

1 General

1.1 SECTION INCLUDES

- 1.1.1 Comply with Division 1 General and Supplementary Conditions, related drawings and general requirements of contract.
- 1.1.2 The work in this section includes furnishing of all commercial finishing hardware as hereinafter specified or obviously necessary for all openings, except items which are specifically excluded from this section.

1.2 RELATED REQUIREMENTS

- 1.2.1 Specifications throughout entirety of Divisions for the project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 RELATED SECTIONS

- 1.3.1 Section 06 10 00 – Rough Carpentry, Blocking for Hardware
- 1.3.2 Section 06 20 00 – Finish Carpentry
- 1.3.3 Section 08 06 11 – Door Schedule
- 1.3.4 Section 08 11 13 – Steel Doors and Frames
- 1.3.5 Section 08 11 16 – Aluminum Doors and Hardware
- 1.3.6 Section 26 00 00 – Electrical
- 1.3.7 Section 28 00 00 – Electronic Safety and Security

1.4 REFERENCE STANDARDS

- 1.4.1 American National Standards Institute ([ANSI](#))/Builders Hardware Manufacturers Association ([BHMA](#)):

- 1.4.1.1 ANSI/BHMA A156.1, Butts and Hinges
 - 1.4.1.2 ANSI/BHMA A156.3, Exit Device
 - 1.4.1.3 ANSI/BHMA A156.4, Door Controls / Door Closers
 - 1.4.1.4 ANSI/BHMA A156.5, Auxiliary Locks and Associated Products
 - 1.4.1.5 ANSI/BHMA A156.6, Door Trims
 - 1.4.1.6 ANSI/BHMA A156.8, Door Controls / Overhead Holders
 - 1.4.1.7 ANSI/BHMA A156.13, Mortise Locks & Latches
 - 1.4.1.8 ANSI/BHMA A156.15, Closer / Holder / Release Devices
 - 1.4.1.9 ANSI/BHMA A156.26, Continuous Hinges
 - 1.4.1.10 ANSI/ICC A117.1-2009, Standard for Accessible and Usable Buildings and Facilities
 - 1.4.1.11 ANSI/BHMA A156 Standards Set
 - 1.4.1.12 ANSI/BHMA A156.10-2005, Power Operated Pedestrian Doors
 - 1.4.1.13 ANSI/BHMA A156.18-2006, Materials and Finishes
 - 1.4.1.14 ANSI/BHMA A156.19-2007, Power Assist and Low Energy Power Operated Doors
 - 1.4.1.15 Builders Hardware Manufacturers Association ([BHMA](#)):
Directory of Certified Products
 - 1.4.1.16 Door and Hardware Institute ([DHI](#)):
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Sequence and Format for the Hardware Schedule

- 1.4.1.17 ANSI/DHI A115.IG Installation Guide for Doors and Hardware
- 1.4.1.18 UL 437-2000, Key Locks
- 1.4.1.19 Warnock Hersey – Intertek (WH):
- 1.4.1.20 Underwriters Laboratories of Canada (ULC):
- 1.4.1.21 NFPA 80 – Fire Doors and Windows
- 1.4.1.22 NFPA 101 – Life Safety Code

1.5 SUBMITTALS

- 1.5.1 Provide required information in accordance with Division 1, General Requirements, Section 01 00 06 and Section 01 33 00 - Submittals
- 1.5.2 Action Submittals – Schedule and Product Data: Provide the following submittals before starting any work of this Section:
 - 1.5.2.1 Product Data: Submit product data (3 copies) indicating installation details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 1.5.2.2 Shop Drawings: Submit shop drawings (3 copies) indicating details of electrified door hardware including, but not limited to, the following:
 - 1.5.2.2.1 Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer installed and site installed wiring, and as follows:
 - Riser diagram
 - Elevation of each door
 - 1.5.2.2.2 Theory of operation for electrified hardware groups
 - 1.5.2.3 Templates: Upon receipt of the reviewed Hardware Schedule furnish a complete set of applicable templates, together with the approved hardware schedule, to the contractor. The contractor shall distribute to the related trades.
 - 1.5.2.4 Hardware Schedule: Submit (3 copies) door hardware schedule prepared by or under the supervision of qualified Architectural Hardware Consultant (AHC), detailing fabrication and assembly of door hardware.

1.6 PROJECT CLOSEOUT SUBMISSIONS

- 1.6.1 Operation and Maintenance Data: Provide two (2) sets of operations and maintenance information documents, in accordance with Section 01 78 23 – Operations and Maintenance Data, 01 00 06 – General Requirements: Operations and Maintenance Data.
 - 1.6.1.1 Approved Hardware Schedule, with architects stamp
 - 1.6.1.2 As-Built Final Hardware Schedule, with includes all approved change orders
 - 1.6.1.3 Catalogue Cut Sheets
 - 1.6.1.4 Hardware Installation and Maintenance Manuals
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- 1.6.1.5 Warranty Letter
- 1.6.1.6 Elevation Drawings for electronic openings

1.7 QUALITY ASSURANCE

1.7.1 Regulatory Requirements:

- 1.7.1.1 Building Code Compliance: Conform to ULC and Building Code requirements, as applicable to hardware, for labelled or rated doors and frames, and for exiting, operation and function.
- 1.7.1.2 Manufacturing Compliance: Use only products listed in the BHMA Directory of Certified Products for hardware of this Project.

1.7.2 Qualifications: Provide proof of qualifications when requested by Consultant:

- 1.7.2.1 Recognized as an architectural hardware supplier, who has been furnishing architectural hardware for a minimum of (5) years to the construction industry.
- 1.7.2.2 Have in its employment at least one permanent staff member who is fully certified and is a licensed Architectural Hardware Consultant (AHC).
- 1.7.2.3 Completed projects with electrified door hardware similar in material, design, and extent to that indicated for this Project, and who has the capability of preparing data for electrified door hardware, including shop drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- 1.7.2.4 Be available during the course of the project to consult with the Contractor, Consultant(s), and/or Owner(s) about door hardware and related section(s) requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

1.8.1 Delivery and Acceptance Requirements: Deliver hardware items in original factory containers, clearly labelling contents and scheduled use for this project and as follows:

- 1.8.1.1 Inventory door hardware on receipt and contractor to provide a secure lock up for door hardware delivered to Project site.
 - 1.8.1.2 Store hardware in a clean, well illuminated (500 lux minimum) securely locked storage room accessible only to authorized personnel.
 - 1.8.1.3 Construction keys are to be hand delivered directly to the contractor / authorized personnel on site.
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1.8.2 Storage and Handling Requirements: Store hardware items on shelves; not on floors, separated and packaged as a group for each individual door with the door number, and list of items for that door on each package related to the door hardware schedule, and include basic installation instructions with each item or package and as follows:

1.8.2.1 Maintain an itemized inventory list of each item, updated on a daily basis, to show items in storage and items installed.

1.9 WARRANTY

1.9.1 Provide written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1.9.2 Warranty against failure due to defective materials and/or workmanship for a minimum period of one (1) year, commencing on the date of final completion, turnover. In the event of failure, promptly repair and/or replace the item(s) at no cost to the owner (Product only, does not include any labour).

1.9.3 Warranty Period: From date of Substantial Performance, and as follows:

Hardware Type	Warranty Term
Hinges	1 year
Locks, latches and cylinders	2 year
Panics	2 years
Closers	10 years
Operators	1 year
Electronic Hardware	1 year
Miscellaneous	1 year

2 Products

2.1 MANUFACTURERS

2.1.1 Hardware to be supplied per tendered Schedule of Finishing Hardware as prepared by Trillium Architectural Products.

2.1.2 Any request for alternates not listed must be made a minimum of seven (7) days prior to tender closing for review by project team.

2.1.3 Any request for alternate must include a complete package of product data for each substituted hardware item detailing conformance with applicable specified product listed in this specification section.

2.1.4 Any substituted product not submitted for review a minimum of seven (7) days prior to tender closing will not be reviewed and will be rejected.

2.1.5 Acceptable Materials Manufacturers: Subject to compliance with requirements specified in this Section and as established by the Basis-of-Design Materials, as specified in Schedule of Finishing Hardware:

- 2.1.5.1 Mortise Hinges:
 - 2.1.5.1.1 Mckinney (ASSA Abloy DSS Canada)
Specified: TA714, TA786
Alternates: Ives, Stanley
 - 2.1.5.2 Continuous Hinges:
 - 2.1.5.2.1 Mckinney (ASSA Abloy DSS Canada)
Specified: MCK-112HD
Alternates: Hager, Ives, Pemko
 - 2.1.5.3 Flush Bolts:
 - 2.1.5.3.1 Rockwood (ASSA Abloy DSS Canada)
Specified: 1848(automatic)
Alternates: Gallery, Hager, Ives
 - 2.1.5.4 Mechanical Locks and Latches:
 - 2.1.5.4.1 Sargent (ASSA Abloy DSS Canada)
Specified: 8200 series, LNJ - Lever Design
Alternates: None
 - 2.1.5.5 Exit Devices:
 - 2.1.5.5.1 Sargent (ASSA Abloy DSS Canada)
Specified: 8800 series J - Lever Design
Alternates: None
 - 2.1.5.6 Cylinders:
 - 2.1.5.6.1 Sargent (ASSA Abloy DSS Canada)
Specified: DG series
Alternates: None
 - 2.1.5.7 Door Closers:
 - 2.1.5.7.1 Sargent (ASSA Abloy DSS Canada)
Specified: 1430 & 350 series
Alternates: None
 - 2.1.5.8 Auxiliary Trims:
 - 2.1.5.8.1 Gallery Specialty Hardware
Specified: GSH-Custom, GS80A
Alternates: None
 - 2.1.5.9 Overhead Stop Holder:
 - 2.1.5.9.1 Sargent (ASSA Abloy DSS Canada)
Specified: 1,55 & 9 series
Alternates: Glynn-Johnson, Rixson
 - 2.1.5.10 Auxiliary Stop:
 - 2.1.5.10.1 Gallery Specialty Hardware
Specified: GSH209
Alternates: CBH, Hager, Ives
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- 2.1.5.11 Door Seals:
 - 2.1.5.11.1 K.N. Crowder Mfg.
Specified: W-13 / W-22 / W-24S / W-25 / W-42 / CT-10 / CT-72
Alternates: Hager, Pemko
 - 2.1.5.12 Key Cabinet:
 - 2.1.5.12.1 Lund
Specified: AWC 150S
Alternates: Telkee
 - 2.1.5.13 Automatic Door Operator:
 - 2.1.5.13.1 Hunter Automation
Specified: HA-8
Alternates: Besam, Dor-O-Matic
 - 2.1.5.14 Finish hardware supplier shall **Supply and Install** electro-mechanical swing door operator, consisting of electro-mechanical swinging door operator and electronic controller(s), aluminum operator header, connecting hardware, and power on/off switch and safety sensors as required, and as follows:
 - 2.1.5.15 Automatic entrance equipment: comply with ANSI A156.10, A156.19 and be UL or ULc listed.
 - 2.1.5.16 Aluminium header extrusions: minimum nominal 4 mm wall thickness with finish anodized AA-M12-C22-A31 clear to match adjacent aluminum materials.
 - 2.1.5.17 Equipment must operate between -35°C and +55°C in all climate conditions.
 - 2.1.5.18 Operator: Electro-mechanical system installed in a header to resist dust, dirt and corrosion; entire operator shall be removable from the header as a unit.
 - 2.1.5.19 Bearings: Fully lubricated and sealed to minimize wear and friction.
 - 2.1.5.20 Operator shall open the door with a minimum of 1/8 HP motor through reduction gears, door arm, and linkage assembly, and as follows:
 - 2.1.5.21 Low energy operator, door opening time: not be less than 4 seconds.
 - 2.1.5.22 The drive train shall have a positive, constant engagement. The operator shall stop the door in the open position by electrically reducing the motor voltage and stalling against a 90° stop.
 - 2.1.5.23 Close the door by spring energy; controlled by employing the motor as a dynamic brake.
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- 2.1.5.24 Door closing time shall not be less than 4.5 seconds.
- 2.1.5.25 Pre-load closing spring for positive closing action at a low material stress level for long spring life.
- 2.1.5.26 The operator shall function as a manual door closer in the direction of swing with or without electrical power.
- 2.1.5.27 The door forces and speeds generated during power opening, and manual opening in both directions of swing, and spring closing in both directions of swing shall conform to the requirements of ANSI A156.10 or A156.19.
- 2.1.5.28 Verify that no defects or errors are present in completed phases of the work that would result in poor application or installation, or cause latent defects of the automatic door equipment.
- 2.1.5.29 Installation and warranty adjustments shall be performed by authorized distributors' factory trained technician.

2.2 KEYING

- 2.2.1 All locks and cylinders are to be furnished as a factory registered keyed system. Sargent patented key control Degree DG1, complete with construction keying provisions.
- 2.2.2 Keys:
 - 2.2.2.1 Keys: Provide keys in accordance with the following:
 - 2.2.2.2 **Quantity:** In addition to the cut keys supplied with each lock, provide the following:
 - 2.2.2.2.1 Cylinder Change Keys: 2
 - 2.2.2.2.2 Grand / Master Keys: 20
 - 2.2.2.2.3 Construction Master Keys: 15

2.3 FINISHES

- 2.3.1 The designations used in the schedule and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 or traditional U.S./Canada finishes shown by certain manufactures for their products.
 - 2.3.2 Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacture's standards, but in no case less the specified by reference standards for the applicable units of hardware.
 - 630/C32D – Satin Stainless Steel (base material, stainless steel)
 - 652/C26D – Satin Chrome Plated (base material, steel)
 - 626/C26D – Satin Chrome Plated (base material, brass/bronze)
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628/C28 – Satin Aluminum	(base material, Steel/aluminum)
689/AL – Power Coated Aluminum	(base material, steel or plastic)
689/AL - Anodized Aluminum	(base material, aluminum)

3 Execution

3.1 EXAMINATION

- 3.1.1 Examine doors and frames, with installer present, for compliance with requirements for installation tolerances, labelled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- 3.1.2 Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- 3.1.3 Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.1.4 Install each door hardware item in accordance with manufacturer's written instructions and any special notes as directed.
- 3.1.5 Coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way.
- 3.1.6 Do not install surface mounted items until finishes have been completed on substrates involved, and as follows:
 - 3.1.6.1 Set units level, plumb, and true to line and location.
 - 3.1.6.2 Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 3.1.6.3 Drill and countersink units that are not factory prepared for anchorage fasteners.
 - 3.1.6.4 Space fasteners and anchors according to industry standards.

3.2 INSTALLATION

- 3.2.1 Mount hardware units at heights in the following applicable publications, except as specifically indicated or required to comply with governing regulations.
 - 3.2.2 "Recommended Locations for Builders Hardware for Standard Steel Doors & Frames" as published by the Door & Hardware Institute (DHI)
 - 3.2.3 Install each hardware item in compliance with the manufacturer's instructions and recommendations.
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3.3 SITE QUALITY CONTROL

- 3.3.1 Verify each door leaf opens closes and latches properly. Inspect fire rated openings to ensure they are installed in compliance with NFPA 80 requirements. Test access control system and electrified hardware devices for proper operation, owner and/or contractor to sign off on verification of operation. Verify electric door release hardware properly upon activates fire alarm system, in coordination with Div.26/28
- 3.3.2 After installation, coordinate with the manufactures representative to perform a hardware installation inspection, by an AHC (or equivalent) who is a member of the Door & Hardware Institute (DHI). Provide to the contractor a written report with a copy sent to the consultant, certifying correctness, functionality, proper operation of the specific scheduled finishing hardware. Provide in the report, detailed opening numbers that are found to have deficiency.

3.4 ADJUSTING

- 3.4.1 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 in accordance with referenced accessibility requirements:

3.5 CLEANING AND PROTECTION

- 3.5.1 Clean adjacent surfaces soiled by door hardware installation.
- 3.5.2 Clean operating items as necessary to restore proper function and finish.
- 3.5.3 Contractor to provide all hardware, as it is stored on the construction site in a covered and dry place.
- 3.5.4 Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.6 ELECTRIC HARDWARE RESPONSIBILITIES: HARDWARE SUPPLIER IS RESPONSIBLE FOR FOLLOWING:

- 3.6.1 Coordinate and confirm all block diagrams with related trades and Consultants for electrical hardware applications, including but not limited to, electric latch retraction exit devices, power transfers, electric strikes, power door operators and associated accessories, maglocks, electrically operated door equipment, power supplies and key switches for operators.
 - 3.6.2 Performing low voltage connections for equipment listed herein and ensuring equipment functions in intended manner. Commission equipment supplied in this Section and test each item. Coordinate to ensure related trades have performed their work in order for equipment provided in this Section to function correctly.
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- 3.6.3 Ensure installation trades have installed equipment supplied in this Section correctly. Report any incorrect installation. Do not wire or commission equipment that has been incorrectly installed.
- 3.6.4 Install, adjust and test all mechanical operations of electric hardware. For example, electric strikes shall be adjusted to allow locks or exit devices to latch correctly taking into account seals, wind pressures, or any other issues affecting normal operation of door and hardware while electric hardware is not activated.
- 3.6.5 Ensure electric action of electric hardware supplied under this Section performs correctly.
- 3.6.6 Where applicable, arrange to either remove item in order to make wire connections, or make connections during initial installation. Do not inhibit other trades from performing their work as a result of electrical connections.
- 3.6.7 Maglock installation shall be by hardware supplier. Ensure mechanical operation of door and hardware is not impeded by maglock installation.
- 3.6.8 Conduit, junction boxes, 120V connections and wire, including low voltage wire, shall be provided by Division 16, except as noted within hardware schedule. Coordinate and confirm Division 16 has applicable information from this Section in order to perform their work correctly.
- 3.6.9 Provide low voltage connections for push button actuators, motion detectors, presence sensors and key switches related to power door operators. Coordinate fire alarm, 120VAC connections, security system connections and any other related connections for power door operators with related trades. After all connections are made, commission equipment, test and adjust to suit requirements of hardware and operator applications.

3.7 DOOR HARDWARE SCHEDULE

- 3.7.1 Addended.
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