1.1 **GENERAL**

1.2 **Related SFU Technical Requirements**

.1 Division 26
.2 Division 28
.3 Section 08 00 10 Openings – General Requirements
.4 Section 28 05 00 Common Work Results for Electronic Safety and Security
.5 Section 28 13 00 Access Control

1.3 **Coordination Requirements**

.1 Electrical Consultant
.2 Architectural Hardware Consultant
.3 SFU IT Services
.4 SFU Facilities Services
.5 Architectural Consultant

1.4 **Description**

.1 The supply only of all mechanical finish hardware.

.2 The supply, installation, termination, testing and verification of all electrified hardware, automatic operators and door control system to form a complete operating system including the installation of all non-electrified finish hardware on all portals with electrified hardware. The supply, installation and termination of all local cable for electrified hardware specified within this section (see scope of work diagram). Local cable is defined as cable between div. 8 devices and the power transfer device (between door and frame). Tenders for supply only of hardware will be rejected outright.

1.5 **Performance Standards**

.1 Hardware shall comply with the current issue of codes and standards as listed herein.

- ANSI American National Standards
- BHMA Builders Hardware Manufacturers Assoc.
- CSA Canadian Standards Association
- ULC Underwriters Laboratories Canada
- NFPA National Fire Protection Association
- DHI Door and Hardware Institute
- NFPA 80 Fire Doors and Windows
- BHMA Standards Materials and Finishes
- DHI - Document Installation Guide for Doors and Hardware
1.6 Design and Coordination Requirements

.1 All electrified hardware applications and products specified herein have been selected to allow for all available options and therefore the exact operation is deemed to be a site configurable variable. It will be the responsibility of this contractor to determine the exact functionality and operational requirement for all electrified hardware as well as the exact requirements for interface to related systems prior to commencing work.

.2 Convene a design review meeting within forty (40) days of Contract award. Coordinate functional review of design documents and resolve any conflicts between Contract Documents and actual requirements.

.3 Coordinate final conduit system design, device locations, and electrical service allocations and requirements. The Division 26 contractor shall be responsible for the supply and installation of all industry standard conduit, back boxes, junction boxes, device boxes, and terminal panels to provide a complete conduit system. Provide all manufactured system specific enclosures to Division 26 contractor for installation as part of the conduit system. Substantial corrosion resistant pull strings to be installed in all conduit runs.

.4 Confer with various sections of work and refer to detail drawings prior to ordering hardware to ensure that they will conform to and fit actual conditions on site. Refer to door schedule for correct sizing of all hardware. Refer to architectural details for exact location of all devices.

.5 Check all architectural details and confirm special frame rebate details and applications. Provide special lip strikes, or any special peripheral components suitable for the application as detailed. Refer to door schedule and architectural details to confirm glazing sizes and applications. Provide hardware sized or templated to accommodate glazed openings.

.6 Coordinate hardware components with door and frame manufacturers to ensure correct door and frame preparation. Inform manufacturers where conduit may be required within their respective assemblies and provide all required templates for door and frame preparation. Ensure that frames have been prepared correctly and that appropriate back boxes for conduit termination have been provided at correct locations prior to frame installation. Ensure that doors have been prepared correctly for all devices and that doors contain flexible conduit where required.

.7 Coordinate with aluminum door trade to ensure the proper preparation and fabrication of aluminum doors and frames. Coordinate where holes and grommets are required in framing system to accommodate cabling. Provide physical samples rather than paper templates if requested. If any devices are required to be installed in door or frame assemblies in the shop or during assembly or fabrication, provide such items direct to manufactures in ample time to allow for work to be completed in accordance with construction schedule. Coordinate and template concealed closer holder devices to the required degree of opening to obtain hold open points without door or hardware contacting other surfaces.
1.7 Quality Control and Assurance

.1 Submittals

.1 Submit six (6) copies of the detailed hardware schedule for review prior to ordering hardware. Schedules shall be standard vertical format. Headings shall include room designations, door numbers, door size and material, frame material, handing, fire resistance rating, degree of opening, and original hardware group. A schedule of mounting heights shall be included with shop drawings. Each opening shall have its own item number and only door and hardware assemblies which are identical in every detail, may be grouped together on one heading. Product description shall be complete in every detail as recommended by the manufacturer under ordering procedures including sizes and fasteners.

.2 Submit six (6) copies of engineering drawings including: system block diagrams indicating all components, interconnection and cabling; complete detailed system point to point circuit and riser diagrams, conduit and cable allocations, enclosure and back box types; and all required information to provide a detailed review of functional criteria and equipment assessment. Provide conduit and cabling drawings specific to each application for coordination with Div. 26 and/or Div. 29 work. Conduit drawings shall show detail for cable hole and grommet locations within curtain wall framing systems where required.

.3 Submit one sample of each device if requested by Consultant.

.4 Submit installation, operating and maintenance manuals:
   - (1) Copy of as installed hardware schedule incorporating all changes
   - (1) Copy of as install systems wiring diagram including changes
   - (1) Copy of all installation instructions
   - (1) Copy of parts and maintenance data
   - (1) Binder for above

.2 Quality Control

.1 Subcontractors shall have a minimum of five (5) years documented experience supplying and installing electrified hardware and shall be registered in the Province of British Columbia with adequate equipment, maintenance, and advisory facilities in the location of the project to fulfill contract obligations.

.2 Project management personnel directly responsible for supervision of this Work, shall be an accredited (A.H.C.) Architectural Hardware Consultant with a minimum of five (5) years of documented experience in the management of electrified hardware installation.

.3 Provide a written statement within (30) thirty days of Contract award outlining supervisors’ experience, projects, and contact references. Any changes to the approved supervisory crew shall require written approval of the Consultant.
2.1 **MATERIALS**

2.2 **General**

.1 Specified products have been selected to establish a minimum requirement for design, finish, operation and functionality and have been proven to be compatible with systems or products specified in other sections. Approval for alternate products or systems may be granted provided that quality and functional criteria has been retained, and submissions are executed in accordance with General Conditions. These submissions must be reviewed by the SFU locksmiths and the Hardware Consultant prior to approval. Be responsible for costs incurred by other trades where an alternate product or system is not compatible with products or systems specified in other sections.

.2 All like products shall be of one manufacture.

2.3 **Specified Manufacturers**

.1 The manufacturers listed herein have been approved for use in the preparation of this document.

.2 Butts
Stanley CB199/CB179
McKinney T4A3386/TA2714
Ives 5BB1HW/5BB1

.3 Mortise Locksets
Sargent 8200 series with LNJ lever
Schlage L9000 series with 03B lever

.4 Cylinders
Abloy (No Sub)

.5 Exit Devices
Von Duprin 98/99 series, 33A/35A series
Sargent 8000 series

.6 Door Closers
LCN LCN 4040XP series
Sargent 350 series

.7 Stops and Flatware
Trimco
Gallery
Ives

.8 Thresholds and Seals
Pemko
Draftseal
Crowder

.9 Power Supplies
Von Duprin PS900 series
Securitron BPS series

.10 Door Position Indicators
Sentrol 1076W
2.4 Material Requirements

.1 Furnish hardware with all necessary fasteners, mounting brackets and special tools required for the proper installation as recommended by the manufacturer. Fastening devices shall be of the same Material and finish as the item to which it is fastened. Any hardware items not installed with fasteners supplied by the manufacturer will be required to be removed and reinstalled with fasteners supplied by the manufacturer.

.2 Provide 114mm x 101mm butts for doors up to 950mm and 127mm x 101mm butts for doors over 950mm wide. Provide 3 butts per leaf for doors up to 2150 in height and one additional butt for each additional 600mm in door height. Exterior out swinging doors shall have non-removable pins. Refer to frame details and dimensions for conditions requiring wide throw hinges or specially swaged hinges.

.3 All locksets shall be provided with 03B/LNJ lever design. Where lever trim is specified on exit devices, trim shall match lever design on locks. Provide wrought boxes with all strikes. Refer to door and frame details and dimensions for conditions requiring special length or flat strike lips. Privacy locks for “unisex washrooms” must be equipped with key exterior, indicator bolt, and large HC thumb turn interior.

.4 Door Closers shall be used only as required by fire ratings and where required to complete the desired function of a door (Security, Energy Loss, Sound Containment, Push/Pull doors). Door closers must be mounted on the inside of a building and on the inside of a room for aesthetics. Doors that swing into a building or room must be installed in “regular arm” application. Doors that swing out of a building or room must be installed in a “parallel arm” or “top jamb” application as is required by the door and frame condition. All parallel arm type closers must be “EDA/P10” heavy duty. All handicap washrooms must be equipped with delayed action, and reduced opening force spring door closers to meet the required accessibility code.

.5 All floor and wall stops shall be cast brass or bronze base material. Provide wall stops wherever possible. Where wall stops are not suitable due to Site conditions, provide suitable floor stops. Provide machine screws and lead shields for all concrete applied floor or wall stops.

.6 All flatware and door protection shall be .050” Type 304 satin stainless steel and fastened with self-tapping sheet metal screws or wood screws. Kickplates and armorplates on push side shall be 50mm less than door width on single doors and shall be 25mm less than door width on double doors. Mopplates on pull side shall be 25mm less than door width on single doors and 25mm less than door width on double doors. Coordinate exact plate sizes to ensure that edges butt directly to edge guards where specified. Kickplate height shall be sized as per schedule except where restricted by glazing or door grilles. Refer to door schedule for detail drawings for grille locations and other requirements. Kickplates are to be applied on doors with door closers only.
.7 All openings with a fire resistance rating and combustible floor materials shall be provided with non-combustible sills as per NFPA80. Thresholds shall be notched for frame stop and shall be drilled and countersunk for flush mounted flat head screws. Provide flat head stainless steel screws and concrete anchors. Install and level thresholds flush with adjacent vinyl floor finish. Thresholds shall be used sparingly (ie exteriors doors, fire rated doors, and acoustic doors). Refer to door schedule for threshold locations and types.

.8 Proper acoustic seals shall be provided for theatres, interview rooms, etc. as required by end users and specified herein.

.9 Conform to Underwriters Laboratories ULC or cUL applicable listings for labelled hardware in rated openings.

2.5 Finishes

.1 Finishes shall be as listed herein except where noted otherwise.

.2 Butts BHMA 626 Satin Chromium Plated
.3 Locksets BHMA 630 Satin Stainless Steel
.4 Exit Devices & Strikes BHMA 630 Satin Stainless Steel
.5 Door Closers BHMA 689 Satin Aluminum Painted
.6 Stops, Holders BHMA 626 Satin Chromium Plated
.7 Flatware, Pulls BHMA 630 Satin Stainless Steel

2.6 Keying System

.1 All permanent cylinders are to be Abloy, supplied by the owner. Abloy products listed are for the benefit of the end user for order entry purposes. Keyed alike temporary cylinders are to be provided by the hardware supplier, for use during construction. Temporary cylinders remain the property of the hardware supplier. Permanent cylinders installed by SFU Locksmiths.

2.7 Wire and Cable

.1 All local wiring for the system shall be supplied, installed, and terminated by this section. All wiring shall meet the standards of the latest edition of the Canadian Electrical Code CSA-22.1. Cable design shall be as required by Contractors’ engineering and the system when complete, must perform to the complete satisfaction of the Consultant and must be free from all interference from cross-talk, hum, switch, and relay noise

.2 All wiring shall be stranded PVC insulated multi-conductor jacketed cable and shall be installed in conduit. Each end of each cable shall be clearly labeled with Panduit # LJSL4-Y3 labeling system. All wiring shall be terminated in terminal strips or blocks and neatly installed, laced tagged where required. Connections to terminal blocks shall be made with solder less connectors with a separate terminal for each conductor.

.3 All wire from hardware power supply to locking devices for power circuits for high inrush latch retraction exit devices shall be #14 AWG for runs up to 50 feet and #12 AWG for runs up to 100 feet. All wire from hardware power supply to locking devices for power circuits for electric locks shall be #18 AWG for runs up to 150 feet and #16 AWG for runs up to 250 feet. All wire for request to exit and monitoring circuits shall be #22 AWG.
2.8 Warranty Requirements

.1 All products shall be guaranteed against defects in design, workmanship, materials, and finishes. Any defects shall be made good at no additional cost to the Owner. Warranty periods shall commence from date of Total Performance of the Work.

<table>
<thead>
<tr>
<th>Product</th>
<th>Warranty Period</th>
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<tbody>
<tr>
<td>Finish Hardware</td>
<td>12 Months</td>
</tr>
<tr>
<td>Door Closers</td>
<td>120 Months</td>
</tr>
<tr>
<td>Electrified Hardware</td>
<td>18 Months</td>
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<tr>
<td>Butt Hinges</td>
<td>Life of Building</td>
</tr>
<tr>
<td>Power Operators</td>
<td>12 Months</td>
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3.1 EXECUTION

3.2 General

.1 Coordinate with electrical, door hardware, door and frame suppliers, and any other trades who may have field devices operating to the demands of the system.

3.3 Inspection

.1 Inspect surfaces and conditions on site prior to commencing work. Verify that all door and frame assemblies have been prepared correctly prior to commencing work. Commencement of work assumes acceptance of site conditions.

.2 Verify that all conduit, back boxes, junction boxes, device boxes, and terminal panels have been installed where required prior to commencing work.

.3 Prior to final inspection verify that all hardware has been installed according to the approved hardware schedule and manufacturer’s instructions and ensure correct operation.

3.4 Installation

.1 Install hardware in accordance with approved hardware schedule, manufacturers installation instructions, and DHI document "Installation Guide for Doors and Hardware". Install hardware to the degree of opening as listed in the approved hardware schedule.

.2 Template and install O/H stops and holders to the required degree of opening to protect exposed trim from contacting other surfaces.

.3 Install adhesive fastened materials on a clean dry surface. Ensure that gasketing does not interfere with closing or latching of door assemblies.

.4 Install wall stops to contact levers or pulls where they protrude from the door. Where push plates and pulls are mounted back to back, through bolts for pulls shall be countersunk and plates shall cover bolt heads.

.5 Size all universal closers to suit site conditions and in accordance with barrier free accessibility code.

.6 If shimming is necessary use only approved corrosive resistant metal shims. Organic materials are not acceptable.
.7 All electrified hardware shall be supplied, installed and terminated by this section except where indicated to be by others in the hardware schedule. All local wire and cable for electrified hardware shall be supplied, installed, and terminated by this section. Local cable is defined as cable between div. 8 devices and the power transfer device (between door and frame).

.8 Request to exit inputs shall be terminated at access panels by Security Contractor. Termination of access panel outputs to hardware power supply inputs coordinated between Div. 8 & Security Contractor.

.9 Door position switches for man doors shall be supplied by this section to allow for door and frame preparation. All door position switches shall be installed by this section and terminated at access panels by Security Contractor.

.10 Power supplies for electrified hardware shall be supplied by Div. 8 and installed connected to conduit, power and fire systems Div. 26. Hardware power supplies shall be provided with control modules that completely isolate hardware power from security access panels. Control modules shall allow a dry trigger input from the access panel outputs to control power to the hardware device and shall provide individual fused outputs for each device.

.11 Where automatic operators are specified on access-controlled openings, provide relay modules which allow push buttons operations to be interfaced with the access control system. Un-secure side push buttons shall be supplied with DPDT switches and shall provide direct activation to the operator and request to exit input to the access system. Secure side push buttons shall provide direct activation of the operator and shall be enabled or disabled by the access control system. Where required, card reader shall provide direct activation of operator.

3.5 Testing and Commissioning

.1 Prior to final inspection verify that all hardware has been installed according to the approved hardware schedule and manufacturer’s instructions. Test all electrical hardware and monitoring devices to ensure that hardware is fully operational in stand-alone mode.

3.6 Protection and Maintenance

.1 Be responsible for protective treatment and other precautions required to ensure that hardware components will be without damage until completion of the Work. Replace any item that is scratched, marred, or damaged. Instruct the Owner on the proper operation, care and maintenance of hardware and door systems.

3.7 Hardware Groups

.1 Manufacturers are listed to provide quality and function information; alternates of the same quality and function are acceptable for use.