

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM A653/A653M-01a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA International)
 - .1 G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-03 Welded Steel Construction .
- .4 Canadian Steel Door Manufacturers' Association, (CSDMA).
 - .1 CSDMA, Specifications for Commercial Steel Doors and Frames, 1990.
 - .2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 1990.
- .5 National Fire Protection Association (NFPA)
 - .1 NFPA 80-99, Standard for Fire Doors and Fire Windows.
 - .2 NFPA 252-99, Standard Methods of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN4-S104-80(R1985), Fire Tests of Door Assemblies.
 - .2 CAN4-S105-85(R1992), Fire Door Frames Meeting the Performance Required by CAN4-S104.
- .7 CAN/ULC-S702-97, Thermal Insulation, Mineral Fibre, for Buildings.
- .8 CAN/ULC-S704-01, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.2 DESIGN REQUIREMENTS

- .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35oC to 35oC.
- .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

1.3 SHOP DRAWINGS

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

- .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, arrangement of hardware and fire rating and finishes.
- .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing fire rating finishes.
- .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .5 Submit test and engineering data, and installation instructions.

1.4 REQUIREMENTS

- .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M ,NFPA 252 for ratings specified or indicated.
- .2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

Part 2 Products

2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF001.

2.2 DOOR CORE MATERIALS

- .1 Honeycomb construction:
 - .1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m³ minimum sanded to required thickness.
 - .2 Stiffened: face sheets laminated, welded, insulated core.
 - .1 Polyisocyanurate: to CAN/ULC-S704 rigid, cyanide free.

2.3 ADHESIVES

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

- .3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMER

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

2.5 PAINT

- .1 Field paint steel doors and frames in accordance with Section 09 90 00 – Painting. Protect weatherstrips from paint. Provide final finish shall be free of scratches or other blemishes.

2.6 ACCESSORIES

- .1 Glazing: in accordance with Section 08 80 50.
- .2 Make provisions for glazing as indicated and provide necessary glazing stops, tamperproof. Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .3 Door silencers: single stud rubber/neoprene type.
- .4 Steel top caps to exterior doors. Inverted, recessed, spot welded channels to top and bottom of interior doors.

2.7 FRAMES FABRICATION GENERAL

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.6 mm welded thermally broken type construction.
- .4 Interior frames: 1.6 mm welded type construction.
- .5 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised cutouts with steel guard boxes.
- .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .8 Manufacturer's nameplates on frames are not permitted.
- .9 Conceal fastenings except where exposed fastenings are indicated.
- .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .11 Insulate exterior frame components with spray applied polyisocyanurate insulation.

2.8 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.
- .4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm o.c. maximum.

2.9 FRAMES: WELDED TYPE

- .1 Welding in accordance with CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .5 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

2.10 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush.
- .2 Exterior doors: insulated bonded core construction. Interior doors: non insulated, honeycomb construction.
- .3 Fabricate doors with longitudinal edges welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .4 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.
- .5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .6 Reinforce doors where required, for surface mounted hardware. Provide flush steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

- .8 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104, ASTM E152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .9 Manufacturer's nameplates on doors are permitted. Location of nameplates to be on hinge side of door concealed from view.

2.11 DOORS: HONEYCOMB/BONDED CORE CONSTRUCTION

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

2.12 THERMALLY BROKEN DOORS AND FRAMES

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

Part 3 Execution

3.1 INSTALLATION GENERAL

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and frames to CSDMA Installation Guide.

3.2 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

- .5 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air barrier and vapour retarder.

3.3 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 10 - Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latchside and head: 1.5 mm.
 - .3 Finished floor, top of carpet, noncombustible sill and thresholds: 13 mm.
- .3 Adjust operable parts for correct function.

3.4 FINISH REPAIRS

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

3.5 GLAZING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Aluminum Association (AA).
 - .1 DAF 45-[03], Designation System for Aluminum Finishes.
- .2 American Architectural Manufacturers Association (AAMA).
 - .1 AAMA 609.1-[02], Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.

1.2 SUBMITTALS

- .1 Product Data: Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings: Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Indicate each type of coiling counter door, arrangement of hardware, operating mechanism and required clearances.

1.3 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 300 mm long pieces of coiling curtain slats.
- .3 Manufacturer's Instructions: Submit manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

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

1.5 QUALITY ASSURANCE

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

Part 2 Products

2.1 MATERIALS

- .1 Coiling doors.
- .2 Aluminum sheet metal: plain finish utility sheet.
- .3 Aluminum extrusions: Aluminum Association alloy AA6063-T5.

2.2 COILING COUNTER DOORS

- .1 Rivet [continuous] [alternate] end locks to slat ends.
- .2 Assemble coiling counter door curtain of 50 mm wide x mm thick, extruded] aluminum interlocking slat sections.
- .3 Provide bottom bar of extruded aluminum section equal mass, aluminum angles.
- .4 Form guides of metal sections of 5 mm minimum thickness for face wall installation.
- .5 Construct counterbalance assembly consisting of torsion spring with 25% overload factor. Enclose spring in steel pipe to support door curtain and counterbalance mechanism with maximum deflection of 1/360th of opening width. Provide ball bearings at rotating points. Provide spring tension adjusting wheel, accessible for setting.
- .6 Support counterbalance assembly on 5 mm minimum thickness steel plate brackets, forming end enclosures.
- .7 Enclose counter balance assembly with [galvanized steel] [stainless steel] [aluminum] sheet formed hood.
- .8 Attach to hood sheet metal flame and smoke baffle to drop in place automatically when activated by temperature rise and melting of fusible link.
- .9 Equip coiling doors for locking from inside both sides with lockset ,cylinder locks for masterkeyed cylinder, specified in Section 08 71 10 - Door Hardware – General.

2.3 ALUMINUM FINISHES

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

2.4 OPERATION

- .1 Equip coiling counter doors for operation by:
 - .1 Hand, install two lift handles at coiling counter door bottom on outsideface of coiling counter door or provide continuous extruded lifting strip.
 - .2 Crank operator with removable hand crank.

Part 3 Execution

3.1 INSTALLATION

- .1 Install coiling counter door in accordance with manufacturers' printed instructions.
- .2 Install masterkeyed cylinders specified in Section 08 71 10 - Door Hardware – General.
- .3 Adjust operable parts for correct function and smooth operation.

3.2 CLEANING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Aluminum Association Designation System For Aluminum Finishes (AA)- 1997
 - .1 DAF 45 1997, Designation System For Aluminum Finishes.
- .2 Architectural Aluminum Manufacturers Association (AAMA)
 - .1 AAMA CW-10-97, Curtain Wall Manual #10 Care and Handling of Architectural Aluminum From Shop to Site.
 - .2 AAMA 607.1-76, Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
- .3 American Society for Testing and Materials (ASTM)
 - .1 ASTM B 209M-95, Specification for Aluminum and Aluminum-Alloy Sheet and Plate Metric.
 - .2 ASTM B 221M-96, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .3 ASTM E 283-91, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - .4 ASTM E 330-97e1, Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - .5 ASTM E 331-96, Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - .6 ASTM E 1105-96, Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls, and Doors by Uniform or Cyclic Static Air Pressure Difference.
- .4 Canadian Standards Association (CSA)
 - .1 CAN/CSA-S157-M83, Strength Design in Aluminum.
 - .2 CSA W59.2-M1991(1998), Welded Aluminum Construction.

1.2 SYSTEM DESCRIPTION

- .1 Vertical glazed aluminum store front wall system includes tubular aluminum sections with self supporting, supplementary support framing, shop fabricated, factory prefinished, vision glass, anchorage and attachment devices.
- .2 Assembled system to permit re-glazing of individual glass units without requiring removal of structural mullion sections.

1.3 PERFORMANCE REQUIREMENTS

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

- .2 Design and size components to withstand seismic loads and sway displacement as calculated in accordance with NBC.
- .3 Limit mullion deflection with full recovery of glazing materials.
- .4 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.
- .5 Provide system to accommodate, without damage to components or deterioration of seals:
 - .1 Movement within system.
 - .2 Movement between system and perimeter framing components.
 - .3 Dynamic loading and release of loads.
 - .4 Deflection of structural support framing.
- .6 Sound attenuation through wall system (exterior to interior): STC 45, measured in accordance with AAMA T1R - A1 - ASTM E 413.
- .7 Limit air infiltration through assembly to 0.0003 m³/s/m² of wall area, measured at a reference differential pressure across assembly of 75 Pa as measured in accordance with AAMA 501 and ASTM E 283.
- .8 Vapour seal with interior atmospheric pressure of 25 mm sp, 22°C, 40% RH: No failure.
- .9 Water leakage: none, when measured in accordance with AAMA 501, ASTM E 331, and ASTM E 1105.
- .10 System to provide for expansion and contraction within system components caused by a cycling temperature range of 95°C over a 12 hour period without causing detrimental affect to system components.
- .11 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
- .12 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

1.4 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide component dimensions, describe components within assembly, anchorage and fasteners, glass.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding required.

1.6 SAMPLES

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

1.7 PRE-INSTALLATION MEETING

- .1 Convene one week before starting work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 .
- .2 Handle work of this section in accordance with AAMA CW-10.
- .3 Protect prefinished aluminum surfaces with wrapping / strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.9 ENVIRONMENTAL REQUIREMENTS

- .1 Do not install sealants when ambient and surface temperature is less than 5°C.
- .2 Maintain this minimum temperature during and after installation of sealants.

1.10 SEQUENCING

- .1 Coordinate work of this section with installation of firestopping, flashing placement and components or materials.

Part 2 Products

2.1 MATERIALS

- .1 Extruded aluminum: ASTM B 221M.
- .2 Sheet aluminum: ASTM B 209M.
- .3 Fasteners: stainless steel and aluminum.
- .4 Bituminous paint: CAN/CGSB1.108, without thinner.
- .5 Vertical glass units: in accordance with Section 08 80 50.
- .6 Sealant: in accordance with Section 07 92 10

2.2 COMPONENTS

- .1 Mullion profiles, frame profile, and door profile as indicated on the drawings.
- .2 Acceptable material system:
 - .1 Door exterior: Kawneer 560 Insulclad

- .2 Door interior : Kawneer 190
- .3 Exterior framing: Kawneer 45L T windows
- .4 Interior framing: Kawneer Trifab VG 450
- .4 Door Hardware: as indicated in schedule

2.3 FABRICATION

- .1 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- .2 Fabricate spandrel infill panels to Section 08 80 50 and seal edge seals around perimeter of panel assembly, enabling installation and minor movement of perimeter seal.
- .3 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- .4 Prepare components to receive anchor devices. Install anchors.
- .5 Arrange fasteners and attachments to ensure concealment from view.
- .6 Prepare system components to receive hardware specified in Schedule
- .7 Visible manufacturer's identification labels not permitted.

2.4 FINISHES

- .1 Finish coatings: conform to AA designations.
- .2 Interior exposed aluminum surfaces: AAMA AA A41 anodized to 215-R1, minimum 0.7 mils thickness, prepared with a mechanical chemical pre-treatment, anodized to clear colour.
- .3 Exterior colour: AA designations electrolytic anodized class 1, colour as selected by Contract Administrator.
- .4 Shop and touch-up primer for steel components: SSPC 25 Paint red oxide.
- .5 Touch-up primer for galvanized steel surfaces: SSPC 20 Paint zinc rich.
- .6 Concealed steel items: galvanized in accordance with ASTM A 123 to 600 gm/m².
- .7 Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

2.5 SOURCE QUALITY CONTROL

- .1 Perform work in accordance with AAMA CW-I-9.

- .2 Manufacturer qualifications: company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- .3 Installer qualifications: company specializing in performing the work of this section and approved by manufacturer.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify dimensions, tolerances, and method of attachment with other work.
- .2 Verify wall openings are ready to receive work of this section.

3.2 INSTALLATION

- .1 Install door system in accordance with manufacturer's instructions.
- .2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- .3 Provide alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.
- .4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.
- .5 Coordinate installation of fire stop insulation, specified in Section 07840, at each floor slab edge and intersection with vertical construction and where indicated.
- .6 Install glass in accordance with Section 08 80 50 – Glazing.
- .7 Install perimeter sealant to method required to achieve performance criteria. Type, backing materials, and installation criteria in accordance with Section 07 92 10 - Joint Sealers.
- .8 Install door hardware to manufacturer's standard locations.

3.3 SITE TOLERANCES

- .1 Maximum variation from plumb: 1.5 mm/m non-cumulative or 12 mm/30 m, whichever is less.
- .2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.
- .3 Maximum sealant space between door system and adjacent construction: 13 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

- .1 Protect finished Work from damage.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Aluminum Association (AA), Designation System for Aluminum Finishes 2000
- .2 Canadian Standards Association (CSA) International
 - .1 CSA-A440-00/A440.1-00, A440-00] Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.
 - .2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-Z91-M90(R2000), Safety Code for Window Cleaning Operations.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 13 00.
- .2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.

1.3 SAMPLES

- .1 Submit samples in accordance with Section 01 13 00.
- .2 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.
- .3 Include 150 mm long samples of head, jamb, sill, meeting rail, mullions to indicate profile.

1.4 CLOSEOUT SUBMITTALS

- .1 Provide operation and maintenance data for windows for incorporation into manual specified.

Part 2 Products

2.1 MATERIALS

- .1 Materials: to CSA-A440/A440.1 supplemented as follows:
- .2 All aluminum windows by same manufacturer.
- .3 Main frame: aluminum thermally broken.
- .4 Glass: in accordance with Section 08 80 50.

.5 Exterior metal sills, aluminum facings: extruded aluminum brake formed aluminum sheet metal of type and size as detailed, to suit job conditions; minimum 3 mm thick, complete with joint covers, jamb drip deflectors, chairs, and anchoring devices.

.6 Isolation coating: alkali resistant bituminous paint.

2.2 WINDOW TYPE

.1 Type: Fixed, Kawneer 518 T.

2.3 FABRICATION

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

.2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 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 Finish steel clips and reinforcement with 380 g/m² zinc coating to CAN/CSA-G164.

2.4 ALUMINUM FINISHES

.1 Finish coatings: conform to AA designations.

.2 Interior exposed aluminum surfaces: AAMA AA A41 anodized to 215-R1, minimum 0.7 mils thickness, prepared with a mechanical chemical pre-treatment, anodized to clear colour.

.3 Exterior colour: AA designations electrolytic anodized class 1, , minimum 0.7 mils thickness, colour as selected by Contract Administrator.

2.5 ISOLATION COATING

.1 Isolate aluminum from following components, by means of isolation coating:

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.3 Wood.

2.6 GLAZING

.1 Glaze windows in accordance with CSA-A440/A440.1 and Section 08 80 50.

2.7 AIR BARRIER AND VAPOUR RETARDER

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

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

Part 3 Execution

3.1 WINDOW INSTALLATION

- .1 Install in accordance with CSA-A440/A440.1.
- .2 Arrange components to prevent abrupt variation in colour.

3.2 SILL INSTALLATION

- .1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece lengths at each location.
- .2 Cut sills to fit mm longer than window opening.
- .3 Secure sills in place with anchoring devices located at ends, joints of continuous sills and evenly spaced 600 mm on centre in between.
- .4 Fasten expansion joint cover plates and drip deflectors with self tapping stainless steel screws.
- .5 Maintain 6 to 9 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.

3.3 CAULKING

- .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.
- .2 Apply sealant in accordance with Section 07 92 10 - Joint Sealers. Conceal sealant within window units except where exposed use is permitted by Contract Administrator.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
 - .1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.
- .2 ANSI/BHMA Standards A156 Series
- .3 CSA B651-04 Accessible Design for the Built Environment.

1.2 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit contract hardware list in accordance with Section 01 13 00.
 - .3 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .2 Samples:
 - .1 Submit samples in accordance with Section 01 13 00.
 - .2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
 - .3 After approval samples will be returned for incorporation in the Work.
- .3 Manufacturer's Instructions: Submit manufacturer's installation instructions
- .4 Closeout Submittals: Provide operation and maintenance data for door closers, locksets, door holders for incorporation into manual.

1.3 QUALITY ASSURANCE

- .1 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 REQUIREMENTS REGULATORY AGENCIES

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

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Deliver, store, handle and protect materials in accordance with Section 01 33 00.

- .2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .2 Storage and Protection: Store finishing hardware in locked, clean and dry area.

1.6 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 13 00.
 - .2 Supply two sets of wrenches for door closers, locksets and fire exit hardware.

Part 2 Products

2.1 HARDWARE ITEMS

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

2.2 DOOR HARDWARE AND SCHEDULE

- .1 As indicated in Schedule

2.3 MISCELLANEOUS HARDWARE

- .1 Indexed key control system: to ANSI/BHMA A156.28, designated by letter E and numeral identifiers, wall mounted type.

2.4 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.

2.5 KEYING

- .1 Doors, to be keyed as noted in Hardware Schedule and as directed. Prepare detailed keying schedule in conjunction with Contract Administrator.
- .2 All locks to be keyed to the existing key system as instructed by City of Winnipeg.

- .3 Provide keys in duplicate for every lock in this Contract.
- .4 Provide three keys for each Master Key.
- .5 Provide three change keys for each lock.
- .6 Stamp keying code numbers on keys and cylinders.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Furnish door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

- .1 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.
- .2 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .3 Install hardware to CSA B651-04 Accessible Design for the Built Environment.
- .4 Provide key control cabinet to Contract Administrator.
- .5 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

3.3 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to provide tight fit at contact points with frames.

3.4 CLEANING

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

- .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.
- .3 Remove protective material from hardware items where present.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.5 KEYING SYSTEM AND CABINET

- .1 Keying System Setup and Cabinet:
 - .1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.
 - .2 Place file keys and duplicate keys in key cabinet on their respective hooks.
 - .3 Lock key cabinet and turn over key to Contract Administrator.

3.6 DEMONSTRATION

- .1 Maintenance Staff Briefing:
 - .4 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.
 - .2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.6 SCHEDULE

HW SET:01					
6	EA	HINGE	3CB1 4.5 X 4 NRP	630	IVE
1	EA	PANIC HARDWARE	35A-EO	626	VON
1	EA	PANIC HARDWARE	35A-NL-OP X BEST CYL	626	VON
2	EA	PULL	3012-2 X #5 MTG	630	STD
1	EA	SURFACE CLOSER	4111 EDA X 18	689	LCN
1	EA	AUTO-EQUALIZER	4642	689	LCN
2	EA	OVERHEAD STOP	100S SERIES	630	GLY
2	EA	THRESHOLD	CT-11	627	KNC
2	EA	DOOR SWEEP	W-13S	628	KNC
4	EA	WALL PLATE SWITCH	7910-956	630	LCN
WEATHERSTRIP BY DOOR SUPPLIER					

HW SET:02

6	EA	HINGE	3CB1 4.5 X 4	652	IVE
2	EA	PULL	2012-2 X #5 MTG	630	STD

2	EA	PUSH BAR	6000-2 SERIES X #5 MTG	630	STD
1	EA	SURFACE CLOSER	4011 X 18	689	LCN
1	EA	AUTO-EQUALIZER	4631	689	LCN
2	EA	OVERHEAD STOP	100S SERIES	630	GLY
4	EA	WALL PLATE SWITCH	7910-956	630	LCN

HW SET:03

3	EA	HINGE	3CB1 4.5 X 4 NRP	630	IVE
1	EA	PANIC HARDWARE	22EO	689	VON
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	OVERHEAD STOP	100S SERIES	630	GLY
1	EA	KICKPLATE	K10A 12" X WIDTH TO SUIT	630	STD
1	EA	THRESHOLD	CT-11	627	KNC
1	EA	DOOR SWEEP	W-13S	628	KNC
1	EA	WEATHERSTRIP	W-20N (TOP ONLY)	628	KNC
1	SET	WEATHERSTRIP	W-50	628	KNC

HW SET:04

3	EA	HINGE	3CB1 4.5 X 4	652	IVE
1	EA	ENTRANCE LOCK	AL53PD SAT	626	SCH
1	EA	PULL	2007-1	630	STD
1	EA	FLOOR STOP	S101/S103	626	STD

HW SET:05

6	EA	HINGE	3CB1 4.5 X 4 NRP	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DEADBOLT	B660P	626	SCH
2	EA	PULL	2412-2	630	STD
2	EA	PUSH PLATE	K11A - 5	630	STD
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	OVERHEAD STOP	100S SERIES	630	GLY
2	EA	KICKPLATE	K10A 12" X WIDTH TO SUIT	630	STD

HW SET:06

3	EA	HINGE	3CB1 4.5 X 4	652	IVE
1	EA	PULL	2412-2	630	STD
1	EA	PUSH PLATE	K11A - 5	630	STD
1	EA	AUTO-EQUALIZER	4631	689	LCN
1	EA	KICKPLATE	K10A 12" X WIDTH TO SUIT	630	STD
1	EA	WALL STOP	S121/S123	626	STD
4	EA	WALL PLATE SWITCH	7910-956	630	LCN

HW SET:07

3	EA	HINGE	3CB1 4.5 X 4	652	IVE
1	EA	ENTRANCE LOCK	AL53PD SAT	626	SCH
1	EA	PULL	2007-1	630	STD
2	EA	KICKPLATE	K10A 12" X WIDTH TO SUIT	630	STD
1	EA	FLOOR STOP	S101/S103	626	STD

HW SET:08

6	EA	HINGE	3CB1 4.5 X 4	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	ENTRANCE LOCK	AL53PD SAT	626	SCH
1	EA	SURFACE CLOSER	1461	689	LCN
1	EA	OVERHEAD STOP	100S SERIES	630	GLY
4	EA	KICKPLATE	K10A 12" X WIDTH TO SUIT	630	STD
1	EA	FLOOR STOP	S101/S103	626	STD

HW SET:09

3	EA	HINGE	3CB1 4.5 X 4	652	IVE
1	EA	STOREROOM LOCK	AL80PD SAT	626	SCH
1	EA	SURFACE CLOSER	1461	689	LCN
1	EA	KICKPLATE	K10A 12" X WIDTH TO SUIT	630	STD
1	EA	FLOOR STOP	S101/S103	626	STD

HW SET:10

6	EA	HINGE	3CB1 4.5 X 4 NRP	652	IVE
2	EA	FIRE EXIT HARDWARE	2227L-F	689	VON
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	OVERHEAD STOP	410S SERIES	630	GLY
2	EA	KICKPLATE	K10A 12" X WIDTH TO SUIT	630	STD

HW SET:11

6	EA	HINGE	3CB1 4.5 X 4 NRP	630	IVE
1	EA	MULLION	KR4954	689	VON
2	EA	PANIC HARDWARE	22EO	689	VON
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	OVERHEAD STOP	100S SERIES	630	GLY
2	EA	KICKPLATE	K10A 12" X WIDTH TO SUIT	630	STD
2	EA	THRESHOLD	CT-11	627	KNC
2	EA	DOOR SWEEP	W-13S	628	KNC
2	EA	WEATHERSTRIP	W-20N (TOP ONLY)	628	KNC
2	SET	WEATHERSTRIP	W-50	628	KNC

HW SET:12

3	EA	HINGE	3CB1 4.5 X 4 NRP	630	IVE
1	EA	DEADBOLT	B660P	626	SCH
1	EA	PASSAGE SET	AL10S SAT	626	SCH
1	EA	SURFACE CLOSER	P1461	689	LCN
1	EA	OVERHEAD STOP	100S SERIES	630	GLY
1	EA	KICKPLATE	K10A 12" X WIDTH TO SUIT	630	STD

1	EA	THRESHOLD	CT-11	627	KNC
1	EA	DOOR SWEEP	W-13S	628	KNC
1	EA	WEATHERSTRIP	W-20N (TOP ONLY)	628	KNC
1	SET	WEATHERSTRIP	W-50	628	KNC

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ANSI/BHMA A156.9-1982, Cabinet Hardware.
- .2 ANSI/BHMA A156.11-1991, Cabinet Locks.
- .3 ANSI/BHMA A156.16-1981, Auxiliary Hardware.
- .4 ANSI/BHMA A156.18-1987, Materials and Finishes.

1.2 SUBMITTALS

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

1.3 QUALITY ASSURANCE

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

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Deliver, store, handle and protect materials in accordance with Section 01 33 00.
 - .2 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .2 Storage and Protection:
 - .1 Store cabinet hardware in locked, clean and dry area.

Part 2 Products

2.1 HARDWARE ITEMS

- .1 Use one manufacturer's product for all similar items.

2.2 CABINET HARDWARE AND MISCELLANEOUS HARDWARE

- .1 Hinges: Blum 110° concealed self-closing with six-way adjustment finish to 26D.
- .2 Pulls, doors and drawers: Richeleu panel products #33205, finish 195 mat nickel, 96 mm c.c. 8/32 screw.
- .3 Drawer slides side mounted zinc plated cold roll steel, full extension type, 100 lb capacity .
 - .1 Typical drawers: Accuride 3832SC, 18"-20".
- .4 Locks for doors and drawers: finish to 170.
 - .1 Acceptable manufacturer: Abloy high security exec office furniture locks OF200E
- .5 Adjustable built-in shelving standards for cabinets: KV255AL. finish nickel.
- .6 Shelving Clips for cabinets: KV256AL, finish nickel.

2.3 FASTENINGS

- .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .2 Exposed fastening devices to match finish of hardware.
- .3 Use fasteners compatible with material through which they pass.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Install hardware to standard hardware location dimensions in accordance with manufacturer's recommendations and to project design requirements.
- .2 Keying: as per owner's instructions.

3.3 ADJUSTING

- .1 Adjust cabinet hardware for optimum, smooth operating condition.
- .2 Lubricate hardware and other moving parts.
- .3 Adjust cabinet door hardware to provide tight fit at contact points with frames.

3.4 CLEANING

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

3.5 DEMONSTRATION

- .1 Maintenance Staff Briefing.
 - .1 Brief maintenance staff regarding:
 - .1 Proper care, cleaning, and general maintenance of projects complete hardware.
- .2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 AN ANSI/ASTM E330- 02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .2 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
 - .3 CAN/CGSB-12.4-M91, Heat Absorbing Glass.
 - .4 CAN/CGSB-12.8-M90 Insulating Glass Units.
 - .5 CAN/CGSB-12.11-M90 Wired Safety Glass.
- .3 Canadian Standards Association (CSA International).
 - .1 CSA A440.2-98, Energy Performance Evaluation of Windows and Sliding Glass Doors.
 - .2 CSA Certification Program for Windows and Doors 2000.
- .4 Glass Association of North America (GANA).
 - .1 GANA Glazing Manual 2004.

1.2 SYSTEM DESCRIPTION

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

1.3 SUBMITTALS

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

1.4 ENVIRONMENTAL REQUIREMENTS

- .1 Install glazing when ambient temperature is 10°C minimum. Maintain ventilated environment for 24 hours after application.

- .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

Part 2 Products

2.1 MATERIALS: FLAT GLASS

- .1 Float glass: to CAN/CGSB-12.3, Glazing quality, 6 mm thick.
- .2 Safety glass: to CAN/CGSB-12.1, transparent, 6 mm thick.
 - .1 Type 2-tempered.
 - .2 Class B-float
- .3 Wired glass: to CAN/CGSB-12.11, 6 mm thick.
 - .1 Type 1-Polished both sides (transparent).
 - .2 Wire mesh styles 3-Square.
- .4 Heat absorbing glass: to CAN/CGSB-12.4, 6 mm thick.
 - .3 Type 2-Insulating glass unit.
 - .4 Class B-Heat strengthened
 - .5 Tint green reflective coating on second surface.

2.2 MATERIALS: SEALED INSULATING GLASS

- .1 Insulating glass units (Door): Non-reflecting glass to CAN/CGSB-12.8, double unit, tempered, 25 mm overall thickness.
 - .1 Exterior and interior light: 6.0 mm fully tempered float glass, titanium sputtered (Comfort TI-AC40 low emissivity coating on surface 3, and 13 mm air space with Edgetech Architectural S-Class Super Spacer.
- .2 Insulating glass units (curtain wall): to CAN/CGSB-12.8, consisting of two lites of glass with outer pane 6 mm of light and heat reflecting /absorbing tempered glass, 13 mm air spaced with Edgetech Architectural S-Class Super Spacer, Argon gas filled and with sputtered Low-E coating on third surface.
 - .1 Shading co-efficient: 0.33
 - .2 U value thermal transmission: 0.25 BTU/FT²/Hr
 - .3 Solar heat gain coefficient: 0.29
 - .4 Visible light transmittance: 35
 - .5 Relative heat gain: 69.93 BTU/FT²/Hr
 - .6 Coating Tint: gray on second surface .

2.3 MATERIALS

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

2.4 ACCESSORIES

- .1 Setting blocks: Neoprene, 80-90 Shore A durometer hardness to ASTM D2240, length of 25 mm for each square meter of glazing, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height, to suit glazing method, glass light weight and area.
- .2 Spacer shims: Neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.
- .3 Glazing tape:
 - .1 Preformed butyl compound 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; size to suit application; black colour.
 - .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 EXAMINATION

- .1 Verify that openings for glazing are correctly sized and within tolerance.
- .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.3 PREPARATION

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

3.4 INSTALLATION TEMPERED GLASS

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

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

- .1 Perform work in accordance with GANA Glazing Manual, IGMAC and Laminators Safety Glass Association - Standards Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .4 Place setting blocks at $\frac{1}{4}$ points, with edge block maximum 150 mm from corners.
- .5 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line. Place glazing tape on glazing light or unit with tape flush with 16 mm below sight line.
- .7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

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

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

3.7 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt. Remove traces of primer, caulking.
- .2 Remove glazing materials from finish surfaces.

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- .3 Remove labels after work is complete.
 - .4 Clean glass using approved non-abrasive cleaner in accordance with manufacture's instructions.
 - .5 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.8 PROTECTION OF FINISHED WORK

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

END OF SECTION