LEGEND

Door Materials HM Hollow Metal AL Aluminum HMI Hollow Metal Insulated SC Solid Core Wood	**Frame Materials** PS Pressed Steel PST Pressed Steel Thermally Broken
Door Types D1, D2, etc. Hollow metal, See drawing A18	**Finishes** PT Painted
Glazing WG Wired Glass Laminated	**Frame Types** F1, F2, etc. HM Frames for Doors
Fire Ratings of Closures U Unrated separation; a fire separation with no fire resistance rating. 45 45 minute fire rated separation	**Jamb Details** J1, J2, etc. Jamb installation types, see drawings.
General Notes: 1. Door sizes in HM frames are rebate dimension. 2. See Drawing A18 for Door, Frame and Jamb Types. 3. Door and door Hardware to be provided by bin cooler supplier.	

No.	Size	DOOR			FRAME					Fire Rating	Glass	Hdware #	Schedule Remarks
		Type	Mat'l	Finish	Type	Mat'l	Finish	Throat	Jamb Detail				
101.1	914 x 2135	D2	HMI	PT	F2	PST	PT	225	4/A12 5/A12	-	WG	H1	
101.2	Not Used	-	-	-	-	-	-	-	-	-	-	-	
101.3	914 x 2135	D2	HMI	PT	F2	PST	PT	225	3/A12	-	WG	H2	
101.4	880 x 880	D3	HMI	PT	F3	PST	PT	225	7/A12	-	-	H3	
102.1	914 x 2135	D2	HM	PT	S1	PS	PT	190	-	-	WG	H4	
102.2	914 x 2135	D2	HMI	PT	S2	PST	PT	225	3/A12	-	WG	H5	
103.1	914 x 2135	D1	SC	PT	F1	PS	PT	190	-	-	-	H6	
104.1	914 x 2135	D1	SC	PT	F1	PS	PT	190	-	-	-	H6	
105.1	914 x 2135	D1	HM	PT	F1	PS	PT	190	-	-	-	H7	
106.1	914 x 2135	D1	-	-	-	-	-	-					3
107.1	914 x 2135	D1	HM	PT	F1	PS	PT	190	-	45	-	H8	
108.1	914 x 2135	DI	HM	PT	F1	PS	PT	190	-	45	-	H8	
109.1	914 x 2135	D1	HM	PT	F1	PS	PT	190	-	45	-	H9	

END

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 08 14 16 - Flush Wood Doors.

.2 Section 08 71 00 - Door Hardware.

.3 Section 08 80 50 - Glazing.

.4 Section 09 21 16 - Gypsum Board Assemblies.

.5 Divisions 26 and 28 - Electrical for wiring.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
.1 ASTM A 653/A 653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
.2 ASTM B 29-03, Standard Specification for Refined Lead.
.3 ASTM B 749-03, Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 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).

.4 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.

.5 National Fire Protection Association (NFPA)
.1 NFPA 80-2010, Standard for Fire Doors and Other Protective Openings.
.2 NFPA 252-12, Standard Methods of Fire Tests of Door Assemblies.

1.2 REFERENCES (Cont'd)

.6 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.

.7 Underwriters' Laboratories of Canada (ULC)
.1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
.2 CAN/ULC-S702-09, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
.3 CAN/ULC-S704-03, 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 Requirements:

.1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
.2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
.3 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 NFPA 252 for ratings specified or indicated.
.4 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104, ASTM E 152 or NFPA 252 and listed by nationally recognized agency having factory inspection services.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide product data: in accordance with Section 01 33 00 - Submittal Procedures.

.3 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.
.1 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing fire rating finishes.
.2 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
.3 Submit test and engineering data, and installation instructions.

.4 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.

.5 Submit one 300 x 300 mm corner sample of each type of frame.

1.5 DELIVERY, STORAGE AND HANDLING

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

.2 Waste Management and Disposal:
.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Hot dipped galvanized steel sheet: to ASTM A 653M, 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 A 653M, ZF75.

2.2 DOOR CORE MATERIALS

.1 Honeycomb construction:
.1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m^3 minimum sanded to required thickness.

.2 Stiffened: face sheets laminated and welded, honeycomb or insulated core.
.1 Fibreglass: to CAN/ULC-S702, semi-rigid Type, density 24 kg/m^3.
.1 Expanded polystyrene: CAN/ULC-S701, density 16 to 32 kg/m^3.

2.3 ADHESIVES

.1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

.2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

2.4 PRIMER

.1 Touch-up prime CAN/CGSB-1.181.

2.5 PAINT

.1 Field paint steel doors and frames in accordance with Sections 09 91 23 - Interior Painting, 09 91 13 - Exterior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

2.6 ACCESSORIES

.1 Door silencers: single stud rubber/neoprene type.

.2 Exterior and interior 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 Metallic paste filler: to manufacturer's standard.

.5 Fire labels: metal rivited.

.6 Sealant: as per Section 07 92 00.

.7 Glazing: as per Section 08 80 50.

.8 Make provisions for glazing as indicated and provide necessary glazing stops.
.1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.
.2 Design exterior glazing stops to be tamperproof.

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: 1.6mm welded, thermally broken type construction.

.4 Interior frames: 1.6 mm welded type 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.

2.7 FRAMES FABRICATION GENERAL (Cont'd)

.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.

2.8 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.3 Provide 2 anchors for rebate opening heights up to 1520 mm (60") and 1 additional anchor for each additional 760 mm (30") of height or fraction thereof.

.4 Locate anchors for frames in existing openings not more than 150 mm (6") from top and bottom of each jambs and intermediate at 660 mm (26") on centre maximum.

2.9 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59.

.2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.

.3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.

.4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.

2.9 FRAMES: WELDED TYPE (Cont'd)

.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.

.7 Fabricate frame products for openings in sections, splice joints for field assembly.

2.10 DOOR FABRICATION GENERAL

.1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.

.2 Exterior doors: insulated hollow steel construction. Interior doors: honeycomb construction.

.3 Fabricate doors with longitudinal edges welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.

.4 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.

.5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

.6 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.

.7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

.8 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104 or 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.

2.10 DOOR FABRICATION GENERAL (Cont'd)

.9 Manufacturer's nameplates on doors are not permitted.

2.11 DOORS: HONEYCOMB CORE CONSTRUCTION

.1 Form face sheets for exterior doors from 1.6 mm sheet steel with polystyrene polyurethane core laminated under pressure to face sheets.

.2 Form face sheets for interior doors from 1.6 mm sheet steel with honeycomb core laminated under pressure to face sheets.

2.12 HOLLOW STEEL CONSTRUCTION

.1 Form face sheets for exterior doors from 1.6 mm sheet steel.

.2 Form face sheets for interior doors from 1.6 mm sheet steel.

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 polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

.3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.

.4 Apply insulation.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION GENERAL

.1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise and to the requirements of all authorities having jurisdiction.

.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 (47") wide. Remove temporary spreaders after frames are built-in.

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

.5 Caulk perimeter of frames between frame and adjacent material.

.6 Maintain continuity of air barrier and vapour retarder.

3.4 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.

.2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
.1 Hinge side: 1.0 mm.
.2 Latchside and head: 1.5 mm.
.3 Finished floor, top of carpet noncombustible sill and thresholds: 13 mm (1/2").

.3 Adjust operable parts for correct function.

.4 Install louvres.

3.5 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.6 GLAZING

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

END

PART 1 - GENERAL

1.1 RELATED WORK

.1 Submittal Procedures: Section 01 33 00

.2 Contract Closeout: Section 01 78 00

.3 Common Product Requirements: Section 01 61 00

.4 Gypsum Board Assemblies: Section 09 21 16

.5 Duct Accessories: Section 23 33 00

.6 Plumbing Specialties and Accessories: Section 22 42 01

1.2 SHOP DRAWINGS

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

.2 Submit catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.

1.3 SAMPLES

.1 Submit samples in accordance with Section 01 33 00.

.2 Submit one sample of each type of hand entry access door.

.3 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.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00.

.2 Apply temporary protective coating to finished surfaces. Remove coating after erection. Do not use

1.5 DELIVERY, STORAGE AND HANDLING (Cont'd)

.2 (Cont'd) 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 ACCESS DOORS

.1 Sizes: Except as indicated otherwise, to be minimum sizes as follows:
.1 For body entry: 600 x 600 mm.
.2 For hand entry: 300 x 300 mm.
.3 Access doors to be sized large enough to serve intended purpose.

.2 Construction:
.1 Galvanized steel. Rounded safety corners, concealed hinges, screwdriver latch, anchor straps, able to open 180. Provide fire-rated access doors where penetrating fire-rated construction.

.3 Materials
.1 Tiled or marble surfaces and other special areas: Stainless steel with brushed satin or polished finish as directed by Departmental Representative.
.2 Other areas: galvanized steel.
.3 Acceptable Manufacturers: Acudor; Buensod; Lettage; Zurn.

2.2 EXCLUSIONS

.1 Lay in tile ceilings: use unobtrusive identification locators.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Installation:
.1 Drywall surfaces: to Section 09 21 16.
.2 Where installed in fire separations, maintain fire rating integrity.

3.2 LOCATION

.1 Location: Ensure that equipment is within view and accessible for operating, inspecting, adjusting, servicing without using special tools.

3.2 LOCATION (Cont'd)

.2 Provide adequately sized galvanized steel access doors for all devices requiring inspection, maintenance or cleaning.

.3 Access doors or panels shall be installed wherever valves, water hammer arresters, plumbing cleanouts, trap primers, drain points, automatic and manual air vents, controllers, controlled devices, volume dampers, duct access doors and panels and where any equipment and system components requiring servicing, inspection or adjusting etc. are not accessible. Where equipment may be required to be removed for repair or servicing, adequate access must be provided.

.4 Access doors shall be located before and after coils, filters, fans, automatic dampers, at fire dampers, fresh air and exhaust air plenums, bottoms of risers, and where required elsewhere.

.5 Access to space above lay-in tile ceilings shall be by removal of lay-in tiles.

.6 Doors shall open greater than 90 degrees, have concealed hangers, anchor straps and screwdriver cam locks.

.7 Doors in block walls or in tile shall be sized to suit masonry unit module.

.8 In fire rated walls and ceilings, access doors and panels shall be fire rated.

.9 Provide stainless steel access doors for tile, marble or terrazzo surfaces.

.10 Access doors shall be tight fitting with sealing gaskets and suitable quick fastening locking devices. Insulate access doors where they are installed in insulated ductwork or plenums.

.11 Gasketted panels (patches) minimum size 30mm x 300mm and fabricated from the same material as the duct and fastened with sheet metal screws are permitted if the access is for cleaning only; otherwise access doors shall be provided.

.12 Duct coverings shall be interrupted at all duct access doors to allow for easy opening.

END

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 05 50 00 - Metal Fabrications.

.2 Section 09 91 13 - Exterior Painting.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)
- .1 ASTM A216/A216M-08 - Specifications for sectional overhead type doors.
- .2 ASTM A229/A229M-99(R2005) - Steel wire, oil tempered for mechanical springs.
- .3 ASTM A 366M-97e1, Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
- .4 ASTM A 1008/A 1008M-09a, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High Strength Low Alloy and High- Strength Low-Alloy with Improved Formability.
- .5 ASTM D 523-08, Test Method for Specular Gloss.
- .6 ASTM D 822-01(2006), Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon_Arc Light and Water Exposure Apparatus.
- .7 ASTM D1929-96(2001)e1 - Ignition temperature test to determine flash and ignition temperature of foamed plastics.
- .8 ASTM E84-10 - Tunnel test for flame spread and smoke developed index.

.2 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-1.105-M91, Quick-Drying Primer.
- .2 CAN/CGSB-1.213-2004, Etch Primer (Pretreatment Coating) for Steel and Aluminum.
- .3 CAN/CGSB-1.181-99, Coating, Zinc-Rich, Organic, Ready Mixed.

.3 Canadian Standards Association (CSA International).
- .1 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.4 Environmental Choice Program (ECP).
- .1 CCD-016-97 (R2005), Thermal Insulation.
- .2 CCD-047a-98, Paints, Surface Coatings.

1.2 REFERENCES (Cont'd)

.4 (Cont'd)
.3 CCD-048-95, Recycled Water-Borne Surface Coatings

1.3 SYSTEM DESCRIPTION

.1 Design Requirements.

.1 Design exterior door assembly to withstand windload of 1.4 kPa with a maximum horizontal deflection of 1/240 of opening width.
.2 Design door panel assemblies with thermal insulation factor 2.82 RSI (R 16.0).
.3 Design door assembly to withstand minimum 100,000 cycles per annum, and 20 year total life cycle.

.2 System Description:
.1 Sectional overhead doors and all accessories and components required for complete and secure installations manufactured as a system from one manufacturer.
.2 Mounting: continuous angle mounting for steel jambs.
.3 Operation: Industrial Duty Jack shaft operator with electric operation.
.4 Sectional overhead doors shall be tested and labelled certifying compliance with ASTM D1929-96(2001)e1 and ASTM E84-10 standards.

1.4 SUBMITTALS

.1 Product Data:
.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
.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 sizes, service rating, types, materials, operating mechanisms, glazing locations and details, hardware and

1.4 SUBMITTALS (Cont'd)

.2 (Cont'd)
.2 (Cont'd)
accessories, required clearances and electrical connections.

.3 Manufacturer's Instructions:
.1 Submit manufacturer's installation instructions.

.4 Manufacturers' Field Reports: submit copies of manufacturers field reports.

1.5 CLOSEOUT SUBMITTALS

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

1.6 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management System, and with Waste Reduction Workplan.

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

.3 Dispose of corrugated cardboard, polystyrene, and plastic packaging material for recycling in accordance with site waste management program.

1.7 WASTE MANAGEMENT AND DISPOSAL (Cont'd)

.4 Divert unused metal and wiring materials from landfill to metal recycling facility approved by Project Manager.

.5 Divert unused paint material from landfill to official hazardous material collections site approved by Project Manager.

.6 Do not dispose of unused paint materials into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

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

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Galvanized steel sheet: commercial quality Z275 zinc coating.

.2 Steel sheet: commercial quality to ASTM A 1008/A 1008M-09a unexposed (U), with semi-gloss finish.

.3 Primer: to CAN/CGSB-1.105-M91 for steel and CAN/CGSB-1.181-99, for galvanized steel surfaces.

.4 Insulation: to meet design requirements, foamed-in-place polyurethane.

.5 Glazing: double glazed insulating units to CAN/CGSB-12.8-97; 2 panes of 3 mm glass, 12 mm overall thickness:
.1 Tempered outer lite, clear, acid etch on #2 surface;
.2 Tempered inner lite; Low "E" on #3 surface.
.3 6 mm high performance thermal spacer:
.1 Superspacer
.2 Intercept
.4 Acceptable Product: identical to product provided by Contractor for Section 08 44 13:
.1 PPG Solarban 60 on Starphire
.2 Prelco Energy Advantage
.3 AGC Flat Glass TiAC-28

2.1 MATERIALS (Cont'd)

.6 Cable: multi-strand galvanized steel aircraft cable.

2.2 DOORS

.1 Fabricate 44 mm thick insulated flush panel doors of roll formed steel sections. Door sections shall be of steel/polyurethane/steel sandwich type construction with thermal break and calculated materials "R" - value of 16.0, in accordance with industry guidelines.

.2 Exterior skin: structural quality, hot dip galvanized steel 1.0 mm (20 gauge), minimum embossing, factory-finished with baked-on polyester primer and finish coat.

.3 Interior skin: structural quality, hot dip galvanized steel 1.0 mm (20 gauge) factory finished with baked-on polyester primer and finish coat.

.4 Ends of section shall be sealed with 2 mm (14 gauge) hot dipped galvanized steel full length/height double end caps.

.5 Reinforcement: provide galvanized steel backup plates at all hardware attachment locations.

.6 Insulation: cavity shall be filled with formed-in-place CFC free polyurethane core separated by a factory extruded thermal break.

.7 Insulated sections shall be tested by an I.C.B.O certified laboratory in accordance with ASTM E8/E8M-09 and shall achieve a flame spread index of 10 or less and a smoke developed index of 210 or less.

.8 Insulation material shall be tested by an I.C.B.O certified laboratory in accordance with ASTM D-1929 and shall achieve a minimum Flash Ignition temperature of 510°C.

.9 All sectional metal doors to be 3300mm wide x 3000mm high clear opening.

.10 Full vision sections: anodized aluminum frames, colour: silver. Sizes and number of vision sections as indicated.

2.3 HEAVY DUTY INDUSTRIAL HARDWARE

.1 Track: standard lift hardware with 75 mm size, 2.75 mm (12 gauge) core thickness, galvanized steel track with weather tight closure.

.2 Track Supports: 2.75 mm (12 gauge) core thickness continuous galvanized steel angle track supports.

.3 Spring counterbalance: heavy duty oil-tempered torsion spring with manufacturer's standard brackets. Spring torsion to be 100,000 cycles.
.1 Drum: 200 mm diameter die cast aluminum.
.2 Shaft: 32 mm diameter solid steel.

.4 Weighted counterbalance: if required to meet spring torsion of 100,000 cycles, provide weighted counterbalance system.
.1 Counterweight: cast iron or steel, suspended from chain or cable with spring damper to prevent jarring.
.2 Enclosure: provide 6mm painted steel enclosure for counterweight mechanism to height of maximum rise of counterweight, enclosure to be removeable for inspection or repair.

.5 Rollers: long-stem, full floating grease packed hardened steel, ball bearing 75 mm diameter solid steel tire.

.6 Roller brackets: double roller brackets, adjustable, minimum 3.1 mm (11 gauge) galvanized steel.

.7 Hinges: heavy duty, 2.75 mm (12 gauge) thick, galvanized.

.8 Cable: 6 mm diameter galvanized steel aircraft cable.

2.4 ACCESSORIES

.1 Overhead horizontal track and operator supports: galvanized steel, type and size to suit installation.

.2 Bumper springs.

2.4 ACCESSORIES (Cont'd)

.3 Handles.
.1 Flat bar door latch with night latch and electric interlock switch.

.4 Two horizontal sliding lock bolts on interior.

.5 Weather stripping.
.1 Sills: double contact full width extruded neoprene weatherstrip.
.2 Jambs and head: extruded aluminum and arctic grade vinyl weatherstrip to manufacturer's standard.
.3 Between panel sections: factory applied co-polymer joint seals.

.6 Finish ferrous hardware items with minimum zinc coating of 300 g/m^2 to CAN/CSA-G164-M92(R2003).

.7 Track guards: 5mm thick formed sheet 2500mm high track guards. Hot dipped galvanized. Paint yellow. At all overhead door tracks. Provide steel bracing and support for track guards as required.

.8 Install a door freefall safety mechanism on each overhead door.

2.5 PREFINISHED STEEL SHEET

.1 Prefinished steel with factory applied silicone modified polyester.
.1 Class F2S.
.2 Colour selected by Project Manager from manufacturer's standard range.
.3 Specular gloss: 30 units +/-5 in accordance with ASTM D 523-08.
.4 Coating thickness: not less than 25 micrometres.
.5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D 822-01(2006) as follows:
.1 Outdoor exposure period 1000 hours.
.2 Humidity resistance exposure period 1000 hours.

2.6 ELECTRICAL OPERATOR

.1 Electrical jack shaft type operator.

.2 Electrical motors, controller units, remote pushbutton stations, relays and other electrical components: to CSA approval with CSA enclosure type 3R per CSA C22.1HB-09.

.3 Power supply: 575 V, 3 phase, 60 Hz.
.1 Motor: 1 horsepower.

.4 Controller units with integral motor reversing starter, solenoid operated brakes heater elements for overload protection, including pushbuttons and control relays as applicable.

.5 Operation: Remote pushbutton stations: surface mounted on steel plate or block as indicated on drawings, with "OPEN-STOP- CLOSE" designations on pushbuttons in English and French.

.6 Safety switch: combination roll rubber with limit switches for full length of bottom rail of bottom section of door, to reverse door to open position when coming in contact with object on closing cycle.

.7 Door position switch: for EMCS control of unit heater equipment. Switch to indicate open/close door position by change of contact status. Switch to have 1 N.O. - 1 N.C. dry contacts rated minimum 5 A, 48 V DC.

.8 For jack shaft operators:
.1 Provide floor level disconnect device to allow for manual operation in event of power failure.
.2 Equip Operator with:
.1 Electrical interlock switch to disconnect power to operator when in manual operation.
.2 Built-in chain hoist for manual operation in event of power failure.

.9 Door speed: 300 mm per second.

.10 Control transformer: for 24 VAC control voltage.

.11 Mounting brackets: galvanized steel, size and gauge to suit conditions. Provide galvanized

2.6 ELECTRICAL OPERATOR (Cont'd)

.11 Mounting brackets:(Cont'd)
steel plate suppport for operators. Provide galvanized steel supports for door springs.

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 door and hardware in accordance with manufacturer's instructions. Installation shall be by a trained and authorized representative of the door manufacturer.

.2 Rigidly support rail and operator and secure to supporting structure.

.3 Verify that existing conditions are ready to receive sectional overhead door work.

.4 Weld track mounting brackets and torsion spring mounting brackets to building structure.

.5 Beginning of sectional overhead door work means acceptance of existing conditions.

.6 Install door complete with necessary hardware, jamb and head mould strips, anchors, inserts, hangers and equipment supports in accordance with final shop drawings and manufacturer's instructions.

.7 Fit, align and adjust sectional overhead door assemblies level and plumb for smooth operation.

.8 Upon completion of final installation lubricate, test and adjust door to operate easily, free from warp, twist or distortion and fitting for entire perimeter.

.9 Adjust weatherstripping to form a weathertight seal.

3.3 FIELD QUALITY CONTROL

.1 Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its products, and submit written reports in acceptable format to verify compliance of Work with Contract.

.2 Manufacturer's field services: provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits to review Work at stages listed:
.1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.
.2 Twice during progress of Work at 25% and 60% complete.
.3 Upon completion of Work, after cleaning is carried out.

.4 Obtain written reports within five days of review and submit to Departmental Representative.

3.4 CLEANING

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

END

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 04 05 00 - Common Work Results for Masonry.

.2 Section 05 12 23 - Structural Steel.

.3 Section 07 26 00 - Sheet Membrane Vapour Air/Vapour Barriers.

.4 Section 07 46 13 - Preformed Metal Siding System.

.5 Section 07 62 00 - Sheet Metal Flashing and Trim.

.6 Section 07 92 00 Joint Sealing.

1.2 REFERENCES

.1 Aluminum Association Designation System For Aluminum Finishes (AA) 2000:
.1 DAF 45 2003, Designation System For Aluminum Finishes.

.2 Architectural Aluminum Manufacturers Association (AAMA)
.1 AAMA CW DG 1 96, Aluminum Curtain Wall Design Guide Manual.
.2 AAMA CW 10 97, Care and Handling of Architectural Aluminum From Shop to Site.
.3 AAMA CW 11 85, Design Windloads for Buildings and Boundary Layer Wind Tunnel Testing.
.4 AAMA 501-94, Methods of Test for Exterior Walls.

.3 American Society for Testing and Materials International, (ASTM).
.1 ASTM A36/A36M 08, Specification for Carbon Structural Steel.
.2 ASTM A123/A123M 08, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
.3 ASTM A167 99(2004), Specification for Stainless and Heat Resisting Chromium Nickel Steel Plate, Sheet, and Strip.
.4 ASTM A653/A653M 08, Standard Specification for Steel Sheet, Zinc Coated

1.2 REFERENCES (Cont'd)

.3 (Cont'd)

.4 (Cont'd)
(Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.

.5 ASTM B209 07, Specification for Aluminum and Aluminum Alloy Sheet and Plate.

.6 ASTM B221 08, 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(2009), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.10 ASTM E1105 00(2008), 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 Type Paint.

.2 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.

.3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.

.4 CAN/CGSB-12.8-97, Insulating glass Units.

.5 CAN/CGSB-12.9-M91, Spandrel Glass CAN/CGSB 12.20 M89, Structural Design of Glass for Buildings.

.6 CGSB-79.1-M91, Insect Screens.

.5 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 CSA-G40.20/G40.21 04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.

1.2 REFERENCES (Cont'd)

.5 (Cont'd)
.3 CAN/CSA G164 M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
.4 CSA S136 07, North American Specification for the Design of Cold-Formed Steel Structural Members.
.5 CAN3-S157 05, Strength Design in Aluminum. CSA W59.2 M1991(R2008), Welded Aluminum Construction.

.6 Society for Protective Coatings (SSPC).
.1 SSPC Paint 20 Zinc Rich Coating.
.2 SSPC Paint 25 Alkyd, Zinc Oxide Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.

1.3 SYSTEM DESCRIPTION

.1 Vertical glazed aluminum curtain wall system and aluminum windows includes thermally broken tubular aluminum sections with self supporting and supplementary support framing, shop fabricated, factory prefinished, vision glass, soffits and ceilings and related backpans, related flashings, anchorage and attachment devices.

.2 Assembled system to permit re glazing of individual glass panel units without requiring removal of structural mullion sections.

.3 This section includes all work including air/vapour barrier connections, expanded foam at perimeter of frames, sealants, insulation, fasteners, z-girts and composite panels.

1.4 PERFORMANCE REQUIREMENTS

.1 Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with NBC to a design pressure of 1.44 kPa. (30 lb/sf) as measured in accordance with AAMA CW11 and ASTM E 330.

.2 Design and size components to withstand seismic loads and sway displacement as calculated in accordance with NBC.

.3 Limit mullion deflection to L/175 with full recovery of glazing materials.

1.4 PERFORMANCE REQUIREMENTS (Cont'd)

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

.5 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 A mid span roof and floor edge deflection of 25mm.

.6 Limit air infiltration through assembly to 0.0003 m3/s/m2 of wall area, measured at a reference differential pressure across assembly of 75 Pa as measured in accordance with AAMA 501 and ASTM E 283.

.7 Vapour seal with interior atmospheric pressure of 25 mm sp, 22EC, 40% RH: No failure.

.8 Water leakage: none, when measured in accordance with AAMA 501, ASTM E 331 and ASTM E 1105.

.9 Systems to provide for expansion and contraction within all system components caused by a cycling temperature range of 110EC over a 12 hour period without causing detrimental affect to system components.

.10 Design windows and curtain wall on the Rain Screen Principle. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

.11 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound. Position thermal insulation on exterior surface of air/vapour barrier.

.12 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.

1.4 PERFORMANCE REQUIREMENTS (Cont'd)

.13 Design composite panels and soffits so that panels are secure, yet free floating to accommodate expansion and contraction and to allow panels to be replaced. Panels shall include hanging and attachment system for dry joint method of installation.

.14 Panel and soffit fabricator and installer to assume undivided responsibility for all components of the exterior panel system including, but not limited to, attachment to sub-construction, panel-to-panel joinery and joint seals associated with the panel system.

1.5 PRODUCT DATA

.1 Submit product data in accordance with Section 01 33 00 Submittal Procedures.

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

1.6 SHOP DRAWINGS

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

.2 Indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details and field welding required.

.3 Shop drawings to be stamped by a Professional Engineer licensed to practice in the Province of Nova Scotia.

1.7 SAMPLES

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

.2 Submit two samples illustrating prefinished aluminum surfaces, specified glass units, and composite panels. Glazing materials to illustrate edges and corners.

1.7 SAMPLES (Cont'd)

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

1.8 DESIGN DATA

.1 Submit design data in accordance with Section 01 33 00 Submittal Procedures.

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

1.9 MOCK UPS

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

.2 Provide full bay curtain wall mock up including intermediate mullions, sill muntin, vision glass units. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.

.3 Locate where directed.

.4 Allow 72 hours for inspection of mock up by Departmental Representative 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.

1.10 DELIVERY, STORAGE AND HANDLING

.1 Handle work of this section in accordance with AAMA CW 10.

.2 Protect prefinished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.11 ENVIRONMENTAL REQUIREMENTS

.1 Do not install sealants when ambient and surface temperature is less than 5EC.

.2 Maintain this minimum temperature during and after installation of sealants.

1.12 SEQUENCING

.1 Coordinate work of this section with installation of fire stopping, air/vapour barrier placement, flashing placement and other components or materials.

1.13 MAINTENANCE DATA

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

1.14 WASTE MANAGEMENT AND DISPOSAL

.1 Collect, separate and recycle all site generated waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management System.

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

.3 Unused or damaged glazing materials are not recycleable and must not be divcerted to municipal recycling programs.

.4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative .

.5 Divert unused caulking material from landfill to official hazardous material collections site approved by Departmental Representative

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

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Extruded aluminum: ASTM B 221M.

.2 Sheet aluminum: ASTM B 209M.

.3 Sheet steel: CAN/CSA S136M ASTM A 653/A 653M; galvanized to Z275 (G90).

.4 Steel sections: to CSA-G40.20/CSA G40.21M and ASTM A 36/A 36M; shaped to suit mullion sections.

.5 Fasteners: stainless steel.

.6 Bituminous paint: CAN/CGSB1.108, Type 1, without thinner.

.7 Sealants:
.1 Perimeter sealant: One-part urethane to CAN/CGSB-19.13.

2.2 COMPONENTS

.1 Mullion profile:
.1 Clerestory:
.1 64 mm wide × 102mm nominal dimension for vertical and horizontal back members, and as required to carry required loads. Internal reinforcement of shaped steel structural sections where required.
.2 Thermally broken with interior tubular section insulated from exterior pressure plate.
.3 Matching stops and pressure plate of sufficient size and strength to provide adequate bite on glass and infill panels.
.4 Drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system.
.5 Internal mullion baffles to eliminate "stack effect" air movement within internal spaces.
.6 Acceptable material:
.1 Kawneer 1600 Series.
.2 Alumicor 2500 Series.
.3 Oldcastle Reliance

2.2 COMPONENTS (Cont'd)

.2 Flashings, typical: 2.0mm thick break formed aluminum, finish to match curtain wall where exposed, secured with concealed fastening method.

.3 Exterior trims:
.1 Extruded aluminum snap on trim secured to pressure plate with concealed fastening method.
.2 19 mm deep as indicated × width of back members.

.4 Air/Vapour retarder transition membrane: refer to Section 07 26 00 for materials and installation procedures.

.5 Foamed-in-place insulation at perimeter of all frames: refer to Section 07 21 29 - Sprayed Insulation - Polyurethane Foam for materials and installation procedures.

2.3 SEALED INSULATING GLASS

.1 VG1: Vision Glass:
.1 Double glazed insulating units to CAN/CGSB 12.8; 2 panes of 6 mm glass, 25mm overall thickness:
.2 Clear float outer lite, Low "E" coating on #2 surface.
.3 Clear float inner lite.
.4 13 mm high performance thermal spacer: Inex Black.
.5 Inert gas fill: argon.
.6 Visible Light Transmittance: 62% average daylight.
.7 Solar Heat Gain Coefficient: 0.27.
.8 Shading Coefficient: 0.31.
.9 U Value (R Value):
.1 Winter 0.23 to 0.29
.2 Summer 0.20 to 0.27
.10 Acceptable Material:
.1 PPG Solarban 70XL on Starphire.
.2 Prelco Cardinal Low E 366. AGC Comfort TiAC-23.

.2 FG1: Frosted Glass:
.1 Double glazed insulating units to CAN/CGSB 12.8; 2 panes of 6 mm glass, 25mm overall thickness:
.2 Clear float outer lite, Low "E" coating on #2 surface.

2.3 SEALED INSULATING GLASS (Cont'd)

.2 FG1:(Cont'd)
.3 Clear float inner lite, acid etch on #3 surface.
.4 13 mm high performance thermal spacer: Inex Black.
.5 Inert gas fill: argon.
.6 Visible Light Transmittance: 62% average daylight.
.7 Solar Heat Gain Coefficient: 0.27.
.8 Shading Coefficient: 0.31.
.9 U Value (R value):
.1 Winter 0.23 to 0.29
.2 Summer 0.20 to 0.27
.10 Acceptable Material:
.1 PPG Solarban 70XL on Starphire.
.2 Prelco Cardinal Low E 366. AGC Comfort TiAC-23.

2.4 FABRICATION: CURTAIN WALL SYSTEMS

.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 Reinforce framing members for external imposed loads.

.6 Visible manufacturer's identification labels not permitted.

2.5 FABRICATION: WINDOWS

.1 Fabricate in accordance with CSA-A440/A440.1 from curtain wall framing material, supplemented as follows:

.2 Fabricate units square and true with a maximum tolerance of plus or minus 1.5mm for units with a diagonal measurement of 1800mm or less and plus or minus 3mm for units with a diagonal measurement over 1800mm.

2.5 FABRICATION: WINDOWS (Cont'd)

.3 Face dimensions detailed are maximum permissible sizes.

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

.5 Finish steel clips and reinforcement with 380 g/m2 zinc coating to CAN/CSA-G164.

.6 Visible manufacturer's identification labels not permitted.

2.6 FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.

.2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class I, Architectural Class II, and Protective and Decorative.

.3 Interior and exterior exposed aluminum surfaces where indicated as clear anodized: Clear Anodized to AA-A41, 7 mil thickness, Architectural Class I.

.4 Interior and exterior exposed aluminum surfaces, where indicated as black anodized: Black Anodized to Architectural Class I, 2 Stage Electrolytic Colour, Black, AA-M12 C22 A44, 7 mil minimum thickness.

.5 Concealed steel items: Primed with iron oxide paint.

.6 Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

2.7 SOURCE QUALITY CONTROL

.1 Perform work in accordance with CANS-A440-00.

.2 Manufacturer qualifications: company specializing in manufacturing the Products specified in this section with minimum five years documented experience.

2.7 SOURCE QUALITY CONTROL (Cont'd)

.3 Installer qualifications: company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.

.4 Design structural support framing components to CAN/CSA-S157 under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the Province of Ontario.

.5 Perform welding Work in accordance with CSA W59.2.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verify dimensions, tolerances, and method of attachment with other work.

.2 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

3.2 INSTALLATION

.1 Install windows, curtain wall and connected panel systems in accordance with manufacturer's instructions, engineering requirements and CSA-A440/A440.1.

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

.3 Provide all steel anchors, alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.

.4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

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

.6 Install sills, flashings and closures.

3.2 INSTALLATION (Cont'd)

.7 Install and seal perimeter air/vapour barrier materials to building air/vapour barrier.

.8 Foam insulate shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.9 Install glass to achieve performance criteria.

.10 Install perimeter sealant to achieve performance criteria, including backing materials, and installation criteria in accordance with Section 07 92 10 Joint Sealing.

3.3 SITE TOLERANCES

.1 Maximum variation from plumb: 1.5 mm/m non cumulative or 12 mm/30 m, whichever is less.

.2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.

.3 Maximum sealant space between curtain wall and adjacent construction: 13 mm.

3.4 CLEANING

.1 Remove protective material from prefinished panel 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.

3.5 PROTECTION

.1 Protect finished Work from damage.

3.6 SITE TOLERANCES

.1 Maximum variation from plumb: 1.5 mm/m non-cumulative or 12 mm/30 m, whichever is less.

3.6 SITE TOLERANCES (Cont'd)

.2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.

.3 Maximum sealant space between curtain wall and adjacent construction: 13 mm.

3.7 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.

3.8 PROTECTION

.1 Protct finished Work from damage.

END

PART 1 - GENERAL

1.1 RELATED SECTIONS

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

1.2 REFERENCES

.1 Standard hardware location dimensions in accordance with the Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers Association.

.2 ANSI/BHMA A156.2-2011, Bored and Preassembled Locks and Latches.

.3 ANSI/BHMA A156.1-2006, Butts and Hinges.

.4 ANSI/BHMA A156.3-2008, Exit Devices

.5 ANSI/BHMA A156.4-2008, Door Controls (Closers).

.6 ANSI/BHMA A156.5-2010, Auxiliary Locks and Associated Products

.7 ANSI/BHMA A156.6-2010, Architectural Door Trim.

.8 ANSI/BHMA A156.7-2009, Template Hinge Dimensions

.9 ANSI/BHMA A156.8-2010, Door Controls - Overhead Stops & Holders

.10 ANSI/BHMA A156.13-2005, Mortise Locks and Latches

.11 ANSI/BHMA A156.16-2008, Auxiliary Hardware.

.12 ANSI/BHMA A156.18-2006, Materials and Finishes

1.3 REQUIREMENTS REGULATORY AGENCIES

.1 Hardware for doors in fire separations and exit doors to be certified by ULI / ULC, a Canadian Certification Organization accredited by Standards Council of Canada.

1.4 SAMPLES

.1 When requested, submit samples of hardware items in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups.

.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.

1.5 HARDWARE SCHEDULE

.1 Submit contract hardware schedule using the standard DHI format for finish hardware schedules in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups.

.2 Clearly indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

1.6 MAINTENANCE DATA

.1 Provide operation and maintenance data for door closers, locksets, door holders and fire exit devices for incorporation into manual specified in Section 01730 - Operation and Maintenance Manual.

.2 Brief maintenance staff regarding proper care, cleaning and general maintenance of door hardware items.

1.7 MAINTENANCE MATERIALS

.1 Provide maintenance materials in accordance with Section 01720.

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

1.8 DELIVERY AND STORAGE

.1 Store finishing hardware in locked, clean and dry area.

.2 Package each item 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 HARDWARE ITEMS

.1 Use one manufacturer's products only for all similar product groups.

.2 The product numbers listed in the finish hardware schedule are to be used as the standard of acceptance for all items and are from the following group of manufacturers:
.1 Full Mortise Hinges: Ives, IRSS
.2 Continuous Hinges: Ives, IRSS Locksets,
.3 Latchsets, Deadlocks: Schlage, IRSS Exit
.4 Devices, Push Bars & Trim: Von Duprin, IRSS
.5 Door Closers: LCN, IRSS
.6 Floor/Wall Stops, Flush Bolts: Ives, IRSS
.7 Push Plates, Pulls & Kickplates: Gallery
.8 Specialty Hardware Thresholds, Sound Seal, Door Bottoms & Sweeps, Astragals & Weatherstripping: Draft Seal

.3 Other manufacturer's products will be considered provided they meet or exceed the performance, grade, quality, function, weight, design and finish of the specified product, and requests for approval are approved by the Departmental Representative in writing through issued addendums seven (7) days prior to tender closing.

2.2 DOOR HARDWARE

.1 Butts and hinges:
.1 Butts and continuous hinges: designated by letter and numeral identifiers, followed by size and finish, as listed in Hardware Schedule.
.2 Self-closing hinges and pivots: designated by letter and numeral identifiers as listed in Hardware Schedule.

2.2 DOOR HARDWARE (Cont'd)

.1 (Cont'd)

.3 Butt hinges on exterior doors and locked doors opening out shall have non removable pins (NRP) and doors equipped with door closers or in high traffic areas shall have ball bearing (BB) hinges.

.4 Continuous hinges shall be Heavy Duty (HD) aluminum geared-type, providing full height cover channels and nylon bearings at each separation for quiet, smooth and self-lubricating operation. Hinge material to be 6063-T6 aluminum with symmetrical hole patterns and a minimum of 32 bearings on each leaf, and be non-handed. Finish to be Clear Anodized Aluminum - 628.

.5 Specified product - butt hinges: Ives, IRSS Specified product - continuous hinges: Ives, IRSS

.2 Locks and latches:

.1 Mortise locks and latches: to ANSI/BHMA A156.13-2005, Series 1000 mortise lock, Grade 1 operational and Grade 1 security, ULC Listed for A label doors, with all functions available in one size case;

.2 Mortise locks shall have a full ¾" throw two-piece mechanical anti-friction latchbolt, a one-piece stainless steel 1" throw deadbolt, and handing of locks shall be reversible without disassembly of the lockcase.

.3 Lever Handles: Schlage # 03 Design, Round solid tubular design, forged, with full return to door.

.4 Escutcheons: Round design "A" as listed in schedule.

.5 Normal strikes: box type, lip projection not to exceed ¼" beyond jam.

.6 Cylinders: key to SFIC keyway and keying system.

.7 Finish to be Satin Stainless Steel 630.

.8 Specified products: Locksets - Schlage Lock

.3 Door Closers and Accessories:

.1 Door controls (closers): to meet or exceed ANSI A156.4-2008 Grade 1 requirements; to be heavy duty cast iron bodies with adjustable spring power and have separate valves for latching, closing and backcheck control. All closer arms to be forged steel with power adjustment arm bracket.

2.2 DOOR HARDWARE (Cont'd)

.3 Door Closers and Accessories:(Cont'd)
.2 All closers are to be non-sized to suit door and opening, and to have full covers with finish 689 or 696. Brackets, shoes, and plates are to be included for proper mounting of closers. All closers shall have minimum 10 - year warranty.
.3 Specified product: LCN

.4 Overhead stops/holders:
.1 Door controls (overhead stops/holders): to meet or exceed ANSI A156.8-2010 Grade 1 or Grade 2 requirements; to be heavy duty or medium duty slide track type wit h shock absorber spr ing and non-metal sl ide block and shock block, non-handed.
.2 To be Type 304 stainless steel material in stainless steel 630 finish.
.3 Specified product: Glynn-Johnson

.5 Auxiliary locks:
.1 To meet ANSI A156.5 -2001 requirements, to be heavy-duty and finished in 626.
.2 Cylinders: rim or mortise type, SFIC, finished to 626, for installation in deadlocks provided with special doors as listed in Hardware Schedule.
.3 Specified product: Schlage

.6 Architectural door trim:
.1 To meet ANSI A156.6-2005 requirements, type 304 stainless steel, finished 630.
.2 Door protection plates: kick plate type 304 stainless steel, 1.27 mm thick stainless steel, finished to 630.
.3 Specified product: Gallery Specialty Hardware.

.7 Auxiliary hardware:
.1 To meet ANSI A156.16-2002 Grade 1 requirements.
.2 Door stops, floor type or wall type, as listed in Hardware Schedule, Finish to be Satin Chrome 626.
.3 Specified product: Ives.

.8 Door bottom seal:
.1 Heavy duty, door seal of extruded aluminum frame and solid closed cell neoprene or nylon seal, surface mounted, adjustable, clear anodized finish.
.2 Specified product: Draft Seal.

2.2 DOOR HARDWARE (Cont'd)

.9 Thresholds:
.1 100/127mm wide x full width of door opening, extruded aluminum, serrated surface, with thermal break of rigid PVC, clear anodized finish.
.2 Specified product: Draft Seal

.10 Weatherstripping:
.1 Head and jamb seal:
.1 Extruded aluminum frame and solid closed cell neoprene insert, clear anodized finish.
.2 Adhesive backed santoprene material.
.3 Specified product: Draft Seal

.11 Astragal:
.1 Adjustable, compensating, extruded aluminum frame with pile insert, clear anodized finish.
.2 Specified product: Draft Seal

2.3 FASTENINGS

.1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.2 Exposed fastening devices to match finish of hardware.

.3 Use fasteners compatible with material through which they pass.

2.4 KEYING

.1 All mortise locksets, deadlocks, and rim or mortise cylinders are to have SFIC core cylinders to suit, and be keyed to an existing master key system. Doors, padlocks and cabinet locks to be keyed differently, keyed alike, keyed alike in groups, master keyed as directed. Prepare detailed keying schedule in conjunction with Departmental Representative.

.2 Provide three (3) change keys for every lock in this Contract.

.3 Provide six (6) master keys for each MK group. Provide one (1) Wall Mounted Key Cabinet and Dual key control system, 50 key

2.4 KEYING (Cont'd)

.3 (Cont'd)
capacity, to suit number of locks and cylinders on project.

PART 3 - EXECUTION

3.1 INSTALLATION INSTRUCTIONS

.1 Furnish metal door and frame manufacturer's with complete instructions and templates for preparation of their work to receive hardware.

.2 Furnish manufacturer's instructions for proper installation of all hardware components.

.3 Install hardware to standard hardware location dimensions in accordance with Canadian Imperial Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.

.4 Where door stop contacts door pulls, mount stop to strike bottom of pull.

3.2 SCHEDULE

.1 Set #H-1 Single Door #101.1:
.1 Each to have:
.1 1 Continuous Hinge Ives 112HD x 2110mm - 628
.2 1 Mortise Deadlock Schlage L460BDC x I/C core to suit - 626
.3 1 Dummy Push Bar Von Duprin 350 - US32D
.4 1 Dummy Trim Von Duprin 996L-DT-03 - 626
.5 1 Door Closer LCN 4111 EDA - 689
.6 1 Cush Shoe Support/Blade Stop Spacer 30/61 - 689
.7 1 Door Stop Gallery GSH270X - C26D
.8 1 Set Door Seal & Sweep - by door supplier

.2 Set #H-2 Single Door 101.3;
.1 Each to have:
.1 3 Hinges Ives 5BB1 114 x 101 NRP - C32D
.2 1 Exit Device Von Duprin 98L x 996L-03 - US32D
.3 1 Rim Cylinder Schlage SFIC 80-116 x I/C core to suit - 626

3.2 SCHEDULE (Cont'd)

.2 (Cont'd)
.1 Each to have:(Cont'd)
.4 1 Door Closer LCN 4111 SCUSH - 689
.5 1 Threshold Draftseal DS501TB x 914 - AL
.6 1 Set Door Seal Draftseal DS132C x 5184 - AL
.7 1 Door Sweep Draftseal DS138C x 914 - AL

.3 Set #H-3 Single Door 101.4;
.1 Each to have:
.1 4 Hinges Ives 5BB1 114 x 101 - C32D
.2 1 Set Constant Latching Flush Bolts Ives FB51P x Inact. Dr. - 32D
.3 1 Mortise Lockset Schlage L9480BDC - 03/A x I/C core to suit - 630
.4 1 Set Door Seal Draftseal DS118C x 6330 - AL
.5 1 Set Astragals Draftseal DS151/151P x 1335 - AL

.4 Set #H-4 Single Door #102.1;
.1 Each to have:
.1 3 Hinges Ives 5BB1 114 x 101 - C32D
.2 1 Mortise Lockset Schlage L9453BDC - 03/A x I/C core to suit - 630
.3 1 Door Closer LCN 4011 REG - 689
.4 1 Kickplate Gallery GSH80A- 254 x 864 - C32D
.5 1 Door Stop Gallery GSH209 - C26D
.6 1 Set Door Seal Draftseal DS132C x 5184 - AL
.7 1 Door Sweep Draftseal DS138C x 914 - AL

.5 Set #H-5 Single Doors # 102.2;
.1 Each to have:
.1 1 Continuous Hinge Ives 112HD x 2110mm - 628
.2 1 Mortise Deadlock Schlage L460BDC x I/C core to suit - 626
.3 1 Dummy Push Bar Von Duprin 350 - US32D
.4 1 Dummy Trim Von Duprin 996L-DT-03 - 626
.5 1 Door Closer LCN 4111 SCUSH - 689
.6 1 Cush Shoe Support/Blade Stop Spacer 30/61 - 689
.7 1 Set Door Seal & Sweep - by door supplier

3.2 SCHEDULE (Cont'd)

.6 Set #H-6 Single Door #103.1, 104.1;
.1 Each to have:
.1 3 Hinges Ives 5BB1 114 x 101 - C26D
.2 1 Mortise Privacy Lockset Schlage L9440S - 03/A x E/K - 630
.3 1 Door Closer LCN 4031 REG - 689
.4 1 Kickplate Gallery GSH80A- 254 x 864 - C32D
.5 1 Door Stop Gallery GSH240 - C26D
.6 1 Set Door Seal Draftseal DS130C x 5184 - AL
.7 1 Door Sweep Draftseal DS138C x 914 - AL

.7 Hardware Set #H-7 Single Door # 105.1;
.1 Each to have:
.1 3 Hinges Ives 5BB1 114 x 101 - C32D
.2 1 Mortise Lockset Schlage L9480BDC - 03/A x I/C core to suit - 630
.3 1 Door Closer LCN 4111 SCUSH - 689
.4 1 Kickplate Gallery GSH80A- 254 x 864 - C32D
.5 1 Set Door Seal Draftseal DS132C x 5184 - AL
.6 1 Door Sweep Draftseal DS138C x 914 - AL

.8 Hardware Set #H-8 Single Doors # 107.1, 108.1;
.1 Each to have:
.1 3 Hinges Ives 5BB1 114 x 101 - C32D
.2 1 Mortise Lockset Schlage L9080BDC - 03/A x I/C core to suit - 630
.3 1 Door Closer LCN 4111 SCUSH - 689
.4 1 Set Door Seal Draftseal DS132C x 5184 - AL
.5 1 Door Sweep Draftseal DS138C x 914 - AL

.9 Hardware Set #H-9 Single Door # 109.1;
.1 Each to have:
.1 3 Hinges Ives 5BB1 114 x 101 - C32D
.2 1 Mortise Lockset Schlage L9480BDC - 03/A x I/C core to suit - 630
.3 1 Door Closer LCN 4011 REG - 689
.4 1 Door Stop Gallery GSH209 - C26D
.5 1 Set Door Seal Draftseal DS132C x 5184 - AL
.6 1 Door Sweep Draftseal DS138C x 914 - AL

END

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 08 11 14 - Metal Doors and Frames: for double glazed units.

.2 Section 08 36 13 - Sectional Metal Doors: for all glazing associated with Section 08 36 13.

.3 Section 08 44 13 - Glazed Aluminum Curtain Walls and Windows: for all glazing associated with Section 08 44 13.

1.2 REFERENCES

.1 ASTM F 1233-08, Test Method for Security Glazing Materials and Systems.

.2 Canadian General Standards Board (CGSB).
.1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
.2 CAN/CGSB-12.3-M91, Flat Clear Float Glass.
.3 CAN/CGSB-12.5-M86, Mirrors, Slivered.
.4 CAN/CGSB-12.11-M90, Wired Safety Glass.

.3 Flat Glass Manufacturers Association (FGMA).
.1 FGMA Glazing Manual - 1997.

1.3 SUBMITTALS

.1 Closeout Submittals:
.1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management System.

.2 Divert metal cut-offs from landfill by disposal at nearest metal recycling facility.

.3 Divert uninstalled materials for reuse at nearest used building materials facility or similar type facility.

1.4 WASTE MANAGEMENT AND DISPOSAL (Cont'd)

.4 Divert unused caulking and sealant materials from landfill through disposal at special wastes depot.

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

.6 Remove form site and dispose of packaging materials at appropriate recycling facilities.

.7 Dispose of corrugated cardboard, polystyrene and plastic packaging materials in appropriate on-site bin for recycling in accordance with site waste management program.

PART 2 - PRODUCTS

2.1 MATERIALS: FLAT GLASS

.1 Float glass: to CAN/CGSB-12.3-M91, Glazing quality, 6 mm thick.

.2 Safety glass: to CAN/CGSB-12.1-M90, transparent, 6 mm thick.
.1 Type 2-tempered.
.2 Class B-float.

.3 Wired glass: to CAN/CGSB-12.11-M90, 6 mm thick, nominal.
.1 Type 1 polished wired glass, both sides.
.2 Wire mesh style 3-Square.

2.2 ACCESSORIES

.1 Setting blocks: Neoprene or EPDM, 80-90 Shore A durometer hardness to ASTM D 2240-05, to suit glazing method, glass light weight and area.

.2 Spacer shims: Neoprene, 50-60 Shore A durometer hardness to ASTM D 2240-05, 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 with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D 2240-05; coiled

2.2 ACCESSORIES (Cont'd)

.3 Glazing tape:(Cont'd)
.1 (Cont'd)
on release paper; 4.7 x 13 mm size; black colour.

.4 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour black.

PART 3 - EXECUTION

3.1 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.

3.2 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION: WET/DRY METHOD (TAPE AND SEALANT

.1 Perform work in accordance with FGMA Glazing Manual for glazing installation methods.

.2 Cut glazing tape to length and install against permanent stops, projecting 1.6 mm above sight line.

.3 Place setting blocks at 1/3 points, with edge block maximum 150 mm from corners.

.4 Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of light or unit.

.5 Install removable stops, with spacer shims inserted between glazing and applied stops at 600 mm intervals, 6 mm below sight line.

3.3 INSTALLATION: WET/DRY METHOD (TAPE AND SEALANT (Cont'd)

.6 Fill gaps between light and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.

.7 Trim protruding tape edge.

3.5 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking.

.3 Remove glazing materials from finish surfaces.

.4 Remove labels after work is complete.

.5 Clean glass using approved non-abrasive cleaner in accordance with manufacture's instructions.

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

3.6 PROTECTION OF FINISHED WORK

.1 After installation, mark light with an "X" by using removable plastic tape or paste.

END