

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 08 14 16 – Flush Wood Doors
- .2 Section 08 71 00 – Door Hardware
- .3 Section 08 80 50 – Glazing
- .4 Section 09 91 23 Interior Painting

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-09, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CSA @59-03, Welded Steel Construction (Metal Arc Welding).
 - .3 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
 - .4 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2006.
 - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 1990.
 - .5 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1113-13, Architectural Coatings.
 - .2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
 - .6 National Fire Protection Association (NFPA)
 - .1 NFPA 80-99, Standard for Fire Doors and Fire Windows.
 - .2 NFPA 252-03, Standard Methods of Fire Tests of Door Assemblies.
 - .7 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 CAN/ULC-S702-09, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
 - .3 CAN/ULC-S704-11, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .4 CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies.
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- .5 CAN4-S105-M85, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.3 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 NFPA 252 for ratings specified or indicated.
 - .2 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 NFPA 252 and listed by nationally recognized agency having factory inspection services.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data: in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings reinforcing, finishes.
 - .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, arrangement of hardware fire rating and finishes
 - .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
 - .4 Submit test and engineering data, and installation instructions.
- .4 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
- .5 Submit one 300 x 300 mm corner sample of each type of frame.
 - .1 Show butt cutout glazing stops snap-on trim with clips 300 mm long removable mullion connection..

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse /recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
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- .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

2.2 DOOR CORE MATERIALS

- .1 Stiffened: face sheets laminated to rigid, modified polyisocyanurate, closed cell board to CAN/ULC-S704. Density 32 kg/m³.

2.3 ADHESIVES

- .1 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .2 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMER

- .1 Touch-up prime CAN/CGSB-1.181.
 - .1 Maximum VOC limit 50 g/L to GC-03.

2.5 PAINT

- .1 Field paint steel frames in accordance with Sections 09 91 23 – Interior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

2.6 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Interior top and bottom caps: steel channels
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Metallic paste filler: to manufacturer's standard.
- .5 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws dry glazing of snap-on type.
 - .2 Design exterior glazing stops to be tamperproof.
- .6 Fire labels: metal riveted.
- .7 Sealant: Refer to Section 07 92 00 - Joint Sealants
- .8 Glazing: Refer to Section 08 80 00 - Glazing
- .9 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.

2.7 FRAMES FABRICATION GENERAL

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Interior frames: 1.2 mm welded type construction.
- .4 Blank, reinforce, drill and tap frames for mortised, templated hardware, using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .5 Protect mortised cutouts with steel guard boxes.
- .6 Include conduits for wiring connections to electronic hardware.
- .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .8 Manufacturer's nameplates on frames and screens are not permitted.
- .9 Conceal fastenings except where exposed fastenings are indicated.
- .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

2.8 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 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.
- .4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

2.9 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.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

2.10 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass openings as indicated.
 - .2 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.
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- .3 Blank, reinforce, drill doors and tap for mortised, templated hardware electronic hardware specified in Section 08 71 00 Door Hardware.
- .4 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .5 Reinforce doors where required, for surface mounted hardware. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .6 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .7 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with 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.
- .8 Manufacturer's nameplates on doors are not permitted.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION GENERAL

- .1 Install frames to CSDMA Installation Guide.

3.3 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.
- .2 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.

3.4 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 and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
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- .2 Latchside and head: 1.5 mm.
- .3 Finished floor, top of carpet, and thresholds: 13 mm.
- .3 Adjust operable parts for correct function.

3.5 FINISH REPAIRS

- .1 Touch up with primer finishes damaged during installation.
- .2 Fill exposed frame anchors surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.6 GLAZING

- .1 Install glazing for doors frames in accordance with Section 08 80 50 - Glazing.

3.7 VERIFICATION

- .1 Verification requirements in accordance with Section 01 47 17 - Sustainable Requirements: Contractor's Verification], include:
 - .1 Materials and resources.
 - .2 Storage and collection of recyclables.
 - .3 Construction waste management.
 - .4 Resource reuse.
 - .5 Local/regional materials.
 - .6 Low-emitting materials.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 08 11 00 – Metal Frames
- .2 Section 08 71 00 – Door Hardware
- .3 Section 08 80 50 - Glazing

1.2 REFERENCES

- .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
 - .1 Architectural Woodwork Standards (2009)
- .2 ASTM International
 - .1 ASTM D5456-14, Standard Specification for Evaluation of Structural Composite Lumber Products
- .3 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-71.19-M88, Adhesive, Contact, Sprayable.
 - .2 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .4 Canadian Standards Association (CSA International).
 - .1 CSA A440.2-14, Energy Performance of Windows and Other Fenestration Systems.
 - .2 CSA O115-M1982(R2001), Hardwood and Decorative Plywood.
 - .3 CAN/CSA O132.2 Series-90(2003), Wood Flush Doors.
 - .4 CAN/CSA-O132.5-M1992(R1998), Stile and Rail Wood Doors.
 - .5 CAN/CSA-Z808-96, A Sustainable Forest Management System: Guidance Document.
 - .6 CSA Certification Program for Windows and Doors 00.
- .5 Environmental Choice Program (ECP).
 - .1 CCD-045-95, Sealants and Caulking Compounds.
 - .2 CCD-046-96, Adhesives.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
 - .1 For caulking materials during application and curing.
 - .2 For door materials and adhesives.
 - .2 Shop Drawings:
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- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate door types and cutouts for lights, sizes, core construction.

1.4 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 wood door.
- .3 Show door construction, core, glazing detail and faces.
- .4 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements:
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Storage and Protection:
 - .1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.
 - .2 Store doors in well ventilated room, off floor, in accordance with manufacturer's recommendations.
 - .3 Protect doors from scratches, handling marks and other damage. Wrap doors.
 - .4 Store doors away from direct sunlight.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .2 Dispose of corrugated cardboard polystyrene plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.
 - .3 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.
 - .4 Divert unused adhesive material from landfill to official hazardous material collections site approved by Departmental Representative.
 - .5 Do not dispose of unused paint materials into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.
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Part 2 Products**2.1 WOOD FLUSH DOORS**

- .1 Solid core: to CAN/CSA-O132.2.1.
 - .1 Construction: particle core, ultra heavy-duty, anti-warping construction:
 - .2 Stiles: 3 mm thick veneer, longitudinally laminated by hot pressing with type 1 structural glue, as per ASTM-D5456-93 (LVL FSC), including a 22 mm piece of hardwood, matched with faces, for a total width of 107 mm.
 - .3 Top and bottom rails: 3 mm thick veneer, longitudinally laminated by hot pressing with type 1 structural glue, as per ASTM-D5456-93 (LVL FSC), or laminated strand lumber (LSL) for a total width of 85 mm.
 - .4 Core: Solid particleboard. Density of 0.45-0.50 metric ton per cubic metre. Complies with CSA-0188 and ANSI A208-1 standards (LD-1/LD-2). Available NAUF/FSC (LD-2).
 - .5 Faces: Oak veneer (2 ply plywood). Available NAUF/FSC.
 - .6 Lock Block: Integrated
 - .7 Adhesive: Type I PVA Cross-link (NAUF)

2.2 FABRICATION

- .1 Vertical edge strips to match face veneer.
- .2 Prepare doors for glazing. Provide glazing stops hardwood oak species with mitred corners.
- .3 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.

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

- .1 Compliance: 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 Unwrap and protect doors in accordance with CAN/CSA-O132.2 Series, Appendix A.
 - .2 Install labelled fire rated doors to NFPA 80.
 - .3 Install doors and hardware in accordance with manufacturer's printed instructions and CAN/CSA-O132.2 Series, Appendix A.
 - .4 Adjust hardware for correct function.
 - .5 Install glazing in accordance with Section 08 80 50 - Glazing.
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3.3 ADJUSTMENT

- .1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

3.4 CLEANING

- .1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .2 Remove traces of primer, caulking; clean doors and frames.
- .3 Clean glass and glazing materials with approved non-abrasive cleaner.
- .4 On completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.5 VERIFICATION

- .1 Verification requirements in accordance with Section 01 47 17 - Sustainable Requirements: Contractor's Verification], include:
 - .1 Materials and resources.
 - .2 Storage and collection of recyclables.
 - .3 Construction waste management.
 - .4 Resource reuse.
 - .5 Local/regional materials.
 - .6 Low-emitting materials.

END OF SECTION

Part 1 General**1.1 RELATED SECTIONS**

- .2 Section 07 92 00 – Joint Sealants.
- .4 Section 08 71 00 - Door Hardware.
- .5 Section 08 80 50 - Glazing.
- .6 Section 09 91 23 - Painting.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A653/A653M-09a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM E90-04 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - .4 ASTM E413-04 - Classification for Rating Sound Insulation.
 - .5 ANSI/WDMA I.S. 1A-2004 - Industry Standard for Architectural Wood Flush Doors.
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G40.20-09, General Requirements for Rolled or Welded Structural Quality Steel.
 - .2 CAN/CSA-G40.21-09, Structural Quality Steels.
 - .3 CSA-W59-03, Welded Steel Construction (Metal Arc Welding).
- .3 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2000.
 - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 1990.
- .4 National Fire Protection Association (NFPA):
 - .1 NFPA 80-2007, Standard for Fire Doors and Other Opening Protectives.
 - .2 NFPA 252-2003, Fire Tests of Door Assemblies.
- .5 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN4-S104-M80(R1985), Standard Method of Fire Tests of Door Assemblies.
 - .2 CAN/ULC-S105-09, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.3 DESIGN REQUIREMENTS

- .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 for ratings specified or indicated.
- .2 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 and listed by nationally recognized agency having factory inspection services.
- .3 Acoustic Performance: Minimum Sound Transmission Class STC 52 and STC 45 tested to ASTM E90.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 00 10 - General Instructions
- .2 Provide complete manufacturer's product data.
- .3 Provide shop drawings:
 - .1 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings, reinforcing, fire rating and finishes.
 - .2 Include schedule identifying each unit, with door and frame numbers relating to numbering on drawings and door schedule.
 - .3 Submit test and engineering data, and installation instructions.
- .4 Test Data:
 - .1 Submit test data indicating compliance with the Sound Transmission Class (STC) requirements. Include laboratory name, test report number, and date of test.
 - .2 Submit certification from test laboratory qualified under the National Voluntary Accreditation Program (NVLAP) of the U.S. Bureau of Standards.
- .5 Installation Instructions: Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

- .1 Perform work to requirements of CSDMA Canadian Steel Door Manufacturers Association HMMA Hollow Metal Manufacturers Association WDMA (Window and Door Manufacturers Association) standards.
- .2 Pre-installation Meeting: Convene a pre-installation meeting two weeks before start of installation of door and frame assemblies. Require attendance of parties directly affecting work of this section, including contractor, Departmental Representative, architect, installer, and manufacturer's representative. Review installation and coordination with other work.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with the manufacturer's instructions.
- .2 Waste Management and Disposal: Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Comply with WDMA I.S. 1A for wood doors.
- .4 Comply with HMMA 840 for steel frames.
- .5 Weld minimum two temporary jamb spreaders per frame prior to shipment.
- .6 Remove frames from wrappings or coverings upon receipt on site and inspect for damage. Leave doors covered for protection until hung.
- .7 Store doors in horizontal position, frames in vertical position, spaced with blocking to permit air circulation between components.
- .8 Store materials out of water and covered to protect from damage. Use covering that allows air circulation and does not permit light to penetrate.
- .9 Store doors between 50 to 90 degrees F (10 to 32 degrees C) and 25 to 55 percent relative humidity.
- .10 Clean and touch up scratches or disfigurement to metal surfaces on frame or wood surfaces on door.

Part 2 Products**2.1 MATERIALS**

- .1 Hot dipped galvanized steel sheet: to ASTM A 653M, ZF75 zinc coating designation, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement: to CSA G40.20/G40.21, Type 44W, galvanized to ASTM A123, minimum 400 g/m² coating weight.
- .3 Sheet Steel:
 - .1 Galvanized steel to ASTM A653/A653M, ZF180, ZF75
- .4 Reinforcement Channel: To CSA G40.20/G40.21, coating designation to ASTM A653/A653M, ZF75 A25.
- .5 Wood Door Panel: Acoustic core with wood veneer facing.
 - .2 Door Facing:
 - .1 Wood Face Veneer: maple species, flat cut; minimum thickness before sanding 0.6 mm.
 - .3 Door Edging:
 - .1 Where door face is wood face veneer, door edges shall be supplied with matching stiles and rails
- .3 Hinges: Heavy weight butt type by section #08 71 10
- .4 Glazing stops for frames: Formed galvanized steel channel, mitred corners; prepared for countersink tamperproof screws for side lite frames.
- .5 Glass: Type as tested to achieve STC and fire ratings. Glazing to be factory supplied and pre-installed.
- .6 Primer: Rust inhibitive zinc chromate on frames.

- .7 Threshold: To provide a seal for door in closed position.
- .8 Perimeter and bottom acoustic seals: to provide an acoustic seal for door is closed position.

2.2 PAINT

- .1 Field paint steel frames in accordance with Section 09 91 99 - Painting. Protect weatherstrips from paint.

2.3 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior and interior top and bottom caps: Steel channels.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Metallic paste filler: to manufacturer's standard.
- .5 Fire labels: metal riveted.
- .6 Sealant: Refer to Section 07 92 00 - Joint Sealants.
- .7 Glazing: Refer to Section 08 80 00 - Glazing.
- .8 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable galvanized steel glazing beads for use with glazing tapes and compounds specified in Section 08 80 00 and secured with countersunk galvanized steel screws.
 - .2 Design exterior glazing stops to be tamperproof.

2.4 FRAME FABRICATION

- .1 Manufacture doors and frames to STC rating of 50 and 45, measured in accordance with ASTM E90.
- .2 Fabricate frames in accordance with CSDMA specifications.
- .3 Fabricate frames to profiles and maximum face sizes as indicated.
- .4 Sheet steel, metal thickness appropriate to maintain door STC and fire ratings, mitred corners, fully welded seams.
- .5 Hardware preparation:
 - .1 Blank, reinforce, drill and tap frames for mortised, templated hardware specified in Section 08 71 00 - Door Hardware, and for electronic security hardware to be provided by the Departmental Representative.
 - .2 Use templates provided by finish hardware supplier, security hardware suppliers and Departmental Representative. Reinforce frames for surface mounted hardware.
 - .3 Include conduits for wiring connections to electronic hardware.
 - .4 Coordinate security hardware requirements with the Departmental Representative prior to fabrication.
 - .5 Protect mortised cutouts with steel guard boxes.
 - .6 Prepare frame for door silencers, 3 for single door.

- .2 Weld frames in accordance with CSA W59.
 - .1 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
 - .2 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
 - .3 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .3 Securely attach floor anchors to inside of each jamb profile.
- .4 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.
- .5 Manufacturer's nameplates on frames and screens are not permitted.
- .6 Conceal fastenings except where exposed fastenings are indicated.
- .7 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .8 Sound insulate frame components with sound attenuating insulation all steel frames in P1, P2 and P3 partitions.

2.5 WOOD DOOR FABRICATION:

- .1 Fabricate doors to ANSI/WDMA IS1A. Provide suitable thickness, design, and core to achieve specified STC and fire performance ratings.
- .2 Reinforce doors where surface-mounted hardware is required.
- .3 Drill and tap for mortised, templated hardware.

2.5 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 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.
- .4 Hardware preparation:
 - .1 Blank, reinforce, drill and tap frames for mortised, templated hardware specified in Section 08 71 00 - Door Hardware, and for electronic security hardware to be provided by the Departmental Representative.
 - .2 Use templates provided by finish hardware supplier and security hardware suppliers. Reinforce frames for surface mounted hardware.
 - .3 Coordinate security hardware requirements with the Departmental Representative prior to fabrication.
 - .4 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .6 Affix permanent metal nameplates to door and frame, indicating manufacturer's name, and STC rating. Note that where concealed vertical rod exit devices are required, the door thickness will be 2 1/8" (53mm) to accommodate the acoustic structure necessary for reinforcement of the door hardware.
- .7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

- .8 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104 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.
- .9 Top and Bottom Rails: Factory sealed with wood sealer.

Part 3 Execution

3.1 MANUFACTURERS INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION GENERAL

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and frames to CSDMA Installation Guide.
- .3 Utilize welders certified by Canadian Welding Bureau (CWB) for field welding of frames

3.3 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.
- .2 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 Seal perimeter of frames between frame and adjacent material in accordance with Section 07 92 00 - Joint Sealants.
- .6 Install hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.
- .7 Install and adjust perimeter and bottom acoustic seals.
- .8 Adjust operable parts for correct function.
- .9 Installation tolerances of installed frame for squareness, alignment, twist and plumbness are to be no more than $\pm 1/16$ in (1.5mm).

3.4 FIELD QUALITY CONTROL

- .1 Provide qualified manufacturer's representative to instruct installers on the proper installation and

adjustment of door assemblies.

- .2 Provide manufacturer's representative to inspect door installation, and test minimum five (5) cycles of operation. Correct any deficient door and frame assemblies.

3.5 FINISH REPAIRS

- .1 Touch up with primer finishes damaged during installation.
- .2 Fill exposed surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

1.2 VERIFICATION

- .1 Verification requirements in accordance with Section 01 47 17 - Sustainable Requirements: Contractor's Verification], include:
 - .1 Materials and resources.
 - .2 Storage and collection of recyclables.
 - .3 Construction waste management.
 - .4 Resource reuse.
 - .5 Local/regional materials.
 - .6 Low-emitting materials.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 08 14 16 – Flush Wood Doors
- .2 Section 08 11-00 – Metal Frames

1.2 REFERENCES

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
 - .1 ANSI/BHMA A156.1-2000, American National Standard for Butts and Hinges.
 - .2 ANSI/BHMA A156.2-2003, Bored and Preambled Locks and Latches.
 - .3 ANSI/BHMA A156.6-2005, Architectural Door Trim.
 - .4 ANSI/BHMA A156.13-2002, Mortise Locks and Latches Series 1000.
 - .5 ANSI/BHMA A156.18-2006, Materials and Finishes.
- .2 CAN/CSA B651-12, Accessible Design for the Built Environment
- .3 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)
 - .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Coordination
 - .1 General Contractor to supply and install and co-ordinate conduit and service box requirements for hardware as required by the Departmental Representative's Security Contractor.
 - .2 General Contractor to co-ordinate work with Departmental Representative/ Security Contractor providing locksets and other hardware as noted in the hardware schedule. General Contractor to coordinate with preparation of doors and frames accordingly.
 - .3 Departmental Representative's Security Contractor to Supply and Install electric strikes, power supplies, card readers, and door closers as noted in the hardware schedule.
 - .4 All other hardware Supplied and Installed by General Contractor.
 - .2 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .3 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for door hardware and include product characteristics, performance criteria, physical size, finish and limitations.
 - .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
-

- .3 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
- .4 After approval samples will be returned for incorporation in Work.
- .5 Hardware List:
 - .1 Submit contract hardware list.
 - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .6 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .7 Manufacturer's Instructions: submit manufacturer's installation instructions.
- .8 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan Waste Reduction Workplan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
 - .2 Recycled Content:
 - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer post-industrial content, and total cost of materials for project.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for door hardware for incorporation into manual.

1.5 MAINTENANCE MATERIALS SUBMITTALS

- .1 Extra Stock Materials:
 - .1 Supply maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Tools:
 - .1 Supply 2 sets of wrenches for door closers locksets and fire exit hardware.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .4 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect door hardware from nicks, scratches, and blemishes.
 - .3 Protect prefinished surfaces with wrapping.
 - .4 Replace defective or damaged materials with new.
- .5 Develop Construction Waste Reduction Workplan related to Work of this Section.
- .6 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials as specified in Construction Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products**2.1 HARDWARE ITEMS**

- .1 Use one manufacturer's products only for similar items.
- .2 All hardware to be finish 626 (satin chrome) unless otherwise indicated.

2.2 TEMPORARY HARDWARE

- .1 Existing double doors E160 and E161 to remain. Remove existing hardware and retain for reuse. Supply and install one new lever lockset and two new cover plates per door leaf to ensure doors can be used for exiting only during construction (not allowing entry). Temporary hardware shall be fastened to existing holes only. Additional drilling will void fire rating of the doors and doors will need to be replaced by contractor.

2.3 CABINET HARDWARE

- .1 Cabinet hardware: to CAN/CGSB-69.25, designated by letter B and numeral identifiers listed in Hardware Schedule and as listed below.
 - .1 Hinges: concealed self closing hinge, 170 degree opening, and finish to 628 satin aluminum.
 - .2 Pulls: surface mounted pull, "D" type - refer to millwork drawings for specifications.
 - .3 Shelf rests and standards: shelf rest installed in holes drilled, type B04013 adjustable shelf standards, type, with open shelf rests, finished to 603 (zinc plated).

- .4 Drawer slides: heavy duty, type B05051, with zinc plate finish, full extension, lift off rail, 34 kg rating, steel ball bearing rollers.

2.4 DOOR HARDWARE

.1 Locks and latches:

- .1 Bored and preassembled locks and latches: to ANSI/BHMA A156.2, grade 1 designed for function and keyed as stated in Hardware Schedule.
- .2 Lever handles: plain design.
- .3 Roses: round.
- .4 Normal strikes: box type, lip projection not beyond jamb.
- .5 Cylinders: key into keying system as directed.

.2 Butts and hinges:

- .1 Butts and hinges: to ANSI/BHMA A156.1, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.
- .2 Auxiliary hardware: to ANSI/BHMA A156.16, designated by letter L and numeral identifiers listed in Hardware Schedule as listed below, finish to match leverset.

.3 Exit devices: to CAN/CGSB-69.19, type , grade 1, modern flat touch bar design.

- .1 Type and function to be as specified in Hardware Schedule.
- .2 Lever design on trim to match exactly lever design on mortised locks specified in paragraph 2.2.1
- .3 Provide fire rated devices for all fire rated doors requiring exit devices.
- .4 Finish to be 630.

.4 Door Closers and Accessories:

- .1 Door closures to be supplied and installed by tenant. Refer to door and hardware schedule on drawings.
- .2 Door controls (closers): to CAN/CGSB-69.20, designated by letter C and numeral identifiers listed in Hardware Schedule
 - .1 Closers: Grade 1, full rectangular cover plates, separate adjusting valves for sweep, finished to 689.
 - .2 Door Controls: overhead holders to CAN/CGSB-69.24, designated by the Letter C and numeral identifiers listed in Hardware Schedule, finished to 630.
- .3 Closer/holder release devices: to CAN/CGSB-69.31, designated by letter C and numeral identifiers listed in hardware schedule
- .4 Door co-ordinator: surface concealed for pairs of doors with overlapping astragal.

.5 Architectural door trim: to CAN/CGSB-69.22, designated by letter J and numeral identifiers listed in Hardware Schedule.

- .1 Door protection plates: type as noted, 1.27 mm thick stainless steel, finished to 630.
- .2 Push plates: type as noted, 1.27 mm thick stainless steel, finished to 630.
- .3 Push/Pull units: type as noted, stainless steel, finished to 630.

- .6 Weatherstripping:
 - .1 Head and jamb seal:
 - .1 Extruded aluminum frame and nylon brush insert,
 - .2 Clear anodized finish.
 - .3 Door bottom seal:
 - .1 Extruded aluminum frame and nylon brush sweep, clear anodized finish.
- .7 Astragal: overlapping, finished to match doors.
- .8 Electric Strikes to be supplied and installed by Industry Canada (other).
 - .1 Refer to door and hardware schedule on drawings. Electric Strikes: to CAN/CGSB-69.21, designated by the letter E and numerical identifiers listed in the hardware schedule, finished to 630. Contractor to verify this specification with Acme Future Security.
 - .2 Door bottom seal: heavy duty, door seal of extruded aluminum frame and solid closed cell neoprene acoustic seal, surface mounted, closed ends, adjustable automatic retract mechanism when door is open, clear anodized finish.
 - .3 Thresholds: the width of the door frame x full width of door opening,
 - .1 extruded aluminum mill finish, serrated surface.

2.5 MISCELLANEOUS HARDWARE

- .1 Indexed key control system: to ANSI/BHMA A156.5, designated by letter E and numeral identifiers, paint finish to Departmental Representative's selection.

2.6 FASTENINGS

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.
- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices to match finish of hardware.
- .4 Use fasteners compatible with material through which they pass.

2.7 KEYING

- .1 Door locks to be keyed differently and master keyed as noted in Hardware Schedule. Prepare detailed keying schedule in conjunction with Departmental Representative.
 - .2 Supply 2 keys in for every lock in this Contract.
 - .3 Supply 3 master keys for each master key or grand master key group.
 - .4 Stamp keying code numbers on keys and cylinders.
 - .5 Permanent cores and keys by Departmental Representative.
 - .6 Obtain written approval of the complete keying system prior to keying of locks.
-

Part 3 Execution**3.1 INSTALLATION**

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Supply metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Supply manufacturers' instructions for proper installation of each hardware component.
- .4 Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).
- .5 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .6 Install key control cabinet.
- .7 Use only manufacturer's supplied fasteners.
 - .1 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .8 Remove construction cores locks when directed by Departmental Representative
 - .1 Install permanent cores and ensure locks operate correctly.

3.2 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to ensure tight fit at contact points with frames.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
 - .3 Remove protective material from hardware items where present.
 - .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 – General Instructions..
- .2 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 DEMONSTRATION

- .1 Keying System Setup and Cabinet:
-

- .1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.
- .2 Place file keys and duplicate keys in key cabinet on their respective hooks.
- .3 Lock key cabinet and turn over key to Departmental Representative
- .2 Maintenance Staff Briefing:
 - .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 and locksets.
 - .3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by door hardware installation.

3.6 VERIFICATION

- .1 Verification requirements in accordance with Section 01 47 17 - Sustainable Requirements: Contractor's Verification], include:
 - .1 Materials and resources.
 - .2 Storage and collection of recyclables.
 - .3 Construction waste management.
 - .4 Resource reuse.
 - .5 Local/regional materials.
 - .6 Low-emitting materials.

3.7 SCHEDULE

General Notes.:

- .1 All hardware noted as (by tenant) will be supplied and installed by the tenant's security contractor. GC to coordinate to prepare the doors and frames to receive the hardware.
 - .2 All other hardware to be supplied by the GC.
 - .3 The quantities stated are the unit amounts required for each door cited in references.
 - .4 Permanent keying will be done by the Departmental Representative
-

Hardware set H1: D100.1, D101.1, D109.1, D110.1, D112.1, D113.1, D123.1, D128.1, D133.1, D136.1, D137.1, D138.1, D139.1, D144.1 (*Typical Office doors*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Wood Door/Hollow Metal Frame		
3	Heavy Duty hinge		
1	Bored lock office function grade (by tenant)		
1	Dome floor mounted door stop (by tenant)		
3	Door silencers, clear neoprene/rubber		
1	Coat Hook (by tenant)		

Hardware set H2: D103.1 (*Secure Meeting Room door*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Wood Door/Hollow Metal Frame STC 52		
3	Heavy duty hinge with non removable pins.		
1	Electrified Hinge (by tenant)		
1	Mortise lockset (by tenant)		
1	Rubber Gasketing (Smoke seal CF12)		
1	Door Closer (by tenant)		
1	Card Reader (by tenant)		
1	Door Contact (by tenant)		
1	Surface mounted Automatic drop bottom door seal		
1	Aluminum threshold		
1	Dome floor mounted door stop (by tenant)		

Hardware Set H3: D104.1 (*Suite Entry door*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Wood Door/Hollow Metal Frame		
1	Storeroom function lockset (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by tenant)		
3	Door silencers, clear neoprene/rubber		
1	Surface mounted door closer (by tenant)		
1	Card reader (by tenant)		
1	Electric Strike (by tenant)		
1	Door Contact (Double throw) (by tenant)		
1	Alarm key pad (by tenant)		
1	Motion detector (by tenant)		

Hardware Set H4: D114.1, D124.1, D125.1 (*Quiet Room doors*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Wood Door/Hollow Metal Frame		
1	Privacy Lockset (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by tenant)		
1	Door silencers, clear neoprene/rubber		

Hardware Set H5: D120.1, 132.1, D141.1 (*Open Office entry doors*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Metal Door/ Hollow Metal Frame		
1	Store room function lockset (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by tenant)		
1	Door silencers, clear neoprene/rubber		
1	Surface Mounted Door Closer (by tenant)		
1	Astragal Plate (by tenant)		
1	Card Reader (by tenant)		
1	Electric Strike (by tenant)		
1	Door Contact (by tenant)		

Hardware Set H6: D107.2, D107.3, D121.1 (*F.R. Access to exit vestibule from public corridor*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Hollow Metal Door /Pressed Steel Frame with 1.5 hour F.R.R.		
1	Passage Latchset (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by tenant)		
3	Door silencers, clear neoprene/rubber.		
1	Door Closer (by tenant)		
2	Kick plate. 305mm high both sides, brushed stainless steel		

Hardware Set H7: D117.1, D117.2, D119.1, D127.1, D130.1, D135.1, D142.1 (*Meeting Room doors*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Wood Door/Hollow Metal Frame STC45		
1	Store room function lockset (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by tenant)		
3	Door silencers, Neoprene clear rubber		
1	Surface mounted door closer (by tenant)		
1	Surface mounted Automatic drop bottom door seal (by tenant)		
1	Aluminum threshold (by tenant)		

Hardware Set H8: D126.1 (*Telecom Entrance door*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Metal Door/Pressed Steel Frame 45 min. Fire Resistance Rating		
1	Store room function lockset (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by tenant)		
3	Door silencers, clear Neoprene /rubber		
1	Surface mounted door closer (by tenant)		
1	Surface mounted Automatic drop bottom door seal (by tenant)		

1	Card reader (by tenant)		
1	Electric strike (by tenant)		
1	Door contact (by tenant)		
1	Alarm Keypad (by tenant)		
1	Heat Sensor (by tenant)		

Hardware Set H9: D122.1 (*Kitchen door*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Single glass and aluminum door with glazed sidelight		
1	Pivot hinge		
2	Pull handles (one on each side)		
3	Clear rubber door silencers		
1	Floor mounted door stop		

Hardware Set H10: D145.1 (*Secure Storage Room door*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Metal Door/Hollow Metal Frame		
1	Storeroom function lockset (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by tenant)		
3	Door silencers, clear neoprene/rubber		
1	Surface mounted door closer (by tenant)		
1	Card and Pin reader (by tenant)		
1	Electric strike (by tenant)		
1	Door contact Double Throw (by tenant)		
1	Alarm Keypad (by tenant)		
1	Motion Detector (by tenant)		

Hardware Set H11: D143.1, D149.1 (*Secondary Exit Through Suite*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Metal Door/Hollow Metal Frame		
1	Piezzo alarm (by tenant)		
1	Relay timer (by tenant)		
1	Panic Set VD99 EO (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by tenant)		
3	Door silencers, clear neoprene/rubber		
1	Door contact (by tenant)		
1	Door Closer (by tenant)		
1	Motion Detector (by tenant)		
1	Bilingual Signage on 1W143 side of the door as per fig.1 below.		



Figure 1: Signage for Door D143.1

Hardware Set H12: D148.1 (*Double door into vestibule*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Double hollow metal double door/ pressed steel frame (1.5 hour F.R.R.)		
2	Panic bar with non-active trim and key override (by tenant)		
6	Heavy duty hinges with non-removable pins		
2	Dome floor mounted door stop (by tenant)		
6	Door silencers, clear neoprene/rubber		
1	Power door operator. Refer to electrical engineer consultant's drawings for specifications and conduit locations (by tenant)		
1	Door Closer (by tenant)		
4	Kick plate. 305mm high both sides, brushed stainless steel (by tenant)		

Hardware Set H13: D107.1, (*Office exit to FRR Vestibule*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Hollow Metal Door/ Pressed Steel Frame 1.5 F.R.R.		
1	Store room function lockset (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by Tenant)		
1	Door silencers, clear neoprene/rubber		
1	Door Closer (by tenant)		
1	Card Reader (by tenant)		
1	Electric Strike (by tenant)		
1	Door Contact (by tenant)		
1	Astragal Steel Plate		

Hardware Set H14: D106.1, D111.1, D118.1, D134.1 (*Storage Room doors*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Wood Door/Hollow Metal Frame		
1	Storeroom Function lockset (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by tenant)		
3	Door silencers, Neoprene clear rubber		
1	Door closer LCN 4041 CUSH (by tenant)		

Hardware Set H15: 147.1, 150.1 (*Suite exit to FRR Vestibule*)

QTY	DESCRIPTION	FINISH	MANUFACTURER
	Hollow Metal Door/ Pressed Steel Frame 1.5 F.R.R.		
1	Store room function lockset (by tenant)		
3	Heavy duty hinges with non-removable pins		
1	Dome floor mounted door stop (by Tenant)		
1	Door silencers, clear neoprene/rubber		
1	Door Closer (by tenant)		
1	Card + Pin Reader (by tenant)		
1	Electric Strike (by tenant)		
1	Door Contact Double Throw (by tenant)		
1	Astragal Steel Plate		
1	Alarm Key Pad (by tenant)		

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 08 11 00 – Metal Frames
- .2 Section 08 14 16 – Flush Wood Doors

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C542-05 (2011), Standard Specification for Lock-Strip Gaskets.
 - .2 ASTM D790-10, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - .3 ASTM D1003-11, Standard Test Method for Haze and Luminous Transmittance of Plastics.
 - .4 ASTM D1929-10, Standard Test Method for Determining Ignition Temperature of Plastics.
 - .5 ASTM D2240-05 (2010), Standard Test Method for Rubber Property - Durometer Hardness.
 - .6 ASTM E84-10, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .7 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - .8 ASTM F1233-08, Standard Test Method for Security Glazing Materials and Systems.
 - .2 International Window Film Association (IWFA)
 - .1 IWFA Visual Quality Standard for Applied Window Film [1999].
 - .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass.
 - .3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
 - .4 CAN/CGSB-12.8-97, Insulating Glass Units.
 - .5 CAN/CGSB-12.8-97 (Amendment), Insulating Glass Units.
 - .6 CAN/CGSB-12.11-M90, Wired Safety Glass.
 - .4 Environmental Choice Program (ECP)
 - .1 CCD-045-95(R2005), Sealants and Caulking Compounds.
 - .5 Glass Association of North American (GANA)
 - .1 GANA Glazing Manual - 2008.
 - .2 GANA Laminated Glazing Reference Manual - 2009.
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- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section on-site installation, with Contractor's Representative and Departmental Representative to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's written installation instructions and warranty requirements.
 - .2 Arrange for site visit with Departmental Representative prior to start of Work to examine existing site conditions adjacent to demolition Work.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.
 - .3 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit duplicate samples of setting blocks, glazing tape and sealant material.
 - .4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
 - .5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
 - .1 Submit testing analysis of glass under provisions of Section 01 45 00 - Quality Control.
 - .2 Submit shop inspection testing for glass.
 - .6 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan/Waste Reduction Workplan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
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- .2 Low-Emitting Materials:
 - .1 Submit listing of adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restrictions requirements.
- .3 Shop Drawings;
 - .1 Provide shop drawings prepared by an engineer licensed in the province of Ontario showing the resin panel and cable suspension system and connection details.
 - .2 Provide shop drawings prepared by an engineer licensed in the province of Ontario showing the glazing details for doors and sidelights, clerestory glazing. Coordinate with door and frame shop drawings.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for glazing and decorative privacy film for incorporation into manual.

1.6 QUALITY ASSURANCE

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .2 Mock-ups:
 - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Construct mock-up to include glazing
 - .3 Mock-up will be used:
 - .1 To judge quality of work, substrate preparation, operation of equipment and material application..
 - .4 Locate where directed where indicated.
 - .5 Allow 24 hours for inspection of mock-up before proceeding with work.
 - .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
 - .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect glazing and frames from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
 - .4 Develop Construction Waste Reduction Workplan related to Work of this Section.
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- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials as specified in Construction Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal

1.8 AMBIENT CONDITIONS

- .1 Ambient Requirements:
 - .1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.
 - .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

Part 2 Products

2.1 MATERIALS

- .1 Design Criteria:
 - .1 Size glass to withstand dead loads and positive and negative live loads to ASTM E330
 - .2 Limit glass deflection to 1/200 flexural limit of glass with full recovery of glazing materials.
- .2 Flat Glass:
 - .1 Safety glass: to CAN/CGSB-12.1, transparent, 6 mm thick.
 - .1 Type 2-tempered.
 - .2 Class B-float.
 - .3 Category 1.
 - .4 Edge treatment.
 - .3 Wired glass: to CAN/CGSB-12.11, 6 mm thick.
 - .1 Type 1-polished both sides (transparent)
 - .2 Wire mesh styles 3-square
 - .4 Acrylic Resin Decorative Panel and cable suspension system
 - .1 Translucent decorative acrylic resin panel 9mm thick with
 - .2 Stainless steel floor to ceiling suspension kit sized to suit thickness of acrylic resin panels.
 - .3
 - .5 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
 - .6 Translucent decorative privacy film to meet or exceed the following criteria:
 - .1 Visible rays transmission: 87%
 - .2 Ultraviolet rays transmission: <1%
 - .3 Insulation:
 - .1 Transmission: 83%
 - .2 Reflectivity: 8%

- .3 Absorbency: 9%
- .4 Shading coefficient: 0.98
- .5 Heat transmission coefficient (W/m²K): 6
- .6 UV resistant
- .7 Matt surface
- .8 Provide 3 types of patterned film as noted in a drawings.

2.2 ACCESSORIES

- .1 Setting blocks: to suit glazing method, glass light weight and area
- .2 Spacer shims: neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.
- .3 Glazing tape:
 - .1 Preformed butyl compound, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; black colour.
 - .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2 %, designed for compression of 25 %
- .4 Glazing clips: manufacturer's standard type.
- .5 Lock-strip gaskets: to ASTM C542.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glazing installation in accordance with manufacturer's written instructions.
 - .1 Verify that openings for glazing are correctly sized and within tolerance.
 - .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.
 - .3 Visually inspect substrate in presence of Departmental Representative
 - .4 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .5 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative

3.2 PREPARATION

- .1 Clean contact surfaces with solvent and wipe dry.
 - .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
 - .3 Prime surfaces scheduled to receive sealant.
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3.3 INSTALLATION: INTERIOR WET/DRY METHOD (TAPE AND SEALANT)

- .1 Perform work in accordance with GANA Glazing Manual GANA Laminated Glazing Reference Manual for glazing installation methods.
- .2 Cut glazing tape to length and install against permanent stops, projecting 1.6 mm above sight line.
- .3 Place setting blocks at 1/3 points, with edge block maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of light or unit.
- .5 Install removable stops, with spacer shims inserted between glazing and applied stops at 600 mm intervals, 6 mm below sight line.
- .6 Fill gaps between light and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.
- .7 Trim protruding tape edge.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions
 - .1 Leave Work area clean at end of each day.
 - .1 Remove traces of primer, caulking.
 - .2 Remove glazing materials from finish surfaces.
 - .3 Remove labels.
 - .4 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacturer's instructions.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 – General Instructions
- .2 Waste Management: separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PREPARATION FOR DECORATIVE PRIVACY FILM APPLICATION

- .1 Clean glass before beginning installation using neutral cleaning solution.
- .2 Ensure no deleterious material adheres to glass by scraping surface of glass using industrial razors.
- .3 Ensure dust, grease, and chemical residue are removed from surface of glass before installation of film.
- .4 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. Report findings to [Departmental Representative.
- .5 Proceed with Work only after receipt of written approval from [Departmental Representative.

- .6 Before beginning Work, place absorbent material on window sill to absorb moisture accumulation generated by film application.

3.6 INSTALLATION OF DECORATIVE FILM

- .1 Cut film edges straight and square.
- .2 Cut edges in accordance with manufacturer's written instructions.
- .3 Apply and attach film to glass in accordance with manufacturer's written instructions.
- .4 Splicing:
 - .1 Splice film only when glass is greater in width than film.
 - .2 Splice film only after receipt of written approval from [Departmental Representative]
 - .3 Use butt factory edges only.
- .5 Use only water and film slip solution on glass to facilitate positioning of film.
- .6 Ensure removal of excess water from between film and glass.
- .7 Remove left over material from work area and return work area to original condition.

3.7 FILM 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 Remove and replace without glass replacement, 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.

3.8 FINAL CLEANING

- .1 Wash both sides of each glass or resin panel and film using cleaning solution recommended by film manufacturer.

3.9 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 After installation, mark each light with an "X" by using removable plastic tape or paste.
 - .1 Do not mark heat absorbing or reflective glass units.
- .3 Repair damage to adjacent materials caused by glazing installation.

3.10 VERIFICATION

- .1 Verification requirements in accordance with Section 01 47 17 - Sustainable Requirements: Contractor's Verification], include:
 - .1 Materials and resources.
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- .2 Storage and collection of recyclables.
- .3 Construction waste management.
- .4 Resource reuse.
- .5 Local/regional materials.
- .6 Low-emitting materials.

END OF SECTION