

SECTION 08 71 00**DOOR HARDWARE****PART 1 - DESIGN DIRECTIVES****1.1 GENERAL**

- A. The purpose of this section is to insure the continuing high standard of finish hardware for all Dartmouth buildings and to ensure system maintainability.
- B. All lock cylinders for non-dormitory buildings are to be removable 6 pin removable core manufactured by Corbin Russwin, or approved equal that meets requirements in Section 2.2. Dormitory buildings must be able to accept Best style 7 pin cores using Best or KSP lock cylinders on all doors.
- C. A design phase review meeting shall be scheduled by the architect to review the hardware and security needs of the building. FOM Access Control Shop, Safety & Security, the project architect, and the user group shall be involved in this meeting. It is important that this meeting is scheduled early in the process on renovation projects.
- D. When remodeling existing buildings, new hardware should match existing / remaining hardware styles & finishes.
- E. All doors up to 90" high shall have a minimum of three (one and one half pair) hinges. For each additional 30" (or fraction thereof) of height add one additional hinge. Use ball bearing hinges for all exterior doors and frequently used interior doors. Infrequently used doors, such as closet doors, shall be heavy duty hinges or standards duty ball bearing hinges. Hinge type shall be reviewed with Dartmouth project manager during Schematic Design.
- F. Electrified power transfer (EPT) devices are the preferred means of providing power to door mounted electrified hardware. Electrified hinges shall be used only where an EPT is not practical.
Armored cable may be used only where EPT or electrified hinges are not practical.

1.2 HARDWARE INSTALLATION TIME FRAME

- A. Planning and preparation of cylinders for installation can be a lengthy process. Additionally, depending on the quantity of locks required on a project, the time frame will vary as will the process of obtaining cylinders. It is important to meet very early in the construction phase to develop and finalize the ordering of the keys and cores.

1.3 REFERENCES

- Applicable state and local building codes and standards.
- FIRE/LIFE SAFETY
 - NFPA - National Fire Protection Association
 - NFPA 70 - National Electric Code
 - NFPA 80 - Standard for Fire Doors and Fire Windows
 - NFPA 101 - Life Safety Code
 - NFPA 105 - Smoke and Draft Control Door Assemblies
 - UL - Underwriters Laboratories
 - UL 10B - Fire Test of Door Assemblies
 - UL 10C - Positive Pressure Test of Fire Door Assemblies
 - UL 1784 - Air Leakage Tests of Door Assemblies
 - UL 305 - Panic Hardware
 - Accessibility
 - ADA - Americans with Disabilities Act
 - ICC (CABO) / ANSI A117.1 - Accessible and Usable Buildings and Facilities
 - Architectural Barrier-Free Design Code (ABFDC-NH)
 - DHI - Door and Hardware Institute
 - Sequence and Format for the Hardware Schedule
 - Recommended Locations for Builders Hardware
- ANSI - American National Standards Institute
 - ANSI/BHMA A156.1 - A156.29, and ANSI A156.31 - Standards for Hardware and Specialties

1.4 SUBMITTALS

- Catalog Cuts: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- Final Hardware Schedule Content: Submit schedule with hardware sets in vertical format as illustrated by the Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening. Include the following information:
 - Door Index; include door number, heading number, and Architects hardware set number.

- Opening Lock Function Spreadsheet; list locking device and function for each opening.
- Type, style, function, size, and finish of each hardware item.
- Name and manufacturer of each item.
- Fastenings and other pertinent information.
- Location of each hardware set cross-referenced to indications on Drawings.
- Explanation of all abbreviations, symbols, and codes contained in schedule.
- Mounting locations for hardware.
- Door and frame sizes and materials.
- Name and phone number for the local manufacturer's representative for each product.
- Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and/or access control components). Operational description should include how the door will operate on egress, ingress, and/or fire/smoke alarm connection.
- Templates: After final approval of the hardware schedule, provide templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware.
- Riser and Wiring Diagrams: After final approval of the hardware schedule, submit riser and wiring diagrams as required for the proper installation of complete electrical, electromechanical, and electromagnetic products.
- Operations and Maintenance Data: Provide in accordance with Division 1 and include the following:
 - Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - Catalog pages for each product.
 - Name, address, and phone number of local representative for each

manufacturer.

- Parts list for each product.
 - Copy of final approved hardware schedule, edited to reflect "As installed."
 - As installed "Wiring Diagrams" for each opening connected to power, both low voltage and 110 volts.
 - One (1) complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
 - Copy of warranties including appropriate reference numbers for manufacturers to identify the project.
- Certificates of Compliance: Upon request of Architect or Authority Having Jurisdiction certificates of compliance for fire-rated hardware and installation instructions shall be made available.

1.5 QUALITY ASSURANCE

- Supplier Qualifications: A recognized architectural hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides a certified Architectural Hardware Consultant (AHC) available to the Owner, Architect, and Contractor, at reasonable times during the course of the Work for consultation.
- Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to the authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.
- Electronic Security Hardware: When electrified hardware is included in the hardware specification, the hardware supplier must employ an individual knowledgeable in electrified components and systems, who is capable of producing wiring diagrams and consulting as needed. Coordinate installation of the electronic security hardware with the Architect and electrical engineers and provide installation and technical data to the Architect and other related subcontractors. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

1.6 WARRANTY

- Provide manufacturer's standard warrantee for all materials
- No liability is to be assumed where damage or faulty operation is due to improper installation, improper use, or abuse. Products judged to be defective during the warranty period shall be replaced or repaired in accordance with the manufacturer's warranty, at no additional cost to the Owner.

1.7 MAINTENANCE

- 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.

PART 2

2.1 PRODUCTS

- A. Dartmouth College has determined that certain products should be selected to ensure continuity of existing and future performance and maintenance standards. Proposed substitutions will be reviewed and approved by the College's Lock Shop as well as the design architect to confirm that they meet the requirements of this Section. Note that even though an acceptable substitute manufacturer may be listed, the product must provide all the functions and features of the preferred product or it will not be approved. See Table below for list of preferred manufacturers and acceptable substitutions for different door hardware components.
- B. Hand of Door: Provide drawings to show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

Item	Preferred Manufacturer	Acceptable Substitute
Hinges	Ives	Hager, Stanley
Continuous Hinges	Markar	Hager
Electric Power Transfer	Von Duprin	Securitron
Flush Bolts & Coordinators	Ives	Rockwood
Locksets & Deadlocks	Corbin-Russwin	Per Section 2.2
Padlocks	Corbin-Russwin	Olympus Lock
Exit Devices & Mullions	Von Duprin	Per Section 2.2
Power Supplies	Von Duprin	Altronix
Roller Latches	Ives	Rockwood
Door Closers	LCN	Per Section 2.2
Electro-Hydraulic Automatic Operators	LCN	Per Section 2.2
Door Trim	Ives	Rockwood
Protection Plates	Ives	Rockwood
Overhead Stops	Glynn-Johnson	Rixson, Sargent
Stops & Holders	Ives	Rockwood
Thresholds & Weatherstrip	National Guard	Reese, Zero
Silencers	Ives	Rockwood
Latch Protector	Ives	Rockwood
Cylinders & Keying	Corbin-Russwin - non dormitory 7 pin small format interchangeable core - dormitory	Per Section 2.2

2.2 MATERIALS

A. Fasteners

1. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
2. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent that no standard units of type specified are available with concealed fasteners. Provide through bolts in all closer and panic device installations.
3. Hardware shall be installed with the fasteners provided by the hardware manufacturer.

B. Hinges

1. Provide five-knuckle, ball bearing hinges of type, material, and height as outlined in the following guide for this specification:
 - a. 1-3/4 inch thick doors, up to and including 36 inches wide:
Interior: heavy weight, steel, 4-1/2 inches high

- b. 1-3/4 inch thick doors over 36 inches wide: Interior: heavy weight, steel, 5 inches high
 - c. 2 inches or thicker doors: Interior: heavy weight, steel, 5 inches high
- 2. Provide three hinges per door leaf for doors 90 inches or less in height, and one additional hinge for each 30 inches of additional door height.
 - 3. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
 - 4. The width of hinges shall be 4-1/2 inches at 1-3/4 inch thick doors, and 5 inches at 2 inches or thicker doors. Adjust hinge width as required for door, frame, and/or wall conditions to allow proper degree of opening.
 - 5. Acceptable manufacturers and/or products: Ives 5BB series, Hager BB series, Stanley FBB Series.

C. Continuous Hinges – Not Preferred

- 1. Provide Pin & Barrel type Continuous Stainless Steel Hinges conforming to ANSI A156.26, Grade 1.
- 2. Provide pin & barrel type continuous hinges, where specified in the hardware sets, fabricated from 14 gauge stainless steel, with .25 inch diameter stainless steel pin.
- 3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
- 4. Hinges shall be capable of supporting door weights up to 600 pounds, 4'0" maximum door width.
- 5. On fire-rated doors, provide Warnock Hersey Int. or UL label for doors up to 3 hours.
- 6. Provide pin & barrel continuous hinges with electrified option where specified. Provide with sufficient number and gage of concealed wires to accommodate electric function of specified hardware.
- 7. Install hinges with fasteners supplied by manufacturer. Hole pattern shall be symmetrically patterned.

8. Acceptable manufacturers and/or products: Markar, Hager.

D. Electric Power Transfer

1. Provide power transfer with ten 24 gauge wires to accommodate electric function of specified hardware.
2. Electric power transfer is to be located per manufacturer's template and UL requirements, unless interference with operation of door or other hardware item.

E. Flush Bolts

1. Provide automatic and manual flush bolts with forged bronze face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch steel or brass rods at doors up to 90 inches in height. Top rods at manual flush bolts for doors over 90 inches in height shall be increased by 6 inches for each additional 6 inches of door height. Provide dust-proof strikes at each bottom flush bolt.
2. Acceptable manufacturers and/or products: Ives, Rockwood.

F. Coordinators

1. Provide a bar-type coordinating device, surface applied to the underside of the stop at the frame head where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors.
2. Provide a filler bar of the correct length for the unit to span the entire width of the opening, and appropriate brackets for parallel arm door closers and surface vertical rod exit device strikes. Factory-prep coordinators for vertical rod devices if required.
3. Acceptable manufacturers and/or products: Ives, Rockwood.

G. Mortise Locks

1. Provide mortise locks certified as ANSI A156.13, Grade 1 Operational, Grade 1 Security, and manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance. Lock case shall be multi-function and field reversible for handing without opening the case. Cylinders: Refer to 2.04 KEYING.
2. Provide locks with a standard 2-3/4 inches backset with a full 3/4 inch

throw stainless steel mechanical anti-friction latchbolt. Deadbolt shall be a full 1 inch throw, constructed of stainless steel.

3. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
4. Provide electrical options as scheduled. Provide normally closed contacts or normally open contacts as required by security system.
5. Lever trim shall be solid brass, bronze, or stainless steel, cast or forged in the design specified, with wrought roses and external lever spring cages. Levers shall be thru-bolted to assure proper alignment, and shall have a 2-piece spindle.
 - a. Lever design shall be equal to Corbin-Russwin Newport (NSM).
 - b. Lever trim on the secure side of doors serving rooms considered by the authority having jurisdiction to be hazardous shall have a tactile warning.
6. Acceptable manufacturers and/or products: Corbin-Russwin ML2000 series, or approved equal.

H. Deadlocks

1. Provide mortise deadlock series conforming to ANSI A156 and function as specified. Cylinders: Refer to 2.04 KEYING.
2. Provide deadlocks with a standard 2-3/4 inches backset. Deadbolt shall be a full 1 inch throw, constructed of stainless steel.
3. Provide manufacturers standard strike.
4. Acceptable manufacturers and/or products: Corbin-Russwin DL4000 series, or approved equal.

I. Padlocks

1. Provide padlocks with 1 inch shackle height, unless noted otherwise, as specified. Cylinders: Refer to 2.04 KEYING.
2. Acceptable manufacturers and/or products: Corbin-Russwin PL series, or approved equal.

J. Exit Devices

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed

for Panic Exit and/or Fire Exit Hardware. Cylinders: Refer to 2.04 KEYING.

2. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to the standard architectural finishes to match the balance of the door hardware.
3. Exit devices shall incorporate a fluid damper or other device that eliminates noise associated with exit device operation. Touchpad shall extend a minimum of one half of the door width, but not the full length of the exit device rail. End-cap will have two-point attachment to door. Touch-pad shall match exit device finish, and shall be stainless steel for US26, US26D, US28, US32, and US32D finishes; for all other finishes, the touch-pad finish shall be of compatible finish to exit device. Only compression springs will be used in devices, latches, and outside trims or controls.
4. Devices to incorporate a deadlatching feature for security and/or for future addition of alarm kits and/or other electrical requirements.
5. Use of vertical rod devices is strongly discouraged. Where necessary, vertical rod devices shall be capable of being field modified to less bottom rod devices by removal of bottom rod and adding firing pin(s), if required at fire rated openings.
6. Provide manufacturer's standard strikes.
7. Provide exit devices cut to door width and height. Locate exit devices at a height recommended by the exit device manufacturer, allowable by governing building codes, and approved by the Architect.
8. Mechanism case shall sit flush on the face of all flush doors, or spacers shall be furnished to fill gaps behind devices. Where glass trim or molding projects off the face of the door, provide glass bead kits.
9. Non-fire-rated exit devices shall have cylinder dogging.
10. Removable mullions shall be a 2 inches x 3 inches steel tube. Where scheduled, mullion shall be of a type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
11. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates. Provide vandal-resistant levers that will travel to a 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
 - a. Lever style will match the lever style of the locksets.

- b. Lever trim on doors serving rooms considered by the authority having jurisdiction to be hazardous shall have a tactile warning.

- 12. Exit devices for fire rated openings shall be UL labeled fire exit hardware.
- 13. Provide electrical options as scheduled.
- 14. Acceptable manufacturers and/or products: Von Duprin 99/33 series, or approved equal.

K. Power Supplies

- 1. Provide power supplies, recommended and approved by the manufacturer of the electrified locking component, for the operation of electrified locks, electrified exit devices, magnetic locks, electric strikes, and other components requiring a power supply.
- 2. Provide the appropriate quantity of power supplies necessary for the proper operation of the electrified locking component and/or components as recommended by the manufacturer of the electrified locking components with consideration for each electrified component utilizing the power supply, the location of the power supply, and the approved wiring diagrams. Locate the power supplies in a central location.
- 3. Provide a power supply that is regulated and filtered 24 VDC, or as required, and UL class 2 listed.
- 4. Provide a power supply, where specified, with the internal capability of charging sealed backup batteries 24 VDC, or as required, in addition to operating the DC load. Provide sealed batteries for battery back-up at each power supply where specified
- 5. Provide a power supply complete requiring only 120VAC to the fused input and shall be supplied in an enclosure.
- 6. Provide a power supply with emergency release terminals, where required, that allow the release of all devices upon activation of the fire alarm system complete with fire alarm input for initiating "no delay" exiting mode.
- 7. Acceptable manufacturers and/or products: Von Duprin 99/33 series, or approved equal.

L. Roller Latches

- 1. Provide roller latches with a 4-7/8 inches strike at single doors to fit ANSI

frame prep. If dummy levers are used in conjunction with roller latch mount the roller latch at a height as to not interfere with the proper mounting and height of the dummy lever.

2. Provide roller latches 2-1/4 inches full lip strike at pair doors. Mount roller in the top rail of each leaf per manufacturer's template.
3. Acceptable manufacturers and/or products: Ives, Rockwood.

M. Door Closers

1. Provide door closers certified to ANSI/BHMA A156.4 Grade 1 requirements by a BHMA certified independent testing laboratory. Surface mounted mechanical closers shall be certified to exceed ten million (10,000,000) full load cycles by a recognized independent testing laboratory. Closers shall be ISO 9000 certified. Units shall be stamped with date of manufacture code.
2. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder, and shall utilize full complement bearings at shaft. Cylinder body shall be 1 1/2 inch diameter, and double heat-treated pinion journal shall be 1 1/16 inch diameter.
3. Provide hydraulic fluid requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F. Fluid shall be fireproof and shall pass the requirements of the UL10C "positive pressure" fire test.
4. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force as required by accessibility codes and standards. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
5. Provide closers with a solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers. When closers are parallel arm mounted, provide closers which mount within a 6-inch top rail without the use of a mounting plate so that closer shall not be visible through vision panel from pull side.
6. Closers shall not incorporate Pressure Relief Valve (PRV) technology.
7. Closer cylinders, arms, adapter plates, and metal covers shall have a powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or shall have special rust inhibitor (SRI).

8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other finish hardware items interfering with closer mounting.
9. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.
10. Door closers meeting this specification: LCN 4010/4110 series, or approved equal.

N. Electro-Hydraulic Automatic Operators

1. Provide low energy automatic operator units with hydraulic closer complying with ANSI A156.19 where automatic operators are specified.
2. Provide hydraulic fluid of a type requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F. Fluid shall be fireproof and shall pass the requirements of the UL10C "positive pressure" fire test.
3. Provide units with conventional door closer opening and closing forces unless the power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check, and opening and closing speed adjustment valves to control door
4. Provide units with on/off switch for manual operation, motor start up delay, vestibule interface delay, electric lock delay, and door hold open delay.
5. Provide units with conventional door closer opening and closing forces unless the power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check valve, sweep valve, latch valve to control door.
6. Provide drop plates, brackets, or adapters for arms as required for details.
7. Provide hard-wired actuator switches for operation as specified. Actuators shall be weather-resistant type at exterior applications.
8. Provide key switches, with LED's, recommended and approved by the manufacturer of the automatic operator as required for the function as described in the operation description of the hardware group with the provisions below. Cylinders: Refer to KEYING.
9. Where automatic operators are scheduled, provide complete assemblies of

controls, switches, power supplies, relays, and parts/material recommended and approved by the manufacturer of the automatic operator for each individual leaf. Actuators shall control both doors simultaneously at pairs. Exterior and vestibule doors with automatic operators shall be sequenced to allow ingress or egress through both sets of openings as directed by the Architect. Locate the actuators, key switches, and other controls as directed by the Architect.

10. Provide units with vestibule inputs, which allow sequencing operation of two units, and a SPDT relay for interfacing with latching or locking devices.
11. Acceptable manufacturers and/or products: LCN 4600 series, or approved equal.

O. Door Trim

1. Provide push plates 4 inches wide x 16 inches high x 0.050 inch thick and beveled 4 edges. Where width of door stile prevents use of 4 inches wide plate, adjust width to fit.
2. Provide push bars of solid bar stock, diameter and length as scheduled. Push bars shall be of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
3. Provide flush pulls as specified. Where required, provide back-to-back mounted model.
4. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
5. Provide pull plates 4 inches wide x 16 inches high x 0.050 inch thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches wide plate, adjust width to fit.
6. Provide wire pulls of solid bar stock, diameter and length as scheduled.
7. Acceptable manufacturers and/or products: Ives, Rockwood.

P. Protection Plates

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch thick as scheduled. Furnish with machine or wood screws, finished to match plates. Sizes of plates shall be as follows:
 - a. Kick Plates - 10 inches high x 2 inches less width of door on single doors, 1 inch less width of door on pairs

- b. Mop Plates - 4 inches high x 2 inches less width of door on single doors, 1 inch less width of door on pairs
- c. Armor Plates - 36 inches high x 2 inches less width of door on single doors, 1 inch less width of door on pairs

2. Acceptable manufacturers and/or products: Ives, Rockwood.

Q. Overhead Stops and Overhead Stop/Holders

- 1. Provide heavy duty concealed mounted overhead stop or overhead stop/holder as specified for exterior and interior vestibule single acting doors.
- 2. Provide heavy or medium duty and concealed or surface mounted overhead stop or overhead stop/holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking a wall, open against equipment, casework, sidelights, and/or where conditions do not allow a wall stop or a floor stop presents a tripping hazard.
- 3. Where overhead holders are specified provide friction type at doors without a closer and positive type at doors with a closer.
- 4. Acceptable manufacturers and/or products: Glynn-Johnson, Rixson, Sargent.

R. Door Stops and Holders

- 1. Provide door stops for all doors in accordance with the following requirements:
 - a. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
 - b. Where wall stops cannot be used, provide dome type floor stops of the proper height.
 - c. At any opening where a wall or floor stop cannot be used, a medium duty surface mounted overhead stop shall be used.
- 2. Acceptable manufacturers and/or products: Ives, Rockwood.

S. Thresholds, Seals, Door Sweeps, Automatic Door Bottoms, and Gasketing

- 1. Provide thresholds, weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items as closely as possible. Size of thresholds shall be as follows:
 - a. Saddle Thresholds - 1/4 inch high x jamb width x door width

- b. Bumper Seal Thresholds - 1/2 inch high x 5 inches wide x door width
- 2. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
- 3. Acceptable manufacturers and/or products: National Guard, Reese, Zero.
- T. Silencers
 - 1. Provide "Push-in" type silencers for each hollow metal or wood frame. Provide three for each single frame and two for each pair frame. Omit where gasketing is specified or required by code.
 - 2. Acceptable manufacturers and/or products: Ives, Rockwood.
- U. Latch Protectors
 - 1. Provide latch protectors of type required to function with the specified lock.
 - 2. Acceptable manufacturers and/or products: Ives, Rockwood.

2.3 KEYING

- A. Non Dormitory Buildings
 - 1. Provide cores and cylinders for the Owner's Existing Corbin-Russwin 6-pin removable core key system conforming to the following requirements:
 - 2. Provide six pin removable core cylinders at all keyed devices, locksets, padlocks, removable mullions, and exit device trim. Provide L4 "blue" construction cores with construction master keying for use during construction. The Owner shall install permanent keyed cores upon completion of the project. The temporary construction cores are to be returned to the hardware supplier.
 - 3. Approved products: Corbin-Russwin, or approved equal.
- B. Dormitory Buildings
 - 1. Provide small format 7 pin interchangeable core. Contact DC-FOM for manufacturer.
- C. Dartmouth College shall order all required final cores. Contractor to provide

hardware with construction cores installed (when desired by contractor).

- D. Provide keys as required for the construction manager.

2.4 NEW LOCKSETS

- A. All new locks are to be ML2000 Series by Corbin Russwin (or approved equal) with solid cast levers. Function and trim styles to be coordinated with the College for each project.

2.5 PANIC DEVICES

- A. All new panic hardware to be Von Duprin 99/98 & 33/35 series or Corbin ED5000. In all cases panic devices shall have exterior trim being a minimum of a blank plate; exterior doors in Academic Buildings are to have NL heavy duty escutcheon type trim. All exterior panic devices, electrified and non-electrified, are to be provided with cylinder dogging.

2.6 CLOSERS

- A. All closers are to be DC6000 Series by Corbin Russwin, non-sized with painted finishes to match hardware, or LCN 4000 series handed door closers with delayed action, where applicable.
- B. All exterior doors to have heavy duty backstop or heavy-duty spring stop type arms and shall have extreme temperature fluid.

2.7 ELECTRIC DEVICES

- A. All electric locking applications shall be 24 volt DC.

B. Electric mortise locks

1. Corbin ML20900 ECL series, or approved equal.

C. Electric Strikes

1. Specific project requirements may require alternate devices.

2. Mortise lockset applications without a deadbolt

- a. Von Duprin 6210, or approved equal.

3. Mortise lockset applications with a deadbolt

- a. Von Duprin 6216, or

approved equal.

D. Electric Panic Devices:

1. Von Duprin EL99/98 or EL33/35 series with heavy duty trim, pulls, and key override, or
2. Corbin series ED5000, with heavy duty trim, pulls, and key override.

E. Power Supplies:

1. Provide power supplies manufactured or approved by the door hardware supplier.
2. Corbin Russwin 781N controller
 - a. Battery backup shall be Ultratech #1460 series or other approved Corbin Russwin supplier.
3. Von Duprin PS873B with 871-2 two zone controller.
 - a. Provide 873-AO option if door is equipped with an automatic operator.
 - b. Provide 873-FA option if door is connected to the fire alarm system.

F. Power transfer devices:

1. Electrical Power Transfer Device: Von Duprin EPT Series, or approved equal.
2. Electrified Hinge: Stanley, or other approved manufacturer to suit project conditions.
3. Armored cable: Cable shall be chrome plated.

G Electromagnetic Shear Locks

1. Normal Security: Ingersoll-Rand series 40 & 70.
2. High Security: Ingersoll-Rand Locknetics series 390+
3. Delayed Egress: Ingersoll-Rand Locknetics series 101+

2.8 POWER DOOR OPERATORS

- A. All door operators shall be low energy style.
- B. All door operators shall be surface mount, not concealed.
- C. Door operators shall be equipped with all weather fluid.
- D. Where operators are located in series forming a vestibule, the doors shall be operated independently.
- E. Where applicable, door operators shall be access control compatible 1.LCN 4630& 4640 series

2.9 CARD READERS OR PIN PAD APPLICATIONS

- A. Refer to Section "281000 Access Control" for requirements.

2.10 ACCESS DOORS

- A. Architectural access doors shall be key operated conforming to the following requirements: Non-Residential Life buildings: 6 pin, large format removable core Corbin Russwin. Residential Life Buildings: 7 pin small format interchangeable core.

PART 3 EXECUTION

3.1 GENERAL

- A. Only temporary construction cores will be permitted during construction period. All must be keyed alike with change keys to be delivered only to job supervisor for distribution. Control key for temporary construction cores to be sent by Registered Receipt Mail to Dartmouth College, McKenzie Hall, Hanover, NH 03755-3552 Attn: Access Control Shop
- B. All final cores and keys must be sent directly to: Dartmouth College
McKenzie Hall
Hanover, NH
03755-3552
Attn: Access Control Shop

Installation of final cores will be performed by College personnel.

- C. Locate power supplies and battery backup in the access control mechanical space when wire run lengths permit. Where wire runs exceed manufacturer's written recommendations, coordinate the location with Access Control Shop.
- D. Door closers and panic devices shall be installed with through-bolts.

3.2 ALTERNATE SUPPLIER

- A. When required, Corbin High Security Hardware may be provided by any supplier who will meet the above specifications, but the final keying and cores for the project must be supplied through the College's High Security Hardware vendor listed below:
Western Mass Door and
Hardware
190 Moody Street
P.O. Box W
Ludlow, MA 01056

3.3 PROJECT SCHEDULE

- A. The general contractor shall develop the project schedule including the Access Control shop timetable for final keying.

3.4 EXAMINATION

- A. Prior to installation of any hardware, examine all doors, frames, walls and related items for conditions that would prevent proper installation of finish hardware. Correct all defects prior to proceeding with installation.

3.4 APPLICATIONS

- A. All lockers, architectural access doors, display cases, mailboxes, and similar applications shall use lock that accept Corbin Russwin or the dormitory manufacturer's standard keyway.

3.6 INSTALLATION

- A. Coordination:

1. Prior to installation of hardware, schedule and hold a meeting for the purpose of instructing installers, and DC-FOM Access Control Shop on proper installation and adjustment of finish hardware. Representatives of locks, exit devices, closers, automatic operators, and electrified hardware shall conduct training; provide at least 10 days notice to representatives. After training a letter of compliance, indicating when the training was held and who was in attendance, shall be sent to the Architect.
2. Prior to ordering electrified hardware, schedule and hold a meeting for the purpose of coordinating finish hardware with security, electrical, doors and frames, and other related suppliers. A representative of the supplier of finish hardware, and doors and frames, the electrical subcontractor, and the Owner's security contractor shall meet with the Owner, Architect, DC-FOM Access Control Shop and General Contractor prior to ordering finish hardware. After meeting a letter of compliance, indicating when the training was held and who was in attendance, shall be sent to the Architect.

- B. Hardware will be installed by qualified tradesmen, skilled in the application of commercial grade hardware. For technical assistance if necessary, installers may contact The Dartmouth College Access Control Shop, or the manufacturer's rep for the item in question, as listed in the hardware schedule.

- C. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
- D. Install each hardware item in compliance with the manufacturer's instructions and recommendations, using only the fasteners provided by the manufacturer.
 - 1. Install all panic hardware and door closers with sex bolts.
- E. Do not install surface mounted items until finishes have been completed on the substrate. Protect all installed hardware during painting.
- F. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- G. Operating parts shall move freely and smoothly without binding, sticking, or excessive clearance.
- H. Wire (including low voltage), conduit, junction boxes, and pulling of wire is by Division 26, Electrical. Wires shall be tested and labeled with the Architects opening number. Connections to/from power supplies to electrified hardware and any connection to fire/smoke alarm system, and/or smoke evacuation system where specified is by Division 26 Electrical.

3.7 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door, to insure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly.
- B. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make a final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- C. Clean adjacent surfaces soiled by hardware installation.
- D. Instruct Owner's personnel in the proper adjustment, lubrication, and maintenance of door hardware and hardware finishes.
- E. Approximately six months after the Date of Substantial Completion, the 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 hardware.
- 2. Consult with and instruct DC-FO&M 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.

3.8 FIELD QUALITY CONTROL

Prior to Substantial Completion, the installer, accompanied by representatives of the manufacturers of locks, exit devices, closer, and any electrified hardware, shall perform the following work:

- A. Examine and re-adjust each item of door hardware as necessary to restore function of doors and hardware to comply with specified requirements.
- B. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures.
- C. Replace hardware items that have deteriorated or failed due to faulty design, materials, or installation of hardware units.
- D. Prepare a written report of current and predictable problems of substantial nature in the performance of the hardware.
- E. Upon completion of the above and prior to substantial completion, Dartmouth College- FOM will commission all door hardware & access control systems.
- F. At completion of project, a qualified factory representative for the manufacturers of locksets, closer, exit devices, and access control products shall arrange and hold a training session to instruct the Owner's personnel on the proper maintenance, adjustment, and/or operation of their respective products. After training a letter of compliance, indicating when the training was held and who was in attendance, shall be sent to the Architect.

3.9 PROTECTION

- A. Provide for the proper protection of complete items of hardware until the Owner accepts the project as complete. Damaged or disfigured hardware shall be replaced or repaired by the responsible party.

3.10 HARDWARE SCHEDULE

- A. Provide hardware for each door to comply with requirements of Section "Finish Hardware," hardware set numbers indicated in door schedule, and in the following schedule of hardware

sets.

- B. It is intended that the following schedule includes complete items of finish hardware necessary to complete the work. If a discrepancy is found in the schedule, such as a missing item, improper hardware for a frame, door or fire codes, the preamble will be the deciding document.
- C. Locksets, exit devices, and other hardware items are referenced in the Hardware Sets for series, type, and function. Refer to the preamble for special features, options, cylinders/keying, and other requirements.
- D. The door hardware supplier shall provide two charts listing the door numbers and the hardware sets, sorted by hardware sets and door numbers. Charts shall be provided in print and electronic form (Microsoft Excel or compatible file).

END OF
SECTION 08710