

Part 1 General

1.1 SECTION INCLUDES

- .1 Hollow metal steel frames.
- .2 Pressed steel doors.

1.2 RELATED SECTIONS

- .1 Section 07 92 00 – Joint Sealants.
- .2 Section 08 71 00 - Door Hardware – Common Requirements
- .3 Section 08 71 01 – Door Hardware – Groups
- .4 Section 08 71 02 – Door Schedule
- .5 Section 09 91 99 – Painting for Minor Works.

1.3 REFERENCES

- .1 ASTM A653/A653M-09 - Steel Sheet, Zinc-Coated (Galvanized).
- .2 ASTM C553-08 - Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
- .3 ASTM C578-09e1 - Rigid, Cellular Polystyrene Thermal Insulation.
- .4 ASTM C591-09 - Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
- .5 ASTM C665-06 - Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- .6 ASTM C1289-08e1 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- .7 ASTM E90-09 - Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- .8 ASTM E413-04 - Classification for Rating Sound Insulation
- .9 CAN/ULC S104-10 - Standard Method for Fire Tests of Door Assemblies.
- .10 CAN/ULC S105-09 - Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.
- .11 CAN/ULC-S704-03 - Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
- .12 CAN/CSA-G40.20-04/G40.21-04 (R2009) - General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

- .13 CSA-W59-03 (R2008) - Welded Steel Construction (Metal Arc Welding).
- .14 CSDMA (Canadian Steel Door Manufacturers Association)
 - .1 Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2000.
 - .2 Selection and Usage Guide for Commercial Steel Doors and Frames, 2009.
- .15 DHI (Door Hardware Institute) - The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
- .16 NFPA 80 - Fire Doors and Fire Windows (2010 Edition).
- .17 NFPA 252-2008 - Methods of Fire Tests of Door Assemblies.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 Coordinate the work with frame opening construction, door, and hardware installation.
- .2 Sequencing: Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

1.5 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submittal Procedures.
- .2 Product Data: Indicate door and frame configurations and finishes, location of cut-outs for hardware reinforcement.
- .3 Shop Drawings:
 - .1 Indicate frame elevations, 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, finishes, and hardware.

1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Closeout Submittals.

1.7 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Conform to requirements of CSDMA. Maintain one (1) copy of document on Site.
- .3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.

1.8 REGULATORY REQUIREMENTS

- .1 Fire Rated Door and Frame Construction: Labelled and listed to CAN4-S104 and NFPA 252.
- .2 Installed Door and Frame Assembly: Conform to NFPA 80 for fire rated class as scheduled.

1.9 DELIVERY, STORAGE, AND PROTECTION

- .1 Refer to Section 01 61 00.
- .2 Remove doors and frames from wrappings or coverings upon receipt on Site and inspect for damage.
- .3 Store in vertical position, spaced with blocking to permit air circulation between components.
- .4 Store materials on planks or dunnage, out of water and covered to protect from damage.
- .5 Clean and touch up scratches or disfigurement caused by shipping or handling with zinc-rich primer.

Part 2 Products

2.1 MANUFACTURERS

- .1 Allmar.
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
 - .1 Shanahan's.
- .3 Substitutions: Refer to City of Winnipeg Bid Opportunity. Approved equals to be in accordance with B7.

2.2 MATERIALS

- .1 Sheet Steel: Galvanized steel to ASTM A653/A653M, commercial grade (CS), Type B.
 - .1 Exterior Doors and Frames: Coating designation Z275 (G90).
 - .2 Interior Doors and Frames: Coating designation ZF120 (A40).
- .2 Reinforcement Channel: To CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653/A653M, coating designation to match door.

2.3 DOOR CORE MATERIALS

- .1 Honeycomb Core: Structural small cell 25.4 mm (1 inch) maximum kraft paper honeycomb; weight 36.3 kg (80 lb) per ream minimum, density 16.5 kg/cu m (1.03 pcf) minimum, sanded to required thickness.
 - .1 Fire Rated Doors: Refer to Drawings and Schedules.

- .2 Polystyrene Core: ASTM C578, Type 1, rigid extruded fire retardant, closed cell board, density 16 to 32 kg/cu m (1 to 2 pcf), thermal values RSI-1.0 (R-6.0) minimum.

2.4 ADHESIVES

- .1 Cores and Steel Components: Heat resistant, structural reinforced epoxy, resin based adhesive.
- .2 Lock Seam: Reinforced epoxy resin, high viscosity, thicksotropic sealant.

2.5 PRIMERS

- .1 Rust inhibitive touch-up only.

2.6 ACCESSORIES

- .1 Door Silencers: Single stud rubber/neoprene.
- .2 Exterior Top Caps: Rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19MA.
- .3 Frame Thermal Breaks: Rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19MA.
- .4 Weatherstripping: Specified in Section 08 71 00.

2.7 FABRICATION - DOORS

- .1 Exterior Doors: Laminated core construction.
- .2 Interior Doors: Laminated core construction.
- .3 Longitudinal Edges: Tack welded, filled and sanded with no visible edge seams.
- .4 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.
- .5 Reinforce for surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware.
- .6 Top and Bottom Channels: Inverted, recessed, welded steel channels.
- .7 Exterior Door: Flush PVC top caps.
- .8 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .9 Sound Rated Door after Fabrication: STC of minimum 48, measured to ASTM E413.

2.8 LAMINATED CORE CONSTRUCTION

- .1 Exterior Doors: Both face sheets 1.2 mm (18 gauge) steel, with polystyrene core, laminated under pressure to face sheets.

- .2 Interior Doors: Both face sheets 1.2 mm (18 gauge) steel with honeycomb core (refer to Schedule), laminated under pressure to face sheets.

2.9 FABRICATION - FRAMES

- .1 Exterior Frames: 1.6 mm (14 gauge) thick base metal thickness.
 - .1 Frames: Welded type construction thermally broken.
- .2 Interior Frames: 1.6 mm (14 gauge) thick base metal thickness.
 - .1 Door Frames and Window Assemblies: Welded type construction.
 - .2 Fire rated Frames: Refer to Drawings and Schedules.
- .3 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.
- .4 Prepare frames for silencers. Provide three (3) single silencers for single doors and mullions of double doors on strike side. Provide two (2) single silencers on frame head at double doors without mullions.
- .5 Configure exterior frames with special profile to receive recessed weatherstripping.
- .6 Attach fire rated label to each fire rated door unit.

Part 3 Execution

3.1 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.

3.2 INSTALLATION

- .1 Install doors and frames to CSDMA.
- .2 Install fire-rated doors and frames in accordance with NFPA 80, and local authority having jurisdiction.
- .3 Coordinate with masonry, gypsum board and concrete wall construction for anchor placement and throat depths.
- .4 Coordinate installation of doors and frames with installation of hardware and view holes specified in Section 08 71 00.
- .5 Set frames plumb, square, level and at correct elevation.
- .6 Secure anchorages and connections to adjacent construction.

- .7 Brace frames rigidly in position while building-in. Install wood spreaders at third points of frame rebate height to maintain frame width. Provide vertical support at centre of head for openings exceeding 1 200 mm (48 inches) in width.
- .8 Remove wood spreaders after frames have been built-in.
- .9 Make allowance for deflection to ensure structural loads are not transmitted to frame product.
- .10 Install doors, and hardware in accordance with hardware templates and manufacturer's instructions.
- .11 Adjust operable parts for correct clearances and function.
- .12 Install door silencers.
- .13 Finish paint as specified in Section 09 91 99.
- .14 Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

3.3 ERECTION TOLERANCES

- .1 Section 01 73 00: Execution Requirements.
- .2 Maximum Diagonal Distortion: 1.5 mm (1/16 inch) measured with straight edges, crossed corner to corner.

3.4 SCHEDULE

- .1 Refer to Door Schedule Section 08 71 00.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Architectural Aluminum Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of curtain wall framing.

1.2 RELATED SECTIONS

- .1 Structural Specifications
- .2 Section 04 22 00 – Concrete Unit Masonry.
- .3 Section 05 50 00 - Metal Fabrications.
- .4 Section 06 20 00 - Finish Carpentry
- .5 Section 07 26 00 - Vapour Retarders.
- .6 Section 07 84 00 - Firestopping.
- .7 Section 07 92 00 - Joint Sealants.
- .8 Section 09 21 16 - Gypsum Board Assemblies.
- .9 Section 09 91 99 – Painting for Minor Works.
- .10 Mechanical Specifications.
- .11 Electrical Specifications.

1.3 REFERENCES

- .1 AAMA 501-05 - Methods of Test for Exterior Walls.
- .2 AAMA 501.1-05 - Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure.
- .3 CSA S157-05/S157.1-05 - Strength Design in Aluminum.
- .4 AAMA 611-98 - Voluntary Specifications for Anodized Finishes Architectural Aluminum.
- .5 AAMA 1503-98 - Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.
- .6 ASTM E783-02(2010) - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
- .7 ASTM B221M-07 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

- .8 ASTM E283-04 - Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- .9 ASTM E331-00 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- .10 ASTM E547-00(2009) - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
- .11 ANSI Z97.1-2009 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- .12 ASTM E1105-00(2008) - 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.
- .13 CAN/CSA A440-00/A440.1-00 - Windows.

1.4 SYSTEM DESCRIPTION

- .1 Curtain Wall System Performance Requirements:
 - .1 Wind loads: Provide Curtain Wall system; include anchorage, capable of withstanding wind load design pressures of 0.8kPa (16.7 lbs./sqft).
 - .2 Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft² (0.3 l/s· m²) at a static air pressure differential of 6.24 psf (300 Pa).
 - .3 Water Resistance, (static): The test specimen shall be tested in accordance with ASTM E 331 and ASTM E 547. There shall be no leakage at a static air pressure differential of 15 psf (720 Pa) as defined in AAMA 501.
 - .4 Structural performance shall be based on Aluminum Association "Specification for Aluminum Structures" or CSA Standard CAN3-S157 "Strength Design in Aluminum". There shall be no deflection in excess of L/175 of the span of any framing member at design load..
 - .5 Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.17 BTU/hr· ft²· °F (0.98 W/m2· °C).
 - .6 Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 85 frame and 80 glass, or Condensation Index (I): when tested to CSA-A440-00, the Condensation Index shall not be less than 77 frame and 76 glass.
- .2 The design of all components in this Section shall take into consideration all elements of the environment in this geographical area, and unless otherwise noted, shall meet the loading requirements for the area as dictated by the National Building Code of Canada.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate with other work having a direct bearing on work of this section.
- .2 Pre-Installation Meeting: Convene one (1) week before starting work of this section.

- .1 Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements, and to review submitted Shop Drawings.

1.6 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission Procedures.
- .2 Shop Drawings: Clearly indicate materials and large scale details for all conditions, construction and interfacing, profiles of components, elevations of unit, anchorage details, location isolation coating, description of related components, and exposed finishes and fasteners.
- .3 Submit manufacture's certificate or engineering seal on shop drawings stating compliance to Design Criteria.

1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission Procedures.
- .2 Test Reports: Submit certified test reports showing compliance with specified performance characteristics.
- .3 Installation Data: Manufacturer's special installation requirements.

1.8 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to product manufacturer.
 - .2 Manufacturer Qualifications: Manufacturer capable of providing structural calculations, applicable independent product test reports, installation instructions, a review of the application method, customer approval and periodic field service representation during construction.
- .2 Source Quality: Provide aluminum curtain walls specified herein from a single source.
 - .1 Building Enclosure System: When aluminum curtain wall are part of a building enclosure system, including entrances, entrance hardware, windows, storefront framing and related products, provide building enclosure system products from a single source manufacturer.

1.9 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Common Product Requirments - Transport, handle, store, and protect products.
- .2 Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- .3 Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

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

1.10 WARRANTY

- .1 See Bid Opportunity.
- .2 Manufacturer's Product Warranty: Submit, for City of Winnipeg's acceptance, manufacturer's warranty for curtain wall system as follows:
 - .1 Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by Kawneer.

Part 2 Products

2.1 MANUFACTURERS

- .1 Kawneer Company, Inc.; Product: Series 1600 Wall System[®].
 - .1 SSG glazing (at vertical intermediate mullion) and aluminum pressure plate caps as indicated on drawings.
- .2 Substitutions: Refer to City of Winnipeg Bid Opportunity.
 - .1 Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
 - .2 Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for curtain wall system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum curtain wall for a period of not less than ten (10) years.
 - .3 Test Reports: Submit test reports verifying compliance with each test requirement for curtain wall required by the project.
 - .4 Product Sample and Finish: Submit product sample, representative of curtain wall for the project, with specified finish and color.

2.2 MATERIALS

- .1 Aluminum (Curtain Wall and Components):
 - .1 Material Standard: Extruded Aluminum, ASTM B 221, 6063-T6 alloy and temper.
 - .2 Mullion Back Section Sizes:
 - .1 63.5mm wide x 95mm deep
 - .3 Mullion Cap Section Sizes:
 - .1 63.5mm wide x 19mm deep
 - .2 Colour: black anodized

- .4 Member Wall Thickness: Each framing member shall have a wall thickness sufficient to meet the specified structural requirements.
- .5 Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 ACCESSORIES

- .1 **Fasteners:** shall be 300 Series Stainless Steel or 400 Series Stainless Steel cadmium plated and of sufficient size and quantity to perform their intended function.
- .2 **Gaskets:** Interior glazing gaskets shall be black closed cell neoprene sponge in vision area. Exterior glazing gaskets and interior gaskets at spandrel areas shall be black EPDM rubber.
- .3 **Perimeter Anchors:** Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- .4 **Glazing tapes:** shall be macro-polyisobutyene, highly adhesive and elastic with continuous built in shim.
- .5 **Air barrier:** to be W.R. Grace Permabarrier.
- .6 **Isolation coating:** to be alkali resistant bituminous paint.
- .7 **Retainer cap:** design decorative retainer clip in collaboration with the Contract Administrator to secure horizontal framing member to the curtain wall horizontal member, if required.
- .8 **Flashing:** 2.1mm aluminum break-formed to suit application and provide water shedding to the exterior. Heavier gauges where indicated on drawings. Colour to match adjacent aluminum window framing.
- .9 **Formed Components:** shall be sheet of alloy and temper suitable for their purpose and finish.

2.4 GLASS AND GLAZING MATERIALS

- .1 Glazing Materials: As specified in Section 08 80 50.

2.5 SEALANT MATERIALS

- .1 Sealant and Backing Materials: As specified in Section 07 92 00.

2.6 FABRICATION

- .1 General:
 - .1 Fabricate components per manufacturer's installation instructions and with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal. Vertical and horizontal members shall be tubular extrusions designed for shear block corner construction.

- .2 Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.
- .3 Prepare components to receive anchor devices. Fabricate anchors.
- .4 Arrange fasteners and attachments to conceal from view.

2.7 FINISHES

- .1 Aluminum Anodic Coating: AAMA 611, Architectural Class I, AA-M12C22A41.
 - .1 Frame Colour: No. 17, Clear anodized.
 - .2 Cap Colour: No. 29, Black anodized.
 - .3 Flashing Colour: to match adjacent aluminum finish.

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 Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive curtain wall system and sill plate is level in accordance with manufacturer's acceptable tolerances.
 - .1 Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

3.2 INSTALLATION

- .1 Install curtain wall system to manufacturer instructions.
- .2 General: Install curtain wall systems plumb, level, and true to line, without warp or rack of frames with manufacturer's prescribed tolerances and installation instructions. Provide support and anchor in place.
 - .1 Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
 - .2 Glazing: Glass shall be outside glazed and held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners.
 - .3 Water Drainage: Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.
- .3 Related Products Installation Requirements:
 - .1 Sealants (Perimeter): Refer to Section - Joint Sealants.
 - .2 Glass: Refer to Section 08 80 50 - Glass and Glazing.

3.3 ERECTION TOLERANCES

- .1 Section 01 73 00: Execution Requirements

3.4 FIELD QUALITY CONTROL

- .1 Section 01 45 00 – Quality Control.
- .2 Field Tests: Contract Administrator shall select curtain wall units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
 - .1 Testing: Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements.
 - .1 Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft², whichever is greater.
 - .2 Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 8 psf (383 Pa).
 - .3 Manufacturer's Field Services: Upon City of Winnipeg's written request, provide periodic Site visit by manufacturer's field service representative.

3.5 ADJUSTING

- .1 Adjust operating sash for smooth operation.

3.6 CLEANING

- .1 Section 01 74 11: Cleaning.
- .2 Remove protective material from prefinished aluminum surfaces.
- .3 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.
- .4 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.
- .5 Cleaning: Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to City of Winnipeg's acceptance. Remove construction debris from project Site and legally dispose of debris.

3.7 PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Maintenance Requirement - Protecting installed work.
- .2 Protect finished Work from damage.

- .3 Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum curtain wall system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Hardware for hollow metal doors.

1.2 RELATED SECTIONS

- .1 Section 08 11 00 –Metal Doors and Frames.
- .2 Section 08 71 00 – Door Hardware - Groups

1.3 REFERENCES

- .1 CAN4-S104-M80(R1985) - Method for Fire Tests of Door Assemblies.
- .2 CAN/ULC-S132-2007 - Emergency Exit and Emergency Fire Exit Hardware.
- .3 CSDMA (Canadian Steel Door Manufacturers Association).
- .4 DHI (Door and Hardware Institute Canada) - AHC and EHC certification programs.
- .5 DHI (Door Hardware Institute) - A115 series.
- .6 DHI (Door Hardware Institute) - WDHS.3 - Hardware Locations for Wood Flush Doors.
- .7 BHMA (Builders Hardware Manufacturers Association) - A156 series.
- .8 NFPA 80 - Fire Doors, Fire Windows.
- .9 NFPA 252 - Fire Tests of Door Assemblies (2008 Edition).
- .10 UL 10B - Fire Tests of Door Assemblies.
- .11 UL 305 - Panic Hardware.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate with other work having a direct bearing on work of this section.
 - .1 Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
 - .2 Coordinate City of Winnipeg's keying requirements during the course of the Work.
- .2 Sequencing: Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.5 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submittal Procedures.

- .2 Shop Drawings:
 - .1 Indicate locations and mounting heights of each type of hardware, schedules, catalogue cuts, electrical characteristics and connection requirements, including make, model, material, function, finish, and all other pertinent information for each door or pair of doors. Use standard typed hardware list. "Horizontal" list not permitted.
- .3 Samples:
 - .1 Submit one (1) sample of each type hardware specified, when requested by Contract Administrator illustrating style, colour, and finish.
 - .2 Identify each sample by label indicating applicable specification paragraph number, finish, and hardware package number.

1.6 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submittal Procedures.
- .2 Installation Data: Manufacturer's special installation requirements.

1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Closeout Procedures.
- .2 Operation and Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- .3 Provide maintenance data, parts list, and manufacturer's instructions for each type door closers, locksets, door holders, and panic hardware for incorporation into maintenance manual.
- .4 Brief maintenance staff regarding proper care of hardware such as lubrication of locksets, adjustments of door closers, cleaning, and general maintenance.
- .5 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in City of Winnipeg's name and registered with manufacturer.
- .6 Record Documentation:
 - .1 Record actual locations of installed cylinders and their master key code.
 - .2 Keys: Deliver with identifying tags to City of Winnipeg by security shipment direct from hardware supplier.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 40: Maintenance and extra material requirements.
- .2 Tools:
 - .1 Provide special wrenches and tools applicable to each different or special hardware component.
 - .2 Provide maintenance tools and accessories supplied by hardware component manufacturer.

1.9 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform Work to the following requirements:
 - .1 BHMA A156 series.
 - .2 DHI - A115 series.
 - .3 DHI - WDHS.3.
 - .4 CSDMA.
 - .5 NFPA 252.
 - .6 UL 10B.
 - .7 UL 305.
 - .8 ULC S132.
 - .9 CAN4-S104.
- .3 Use ULC listed and labelled hardware for doors in fire separations and exit doors.
- .4 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years experience.
- .5 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

1.10 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for Products requiring electrical connection. Listed and classified by ULC as suitable for the purpose specified and indicated.

1.11 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.12 WARRANTY

- .1 See Bid Opportunity.

Part 2 Products

2.1 SUPPLIERS

- .1 Acceptable Suppliers: As indicated in Hardware Schedule.

2.2 MANUFACTURERS

- .1 Acceptable Manufacturers: As indicated in Hardware Schedule.

2.3 KEYING

- .1 Contractors to supply, install and make use of construction cylinders in all exterior doors. City of Winnipeg will exchange all construction cylinders at building turnover.

2.4 FINISHES

- .1 Finishes: Identified in Schedule at end of section.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify that doors and frames are ready to receive work and dimensions are as indicated on Shop Drawings.
- .2 Verify that electric power is available to power operated devices and is of the correct characteristics.

3.2 INSTALLATION

- .1 Install hardware to manufacturer's written instructions.
- .2 Use templates provided by hardware item manufacturer.
- .3 Mounting heights for hardware from finished floor to centre line of hardware item.

3.3 ADJUSTING

- .1 Adjust hardware for smooth operation.

3.4 PROTECTION OF FINISHED WORK

- .1 Do not permit adjacent work to damage hardware or finish.

3.5 SCHEDULES

- .1 Refer to Door Hardware Schedule.

END OF SECTION

NO.	NOM.SIZE	DOOR					FRAME				FIRE RATING	HARD. GROUP	KEYNOTE
		TYPE	MAT.	CORE	FIN.	GLS.	TYPE	MAT.	FIN.	GLS.			
D101	1100 x 2150 x 45mm	-	HM	INSUL.	PT	-	-	PS	PT	-		1	3
D102	2 - 950 x 2150 x 45mm	-	HM	INSUL.	PT	-	-	PS	PT	-		2	3
D103A	1100 x 2150 x 45mm	-	HM	INSUL.	PT	-	-	PS	PT	-		1	3
D103B	900 x 2150 x 45mm	-	HM	INSUL.	PT	-	-	PS	PT	-		5	3
D104	1100 x 2150 x 45mm	-	HM	INSUL.	PT	-	-	PS	PT	-		3	1,2,3
D105	1100 x 2150 x 45mm	-	HM	INSUL.	PT	-	-	PS	PT	-		4	2,3
D106	1100 x 2150 x 45mm	-	HM	INSUL.	PT	-	-	PS	PT	-		4	2,3

LEGEND

A Anodized	PT Paint
AL Aluminum	WD Wood - Solid Core
HM Hollow Metall	WG Wired Glass
T Tempered glass	PS Pressed Steel (welded) frame
THSDG Tempered hermetically sealed dual glazing	TBHM Thermally broken steel frame
INSUL Insulated	

GENERAL NOTES

- Contractor to supply, install and make use of construction cylinders on all doors, to be replaced by The City at building turnover.

KEYNOTES

- Two deadbolts specified. One to be used for securing door after-hours, the other for privacy when washroom is occupied.
- Power door operator required
- Refer to Drawings for door and frame elevations

Group 1

4 Hinges	TA 386	4 ½ x 4	NRP	26D	MCK
1 Mortise Lock	8851 x LNL x L/C			26D	SAR
1 Door Closer	351-0Z x 351B			EN	SAR
1 Set W/Strip	319CN	5400		AL	PEM
1 Threshold	271	1100		AL	PEM
1 Door Bottom	216APK	1100		AL	PEM
1 Latch Guard	#321			32D	RO

Group 2

6 Hinges	TA 386	4 ½ x 4	NRP	26D	MCK
1 Mortise Lock	8851 x LNL x L/C			26D	SAR
2 Door Closers	351-0Z x 351B			EN	SAR
1 Set Flush Bolts	555	12"		26D	RO
1 Set W/Strip	319CN	6200		AL	PEM
1 Threshold	271	1900		AL	PEM
1 Door Bottom	216APK	950		AL	PEM
1 Seal	S88***	2150		BK	PEM
1 Latch Guard	#321			32D	RO

*** Install on HM – Z astragal

Group 3

4 Hinges	TA 386	4 ½ x 4	NRP	26D	MCK
1 Deadlock	4877 L/C	Mounted at 48"		26D	SAR
1 Privacy Dead lock	291	Occupancy Indicator		26D	
1 Monitor switch	LMS-1				SEC
1 Push Plate	70C	4 x20		32D	RO
1 Door Pull	BF152	12"		32D	RO

1 Power Operator	6010 x 120V			NOR
2 INGRESS'R	I36-5		32D	XX
1 Set W/Strip	319CN	5400	AL	PEM
1 Auto Door Bottom	420PKL	1100	AL	PEM
1 Threshold	271	1900	AL	PEM

Method of operation: For permanent locking use the 4877 Deadlock. For privacy use the Occupancy deadlock. When engaged the actuators on the Power Operator will not function.

Group 4

4 Hinges	TA 386	4 ½ x 4	NRP	26D	MCK
1 Deadlock	4877 L/C	Mounted at 48"		26D	SAR
1 Push Plate	70C	4 x20		32D	RO
1 Door Pull	BF152	12"		32D	RO
1 Power Operator	6010 x 120V				NOR
2 INGRESS'R	I36-5			32D	XX
1 Set W/Strip	319CN	5400		AL	PEM
1 Auto Door Bottom	420PKL	1100		AL	PEM
1 Threshold	271	1900		AL	PEM

Group 5

4 Hinges	TA 386	4 ½ x 4	NRP	26D	MCK
1 Deadlock	4877 L/C			26D	SAR
1 Push Plate	70C	4 x20		32D	RO
1 Door Pull	BF152	12"		32D	RO

Cylinders to be supplied to comply with City of Winnipeg keying (Best SFC).

Coordinate with City Of Winnipeg

Part 1 General

1.1 SECTION INCLUDES

- .1 Glass and glazing for glazed windows and doors.

1.2 RELATED SECTIONS

- .1 Section 06 20 00 - Finish Carpentry.
- .2 Section 07 26 00 - Vapour Retarders.
- .3 Section 07 92 00 - Joint Sealants: Sealant and back-up material.
- .4 Section 08 11 00 - Metal Doors and Frames.
- .5 Section 08 44 13 - Glazed Aluminum Curtain Walls Windows

1.3 REFERENCES

- .1 ANSI Z97.1-04e1 - Safety Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test.
- .2 ASTM C542-05 - Specification for Lock-Strip Gaskets.
- .3 ASTM C864-05 - Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- .4 ASTM C920-08 - Elastomeric Joint Sealants.
- .5 ASTM C1036-06 - Flat Glass.
- .6 ASTM C1048-04 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
- .7 ASTM C1193-09 - Use of Joint Sealants.
- .8 ASTM D412-06ae2 -Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
- .9 ASTM D1149-07 - Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber.
- .10 ASTM D2240-05 - Test Method for Rubber Property - Durometer Hardness.
- .11 ASTM E84-09c - Test Method for Surface Burning Characteristics of Building Materials.
- .12 ASTM E283-04 - Test Method For Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.

- .13 ASTM E330-02 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- .14 CAN/CGSB 12.1-M90 - Tempered or Laminated Safety Glass.
- .15 CAN/CGSB 12.2-M91 - Flat, Clear Sheet Glass.
- .16 CAN/CGSB 12.3-M91 - Flat, Clear Float Glass.
- .17 CAN/CGSB 12.4-M91 - Heat Absorbing Glass.
- .18 CAN/CGSB 12.8-97 - Insulating Glass Units.
- .19 CAN/CGSB 12.13-M91 - Patterned Glass.
- .20 CAN/CGSB 12.20-M89 - Structural Design of Glass for Buildings.
- .21 CGSB 19-GP-5M-1984 - Sealing Compound, One Component, Acrylic Base, Solvent Curing (Incorporating Amendment No. 1)
- .22 GANA (Glass Association of North America)
 - .1 Glazing Manual (2004).
 - .2 FGMA Sealant Manual.
 - .3 Laminated Glazing Reference Manual (2006).
- .23 IGMAC (Insulating Glass Manufacturers Association of Canada) - Sealed Insulating Glass: Certification Program.
- .24 IGMA (Insulating Glass Manufacturers Alliance).

1.4 PERFORMANCE REQUIREMENTS

- .1 Provide glass and glazing materials for continuity of building enclosure vapour retarder and air barrier:
 - .1 In conjunction with materials described in Section 07 26 00 - Vapour Retarders and Section 07 92 00 – Joint Sealants.
 - .2 To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapour retarder seal.
 - .3 To maintain a continuous air barrier and vapour retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- .2 Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as calculated in accordance with National Building code to a design pressure of 0.8 kPa (16.7 lb/sq ft).
- .3 Limit glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.

1.5 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submittal Procedures.

- .2 Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- .3 Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colours.
- .4 Samples: Submit two (2) samples 300 mm (12 inch) in size, exemplifying glass units of each glass type.

1.6 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submittal Procedures.
- .2 Certificates: Certify that Products meet or exceed specified requirements.
- .3 Manufacturer's Certificate: Certify that sealed insulated environmental glass, meets or exceeds specified requirements.

1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 00: Closeout Submittals.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 40: Maintenance and extra material requirements.

1.9 QUALITY ASSURANCE

- .1 Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual GANA Laminated Glazing Reference Manual for glazing installation methods.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

1.10 ENVIRONMENTAL REQUIREMENTS

- .1 Do not install glazing when ambient temperature is less than 10 degrees C (50 degrees F).
- .2 Maintain minimum ambient temperature before, during and twenty-four (24) hours after installation of glazing compounds.

1.11 WARRANTY

- .1 See Bid Opportunity.
- .2 Provide a five (5) year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same from date of Substantial Performance.
 - .1 Condensation on inner faces of glass detrimental to vision will be considered sufficient evidence of seal failure.

Part 2 Products

2.1 FLAT GLASS MATERIALS

2.2 GLAZING SCHEDULE

- .1 Flat Glass:
 - .1 Float glass: to CAN/CGSB-12.3, glazing quality, 6 mm thick.
 - .2 Tempered Safety Glass: To CAN2-12.1-M90 Type 2, Class B
- .2 Exterior Aluminum Windows:
 - .1 Insulating glass units: to CAN/CGSB-12.8, double unit, 25mm overall thickness.
 - .1 **Transparent:** 25 mm sealed dual glazed with 6 mm (1/4") clear inner and outer panes, 12.5 mm (1/2") air space between panes. Thermal separator for curtainwall to be Edgetech Superspacer Premium Plus warm edge spacer, primary seal, silicone dual seal, colour black. Argon fill and Comfort T1-AC 40 coating on #2 surface.
 - .1 Tempered where required by NBC
 - .2 Standard of Acceptance:
 - .1 AGC.
 - .3 Edge Seal Material: Colour Black.
- .3 Exterior Doors, Sidelites and Transoms
 - .1 Dual clear 6mm (1/4") insulating tempered glass units with 12.5 mm (1/2") air space between panes, argon fill and Comfort E2 on #2 surface.

2.3 GLAZING AND SEALING COMPOUND MATERIALS

- .1 Sealant for heel bead (air seal) or toe bead shall be one part urethane sealant. Colour to be selected by Contract Administrator.
 - .1 **Standard of Acceptance:**
 - .1 Tremco Dymonic.
 - .2 Permapol RC-1.
- .2 Sealant for cap or needle bead. One part low modulus silicone sealant conforming to NSC/CGSB CAN2-19-13-M82.
 - .1 **Standard of Acceptance:**
 - .1 Tremco Spectrem 2.
 - .2 GE GESIL N2600.
- .3 Primers, if required, according to sealant manufacturer's recommendations.
- .4 **Glazing tape:** Lites of glass over 1905 united mm (6'-3"), tape shall be macro polyisobutylene butyl with integral continuous EPDM shim.
 - .1 **Standard of Acceptance:**
 - .1 Tremco Ployshim II Tape.
- .5 **Setting blocks:** To be neoprene or EPDM with a Shore "A" hardness of 80 plus or minus 5 durometer. Length to be 2.5mm (.1") per 90 sq. mm (1.4 sq.in.) of glass, but not less than 100mm (4"). Width for setting block to be 1.5mm (0.059") more than glass thickness and high enough to provide the bite recommended by glass manufacturer. When thickness offsetting block exceeds 18mm (3/4") thickness, the glass manufacturer must be consulted for size and configuration. In a vented system, setting block shall be designed so as not to restrict the flow of water within the glazing rabbet to the weep holes.

- .6 **Glazing gaskets:** To be continuous extruded EPDM, designed specifically for use in the window section with a shore "A" hardness balanced to that of shim in the tape.
 - .1 **Standard of Acceptance:**
 - .1 Tremco Plyshim II Glazing Splines.
- .7 Edge blocks shall be of a material and hardness to provide proper edge clearance according to glass manufacturer's recommendations.
- .8 Cleaning material for surfaces to receive glazing of tape or sealants to be xylol, methethylketone, toluol, or as recommended by manufacturer of sealant. The only acceptable cleaner for use with silicone 0 based sealants shall be methylethylketone (MEK).
- .9 Ensure that glazing sealants used are compatible with insulating glass sealant.

2.4 GLAZING ACCESSORIES

- .1 To Industry Standards.

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 that may impede moisture movement, weeps are clear, 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.
- .4 Install sealant in accordance with manufacturer's written instructions, ensuring that each material in the glazing system is compatible with the others.
- .5 All surfaces receiving glazing material shall be thoroughly wiped with a clean cloth, dampened with the appropriate cleaner, as approved by the sealant/glazing tape manufacturer. Special precautions must be taken in cold weather to ensure the surfaces are free from frost.
- .6 All framing members of windows shall be checked prior to glazing to make certain that the frame is square, plumb, and secure in order that uniform face and edge clearances are maintained. Inspect all butt and mitre joints. If these joints are open, they shall be sealed with sealant prior to glazing. All ventilators shall be properly adjusted. Maintain 3mm (1/8") minimum face clearance between glass and metal, on both sides, or unless otherwise outlined by the glass manufacturer.

3.3 INSTALLATION - EXTERIOR DRY METHOD (TAPE AND GASKET SPLINE GLAZING)

- .1 Cut glazing tape or spline to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.

- .2 Place setting blocks at 1/4 points with edge block no more than 150 mm (6 inches) from corners.
- .3 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- .4 Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- .5 Trim protruding tape edge.
- .6 In setting the gasket into the channel between the glass and removable stops, the horizontal strips (head and sill) shall be set first, then the vertical (jamb) strips.

3.4 INSTALLATION - EXTERIOR BUTT GLAZED METHOD (SEALANT ONLY)

- .1 Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
- .2 Temporarily secure a small diameter non-adhering foamed rod on back side of joint.
- .3 Apply sealant to open side of joint in continuous operation; thoroughly fill the joint without displacing the foam rod. Tool the sealant surface smooth to concave profile.
- .4 Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.
- .5 Remove masking tape.

3.5 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)

- .1 Cut glazing tape to length and set against permanent stops, projecting 1.5 mm (1/16 inch) above sight line.
- .2 Place setting blocks at 1/4 ~~1/3~~ points with edge block no more than 150 mm (6 inches) from corners.
- .3 Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- .4 Place glazing tape on free perimeter of glazing in same manner described above.
- .5 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .6 Knife trim protruding tape.

3.6 CLEANING

- .1 Section 01 74 11: Cleaning installed work.
- .2 Remove glazing materials from finish surfaces.

- .3 Remove labels after Work is complete.
- .4 Clean glass and adjacent surfaces.
- .5 Clean films to manufactures recommendations.

3.7 PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.
- .2 After installation, mark pane with an 'X' by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

END OF SECTION