by Hager.
 2. Equal products by the producers specified for Thresholds.
 3. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.21 ASTRAGALS

- A. Description. Steel strip applied to active leaf in labeled openings and in other locations as specified to reduce passage of air or noise.
- B. Examples of required astragal qualities and format for Hardware Schedule.
Astragal: Hager 8375AV x UL.
- C. Producer.
 1. 8375AV, by Hager.
 2. Equal product of other producers specified for Thresholds.
 3. Equal reviewed and approved by the A/E and the Board's Central Lock Dept.

2.22 ACCESSORIES

- A. Viewport / Peephole: 1755 x 626, by Hager.
- B. Overhead Rain Drip: Aluminum, 2-1/2 in. wide, screw applied, for use exposed over concrete or masonry, or embedded in cement plaster. 810S x alum, by Hager
- C. Silencers. Neoprene or EPDM: 307D, by Hager.
- D. Fasteners. Provide the following fasteners, the head and color of which shall approximate the color of each surface to which hardware is fastened.
 1. Case-hardened stainless steel screw anchors (CHSS) with baked-on rust-inhibitive coating, for seating in drilled hole in concrete or masonry, such as GrabCon by Grabber, Tapcon by ITW Buildex, Tapper by Powers, or other product and producer approved by Central Lock Dept.
 2. For visible fasteners at steel or wood doors: Recessed oval head (OH) Phillips corrosion-resistant screws, sheet metal or wood screw type as appropriate.
 3. For concealed fasteners at steel doors: Machine screws.
 4. For wall stops: CHSS screw(s), plus Liquid Nail or other super-adhesive approved by Central Lock Dept.
 5. For push & kick plates, door armor at steel doors: Oval head (OH) Phillips recessed Type A stainless steel sheet metal screws (SMS).
 6. For thresholds: Cadmium plated expansion screws, such as Hager FHSL 25-1/4 x 1/4-20 x 2, or equal approved by Central Lock Dept. Set in non-corroding, non-lead drilled shields. CHSS may be used if approved by Central Lock Dept.

7. For brush weatherstrips: Fasteners for various substrates as recommended by weatherstrip producer.
8. For rain drips: CHSS.

SPECIFIER: Specify the following key cabinet at elementary, K-8 center, middle, and high schools. Add a key cabinet to existing key cabinet at major additions to existing facilities.

2.23 KEY CABINETS

- A. Description: Lockable enameled steel cabinets, recessed unless otherwise shown, with piano hinged doors, containing key hooks and room for large labels, the Door Key cabinet sized for 10% growth. Provide each with a masterkeyed key lock.
 1. Provide 2 key cabinets, each labeled as follows in 1 in. high letters:
 - a. Door Keys.
 - b. Cabinet / Equipment / Padlock Keys. Equal in size to Door Key cabinet.
 2. Provide indexing labels, cards, and register sheets, numbered tags, signature cards, and envelopes sufficient to serve twice the total key cabinet capacity.
- B. Standards:
 1. ANSI/BHMA 156.28.
 2. Fed. Spec. AA-C-30d.
- C. Producer / Product: No substitution.
 1. Tel-Kee AWC 500, by Kee Safety.

2.24 MISCELLANEOUS LOCKS

- A. Elevator Hall Station Locks, for restricted use elevators. A spring barrel, tubular key lock / switch, with keys (keyed alike to 7022), will be provided for each restricted use elevator under the elevator work.
- B. Sliding Glass Door Locks: Sliding glass door locks for equipment such as display cabinets that use 1/4 in. thick sliding doors of tempered glass, in 630 finish.
 1. Producer: Wonder Lock, or equal approved by Central Lock Dept.
- C. Padlocks: High strength, non-corroding steel body and mechanism, with hasp. Provide from one source at security gates, security grilles, protective guards, equipment cages, interior of roof hatches, and other construction that needs protection.
 1. Masterkey to facility's system.
 2. Hasp: Safety type, galvanized, such as Hager 1915.
 3. Padlock to FPL space: By FPL.
 4. List producer name and model numbers, along with actual locations and quantities on Hardware Schedule.

SPECIFIER: For additions and remodeling, contact Central Lock Dept. to see if changes in the following procedures need be made for the particular project.

2.25 KEYING OF DOOR HARDWARE

- A. Scope and Security.
 - 1. Provide Great Grand Master Keys (GGMK), Grand Master Keys (GMK), Master Keys, Section Master Keys (SMK) and Change Keys (CK) following the keying schedule provided by Central Lock Dept:
 - 2. Provide individual lock cylinder keying following Central Lock Dept.-supplied keying schedule.
 - 3. Key and register lock cylinders at the factory for all Master Key (MK) and Construction Master Key (CMK) systems for identification and to maintain security.
 - 4. Maintain lock keying / bitting security as specified in PART 1 SECURITY.

- B. Construction Master Keying:
 - 1. Cylinders shall be Construction Master Keyed (CMK).
 - 2. List the quantity of CMK keys to be supplied for Work on the Hardware Schedule.
 - 3. Keep all locks in the Work on the CMK system until lockset installation is accepted by the Board. After acceptance and notification by Board's Project Manager, Central Lock Dept. will knock out the CMK system and replace with permanent keying.

- C. Master Keys, Change Keys, and CMK Plug Extractors:
 - 1. Provide each cylinder lock with 5 cut change keys (CK).
 - 2. Provide 10 CMK Plug Extractors.
 - 3. Provide 5 Master Keys (MK) for each MK group.
 - 4. Provide temporary (CMK) keys and plug extractors in enveloped sets and identify with keyset numbers and factory file or folio number.
 - 5. Coordinate delivery and pickup of the following items with Central Lock Dept.:
 - a. Cut keys, blank keys, and CMK Plug Extractors used in construction.786
 - b. Each CMK used on the Work (whole keys or pieces of keys) in the Contractor's possession at the time of project acceptance.
 - c. Accounting of any lost or destroyed CMKs.
 - d. Maintain lockset cylinder/keying security as specified in PART 1 SECURITY.
 - e. Obtain a receipt for items listed above from Central Lock Dept. upon delivery.

- D. Key Stamping:
 - 1. Stamp cut keys with the words DO NOT DUPLICATE and the MDCPS post number on opposite sides.
 - 2. Verify with Central Lock Dept. the specific post numbers on the keying schedule.
 - 3. Do not stamp bitting numbers or any factory nomenclature on the keys.

- E. Key Bows: Provide large, unembossed bows of standard design.

- F. Cylinder Location Verification:
 - 1. Central Lock Dept. will determine if key cylinders are properly located within the Work by referring to the approved Hardware and Keying Schedules.
 - 2. As CMK cylinders are knocked-out, cylinders found incorrectly or improperly keyed, in wrong location, or otherwise malfunctioning shall be corrected by Contractor at no cost to the Board.

- G. Keying and Delivery of Miscellaneous Keys:
 - 1. Elevator hall station keys are specified to be coded 7022 and delivered by the elevator installers to Central Lock Dept. (for labeling and inclusion in the Door Keys cabinet).

2. Mark and tag all other keys and deliver for inclusion in the Cabinet / Equipment / Padlock Key cabinet, such as keys for built-in classroom and laboratory cabinets and equipment, access panels, access doors, coiling doors, gates, display cases, vaults, lockers, cages, toilet accessories, food storage and cooking equipment, mechanical equipment, electric panels and equipment, emergency supplies, padlocks, and any other miscellaneous keys, each with description and room number or location.
3. Turn all CMK and other keys over to Central Lock Dept. upon acceptance of Work and obtain a receipt. Do not leave the facility without obtaining a MDCPS receipt.

PART 3 EXECUTION

Follow 01700

3.1 INSPECTION

- A. Before starting installation of the work of this section, the installer of this work shall – accompanied by Contractor – inspect areas where the work will be performed. Ensure that earlier construction is complete. Confirm that poor workmanship and unsatisfactory conditions have been corrected in ways acceptable to the installer of this work.

3.2 PREPARATION

- A. Do not start installing the work of this section until earlier construction and conditions detrimental to the timely and proper installation of this work have been completed and corrected, by the Contractor and other entities that have performed earlier work, in ways that are acceptable to the installer of this work of this section.

3.3 DELIVERY, STORAGE, AND ENVIRONMENTAL CONDITIONS

- A. Package and label door hardware items and sets following the Hardware Schedule, complete with necessary screws, special tools, instructions, and installation templates. Do not package keys (other than CMK) with the individual hardware sets.
- B. Store hardware in a dry, secure area with work surface for assembling hardware and sets.
- C. Do not proceed with the work of this section until conditions detrimental to the proper installation and protection of door hardware have been corrected and all damp construction operations in spaces are dry.
- D. Do not install silencers or any other items of finish hardware, including weatherstrips, until and all field coats of paint have been applied to doors.

3.4 LOCATION OF HARDWARE ON DOORS

- A. Locate each item as follows:
 1. Lever Lockset: Lever handle 38 in. from door bottom, except 34 in. for accessibility by children in primary grades.
 2. Exit Device: Centerline 40 in. from door bottom.
 3. Door stops: Match actual point of impact of door lever or other impacting projection.
 4. Pushplate bottom: 1 in. above pushpad operator; 1 in. above top of exit device.
 5. Pushplate near a vision panel: 1 in. above top of exit device mechanism and between vision panel and edge of door.
 6. Kickplate: 1 in. from bottom edge of door, or 1/2 in. from top of surface-mounted automatic door bottom.

7. Viewport / peephole: Centerline 60 in. above door bottom.
8. Rain drip. Bottom edge of drip 1/4 to 3/4 in. above door's masonry opening. Where door frame is flush with exterior, place bottom edge of drip 1/2 to 3/4 in. above top of door

3.5 DOOR HARDWARE INSTALLATION

- A. All Items. Install door hardware items following producer's recommendations except as more stringently specified herein.
 1. Maintain lockset cylinder/keying security as specified in PART 1 SECURITY.
- B. Cylinders. Install temporary CMK cylinders with locksets. Central Lock Dept. will rekey.
- C. Closers.
 1. Install with closer producer's thrubolts and adjust for proper operation.
 2. Location: Locate closer on door as if door were to swing 180°, regardless of the actual swing of the door. When using Spring-Cush, mount for maximum opening swing. Verify 90°, 100°, or 110° template mounting for each leaf.
 3. Closer Foot: Install with 5 screws for wood jambs or 5 stove bolts for metal jambs. Provide a matching spacer (if required by the width of the stop) for the fifth fastener.
 4. Use bolt, not screw, fasteners at metal door frames.
- D. Electromagnetic Holder / Releases: Wire to fire detection devices and to the fire alarm system so as to release in case of fire.
- E. Wall-mounted Door Stops: Ensure that these stops are mounted on walls that have adequate reinforcement in back of any finish material less than 1 in. thick (such as gypsum wallboard or plaster). Mount with liquid nail glue.
- F. Stop and Hold Devices.
 1. Wall-mounted: Install at top outside corner of door, with thrubolts. Install wall portion to withstand 100 lb. shear pressure under actual field conditions.
- G. Thresholds.
 1. Set exterior thresholds in a full bed of sealant.
 2. If threshold is saddle type, coordinate so that automatic door bottom drops onto level portion of saddle.
- H. Push Plates. Install between each vision panel and edge of door, on push side, 1 in. above exit device, on push side of door.
- I. Door Pulls on other side of doors with Exit Devices: Locate the top screw hole of the door pull plate on vertical centerline of the exit device's lock mechanism case and 2 in. above the horizontal centerline of the exit device so as not to interfere with exit device fasteners.
- J. Accessories:
 1. Viewports: Install at kitchen receiving door and custodial receiving area doors.
 2. Rain drips: Install full width + 6 in. to each side above exterior doors, unless they are already protected by a roof (or eyebrow) overhang at least 1 ft deep that is located within 2 ft above each door.
 3. Silencers: Install 3 silencers in interior single leaf steel door frames, and 2 in interior double leaf steel door frames.

- a. At steel door frames that receive weatherstrips, do not install silencers. Fill each silencer hole in frame with silicone and make surface flush with frame, ready for field painting.
- 4. Sliding glass door locks: Deliver to casework producers, keyed as specified herein.

3.6 ADJUSTMENT AND CLEANING

- A. Adjust and lubricate door hardware to smooth, quiet operating condition.
- B. Adjust each closer, when it is fully installed and the facility's air conditioning test & balance is nearly complete. Adjust closers to speed and force needed to ensure smooth operation, with attention to ADA closing speed requirements, and, at exterior doors, smooth operation under strong wind.
- C. Adjust or repair operating door hardware items such as hinges, cylinders, locksets, deadbolts and auxiliary locks, exit devices, electromagnetic holder / releases, electric strikes, overhead stop & holds, and door bottoms to smooth, quiet, dependable operating condition during the Special Warranty period. If operating door hardware items cannot be kept in smooth, quiet, dependable operating condition after 2 adjustments or repairs, replace with new items matching the defective items.
- D. Clean each item and repair or replace defective items or components. ///