

1 General

1.1 RELATED SECTIONS

- .1 Section 07 92 10 - Joint Sealing: Caulking of joints between frames and other building components.
- .2 Section 08 71 10 - Door Hardware - General: Supply of finish hardware, including weatherstripping and mounting heights.

1.2 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-M1989(R2001), Welded Steel Construction (Metal Arc Welding) (Metric Version).
- .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-S701-01, Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- .8 CAN/ULC-S704-01, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.3 DESIGN REQUIREMENTS

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

1.4 SHOP DRAWINGS

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

1.5 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 and CAN4 S105M 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, 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.
- .3 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.
- .3 Divert unused paint and sealant materials from landfill to official hazardous material collections site approved by Contract Administrator.
- .4 Do not dispose of unused paint and sealant materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.
- .5 Divert unused metal materials from landfill to metal recycling facility approved by Contract Administrator.
- .6 Divert unused wood materials from landfill to recycling facility approved by Contract Administrator.
- .7 Damaged or broken glazing materials are not recyclable. These materials must not be disposed of with materials destined for recycling.

2 Products

2.1 MATERIALS

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

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 welded, insulated core.
 - .1 Fibreglass: to CAN/ULC-S702, semi-rigid, density 24 kg/m³.
 - .2 Expanded polystyrene: CAN/ULC-S701, density 16 to 32 kg/m³.
 - .3 Polyurethane: to CAN/ULC-S704 rigid, modified poly/isocyanurate, closed cell board. Density 32 kg/m³.
- .3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250°C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

2.3 ADHESIVES

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

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior and interior, top and bottom caps: steel.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Door bottom seal: Refer to 08 71 10 Door Hardware.
- .5 Metallic paste filler: to manufacturer's standard.
- .6 Fire labels: metal riveted.
- .7 Sealant: See 07 92 10.

2.6 FRAMES FABRICATION GENERAL

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Steel frames to exterior and interior openings 1200 mm or less in unsupported width 1.63 mm (16 gauge) base thickness.
- .4 Steel frames exterior and interior openings over 1200 mm in unsupported width 1.63mm (16 gauge) base thickness c/w rib stiffeners and reinforcing requirements.
- .5 Exterior frames: 1.6 mm welded thermally broken type construction.
- .6 Interior frames: 1.6 mm welded type construction.
- .7 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.
- .8 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .9 Manufacturer's nameplates on frames and screens are not permitted.
- .10 Conceal fastenings except where exposed fastenings are indicated.
- .11 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .12 Insulate exterior frame components with polyurethane insulation.
- .13 All frames shall have double (drywall) returns at throat openings.

- .14 Install conduit as required for electric locks.
- .15 Provide two steel channel or angle removable temporary spreaders welded to jambs at bottom of door opening to maintain proper alignment.

2.7 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 Where anchoring into concrete, masonry or steel - 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.
- .5 Provide adjustable jamb anchors for fixing at floor.

2.8 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.

2.9 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and/or louver openings as indicated.
- .2 Exterior doors: hollow steel construction. Interior doors: hollow steel 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 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E330.
- .5 Blank, reinforce, drill and tap doors and frames for mortised hardware. Reinforce doors and frames for surface mounted hardware
- .6 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .7 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.
- .8 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .9 Shop prime cold rolled steel sheet in accordance with CGSB 85-GP-16M.

- .10 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .11 Manufacturer's nameplates on doors are not permitted.
- .12 Fabricate doors and frames as detailed, to Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA) Canadian Manufacturing Specifications for Steel Doors and Frames, latest edition; except where specified otherwise. Reinforce door and frames to suit hardware requirements specified Section 08710 - Door Hardware.
- .13 Make provision for glazing as indicated and provide necessary glazing stops.
- .14 Steel doors to be fabricated from sheet steel 1.6mm (16 gauge) base thickness, commercial grade steel to ASTM A 525-93 finished to ASTM A 526/A 526M-90 (1975) FZ075 wiped zinc finish.
- .15 Door core to be hollow steel: vertically stiffened with steel ribs and all voids filled with semi-rigid fibrous insulation minimum density 24 kg/m³. Provide 1.6 mm steel for jamb channels, lock pockets and miscellaneous reinforcement for finish hardware.
- .16 Boded Core: urethane or isocyanurate board insulation to CGSB 51-GP-21M-78
- .17 Weld continuous steel channel cap and plate at head and sill of door. Door seams to be continuously welded.
- .18 Make provision for glazing as indicated and provide necessary glazing stops. Minimum 1.6mm base steel thickness sheet finished to ASTM A 525-93 with FZ075 wiped zinc.

2.10

HOLLOW STEEL CONSTRUCTION

- .1 Form each face sheet for exterior doors from 1.6 mm sheet steel.
- .2 Form each face sheet for interior doors from 1.6 sheet steel.
- .3 Reinforce doors with vertical stiffeners, securely welded to each face sheet at 150 mm on centre maximum.
- .4 Fill voids between stiffeners of exterior doors with polystyrene core.
- .5 Fill voids between stiffeners of interior doors with temperature rise rated core.

2.11

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 for exterior doors using steel core, separating exterior portion of frame from interior portion with polyvinyl chloride thermal breaks.
- .4 Apply insulation.

2.12

PRIMER

- .1 For galvanized steel sheet: CGSB 1-GP-181M-77+Amdt-Mar-78.
- .2 For cold rolled steel sheet: CGSB 1-GP-40M-79, CGSB 1-GP-148M-80.
- .3 **All primers to be compatible with paint finish.**

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 - General.
- .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 and thresholds: 13 mm.
- .3 Adjust operable parts for correct function.
- .4 Install louvres.

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.

END OF SECTION

1 General

1.1 RELATED SECTIONS

- .1 Section 07 92 10 - Joint Sealing.
- .2 Section 08 71 10 - Door Hardware - General.
- .3 Section 26 27 26 - Wiring Devices.

1.2 REFERENCES

- .1 Aluminum Association (AA).
 - .1 DAF 45-03, Designation System for Aluminium Finishes.
- .2 American Architectural Manufacturers Association (AAMA).
 - .1 AAMA 609-93, Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminium.
- .3 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .4 Canadian General Standards Board (CGSB).
 - .1 CGSB 1.40-97, Primer, Structural Steel, Oil Alkyd Type.
 - .2 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .3 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
- .5 Canadian Standards Association (CSA International).
 - .1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 SYSTEM DESCRIPTION

- .1 Design Criteria.
 - .1 Design frames and doors in exterior walls to:
 - .1 Accommodate expansion and contraction within service temperature range of -35 to 75 degrees C.
 - .2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E330 under wind load of 1.2 kPa, submit certificate of tests performed.
 - .3 Movement within system.
 - .4 Movement between system and perimeter framing components or substrate.
- .2 Size glass thickness and glass unit dimensions to limits in accordance with CAN/CGSB-12.20.
- .3 Design door system to provide MAXIMUM thermal resistance available
- .4 Provide continuous air barrier and vapour retarder through door system. Primarily in line with pane of glass and heel bead of glazing compound.

1.4 SHOP DRAWINGS

- .1 Indicate materials and profiles and provide full-size, scaled details of components for each type of door and frame. Indicate:
 - .1 Interior trim and exterior junctions with adjacent construction.
 - .2 Junctions between combination units.
 - .3 Elevations of units.
 - .4 Core thicknesses of components.
 - .5 Type and location of exposed finishes, method of anchorage, number of anchors, supports, reinforcement, and accessories.
 - .6 Location of caulking.

- .7 Each type of door system including location.
- .8 Arrangement of hardware and required clearances.

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

1.5 SAMPLES

- .1 Submit one 300 x 300 mm corner sample of each type door and frame.
- .2 Submit sample showing glazing detail, reinforcement, finish and location of manufacturer's nameplates.
- .3 Frame sample to show glazing stop, doorstop, jointing detail, and finish, joining details, door sweeps and seals.
- .4 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.
- .5 Manufacturers' Field Reports: Submit three copies of manufacturers field reports.

1.6 QUALITY ASSURANCE

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

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Storage and Protection:
 - .1 Apply temporary protective coating to finished surfaces. Remove coating after erection. Do not use coatings that will become hard to remove or leave residue.
 - .2 Leave protective covering in place until final cleaning of building.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Dispose of polystyrene, plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.
- .3 Divert used metal cut-offs from landfill by disposal into the on-site metals recycling bin or at nearest metal recycling facility.

2 Products

2.1 MATERIALS

- .1 Aluminium extrusions: Aluminium Association alloy AA6063-T5 or T6 anodizing quality.
- .2 Sheet aluminium: Aluminium Association alloy AA1100-H14 anodizing quality.
- .3 Steel reinforcement: to CAN/CSA-G40.21, grade 300 W.
- .4 Fasteners: cadmium plated steel and stainless steel, finished to match adjacent material.

- .5 Weatherstrip: replaceable mohair. Refer to section 08 71 10.
- .6 Door bumpers: black neoprene.
- .7 Door bottom seal: adjustable type of door seals (refer to section 08 71 10) of anodized extruded aluminium frame and vinyl weather seal, recessed in door bottom, closed ends c/w automatic retract mechanism when door is open.
- .8 Isolation coating: alkali resistant, bituminous paint or epoxy resin solution.
- .9 Glass: tempered glass to CAN/CGSB-12.1, tempered, clear, 6mm thickness. Refer to section 08 80 50 "Glazing".
- .10 Sealants: to CAN/CGSB-19 – colour selected by Contract Administrator. – Refer to section 07 92 10 "Joint Sealing".
- .11 Glaze exterior aluminium doors and sidelights with 10 mm thick, class B, tempered safety glass, type 1, as manufactured by AFGD Glass
 - .1 Entrance doors located within curtain wall: clear float glass
 - .2 Glaze interior doors and sidelights with tempered safety glass, type 1, class B, clear, 6 mm thick

2.2 ALUMINUM DOORS

- .1 Construct doors of porthole extrusions with minimum wall thickness of 2.4 mm.
- .2 Door stiles – Refer to drawings for door types showing sizes.
- .3 Top rail - Refer to drawings for door types showing sizes.
- .4 Bottom rail - Refer to drawings for door types showing sizes.
- .5 Reinforce mechanically-joined corners of doors to produce sturdy door unit.
- .6 Glazing stops: interlocking snap-in type for dry glazing. Exterior stops: tamperproof type.
- .7 Provide thermally broken doors for exterior. Utilize factory sealed double glazed units for exterior doors.
- .8 Hardware: Refer to section 08 71 10

2.3 ALUMINUM FRAMES / DOORS

- .1 Acceptable Products:
 - .1 Exterior framing to be **TRIFAB VG 451T (centre shear block) by Kawneer.**
 - .2 Exterior swing doors to be: **type 360 Insulclad by Kawneer.**
 - .3 Interior swing doors: **type 500 by Kawneer** with custom top rail of 6".
- .2 Construct thermally broken and insulated frames of aluminium extrusions with minimum wall thickness of 2.4 mm.
- .3 Frame members 45 x 114 mm nominal size, for flush glazing or applied stops.

2.4 ALUMINUM FINISHES

- .1 Finish exposed surfaces of aluminium components in accordance with Aluminium Association Designation System for Aluminium Finishes.
 - .1 Clear anodic finish: designation AA-MA 605-2. Provide sample.
- .2 Appearance and properties of anodized finishes designated by the Aluminium Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

2.5 STEEL FINISHES

- .1 Finish steel clips and reinforcing steel with steel primer to CGSB 1.40 and zinc coating to CSA G164.

2.6 FABRICATION

- .1 Doors and framing to be by same manufacturer.
- .2 Fabricate doors and frames to profiles and maximum face sizes as shown. Provide minimum 10 mm bite for glazed units.
- .3 Provide structural steel reinforcement as required.
- .4 Fit joints tightly and secure mechanically.
- .5 Conceal fastenings.
- .6 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided under Section 08 71 10 - Door Hardware – General.
- .7 Isolate aluminium from direct contact with dissimilar metals, concrete and masonry.

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 Set frames plumb, square, level at correct elevation in alignment with adjacent work.
- .2 Anchor securely.
- .3 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.
- .4 Adjust operable parts for correct function.
- .5 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.
- .6 Brace frames rigidly for building-in. Install temporary horizontal wood spreaders 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 and supports after frames are built-in.
- .7 Install master-keyed cylinders as specified in Section 08 71 10 - Door Hardware.

3.3 GLAZING

- .1 Glaze exterior aluminum doors with 10 mm thick, class B, tempered glass, type 1, as manufactured by AFGD Glass
 - .1 Door at curtain wall: tempered clear float
 - .2 Glaze interior doors and sidelights with tempered safety glass, type 1, class B, clear, 10 mm thick

3.4 CAULKING

- .1 Seal joints to provide weathertight seal at outside and air, vapour seal at inside.

- .2 Apply sealant in accordance with Section 07 92 10 - Joint Sealing. Conceal sealant within the aluminium work except where exposed use is permitted by Contract Administrator.

3.5 FIELD QUALITY CONTROL

- .1 Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its product[s], and submit written reports in acceptable format to verify compliance of Work with Contract.
- .2 Manufacturer's field services: provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits to review Work at stages listed:
 - .1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.
 - .2 Once during progress of Work at 25%.
 - .3 Upon completion of Work, after cleaning is carried out.
- .4 Obtain reports within three days of review and submit.

3.6 CLEANING

- .1 Perform cleaning of aluminium components in accordance with AAMA 609.1 - Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminium.
- .2 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .3 Clean aluminium with damp rag and approved non-abrasive cleaner.
- .4 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.
- .5 Clean glass and glazing materials with approved non-abrasive cleaner.
- .6 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

1 General

1.1 RELATED WORK

- .1 Section 07 92 10 - Joint Sealing
- .3 Section 08 11 16 - Aluminum Doors and Frames
- .4 Section 08 71 10 - Door Hardware
- .5 Section 08 44 13 - Glazed Curtain Walls

1.2 REFERENCES

- .1 CAN/CGSB-12.1-M79 Glass, Safety, Tempered or Laminated.
- .2 CGSB 79-GP-2M-76 Screens, Aluminum Frame, Sliding Door.
- .3 CGSB 82-GP-1M-77 Doors, Glass, Aluminum Frame, Sliding, Standard-Duty.

1.3 SHOP DRAWINGS

- .1 Indicate materials and large scale details for head, jambs and sill profiles of components, elevations of unit, anchorage details, description of related components and exposed finishes and fasteners.

1.4 WARRANTY

- .1 Submit extended warranty on Manufacturer's letterhead in accordance with the General Conditions GC 12.3, but for three **(3) years**, *guaranteeing automatic sliding entrance systems* against leakage, defects, or malfunctions under normal usage. Warranty to commence from the date of Total Performance of the project.
- .2 Submit extended warranty on Manufacturer's letterhead in accordance with the General Conditions GC 12.3, but for **ten (10) years**, *guaranteeing insulating glass units* against defects, failure of air seal and deposits on inner faces of glass detrimental to vision. Warranty to commence from the date of Total Performance of the project.

1.5 QUALIFICATIONS

- .1 Contractor executing work of this section shall be approved and trained by the Manufacturer and shall execute work in strict conformance to manufacturer's instructions.
- .2 Manufacturer to have a minimum of five (5) years successful experience in the fabrication of automatic doors of the type required for this project. Manufacturer is to be capable of providing field service representation during installation for the purpose of approving acceptable installer and the application method.

1.6 PROTECTION

- .1 Apply temporary coating to finished surfaces. Remove coating after erection. Do not use coatings that will become hard to remove or leave residue.
- .2 Provide protection from exposure to harmful weather conditions and vandalism.

1.7 SITE CONDITIONS

- .1 Verify site conditions and obtain field dimensions prior to fabrication of automatic sliding entrance systems. Co-ordinate with fabrication and construction schedule to avoid construction delays.

2 Products

2.1 MATERIALS

- .1 **Doors:** to CGSB 82-GP-1M as follows:
Acceptable Product: Horton Automatics, a division of Overhead Door.
Manufactured Unit : Shall include operator, header and track, jambs, sliding door panel(s), and sidelite(s). Units can be mounted within rough opening with sliding panel(s) sliding along sidelite and sliding at the interior side in all cases. Manufacturer's nameplates on doors, frames and screens are not permitted:
- .1 Type 310: Slide-Swing panel(s) shall slide along interior side. Breakaway sidelite.
 - .2 Type 110: Slide-Swing panel(s) shall slide along interior side. Breakaway sidelite
- .2 **Operators:**
- .1 Electric Operating Mechanism shall be Series 2003 Belt Drive. The operator shall be mounted and concealed within the header. Drive belt to be Neoprene reinforced nylon, 3/4" (19 mm) wide. Idler pulley to be reinforced, non-metallic material.
 - .2 The Microprocessor Master Control shall have Horton Version 2 software and have programmable speed values for: Open Speed, Close Speed, Open Check, Close Check, and Open Cushion; however, Close Speed not to exceed 12" (305 mm) per second.
 - .3 The control shall also have programmable time values for: Full-Open Time Delay and Partial-Open Time Delay. Partial-Opening to be adjustable in increments of 1" (25 mm). Modes of operation shall be: Auto-seal mode with self-close approximately every 11 seconds, Self-cycle test mode (operates door during tune-in process), Night mode power fail operation, Day mode autolock prevention, Day 1-way and 2-way, Night 1-way and 2-way. Diagnostics shall be accomplished via a digital display.
 - .4 Control to have dedicated interface connection.
 - .5 A Revolution Encoder shall instruct the control on sliding panel's speed and position. An Adjustable Reversing Circuit will reopen door unit if closing path is obstructed. Maximum force required to prevent sliding panel from closing = 28 lbf.
 - .6 Finger Safety: When unit slides open, strike rail of sliding panel will stop 3 1/2" (89 mm) short of adjacent sidelite; resulting opening is net slide.
 - .7 Power On/Off Switch: Shall be located inside header and when switched OFF, unit reverts to free manual operation (likewise during electrical power failure).
 - .8 Operator shall have Autolock Fail Safe: If power fails the lock disengages.
- .3 **Header:**
- .1 Shall be aluminum with removable face plate and capable of self-support up to length of 16 feet (4877 mm) on standard door size and glazing. Optional transom of size and type indicated mounted on header. Header sizes to be:
 - .2 Header size to be 6" (152 mm) deep by 6" (152 mm) high.
- .4 **Track:**
- .1 Shall be aluminum, 5/8" (8 mm) wide and replaceable. Door-hanger Rollers will be non-metallic, sealed ball bearing wheels 1-3/4" (44 mm) diameter. Anti-Derailing shall be accomplished by means of a separate adjustable roller.
- .5 **Sliding Panel(s) and Sidelite(s):**
- .1 Shall be aluminum, 1-3/4" (44 mm) deep with narrow stile horizontal and vertical rails. Weather-stripping to be along perimeter of sliding panel(s) and swingout sidelite(s). Concealed guides to stabilize bottom of sliding panel. Insulating glass units: to CAN/CGSB-12.8, hermetically sealed double glazed, with 13 mm air space between panes, Spacer: Edgetech Super Spacer, Premium Plus. Glass: 2 panes of tempered safety glass. Interior doors to be prepared for 1/4" (6 mm) tempered safety glass.
 - .2 Emergency Egress: Slide-swing panels can swing out 90° from any position of slide movement and require no more than 50 lbf. (222 N) of force applied at the lock stile to open. Swing-slide panels and swing-out sidelites have torsion spring designed to re-close panel if pushed open in the direction of egress; also, include intermediate horizontal rail. Units with emergency egress feature are UL listed as an exit way and are compliant with NFPA 101.
 - .3 For Sliding Panel and Sidelite configurations, swing direction etc., see Project Manual and Drawings.

- .6 **Jambs / Frames:**
.1 Shall be aluminum. Jamb dimensions to be:
1. 1 3/4" (44 mm) deep by 4" (102 mm) wide for Types 110 & 310.
- .7 **Thresholds:**
.1 Shall be aluminum, barrier free access type , low profile , 7" (178 mm) wide for exterior to interior transitions. Interior to interior transitions to be recessed type of thresholds (see 2.5 "Door Applications").
- .8 **Hardware:**
.1 Provided and installed in Door DR1000A shall be:
.1 Panic exit device C2300.
.2 Electric solenoid lock C3977 fail safe.
.3 Provide three Locknetics 621-BK momentary pushbuttons for remote unlocking of door.

2.2 RELATED EQUIPMENT

- .1 Basic Sensor System to be 24 VAC, class II circuit:
.1 *Motion sensors:* Microwave sensor with added threshold scan: shall be header-mounted each side of door unit for detection of traffic each direction. Sensor also includes active infrared presence sensor that provides additional threshold protection. Installer to adjust so that minimum width of detection pattern equals clear door opening, minimum projection out from threshold equals 43" (1092 mm), and detection is within 5" (127 mm) of closed door.
.2 *Hold-open beams:* Two LED pulsed infrared photoelectric beams to be mounted in vertical rails of sidelite or in jambs at heights of 24" (610 mm) and 48" (1219mm). Sender/receiver arrangement parallels door opening: They shall be installed within 3" (76 mm) from the center of the slide door. The beams shall remain active from fully open to within 3" (75 mm), of closed.

2.3 RELATED WORK REQUIREMENTS

- .1 *ELECTRICAL:* 120 VAC, 60 cycle, 1 phase, 15 amp. Non-North American voltages can be 240 VAC (operator must have 240 volt power supply).
- .2 *GLASS AND GLAZING:* Glass stops, glazing vinyl and setting blocks for field glazing as per Safety Glazing standard ANSI Z97.1.2. and CAN/CGSB-12.1 to be 10 mm thick, tempered:
.1 Clear float glass
.2 Contractor to coordinate acquisition of glass in thickness and type in accordance with manufacturer's recommendations for prescribed design intent.

2.4 MATERIALS, FINISHES AND FABRICATION

- .1 *EXTRUDED ALUMINUM:* ASTM B221, 6063-T5 alloy and temper, anodized:
.1 Structural Header Sections: Minimum 3/16" (5 mm) thickness.
.2 Structural Frame Sections: Minimum 1/8" (3 mm) thickness.
.3 Structural Panel Sections: Commercial grade.
- .2 *FINISHES* (for all exposed aluminum surfaces):
Shall be of the following:
.1 204-R1 Clear Anodized Aluminum: Arch. Class II Anodized Coating, AA-MI2C22A32.
- .3 *PANEL CONSTRUCTION:* Mortise and tenon type joints, neatly and mechanically secured. Sash consists of snap-in glass stops, snap-in glazing beads and vinyl gaskets.
- .4 *FRAME CONSTRUCTION:* Butt joints, neatly and mechanically secured by means of screws and formed aluminum corner brackets.
- .5 *OPERATOR CONSTRUCTION:* Electromechanical, modular type construction.

2.5 DOOR APPLICATIONS

.1 DR1000A : Main Entrance exterior door

- .1 Type: Horton 2003-310
- .2 Size: standard package width 3658 (12'-0") x custom height 2335, panels shall slide along interior side.
- .3 Required: optional 10" bottom rail, 165 muntin for panic hardware required, other rails to be standard sized.
- .4 Insulating glass unit, spacer: Edgetech Super Spacer, Premium Plus
- .5 Low profile Barrier Free threshold, 1/4 " x 7 1/2", Acceptable Product: Thermal Barrier saddle, 273X3AFG, as supplied by PEMKO.
- .6 Doors to be equipped with solenoid and rod.

3 Execution

3.1 INSTALLATION

- .1 Install aluminum sliding glass doors in accordance with recommendations of CGSB 82- GP-1M.
- .2 Install masterkeyed cylinders specified in Section 08 71 10 - Door Hardware.
- .3 Adjust operable parts for correct function.
- .4 Leave protective covering in place until final cleaning of building.
- .5 After repeated operation of completed installation re-adjust operable parts and controls for optimum condition and safety.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Sustainable requirements for construction, verification and operation.
- .2 Curtain wall assembly of aluminium extrusions, glass and glazing, metal panels, wall louvers, and attachments to building structure.

1.2 RELATED SECTIONS

- .1 Section 07 27 10 - Air Barriers.
- .2 Section 07 92 10 - Joint Sealing: System perimeter sealant and back-up materials.
- .3 Section 08 11 16 - Aluminium Doors and Frames: Entrance doors, frames, and glazed lights.

1.3 REFERENCES

- .1 Aluminium Association Designation System For Aluminium Finishes (AA)-1997.
 - .1 DAF 45 2003, Designation System For Aluminium Finishes.
- .2 American Architectural Manufacturers Association (AAMA).
 - .1 AAMA CW-DG-1-96, Aluminium Curtain Wall Design Guide Manual.
 - .2 AAMA CW-10-97, Care and Handling of Architectural Aluminium From Shop to Site.
 - .3 AAMA CW-11-85, Design Wind Loads for Buildings and Boundary Layer Wind Tunnel Testing.
 - .4 AAMA T1R-A1-02, Sound Control for Fenestration Products.
 - .5 AAMA 501-94, Methods of Test for Exterior Walls.
 - .6 AAMA 503-92, Voluntary Specification for Field Testing of Metal Storefronts, Curtain Wall and Sloped Glazing Systems.
 - .7 AAMA 611-98, Voluntary Specifications for Anodized Finishes Architectural Aluminum.
 - .8 AAMA 612-02, Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminium.
 - .9 AAMA 2603-02, Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminium Extrusions and Panels.
 - .10 AAMA 2604-02, Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- .3 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM A36/A36M-103a, Specification for Carbon Structural Steel.
 - .2 ASTM A123/A123M-02, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A167-99, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .4 ASTM A653/A653M-03, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .5 ASTM B209-02a, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .6 ASTM B221-02, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .7 ASTM E283-91(1999), Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - .8 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.
 - .9 ASTM E331-00, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.
 - .10 ASTM E413-87(1999), Classification for Rating Sound Insulation.
 - .11 ASTM E1105-00, Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

- .4 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB 1.108-M89, Bituminous Solvent Type Paint.
 - .2 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
- .5 Canadian Standards Association (CSA International).
 - .1 CSA-G40.20/G40.21-98(R2003), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA-S136-01, North American Specification for the Design of Cold-Formed Steel Structural Members.
 - .4 CAN3-S157-M83(R2002), Strength Design in Aluminum.
 - .5 CSA W59.2-M1991(R2003), Welded Aluminum Construction.
- .6 Environmental Choice Program (ECP).
 - .1 CCD-45-95, Sealants and Caulking Compounds.
 - .2 CCD-47-1998, Surface Coatings.
 - .3 CCD-48-95, Recycled Water-Borne Surface Coatings.
- .7 Society for Protective Coatings (SSPC).
 - .1 SSPC - Paint 20 Zinc Rich Coating.
 - .2 SSPC - Paint 25 Alkyd, Zinc Oxide Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.

1.4 SYSTEM DESCRIPTION

- .1 Vertical glazed aluminium curtain wall system includes thermally broken tubular aluminium sections with self supporting framing, shop fabricated, factory prefinished, vision glass, spandrel infill, related flashings, anchorage and attachment devices.
- .2 Assembled system to permit re-glazing of individual glass (and infill panel) units from exterior without requiring removal of structural mullion sections.

1.5 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 as measured in accordance with AAMA CW 11, ASTM E330.
- .2 Design and size components to withstand seismic loads and sway displacement as calculated in accordance with NBC.
- .3 Limit mullion deflection to flexure limit of glass; 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.
 - .5 Shortening of building concrete structural columns.
 - .6 Creep of concrete structural members.
- .6 Sound attenuation through wall system (exterior to interior): STC 45 measured in accordance with AAMA T1R - A1, ASTM E413.
- .7 Vapour seal with interior atmospheric pressure of 25 mm sp, 22 degrees C, 40% RH: No failure.
- .8 Water leakage: none, when measured in accordance with AAMA 501, ASTM E331 and ASTM E1105.

- .9 System to provide for expansion and contraction within system components caused by a cycling temperature range of 95 degrees C over a 12-hour period without causing detrimental affect to system components.
- .10 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
- .4 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound
- .5 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.
- .6 Reinforce curtain wall system to accommodate window washing guide rails. Provide anchors sufficiently rigid to resist loads caused by equipment platform, without damage to wall system
- .7 Submit substantiating engineering data, test results of previous tests by independent laboratory, which purport to meet performance criteria, and supportive data.
- .8 Air Infiltration: Shall not exceed 0.06 cfm/ft sq. when tested in accordance with ASTM E283 at a pressure differential of 6.24 p.s.f. (300 Pa.)
- .9 Water Infiltration: There shall be no water infiltration when tested in accordance with ASTM E331 with pressure differential of 15.0 p.s.f. (720 Pa.)
- .10 Structural Performance: Shall be based on CSA standard CAN3-S157 Strength Design in Aluminium and a maximum deflection of 1/175 of the span.
- .11 Thermally: the grid members shall have a condensation resistance equal to or better than the area along bottom of a 1" sealed glass unit with standard metal spacer edge construction.
- .12 Windows shall conform to the following requirements of CSA standard CAN/CSA-A440 Windows.
 - .1 Air infiltration shall meet the fixed rating.
 - .2 Water infiltration shall meet B7 rating
 - .3 Wind Load resistance shall meet C5 rating
 - .4 Intermediate mullions and horizontals shall be designed to withstand loading in accordance with the National Building Code of Canada.
 - .5 Condensation resistance temperature index of the framing shall be a minimum of 55.2
- .13 **The curtain wall assembly is to be designed for a concentrated load of 1 kN applied at any point. Shop drawings shall be submitted with engineer's seal attesting to the above requirement.**

1.6 PRODUCT DATA

- .1 Submit WHMIS MSDS - Material Safety Data Sheets
- .2 Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details

1.7 SHOP DRAWINGS

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

1.8 SAMPLES

- .1 Submit one representative model of each type window.

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

.3 Include 6" long samples of head, jamb, sill, meeting rail, mullions to indicate profile

1.9 DESIGN DATA

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

1.10 MOCK-UP

.1 Locate where directed

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

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

1.11 PRE-INSTALLATION MEETING

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

1.12 DELIVERY, STORAGE, AND HANDLING

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

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

1.13 AIR BARRIER AND VAPOUR BARRIER

.1 Equip curtain wall frames with factory-installed flanges for sealing air/vapour barrier to curtain wall frames.

.1 The curtain wall supplier shall be responsible for providing mechanical fastening of the Air Barrier and to be compatible with self adhesive membrane being utilized - see section 07 27 10 - Air Barriers.

.2 Air-barrier backpans shall be steel, galvanized (1.25 oz/sq. ft. coating) 20 gauge thick (or as otherwise specified) with sealed corners.

1.14 SEQUENCING

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

1.15 WARRANTY

.1 Contractor hereby warrants any defects in workmanship or materials, which might render the product unserviceable for a period of one (1) year. The contractor will, without charge, repair or replace any components which have defects in workmanship or materials so as to render the product unserviceable and the contractor will repair or replace such components in the same state as originally furnished, provided a claim is made within ten (10) days of discovery of such defect.

.2 Glazed aluminium curtain wall will stay in place and remain leak proof including coverage for complete system failure in accordance with GC 24, but for Twenty-four (24) months.

.3 Insulated glass is warranted by the contractor from failure of the air seal due to defects in material or workmanship for a period of **ten (10)** years from the date of purchase. Warranty applies to product only, labour to be assessed at prevailing rates.

1.16 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Dispose of packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

2 Products

2.1 MATERIALS

- .1 Materials: to CAN/CSA-A440 supplemented as follows:
 - .1 Acceptable Product: Kawneer 1600 series Curtain Wall System Silicone framing, clear anodized finish.
 - .2 Frame: Extrusions shall be 6063 T54 alloy and temper: Aluminium Association alloy AA6063-T54.
 - .3 Steel Reinforcement: to CAN3-G40.21, grade 300W.
 - .4 Sheet Steel: commercial quality to ASTM 526 with Z275 zinc coating.
 - .5 Thermal Break: Weathering and glazing gaskets shall be extruded, black, closed cell or dense elastomer of durometer appropriate to the function.
 - .6 Fasteners: stainless steel, cadmium plated, and of sufficient size and quantity to perform their intended function.
 - .7 Isolation Coating: Alkali resistant, bituminous paint.
 - .8 Sealants and weather seals: in accordance with Section 07 92 10 - Joint Sealing.
 - .9 Equip window frames with extruded flanges (to suit site conditions) for sealing air barrier material to frame. Refer to item 1.8 above.
 - .10 Insulation: for spandrel glazing panels Fibreglass AF530 (3lb. density), thickness to suit.
 - .11 Alumicor 'T' anchor to be used as per details.

2.2 GLASS AND GLAZING MATERIALS

- .1 Exterior pressure plate and interior backbar to both receive neoprene gasket.
- .2 Single pane: Total thickness: sealed units, as manufactured by AFGD Glass.

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 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof
- .3 Prepare components to receive anchor devices. Install anchors.
- .4 Arrange fasteners and attachments to ensure concealment from view.
- .5 Prepare system components to receive exterior doors and hardware.
- .6 Reinforce framing members for external imposed loads.
- .7 Visible manufacturer's identification labels not permitted.

- .8 Window Frames
 - .1 Fabricate frames from extrusions of size and shape on shop drawings and as detailed on construction drawings.
 - .2 Vertical and Horizontal members shall be tubular extrusions designed for shear block corner construction.
 - .3 At structural supports, (hidden by spandrel glass) vertical members shall be interlocking extruded mullion halves and horizontal members shall be tubular extrusions designed for screw spline connections
 - .4 All joints shall be accurately machined, assembled and sealed
 - .5 Assemble multiple units as shown on drawing complete with interior and exterior covers applied.
 - .6 All frame members, transoms, mullions, etc. shall be fastened together to exclude weather and in accordance with the rain screen principle.
 - .7 Fastening devices shall be recommended by the manufacturer of windows.
 - .8 Finish of aluminium to be Anodized Clear

2.4 SOURCE QUALITY CONTROL

- .1 Perform work in accordance with AAMA GSM-1, AAMA CW-I-9. Maintain one copy on site.
- .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 approved by manufacturer.
- .4 Design structural support framing components to CAN3 S157 under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the Province of Manitoba
- .5 Perform welding Work in accordance with CSA W59.2.

3 Execution

3.1 EXAMINATION

- .1 Verify dimensions, tolerances, and method of attachment with other work.
- .2 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

3.2 INSTALLATION

- 1 To ensure proper installation all horizontal and vertical members must be:
 - .1 Square (equal corner to corner)
 - .2 Level (head, sill and jambs)
 - .3 Plumb
- .2 Make sure the on site dimensions are properly measured.
- .3 Install units making sure that the sill and heads are level, the jambs plumb and supported.
- .4 Check for squareness of the units before final anchoring to the opening.
- .5 Fill all opening voids between jamb and framing with loose insulation or with a low expansion foam insulation.
- .6 Leave adequate clearance between sill and masonry for caulking and movement of framework.
- .7 Caulk area where window makes contact with exterior finish material.

- .8 Do not paint weatherstripping or interior hardware finish.
- .9 Protect complete unit during construction.
- .10 Check window installation (square, level, plumb) and window perimeter seal before application of interior trim.

3.3 WINDOW INSTALLATION

- .1 Set window units in prepared opening, plumb, square and level, free from warps, twist or superimposed loads.
- .2 Secure work adequately and accurately in structure in required position in a manner not restricting normal movements of glass windows and glazed spandrels.
- .3 Install fibreglass batting or non-expanding foam insulation to shim spaces and fill perimeter of frame assembly cavity to maintain continuity of thermal barrier.

3.4 SITE TOLERANCES

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

3.5 CAULKING

- .1 Seal joints between frame members and other non-operating components with sealant to provide weather tight and airtight seal at outside and vapour seal inside.
- 2 Seal joints between windows and windowsills with sealant.

3.6 MANUFACTURER'S FIELD SERVICES

- .1 Curtain wall product manufacturers to provide field surveillance of installation of their Products.
- .2 Monitor and report installation procedures, unacceptable conditions

3.7 ADJUSTING

- .1 Adjust operating sash for smooth operation.

3.8 CLEANING

- .1 Remove protective material from prefinished aluminium 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.

3.9 PROTECTION

- .1 Protect finished Work from damage.

END OF SECTION

1 GENERAL

1.1 WORK INCLUDED

- .1 Design, manufacture and installation of translucent insulating system. An assembly of extruded Nano-Cell polycarbonate glazing panels incorporated into a complete aluminum framed system that has been tested and warranted by the manufacturer as a single source system.
- .2 All anchors, brackets, and hardware attachments necessary to complete the specified structural assembly, weatherability and water-tightness performance requirements. All flashing up to but not penetrating adjoining work are also required as part of the system and shall be included.
- .3 Trained and factory authorized labor with supervision to complete the entire panel installation.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- .1 Section 05 12 23 - Structural Steel.
- .2 Section 07 62 00 - Sheet Metal and Flashing.
- .3 Section 07 92 10 - Joint Sealers.

1.3 QUALITY ASSURANCE

- .1 Skylight system must be evaluated and listed by recognized building code authorities: International Council Evaluation Service Inc (ICC-ES) and SBCCI - Public Safety Testing and Evaluation Services Inc.
- .2 Materials and Products shall be manufactured by a company continuously and regularly employed in the manufacture of skylights using polycarbonate (not glass) panel systems for a period of at least ten (10) years. Manufacturers shall provide a list of at least ten (10) projects having been in place a minimum of ten (10) years, with similar size, scope, climate and type.
- .3 Erection shall be by a factory-approved installer which has been in the business of erecting similar material for at least five (5) consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.
- .4 The manufacturer shall be responsible for the configuration and fabrication of the complete panel system, and will ensure that it fully meets all requirements of this specification.
- .5 **APPROVED MANUFACTURERS:**
All manufacturers acceptable for use on this project under this section must be approved prior to bid. Manufacturers must submit evidence of compliance with all performance criteria specified herein. This evidence must include proof of conformance and test reports as specified below. Any exceptions taken from this specification must be noted on the approval request. If no exceptions are noted and approval is given, product performance will be as specified. Should non-compliance be subsequently discovered, the previously given approval will be invalidated and use of the product on the project will be disallowed. Requests for approval, with all appropriate submittal data and samples must be received no less than 15 days prior to bid date. A list of all approved manufacturers and products will be issued by addendum. No other manufacturers will be acceptable. No verbal approval will be given.

1.4 SUBMITTALS

- .1 The manufacturer shall submit written guarantee accompanied by substantiating data, stating that the products to be furnished are in accordance with or exceed these specifications.

- .2 The manufacturer shall submit certified test reports made by an independent organization for each type and class of panel system. Reports shall verify that the material will meet all performance requirements of this specification. Previously completed test reports will be acceptable if they are current and indicative of products used on this project. Test reports required are:
- .1 Self Ignition Temperature (ASTM 1929-3)
 - .2 Smoke Density (ASTM D-2843)
 - .3 Burning Extent (ASTM D-635)
 - .4 Interior Flame Spread (ASTM E-84)
 - .5 Color Difference (ASTM D-2244-85)
 - .6 Weathering (ASTM D-4364)
 - .7 Yellowing Index (ASTM D-1925)
 - .8 Weathering Evaluation before and after exposure to 300°F, 25 minutes include Light Transmission, Color Change, and Yellowing Index, per ASTM E-1175, ASTM D-2244 and ASTM D-1925 respectively.
 - .9 Shatter Resistance (ASTM D-3841/SPI Method B)
 - .10 Large Missile Test - Impact Resistance per SFBC PA 201-94
 - .11 Insulation "U" Factor per NFRC100 test methods & procedures
 - .12 Water Penetration (ASTM E-331)
 - .13 Load Bearing Capability (ASTM E-330-97)
 - .14 OSHA Life Safety Fall and Walk Through Protection for 300 lb. point load per STD 29 CFR 1910.23 (e)(8)
 - .15 OSHA Life Safety STD 29 CFR - Impact loading by blunt object of 500 ft. lbs. per ASTM E-695-03
 - .16 Performance of exterior windows, curtain walls when impacted by wind-borne debris per ASTM E 1996-02, Level D
 - .17 IES LM-44-90 Testing for Total and Diffused Reflectometry (Diffused Light Transmission)
- .3 MAINTENANCE DATA: The manufacturer shall provide recommended maintenance procedures, schedule of maintenance and materials required or recommended for maintenance.

1.5 WARRANTY

- .1 Provide a single source skylight / wall light / walkway / canopy system manufacturer warranty for glazing panels and framing system – third party warranty for glazing panels shall not be acceptable.
- .2 Provide manufacturer 10 year warranty to include:
- .1 Change in light transmission of no more than 6% per ASTM D-1003
 - .2 No delamination of panel affecting appearance, performance or structural integrity of the panel or the system.
 - .3 Thermal aging - the light transmission and the color shall not change after exposure to heat of 300°F for 25 minutes. (When measured per ASTM D-1003 and ASTM D-2244 respectively).

2 PRODUCTS

2.1 TRANSLUCENT INSULATING INTERLOCKING NANO-CELL GLAZING TECHNOLOGY:

- .1 The design and performance criteria of this job are based on products manufactured by CPI Daylighting, Inc., Phone: (800) 759-6985, Fax (847)816-0425; Website: www.cpidaylighting.com
And as locally represented by: Rieger Architectural Products
Telephone: 204.654.9704

Substitute products must be proven equal and approved by addenda prior to the published bid date per specification section 1.04 E. Fiberglass skins are unacceptable.

2.2 TRANSLUCENT PANEL PERFORMANCE

- .1 Nano-Cell Panel Technology – Longevity and Resistance to Buckling and Pressure
 - .1 Translucent Panels must be of Nano-Cell technology. Wide Cell technology (cell size exceeding 0.18") shall not be acceptable.
 - .2 The translucent panel shall include an integral extruded Nano-Cell structural core. The panel's exterior skins shall be connected with supporting continuous ribs, perpendicular to the skins, at a spacing not to exceed 0.18" (truss-like construction). In addition, the space between the two exterior skins shall be divided by multiple parallel horizontal surfaces, at a spacing not to exceed 0.18".
- .2 Appearance:
 - .1 Panel assembly thickness shall be a minimum .63" (16mm) single panel with exposed interlocking 1.25" wide U battens.
 - .2 Panel Width: Shall not exceed 2' to ensure best performance for wind uplift, vibration, oil canning and visual appearance. Panels over 2' wide will not be approved.
 - .3 The panels shall be uniform in color with an integral Nano-Cell core. In a cross section, the core shall be constructed of Nano-Cell square cells not to exceed 0.18" x 0.18". The appearance should be equal to CPI's Pentaglas 16 Panel. Wide cell panel configurations greater than 0.18" by .018" shall not be accepted.
- .3 Thermal and solar performance:
 - .1 Insulation Value ("U") per NFRC 100 test methods & procedures - 0.38
 - .2 Light Transmission (L.T.%) 66 per ASTM E972, E1175 or D-1003
 - .3 Solar Transmission (S.T.) 0.64 per ASTM E1084 at "normal" (90°) incidence angle.
 - .4 Color: Ice White
- .4 Translucent Panel Joint System:
 - .1 Panel shall be extruded in one single formable length. Maximum panel width shall not exceed 2'. Transverse connections are not acceptable.
 - .2 The panels should be manufactured with grip-lock double tooth upstands that are integral to the unit. The upstands shall be 90 degrees to the panel face (standing seam dry glazed concept). Welding or gluing of upstands or standing seam is not acceptable.
 - .3 The U or H battens shall have a grip-lock double tooth locking mechanism to ensure maximum uplift capability.
 - .4 The metal retention clip shall be configured with a 0.4" wide top flange that extends continuously across the web from end to end and from side to side. To allow a safety factor, the clip must be tested to meet a wind uplift standard of 90 psf per ASTM E330-97.
 - .5 The panel system U connection shall meet wind load performance requirements without deterioration after 100 months of Florida outdoor exposure. This performance must be demonstrated by providing independent lab comparison test reports for a weathered vs. a new panel assembly. As a standard for all systems, provide test reports for a 16mm panel assembly, 6' wide x 12' long that have been exposed to Florida weather conditions for 100 months per ASTM E-330-97 for loading, ASTM E 1886-97 for cycling and ASTM E-1996-02 for missile impact at design load of 70 PSF.
 - .6 Water Penetration: No water penetration of the panel U/H joint connection length at test pressure of 10.0 PSF per ASTM E-331
 - .7 Free movement of the panels shall be allowed to occur without damage to the weather tightness of the completed system.

- .5 Flammability
 - .1 The exterior and interior faces shall be an approved light transmitting panel with a CC1 fire rating classification per ASTM D-635. Flame spread no greater than 25 per ASTM E-84. Smoke density no greater than 75 per ASTM D2843 and a minimum self-ignition temperature of 1000°F per ASTM 1929. The panel shall be self-extinguishing.
 - .2 Interior flame spread classification of Class I per ASTM E84.
- .6 Impact Resistance - the panels shall pass the following tests:
 - .1 ASTM D-3841/SPI - Impact and Shatter Resistance of 200 ft. lbs.
 - .2 SFBC – PA 201-94, impact resistance of 350 ft. lbs.
 - .3 ASTM E-1996-02 - Must comply with standard specification for performance of exterior windows or curtain walls when impacted by windborne debris at level D and after cyclic wind loading at the specified design load.
- .7 OSHA Life Safety Standards 29 CFR 1926.502 (i)(2) and 29 CFR 1910.23 (e)(8)
 - .1 Panel assembly shall withstand impact loading by blunt object of 500 ft. lbs. per ASTM E695-03
 - .2 Panel assembly shall withstand a 300 lb. point load at 5' span per OSHA standard 29CFR 1910 23e8.
- .8 Cyclic Wind Load – Translucent Panels shall be tested for cyclic wind loads and impact resistance per ASTM E 1886-97 and ASTM E 1996-02 at test load to verify the positive and negative design loads and level D impact.
- .9 Weatherability:
 - .1 The light transmission as measured by ASTM D1003, shall not decrease more than 6% over 10 years, or after exposure to temperature of 300°F for 25 minutes (thermal aging).
 - .2 The panel shall be tested by recognized laboratory for weathering evaluation per ASTM D4364-84 (EMMAQUA, UNBACKED), after exposure to minimum concentrated natural sunlight radiation of 56000 MJ/M² (1540 MJ/M² of UV, 200 – 385 N.M). The panel shall not change in color more than 4.0 units Delta E, 4.0 units Delta L and Delta B.
 - .3 The panel shall not change color more than 4.0 units (DELTA-E by ASTM D2244) after 60 months outdoor weathering in Arizona determined by an average of at least two samples.
 - .4 Thermal aging - the interior and exterior faces shall not change color in excess of 0.75 Delta E by ASTM D2244 and shall not darken more than 0.3 units (Delta L by ASTM D2244) and 0.2 units Delta Y (YI) by ASTM D1925 and shall not show cracking or crazing when exposed to 300°F for 25 minutes.
 - .5 The faces shall not become readily detached when exposed to temp of 300°F and 0°F for 25 minutes.
 - .6 Panels shall consist of a polycarbonate resin with a permanent, co-extruded, ultra-violet protective layer. Post-applied coating or films of dissimilar materials are unacceptable. Fiberglass skins are unacceptable.
 - .7 UV Maintenance: The system shall require no scheduled re-coating to maintain its performance or for UV protection.
 - .8 Panel shall be factory sealed at the sill to restrict dirt ingress.
- .10 Diffused Light Transmission:

As a reference for measuring the quality of the diffused light through the panel assembly, the IES (Illuminating Engineering Societies) LM-44-1990 Approved Method for Total and Diffuse Reflectometry procedure shall be used. Results for a Clear Pentaglas / Single Glazed panel assembly shall be provided as a base standard for comparison.

For Pentaglas / Single Glazed systems with total illuminator flux output at 60 lumens, diffused light transmission requirements are:

Zonal Zone	% of transmittance from the maximum total lumens transmitted through the panels
0-30	66.0
0-40	78.5
0-60	94.0
0-90	100.0

2.3 ICE AND SNOW GUARDS

- .1 Sno-Gem Original Polycarbonate snow guard (5" x 5" base) (minimum 25 sq. inch bonding surface)

3 EXECUTION

3.1 EXAMINATION

- .1 Contractor to verify when structural support is ready to receive all work in this section and to convene a Pre-Installation Conference at least one week prior to commencing work of this Section. Attendance required of Contractor, skylight installer and all parties directly affecting and effected by the work of this section.
- .2 All submitted opening sizes, dimensions and tolerances are to be field verified by Contractor unless otherwise stipulated.
- .3 Installer to examine area of installation to verify readiness of site conditions. Notify Contractor about any defects requiring correction. Do not work until conditions are satisfactory.

3.2 INSTALLATION

- .1 Install components in strict accordance with manufacturer's instructions and approved shop drawings. Use proper fasteners and hardware for material attachments as specified.
- .2 Use methods of attachment to structure allowing sufficient adjustment to accommodate tolerances.
- .3 Remove all protective coverings on panels immediately after installation.

3.3 CLEANING

- .1 Follow manufacturer's instructions when washing down exposed panel surfaces using a solution of mild detergent in warm water that is applied with soft, clean wiping cloths.
- .2 Follow strict panel manufacturer guidelines when removing foreign substances from panel surfaces requiring mineral spirits or any solvents that are acceptable for use.
- .3 Installers shall leave panel system clean at completion of installation. Final cleaning is by others upon completion of project, following manufacturer's cleaning instructions.

END OF SECTION

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 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-69.17-M86(R1993), Bored and Preamsembled Locks and Latches.
 - .2 CAN/CGSB-69.18-M90/ANSI/BHMA A156.1-1981, Butts and Hinges.
 - .3 CAN/CGSB-69.19-93/ANSI/BHMA A156.3-1984, Exit Devices.
 - .4 CAN/CGSB-69.20-M90/ANSI/BHMA A156.4-1986, Door Controls (Closers).
 - .5 CAN/CGSB-69.21-M90/ANSI/BHMA A156.5-1984, Auxiliary Locks and Associated Products.
 - .6 CAN/CGSB-69.22-M90/ANSI/BHMA A156.6-1986, Architectural Door Trim.
 - .7 CAN/CGSB-69.24-M90/ANSI/BHMA A156.8-1982, Door Controls - Overhead Holders.
 - .8 CAN/CGSB-69.26-96/ANSI/BHMA A156.10-1991, Power-operated Pedestrian Doors.
 - .9 CAN/CGSB-69.28-M90/ANSI/BHMA A156.12-1986, Interconnected Locks and Latches.
 - .10 CAN/CGSB-69.29-93/ANSI/BHMA A156.13-1987, Mortise Locks and Latches.
 - .11 CAN/CGSB-69.30-93/ANSI/BHMA A156.14-1991, Sliding and Folding Door Hardware.
 - .12 CAN/CGSB-69.31-M89/ANSI/BHMA A156.15-1981, Closer/Holder Release Device.
 - .13 CAN/CGSB-69.32-M90/ANSI/BHMA A156.16-1981, Auxiliary Hardware.
 - .14 CAN/CGSB-69.33-M90/ANSI/BHMA A156.17-1987, Self-closing Hinges and Pivots.
 - .15 CAN/CGSB-69.34-93/ANSI/BHMA A156.18-1987, Materials and Finishes.
 - .16 CAN/CGSB-69.35-M89/ANSI/BHMA A156.19-1984, Power Assist and Low Energy Power Operated Doors.
 - .17 CAN/CGSB-69.36-M90/ANSI/BHMA A156.20-1984, Strap and Tee Hinges and Hasps.

1.2 REQUIREMENTS of REGULATORY AGENCIES

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

1.3 SUBMITTALS

- .1 Samples:
 - .1 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
 - .2 After approval samples will be returned for incorporation in the Work.
- .3 Hardware List:
 - .1 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .4 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements..

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 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:
 - .1 Store finishing hardware in locked, clean and dry area.

1.6 WASTE DISPOSAL AND MANAGEMENT

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Dispose of packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.7 MAINTENANCE

- .1 Extra Materials:
 - .1 Supply two sets of wrenches for door closers, locksets and fire exit hardware.
 - .2 Brief maintenance staff regarding proper care, cleaning and general maintenance.

2 Products

2.1 HARDWARE ITEMS

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

2.2 DOOR HARDWARE

- .1 See Drawings for hardware schedule.

2.3 KEY CONTROL CABINET

- .1 Provide a Tel-Kee enamel finish steel control cabinet of capacity to handle the number of keys to accommodate all locks as per hardware schedule, plus 50% extra for future expansion. Supplier shall cooperate with and assist Contract Administrator in setting up of key control unit.

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, padlocks and cabinet locks to be keyed differently, master keyed, grand master keyed and great grand master keyed, as directed. Prepare detailed keying schedule in conjunction with Contract Administrator. All locks to be construction keyed.

- .2 Provide keys in triplicate for every lock in this Contract.
- .3 Provide three masterkeys for each MK, GMK and GGMK group.
- .4 Stamp keying code numbers on keys and cylinders.
- .5 Supply 20 extra key blanks to owner.
- .5 Provide all permanent cores and keys to Owner
- .6 All locks to be supplied in a restricted patented keyway.
 - .1 Acceptable products are:
 - .1 Schlage Everest "D".

2.6 TEMPLATES AND REINFORCING UNITS

- .1 Supply all necessary templates, blueprints, reinforcing units to any sub trade requiring same for completion of that portion of the contract.

2.7 LOCKSETS AND LATCHSETS

- .1 Bring in locksets and latchsets from factory properly itemized as to keying and location.
- .2 All locksets and latchsets to have 70 mm back set unless design of door makes this impossible.

2.8 HINGES

- .1 All doors up to and including 2150 mm in height and 900 mm in width to be hung on three hinges. Doors over these sizes to have four hinges or piano hinges.

2.9 KICK PLATES

- .1 Shall be installed on push side of door unless otherwise indicated. Width of plate to be 40 mm less than door width on push side of door and 25 mm less on pull side of door. Height of plate as specified. Plate shall be Type 304 stainless steel, gauge as specified. Install with oval head screws.

3 Execution

3.1 INSTALLATION INSTRUCTIONS

- .1 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .2 Furnish manufacturers' instructions for proper installation of each hardware component.
- .3 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.
- .4 Where doorstop contacts door pulls, mount stop to strike bottom of pull.
- .5 Install key control cabinet.
- .6 Remove construction cores when directed by Contract Administrator; install permanent cores and check operation of all locks.

3.2 SETUP KEYING SYSTEM 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 key over to Contract Administrator.

3.3 MOUNTING HEIGHTS

- .1 These dimensions are only to be used as a general guide in the placement of hardware. Where special items are concerned, or uncertainty exists, check with the Contract Administrator before fitting. Dimensions indicated are from finish floor to centre line of item, except as noted.
 - .1 Locksets: 900 mm
 - .2 Push Plates: 900 mm(bottom of plate)
 - .3 Guard Bars: 900 mm
 - .4 Pull Plates: 900 mm(bottom of plate)
 - .5 Deadlock: 1220 mm
 - .6 Exit Devices: 920 mm(top of horizontal portion, not latch cover)

3.4 FINAL INSPECTION

- .1 The hardware supplier shall, upon completion of the Work, visit the job site, check the installation of all hardware and certify in writing to the Contract Administrator that the hardware is as specified and is installed correctly and is in proper working order.

END OF SECTION