

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-[06a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B29-[03], Standard Specification for Refined Lead.
 - .3 ASTM B749-[03], Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-[2004], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-[99], Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-[84], Rigid Vinyl Extrusions for Windows and Doors.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20-[04]/G40.21-[04], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-[03], Welded Steel Construction (Metal Arc Welding).
- .5 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].
- .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 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1113-[04], Architectural Coatings.
 - .2 SCAQMD Rule 1168-[05], Adhesives and Sealants Applications.
- .8 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-[01], Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 CAN/ULC-S702-[97], Standard for Thermal Insulation, Mineral Fibre, for Buildings.
 - .3 CAN/ULC-S704-[03], Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .4 CAN4-S104-[M80], Standard Method for Fire Tests of Door Assemblies.
 - .5 CAN4-S105-[M85], Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SYSTEM DESCRIPTION

- .1 Design door assembly to withstand minimum 1,000,000 swing cycles in accordance with ANSI A151.1, with no failure of any design features of the door.
- .2 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.
- .3 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
- .4 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 and NFPA 252 for ratings specified or indicated.
- .5 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 and NFPA 252 and listed by nationally recognized agency having factory inspection services and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.3 SUBMITTALS

- .1 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, louvred, arrangement of hardware and fire rating and finishes.
- .2 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing firerating and finishes.
- .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .4 Submit one 300 x 300 mm top corner sample of each type door.

1.4 QUALITY ASSURANCE

- .1 Conform to requirements of CSDFMA SDI-100 and ANSI A117.1.
- .2 Company specializing in manufacturing products specified with a minimum of five (5) years documented experience.

1.5 PROJECT CONDITIONS

- .1 Coordinate the Work with frame opening construction, door, and hardware installation. Contractor to Site verify all rough openings prior to fabrication.
- .2 Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store, handle and protect doors and frames in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver, handle and store doors and frames at the job Site in such a manner as to prevent damage.
- .3 Store doors and frames under cover with doors stored in a vertical position on blocking, clear of floor and with blocking between doors to permit air circulation.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.8 WARRANTY

- .1 Provide a written warranty for Work of this section from manufacturer for failure due to defective materials and from Contractor for failure due to defective installation Workmanship, for one (1) year respectively.

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.
- .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.
- .3 Cast or rolled pure sheet lead: to ASTM B29.
- .4 CompoSites: balance of core materials used in conjunction with lead: in accordance with manufacturers' proprietary design.

2.2 DOOR CORE MATERIALS

- .1 Stiffened: face sheets welded insulated core.
 - .1 Expanded polystyrene: CAN/ULC-S701, density 16 to 32 kg/m³.
 - .2 Polyurethane: to CAN/ULC-S704 rigid, modified polyisocyanurate, closed cell board. Density 32 kg/m³.

- .2 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250°C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E152 or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.
- .3 Thermal Insulation material must:
 - .1 Not require being labelled as poisonous, corrosive, flammable or explosive under the Consumer Chemical and Container Regulations of the Hazardous Products Act.
 - .2 Be manufactured using a process that uses chemical compounds with the minimum zone depletion potential (ODP) available.

2.3 ADHESIVES

- .1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
 - .1 Adhesive: maximum VOC content to SCAQMD Rule 1168.
- .2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .3 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 to SCAQMD Rule 1168.

2.5 PAINT

- .1 Field paint steel doors and frames in accordance with Sections 09 91 13 - Exterior Painting and 09 91 23 - Interior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.
 - .1 Maximum VOC emission level to SCAQMD Rule 1168.

2.6 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior top and bottom caps steel.
- .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 Door bottom seal: Section 08 71 00 – Door Hardware.
- .5 Metallic paste filler: to manufacturer's standard.
- .6 Fire labels: metal riveted.
- .7 Sealant: Section 07 92 00 – Joint Sealants.

- .8 Provide low expanding, single component polyurethane foam sealant installed at head and jamb perimeter of door frame for sealing to building air barrier, vapour retarder and door frame. Foam sealant width to be adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder foam interior. Refer to Section 07 21 20 – Low Expanding Foam Sealant.
- .9 Glazing: Section 08 80 00 – Glazing.
- .10 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable stainless steel glazing beads for dry glazing of snap-on type.
 - .2 Design exterior glazing stops to be tamperproof.
- .11 Finish Painting: to Section 09 91 13 – Exterior Painting and Section 09 91 23 – Interior Painting.

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 Exterior Frames:
 - .1 Minimum 14 gauge pressed metal, thermally broken, welded construction.
- .4 Interior Frames:
 - .1 Minimum 14 gauge pressed metal, welded construction.
- .5 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised cutouts with steel guard boxes.
- .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.
- .11 Insulate exterior frame components with polyurethane insulation. Fabricate frames as welded unit. Welding in accordance with CSA W59.
- .12 Mullions for Double Doors: Fixed type, of same profiles as jambs.
- .13 Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.
- .14 Reinforce frames wider than 1200 mm inches with roll formed steel channels fitted tightly into frame head, flush with top.
- .15 Prepare frames for silencers. Provide three single silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions.

- .16 Attach fire rated label to each fire rated door unit.
- .17 Attach channel spreaders at bottom of frames for shipping.

2.8 FRAME ANCHORAGE

- .1 Shim and anchor new doors in accordance with CAN/CSA A440.4.
- .2 Provide appropriate anchorage to floor and wall construction.
- .3 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .4 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.
- .5 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jamb and intermediate at 660 mm o.c. 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 All metal doors to be minimum 16 gauge with welded seams.
- .2 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .3 Exterior doors: insulated, hollow steel construction. Interior doors: honeycomb hollow steel construction.
- .4 Fabricate doors with longitudinal edges locked seam. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .5 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E330.
- .6 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.

- .7 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on Site, at time of hardware installation.
- .8 Reinforce doors where required, for surface mounted hardware. Provide flush steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .9 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .10 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104 ASTM E152 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.
- .11 Manufacturer's nameplates on doors are not permitted.

2.11 DOORS TYPES

- .1 Refer to Door and Door Frame Schedule in drawings for further information.

2.12 HOLLOW STEEL CONSTRUCTION

- .1 Form each face sheet for exterior doors from 16 gauge sheet steel.
- .2 Form each face sheet for interior doors from 16 gauge steel.
- .3 Reinforce doors with vertical stiffeners, securely welded to each face sheet at 150 mm on centre maximum.
- .4 Fill voids between stiffeners of exterior doors with polystyrene core.
- .5 Fill voids between stiffeners of interior doors with honeycomb core.

2.13 THERMALLY BROKEN DOORS AND FRAMES

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 Apply insulation.

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 labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and 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].
- .6 Maintain continuity of air barrier and vapour retarder.

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 as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latch side and head: 1.5 mm.
 - .3 Finished floor: 13 mm.
- .3 Adjust door for smooth and balanced door movement.
- .4 Install louvres.

3.5 FINISH REPAIRS

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

3.6 GLAZING

- .1 Install glazing for doors and frames in accordance with Section 08 80 00 - Glazing.

3.3 ERECTION TOLERANCES

- .1 Maximum Diagonal Distortion: 1.5 nun inch measured with straight edges, crossed corner to corner.

- .2 Clearance on steel doors at head and jambs shall be 3mm maximum, and 3mm maximum between pairs of doors.

3.7 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Architectural Manufacturers Association (AAMA)
 - .1 AAMA 609/610, Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
- .2 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .3 Canadian General Standards Board (CGSB).
 - .1 CGSB 1.40, Anticorrosive, Structural Steel, Alkyd Primer.
 - .2 CAN/CGSB-12.1, Tempered or Laminated Safety Glass.
 - .3 CAN/CGSB-12.20, Structural Design of Glass for Buildings.
- .4 Canadian Standards Association (CSA).
 - .1 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .5 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SYSTEM DESCRIPTION

- .1 Design frames and doors in exterior walls to:
 - .1 Accommodate expansion and contraction within service temperature range of -35° to 35°C.
 - .2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E330 under wind load of 1.2Kpa.
 - .3 Movement within system.
 - .4 Movement between system and perimeter framing components or substrate.
- .2 Size glass thickness and glass unit dimensions to limits in accordance with CAN/CGSB-12.20.
- .3 Provide continuous air barrier and vapour retarder through door system. Primarily in line with inside pane of glass and heel bead of glazing compound.

1.3 SUBMITTALS

- .1 Submit one 300 x 300 mm corner sample of each type door and frame.
- .2 Submit sample showing glazing detail, reinforcement, finish and location of manufacturer's nameplates.

- .3 Frame sample to show glazing stop, door stop, jointing detail & finish.
- .4 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.
- .5 Indicate materials and profiles and provide full-size, scaled details of components for each type of door and frame. Indicate:
 - .1 Interior trim and exterior junctions with adjacent construction.
 - .2 Junctions between combination units.
 - .3 Elevations of units.
 - .4 Core thicknesses of components.
 - .5 Type and location of exposed finishes, method of anchorage, number of anchors, supports, reinforcement, and accessories.
 - .6 Location of caulking.
 - .7 Each type of door system including location.
 - .8 Arrangement of hardware and required clearances.
- .6 Submit catalogue details for each type of door and frame illustrating profiles, dimensions and methods of assembly.
- .7 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheets.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets for door materials, adhesives and aluminum cleaner. Indicate VOC's for caulking materials during application and curing.
- 1.4 PROJECT CONDITIONS**
 - .1 Coordinate the Work with frame opening construction, door, and hardware installation. Contractor to Site verify all rough openings prior to fabrication.
 - .2 Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.
- 1.5 DELIVERY, STORAGE AND HANDLING**
 - .1 Apply temporary protective coating to finished surfaces. Remove coating after erection. Do not use coatings that will become hard to remove or leave residue.
 - .2 Leave protective covering in place until final cleaning of building.
- 1.6 CLOSEOUT SUBMITTALS**
 - .1 Provide maintenance data for cleaning and maintenance of aluminum finishes for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- 1.7 WASTE MANAGEMENT AND DISPOSAL**
 - .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
 - .2 Place materials defined as hazardous or toxic waste in designated containers.

- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.8 WARRANTY

- .1 Provide a written warranty for Work of this section from manufacturer for failure due to defective materials and from Contractor for failure due to defective Workmanship for ten (10) years respectively from the date of Substantial Completion.

Part 2 Products

2.1 MATERIALS

- .1 Aluminum extrusions: Aluminum Association alloy AA6063-T5 anodizing quality.
- .2 Steel reinforcement: to CAN/CSA-G40.20/G40.21, grade 300 W.
- .3 Fasteners: stainless steel, finished to match adjacent material.
- .4 Weatherstrip: mohair metal backed wool pile.
- .5 Door bumpers: black neoprene.
- .6 Door bottom seal: adjustable door seal of anodized extruded aluminum frame and vinyl weather seal, surface mounted with drip cap, closed ends.
- .7 Provide low expanding, single component polyurethane foam sealant installed at head and jamb perimeter of door frame for sealing to building air barrier, vapour retarder and door frame. Foam sealant width to be adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder foam interior. Refer to Section 07 21 20 – Low Expanding Foam Sealant.
- .8 Isolation coating: alkali resistant epoxy resin solution.
- .9 Glass in exterior and interior doors: 6 mm transparent, tempered glass to CAN/CGSB-12.1, Type 2, Class B.
- .10 Glazing materials: Section 08 80 00 – Glazing.
- .11 Sealants: Section 07 92 00 – Joint Sealants, colour as selected by Contract Administrator.

2.2 ALUMINUM DOORS

- .1 Construct doors of porthole extrusions with minimum wall thickness of 3 mm.
- .2 Door stiles: widths as indicated on drawings.
- .3 Top rail: widths as indicated on drawings.
- .4 Bottom rail: widths as indicated on drawings.

- .5 Centre rail: widths as indicated on drawings.
- .6 Reinforce mechanically-joined corners of doors to produce sturdy door unit.
- .7 Glazing stops: interlocking snap-in type for dry glazing. Exterior stops: tamperproof type.
- .8 Provide thermally broken doors for exterior.
- .9 Hardware: as per Section 08 71 00 – Door Hardware.

2.3 ALUMINUM FRAMES

- .1 In accordance with Section 08 41 13 – Aluminum Framed Storefronts and Entrances.

2.4 ALUMINUM FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
 - .1 Clear anodic finish: designation AA-M12, C22, A31.
- .2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

2.5 STEEL FINISHES

- .1 Finish steel clips and reinforcing steel with zinc coating to CSA G164.

2.6 FABRICATION

- .1 Doors and framing to be by same manufacturer.
- .2 Fabricate doors and frames to profiles and maximum face sizes as shown.
- .3 Provide structural steel reinforcement as required.
- .4 Fit joints tightly and secure mechanically.
- .5 Conceal fastenings.
- .6 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided under Section 08 71 00 - Door Hardware.
- .7 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

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 Set frames plumb, square, level at correct elevation in alignment with adjacent Work.
- .2 Anchor securely.
- .3 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.
- .4 Adjust operable parts for correct function.
- .5 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.
- .6 Coordinate installation of door security hardware in accordance with Section 08 71 00 – Door Hardware and manufacturer's instructions.

3.3 GLAZING

- .1 Glaze aluminum doors and frames in accordance with Section 08 80 00 - Glazing.

3.4 CAULKING

- .1 Seal joints to provide weathertight seal at outside and air, vapour seal at inside.
- .2 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within the aluminum Work except where exposed use is permitted by Contract Administrator.

3.5 CLEANING

- .1 Perform cleaning of aluminum components in accordance with AAMA 609.1 - Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.
- .2 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .3 Clean aluminum with damp rag and approved non-abrasive cleaner.
- .4 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.
- .5 Clean glass and glazing materials with approved non-abrasive cleaner.
- .6 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.6 PROTECTION

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Architectural WoodWork Manufacturers Association of Canada (AWMAC).
 - .1 Quality Standards for Architectural WoodWork [2009].
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-71.19-[M88], Adhesive, Contact, Sprayable.
 - .2 CAN/CGSB-71.20-[M88], Adhesive, Contact, Brushable.
- .3 Canadian Standards Association (CSA International).
 - .1 CSA A440.2-[98], Energy Performance of Windows and Other Fenestration Systems.
 - .2 CSA O115-[M1982(R2001)], Hardwood and Decorative Plywood.
 - .3 CAN/CSA O132.2 Series-[90(R1998)], 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].
- .4 Environmental Choice Program (ECP).
 - .1 CCD-045-[92], Sealants and Caulking Compounds.
 - .2 CCD-046-[92], Adhesives.
- .5 National Fire Protection Association (NFPA).
 - .1 NFPA 80-[1999], Standard for Fire Doors and Fire Windows.
 - .2 NFPA 252-[1999], Standard Method of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC).
 - .1 CAN-4S104M-[80(R1985)], Fire Tests of Door Assemblies.
 - .2 CAN4-S105M-[85 (R1992)], Fire Door Frames Meeting the Performance Required by CAN4-S104.
- .7 Canada Green Building Council (CaGBC).
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 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:

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate door types and cutouts for lights, sizes, core construction.

1.3 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: Submit manufacturer's installation instructions.

1.4 REGULATORY REQUIREMENTS

- .1 Wood fire rated doors: labelled and listed by an organization accredited by Standards Council of Canada.

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Wood fire rated doors: labelled and listed by an organization accredited by Standards Council of Canada.
- .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.

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.
 - .4 Store doors away from direct sunlight.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.8 WARRANTY

- .1 Provide a written guarantee, signed and issued in the name of The City, covering the wood doors for both material and Workmanship for a period of 10 (ten) years from the date of Substantial Completion.
- .2 Areas which prove to be defective in any way shall be repaired or replaced and any damage to other Work as a result of such defects shall be repaired at no cost to The City.

Part 2 Products

2.1 FIRE RATED WOOD DOORS

- .1 FRR Wood doors: tested in accordance with CAN4-S104/NFPA 252 to achieve rating as scheduled exceeding 45 minutes shall have an incombustible mineral core (asbestos free).
 - .1 Face panels:
 - .1 Hardwood: Grade I Premium
 - .2 Paint grade: Douglas fir G1S, custom AWMAC
 - .2 Ratings:
 - .1 Provide UL label in accordance with fire rating noted in door schedule.

2.2 WOOD DOORS

- .1 Solid core: to CAN/CSA-O132.2.1.
 - .1 Construction:
 - .1 Solid particleboard core: stile and rail frame bonded to particleboard core with wood lock blocks 7-ply construction.
 - .2 Solid wood core:
 - .1 Glued block core with wood edge band.
 - .2 Framed block glued core.
 - .3 Framed block nonglued core.
 - .4 Stile and rail core.
 - .5 7-ply construction.
 - .2 Face Panels:
 - .1 Birch veneer Grade I (Premium)
 - .3 Adhesive: Type II (Water resistant) For interior doors.
- .2 Hollow core: to CAN/CSA-0132.2.2.
 - .1 Construction:
 - .1 Ladder core with lock blocks, 7-ply construction.
 - .2 Face Panels:
 - .1 Birch veneer Grade I (Premium)
 - .3 Adhesive: Type II (water resistant) for interior exterior doors.

2.3 DOORS TYPES

- .1 Refer to Door and Door Frame Schedule in drawings for further information.

2.4 GLAZING

- .1 Glass: in accordance with Section 08 80 00 - Glazing.
- .2 All glass in doors to be tempered unless otherwise noted.

2.5 FABRICATION

- .1 Vertical edge strips to match face veneer.
- .2 Prepare doors for glazing. Provide hardwood birch species to match face veneer, glazing stops 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.
- .4 Radius vertical edges of double acting doors to 60 mm radius.
- .5 Provide waterproof non-staining membrane at cutouts on exterior doors to exclude moisture from core.

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 00 - Glazing.
- .6 Install louvres and stops.
- .7 Secure transom and side panels by means of concealed fasteners or countersunk screws concealed by means of wood plugs matching panel in grain and colour.
- .8 Coordinate installation of door security hardware in accordance with Section 08 71 00 – Door Hardware and manufacturer's instructions.

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.
- .5 On completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM E119-05a - Standard Test Methods for Fire Tests of Building Construction and Materials.
- .2 Canadian Standards Association (CSA International).
 - .1 CAN/CSA-A440-00/A440.1-00 (R2005) - User Selection Guide to CSA Standard A440-00, Windows.
- .3 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC S101-04 - Standard Methods of Fire Endurance Tests of Building Construction and Materials.
 - .2 UL - Fire Resistance Directory.
 - .3 UL 10B-1997 - Standard for Fire Tests of Door Assemblies.
- .4 National Fire Protection Association (NFPA)
 - .1 NFPA 251-2006 - Standard Methods of Tests of Fire Resistance of Building Construction and Material.
 - .2 NFPA 252-2003 - Standard Methods of Fire Tests of Door Assemblies.
 - .3 NFPA 288-2001 - Standard Method of Fire Tests of Floor Fire Door Assemblies Installed Horizontally in Fire Resistance Rated Floor Systems.
- .5 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

- .1 In accordance with Section 01 33 00 - Submittal procedures.
- .2 Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining Work.
- .3 Shop Drawings: Indicate exact position of all access door units.

1.3 SAMPLES

- .1 Submit one sample of each type of hand entry access door.
- .2 Submit one 300 x 300 mm corner sample of each type of body entry door.

1.4 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.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 All materials shall be delivered in manufacturer's original packaging.
- .3 Store materials in a dry, protected, well-vented area. The Contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.
- .4 Leave protective covering in place until final cleaning of building.

Part 2 Products

2.1 HOSE REEL ACCESS DOOR

- .1 Acceptable Manufacturer
Acudor, 1125 Squires Beach Road, Pickering, Ontario, Tel: 1-888-388-3611 (or approved equal in accordance with B7).
- .1 Acceptable Products:
 - .1 LT-4000 8 x 8 RC lightweight aluminum specialty door, as manufactured by Acudor (or approved equal in accordance with B7).
 - .1 Size: 203 mm x 203 mm (8" x 8")
 - .2 Door/Door Frame: Aluminum: .064 door and .080 frame flush to edge of frame, 1-5/16" mitered aluminum extrusion flange with 1-1/2" deep mounting frame
 - .3 Hinge: Concealed pin hinge.
 - .4 Insulation: 3/4" polystyrene insulation, with 4.0 R-value at 750 F mean temperature.
 - .5 Gasket: 1/8" x 3/8" closed cell neoprene gasketing
 - .6 Standard Latch: Screwdriver operated cam latch
 - .7 Optional Latches/Locks: Rim cylinder lock & key
 - .8 Finish: Mill finish

2.2 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

2.3 FABRICATION

- .1 General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- .2 Size: As indicated on Drawings or size as required for access to concealed spaces, valves, or equipment.
- .3 Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- .4 Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.
- .5 Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

2.4 FINISHES, GENERAL

- .1 A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- .2 Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- .3 Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- .4 Steel and Metallic-Coated-Steel Finishes:
 - .1 1. Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromatefree, universal primer immediately after surface preparation and pretreatment.
 - .2 Factory Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry-film thickness of 1 mil (0.025 mm) for topcoat.

Part 3 Execution

3.1 PREPARATION

- .1 Advise installers of other Work about specific requirements relating to access door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices.

- .2 Verify that rough openings for door and frame are correctly sized and located.

3.2 INSTALLATION

- .1 Comply with manufacturer's written instructions for installing access doors and frames.
- .2 Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.3 ADJUSTING AND CLEANING

- .1 Adjust doors and hardware after installation for proper operation.
- .2 Remove and replace doors and frames that are warped, bowed, or otherwise damaged.
- .3 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - .3 ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - .4 ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .5 ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
- .2 The Association of Electrical Equipment and Medical Imaging Manufacturers (NEMA)
 - .1 NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - .2 NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
 - .3 NEMA MG 1 - Motors and Generators.
- .3 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Manufacturer's data sheets on each product to be used, including:
 - .1 Preparation instructions and recommendations.
 - .2 Storage and handling requirements and recommendations.
 - .3 Details of construction and fabrication.
 - .4 Installation methods.
- .3 Shop Drawings: Include detailed plans, elevations, details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent construction.
- .4 Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- .5 Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.
- .6 Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.3 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years' experience in the fabrication and installation of security closures.
- .2 Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.
- .3 Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application Workmanship.
 - .1 Install in areas designated by Contract Administrator.
 - .2 Do not proceed with remaining Work until Workmanship and installation is approved by Contract Administrator.
 - .3 Refinish mock-up area as required to produce acceptable Work.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Store products in manufacturer's unopened packaging until ready for installation.
- .2 Protect materials from exposure to moisture. Do not deliver until after wet Work is complete and dry.
- .3 Store materials in a dry, warm, ventilated weathertight location.

1.5 PROJECT CONDITIONS

- .1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.6 COORDINATION

Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.8 WARRANTY

- .1 Manufacturer's limited door warranty for 2 years for all parts and components.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURERS

- .1 Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499 (or approved equal in accordance with B7).

2.2 OVERHEAD COILING STEEL COUNTER DOORS

- .1 Anodized Aluminum Counter Doors: Overhead Door Corporation 652 Series (or approved equal in accordance with B7).
 - .1 Wall Mounting Condition: Face-of-wall mounting.
 - .2 Curtain: Interlocking slats, Type F-158 fabricated of anodized aluminum. Endlocks attached to alternate slats to maintain curtain alignment and prevent lateral slat movement.
 - .3 Finish: Anodized
 - .1 Slats and hood clear anodized aluminum.
 - .2 Bottom Bar: Extruded aluminum tubular shape with astragal.
 - .3 Guides: Extruded aluminum.
 - .4 Brackets: Steel plate to support counterbalance, curtain and hood.
 - .5 Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel.
 - .6 Hood: Provided with intermediate support brackets as required and fabricated of aluminum.
 - .7 Operation: Manual push up.
 - .8 Locking: Two point dead locks with mortise cylinders.
 - .9 Sizes: As indicated.

2.3 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

Part 3 Execution

3.1 EXAMINATION

- .1 Do not begin installation until openings have been properly prepared.
- .2 Verify opening sizes, tolerances and conditions are acceptable.
- .3 Examine conditions of substrates, supports, and other conditions under which this Work is to be performed.
- .4 If substrate preparation is the responsibility of another installer, notify Contract Administrator of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- .1 Clean surfaces thoroughly prior to installation.

- .2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions

3.3 INSTALLATION

- .1 Install in accordance with manufacturer's instructions.
- .2 Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- .3 Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- .4 Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- .5 Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.
- .6 Install perimeter trim and closures.

3.4 ADJUSTING

- .1 Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- .2 Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- .1 Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- .2 Remove labels and visible markings.
- .3 Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- .1 Protect installed products until completion of project.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - .3 ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - .4 ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- .2 American National Standards Institute (ANSI)
 - .1 ANSI/DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors.
- .3 The Association of Electrical Equipment and Medical Imaging Manufacturers (NEMA)
 - .1 NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - .2 NEMA MG 1 - Motors and Generators.
- .4 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 DESIGN / PERFORMANCE REQUIREMENTS

- .1 Wind Loads: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with applicable code.
- .2 Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

1.3 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Manufacturer's data sheets on each product to be used, including:
 - .1 Preparation instructions and recommendations.
 - .2 Storage and handling requirements and recommendations.
 - .3 Installation methods.
- .3 Shop Drawings: Indicate plans and elevations including opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.
- .4 Manufacturer's Certificates: Certify products meet or exceed specified requirements.

- .5 Operation and Maintenance Data.

1.4 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- .2 Installer Qualifications: Authorized representative of the manufacturer with minimum five years documented experience.
- .3 Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Store products in manufacturer's unopened packaging until ready for installation.
- .2 Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- .3 Store materials in a dry, warm, ventilated weathertight location.

1.6 PROJECT CONDITIONS

- .1 Pre-Installation Conference: Convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.7 COORDINATION

Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.9 WARRANTY

- .1 Warranty: Manufacturer's limited door and operators System warranty for 10 year against delamination of polyurethane foam from steel face and all other components for 3 years or 20,000 cycles, whichever comes first.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURERS

- .1 Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: info@overheaddoor.com. (or approved equal in accordance with B7).

2.2 INSULATED SECTIONAL OVERHEAD DOORS

- .1 Insulated Steel Sectional Overhead Doors: 593 Series Thermacore Insulated Steel Doors by Overhead Door Corporation (or approved equal in accordance with B7). Units shall have the following characteristics:
 - .1 Door Assembly: Metal/foam/metal sandwich panel construction, with hot melt thermal break and weather-tight ship-lap design meeting joints.
 - .1 Panel Thickness: 1-3/8 inches (35 mm).
 - .2 Exterior Surface: Ribbed, textured.
 - .3 Exterior Steel: .015 inch (.38 mm), hot-dip galvanized.
 - .4 End Stiles: 20 gauge.
 - .5 Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of diecast aluminum with high strength galvanized aircraft cable. Sized with a minimum 7 to 1 safety factor.
 - .1 Standard cycle spring: 10,000 cycles.
 - .6 Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - .7 Thermal Values: R-value of 12.76; U-value of 0.078.
 - .8 Air Infiltration: 0.08 cfm at 15 mph; 0.15 cfm at 25 mph.
 - .2 Finish and Color:
 - .1 Two coat baked-on polyester:
 - .1 Interior color, white.
 - .2 Exterior color, white.
 - .3 Windload Design: Provide to meet the Design/Performance requirements specified.
 - .4 Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
 - .5 Lock:
 - .1 Interior mounted slide lock with padlock option.
 - .6 Weatherstripping:
 - .1 EPDM bulb-type strip at bottom section.
 - .2 Flexible Jamb seals.
 - .3 Flexible Header seal.
 - .7 Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - .1 Size:
 - .1 2 inch (51 mm).
 - .2 Type:
 - .1 Follow roof slope.

.8 Manual Operation: Chain hoist.

2.3 SUBSTITUTIONS

.1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

Part 3 Execution

3.1 EXAMINATION

.1 Do not begin installation until openings have been properly prepared.

.2 Verify opening sizes, tolerances and conditions are acceptable.

.3 Examine conditions of substrates, supports, and other conditions under which this work is to be performed.

.4 If substrate preparation is the responsibility of another installer, notify Contract Administrator of unsatisfactory preparation before proceeding.

3.2 PREPARATION

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions

3.3 INSTALLATION

.1 Install overhead doors and track in accordance with approved shop drawings and the manufacturer's printed instructions.

.2 Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.

.3 Anchor assembly to wall construction and building framing without distortion or stress.

.4 Securely brace door tracks suspended from structure. Secure tracks to structural members only.

.5 Fit and align door assembly including hardware.

.6 Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

3.4 CLEANING AND ADJUSTING

.1 Adjust door assembly to smooth operation and in full contact with weatherstripping.

.2 Clean doors, frames and glass.

.3 Remove temporary labels and visible markings.

3.5 PROTECTION

- .1 Do not permit construction traffic through overhead door openings after adjustment and cleaning.
- .2 Protect installed products until completion of project.
- .3 Touch-up, damaged coatings and finishes and repair minor damage before Substantial Completion.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Section Includes: Architectural Aluminum Storefront Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront units.

1.2 REFERENCES

- .1 Aluminum Association (AA):
 - .1 AA-C22-A41 Anodized Clear Coatings
 - .2 AA-C22-A42 Integral Colour Coatings
 - .3 DAF 45-03 Designation System for Aluminum Finishes
- .2 American Architectural Manufacturers Association (AAMA):
 - .1 AAMA 603.8-94 Voluntary Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum
 - .2 AAMA 605.2-92 Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels
 - .3 AAMA 609-93 Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum
- .3 American Society for Testing and Materials (ASTM):
 - .1 ASTM E330 02 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- .4 Canadian General Standards Board (CGSB):
 - .1 CGSB 1.40-97 Anticorrosive Structural Steel Alkyd Primer
 - .2 CAN/CGSB 12.1-M90 Tempered or Laminated Safety Glass
 - .3 CAN/CGSB 12.20-M89 Structural Design of Glass for Buildings
 - .4 CGSB 19 GP 5M, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Incorporating Amendment No. 1)
- .5 Canadian Standards Association (CSA):
 - .1 CAN/CSA G40.20 /G40.21-04 Rolled or Welded Structural Quality Steel/Structural Quality Steel
 - .2 CAN/CSA G164-M92(R2003) Hot Dip Galvanizing of Irregularly Shaped Articles
- .6 National Fire Protection Association (NFPA):
 - .1 NFPA 80 99 Fire Doors and Fire Windows
 - .2 NFPA 252 03 Fire Tests of Door Assemblies
- .7 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD):
 - .1 SCAQMD Rule 1168-06 Adhesives and Sealants Applications
- .8 Underwriters' Laboratories of Canada (ULC):
 - .1 CAN/ULC S701 05 Thermal Insulation, Polystyrene, Boards and Pipe Covering

- .2 CAN/ULC S702 03 Thermal Insulation, Mineral Fibre, for Buildings
- .3 CAN/ULC S704 03 Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced
- .9 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.3 DESIGN

- .1 Design members to withstand, within acceptable deflection limitations, their own weight, the weight of glass, and the minimum design loads due to the pressure and suction of wind as calculated in accordance with the 2010 National Building Code of Canada.
- .2 Make provision to drain, to the exterior, any water entering at joints and/or condensation occurring within the wall construction.
- .3 Design assembly to accommodate expansion and contraction when subjected to minimum and maximum surface temperature of - 35°C to +75°C.
- .4 Deflection limit for mullions shall be governed by flexure limit of glass unit to permissible maximum by glass manufacturer and calculated with a safety factor of 2.5 with full recovery of glazing compounds or 1/175 maximum deflection of unsupported length; whichever is less.

1.4 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 for:
 - .1 Sealant materials during application [and curing].
 - .2 Door materials and adhesives.
 - .3 Shop Drawings:
 - .1 Clearly indicate, by large scale details, all perimeter conditions of construction, mullion/muntin details, all components of the assembly, anchorage, sealing techniques, tolerances of openings, elevations, all materials, hardware and finishes.
 - .4 Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12" (300 mm) lengths of full-size components and showing details of the following:
 - .1 Joinery, including concealed welds.
 - .2 Anchorage.
 - .3 Expansion provisions.
 - .4 Glazing.
 - .5 Flashing and drainage.
- .5 Manufacturer's Instructions:

- .1 Submit manufacturer's product literature indicating:
 - .1 Compliance with requirements of this Section.
 - .2 Installation Instructions.

1.5 CLOSEOUT SUBMITTTALS

- .1 Operation and Maintenance Data:
 - .1 Provide operation and maintenance data for hardware for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.7 QUALITY ASSURANCE

- .1 Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
- .2 Manufacturer Qualifications: A manufacturer capable of providing aluminum framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- .3 Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum framed storefront system and are based on the specific system indicated. Do not modify size and dimensional requirements.
 - .1 Do not modify intended aesthetic effects, as judged solely by Contract Administrator, except with Contract Administrator's approval. If modifications are proposed, submit comprehensive explanatory data to Contract Administrator for review.
- .4 Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - .1 Build mockup for type(s) of storefront elevation(s) indicated, in location(s) shown on Drawings.
- .5 Structural-Sealant Glazing: Comply with ASTM C 1401, "Guide for Structural Sealant Glazing" for design and installation of structural-sealant-glazed systems.
- .6 Structural-Sealant Joints: Design reviewed and approved by structural-sealant manufacturer.

1.8 PROJECT CONDITIONS

- .1 Field Measurements: Verify actual dimensions of aluminum framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1.9 WARRANTY

- .1 Manufactures Warranty: Submit, for The City's acceptance, manufacturer's standard warranty.
- .2 Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURERS AND PRODUCTS

- .1 Acceptable Manufacturers:
 - .1 Kawneer Company, Inc., 555 Guthridge Court, Technology Park/Atlanta, Norcross, GA 30092, Telephone: 770 449 5555 (or approved equal in accordance with B7).
- .2 Acceptable Products:
 - .1 Exterior: Kawneer Trifab VG 451UT (Ultra-Thermal) Storefront system (or approved equal in accordance with B7).
 - .1 2" x 4-1/2" (50.8 mm x 114.3 mm) System Dimensions
 - .2 Glass: Center Plane
 - .2 Interior: Kawneer Trifab® VG 450 (non-Thermal) Storefront system (or approved equal in accordance with B7).
 - .1 1-3/4" x 4-1/2" (44.5 mm x 114.3 mm) System Dimensions
 - .2 Glass: Center Plane

2.2 MATERIALS

- .1 Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
- .2 Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
- .3 Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- .4 Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

- .5 Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- .6 Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 EXTERIOR STOREFRONT FRAMING SYSTEM

- .1 Kawneer Trifab® VG 451UT (Ultra-Thermal) Storefront System:
 - .1 Kawneer DUAL IsoLock® Thermal Break with two (2) 1/4" (6.4 mm) separations consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
 - .1 Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
 - .2 Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
 - .3 Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposes shall be stainless steel.
 - .1 Provide break metal adapters and fillers as shown. Break metal fillers shall be 3 mm anodized aluminum to match curtain wall. Sealant between break metal adapters and adjacent jambs to be colour matched to aluminum frame.
 - .1 Fill all break metal adapters with ROXUL PLUS MB blanket mineral wool insulation.
 - .2 All sills to include HP sill flashing complete with splice sleeve at joints.
 - .3 Include head receptors at top of storefront framing where abutting structural framing and where indicated.
 - .4 Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
 - .5 Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - .6 Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

2.4 INTERIOR STOREFRONT FRAMING SYSTEM

- .1 Kawneer Trifab® VG 450 Storefront System
 - .1 1-3/4" x 4-1/2" (44.5 mm x 114.3 mm) nominal dimension;
 - .2 Non-Thermal;
 - .3 Center Plane,
 - .4 Structural Silicone or Weatherseal Glazed (Type B);
 - .5 Screw Spline, Shear Block, Stick or Punched Opening Fabrication.

- .2 Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- .3 Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposes shall be stainless steel.
- .4 Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action
- .5 Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- .6 Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

2.5 GLAZING SYSTEMS

- .1 Glazing: Refer to 08 80 00 – Glazing.
- .2 Operable windows: Provide STOREFRONT GLASSvent outswing casement windows where shown.
 - .1 Accessories:
 - .1 Hinges: Stainless steel bar hinge
 - .2 Lock: Cast white bronze concealed lock with removable hex key
 - .3 Insect screen
- .3 Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- .4 Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- .5 Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- .6 Glazing Sealants: As recommended by manufacturer for joint type, and as follows:
 - .1 Structural Sealant: ASTM C 1184, single-component neutral-curing silicone formulation that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by a structural-sealant manufacturer for use in aluminum-framed systems indicated.
 - .1 Color: Black
 - .2 Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.
 - .1 Color: Matching structural sealant.

2.6 ENTRANCE DOOR SYSTEMS

- .1 Entrance Doors: As specified in Section 08 11 16 - Aluminum Doors and Frames.
- .2 Entrance Door Hardware: As specified in Section 08 71 00 - Door Hardware.

2.7 ACCESSORY MATERIALS

- .1 Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Section 07 92 00 – Joint Sealants.
- .2 Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30 mil (0.762 mm) thickness per coat.

2.8 FABRICATION, GENERAL

- .1 Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - .1 Profiles that are sharp, straight, and free of defects or deformations.
 - .2 Accurately fit joints; make joints flush, hairline and weatherproof.
 - .3 Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - .4 Physical and thermal isolation of glazing from framing members.
 - .5 Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - .6 Provisions for field replacement of glazing.
 - .7 Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- .2 Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- .3 Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
- .4 Storefront Framing: Fabricate components for assembly using manufactures standard installation instructions.
- .5 After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 FABRICATION OF ALUMINUM DOORS

- .1 Fabricate in accordance with Section 08 11 16 - Aluminum Doors and Frames.

2.10 FINISHES

- .1 Shop Finishing:
 - .1 Kawneer Clear Anodized Finish AA-M12C22A41, AAMA 611, Architectural Class I Clear Anodic Coating
 - .1 Color #14 Clear

2.11 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight aluminum framed storefront system installation.
 - .1 Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
 - .2 Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
 - .3 Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
 - .4 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- .1 Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum framed storefront system, accessories, and other components.
- .2 Install aluminum framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- .3 Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- .4 Install aluminum framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within sliding door to the exterior.
- .5 Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 FIELD QUALITY CONTROL

- .1 Field Tests: Contract Administrator shall select storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the Contract amount.
 - .1 Testing shall be performed by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements. Testing Standard per AAMA 503, including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 Water Infiltration Test.

- .1 Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft², whichever is greater.
- .2 Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 6.24 psf (300 Pa).
- .2 Manufacturer's Field Services: Upon the City's written request, provide periodic Site visit by manufacturer's field service representative.

3.4 GLAZING

- .1 Glaze aluminum storefront, doors and frames in accordance with Section 08 80 00 - Glazing.

3.5 CAULKING

- .1 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within the aluminum work except where exposed use is permitted by Contract Administrator.

3.6 ADJUSTING, CLEANING, AND PROTECTION

- .1 Clean aluminum surfaces immediately after installing aluminum framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- .2 Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- .3 Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-69.25/ANSI/BHMA A156.9, Cabinet Hardware.
 - .2 CAN/CGSB-69.27/ANSI/BHMA A156.11, Cabinet Locks.
 - .3 CAN/CGSB-69.32/ANSI/BHMA A156.16, Auxiliary Hardware.
 - .4 CAN/CGSB-69.34/ANSI/BHMA A156.18, Materials and Finishes.

1.2 SUBMITTALS

- .1 Product Data: Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Samples: Submit samples in accordance with Section 01 33 00 - Submittal Procedures
- .3 Hardware List:
 - .1 Submit Contract hardware list in accordance with Section 01 33 00 - Submittal Procedures
 - .2 Indicate specified hardware, including make, model, material, function, finish and other pertinent information.
- .4 Manufacturer's Instructions: Submit manufacturer's installation instructions.
- .5 Closeout Submittals: Provide maintenance data, parts list, and manufacturer's instructions for incorporation into maintenance manual specified in Section 01 78 00 – Closeout Submittals.

1.3 QUALITY ASSURANCE

- .1 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

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

Part 2 Products

2.1 CABINET HARDWARE

- .1 All hardware to be approved by Contract Administrator by shop drawing prior to ordering.
- .2 Cabinet hardware: to CAN/CGSB-69.25 (All hardware to be approved by shop drawing prior to order).
 - .1 Hinges:
 - .1 BLUM Clip Top hinge with 120° opening angle for typical doors; Product: # 71T558180 (or approved equal in accordance with B7).
 - .2 Door/Drawer Pulls:
 - .1 Hettich # 1170149 Novum pull (192mm centers) brushed nickel (or approved equal in accordance with B7).
 - .3 Full extension drawer slides
 - .1 Accuride #7957 heavy duty slide for typical drawers (or approved equal in accordance with B7).
 - .2 Accuride #1321 Pro-Pocket flipper door slide for canteen display case doors (or approved equal in accordance with B7).
 - .4 Adjustable Pilaster and Shelf supports:
 - .1 Knappe & Vogt KV255 and KV256 supports (or approved equal in accordance with B7)..
 - .5 Locks:
 - .1 Wood cabinet drawers: Richelieu #BP140200140 (or approved equal in accordance with B7).
 - .2 Wood cabinet doors:
 - .1 Richelieu #BP140100140 (or approved equal in accordance with B7).
 - .2 Provide lever operated bolt hardware with strike plate where indicated.
 - .1 Hardware to be flush mounted in a mortise set into the stile edge of the door. A recessed tab is used to extend or withdraw the bolt.
 - .3 Glass doors: Richelieu #BP140500140 (or approved equal in accordance with B7).
 - .4 Cylinders: key to keying system as directed
 - .6 Wall standards and brackets:
 - .1 Knappe & Vogt KV85-185 double-slot standards, lengths as indicated with 300 mm deep KV185 brackets (or approved equal in accordance with B7).
 - .7 Coat rods:
 - .1 Knappe & Vogt KV660, 30 mm o.d. SS rod c/w KV734 and KV735 polished chrome flanges (or approved equal in accordance with B7).. Size rods to suit closet widths as indicated on drawings
 - .8 Door/drawer bumpers:
 - .1 Clear nylon bumpers, push in type

- .9 Grommets:
 - .1 As required to match adjacent surface.
- .10 Z-clips:
 - .1 Lee Valley ¼" Z-clips, Item #: 00S18.20 (or approved equal in accordance with B7).
- .11 Tempered display glass hardware (Departure Lounge):
 - .1 CR Lawrence CRL Z-Series Zinc Large Round Clamp for 6mm glass (or approved equal in accordance with B7).
 - .1 Product #: Z106BN, Brushed nickel finish
- .12 Hardware Finish: Unless otherwise indicated chrome or nickel plated.

2.2 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

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.

2.4 KEYING

- .1 Cabinet locks to be as keyed alike in a room or as directed. Submit keying schedule for approval.
- .2 Provide keys in duplicate for every type of lock in this Contract. Stamp keying code numbers on keys and cylinders.

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 Install hardware to standard hardware location dimensions in accordance with manufacturer's recommendations and to project design requirements.

3.3 ADJUSTING

- .1 Adjust cabinet hardware for optimum, smooth operating condition. Lubricate hardware and other moving parts.

- .2 Adjust cabinet door hardware to provide tight fit at contact points with frames.

3.4 CLEANING

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

3.5 DEMONSTRATION

- .1 Keying System Setup:
 - .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 Designated Staff Briefing.
 - .1 Brief designated staff regarding:
 - .1 Proper care, cleaning, and general maintenance of projects complete hardware.
 - .2 Description, use, handling, and storage of keys.
- .3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 08 10 00 – Metal Doors and Frames
- .2 Section 08 14 16 – Wood Doors

1.2 REFERENCES

- .1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
 - .1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).
 - .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-69.17, Bored and Preassembled Locks and Latches.
 - .2 CAN/CGSB-69.18 /ANSI/BHMA A156.1, Butts and Hinges.
 - .3 CAN/CGSB-69.19/ANSI/BHMA A156.3, Exit Devices.
 - .4 CAN/CGSB-69.20/ANSI/BHMA A156.4, Door Controls (Closers).
 - .5 CAN/CGSB-69.21/ANSI/BHMA A156.5, Auxiliary Locks and Associated Products.
 - .6 CAN/CGSB-69.22/ANSI/BHMA A156.6, Architectural Door Trim.
 - .7 CAN/CGSB-69.24/ANSI/BHMA A156.8, Door Controls - Overhead Holders.
 - .8 CAN/CGSB-69.28 /ANSI/BHMA A156.12, Interconnected Locks and Latches.
 - .9 CAN/CGSB-69.29/ANSI/BHMA A156.13, Mortise Locks and Latches.
 - .10 CAN/CGSB-69.30/ANSI/BHMA A156.14, Sliding and Folding Door Hardware.
 - .11 CAN/CGSB-69.31/ANSI/BHMA A156.15, Closer/Holder Release Device.
 - .12 CAN/CGSB-69.32-M90/ANSI/BHMA A156.16-1981, Auxiliary Hardware.
 - .13 CAN/CGSB-69.33/ANSI/BHMA A156.17, Self-Closing Hinges and Pivots.
 - .14 CAN/CGSB-69.34/ANSI/BHMA A156.18, Materials and Finishes.
 - .15 CAN/CGSB-69.35/ANSI/BHMA A156.19, Power Assist and Low Energy Power Operated Doors.
- .3 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.3 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 Contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.

- .3 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .2 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
 - .3 After approval samples will be returned for incorporation in the Work.
- .3 Manufacturer's Instructions: Submit manufacturer's installation instructions
- .4 Closeout Submittals: Provide operation and maintenance data for door closers, locksets, door holders for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 REQUIREMENTS REGULATORY AGENCIES

- .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

1.5 DELIVERY, STORAGE, AND HANDLING

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

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 Only products meeting ANSI/BHMA standards are acceptable. Items that are equal in design, function and quality will be accepted upon approval of the Contract Administrator.
- .3 Only recognized Contract hardware distributors will be considered for the Work of this section. The distributor shall have on staff a qualified Architectural Hardware Consultant recognized by the Door and Hardware Institute or a person with equivalent qualifications to assist installers and direct detailing, processing and delivery of material, and certify installation acceptance.

1.7 MAINTENANCE SERVICE

- .1 Provide maintenance service for one year during warranty period to maintain all barrier free entrance automatic operators as follows:
 - .1 Qualified service personal approved by manufacturer of operators.

- .2 Site inspection every three months will all necessary adjustment made during this visit. Separate warranty service calls, if required, will only qualify as an inspection if time of call is close to the three month intervals.
- .3 Make detailed reports of each visit and copy to The City and Contract Administrator.
- .4 Cost of this service will be included as part of this Section and is not covered by any allowance amount.
- .2 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .3 Supply two sets of wrenches for door closers, locksets and fire exit hardware.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.9 WARRANTY

- .1 Provide a written manufacturer's warranty for Work of this Section for failure due to defective materials for ten (10) years, dated from substantial completion certificate.
- .2 Provide a written Contractor's warranty for Work of this Section for failure due to defective installation Workmanship for one (1) year, dated from submittal completion certificate.

Part 2 Products

2.1 HARDWARE ITEMS

- .1 Use one manufacturer's products only for similar items.
- .2 Manufacture hardware to ANSI/BHMA standard for each specific item.

2.2 DOOR HARDWARE

- .1 Locks and latches:
 - .1 Bored and preassembled locks and latches: to CAN/CGSB-69.17, 4000 bored lock, grade 1, designed for function and keyed as stated in Hardware Schedule.

- .2 Mortise locks and latches: to CAN/CGSB-69.29, series 1000 mortise lock, designed for function and keyed as stated in Hardware Schedule.
- .3 Knobs Lever handles : plain design.
- .4 Roses: round.
- .5 Normal strikes: box type, lip projection not beyond jamb.
- .6 Cylinders: key into keying system as directed.
- .7 All corresponding cylinders to be removable.
- .8 Finished to BHMA 626.
- .2 Butts and hinges:
 - .1 Butts and hinges: to CAN/CGSB-69.18, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.
- .3 Exit devices:
 - .1 to CAN/CGSB-69.19, function, grade and finish as per schedule. Rim type with push pad design.
- .4 Door Closers and Accessories:
 - .1 Door controls (closers): to CAN/CGSB-69.20, designated by letter C and numeral identifiers listed in Hardware Schedule.
- .5 Door Operators:
 - .1 Power-operated pedestrian doors: to CAN/CGSB-69.26.
- .6 Auxiliary locks and associated products: to CAN/CGSB-69.21, designated by letter E and numeral identifiers listed in Hardware Schedule.
 - .1 Key into keying system as noted.
- .7 Architectural door trim: to CAN/CGSB-69.22, designated by letter J and numeral identifiers listed in Hardware Schedule.
 - .1 Door protection plates: 1.27 mm thick stainless steel, finished to BMHA 630.
 - .2 Push plates: 1.27 mm thick stainless steel finished to BMHA 630.
 - .3 Push/Pull units: type stainless steel finished to BMHA 630.
- .8 Auxiliary hardware: to CAN/CGSB-69.32, designated by letter L and numeral identifiers listed in Hardware Schedule.
 - .1 Combination stop and holder, floor mounted: finished to BMHA 626.
 - .2 Surface bolt lever extension flush bolt: finish to BMHA 626.
- .9 Door bottom seal: heavy duty, door seal of extruded aluminum frame and hollow closed cell neoprene weather seal, surface mounted with drip cap closed ends, clear anodized finish.
- .10 Thresholds: to ANSI/BHMA A156.21 extruded aluminum mill finish, serrated surface, with lip and vinyl door seal insert.
- .11 Weatherstripping:
 - .1 Head and jamb seal:

- .1 Extruded aluminum frame and solid closed cell neoprene insert, clear anodized finish.
 - .12 Astragal: overlapping, extruded aluminum frame with vinyl insert, finished to match doors.
- 2.3 MISCELLANEOUS HARDWARE**
- .1 Indexed key control system: to ANSI/BHMA A156.28, designated by letter E and numeral identifiers, wall mounted type.
 - .2 Refer to Section 28 13 01 – Electronic Security and Intrusion System Rough-In for door rough-in provisions. Security devices to be provided by The City and installed by others.
- 2.4 KEY CABINET**
- .1 Provide one wall mounted steel key cabinet with capacity for 1.5 times the number of keys with an indexed key control system to CAN/CGSB-69-21.
- 2.5 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 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.
- 2.6 KEYING**
- .1 Doors, padlocks and cabinet locks to be master keyed as directed. Prepare detailed keying schedule in conjunction with Contract Administrator and The City.
 - .2 Provide keys in triplicate for every lock in this Contract.
 - .3 Provide six master keys for each MK or GMK group. Allow for six (6) levels of sub master keying.
 - .4 Stamp keying code numbers on keys and cylinders.
 - .5 Provide construction cores.
 - .6 Provide all permanent cores and keys to Contract Administrator.
 - .7 Supply fifty (50) blanks for each sub master group used.

2.7 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

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.
- .2 Furnish 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 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 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .3 Install key control cabinet.
- .4 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .5 Remove construction when directed by Contract Administrator; install permanent cores and check operation of locks.
- .6 Wiring Diagrams:
 - .1 Provide any special information, voltage requirements and wiring diagrams to other trades requiring such information.

3.3 EXAMINATION

- .1 Visit Site prior to start of installation of hardware.
- .2 Visit will include examination of openings, Site conditions and materials for conditions that prevent proper application of finish hardware.
- .3 Installation will imply conditions for installation acceptable hardware Subcontractor to accept responsibility.

3.4 FIELD QUALITY CONTROL

- .1 Hardware Subcontractor to have a qualified AHC representative from the manufacturer/supplier on Site at Substantial Completion Inspection and at commissioning of the finished hardware. Cost of the visits to be included in Contract.

3.5 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 provide tight fit at contact points with frames.
- .4 Where hardware is found defective, repair or replace or correct as desired by inspection reports.

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 manufacturer's instructions.
- .3 Remove protective material from hardware items where present.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.7 PROTECTION

- .1 All hardware shall be protected against damage from paint, plaster or other defacing materials. Whenever possible manufacturers protective covering when applied, shall not be removed until final project cleaning takes place. Material not protected by manufacture shall be covered or removed from door during painting or any other adjustments that can cause damage to hardware.

3.8 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 Contract Administrator.
- .2 Designated Staff Briefing:
 - .1 Brief designated 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.
- .3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.9 HARDWARE GROUPS

- .1 Provide hardware as specified in the previous articles in sets according to the following groups:

Hardware Set #1.0 – Door D100A				
1	Continuous Hinge	CFM83SLF-HD1		PE
1	Exit Device	DG1 16 AD8504	US32D	SA
1	BEST Rim Cylinder to suit		626	BE
1	BEST Mortise Cylinder to suit		626	BE
1	Door Pull	BF158	US32D	RO
1	Automatic Operator	6060	689	NO
2	Full Height Door Switch	639	630	NO
1	Guide Rail	Currant or equal guide rail to Manitoba standards	AL	
1	Threshold	272A		PE
1	Weatherstrip and sweep	By door supplier		00
NOTE: Door to be dogged down with use of cylinder dogging in pushbar. Auto operator to be manually turned on/off.				

Hardware Set #2.0 – Doors D100B, D107B				
1	Continuous Hinge	CFM83SLF-HD1		PE
1	Push Bar & Pull	BF15847	US32D	RO
1	Automatic Operator	6060	689	NO
2	Full Height Door Switch	639	630	NO
1	Door Stop	441H	US26D	RO
1	Threshold	270A		PE

Hardware Set #3.0 – Door D102A				
3	Hinge	TA2714 NRP 114mm x 102mm	US26D	MK
1	Office Lock	DG1 28 10G05 LL	US26D	SA

1	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Wall Stop	406	US26D	RO

Hardware Set #4.0 – Doors D102B, D105B, D105C, D105E, D108C

NOTE: All hardware by door supplier

Hardware Set #5.0 – Door D105A

4	Hinge	TA2714 NRP 114mm x 102mm	US26D	MK
1	Deadbolt	DG1 475	US26D	SA
1	Pull Plate	107x70C	US32D	RO
1	Push Plate	70C	US32D	RO
1	Surface Overhead Holder/Stop	1701M Series	US26D	SA
1	Door Switch	502		NO
1	Full Height Door Switch	639	630	NO
1	Automatic Operator	5730	689	NO
1	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Monitor	LMS-1		SU

NOTE: Actuators to be wired through the LMS-1 switch, and only be operable when deadbolt is retracted. 639 full height actuator to be mounted on pull side of door.

Hardware Set #6.0 – Doors D104B, D104C

1	Sliding door kit	CRT-101 (confirm width)	US32D	KN
1	Flush Bolt	1877	628	AD
1	Dust Proof Strike	570	US26D	RO
1	Cylinder	DG1 41 101	US26D	SA
1	Thumbturn	4066	628	AD
1	Push Bar	YRM350 Back to Back set x 11XHD	US32D	RO

NOTE: Install channel in bottom of door so as not to interfere with flush bolt operation. Push bar to be 63" c/c of mounting lugs. Confirm dimension with architect.

Hardware Set #7.0 – Door D111A				
1	Continuous Hinge	CFM83SLF-HD1		PE
1	Exit Device	DG1 16 8504 657 SHIM	US32D	SA
1	Door Pull	BF158	US32D	RO
1	Automatic Operator	6060	689	NO
2	Full Height Door Switch	639	630	NO
1	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Threshold	270A		PE
NOTE: Auto operator must be manually turned off when door is not dogged open. Bollard to be mounted on pull side of door.				

Hardware Set #8.0 – Doors D104D, D104E				
6	Hinge	TA2714 NRP 114mm x 102mm	US26D	MK
2	Flush Bolt	557	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Classroom Lock	DG1 28 10G37 LL	US26D	SA
2	Surface Overhead Holder/Stop	1701M Series	US26D	SA
2	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Astragal	By door supplier		

Hardware Set #9.0 – Door D104F, D105D				
4	Hinge	TA2714 114mm x 102mm	US26D	MK
1	Double Cylinder Lock	DG1 8259 LL Less Trim One Side	US26D	SA
1	Push Plate	70E	US32D	RO
1	Concealed Overhead Holder/Stop	1720M Series	US26D	SA
1	Kickplate	K1050 12" x W.T.S.	US32D	RO

Hardware Set #10.0 – Door D108A				
4	Hinge	TA2714 114mm x 102mm	US26D	MK
1	Storeroom Lock	DG1 28 76 10G04 LL	US26D	SA
1	Door Closer	1431 O	EN	SA
1	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Door Stop	441H	US26D	RO
1	Gasketing	S88BL		PE
1	Door Bottom	4131CRL		PE

Hardware Set #11.0 – Door D108B				
4	Hinge	TA2314 NRP 114mm x 102mm	US26D	MK
1	Storeroom Lock	DG1 28 10G04 LL	US26D	SA
1	BEST core			BE
1	Concealed Overhead Stop	690S Series	US26D	SA
1	Door Closer	351 P10	EN	SA
1	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Threshold	2746x6A		PE
1	Gasketing	2891AS (Head)		PE
1	Gasketing	316AS		PE
1	Sweep	315CN		PE
1	Latch Protector	320CXL	US32D	RO

Hardware Set #12.0 – Doors, D111E, D111F				
6	Hinge	TA2714 NRP 114mm x 102mm	US26D	MK
2	Flush Bolt	550	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Storeroom Lock	DG1 8206 LL	US26D	SA
1	Flush Pull	94	US32D	RO
2	Surface Overhead Holder/Stop	1540S Series	US26D	SA
1	Astragal	By door supplier		00

Hardware Set #13.0 – Door D110				
4	Hinge	TA2714 114mm x 102mm	US26D	MK
1	Deadbolt	DG1 475	US26D	SA
1	Push Plate	70E	US32D	RO
1	Pull Plate	107x70C	US32D	RO
2	Full Height Door Switch	639	630	NO
1	Automatic Operator	5710	689	NO
1	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Wall Stop	406	US26D	RO
1	Monitor	LMS-1		SU

NOTE: Pressing actuator on either side of door will power open the door. Actuators to be wired through the LMS-1 switch. Actuators to be disabled when deadbolt is thrown.

Hardware Set #14.0 – Door D111B				
2	Continuous Hinge	CFM83SLF-HD1		PE
2	Flush Bolt	557	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Exit Device	DG1 16 8304 SHIM	US32D	SA
1	Door Pull	BF158	US32D	RO
1	Concealed Overhead Holder	690H Series	US26D	SA
1	Automatic Operator	6060	689	NO
2	Full Height Door Switch	639	630	NO
2	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Threshold	270A		PE
1	Astragal	By door supplier		
<p>NOTE: Inactive leaf always pinned shut. Auto operator must be manually turned off when door is not dogged open. Overhead stop used on inactive leaf. Bollard to be mounted on pull side of door.</p>				

Hardware Set #15.0 – Doors D111C, D111D				
8	Hinge	TA2314 NRP 114mm x 102mm	US26D	MK
2	Exit Device	8710	US32D	SA
2	Concealed Overhead Stop	690S Series	US26D	SA
2	Door Closer	351 P10	EN	SA
2	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Threshold	2746x6A		PE
1	Gasketing	2891AS (Head)		PE
2	Gasketing	316AS		PE
2	Sweep	315CN		PE
1	Astragal	351C		PE
1	Astragal	351CP		PE

Hardware Set #16.0 – Door D113				
4	Hinge	TA2714 NRP 114mm x 102mm	US26D	MK
1	Storeroom Lock	DG1 28 10G04 LL	US26D	SA
1	Door Closer	1431 PS	EN	SA
1	Kickplate	K1050 12" x W.T.S.	US32D	RO

Hardware Set #17.0 – Door D200				
4	Hinge	TA2714 114mm x 102mm	US26D	MK
1	Storeroom Lock	DG1 28 10G04 LL	US26D	SA
1	Door Closer	1431 O	EN	SA
1	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Wall Stop	406	US26D	RO

Hardware Set #18.0 – Door D104A				
4	Hinge	TA2714 114mm x 102mm	US26D	MK
1	Deadbolt	DG1 475	US26D	SA
1	Door Pull Set	112 BTB-5	US32D	RO
2	Full Height Door Switch	639	630	NO
1	Automatic Operator	5710	689	NO
1	Kickplate	K1050 12" x W.T.S.	US32D	RO
1	Monitor	LMS-1		SU
NOTE: Pressing actuator on either side of door will power open the door. Actuators to be wired through the LMS strike monitor. Actuators to be disabled when the deadbolt is thrown.				

Hardware Set #19.0 – Door D107A				
1	Continuous Hinge	CFM83SLF-HD1		PE
1	Exit Device	DG1 16 AD8504	US32D	SA
1	BEST Rim Cylinder to suit		626	BE
1	BEST Mortise Cylinder to suit		626	BE
1	Door Pull	BF158	US32D	RO
1	Automatic Operator	6060	689	NO
2	Full Height Door Switch	639	630	NO
1	Guide Rail	Currant or equal guide rail to Manitoba standards	AL	
1	Threshold	2746A		
1	Weatherstrip and sweep	By door supplier		PE
NOTE: Door to be dogged down with use of cylinder dogging in pushbar. Auto operator to be manually turned on/off.				

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ANSI/ASTM E330- 02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- .2 American National Standards Institute (ANSI).
 - .1 ANSI/ASTM E330-[02], Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .3 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C542-[94(1999)], Specification for Lock-Strip Gaskets.
 - .2 ASTM D790-[02], Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - .3 ASTM D1003-[00], Test Method for Haze and Luminous Transmittance of Plastics.
 - .4 ASTM D1929-[96(R2001)e1], Test Method for Determining Ignition Temperature of Plastics.
 - .5 ASTM D2240-[02b], Test Method for Rubber Property - Durometer Hardness.
 - .6 ASTM E84-[01], Test Method for Surface Burning Characteristics of Building Materials.
 - .7 ASTM F1233-[98], Test Method for Security Glazing Materials and Systems.
- .4 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-12.4-[M91], Heat Absorbing Glass.
 - .5 CAN/CGSB-12.5-[M86], Mirrors, Silvered.
 - .6 CAN/CGSB-12.6-[M91], Transparent (One-Way) Mirrors.
 - .7 CAN/CGSB-12.8-[97], Insulating Glass Units.
 - .8 CAN/CGSB-12.9-[M91], Spandrel Glass.
 - .9 CAN/CGSB-12.10-[M76], Glass, Light and Heat Reflecting.
 - .10 CAN/CGSB-12.11-[M90], Wired Safety Glass.
 - .11 CAN/CGSB-12.12-[M90], Plastic Safety Glazing.
 - .12 CAN/CGSB-12.13-[M91], Patterned Glass.
- .5 Canadian Standards Association (CSA International).
 - .1 CSA A440.2-[98], Energy Performance Evaluation of Windows and Sliding Glass Doors.
 - .2 CSA Certification Program for Windows and Doors [2000].
- .6 Environmental Choice Program (ECP).

- .1 CCD-045-[95], Sealants and Caulking.
- .7 Flat Glass Manufacturers Association (FGMA).
 - .1 FGMA Glazing Manual - [1997].
- .8 Laminators Safety Glass Association (LSGA).
 - .1 LSGA Laminated Glass Design Guide [2000].
- .9 Canada Green Building Council (CaGBC).
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SYSTEM DESCRIPTION

- .1 Performance Requirements: Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
 - .1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
- .2 Size glass to withstand wind loads, dead loads and positive and negative live loads in accordance with ASTM E 300-97el..
- .3 Limit glass deflection to 1/200 with full recovery of glazing materials.

1.3 SUBMITTALS

- .1 Product Data: Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings: Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Manufacturer's Instructions: Submit manufacturer's installation instructions.
- .4 Closeout Submittals: Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 QUALITY ASSURANCE

- .1 Perform Work in accordance with FGMA Glazing Manual IGMAC and Laminators Safety Glass Association – Standards Manual for glazing installation methods. Provide shop inspection and testing for glass.
- .3 Provide certificate of quality compliance from manufacturer.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.

- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.6 WARRANTY

- .1 Provide ten (10) year warranty for glazing units.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Install glazing when ambient temperature is 10°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 GLASS MATERIALS

- .1 Float Glass: to CAN/CGSB-12.3, Glazing quality, 6mm thick
- .2 Exterior Insulating Sealed Glass Units (EGU): to CAN/CGSB-12.8.
- .3 Safety glass: to CAN/CGSB-12.5, Type 1, 2 layers of 6 mm thick glass, laminated (12 mm total thickness) and Type 2, 6mm thick tempered.
- .4 Wired Glass: to CAN/CGSB-12.11, Type 1, wired mesh style 3, 6mm thick
- .5 Mirrors: to CAN/CGSB-12.5, silvered, Type A, 6mm thick, unframed, ground and polished edges, of sizes as indicated.
- .6 Glass for cabinet and millWork: to CAN/CGSB-12.5, transparent, minimum 4.0 mm thick, unless otherwise indicated. Type 2 - Tempered.

2.2 SEALED INSULATING GLASS

- .1 Exterior Units (refer to window schedule for locations):
 - .1 Type EGU1 – Double Unit Storefront Glazing:
 - .1 Outer board: 6 mm tempered glazing
 - .2 Inter-cavity space thickness: 13 mm.
 - .3 Inner Board: 6 mm tempered glazing
 - .4 Glass coating: surface number 2 (inside surface of outer light), low “E”.
 - .1 Cardinal Glass; 272 coating.
 - .5 Inert gas: argon.

- .6 Light transmittance: minimum 0.70.
- .7 Glazing tints/finishes (final tints/finishes to be selected by Contract Administrator from manufactures full range of finishes):
 - .1 Clear
 - .2 Dark Green
 - .3 Sandblasted (on surface number 3)
 - .1 Sandblasted glass shall be frosted to a uniform speckle of 20% translucency with a 120-grit sandblast spray.

2.3 INTERIOR WINDOWS

- .1 Safety glass: to CAN/CGSB 12.5, Type 2, 6mm thick tempered.

2.4 INTERIOR WOOD AND METAL DOORS

- .1 Safety glass: to CAN/CGSB-12.5, Type 2, 6mm thick tempered. Sizes as indicated.
- .2 Wired Glass: to CAN/CGSB-12.11, Type 1, wired mesh style 3, 6mm thick
- .3 Refer to door schedule.

2.5 CABINET GLASS SHELVES AND DOORS

- .1 Doors and shelves: Safety glass: to CAN/CGSB-12.5, Type 2, 6mm thick tempered. Sizes as indicated.

2.6 SEALANT MATERIALS

- .1 Sealant: one component compound, to CAN/CGSB-19.13, Class 2-40, neutral cure silicone gun grade, colour to match adjacent surfaces.

2.7 ACCESSORIES

- .1 Setting blocks: Neoprene, 80-90 Shore A durometer hardness to ASTM D2240, length of 25 mm for each square meter of glazing, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height, 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; size to suit application; 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%, to effect an air and vapour seal.
- .4 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.

- .5 Glazing clips: manufacturer's standard type.
- .6 Lock-strip gaskets: to ASTM C542.
- .7 Mirror attachment accessories:
 - .1 Stainless steel clips.
 - .2 Plastic rosettes.
 - .3 Mirror adhesive, chemically compatible with mirror coating and wall substrate.
 - .4 Mirror frame

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 EXAMINATION

- .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.

3.3 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.
- .4 Install Sealant according to Manufacturer's instructions.

3.4 INSTALLATION TEMPERED GLASS

- .1 Install tempered glass with horizontal tempering, that is, with tempered distortion parallel with floor.

3.5 INSTALLATION: EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

- .1 Perform Work in accordance with FGMA Glazing Manual, IGMAC and Laminators Safety Glass Association - Standards Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.

- .3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .4 Place setting blocks at $\frac{1}{4}$ points, with edge block maximum 150 mm from corners.
- .5 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line. Place glazing tape on glazing light or unit with tape flush with 16 mm below sight line.
- .7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.6 INSTALLATION: INTERIOR - DRY METHOD (TAPE AND TAPE)

- .1 Perform Work in accordance with FGMA Glazing Manual, IGMAC, and Laminators Safety Glass Association - Standards Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .3 Place setting blocks at $\frac{1}{4}$ points, with edge block maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.
- .5 Place glazing tape on free perimeter of glazing in same manner described.
- .6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .7 Knife trim protruding tape.

3.7 INSTALLATION: MIRRORS

- .1 Set mirrors with adhesive, applied in accordance with adhesive manufacturer's instructions.
- .2 Set mirrors with clips. Anchor rigidly to wall construction.
- .3 Set in frame.
- .4 Place plumb and level.

3.8 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt. Remove traces of primer, caulking.
- .2 Remove glazing materials from finish surfaces.
- .3 Remove labels after Work is complete.
- .4 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.
- .5 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.9 PROTECTION OF FINISHED WORK

- .1 After installation, mark light with an "X" by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

END OF SECTION