

METAL DOORS AND FRAMES**Part 1 General****1.1 SYSTEM DESCRIPTION**

- .1 Extra heavy duty commercial doors and frames to ASTM 1008/M. Increase thickness of galvanised sheet steel over industry standards where indicated below. Provide vertical steel stiffeners at 150 mm centers, cap door tops and bottoms as indicated below and provide continuously weld seams throughout.
- .2 Where power transfers and electromechanical locksets are indicated in 08 71 10 – Door Hardware – General shop prep with a direct 12.5mm EMT conduit from point to point between door skins. Where bends are required to negotiate window openings a minimum bend radius of 300mm shall be observed. Shop prep all doors and frames to accommodate specified and supplied hardware.

1.2 RELATED SECTIONS

- .1 Section 07 92 00 - Joint Sealants.
- .2 Section 08 71 00 - Door Hardware.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM International).
 - .1 ASTM A653/A653M-11. Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM A924/A924M-13. Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-19.13-M87. Sealing Compound, One-component, Elastomeric, Chemical Curing.
 - .2 CGSB 41-GP-19Ma-84. Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA International).
 - .1 CSA-G40.20-04/G40.21-04 (R2009). General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA-W59-03 (R2008). Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association, (CSDMA).
 - .1 CSDMA. Recommended Specifications for Commercial Steel Door and Frame Products, 2009.
 - .2 CSDMA. Recommended Selection and Usage Guide for Commercial Steel Doors and Frame Products, 2009.
- .5 National Fire Protection Association (NFPA).
 - .1 NFPA 80-2013. Standard for Fire Doors and Other Opening Protectives.

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- .2 NFPA 252-2012. Standard Methods of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC).
 - .1 CAN/ULC-S104-10-EN. Standard Method for Fire Tests of Door Assemblies.
 - .2 CAN/ULC-S105-09-EN. Standard Specification For Fire Door Frames Meeting The Performance Required By Can/Ulc-S104.
 - .3 CAN/ULC-S704-11-EN. Standard For Thermal Insulation, Polyurethane And Polyisocyanurate, Boards, Faced.

1.4 DESIGN REQUIREMENTS

- .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.
- .2 Design exterior frame assembly from thermally broken components where the interior is separated from the exterior portions of the frame by a rigid non-conductive material.
- .3 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate each type of door, material, steel core thicknesses, insulation type and RSI value, mortises, reinforcements, location of exposed fasteners, openings, glazing, louvres, arrangement of hardware. Indicate fire rating and finishes.
- .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing. Indicate fire rating and finishes. Indicate thermal break and method to insulate frames. Indicate specialized detailing for thermally broken frame components.
- .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .5 Submit test and engineering data, and installation instructions.

1.6 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit one 300 x 300 mm corner sample of each type door.
- .3 Submit one 300 x 300 mm corner sample of each type of frame. Show cutout for butt hinges, glazing stops. Provide a 300 mm long removable mullion connection. Submit anchors and clips.
- .4 Submit samples of thermally broken frame.

METAL DOORS AND FRAMES**1.7 REQUIREMENTS**

- .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC-S104M and NFPA 252 for ratings specified or indicated.
- .2 Provide fire labelled frames and doors for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN/ULC-S104, ASTM E152 or NFPA 252 and list by nationally recognized agency having factory inspection service. Construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Protect finished surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Apply additional temporary protection to all finished surfaces to protect from impact and shipping damage.
- .2 Leave protective coverings in place until final cleaning of building.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction / Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative. Divert unused wood materials from landfill to recycling facility approved by Departmental Representative.

Part 2 Products**2.1 MATERIALS**

- .1 Sheet Steel: tension leveled steel to ASTM A924, hot dip galvanized to ASTM A653, Commercial Steel (CS), galvanized coating, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement: structural steel channel: to CSA-G40.20/G40.21, Type 44W, coating designation to ASTM A653M.

2.2 DOOR CORE MATERIALS

- .1 Interior doors: face sheets welded to perimeter framing and laminated to honeycomb construction: structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight:

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36.3 kg per ream minimum, density: 16.5 kg/m³ minimum sanded to required thickness.

- .2 Exterior doors: face sheets welded to perimeter framing and laminated to insulated core. Polyurethane insulation: to CAN/ULC-S704. Rigid closed cell board with foil facing both sides. Density 32 kg/m³.

2.3 ACCESSORIES

- .1 Adhesives:
 - .1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
 - .2 Polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .2 Touch-up primer: by manufacturer.
- .3 Door silencers: single stud rubber/neoprene type.
- .4 Cap: steel top and bottom caps. Install to all interior and exterior doors. Spot welded in place.
- .5 Thermal break: rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.
- .6 Metallic paste filler: to manufacturer's standard.
- .7 Fire labels: metal riveted.
- .8 Sealants: one part silicone to CAN/CGSB-19.13.
- .9 Glazing: as specified in Section 08 80 50 - Glazing.
- .10 Make provisions for glazing as indicated and provide glazing stops.
 - .1 Fabricate removable stainless steel glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to door and frame sections with counter-sunk stainless steel, oval head sheet metal screws. Design exterior glazing stops to be tamperproof.

2.4 DOOR FRAMES FABRICATION GENERAL

- .1 Fabricate frames, transoms and sidelights in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.6 mm thick galvanised sheet steel. Welded type construction. Thermally broken.
- .4 Interior frames: 1.6 mm thick galvanised sheet steel. Welded type construction.
- .5 Provide fire labeled frames for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN/ULC-S104, or NFPA

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252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures or Factory Inspection Manuals issued by listing agency to individual manufacturers.

- .6 Blank, reinforce, drill and tap frames for mortised, templated hardware and electronic hardware. Use templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .7 Prepare door frames as follows:
 - .1 ANSI strike.
 - .2 Reinforcing at head for door closer.
 - .3 Hole: 19 mm diameter for contact.
 - .4 Heavy or standard weight template hinges, 1.5 or 2 pair.
 - .5 Auxiliary deadbolt.
 - .6 Guard boxes at strike and hinge locations.
 - .7 Power box at head.
 - .8 Protect mortised cutouts with steel guard boxes.
- .8 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .9 Manufacturer's nameplates on frames and screens are not permitted.
- .10 Conceal fastenings except where exposed fastenings are indicated.
- .11 Insulate exterior frame components with polyurethane insulation.

2.5 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction. Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb. Securely attach floor anchors to inside of each jamb profile.
- .2 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.
- .3 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm o.c. maximum.

2.6 FRAMES: WELDED TYPE

- .1 Welding in accordance with CSA-W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.

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- .5 Provide temporary jamb spreaders per frame to maintain proper alignment during shipment.
- .6 Fabricate frame products for large openings in section as large as practical to suit site restrictions. Prepare joints in frames for field splicing and assembly.

2.7 THERMALLY BROKEN FRAMES

- .1 Fabricate thermally broken frames by separating exterior parts from interior parts with continuous interlocking thermal break. Apply insulation to exterior frames.

2.8 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and louvered openings as indicated.
- .2 Fabricate exterior doors from 2.0 mm thick galvanized sheet steel. Faces laminated under pressure to polyurethane core and spot welded to perimeter door framing.
- .3 Fabricate interior doors from 2.0 mm thick galvanized sheet steel. Faces laminated under pressure to honeycomb core and spot welded to perimeter door framing.
- .4 Fabricate doors with longitudinal edges welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .5 Blank, reinforce, drill doors and tap for mortised, templated hardware. Prepare for electronic hardware.
- .6 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .7 Reinforce doors where required, for surface mounted hardware.
- .8 Provide inverted, recessed, flush, spot welded steel channel caps to top and bottom of interior doors.
- .9 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN/ULC-S104, ASTM E152 and NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .10 Manufacturer's nameplates on doors are not permitted.

Part 3 Execution**3.1 INSTALLATION GENERAL**

- .1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and datasheet.

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- .2 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .3 Install doors and frames to CSDMA Installation Guide.
- .4 Maintain protection on doors and frames as required to prevent damage during construction.

3.2 FRAME INSTALLATION

- .1 Co-ordinate installation of door frames with Departmental Representative and other trades involved to ensure that erection schedule is maintained. Turn over frames to other trades for building into masonry or gypsum board partitions.
- .2 Set frames plumb, square, level and at correct elevation. Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air barrier and vapour barrier.

3.3 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor or thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latchside and head: 1.5 mm.
 - .3 Finished floor, top of carpet, sill or thresholds: 13 mm.
- .3 Adjust operable parts for correct function.

3.4 FINISH REPAIRS

- .1 Touch up where galvanized finishes were damaged during installation.
- .2 Repairs of any damage to doors and frames to be invisible in final assembly. Repairs are to the approval of the Departmental Representative.
- .3 Remove and replace any component where damage can not be repaired to approval of the Departmental Representative.

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- .4 Doors or frames with visible repairs and/or visible defects will be removed from site and replaced.

3.5 GLAZING

- .1 Install tempered glazing for doors and frames in non rated assemblies in accordance with Section 08 80 50 - Glazing.
- .2 Install georgian wired glazing in doors and frames in fire rated assemblies in accordance with Section 08 80 50 - Glazing.

END OF SECTION

Part 1 General**1.1 RELATED SECTION**

- .1 Section 09 21 16 - Gypsum Board Assemblies.
- .2 Section 09 30 13 - Ceramic Tiling.

1.2 SUBMITTALS

- .1 Provide Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit Shop Drawings. Submit catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.
- .3 Submit samples. Submit one sample of each type of hand entry access door. Submit one 300 x 300 mm corner sample of each type of body entry door.

1.3 CLOSEOUT SUBMITTALS

- .1 Provide maintenance data for cleaning and maintenance of stainless steel finishes for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction / Demolition Waste Management and Disposal, and with the Waste Reduction Workplan. Remove from site and dispose of all packaging materials at appropriate recycling facilities. Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Apply temporary protective coating to finished surfaces. Remove coating after erection. Do not use coatings that will become hard to remove or leave residue. Leave protective covering in place until final cleaning of building.

Part 2 Products**2.1 ACCESS DOORS**

- .1 Sizes: except as indicated otherwise, to be minimum sizes as follows:
 - .1 For body entry: 600 x 600 mm.
 - .2 For hand entry: 300 x 300 mm.
- .2 Materials:

ACCESS DOORS - MECHANICAL

- .1 Tiled or marble surfaces and other special areas: Stainless steel with brushed satin finish.
 - .2 Preformed Metal Cladding or Composite Wall Panels: Stainless steel with brushed satin finish.
 - .3 Gypsum board assemblies: Sheet steel. Factory primed.
- .3 Fire Rated Access Doors: ULC listed for the fire rating of the wall, floor or ceiling,

2.2 FABRICATION

- .1 Fabricate frames and flanges of 1.5 mm thick steel. Rounded safety corners.
- .2 Fabricate door panels of 1.8 mm thick single thickness steel sheet. Provide double sheet with integral non-combustible insulation filler for fire rated assemblies.
- .3 Weld, fill, and grind joints to ensure flush and square unit.
- .4 Hardware:
 - .1 Hinge: 175 degree stainless steel piano hinge. Concealed constant force closure spring type.
 - .2 Lock: screw driver slot for quarter turn cam lock. Provide cylinder lock with latch, two keys for each unit where indicated in the drawings.

2.3 FINISHES

- .1 Base metal protection: galvanized, wiped coat finish. Prime coat units with baked on primer. Finish: final paint finish as specified in Section 09 91 23 - Painting.
- .2 Stainless Steel: No. 4 brushed satin finish.

Part 3 Execution**3.1 EXAMINATION**

- .1 Verify existing conditions before starting work. Verify that rough openings for door and frame are correctly sized and located.
- .2 Coordinate size and location on site to minimize requirements for access doors and to consolidate services such that a single door may serve multiple functions.

3.2 INSTALLATION

- .1 Install units to manufacturer instructions. Install frames plumb and level in opening. Secure rigidly in place.

ACCESS DOORS - MECHANICAL

- .2 Location: Ensure that equipment is within view and accessible for operating, inspecting, adjusting, servicing without using special tools. Position unit to provide convenient access to concealed work requiring access.
- .3 Install fire rated access doors as per manufacturers written instructions.

END OF SECTION

DOOR HARDWARE**Part 1 General****1.1 RELATED SECTIONS**

- .1 Section 08 11 14 - Metal Doors and Frames.

1.2 REFERENCES

- .1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
 - .1 Recommended Dimensional Standards for Commercial Steel Doors and Frames. 2007.
- .2 American National Standard Institute (ANSI), Builders Hardware Manufacturers Association (BHMA).
 - .1 ANSI/BHMA A156.1-2013. Butts and Hinges.
 - .2 ANSI/BHMA A156.4-2008. Door Controls- Closers.
 - .3 ANSI/BHMA A156.5-2010. Cylinders and Input Devices for Locks.
 - .4 ANSI/BHMA A156.6-2010. Architectural Door Trim.
 - .5 ANSI/BHMA A156.8-2010. Door Controls - Overhead Stops and Holders.
 - .6 ANSI/BHMA A156.13-2012. Mortise Locks & Latches, Series 1000.
 - .7 ANSI/BHMA A156.16-2008. Auxiliary Hardware.
 - .8 ANSI/BHMA A156.21-2009. American National Standard for Thresholds.
 - .9 ANSI/BHMA A156.22-2012. Door Gasketing and Edge Seal Systems.
 - .10 ANSI/BHMA A156.30-2007. American National Standard for High Security Cylinders.

1.3 SUBMITTALS

- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
 - .2 After approval samples will be returned for incorporation in the Work.
- .3 Submit 5 copies of hardware list to Departmental Representative in accordance with Section 01 33 00 - Submittal Procedures. Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information. Include complete cross-reference to information included in Door Schedule.
- .4 Submit manufacturer's installation instructions.
- .5 Provide operation and maintenance data for door closers, locksets, door holders, electrified hardware and fire exit hardware for incorporation into manual specified in Section 017800 - Closeout Submittals.

DOOR HARDWARE**1.4 QUALITY ASSURANCE**

- .1 Regulatory Requirements. All hardware for doors in fire separations and exit doors to be certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Provide product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .3 Store finishing hardware in locked, clean and dry area.

1.6 WASTE DISPOSAL AND MANAGEMENT

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction / Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Dispose of corrugated cardboard, polystyrene and plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.7 MAINTENANCE

- .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Supply two sets of wrenches for door closers, locksets and fire exit hardware.
- .3 Brief maintenance staff regarding proper care, cleaning, and general maintenance.

Part 2 Products**2.1 HARDWARE ITEMS**

- .1 Use one manufacturer's products only for similar items.

2.2 DOOR HARDWARE

- .1 Use one manufacturer's products only for all similar items.

DOOR HARDWARE

- .2 Butts and hinges: to ANSI/BHMA A156.1.
 - .1 Designated by letter A and numeral identifiers, followed by size and finish as listed in Hardware Schedule. Heavy weight 5 knuckle ball bearing type typical.
 - .2 Use non-removable pins (NRP) and safety Studs (SS) for all exterior locations and NRP only where indicated for interior doors.
 - .3 Use non-ferrous material for all exterior locations and where indicated. Finish as indicated in Hardware Schedule.
- .3 Mortised locks and latches: to ANSI/BHMA A156.13.
 - .1 Series 1000 cylindrical lock grade 1, designed for function.
 - .2 Locksets are to be supplied less cylinder (L/C) unless specified otherwise.
 - .3 Lever handles: round tubular design complete with return to door.
 - .4 Roses: round plain design.
 - .5 Normal strikes: box type, lip projection not beyond jamb.
 - .6 Finish: as noted in the Hardware Schedule.
- .4 Door closers and Accessories: to ANSI/BHMA A156.4.
 - .1 Closers: to ANSI/BHMA A156.4. Designated by letter C and numeral identifiers listed in Hardware Schedule. Grade 1 complete with cast iron bodies, full rectangular cover plates, separate adjusting valves for sweep, latching and backcheck. Fully adjustable spring power. Closers are to have delayed action and built-in stop features where specified. Finish 689.
 - .2 Adjust closers to require no greater than 22 Newtons of force to open interior doors and no more than 34 Newtons of force to open exterior doors.
 - .3 Overhead holders: to ANSI/BHMA A156.8. Designated by letter C and numeral identifiers listed in Hardware Schedule. Finish 630.
- .5 Auxiliary locks and associated products: to ANSI/BHMA A156.5. Designated by letter E and numeral identifiers listed in Hardware Schedule. Finished as indicated in Hardware Schedule.
- .6 Cylinders: Supplied by Departmental Representative for installation by the Contractor. Mechanical type high security "Level C" to ANSI/BHMA A156.30 finished to 626, for installation in all locksets unless specified otherwise in the attached schedule.
- .7 Architectural door trim: to ANSI/BHMA A156.6. Designated by letter J and numeral identifiers listed in Hardware Schedule. Finished to 630.
 - .1 Door protection plates: size as noted, 1.27 mm thick, bevelled edges, brushed stainless steel, tape mounting and fire rated where applicable.
- .8 Auxiliary Hardware: to ANSI/BHMA A156.16.
 - .1 Flush bolts: heavy-duty flush mounted bolts. Size as indicated. Mounted to inactive leaf. Finished as indicated in Hardware Schedule.
 - .2 Floor stops shall be dome type, heavy-duty, cast bronze, low or high-rise as noted in schedule.

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- .3 Wall stops shall be heavy-duty, cast bronze c/w concave pad with no visible fasteners as noted in schedule.
- .9 Door Gasketing & Edge Seal Systems: to ANSI/BHMA A156.22.
 - .1 All gasketing must be fire rated type where used on fire rated openings.
 - .2 Door bottom seal: heavy duty, door seal of extruded aluminum frame and neoprene weather seal, surface mounted with drip cap, adjustable. Clear anodized finish.
 - .3 Weatherstripping: head and jamb seal. Heavy-duty neoprene in a 6mm thick solid aluminum extrusion designed to be continuous under exit device strikes and closer brackets.
 - .4 Automatic door bottoms: heavy-duty adjustable surface mounted in rectangular aluminum extrusion with neoprene seal.
- .10 Thresholds: to ANSI/BHMA A156.21.
 - .1 Thresholds to be extra wide by full width of opening.
 - .2 Extruded aluminum tapered threshold width to be selected to run from centerline of door to outside edge of corridor doorframe face as a minimum, further if indicated on drawings.
 - .3 Thresholds shall be cut to fit around frame jambs and all edges to be caulked.
 - .4 Use multi-component thermally broken extruded aluminum systems with incremental add-on extensions to meet required sectional threshold dimensions.
 - .5 Serrated surface, 6mm high.
 - .6 Thresholds at exterior openings are to be set in a mortar bed.

2.3 FASTENINGS

- .1 Use only fasteners provided by manufacturer. Failure to comply may void manufacturer's warranties and applicable licensed labels. The use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices are to match finish of hardware.
- .4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.
- .5 Use fasteners compatible with material through which they pass.
- .6 Doors and frames will not be painted in final installation therefore it is critical to protect the factory applied galvanised finish during preparation, fastening and on final installations.

DOOR HARDWARE**Part 3 Execution****3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

- .1 Unless noted otherwise install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.
- .2 Note specific mounting height for locks and exit devices shown in architectural door elevations. Centreline of locksets and exit devices to be 850mm from finished floor.
- .3 Where doorstop contacts door pulls, mount stop to strike bottom of pull.
- .4 Do not modify finishing hardware without manufacturers written consent.
- .5 Door Closers:
 - .1 Confirm degree of swing for door closers.
 - .2 Ensure that all adjustments have been made to sweep, latching and backcheck cycles for each closer.
 - .3 Mount on room side of doors wherever possible.
- .6 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .7 Remove construction cores or locks when directed by Departmental Representative. Install permanent cores and check operation of locks.
- .8 Door contacts are to be supplied and installed by Departmental Representative but rough-in for these contacts is to be part of this project.
- .9 Contractor is to patch and make good all holes in existing frames resulting from relocation of existing hardware and electronic components.

3.3 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

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- .2 Adjust door closers to require no more than 22 Newtons of force to open interior doors and no more than 34 Newtons of force to open exterior doors.
- .3 Lubricate hardware, operating equipment and other moving parts.
- .4 Adjust door hardware to provide tight fit at contact points with frames.
- .5 Adjust hardware for proper installation and function.
- .6 Consult with Departmental Representative before changing the hand of any lockset.

3.4 CO-ORDINATION WITH ELECTRICAL

- .1 Ensure co-ordination with the Electrical Contractor.
- .2 Provide all necessary information including templates to the Electrical Contractor.
- .3 Line voltage, wiring including low voltage, electrical back boxes, conduits as required and fire alarm interface where required is to be supplied and installed by the Electrical Contractor.
- .4 The Electrical Contractor is to supply switched line voltage to each power supply in this project.
- .5 Low voltage wiring from hardware device to transformers is to be supplied and installed by the Electrical Contractor.

3.5 CO-ORDINATION WITH ELECTRONIC SAFETY & SECURITY

- .1 Ensure co-ordination with the Departmental Representative.
- .2 Provide all necessary information including templates to the Departmental Representative.
- .3 Wiring, card readers, motion detectors and door contacts are to be supplied and installed by the Departmental Representative.

3.6 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.
- .3 Remove protective material from hardware items where present.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

DOOR HARDWARE

3.7 DEMONSTRATION

- .1 Brief maintenance staff regarding:
 - .1 Proper care, cleaning, and general maintenance of projects complete hardware.
 - .2 Description, use, handling, and storage of keys.
 - .3 Use, application and storage of wrenches for door closers, locksets and fire exit hardware.
- .2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.8 LEGEND

- .1 HM Dr: Indicates hollow metal door. Paint
- .2 IHM Dr: Indicates insulated hollow metal door. Paint.
- .3 PS Fr: Indicates pressed steel frame. Paint.
- .4 IPS Fr: Indicates insulated pressed steel frame. Paint.
- .5 LTS Indicates Length to suit opening size.
- .6 Exist. Indicates existing door and frame to remain. Paint.

3.9 HARDWARE SCHEDULE**Heading #1**

1	Sgl dr	D04	Room 09 to Room 04	LH
1	Sgl Dr	D05	Room 09 to Room 05	RH

Refer to Arch. Door Schedule HM Dr/PS Fr

6	Ea	Hinge	A8112 114 x 101		652
2	Ea	Privacy Set	F02 x Lever		626
2	Ea	Door Closer	C02011 x PT4F		689
2	Ea	Kickplate	J102 250mm x LTS	TAPE	630
2	Ea	Floor Stop	L02141		626

DOOR HARDWARE

Heading #2

1	Sgl dr	D09D	Exterior to Room 11	LHR
1	Sgl dr	D09C	Exterior to Room 10	RHR
1	Sgl dr	D03	Room 09 to Equipment Room 1	RH
1	Sgl dr	D06	Room 09 to Equipment Room 2	RH
1	Sgl dr	D09A	Exterior Room 10 to Room 07	LHR
1	Sgl dr	D09B	Exterior Room 11 to Room 09	RHR

Refer to Arch. Door Schedule IHM Dr/HMD/PS Fr

18	Ea	Hinge	A8112 114 x 101	NRP	652
6	Ea	Lockset	Departmental representative.		
6	Ea	Cylinder	See notes below		
6	Ea	Door Closer	see notes below		689
6	Ea	Kickplate	J102 250mm x LTS	Tape	630
6	Ea	Floor Stop	L02141		626
6	Set	Weatherstrip	R3B166E x LTS		628
6	Ea	Saddle Threshold	J32153E x LTS		627
6	Ea	Auto Bottom	R3B33E x LTS		628
4	Ea	Astragal	Full vertical overlapping 1.63mm galvanized steel with tamper resistant security fasteners.	On reverse hung doors.	Paint

- .1 The following door hardware will be supplied by Departmental Representative for coordination, installation and commissioning by division 8:
- .1 Lockset: Grade 1 Sargent 8271 RX DX mortise locks
 - .2 Power transfer: Abloy EA 280 wire transfer.
 - .3 Closer: LCN 4040XP door closer.
 - .4 Cylinders: Keyed construction cylinders
- .2 Coordinate preparation of doors and frames with Departmental Representative obtain all part numbers and coordinate all templates for supplied hardware. Connect and commission all hardware and devices.
- .3 Line voltage, electrical back boxes, conduit as required by electrical.

DOOR HARDWARE

Heading #3

1 Sgl dr D02 Room 09 to Office 02 LH

Refer to Arch. Door Schedule HM Dr/PS Fr

3	Ea	Hinge	A8112 114 x 101	NRP	652
1	Ea	Lockset	see notes below		
1	Ea	Cylinder	see notes below		
1	Ea	Kickplate	J102 250mm x LTS	Tape	630
1	Ea	Floor Stop	L02141		626

.1 The following door hardware will be supplied by Departmental Representative for coordination, installation and commissioning by division 8:

.1 Lockset: Grade 1 Schlage L9456.

.2 Cylinder: Construction cylinder

.2 Coordinate preparation of doors and frames with Departmental Representative obtain all part numbers and coordinate all templates for supplied hardware. Connect and commission all hardware and devices.

Heading #4

1 Pr drs D07 Room 07 to Supplies Storage LHRA

Refer to Arch. Door Schedule HM Dr/PS Fr

6	Ea	Hinge	A8112 114 x 101	NRP	652
2	Ea	Flush Bolt	L04251	(LHR)	626
1	Ea	Overhead Stop	C04542	(LHR)	630
1	Ea	Lockset	F07 x Lever	MK	626
1	Ea	Cylinder	see notes below		
1	Ea	Door Closer	C02021 x PT4G		689

.1 The following door hardware will be supplied by Departmental Representative for coordination, installation and commissioning by division 8:

.1 Cylinder: Construction cylinder

DOOR HARDWARE

Heading #5

1 Sgl dr D01 Room 09 to Room 01 LH

Refer to Arch. Door Schedule HM Dr/PS Fr

3	Ea	Hinge	A8112 114 x 101	NRP	652
1	Ea	Lockset	see notes below		
1	Ea	Cylinder	see notes below		
1	Ea	Closer	see notes below		
1	Ea	Kickplate	J102 250mm x LTS	Tape	630
1	Ea	Floor Stop	L02141		626

.1 The following door hardware will be supplied by Departmental Representative for coordination, installation and commissioning by division 8:

.1 Lockset: Grade 1 Schlage L9010.

.2 Closer: LCN 4040XP

.3 Cylinder: Construction cylinder

.2 Coordinate preparation of doors and frames with Departmental Representative obtain all part numbers and coordinate all templates for supplied hardware. Connect and commission all hardware and devices.

END OF SECTION

Part 1 General**1.1 RELATED SECTIONS**

- .1 Section 06 40 00 - Architectural Woodwork.
- .2 Section 08 71 00 - Door Hardware.

1.2 REFERENCES

- .1 American National Standard Institute (ANSI), Builders Hardware Manufacturers Association (BHMA).
 - .1 ANSI/BHMA A156.9-2010. Cabinet Hardware.
 - .2 ANSI/BHMA A156.11-2010. Cabinet Locks.
 - .3 ANSI/BHMA A156.18-2012. Materials and Finishes.

1.3 SUBMITTALS

- .1 Provide Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit manufacturer's printed product literature, specifications and data sheet.
- .3 Submit samples. Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number. After approval, samples will be returned for incorporation in the Work.
- .4 Submit 5 copies of hardware list. Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information. Include complete cross reference to information included in Door Schedule and millwork details.
- .5 Submit manufacturer's installation instructions.
- .6 Provide closeout submittals including maintenance data, maintenance materials, parts list, and manufacturer's instructions for incorporation into maintenance manual specified in Section 01 78 00 - Closeout Submittals. Brief maintenance staff regarding proper care, cleaning, and general maintenance.

1.4 QUALITY ASSURANCE

- .1 Submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

SPECIAL FUNCTION HARDWARE

- .2 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .3 Store cabinet hardware in locked, clean and dry area.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction / Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Dispose of corrugated cardboard, polystyrene and plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

Part 2 Products**2.1 HARDWARE ITEMS**

- .1 Use one manufacturer's product for all similar items.

2.2 CABINET HARDWARE

- .1 Cabinet hardware: to ANSI/BHMA A156.9, designated by letter B and numeral identifiers as listed below.
 - .1 Hinges: concealed European style cup hinge. Minimum 90 degree swing. For full overlay cabinet doors. Satin chromium plated. Equipped with self closing adjustable soft close feature.
 - .2 Pulls: back mounted pull, 150 mm centres. D-style pull. Solid stainless steel. Brushed finish.
 - .3 Piano hinge: type B81491. Continuous piano hinge, reversible, 30 mm x 0.76 mm thick. Holes at 50 mm OC. Screw size: No. 5 flat head. Stainless steel with satin finish.
 - .4 Catches: type B83291, friction type catch. Surface mounted. Adjustable holding force to 18 N. Style to approval of Departmental Representative. Finish 645, nickel plated. Roller type catch.
 - .5 Shelf rests: solid stainless steel, paddle style, shelf support pins. 7 mm diameter base. Installed in 7.5 mm sleeve in drilled holes.
 - .6 Drawer slides: type B05051. Bottom edge mounted, heavy duty, full extension, lift off rail. Zinc plated. Steel ball bearing rollers. Rated for 100 Kg per pair. Equipped with self closing feature.
 - .7 Track and guides for sliding panels: recessed mounted with anti-friction inserts.
 - .8 Cabinet door or drawer locks: to ANSI/BHMA A156.11. Half mortised into back of door or drawer. Nickel plated. Key into keying system as approved.

SPECIAL FUNCTION HARDWARE**2.3 FASTENINGS**

- .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .2 Exposed fastening devices to match finish of hardware.
- .3 Use fasteners compatible with material through which they pass.
- .4 Use only fasteners provided by manufacturer. The use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .5 Where pull is scheduled on doors or drawers, supply fastening devices, and install so pull can be secured through door from reverse side.
- .6 Provide stainless steel cup washers for all screws that are exposed in final assembly. Size to suit.

2.4 FINISHES

- .1 Finishes for all hardware to ANSI/BHMA A156.18.

2.5 KEYING

- .1 Cabinet locks to be keyed differently and master keyed as approved. Submit keying schedule for approval. Provide keys in duplicate for every lock.

Part 3 Execution**3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

- .1 Install hardware to standard hardware location dimensions in accordance with manufacturer's recommendations and to project design requirements.
- .2 Furnish millwork fabricator with complete instructions and templates for preparation of their work to receive hardware.
- .3 Furnish manufacturers' instructions for proper installation of each hardware component.

3.3 ADJUSTING

- .1 Adjust cabinet hardware for optimum, smooth operating condition. Lubricate hardware and other moving parts. Adjust cabinet door hardware to provide tight fit at contact points with frames.

SPECIAL FUNCTION HARDWARE

3.4 CLEANING

- .1 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions. Remove protective material from hardware items where present.

END OF SECTION

Part 1 General**1.1 REFERENCES**

- .1 American Society for Testing and Materials (ASTM International).
 - .1 ASTM D1004-13. Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
- .2 American National Standards Institute (ANSI).
 - .1 ANSI Z97.1-2009. Standard - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- .3 Consumer Product Safety Commission Publications (CPSC) Code of Federal Regulations (CFR).
 - .1 CPSC, 16 CFR 1201. CAT II. 2013.
- .4 International Window Film Association (IWFA).
 - .1 IWFA Visual Quality Standard for Applied Window Film 1999.
- .5 Underwriters Laboratory of Canada (ULC).
 - .1 ULC-S332-93 (R1998). Standard for Burglary Resisting Glazing Material.

1.2 SUBMITTALS

- .1 Provide all listed submittals to Departmental Representative in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit WHMIS MSDS - Material Data Sheets.
- .3 Submit manufacturer's product data sheets.
- .4 Submit samples. Submit one 500 x 500 mm sample of film installed on 6 mm thick clear glass. Submit one 500 x 500 mm sample of each type of film alone.
- .5 Submit test reports from approved independent testing laboratory, certifying film's compliance with specified requirements.

1.3 QUALITY ASSURANCE

- .1 Comply with requirements of WHMIS regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Canada Labour Code.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with section 01 61 00 - Common Product Requirements. Deliver, store and handle materials in accordance with manufacturer's written instructions.

SECURITY FILMS**.2 Waste Management and Disposal:**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction / Demolition Waste Management and Disposal, and with Waste Reduction Workplan.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal.

1.5 WARRANTY**.1 Ensure warranty includes items as follows:**

- .1 Maintaining adhesion properties without blistering, bubbling or delaminating from glass surface.
- .2 Maintaining appearance without discolouration.
- .3 Removal replacement and reapplication of defective materials.
- .4 In event of product failure under warranty terms, remove and re-apply film without glass replacement at no cost to Departmental Representative.

1.6 MAINTENANCE DATA

- .1 Provide operation and maintenance data for security film for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .2 Submit manufacturers written instructions for care and maintenance of security film. Submit information on the use of cleaning solution recommended by manufacturer for regularly scheduled cleaning of security film.

Part 2 Products**2.1 MATERIALS**

- .1 Security film: Optically clear, micro layered, polyester film. Abrasion resistant coating and release liner. Security Film to the following properties:
 - .1 Safety Impact Tests: Category II when tested to CPSC 16 CFR.
 - .2 Film thickness: 0.26 mm. (42 laminated micro layers)
 - .3 Tensile strength: 206.8 MPa.
 - .4 Breaking strength: 82 kg/cm.
 - .5 Surface burn characteristics: Class A, interior use.

2.2 FABRICATION

- .1 Apply all glazing films to glass in accordance with manufacturer's written instructions. Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and datasheet.
- .2 Shop apply glazing film to glass panels as follows:
 - .1 Ensure no deleterious material adheres to glass by scraping surface of glass using industrial razors.

SECURITY FILMS

- .2 Ensure dust, grease, and chemical residue are removed from surface of glass before installation of film.
- .3 Examine glass under natural daylight and identify cracks, blisters, bubbles, discolouration, edge defects or other anomalies that may cause film to delaminate, or cause vision transparency or distortion problems.
- .4 View glass from 2.0 m minimum. Report findings to Departmental Representative.
- .5 Install glazing film to glass panels ensuring no blisters, bubbles, scratches, edge defects or distortions.
- .6 Cut film edges straight and square to within 3 mm of edge of panel.
- .3 Splicing. Splice film only when glass is greater in width than film. Splice film only after receipt of written approval from Departmental Representative. Use butt factory edges only.

Part 3 Execution**3.1 INSTALLATION**

- .1 Remove all window glazing stops and window sealing device. Ensure glazed panels are installed such that all glazing films are installed behind glazing stops.
- .2 Security film to be wet glaze anchored to the frame behind the stops.

3.2 INSTALLER'S INSPECTION

- .1 Visual Inspection: in accordance with IWFA - Visual Quality Standard for Applied Window Film.
- .2 Remove and replace film that continues to show blisters, bubbles, tears, scratches, edge defects or vision distortion in film when viewed under natural daylight from 2.0 m minimum after 30 day period.

3.3 FINAL CLEANING

- .1 Wash interior and exterior of each glass panel and film using cleaning solution recommended by film manufacturer.

3.4 SCHEDULE

- .1 Install Security Glazing film to glazing noted in drawings.

END OF SECTION

