Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 08 99 – Rough Carpentry for Minor Works

.2 Section 07 27 10 - Modified Bituminous Sheet Air Barrier.

.3 Section 07 92 00 – Sealant

.4 Section 08 71 00 – Door Hardware

.5 Section 08 80 50 – Glazing

.6 Section 08 71 00 – Finish Hardware

.7 Section 09 91 00 - Painting: Field painting of doors and frames

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.1 American National Standards Institute (ANSI)

.1 ANSI/SDI A250.8-2014, Specification for Standard Steel Doors and Frames (SDI-100)

.2 Canadian Standards Association (CSA International)

.1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.2 CSA-G40.20-04/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.3 CSA W59-13, Welded Steel Construction (Metal-Arc Welding).

.3 Canadian Steel Door Manufacturers' Association (CSDMA)

.1 CSDMA, Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2000.

.2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors and Frame Products, 2009.

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 Rated and non-rated doors and frames.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Provide product data: Indicate door and frame configurations and finishes, location of cut-outs for hardware reinforcement.

.3 Shop Drawings:

.1 Indicate frame elevations, frame section, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.

.2 Indicate door elevations, internal reinforcement, closure method, and cut-outs for glazing, and finishes.

.3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

1.5 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 MATERIALS

.1 Hot dipped galvanized steel sheet: to ASTM A653/A653M-15e1, Z275.

.2 Reinforcement channel: to CSA G40.20-04/G40.21-04(R2009),, Type 44W, coating designation to ASTM A653/A653M-15e1, Z275

2.2 DOOR CORE MATERIALS

.1 Expanded Polystyrene Core: Rigid extruded fire retardant, closed cell board, density 16 to 32 kg/m^3, thermal values RSI 1.0 minimum, Type 1, in accordance with CAN/ULC-S701-11.

.2 Honeycomb Core: Structural small cell 25.4 mm maximum kraft paper honeycomb, sanded to required thickness.

.3 Stiffened: face sheets welded, insulated core.

.4 Adhesive for cores and steel components: Manufacturer’s standard heat resistant.

2.3 ACCESSORIES

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

.2 Top and bottom caps: Inverted, (legs facing inward) continuously welded, weathertight steel channel.

.3 Joint Sealers: to Section 07 92 00, colour to match adjacent wall finish.

.4 Glazing Stops: Formed galvanized steel channel, minimum 16 mm high, accurately fitted, butted at corners and fastened to frame sections with counter-sunk tamper proof sheet metal screws.

.5 Glass: In accordance with Section 08 80 50; Types as indicated.

2.4 DOOR FABRICATION

.1 Interior Doors: Laminated honeycomb core construction.
- .1 Face sheet thickness: 1.52 mm.
- .2 Honeycomb core: laminated under pressure to face sheets.

.2 Exterior Doors: Polystyrene insulated and stiffened construction.
- .1 Face sheet thickness: 1.52 mm.

.3 Fabricate frames in accordance with CSDMA specifications and as follows:

- .1 Exterior Doors: Stiffened construction.
- .2 Maximum Duty doors: Level 4 and Physical Performance Level A in accordance with ANSI A250.8-2014.
- .3 Face sheet thickness: 1.7 mm
- .4 Reinforce doors with vertical stiffeners, securely welded to face sheets at 150 mm on centre maximum.
- .5 Fill voids between stiffeners of doors with polystyrene core.
- .6 Longitudinal Edges: Mechanically interlocked, continuously welded.
- .7 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.
- .8 Reinforce for surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware.
- .9 Top and Bottom Channels:
  - .1 Recessed, welded steel channels. (legs facing inward); Continuously welded.
- .10 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

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

2.1 FRAMES FABRICATION

.1 Interior Frames: Face sheet thickness: 1.91mm.
- .1 Welded type construction.

.2 Exterior Frames: Face sheet thickness 1.91 mm.
- .1 Welded type construction.

.3 Welding in accordance with CSA W59.

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

.5 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

.6 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.

.7 Reinforce frames wider than 1200 mm with roll formed steel channels fitted tightly into frame head, flush with top.

.8 Prepare frames for three (3) silencers.

.9 Provide appropriate anchorage to floor and wall construction.

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

.2 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

.3 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

2.2 FINISH

.1 Finish: Field painted in accordance with Section 09 91 00.

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 EXAMINATION

.1 Verify that opening sizes and tolerances are acceptable; check floor area within path of door swing for flatness.

.2 Verify doors and frames are correct size, swing, rating and opening number.

.3 Remove temporary shipping spreaders.

3.3 INSTALLATION GENERAL

.1 Install doors and frames to CSDMA Installation Guide.

3.4 INSTALLATION

.1 Install doors and frames to CSDMA.

.2 Frames:

.1 Coordinate with wall construction for anchor placement.

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

.3 Secure anchorages and connections to adjacent construction.

.4 Brace frames rigidly in position while building-in.

.5 Install wood spreaders at third points of frame rebate height to maintain frame width.

.6 Provide vertical support at centre of head for openings exceeding 1200 mm in width.

.7 Remove wood spreaders after frames have been built-in.

.8 Make allowance for deflection to ensure structural loads are not transmitted to frame product.

.9 Foam fill shim space at perimeter of frame and open back sections

.10 Caulk perimeter of door frame to Section 07 92 00.

.3 Doors:

.1 Install doors, and hardware specified in Section 08 71 00 in accordance with hardware templates and manufacturer's instructions.

.1 Adjust operable parts for correct clearances and function.

.2 Install door silencers and coordinate installation of glazing.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 07 21 00 - Building Insulation: Foam fill at frames.

.2 Section 07 27 00- Modified Bituminous Sheet Air Barrier:

.3 Section 07 92 00 - Joint Sealants: System perimeter sealant and back-up materials.

.4 Sections 08 11 16 – Aluminum Doors and Frames

.5 Section 08 71 00 - Door Hardware.

.6 Section 08 80 50 - Glazing

1.2 REFERENCES

.1 All References are to be the latest edition or latest edition adopted by the authorities having jurisdiction including all adopted addendums.

.2 AA (Aluminum Association)

.1 DAF-45 Designation System for Aluminum Finishes.

.3 AAMA (American Architectural Manufacturers' Association)

.1 AAMA CW-10-15, Care and Handling of Architectural Aluminum From Shop to Site.

.2 AAMA CW-11-85, Design Wind Loads and Boundary Layer Wind Tunnel Testing.

.3 AAMA 501-15, Methods of Test for Exterior Walls.

.4 AAMA 611-12, Voluntary Specifications for Anodized Architectural Aluminum.

.4 ASTM International

.1 ASTM A36/A36M-14, Standard Specification for Carbon Structural Steel.

.2 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.3 ASTM A653/A653M-15e1 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM B209-14, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.5 ASTM B221-14, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.6 ASTM E283-04(2012), Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.7 ASTM E283-04(2012), Standard 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/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.

.9 ASTM E331-00(2016), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.10 ASTM E413-16, Classification for Rating Sound Insulation.

.11 ASTM E1105-15, 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.

.12 ASTM E1748-95(2009), Standard Test Method for Evaluating the Engagement Between Windows and Insect Screens as an Integral System.

.5 CSA International

.1 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

.2 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.3 CSA S136-16, North American Specification for the Design of Cold Formed Steel Structural Members.

.4 CAN/CSA-S157/S157.1-05 (R2015), Strength Design in Aluminum/Commentary on CAN/CSA-S157-05, Strength Design in Aluminum.

.5 CSA W59.2-M1991(R2013), Welded Aluminum Construction.

.6 Screen Manufacturers Association (SMA)

.1 SMA 1201R-2007 (R2012) Specification for Insect Screens for Windows, Sliding Doors and Swinging Doors.

1.3 QUALITY ASSURANCE

.1 Perform Work in accordance with AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

.2 Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed to practice in the Province of New Brunswick.

.3 Provide products specified this Section from the same manufacturer as Sections 08 11 16.

.4 Convene one week before starting work of this section.

1.4 SUBMITTALS FOR REVIEW

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

.2 Product Data

.1 Submit manufacturer's instructions, printed product literature and data sheets for curtain wall components, anchorage and fasteners, glass and infill, and internal drainage details and include product characteristics, performance criteria, physical size, finish and limitations and water flow diagrams.

.3 Design Data: Provide framing member structural and physical characteristics, calculations, climatic data and dimensional limitations. Design data to be stamped by a Professional Structural Engineer licensed to practice in the Province of New Brunswick.

.4 Shop Drawings:

.1 Shop drawings to be stamped by a Professional Structural Engineer licensed and licensed to practice in the Province of New Brunswick.

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

.5 Samples

.1 Submit 2 samples 300 mm x 300 mm in size illustrating prefinished aluminum surface, finish, colour, texture, specified glass unit], glazing materials illustrating edge and corner.

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

.1 Windows classifications.

.2 Anodized finish, weathering characteristics.

.3 Insect screens.

.4 Air tightness.

.5 Water tightness.

.6 Wind load resistance.

.7 Sash strength and stiffness.

.8 Ease of operation - windows with operable lights.

.9 Forced entry resistance.

.10 Mullion deflection - combination and composite windows.

1.5 DELIVERY, STORAGE, AND HANDLING

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

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

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

.2 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.3 Store and protect aluminum glazed curtain wall components from nicks, scratches, and blemishes.

.4 Protect prefinished aluminum surfaces with wrapping strippable coating.

.1 Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

.5 Replace defective or damaged materials with new.

1.6 COORDINATION

.1 Coordinate with other work having a direct bearing on work of this section.

.2 Coordinate the Work with installation of air barrier placement and vapour retarder placement.

Part 2 Products

2.1 CURTAIN WALL SYSTEM

.1 Thermally Broken system.

.2 System Design: Design and size components to withstand dead loads and live loads caused by positive and negative wind loads acting normal to plane of wall.

.3 Seismic Loads: Design and size components to withstand seismic loads and sway displacement.

.4 Deflection: Limit mullion deflection to flexure limit of glass with full recovery of glazing materials.

.5 System Assembly: Accommodate without damage to system, components or deterioration of seals, movement within system, movement between system and perimeter framing components, dynamic loading and release of loads, deflection of structural support framing, tolerance of supporting components.

.6 Vapour Seal: Limit vapour seal with interior atmospheric pressure of 25 mm, 22 degrees C, 40 percent RH without seal failure.

.7 Expansion / Contraction: System to provide for expansion and contraction within system components caused by a cycling temperature range of 95 degrees C over a 12 hour period without causing detrimental effect to system components.

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

.9 Air and Vapour Seal: Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

.10 Not Permitted: 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.

.11 Acceptable Products:

.1 51mm x 102 mm back section, with 20 mm snap cap.

2.2 MATERIALS

.1 Materials: to CSA PKG.A440-00 supplemented as follows:

.1 Extruded Aluminum: ASTM B221-14.

.2 Sheet and Plate Aluminum: ASTM B209-14 anodizing quality.

.3 Fasteners: Stainless steel.

.2 All windows by same manufacturer.

.3 Sash: thermally broken aluminum.

.4 Main frame: thermally broken aluminum.

.5 Screens:

.1 Type: 1 - standard duty.

.2 Class: C - fixed.

.3 Style: manufacturer's standard.

.4 Insect screening mesh count: manufacturer's standard.

.5 Sills: Extruded aluminum complete with securing clips. Colour to match window frames.

2.3 WINDOW TYPES AND CLASSIFICATION

.1 Awnings and Fixed.

.2 Classification rating: to CSA PKG.A440-00:

.1 Air tightness: Fixed.

.2 Water tightness: B7.

.3 Wind load resistance: C5.

.4 Forced Entry: F2.

2.4 CURTAIN WALL COMPONENTS

.1 Format: Outside glazed pressure plate format, except where SSG assemblies are indicated.

.2 Rain Screen: Drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system.

.3 Provide internal mullion baffles to eliminate "stack effect" air movement within internal spaces.

.4 Corners - SSG: Fabricate exterior vertical SSG corners using two-piece 90 degree corner adapters.

.5 Integral Aluminum Doors and Frames:

.1 Manufacturer’s standard thermally broken mullion frame intended for gear hinges, pile weatherstripping at meeting stiles.

.2 Zero-sightline aluminum door stops secured to curtain wall system, with replaceable pile weatherstripping.

.3 Doors: Manufacturer’s thermally broken door, stile and rail sizes as indicated.

.4 Door Hardware: Refer to Section 08 71 00.

2.5 MISCELLANEOUS COMPONENTS

.1 Infill Panels: 3 mm thick extruded aluminum, full contact pressure bonded ensuring flat surface, anodized finish to match curtain wall mullion sections, custom profile and shape as indicated.

.2 Flashings: 0.80 mm thick aluminum, finish to match curtain wall mullion sections where exposed, secured with concealed fastening method.

.3 Plywood: CSA O151 (CSP), CANPLY Grade SHG; unsanded, exterior use, thicknesses as indicated; Urea-Formaldehyde free.

.4 Construction Adhesive: Low VOC polyurethane construction adhesive, resistant to freezing; VOC Limit: 70 g/l (0.58 lb/gal) when tested in accordance with USEPA Method 24 and ASTM D2369.

.5 Extruded aluminum sills:

.1 Same finish as curtain wall complete with securing clips.

.6 Panning where require or shown.

.7 Window limit stop.

.8 Metal trim as detailed and as required to allow for expansion – contraction and to fill any gap(s) between frame and structure.

.9 Operable windows to be complete with fly screen and crank extension pole.

2.6 INSULATED SPANDREL PANELS

.1 Insulated Spandrel Panels: with insulated back pan panels installed in locations shown on the drawings.

.1 3.0 mm thick face panel of anodized aluminum or spandrels glass.

.2 0.85 mm thick back pan panels of galvanized steel.

.3 Backpan with 25 mm lip flush with interior face of framing and screw attached to mullions and transoms along all edges with 13 mm long NO 10 self tapping screws spaced minimum 200 mm o.c. Perimeter of pan sealed with silicone sealant.

2.7 GLASS AND GLAZING MATERIALS

.1 Glass Materials: Insulating glass units for exterior locations, tempered single pane glazing for interior locations; refer to Section 08 80 00

.2 Glazing Materials: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.8 SEALANT MATERIALS

.1 Sealant and Backing Materials: as specified in Section 07 92 00;

.1 Perimeter Sealant: Silicone; colour to match aluminum framing. of types described below.

.2 Structural Silicone: SSG Silicone as recommended by curtain wall manufacturer; colour to match aluminum framing.

.2 Expanding Foam Insulation and Sealant: to Section 07 21 00, VOC compliant.

2.9 FABRICATION

.1 Fabricate in accordance with CSA PKG.A440-00 supplemented as follows:

.2 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal. Utilize deflection track framing where indicated or otherwise required by design.

.3 Provide dead load anchors and clips to attach curtain wall assembly to floor slab and supporting structural steel; including suspended assemblies not bearing on foundations or footing.

.4 Provide reinforcing steel within tubular extrusions where required by design.

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

.6 Prepare components to receive anchor devices. Fabricate anchors.

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

.8 Reinforce interior horizontal head rail to receive drapery track brackets and attachments.

.9 Reinforce framing members for external imposed loads.

.10 Aluminum Panels: Fabricate panels as extruded aluminum sheet laminated to plywood core using construction adhesive.

2.10 FINISHES

.1 To AAMA 611-12.

.2 Exposed Aluminum Surfaces: AA-M12C22A31, Class II Clear Anodic Coating.

.3 Shop Primer for Steel Components: SPCC Paint 25 red oxide.

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

Part 3 Execution

3.1 EXAMINATION

.1 Verify existing conditions before starting work.

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

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

3.2 INSTALLATION

.1 Install in accordance with CSA PKG.A440-00

.2 Install curtain wall system in accordance with manufacturer’s written instructions.

.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.

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

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

.7 Install aluminum sills using securing clips.

.1 Ensure sill slopes away from building providing positive drainage.

.8 Coordinate attachment and seal of perimeter air barrier and vapour retarder materials.

.9 Foam fill shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.10 Install angle trim to allow movement and or to fill gaps between frames and rough openings.

.11 Install glass in accordance with Section 08 80 50.

.12 Install perimeter sealant to method required to achieve performance criteria, to glazing method required to achieve performance criteria.

.13 Install perimeter sealant to aluminum infill panels.

3.3 ERECTION 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 Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 19 mm and minimum of 6 mm.

3.4 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.

3.5 PROTECTION OF FINISHED WORK

.1 Protect finished Work from damage.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 07 21 00 - Building Insulation: Foam fill at frames.

.2 Section 07 27 10 – Modified Bituminous Sheet Air Barrier

.3 Section 08 50 00 – Aluminum Windows

.4 Section 08 71 00 - Door Hardware.

.5 Section 08 80 50 – Glazing

1.2 REFERENCES

.1 AA (Aluminum Association)

.1 DAF-45 Designation System for Aluminum Finishes.

.2 AAMA (American Architectural Manufacturers' Association)

.1 AAMA CW-10-15, Care and Handling of Architectural Aluminum from Shop to Site.

.2 AAMA 611-12, Voluntary Specifications for Anodized Architectural Aluminum.

.3 AAMA SFM-1 -14 - Aluminum Store Front and Entrance Manual.

.3 ASTM International

.1 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.

.2 ASTM B209 -14 – Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.3 ASTM B221 -14 – Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.4 CSA International

.1 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

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

.3 CSA O151, Canadian Softwood Plywood (CSP).

1.3 SUBMITTALS

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

.2 Product Data: Provide component dimensions; describe components within assembly, anchorage and fasteners, glass.

.3 Design Data: Provide framing member structural and physical characteristics, calculations, and dimensional limitations.

.4 Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

.5 Colour Samples: Frame material manufacturer's colour charts or chips illustrating full range of colours, finishes and patterns available for factory applied finishes-no restrictions.

.6 Samples: Submit two (2) samples of each colour selected, in 300 mm x 300 mm size illustrating finish colour, sheen, and texture.

.7 Manufacturer's Installation Instructions: Indicate special handling criteria, installation sequence, and cleaning procedures.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 and manufacturer's written instructions.

1.8 PROJECT CONDITIONS

.1 Coordinate the Work with installation of air barrier, vapour retarder, and blocking components or materials.

Part 2 Products

2.1 WINDOW TYPES AND CLASSIFICATION

.1 Classification rating: to CSA PKG.A440-00:

.1 Air tightness: Fixed or A3

.2 Water tightness: B7.

.3 Wind load resistance: C5.

.4 Forced Entry: F2.

2.2 ACCEPTABLE MANUFACTURERS

.1 Exterior Doors:

.1 Heavy Duty Door, 102mm stiles, 203mm mid rail, 116mm top rail, 203mm bottom rail, 51mm thickness.

2.3 MATERIALS

.1 Extruded Aluminum: ASTM B221-14

.2 Sheet Aluminum: ASTM B209/-14.

.3 Fasteners: Stainless steel.

.4 Plywood: CSA O151 (CSP), CANPLY Grade SHG; unsanded, exterior use, thicknesses as indicated; Urea-Formaldehyde free.

.5 Door Hardware: By Section 08 71 00;

.1 Coordinate preparation of doors and frames using templates provided by hardware supplier.

2.4 GLASS AND GLAZING MATERIALS

.1 Glass and Glazing Materials: As scheduled;

.1 Refer to Section 08 80 50

2.5 FABRICATION

.1 Fabricate components with minimum clearances and shim spacing around perimeter of assembly.

.2 Accurately fit and secure joints and corners.

.1 Make joints flush, hairline, and weatherproof.

.3 Prepare components to receive anchor devices.

.4 Fabricate anchors.

.5 Fabricate continuous aluminum angle to allow vertical movement with slotted holes for surface anchors.

.6 Arrange fasteners and attachments to conceal from view.

.7 Reinforce framing members for imposed loads.

.8 Aluminum Panels: Fabricate panels as extruded aluminum sheet laminated to plywood core using construction adhesive.

2.6 FINISHES

.1 Exposed Aluminum Surfaces: AAMA AA-M12C22A31; 0.40 mils Class II Clear Anodic Coating.

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

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

.1 Install system in accordance with manufacturer's instructions and AAMA Metal Curtain Wall, Window, Store Front and Entrance Guide Specifications Manual.

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

.3 Install continuous aluminum angle with vertical slotted holes to top of windows to allow building vertical movement.

.1 Seal angle to structure with silicone sealant to Section 07 92 00.

.4 Install continuous aluminum angle with to perimeter of frames where required to to fill the gap between frame and interior and exterior walls (heads/jambs/sills) and as directed by the departmental representative at no extra charge.

.1 Seal angle to structure with silicone sealant to Section 07 92 00.

.5 Provide alignment attachments and shims to permanently fasten system to building structure.

.6 Align assembly plumb and level, free of warp or twist.

.1 Maintain assembly dimensional tolerances.

.7 Coordinate installation of doors and frames with installation of hardware specified in Section 08 71 00

.8 Install glass in accordance with Section 08 80 50

3.3 CLEANING

.1 Remove protective material from pre-finished aluminum surfaces.

.2 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths.

.3 Take care to remove dirt from corners.

.4 Wipe surfaces clean.

.5 Remove excess sealant by method acceptable to sealant manufacturer.

3.4 PROTECTION OF FINISHED WORK

.1 Protect finished Work from damage.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 04 04 99 –Masonry for Minor Works

.2 Section 07 92 00 – Joint Sealants

.3 Section 09 21 16 – Gypsum Board Assemblies

.4 Section 09 91 00 - Painting.

.5 Mechanical Sections

.6 Electrical Sections

1.2 SUBMITTALS

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

.2 Product Data: Provide data indicating material characteristics, performance criteria, and limitations.

.3 Manufacturer's Installation Instructions: Indicate preparation and installation requirements, techniques.

1.3 DELIVERY, STORAGE, AND HANDLING

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

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

Part 2 Products

2.1 ACCESS DOORS

.1 Sizes: as follows unless indicated:

.1 For body entry: 600 x 600 mm minimum.

.2 For hand entry: 300 x 300 mm minimum.

2.2 MATERIALS

.1 Access Doors: Stainless Steel, un- insulated flush access door designed for flush installation in drywall.

.1 Drywall taping flange.

.2 Screwdriver operated cam latches.

.3 Concealed hinge.

.4 Sizes & Quantity: Provided by Mechanical and Electrical contractors as required for access to mechanical and electrical items.

.2 Access Doors: Stainless Steel, un-insulated flush access door designed for flush installation in masonry.

.1 Surface flange.

.2 Screwdriver operated cam latches.

.3 Concealed hinge.

.4 Sizes & Quantity: Provided by Mechanical and Electrical contractors as required for access to mechanical and electrical items.

Part 3 Execution

3.1 INSTALLATION

.1 Coordinate installation with erection and finishing of ceiling assembly, in accordance with manufacturer's printed instructions.

.2 Adjust door operating components to ensure smooth opening and closing of doors.

END OF SECTION

PART 1 General

1.1 RELATED SECTIONS

.1 Section 05 50 00 - Metal Fabrications.

.2 Section 07 90 00 – Joint Sealers

.3 Electrical Sections: Power supply

1.2 SUBMITTALS

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

.2 Product Data: Submit product data on glazed overhead door and all components.

.3 Shop drawings shall clearly show door assemblies, hardware, operating components including adjacent construction. Show elevations, sections and details and clearances required for the door assemblies.

.4 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

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

1.3 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 Provide the necessary instructions to ensure proper operation and maintenance of all the hardware components for the doors.

1.4 QUALITY ASSURANCE

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

.2 Source Limitations: Obtain sectional overhead doors operators and controls through one source from a single manufacturer.

1.5 MAINTENANCE MATERIALS AND TOOLS

.1 Provide spare parts and specialty tools in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide spare parts for vertical lift doors as follows:

.1 Door rollers: 3 pair.

.2 Weatherstripping: 1 sets.

.3 Store where directed.

.4 Identify each part and reference to appropriate door.

PART 2 Products

2.1 DESCRIPTION

.1 "Service station style"; 45 mm thick, fully glazed garage door, Heavy Duty Service, overhead.

.1 Dimensions and sizes noted are minimum requirements. Provide all required upgrades and options for a complete heavy duty service installation.

2.2 DESIGN REQUIREMENTS

.1 Doors and hardware system shall be designed to meet or exceed the NBCC and industry standard for wind load (Door & Access Systems Manufacturer Association), and the following; the most stringent requirements will apply.

.1 Doors, tracks and springs shall be designed to withstand for the maximum operation cycles with a minimum of at operation cycles of 10,000 per year.

.2 Design exterior door assembly to withstand wind load while in the closed position of minimum 1 kPa (20 lbf/sq. ft.) with a maximum horizontal deflection while the door is in open of 1/240 of opening width.

.3 Air Infiltration: Maximum rate not more than indicated when tested according to ASTM E 283.

.1 Maximum Rate: 0.08 cfm (0.038 L/s) at 15 mph (24 km/h).

2.3 MATERIALS

.1 Sections assembly: Door sections shall be fabricated from 45 mm thick 6036-T6 aluminum alloy extrusions with heavier walls at hardware mounting locations.

.2 The stile and rail shall be assembled using minimum 6 mm diameter hexagon head bolts.

.3 Center stiles: 76 mm wide.

.4 End stiles: 64 mm wide. Double end stiles for door width over 16’-3” (4953 mm).

.5 Top rail: 56 mm wide.

.6 Bottom rail: 65 mm wide.

.7 Pair of meeting rails: 114 mm wide.

.8 Seals: Continuous replaceable seal between sections.

.9 Finish: Clear anodized.

.10 Trusses: Provide adequate number of galvanized steel linear type reinforcing trusses to meet the wind loading.

2.4 PANELING

.1 Paneling 16 mm thick, triple-wall extruded polycarbonate panels, R= 2.5 ft^2hF/Btu (U= 2.271 W/ m^2K), light transmission 74%, SHGC= 0.75 retained with polyethylene gaskets.

.1 UV Protection: The exterior side of the polycarbonate is protected with a coextruded layer warranting resistance to atmospheric agents and U.V. rays.

.2 Fire Reaction: ASTM E84-01 Flame spread and smoke developed: Class A.

.3 Colour: Clear.

.2 Insulated Sections: Double-walled section, 26-gauge, G60 galvanized steel, polyurethane-injected with a total thickness of 45 mm.

.1 Colour: Anodized Aluminum.

2.5 HARDWARE

.1 Standard of Acceptance: Linear Hardware System as manufactured by Richard-Wilcox Canada. Doors shall be equipped with double end roller brackets and long stem rollers.

.2 Finish: Door hardware, tracks and track mounting hardware and torsion assembly mounting brackets, fabricated from commercially galvanized steel.

.3 Track: 2.75 mm thick, commercial galvanized roll formed track 80 mm overall outside dimension.

.4 Vertical Track Mounting: Adjustable Continuous Track Angle (ADCA) bolted type, field adjustable, sloped to ensure weather tight seal, shall be fabricated from 2.4mm commercially galvanized steel, designed to provide continuous tracks support for vertical track.

.1 **Combination angle and clip mounting not acceptable.**

.5 Hinges: Linear type, fabricated from 2.75 mm thick galvanized steel with embossments designed to resist higher load and to provide greater stability and improved performance.

.6 Doors width 4953 mm and over shall have double end hinges featuring full width bushing for both the hinge pivot and roller carries to allow for ease installation and eliminating any possibility of misalignment of the hinges.

.7 Track Hangers: Minimum 32 x 32 x 2 mm galvanized steel angles suitably spaced to transmit door weight to the building structure.

.8 Weather-stripping: Doors shall be equipped with a heavy duty, factory installed continuous top seal to seal against header, continuous co-polymer joint bulb seal between sections and vinyl bulb shaped astragal on the bottom edge of the door.

.1 Dual Durometer vinyl jamb weather seal bolted to the continuous adjustable mounting angle (ADCA) for easy replacement, as supplied by Richards-Wilcox Canada.

.9 Rollers: Steel rollers 76 mm diameter, with ten (10), 8 mm diameter ball bearings, 11 mm diameter roller axles and both inner and outer ball races of hardened steel.

.1 Length of roller stem as required.

.10 Linear Roller Brackets: Fabricated from 3.1 mm galvanized steel.

.11 Shaft and Counter Balance Springs: Helically wound torsion springs manufactured from oil tempered spring wire stress relieved, minimum 10,000 cycles.

.1 Aluminum die cast grooved drums and flexible galvanized aircraft cables, 7 x 19 construction, mounted on 25.4 mm CRS solid steel shaft, keyed full length, mounted on ball bearings

.12 Bumper springs shall be installed at the end of each horizontal track to stop door over travel.

.13 Track Guards:

.1 Continuous minimum 4.5 mm x 1524 mm high, bent Z plate bolted to wall and floor.

.2 See drawings.

2.6 FABRICATION

1. Fabricate the work true to dimensions detailed and square, and to the reviewed shop drawings, free from distortion and defects detrimental to the appearance and performance.
2. Verify the door opening dimensions prior to the fabrication of the doors.
3. Doors shall be 50 mm higher than finished openings and extend 50 mm beyond jamb on both sides of finished opening width.
4. Shop and field connections shall comply with CAN/CSA S16.1-M.
5. Accurately fit joints and intersecting members with adequate fastenings.

PART 3 Execution

3.1 EXAMINATION

.1 Prior to commencement of work of this Section, thoroughly examine opening frames and frame extensions to receive the doors and related components for installation.

.2 Ensure that the opening frames are square, plumb and that the floor is level and square to building lines, so that the door properly seal against the frame and floor.

.3 Report to the Contractor in writing of any condition adversely affecting this work.

.1 Contractor will correct noted items

.4 Proceed with the installation of the doors only when site conditions are satisfactory for the installation.

.5 Commencement of the overhead door installation constitutes acceptance of the opening conditions, any subsequent problems arising during the door installation will be the responsibility of the door installer.

3.2 INSTALLATION GENERAL

.1 **Installation shall be by the door manufacturer or by authorized manufacturer's representative for the region.**

.2 Install doors, tracks and operating equipment complete with necessary hardware, weather-stripping, anchors, hangers, brackets and accessories, in accordance to manufacturer's printed instructions.

.3 Isolate metals where necessary to prevent corrosion due to contact with dissimilar metals and between metals, masonry and concrete. Use bituminous paint or butyl tape or as recommended, in writing, by the door manufacturer.

.4 Complete installation must be to the satisfaction of the departmental representative.

.1 Any and all aspects of installation adversely affecting appearance and/or performance of such installation shall be deemed unacceptable and shall be fully replaced at no additional cost.

3.3 DOOR

.1 Fit, align and adjust overhead door assemblies, level and plumb, to ensure smooth operation and to provide correct closure to the satisfaction of the Departmental Representative.

.2 Ensure that complete installation includes tracks, operating equipment, necessary hardware, weather-stripping, anchors, hangers, brackets and any other accessories deemed necessary.

.3 Include any other items, not specified herein, but is required for a complete installation.

3.4 HARDWARE

.1 Mount counterbalancing mechanism with brackets at each end of shaft and at maximum 2438 mm o/c. in between.

.2 Fasten vertical track assembly to opening frame at maximum 508 mm o/c. vertically.

.3 Install additional track anchors where deemed necessary by the Consultant.

.4 Support the horizontal track to transmit the door dead and operating loads to the building structure.

.5 Install sufficient supports, anchors, fasteners etc. so that the track assembly is rigid and free from undue movement as required by the door manufacturer and to the satisfaction of the Departmental Representative.

.6 Install additional track anchors where deemed necessary by the Departmental Representative.

.7 Provide bumper springs at the end of each track.

.8 Ensure that weather-stripping is securely fastened and adjusted to provide effective seal.

3.5 LUBRICATION AND ADJUSTMENT

.1 Upon completion of installation of doors and operating equipment, lubricate moving parts before operation.

.2 Grease sprockets, bearings, cables, link chains and guides.

.3 Lubricant shall be as recommended by the manufacturer.

.4 Test the door operation and adjust operable parts for correct function, weatherstripping to form weathertight seal and adjust for smooth operation, free from warp, twist or distortion.

3.6 FIELD QUALITY CONTROL

.1 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.

.1 Complete installation and startup checks according to manufacturer's written instructions.

.2 Test and adjust controls and safeties.

.3 Replace damaged and malfunctioning controls and equipment.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 07 92 00 – Joint Sealants

.2 Section 08 80 50 - Glazing

1.2 REFERENCES

.1 Aluminum Association (AA)

.1 AA DAF 45 -Designation System for Aluminum Finishes.

.2 ASTM International

.1 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip galvanized) Coatings on Iron and Steel Products.

.2 ASTM E1748-95(2009), Standard Test Method for Evaluating the Engagement Between Windows and Insect Screens as an Integral System.

.3 CSA Group

.1 AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.

.2 CSA A440S1-09, Canadian Supplement to AAMA/WDMA/CSA 101/1.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.

.3 CAN/CSA-A440.4-07(R2016), Window, Door, and Skylight Installation

.4 Screen Manufacturers Association (SMA)

.1 SMA 1201R-2007 (R2012) Specification for Insect Screens for Windows, Sliding Doors and Swinging Doors.

1.3 SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for windows and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 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.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for windows for incorporation into manual.

1.5 QUALITY ASSURANCE

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

1.6 DELIVERY, STORAGE AND HANDLING

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

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect windows from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Materials: to AAMA/WDMA/CSA 101/I.S.2/A440-08 supplemented as follows:

.1 All windows by same manufacturer.

.2 Sash: Fiberglass

.3 Main frame: Fibreglass

.4 Glass: in accordance with Section 08 80 50 - Glazing.

.5 Nailing Flange:

.1 With for windows installed in wood construction.

.2 Without for windows installed in masonry construction.

.6 Screens: to SMA 1201R- 2007 (R2012) on the ventilating portion of the windows.

.1 Type: Heavy Duty

.2 Insect screening mesh: fiberglass manufacturer’s standard

.3 Screen frames: aluminum fixed with tamper proof fasteners

.4 Mount screen frames for interior replacement.

.7 Sealants: to Section 07 92 00.

.8 Expanding Foam Insulation: Low density foam.

.9 Glaze windows in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-08.

.10 Hardware:

.1 Hardware: stainless steel

.2 Locks: provide locking device(s), to provide locking in closed position.

2.2 WINDOW TYPE AND CLASSIFICATION

.1 Operable windows as per window schedule, manufacturer's standard operating hardware.

.1 Awning

.2 Surface condensation control: compliant with standard CAN/CSA-A440.2/A440.3.

.3 Forced Entry: F2.

.4 All metal components: 316 Stainless steel

2.3 FABRICATION

.1 Fabricate in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 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 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.

.5 Provide 316 stainless steel clips and reinforcement.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Install in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-08.

.2 Foam fill perimeter of window framing to seal air/vapour barrier.

.3 Caulking:

.1 Seal joints between windows opening with sealant over foam backer rod.

.2 Apply sealant in accordance with Section 07 92 00.

.3 Seal interior joints around window using colour matching silicone sealant.

.4 Conceal sealant within window units except where exposed use is permitted by Departmental Representative.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 08 11 00 Metal Doors and Frames

1.2 REFERENCES

.1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)

.1 ANSI/BHMA A156.1-2013, Butts and Hinges.

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

.3 ANSI/BHMA A156.4-2013, Door Controls - Closers.

.4 ANSI/BHMA A156.5-2014, Cylinder and Input Devices for Locks.

.5 ANSI/BHMA A156.6-2015, Architectural Door Trim.

.6 ANSI/BHMA A156.8-2010, Door Controls - Overhead Stops and Holders.

.7 ANSI/BHMA A156.10-2005, Power Operated Pedestrian Doors.

.8 ANSI/BHMA A156.12-2013, Interconnected Locks.

.9 ANSI/BHMA A156.13-2012, Mortise Locks and Latches Series 1000.

.10 ANSI/BHMA A156.14-2013, Sliding and Folding Door Hardware.

.11 ANSI/BHMA A156.15-2015, Closer Holder, Electromagnetic and Electromechanical.

.12 ANSI/BHMA A156.16-2013, Auxiliary Hardware.

.13 ANSI/BHMA A156.18-2016, Materials and Finishes.

.14 ANSI/BHMA A156.19-2013, Power Assist and Low Energy Power - Operated Doors.

.2 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)

.1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames 2000.

1.3 SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for door hardware and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Hardware List:

.1 Submit detailed hardware list and keying schedule. Hardware Schedule is to be submitted as per DHI vertical format which is in the “Sequence and Format for Hardware Schedules”.

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

.3 Furnish other Sections with templates required for hardware preparation and installation.

.1 Issue templates when requested so as not to cause any delays but not before hardware list has received final review by Engineer-Architect.

.4 Keying Schedule to be in accordance with DHI manual “Keying Systems Names and Nomenclature”.

.1 Key schedule is not to hold up the processing of the hardware list.

.5 Wiring Diagrams will only be supplied after the final approval of the Hardware Schedule.

.1 Submit wiring diagrams as requested for proper installation of electrical, electrical-mechanical and electrical-magnetic products.

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

.5 Manufacturer's Instructions: submit manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for door hardware for incorporation into manual.

.3 Provide three sets of maintenance tools for closers, locks and exit devices as well as a complete set of installation instructions.

1.5 QUALITY ASSURANCE

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

1.6 DELIVERY, STORAGE AND HANDLING

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

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

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

.4 Storage and Handling Requirements:

.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect door hardware from nicks, scratches, and blemishes.

.3 Protect prefinished surfaces with wrapping strippable coating.

.4 Replace defective or damaged materials with new.

Part 2 Products

2.1 HARDWARE ITEMS

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

2.2 DOOR HARDWARE

.1 All fasteners to come complete with the hardware as described.

.1 Hardware supplier must be advised immediately if required fasteners are not enclosed with hardware.

.2 Hardware must be installed with fasteners supplied by the manufacturer.

.1 All non-conforming fasteners will be removed and replaced with conforming type at the contractor’s expense.

.3 Hinges Butts and hinges: to ANSI/BMHA A156.1.

.1 Non removable pins (NRP) for all doors.

.2 Material: Stainless steel

.3 All hinges to be five-knuckle design and ball bearing.

.4 All electric hinges to be supplied with plug in connectors as specified.

.5 Finish Stain Stainless Steel.

.4 Mortise locks and latches: to ANSI/BMHA A156.13, Series 1000, Operational Grade 1 with all standard trim

.1 Locks shall be easily re-handed.

.2 Multi-functional lock body to make it easy to change functions in the field.

.3 Construction: Lock functions shall be manufactured in a single-sized case formed from 2.6mm steel minimum.

.4 Locks shall have field adjustable, beveled, armored front, with a 3mm thickness minimum.

.5 Locks shall have a one piece, 19mm throw anti-friction stainless steel latch.

.6 Backset: 70mm.

.7 Strikes shall be non-handed with a curved lip. To ensure proper alignment, trim, knobs or levers, shall be through-bolted and fully interchangeable between rose and escutcheon.

.8 Lever handles: "LNL" design.

.9 Roses: round.

.10 Finished to stainless steel

.11 Cylinders: key into keying system as noted as directed.

.5 Deadbolt: to ANSI/BHMA A156.5, as listed in Hardware Schedule.

.1 Cylinders: Rim and Mortise, length to suite, cam to suite.

.2 Small Case Mortise Deadbolt, Keyed both sides

.3 Finished Stainless steel

.4 Full 25mm throw and made of one-piece hardened stainless steel.

.5 Cylinders: key into keying system as noted as directed.

.6 Door Closers: to ANSI/BMHA A156.4 as listed in Hardware Schedule.

.1 Modern type, surface applied.

.2 Adjustable to provide sizes 1 through 6 and comply with ADA.

.3 Full rack and pinion construction.

.4 Closing speed, latching speed and backcheck shall be controlled by key operated valves.

.5 Spring power shall be continuously adjustable over the full range of closer sizes and allow for reduced opening force for the physically handicapped.

.6 Hydraulic regulation shall be tamper proof, non-critical valves.

.7 Closers shall have separate adjustments for latch speed, general speed and backcheck.

.8 Captivated valves.

.9 Delayed action controlled by a separate valve.

.10 Backcheck - shall be available in addition to, not in lieu of delayed action.

.11 One piece closer body of die cast aluminum.

.12 An increase of 15% in closing power shall be provided by means of adjustment of the arm leverage at the foot connection. (Standard Arm).

.13 All closer to have a forged steel main arm and forged forearm for parallel arm closers.

.14 Two mounting positions of the closer shall meet all requirements. Standard mountings shall provide 120° door opening and alternate mounting 180° door opening.

.15 All closers shall be suitable for standard, top jamb, parallel arm and track type applications when provided with proper brackets and arms.

.16 Closer covers shall be of high impact plastic material of flame retardant grade.

.17 Secured by machine screws.

.18 Finish : Stainless steel

.7 Architectural door trim: to ANSI/BHMA A156.6, finished to stainless steel 630.

.1 Door Kickplate: 1.3 mm thick stainless steel, 203mm high, unbevelled edges, width less 40mm push side, width less 25mm on pull side for single doors. Width less 25mm for pairs. Stainless steel 630

.2 Door Push plates: 1.3 mm thick stainless steel, size 89mm x 381mm, finished to stainless steel 630.

.3 Door Pulls: 19mm round pull, 228.6mm centre to centre pulls, with 76mm x 305mm protection plate, mount type 1, stainless steel 630.

.8 Overhead stop: to ANSI/BMHA A156.8, heavy duty construction, BHMA Grade 1 Certified, stainless steel construction.

.1 Holder Selector: Turn knob to activate and deactivate the hold open function

.2 Thru bolts capture channel and end caps.

.3 Heavy duty shock spring absorbs load and gradually stops door.

.4 Sized as per manufacturer's guidelines. Take into account other hardware mounted on doors.

.5 Finishes stainless steel, 630.

.9 Door Stops: to ANSI/BMHA A156.16 Finished to 26D.

.1 Wall stops classification, convex or concave, cast brass or bronze. Fasteners to suite wall conditions.

.10 Power Assist and Low Energy Power Operated Doors: to ANSI/BMHA A156.19.

.1 Automatic operators shall be complete with all components including Operator Housing, Power Operator, Electronic Control, Soft Start, Switching Networks and all Connecting Hardware.

.2 Size full width of door.

.3 Operator Housing shall be complete with finished end caps prepared for mounting to door frame.

.4 Operator shall be factory assembled with all necessary components for proper operation and switching.

.5 Relays, wiring harness and other components shall be plug-in type.

.6 Controls shall include adjustable time delay, safe-swing circuit as well as provision for accessories.

.7 All wiring shall be of the shielded type with proper number of conductor wires to install all components specified.

.8 Operator shall include sufficient power supplies to operate all hardware and accessory items as detailed in Hardware Sets.

.9 In the event additional power supplies are required it shall be added at no increase in contract price.

.10 Complete unit shall be mounted with provisions for easy servicing or replacement without removing the door or frame.

.11 Confirm frame detail and if necessary provide a suitable mounting plate to install operator properly.

.12 Electrical box and actuator: Hardwired low voltage actuator with stainless steel 114 mm round plate, engraved blue filled with handicap symbol. Box 51 mm wide x 102 mm high x 50 mm deep single gang electrical box, flush mounted in wall, locations indicated.

.13 Power Supplies: ULc Listed, Class 2, linear regulated power supply

.1 Dual output, field selectable 12 or 24 VDC via clearly marked toggle switch.

.2 Continuous current output:1 full AMP.

.3 LED indication (AC & DC) showing power supply status ULc listed low current.

.11 Thresholds: to ANSI/BMHA A156.21.

.1 Saddle threshold 152.4 mm wide x full width of door opening, extruded aluminum mill finish, serrated surface.

.12 Door Gasketing and Edge Seal Systems: to ANSI/BMHA A156.22.

.1 Head and Jambs Seal:

.1 Extruded aluminum frame and neoprene insert, clear anodized finish.

.2 Surface overhead stops and exit device strikes to mount below weatherstrip to provide continuous seal.

.2 Bottom Seal

.1 Extruded Aluminum frame and nylon brush sweep, clear anodized finish.

.2 Heavy duty, door seal of extruded aluminum frame and solid closed cell neoprene weather seal, recessed in door bottom, closed ends, automatic retract mechanism when door is open, clear anodized finish.

2.3 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.

2.4 KEYING

.1 Doors, to be keyed differently in groups master keyed as directed.

.2 Prepare detailed keying schedule in conjunction with Departmental Representative.

.3 Supply keys in duplicate for every lock in this Contract.

.4 Supply 3 master keys for each master key or grand master key group.

Part 3 Execution

3.1 INSTALLATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Supply metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.3 Supply manufacturers' instructions for proper installation of each hardware component.

.4 Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).

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

.6 Use only manufacturer's supplied fasteners.

.1 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

3.2 ADJUSTING

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

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to ensure tight fit at contact points with frames.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

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

.3 Remove protective material from hardware items where present.

.4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.4 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 Lock key cabinet and turn over key to Departmental Representative.

.2 Maintenance Staff Briefing:

.1 Brief maintenance staff regarding:

.1 Proper care, cleaning, and general maintenance of projects complete hardware.

.2 Description, use, handling, and storage of keys.

.3 Use, application and storage of wrenches for door closers locksets and fire exit hardware.

.3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by door hardware installation.

3.6 SCHEDULE & SETS

.1 See Drawings for Schedule

.2 Set 1

3 Hinges A5111, NRP,114 x 101 mm 630.

1 Mortise deadlocks E06061, MK and KA 630.

1 Pull with plate J405, size as specified 630

1 Push plates J301, size as specified 630

1 Kick Plate pull side 630

1 Closer

1 Overhead stop

1 Thresholds width of door

1 Door bottom seals

1 Head and Jambs seal

.3 Set 2

1 Hinges A5111, NRP,114 x 101 mm 630.

1 Storeroom Lockset F44 301D, MK and KD 630

1 Closer

1 Overhead stop

1 Thresholds width of door

1 Door bottom seals

1 Head and Jambs seal

.4 Set 3

3	Hinges A5111, NRP,114 x 101 mm 630.
1	Mortise deadlocks E06061, MK and KA 630.
1	Pull with plate J405, size as specified 630
1	Push plates J301, size as specified 630
1	Kick Plate pull side 630
1	Automatic Door Operator
1	Backing Plate
1	Mounting Plate
2	Wall Mounted Actuators 10BR451
1	Thresholds width of door
1	Door bottom seals
1	Head and Jambs seal

Requires 120VAC power to door operator by electrical contractor
Requires low voltage from door operator to actuator buttons
Supply riser and point to point electrical drawings

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 08 11 00 - Metal Doors and Frames.

.2 Section 08 50 00 –Windows

1.2 REFERENCES

.1 ASTM International

.1 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.2 Canadian General Standards Board (CGSB)

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

.2 CAN/CGSB 12.8-97 - Insulating Glass Units.

.3 Glass Association of North American (GANA)

.1 GANA Glazing Manual – 50th Edition

.4 IGMAC (Insulated Glass Manufacturers Association of Canada)

.1 Quality Standard Specification.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Submit for review duplicate 300 mm X 300 mm size samples of each type of glazing unit.

.2 Samples will not be returned.

1.4 DELIVERY, STORAGE AND HANDLING

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

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect glazing from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Design Criteria:

.1 Size glass to withstand wind loads, dead loads and positive and negative live loads to ASTM E330/E330M-14.

.2 Limit glass deflection to flexural limit of glass with full recovery of glazing materials.

.2 Tempered Glass: CAN/CGSB 12.1-M90; Clear; 6 mm thick,

.3 Insulating Glass Units:

.1 Insulating glass units: to CAN/CGSB-12.8, double unit, 25 mm overall thickness.

.1 Glass: to CAN/CGSB-12.1-M90

.2 Glass thickness: 6mm each light

.3 Inter-cavity space thickness: 12.7mm

.4 Provide frosted interior glazing at washrooms.

.4 Sealant: Manufacturer’s standard.

2.2 ACCESSORIES

.1 Setting Blocks: Neoprene, EPDM or Silicone, 80 to 90 Shore A durometer hardness.

.2 Spacer Shims: Neoprene, Silicone, 50 to 60 - Shore A durometer hardness.

.3 Glazing Tape: Preformed butyl compound with integral resilient tube spacing device.

.4 Glazing Splines: Resilient silicone extruded shape.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that openings for glazing are correctly sized and within tolerance.

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 GLAZING METHODS

.1 Verify that selected sealants and glazing tapes are compatible.

.2 Perform glazing as required by frame manufacturer to achieve specified performance criteria.

.3 Completed exterior glazed assemblies to provide full perimeter air and vapour seal to the glazed frames and be pressure equalized.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

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

.3 Repair damage to adjacent materials caused by glazing installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 08 99 – Rough Carpentry for Minor Works

.2 Section 07 27 00 – Air Barrier

.3 Section 07 27 10 - Modified Bituminous Sheet Air Barrier.

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

.5 Section 07 92 00 - Joint Sealing.

1.2 REFERENCES

.1 The Aluminum Association Inc. (AAI)

.1 AAI DAF45, Designation System for Aluminum Finishes - 9th Edition.

.2 American National Standards Institute (ANSI)

.1 ANSI H35.1/H35.1M-2013, Temper Designation.

.2 ANSI/AMCA Standard 500-L-12 (Rev 2015), Laboratory Methods of Testing Louvers for Rating.

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

.1 ASTM B209-14, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.2 ASTM B221-14, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.3 ASTM D523-14, Standard Test Method for Specular Gloss.

.4 ASTM D822/D822M-13 Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.213-2004, Etch Primer (Pre-treatment Coating of Tie Coat) for Steel and Aluminum.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Indicate fabrication and erection details, including anchorage, accessories, and finishes.

.2 Show frame detail, screening and finish.

.4 Samples:

.1 Submit duplicate metal samples of manufacturer's standard colours and finish for selection by Departmental Representative

1.4 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:

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

.2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.3 Deliver materials to the site in undamaged condition.

.2 Storage and Protection:

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Protect louvres from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 GENERAL

.1 Stationary stormproof and drainable extruded aluminum louvre, fully welded, continuous horizontal blade using concealed blade braces.

.2 Weather resistant louvres, with insect screens made to withstand a wind load of not less than 1.44 kilopascals.

.3 AMCA Performance: A 1220 mm x 1220 mm unit shall conform to the following: 57.0% free area.

.4 Wind Driven Rain Performance: AMCA certified ratings program seal for air performance and water penetration in accordance with ANSI/AMCA Standard 500-L-12 (Rev 2005).

.5 Ratings to indicate water penetration of 0.06 kilograms or less per square meter of free area at free velocity of 244 meters per minute.

2.2 MATERIALS

.1 Aluminum extrusions: ASTM B221-14, Alloy 6063-T5

.2 Aluminum sheet: to ASTM B209-14 alloy 1100, 3003 or 5005 with temper as required for forming.

.3 Primer: to CAN/CGSB-1.213-2004 aluminum surfaces.

.4 Blade and Frame: Minimum 2.06 mm wall thickness.

.5 Frame depth 100 mm.

.6 Prefinished aluminum sheet:

.1 Finish aluminum sheet metal with factory applied coating as follows:

.1 Class F2S.

.2 Colour selected by the Departmental Representative from manufacturer's standard range.

.3 Specular gloss: 30 units +/-5 to ASTM D523-14.

.4 Coating thickness: not less than 200micrometres.

.5 Outdoor exposure period 20 years.

.6 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D822éD822M-13 as follows:

.1 Outdoor exposure period 5000 hours minimum.

.2 Humidity resistance exposure period 5000 hours minimum.

.7 Screens:

.1 Bird and Insect Screens: Removable, extruded aluminum frame; 12.7 mm square; 1.60 mm aluminum.

2.2 FABRICATION

.1 Material: Heads, sills, jambs and mullions to be one-piece structural aluminum members with integral caulking slot and retaining beads.

.2 Construct louvres from aluminum extrusions of minimum 3 mm thickness to sizes and shapes indicated.

.3 Blades to be one-piece aluminum extrusions with front lip gutter designed to catch and direct water to sill.

.4 Louvers to be supplied with sill flashings formed from minimum 26 gauge aluminum to profiles indicated.

.1 Sill flashings to have welded side panels.

.2 Louvers and sill flashings to be installed in accordance with the manufacturer's recommended procedures to ensure complete water integrity performance of the louver system.

.5 Louvers to be mechanically assembled using stainless steel or aluminum fasteners.

.6 Include supports, anchorage, and accessories required for complete assembly.

.7 Louvres shall be supplied with a continuous fully air and water sealed flanged frame including at corners.

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

.1 Install louvres where indicated.

.2 Attach screen to inside face of louvre or vent.

.3 Repair damage to louvres to match original finish.

.4 Install wall louvers using stops, mouldings, flanges, strap anchors, jamb fasteners as appropriate for wall construction and in accordance with manufacturer's recommendations.

3.3 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

3.4 PROTECTION

.1 Where aluminum contacts metal other than zinc, paint dissimilar metal with primer and two coats of aluminum paint.

.2 Paint metal in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.

END OF SECTION