Part 1 General

1.1 RELATED SECTIONS

.1 Section 08 71 00 – Door Hardware

.2 Section 28 13 01 – Electronic Security and Intrusion System Rough In

1.2 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.

1.3 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.

1.4 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.

1.5 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.

1.6 PROJECT CONDITIONS

.1 Coordinate the work with frame opening construction, door, and hardware installation.

.2 Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

1.7 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.

1.8 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 Sealing.

.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 jambs 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 form interior parts with continuous interlocking thermal break.

.4 Apply insulation.

2.14 DOOR SECURITY

.1 Door security hardware to be flush mounted on all frames

.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.

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.

.7 Coordinate installation of door security hardware in accordance with Section 28 13 01 – Electronic Security and Intrusion System Rough In and manufacturer's instructions.

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.

.5 Coordinate installation of door security hardware in accordance with Section 28 13 01 – Electronic Security and Intrusion System Rough In and manufacturer's instructions.

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 RELATED SECTIONS

.1 Section 08 71 00 – Door Hardware

.2 Section 28 13 01 – Electronic Security and Intrusion System Rough In.

1.2 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.

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 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.

1.4 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit one 300 x 300 mm corner sample of each type wood door.

.3 Show door construction, core, glazing detail and faces.

.4 Manufacturer's Instructions: Submit manufacturer's installation instructions.

1.5 REGULATORY REQUIREMENTS

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

1.6 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.

1.7 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.

1.8 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 Hardwood; veneer grades: 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 Hardwood: 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.

2.6 DOOR SECURITY

.1 Door security hardware to be flush mounted on all frames

.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.

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 28 13 01 – Electronic Security and Intrusion System Rough In 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.

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 00 – Cleaning and Waste Management.

1.6 DELIVERY, STORAGE AND HANDLING

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

.2 Apply temporary protective coating to finished surfaces. Remove coating after erection. Do not use coatings that will become hard to remove or leave residue.

.3 Leave protective covering in place until final cleaning of building.

Part 2 Products

2.1 CRAWLSPACE ACCESS DOOR

.1 Acceptable Manufacturer

Acudor, 1125 Squires Beach Road, Pickering, Ontario, Tel: 1-888-388-3611

.1 Acceptable Products:

.1 Floor Door FT-8040, 150 lb/sqft. Loading - Recessed 1/8" crawlspace access door, as manufactured by Acudor

.1 Size: 914 mm x 914 mm (36” x 36”)

.2 Door: 1/4" smooth aluminum plate reinforced for live load of 150 pounds/sq. ft. Extruded edging is welded to door panel, providing a 1/8" recess.

.3 Door weight: 34 kg. (75 lbs.)

.4 Frame: Angle frame fabricated from aluminum extrusion with integral 1" anchor flange on three sides and welded anchor straps on the hinge side

.5 Hinge: Extruded aluminum hinges are welded to inside of door panel and pivot on stainless steel pins. Hold open arm with red Vinyl grip allow automatic opening.

.6 Opening device: Door panel to open to 90 degrees, locking door in open position, and allowing for easy control when closing door panel. Stainless steel torsion bars provide lift assistance

.7 Latch: Stainless steel slamlock with a fixed inside handle, removable outside handle, and removable threaded plug

.8 Finish: Mill finish, with optional bituminous coating on exterior frame.

.9 Location: Mechanical Room – Room 110

2.2 HOSE REEL ACCESS DOOR

.1 Acceptable Manufacturer

Acudor, 1125 Squires Beach Road, Pickering, Ontario, Tel: 1-888-388-3611

.2 Acceptable Products:

.1 LT-4000 8 x 8 RC lightweight aluminum specialty door, as manufactured by Acudor

.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

.9 Location: Mechanical Room – Room 110

2.3 SUBSTITUTIONS:

.1 Refer to Section 01 33 00 – Submittal Procedure, subsection 2.2.

2.4 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.

2.5 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.Canada Green Building Council (CaGBC)

.2 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.

1.2 SYSTEM DESCRIPTION

.1 Overhead coiling sheet doors:

.1 Operation: Design door assembly, including operator, to operate for not less than 10,000 cycles.Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35˚C to 35˚C.

.2 Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

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 Details of construction and fabrication.

.4 Installation instructions.

.3 Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, 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.

.7 Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.4 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: 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 Finish areas designated by Contract Administrator.

.2 Do not proceed with remaining work until workmanship, color, and sheen are approved by Contract Administrator.

.3 Refinish mock-up area as required to produce acceptable work.

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 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.

1.7 COORDINATION

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

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.

2.2 ACCEPTABLE PRODUCTS

.1 Overhead Coiling Self Storage Sheet Doors: Overhead Door Corporation 770 Series.

.1 Curtain: Roll formed, 26 gauge galvanized steel, per ASTM A 653 SQ Grade 80, Galvanized G-30. Sections interlocked and permanently seamed together to form a continuous curtain. Provided with a PVC edge strip stapled on the edge of curtain's exterior side to minimize steel-to-steel contact, enhance door operation, and minimize curtain nesting and scratching.

.2 Finish:

.1 Curtain slats shall receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.

.2 Top Coat Color: As selected by the Contract Administrator from the manufacturers standard colors.

.3 Guides, angles, bottom bar stops, headplates and rings galvanized. Aluminum bottom bar clear anodized.

.3 Bottom Bar: Extruded aluminum reinforced with 1-1/2 inch by 1-1/2 inch (38 mm by 38 mm) roll formed steel angle and provided with a flexible PVC bulb type astragal to ensure a consistent seal along the floor. Extrusion designed to interlock with door curtain.

.4 Bottom Bar Stops: Bottom bar stops shall be of “quick connect” design that allows the curtain to be inserted into the “universal” guide, then locked into place without the use of fasteners. Bottom bar stops shall be 14 gauge.

.5 Guides: Guide roll-formed from 18-gauge steel. Guides 1-5/8 inches (41 mm) wide with UHMW polypropylene rub strips on each edge of the guide. Through hole, universal design shall allow easy access from the front of the guide for fastener attachment to the door jamb material. Guides of universal design for use in concrete, wood, steel or masonry jambs Guides pre-punched to accept “quick connect” attachment of the headplate and bottom bar stops.

.6 Headplates: Headplates of “quick connect” design for quick assembly to the guides. Headplates 14-gauge steel and includes steel roller bearings to prevent steel-to-steel contact for improved door operations and extended door shaft life.

.7 Counterbalance: Counterbalance assembly with “stepped” designed steel rings to ensure a tight and uniform curtain wrap. 3-3/8 inch (86 mm) I.D. springs \lubricated at factory to enhance long life and door operation. Shaft 1-5/16 inch (35 mm) diameter with .065 inch (1.65 mm) wall thickness to minimize door deflection

.8 Operation: Manual push up.

.9 Locking:

.1 Standard Interior bottom bar slide bolt on each end of the door’s bottom bar assembly.

.2 Optional Dual Exterior curtain locks, 770 series slide bolt lock.

2.3 SUBSTITUTIONS

.1 Refer to Section 01 33 00 – Submittal Procedure, subsection 2.2.

Part 3 Execution

3.1 EXAMINATION

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

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

.3 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 electrical service with Section 16150. Complete wiring from disconnect to unit components.

.6 Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.

.7 Install perimeter trim and closures.

.8 Instruct The City’s personnel in proper operating procedures and maintenance schedule.

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 Aluminum Association Designation System For Aluminum Finishes (AA)-[1997].

.1 DAF 45 [2003], Designation System For Aluminum Finishes.

.2 Architectural Aluminum Manufacturers Association (AAMA)

.1 AAMACW-DG-1-[96], Aluminum Curtain Wall Design Guide Manual

.2 AAMACW-10-[97], Curtain Wall Manual #10 Care and Handling of Architectural Aluminum >From Shop to Site

.3 AAMACW-11-[85], Curtain Wall Manual – Design Windloads for Buildings and Boundary Layer Wind Tunnel Testing

.4 AAMAT1R-A1-[75], Sound Control for Aluminum Curtain Walls and Windows

.5 AAMA 501-[94], Methods of Test for Exterior Walls

.6 AAMA 503-[92], Voluntary Specification for Field Testing of Metal Storefronts, Curtain Wall and Sloped Glazing Systems

.7 AAMA 606.1-[76], Specifications and Inspection Methods for Integral Colour Anodic Finishes for Architectural Aluminum

.8 AAMA 607.1-[76], Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum

.9 AAMA 608.1-[77], Specification and Inspection Methods for Electrolytically Deposited Colour Anodic Finishes for Architectural Aluminum

.10 AAMA 1503-98, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections

.11 AAMA 2603-[98], Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels

.12 AAMA 2604-[98], Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels

.3 American Society for Testing and Materials International, (ASTM).

.1 ASTM A36/A36M-08, Specification for Carbon Structural Steel.

.2 ASTM A123/A123M-12, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.3 ASTM A167-99, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.4 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM B209-10,, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.6 ASTM B221-12a, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.7 ASTM E283-04, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.8 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.

.9 ASTM E331-00, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.10 ASTM E413-10, Classification for Rating Sound Insulation.

.11 ASTM E1105-00, Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

.4 Canadian General Standards Board (CGSB).

.1 CAN/CGSB 1.108-[M89], Bituminous Solvent Type Paint.

.2 CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings.

.5 Canadian Standards Association (CSA)

.1 CSA-G40.20/G40.21-[98(R2003)], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.

.2 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA-S136-[01], North American Specification for the Design of Cold-Formed Steel Structural Members.

.4 CAN3-S157-[M83(R2002)], Strength Design in Aluminum.

.5 CSA W59.2-[M1991(R2003)], Welded Aluminum Construction.

.6 CAN/CSA-A440-00/A440.1-00 (R2005) - CAN/CSA-A440-00, Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard CAN/CSA-A440-00, Windows

.7 CAN/CSA-A440.2-09/A440.3-09 - Fenestration energy performance/User guide to CSA A440.2-09, Fenestration energy performance

.8 CAN/CSA-A440.4-07 (R2012) - Window, Door, and Skylight Installation

1.2 SYSTEM DESCRIPTION

.1 Vertical glazed aluminum curtain wall system includes thermally broken tubular aluminum sections with supplementary support framing, shop fabricated, factory prefinished, vision glass, insulated metal panel, spandrel infill, column covers, related flashings, anchorage and attachment devices.

.2 Firestop and smoke seal between concrete floor slab and curtain wall

.3 Design, supply, fabrication and installation of stone that is part of curtain wall

.4 Sheet metal air/vapour barrier closures and finish closures

.5 Insulation and air/vapour barrier seals between work of this section and adjacent construction

.6 Sealants for work of this section and between work of this section and adjacent construction

.7 Supply and installation of finish hardware for work of this section

.8 Prefabricated expansion joint assemblies

1.3 PERFORMANCE REQUIREMENTS

.1 Design and size components to withstand dead and live loads caused by pressure and suction of wind, snow and hail for sloped glazing, acting normal to plane of system as calculated in accordance with NBC.

.2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E330 under wind loads for building capacity as ascertained by NBC supplement No. 1 Climatic Information for Building Design in Canada, with full recovery of glazing materials.

.3 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.

.4 Provide system to accommodate, without damage to components or deterioration of seals:

.1 Movement within system.
.2 Movement between system and perimeter framing components.
.3 Dynamic loading and release of loads.
.4 Deflection of structural support framing.
.5 Shortening of building concrete structural columns.
.6 Creep of concrete structural members.

.5 Thermal Resistance:

.1 To AAMA 1053 and CAN/CSA-A440.4-07 (R2012)
.2 Vision glass areas: Minimum RSI of 0.65 (R3.7).

.6 Sound Transmission Loss: When tested to ASTM E90 and ASTM E1425, the Sound Transmission Class (STC) and Outdoor/Indoor Transmission Class (OITC) shall not be less than:

.1 STC 31 or OITC 26 based upon 1” insulating glass (1/4", 1/2" AS, 1/4"),
.2 STC 37 or OITC 30 based upon 1” laminated glass (1/4" laminated, 1/2" AS, 1/4” laminated).

.7 Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft^2 (0.3 l/s · m^2) at a static air pressure differential of 6.24 psf (300 Pa).

.8 Vapour seal with interior atmospheric pressure of 25 mm sp, 22°C, 40% RH: No failure.

.9 Water Resistance, (static): The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a static air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.

.10 Water Resistance, (dynamic): The test specimen shall be tested in accordance with AAMA 501.1. There shall be no leakage at an air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.

.11 Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than Condensation Index (I): when tested to CSA-A440-00, the Condensation Index shall not be less than 68 (frame) and 54 (glass).

.12 Seismic: When tested to AAMA 501.4, system must meet design displacement of 0.010 x the story height and ultimate displacement of 1.5 x the design displacement.

.13 System to provide for expansion and contraction within system components caused by a cycling temperature range of 95°C over a 12 hour period without causing detrimental affect to system components.

.14 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

.15 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

.16 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur

.17 Submit certificate of tests performed.

1.4 SUBMITTALS

.1 Submit sample showing glazing detail, reinforcement, finish and location of manufacturer's nameplates.

.2 Frame sample to show glazing stop, door stop, jointing detail, finish and wall trim.

.3 Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details.

.4 Construct mock-up of one (1) of each curtain wall system type in its final location for review by the Contract Administrator before proceeding with the remainder of the Work.

.5 Indicate each type of curtain wall extrusion profiles, method of assembly, section and hardware reinforcement, locations of exposed fasteners, finishes and location of manufacturer’s nameplates.

.6 Submit catalogue details for type of curtain wall illustrating profiles, dimensions and methods of assembly.

.7 Each drawing submitted shall bear the proof professional stamp and signature of a qualified Professional Engineer registered in the Province of Manitoba

.8 Provide framing member structural and physical characteristics, dimensional limitations, special installation requirements.

1.5 MAINTENANCE DATA

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

1.6 MOCK-UP

.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

.2 Provide mock-up including intermediate mullion, vision glass light, and insulated infill panel. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.

.3 Locate where directed.

.4 Allow 24 hours for inspection of mock-up by Contract Administrator before proceeding with work.

.5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.7 DELIVERY, STORAGE AND HANDLING

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

.2 Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

.3 Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

.4 Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle material and components to avoid damage. Protect curtain wall material against damage from elements, construction activities, and other hazards before, during and after curtain wall installation.

1.8 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer Qualifications: Installer experienced to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to product manufacturer.

.2 Manufacturer Qualifications: Manufacturer capable of providing structural calculations, applicable independent product test reports, installation instructions, a review of the application method, customer approval and periodic field service representation during construction.

.2 Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer’s installation instructions, and manufacturer’s warranty requirements.

1.9 WARRANTY

.1 Manufacturer’s Product Warranty: Submit, for The City’s acceptance, manufacturer’s warranty for curtain wall system as follows:

.1 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

.2 Acceptable Products:

.1 Exterior Curtain Wall: Kawneer Series 1600, Wall System 1.

2.2 MATERIALS

.1 Aluminum (Curtain Wall and Components):

.1 Material Standard: Extruded Aluminum, ASTM B 221, 6063-T6 alloy and temper.

.2 Member Wall Thickness: Each framing member shall have a wall thickness sufficient to meet the specified structural requirements.

.3 Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 ACCESSORIES

.1 Fasteners: Where exposed, shall be Stainless Steel.

.2 Gaskets: Glazing gaskets shall comply with ASTM C 864 and be extruded of a silicone compatible EPDM rubber that provides for silicone adhesion.

.3 Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

.4 Thermal Barrier: Thermal separator shall be extruded of a silicone compatible elastomer that provides for silicone adhesion.

.5 Versoliel™ Sunshade Outrigger System – for exterior curtain wall (consisting of outriggers, louvers, and fascia which may be selected from standard configurations, modified configurations, or customized) that is anchored directly to the vertical curtain wall mullions.

2.4 RELATED MATERIALS

.1 Sealants: Refer to Section 07 92 00 – Joint Sealing

.2 Glass: Refer to Section 08 80 00 – Glazing and 08 81 00 – Spandrel Glazing.

2.5 FABRICATION

.1 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal

.2 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.3 Prepare components to receive anchor devices. Install anchors.

.4 Arrange fasteners and attachments to ensure concealment from view.

.5 Prepare system components to receive door hardware specified in Section 08 71 00 – Door Hardware.

.6 Reinforce framing members for external imposed loads.

.7 Visible manufacturer's identification labels not permitted.

2.6 FABRICATION – INFILL PANELS

.1 Fabricate infill panels with metal covered edge seals around perimeter of panel assembly, enabling installation and minor movement of perimeter seal.

.2 Reinforce interior surface of exterior panel sheet from deflection aused by wind and suction loads.

.3 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.4 Place insulation within panel, adhered to exterior face of interior panel sheet over entire area of sheet with impale fasteners.

.5 Ventilate and pressure equalize the air space outside the exterior surface of the insulation, to the exterior.

.6 Arrange fasteners and attachments to ensure concealment from view

2.7 FINISHES

.1 Shop Finishing:

.1 Kawneer Clear Anodized Finish AA-M12C22A41, AAMA 611, Architectural Class I Clear Anodic Coating

.1 Color #14 Clear

2.8 SUBSTITUTIONS:

.1 Refer to Section 01 33 00 – Submittal Procedure, subsection 2.2.

Part 3 Execution

3.1 EXAMINATION

.1 Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive curtain wall system and sill plate is level in accordance with manufacturer's acceptable tolerances.

.1 Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

3.2 INSTALLATION

.1 Install curtain wall system in accordance with manufacturer's instructions.

.2 Install curtain wall systems plumb, level, and true to line, without warp or rack of frames with manufacturer's prescribed tolerances and installation instructions. Provide support and anchor in place.

.1 Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.

.2 Glazing: Glass shall be outside glazed and held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners spaced no greater than 9" on center.

.3 Water Drainage: Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.

.3 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

.4 Provide alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.

.5 Set frames plumb, square, level at correct elevation in alignment with adjacent work.

.6 Provide thermal isolation where components penetrate or disrupt building insulation.

.7 Anchor securely.

.8 Install sill flashings.

.9 Adjust operable parts for correct function.

.10 Co-ordinate attachment and seal of perimeter air barrier and vapour retarder materials.

.11 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.12 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.

3.3 SITE TOLERANCES

.1 Maximum variation from plumb: [1.5] mm/m (0.2 feet) non-cumulative or [12] mm/30 m (1/2 inch / 100 feet), whichever is less.

.2 Maximum misalignment of two adjoining members abutting in plane: [0.8] mm (1/32 inch).

.3 Maximum sealant space between curtain wall and adjacent construction: [13] mm (1/2 inch).

3.4 GLAZING

.1 Glaze curtain wall in accordance with Section 08 80 00 – Glazing and 08 81 00 – Spandrel Glazing.

3.5 CAULKING

.1 Seal joints to provide weather tight seal at outside and air vapour seal at inside.

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

3.6 FIELD QUALITY CONTROL

.1 Field Tests: Contract Administrator shall select curtain wall 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: Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements.

.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/ft^2, 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 8 psf (383 Pa).

.2 Manufacturer's Field Services: Upon The City's written request, provide periodic site visit by manufacturer's field service representative.

3.7 PROTECTION AND CLEANING

.1 Remove protective material from prefinished aluminum surfaces.

.2 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.3 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Aluminum Association (AA), Designation System for Aluminum Finishes (2000)

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-[97], Anticorrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-79.1-[M91], Insect Screens.

.3 Canadian Standards Association (CSA) International

.1 CSA-A440-[00]/A440.1-[00], A440-[00], Windows / Special Publication A440.1-[00], User Selection Guide to CSA Standard A440-[00], Windows.

.2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA-Z91-[M90(R2000)], Safety Code for Window Cleaning Operations.

1.2 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units elevations of unit, anchorage details, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit one representative model of each type window.

.3 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.

.4 Include 150 mm long samples of head, jamb, sill, meeting rail, mullions to indicate profile.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan.

.4 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.5 Divert unused or damaged wood materials from landfill to recycling facility approved by Contract Administrator.

.6 Divert unused metal materials from landfill to metal recycling facility approved by Contract Administrator.

.7 Divert unused caulking material from landfill to official hazardous material collections site approved by Contract Administrator.

.8 Plastic caulking tubes are not recyclable and must not be diverted for recycling with other plastic materials.

1.5 TEST REPORTS

.1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:

.1 Windows classifications
.2 Air tightness
.3 Water tightness
.4 Wind load resistance
.5 Condensation resistance
.6 Forced entry resistance
.7 Insect screens
.8 Glazing
.9 Safety drop - vertical sliding windows only
.10 Ease of operation - windows with operable lights
.11 Sash pull-off - fiberglass windows

1.6 WARRANTY

.1 Provide a written warranty for work under this Section from Manufacturer for failure due to defective materials and from Contractor for failure due to defective installation, workmanship for ten (10) years respectively.

1.7 CLOSEOUT SUBMITTALS

.1 Provide operation and maintenance data for windows for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

Part 2 Products

2.1 MATERIALS

.1 Materials: to CSA-A440/A440.1 supplemented as follows:

.2 All fiberglass windows by same manufacturer.

.3 Sash: Pultruded, fibreglass, nominal wall thickness 2.3 mm, thermally broken.

.4 Main frame: pultruded, fibreglass, nominal wall thickness 2.3 mm.

.5 Glass: in accordance with Section 08 80 00 - Glazing.

2.2 WINDOW TYPES AND CLASSIFICATION

.1 Windows:

.1 Fixed sash fibreglass windows: with insulating glass

.2 To: A440-05.

.2 Classification Rating: to CSA-A440/A440.1.

.1 Air Leakage: A3

.2 Water Leakage: B6

.3 Wind Load Resistance: C3

.4 Condenstation Resistance: Temperature index I55

.5 Forced Entry: F

.6 Glazing: G

.3 Energy ratings: windows to be Energy Star certified to Canadian Standards Association for Manitoba.

.4 Windows schedule: refer to drawings for window schedule information.

2.3 FABRICATION

.1 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:

.2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3.0 mm for units with a diagonal measurement over 1800 mm.

.3 Face dimensions detailed are maximum permissible sizes.

.4 Brace frames to maintain squareness and rigidity during shipment and installation.

2.4 FIBERGLASS FINISHES

.1 Fiberglass finish: durable isocyanate-free two part polymer enamel with minimum dry film thickness of 0.038 mm and medium gloss of 25-40, conforming to AAMA 613, Organic Coatings.

2.5 GLAZING

.1 Glaze windows in accordance with CSA-A440/A440.1 and Section 08 80 00 - Glazing.

2.6 AIR BARRIER AND VAPOUR RETARDER

.1 Equip window frames with factory / site installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder as follows:

.1 Material: identical to, or compatible with, building air barrier and vapour retarder materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.

.2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder from interior.

Part 3 Execution

3.1 WINDOW INSTALLATION

.1 Install in accordance with CSA-A440/A440.1.

.2 Arrange components to prevent abrupt variation in colour.

.3 Install shims between windows and building frame at each installation screw location. Shim and fasten windows in accordance with manufacturer's recommendations and CAN/CSA A440.4.

3.2 CAULKING

.1 Seal joints between windows and building with sealant. Apply sealant in accordance with Section 07 92 00 - Joint Sealing. Conceal sealant within window units except where exposed use is permitted by Contract Administrator.

.2 Apply sealant in accordance with Section 07 92 00 - Joint Sealing. Conceal sealant within window units except where exposed use is permitted by Contract Administrator.

3.3 CLEANING

.1 Leave work area free of all surplus materials, packing, and debris.

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.

.3 Hardware List:

.1 Submit Contract hardware list in accordance with Section 01 33 00.
.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.

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 Cabinet hardware: to CAN/CGSB-69.25

.1 Hinges:
.1 Blum 110 degree, half overlay.
.2 Door/Drawer Pulls:

.1 Hettich # 1170149 Novum pull (192mm centers) brushed nickel.

.3 Drawer slides:

.1 Accuride #3832 full extension.

.4 Adjustable Pilaster and Shelf supports:

.1 Knape & Vogt KV255 and KV256 supports.

.5 Locks:

.1 Low Security: Richelieu #BP140301140

.2 High Security: Richelieu #BP140001140

.3 Cylinders: key to keying system as directed

.6 Wall standards and brackets:

.1 Knape & Vogt KV85-185 double-slot standards, lengths as indicated with 300 mm deep KV185 brackets.

.7 Coat rods:

.1 Knape & Vogt KV660, 30 mm o.d. SS rod c/w KV734 and KV735 polished chrome flanges. 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 Hardware Finish: Unless otherwise indicated chrome or nickel plated.

2.2 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.

2.3 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.

.3 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.

.2 Lubricate hardware and other moving parts.

.3 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.

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.

.3 Remove protective material from hardware items where present.

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

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

.3 Section 28 13 01 – Electronic Security and Intrusion System Rough In

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.

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 Packing, Shipping, Handling and Unloading:

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

.2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.2 Storage and Protection: Store finishing hardware in locked, clean and dry area.

1.6 MAINTENANCE

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Supply two sets of wrenches for door closers, locksets and fire exit hardware.

1.7 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.

1.8 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.

1.9 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.

1.10 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.

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.

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 manufacture's instructions.

.3 Remove protective material from hardware items where present.

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

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 Group No. 01 – Door D101				
4 EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE
1 EA	PANIC HARDWARE	35A-NL-OP-LESS TRIM	626	VON
1 EA	RIM CYLINDER	20-021	626	SCH
1 EA	ELECTRIC STRIKE	6111 FSE SHIM	630	VON
1 EA	LONG DOOR PULL	9265 72" 56" STD	630	IVE
1 EA	SURF. AUTO OPERATOR	9542 DD MS	ANCL R	LCN
1 EA	GUIDE RAIL	CE-810-605-H-3 LESS BUTTON	628	CRR
1 EA	SAFETY SENSOR	8310-804-2		LCN
1 EA	ACTIV, SAFETY SENSOR	8310-847	689	LCN
1 EA	THRESHOLD	CT-68	627	KNC
1 EA	POWER SUPPLY	PS902 900-4RL CARD READER BY OTHERS REQUEST TO EXIT BY OTHERS WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	LGR	SCE
2 EA	ACTUATOR, WALL MOUNT	8310-836T	630	LCN

Hardware Group No. 02 – Door D102A				
4 EA	HINGE	5BB1 4.5 X 4	652	IVE
1 SET	LONG DOOR PULL	PR 9267 72" 56" J	630	IVE
1 EA	SURF. AUTO OPERATOR	9542 DD MS	ANCL R	LCN
1 EA	KICK PLATE	8400 12"	630	IVE
2 EA	ACTUATOR, WALL MOUNT	8310-836T	630	LCN

Hardware Group No. 03 – Doors D102B, 102C				
3 EA	HINGE	5BB1 4.5 X 4 NRP	652	IVE
1 EA	STOREROOM LOCK	AL80PD SAT	626	SCH
1 EA	OH STOP	450S	652	GLY

Hardware Group No. 04 – Door D102D				
4 EA	HINGE	5BB1 4.5 X 4 NRP	652	IVE
1 SET	LONG DOOR PULL	PR 9267 72" 56" J	630	IVE
1 EA	SURF. AUTO OPERATOR	9542 MS	ANCL R	LCN
1 EA	KICK PLATE	8400 12"	630	IVE
2 EA	ACTUATOR, WALL MOUNT	8310-836T	630	LCN

Hardware Group No. 05 – Door D103A				
4 EA	HINGE	5BB1 4.5 X 4 NRP	652	IVE
1 EA	CLASSROOM LOCK	ND70PD RHO	626	SCH
1 EA	ELECTRIC STRIKE	6211 FSE	630	VON
1 EA	SURFACE CLOSER	4040XP HCUSH	689	LCN
1 EA	KICK PLATE	8400 12”	630	IVE
1 EA	POWER SUPPLY	PS902 900-2RS CARD READER BY OTHERS REQUEST TO EXIT BY OTHERS	LGR	SCE

Hardware Group No. 06 – Door D103B				
2 EA	HINGE	5BB1 4.5 X 4 (SMALL LEAF)	652	IVE
3 EA	HINGE	5BB1 5 X 4.5 NRP (LARGE LEAF)	652	IVE
2 EA	MANUAL FLUSH BOLT	FB358 (LARGE LEAF)	626	IVE
1 EA	SGL CYL DEADBOLT	B660P (SMALL LEAF)	626	SCH
2 EA	FLUSH PULL	H404	626	SMH
1 EA	WALL STOP/HOLDER	FS495 (LARGE LEAF)	626	IVE
1 EA	WALL STOP	WS406CVX	630	IVE
NOTE: 5" HINGES, FLUSHBOLTS, FS495 HOLDER TO BE INSTALLED ON LARGE DOOR. DEADBOLT TO BE INSTALLED ON SMALL DOOR. FLUSH PULLS TO BE MOUNTED ON PULL SIDE OF BOTH DOORS. SMALL DOOR TO SWING 180 DEGREES TO WALL.				

Hardware Group No. 07 – Door D104				
3 EA	HINGE	5BB1 4.5 X 4 NRP	652	IVE
1 EA	STOREROOM LOCK	ND80PD RHO	626	SCH
1 EA	SURFACE CLOSER	1461 DEL CUSH	689	LCN
1 EA	KICK PLATE	8400 12"	630	IVE

Hardware Group No. 08 – Doors D105, D106

4 EA	HINGE	5BB1 4.5 X 4	652	IVE
1 EA	STOREROOM LOCK	ND80PD RHO	626	SCH
1 EA	ELECTRIC STRIKE	6211 FS	630	VON
1 EA	SURF. AUTO OPERATOR	9531 MS	ANCL R	LCN
1 EA	KICK PLATE	8400 12"	630	IVE
1 EA	WALL STOP	WS406CVX	630	IVE
1 EA	DOOR CONTACT	679-05WD	BLK	SCE
1 EA	POWER SUPPLY	PS902	LGR	SCE
1 EA	RESTROOM CONTROL KIT	CX-WCI		CAM
2 EA	ACTUATOR, WALL MOUNT	8310-836T	630	LCN

NOTE: SUBSTITUTE 679-05 DOOR CONTACT FOR CONTACT SUPPLIED IN CX-WCI KIT. CONTACT TO BE CONCEALED IN DOOR, NOT SURFACE MOUNTED.

OPERATION: ONCE INSIDE THE WASHROOM, USE THE PUSH BUTTON TO DISABLE THE OUTSIDE ACTUATOR AND LOCK THE ELECTRIC STRIKE. DOOR MUST BE CLOSED BEFORE PUSH BUTTON CAN BE USED. INSIDE LEVER ALWAYS FREE FOR IMMEDIATE EXIT. PUSHING ON THE INSIDE ACTUATOR WILL RELEASE THE ELECTRIC STRIKE, ENABLE THE OUTSIDE ACTUATOR AND OPEN THE DOOR. ALTERNATIVELY, OPENING THE DOOR WITH THE INSIDE LEVER WILL RELEASE THE ELECTRIC STRIKE AND ENABLE THE OUTSIDE ACTUATOR. STRIKE WILL REMAIN UNLOCKED AND OUTSIDE ACTUATOR WILL REMAIN ENABLED UNTIL THE DOOR IS CLOSED AND PUSH BUTTON INSIDE WASHROOM IS PRESSED AGAIN.

Hardware Group No. 09 – Door D107

4 EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE
1 EA	PANIC HARDWARE	35A-EO	626	VON
1 EA	ELECTRIC STRIKE	6111 FSE SHIM	630	VON
1 EA	SURF. AUTO OPERATOR	9542 DD MS	ANCL R	LCN
1 EA	THRESHOLD	CT-68	627	KNC
1 EA		WEATHERSTRIP BY DOOR/FRAME MANUFACTURER		
1 EA	ACTUATOR, WALL MOUNT	8310-836T	630	LCN

NOTE: ELECTRIC STRIKE POWERED BY THE AUTO OPERATOR'S POWER SUPPLY. NO PULL OR ACTUATOR ON EXTERIOR OF DOOR. DOOR IS EXIT ONLY.

Hardware Group No. 10 – Doors D108, D109				
1 EA	MORTISE CYLINDER	20-013 118 BALANCE OF HARDWARE BY DOOR MANUFACTURER	626	SCH
NOTE: CONFIRM QUANTITY AND TYPE OF CYLINDER WITH DOOR MANUFACTURER PRIOR TO ORDERING.				

Hardware Group No. 11 – Door D110A				
3 EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE
1 EA	PASSAGE SET	ND10S RHO	626	SCH
1 EA	SGL CYL DEADBOLT	B660P	626	SCH
1 EA	SURFACE CLOSER	1461 CUSH	689	LCN
1 EA	KICK PLATE	8400 12"	630	IVE
1 EA	WEATHERSTRIP	W-20S	628	KNC
2 EA	WEATHERSTRIP	W-50	628	KNC
1 EA	DOOR SWEEP	W-13S	628	KNC
1 EA	THRESHOLD	CT-10	627	KNC

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 AN 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].

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 00 – Cleaning and Waste Management.

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 Spandrel glass: to Section 08 81 00 – Spandrel Glazing.

.4 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.

.5 Wired Glass: to CAN/CGSB-12.11, Type 1, wired mesh style 3, 6mm thick

.6 Mirrors: to CAN/CGSB-12.5, silvered, Type A, 6mm thick, unframed, ground and polished edges, of sizes as indicated.

.7 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 EGU1A – Double Unit Curtain Wall Glazing:
- .1 Outer board: 6 mm float glazing
- .2 Inter-cavity space thickness: 13 mm.
- .3 Inner Board: 6 mm float glazing
- .4 Glass coating: surface number 2 (inside surface of outer light), low “E”.
- .5 Inert gas: argon.
- .6 Light transmittance: minimum 0.70.

.2 Type EGU1B – Double Unit Curtain Wall 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”.
- .5 Inert gas: argon.
- .6 Light transmittance: minimum 0.70.

.3 Type EGU2A – Triple Unit Fibreglass Window Glazing:
- .1 Outer board: 12 mm Type 1 safety glass (2 layers of 6mm - laminated)
- .2 Inter-cavity space thickness: 13 mm.
- .3 Centre board: 6 mm float glazing
- .4 Inter-cavity space thickness: 13 mm
- .5 Inner Board: 6 mm float glazing
- .6 Glass coating: surface number 2 (inside surface of outer light), low “E”.
- .7 Inert gas: argon.
- .8 Light transmittance: minimum 0.70.

.4 Type EGU2B – Triple Unit Fibreglass Window Glazing:
- .1 Outer board: 12 mm Type 1 safety glass (2 layers of 6mm - laminated)
- .2 Inter-cavity space thickness: 13 mm.

.3 Centre board: 6 mm float glazing
.4 Inter-cavity space thickness: 13 mm
.5 Inner Board: 6 mm tempered glazing
.6 Glass coating: surface number 2 (inside surface of outer light), low “E”.
.7 Inert gas: argon.
.8 Light transmittance: minimum 0.70.

2.3 INTERIOR GLAZING SCREENS

.1 Window Type 8:

.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 Refer to door schedule for locations.

2.5 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.

2.6 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 Polyester Glazing film:

.1 Acceptable Manufacturer: 3M
.2 Acceptable Product: 3M Fasara Glass Finishes – Milky White
.3 Locations: Refer to window schedule for locations.

.8 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 ¼ 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 ¼ 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 INSTALLATION: GLAZING FILM

.1 Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.

.2 Place without air bubbles, creases or visible distortion.

.3 Fit tight to glass perimeter with razor cut edge.

3.9 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 manufacture's instructions.

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

3.10 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

Part 1 General

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB).

.1 CAN/CGSB - 12.1-M Tempered or Laminated Safety Glass

.2 CAN/CGSB - 12.2-M Flat Clear Sheet Glass

.3 CAN/CGSB - 12.3-M Flat Clear Flat Glass

.2 Glass Association of North America

.1 GANA Glazing Manual

.2 GANA 89-1-6 Specification for Environmental Durability of Fully Tempered or Heat-Strengthened Spandrel Glass with Applied Opacifiers

1.2 DEFINITIONS

.1 Monolithic glass & coating orientation

.1 Surface 1: Exterior surface (surface facing outdoors)

.2 Surface 2: Interior surface (surface facing indoors)

.2 Insulated Glass Unit & coating orientation

.1 Surface 1: Exterior surface of outer lite (surface facing outdoors of outboard lite)

.2 Surface 2: Interior surface of outer lite (surface facing indoors of outboard lite)

.3 Surface 3: Exterior surface of inner lite (surface facing outboard lite)

.4 Surface 4: Interior surface of inner lite (surface facing indoors of inboard lite)

.3 OPACI-COAT-300® Spandrel glass: Glass that has been rendered opaque with a water-based silicone elastomeric spandrel coating for non-vision applications.

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.

.5 Submit 300mm x 300mm samples of each glass type indicated, with each color required for the spandrel glass. Contract Administrator approval must be sought before manufacture.

.6 Glazing Subcontractor shall obtain compatibility reports from component manufacturers (such as opacifier, sealants, gaskets, setting blocks, etc), ensuring that the glazing materials were tested for compatibility.

.7 Glazing Subcontractor shall provide test reports showing that the applied opacifier meets durability requirements as shown in GANA 89-1-6 Specification for Environmental

Durability of Fully Tempered or Heat- Strengthened Spandrel Glass with Applied Opacifier, in total without omitted sections.

1.4 QUALITY ASSURANCE

.1 A. Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section or referenced standards.

.1 GANA Publications
.2 AAMA Publications
.3 IGMA/IGMAC Publications

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Comply with manufacturer's instructions for receiving handling, storing and protecting glass & glazing materials.

.2 Delivery: Deliver materials in manufacturer's original containers with identification labels intact.

.3 Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperatures and humidity conditions recommended by the manufacturer.

.4 Exercise exceptional care to prevent edge damage to glass, and damage/deterioration to coating on glass.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.

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.

1.8 WARRANTY

.1 The opacifying coating will not lose adhesion, flake, peel, chip or develop any noticeable color change for a period of ten (10) years from date of installation.

Part 2 Products

2.1 MATERIALS

.1 Monolithic OPACI-COAT-300® Spandrel Glass.

.1 1. The OPACI-COAT-300® opacifying coating shall have a minimum thickness of 4-5 mils dry (0.10 mm to .127 mm). For fallout protection a minimum thickness of 6.50 mils (0.17mm) dry.

.2 Only Approved Factory Fabricators (AFF) are allowed to produce the OPACI-COAT-300® silicone spandrel, as AFF glass fabricators are certified and trained by ICD in the application and manufacture of the spandrel glass.

.3 For a list of Approved Factory Fabricators, please contact ICD at 1.360.546.2286 or www.icdcoatings.com.

.4 Approved manufacturers of OPACI-COAT-300®:

.1 ICD High Performance Coatings, 13911 NW 3rd CT, Vancouver, WA 98685, USA. SEALED INSULATING GLASS

.2 Glazing type (refer to window schedule for locations) :

.1 SPA 1: Float Glass to CAN/CGSB-12.3, Glazing quality, 6mm thick

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

.3 Spandrel Coating Orientation: Surface #2

.4 Colours: Exact OPACI-COAT-300® Color Name and Numbers to be determined by Contract Administrator.

.1 Colour A: To be yellow-green

.2 Colour B: To be light green

.5 Requirements:

.1 GANA 89-1-6 Specification for Environmental Durability of Fully Tempered or Heat-Strengthened Spandrel Glass with Applied Opacifiers, and with other requirements as specified. Tempered or Heat-Strengthened Spandrel Glass with Applied

Part 3 Execution

3.1 PREPARATION

.1 Protection

.1 Handle and store product according to GANA Glazing Manual recommendations as well as the recommendations of the manufacturer and fabricator.

.2 Surface Preparation

.1 Clean and prepare glazing channels and other framing members to receive glass.

3.2 INSTALLATION

.1 Cut all glazing sheets square, assure edges are smooth and free of chips and hairline cracks.

.2 Cut glazing sheets to field measurements, allow for expansion clearances as recommended by manufacturer of materials.

.3 Use setting blocks at quarter points for all glazing. Position setting blocks at bottom quarter points.

.4 Use spacers to 3.18mm clearances between sheets, rabbet sides.

.5 Strip surplus glazing materials from both sides of glass at an angle, do not undercut.

.6 Use non-acidic sealants. Refer to manufacturer for a complete list of approved sealants and glazing material.

.7 Comply with manufacturer's written instructions and installation requirements.

3.3 CLEANING

.1 Clean excess sealant or compound from glass and framing members immediately after application, using solvents or cleaners recommended by manufacturers.

.2 Glass to be cleaned according to:

.1 GANA Glass Informational Bulletin GANA 01-0300 - Proper Procedures for Cleaning Architectural Glass Products.

.2 GANA Glass Informational Bulletin GANA TD-02-0402 - Heat-Treated Glass Surfaces Are Different.

.3 Do not use scrapers or other metal tools to clean glass.

.4 If coating becomes damaged by visible scratches, field repairs can be made to the coating, please contact manufacturer for specific instructions.

3.4 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