

## 1. GENERAL

### 1.1 References

- .1 ASTM International (ASTM)
  - .1 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .2 ASTM B29, Standard Specification for Refined Lead.
  - .3 ASTM B749, Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
  - .4 ASTM D4726, Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) exterior – Profile Extrusions used for assembled Windows in Doors.
- .2 Master Painters Institute (MPI)
  - .1 Master Painters Institute MPI #18 Primer, Zinc Rich, Organic.
- .3 Canadian Standards Association (CSA)
  - .1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CSA W59, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers Association (CSDMA)
  - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames.
  - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors.
- .5 National Fire Protection Association (NFPA)
  - .1 NFPA 80, Standard for Fire Doors and Fire Windows.
  - .2 NFPA 252, Standard Methods of Fire Tests of Door Assemblies.
- .6 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S702, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
  - .3 CAN/ULC-S704, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
  - .4 CAN4-S104, Standard Method for Fire Tests of Door Assemblies.

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- .5 CAN4/ULC-S105, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

## 1.2 System Description

- .1 Design Requirements:
- .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35°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.
  - .3 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104, CAN4/ULC-S105M for ratings specified or indicated.
  - .4 Provide fire labeled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 and listed by nationally recognized agency having factory inspection services.

## 1.3 Action and Informational Submittals

- .1 Provide submittals in accordance with Section E4 –Shop Drawings.
- .2 Provide product data: in accordance with Section E4 –Shop Drawings.
- .3 Provide Shop Drawings: in accordance with Section E4 –Shop Drawings.
  - .1 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, louvred, arrangement of hardware and fire rating and finishes.
  - .2 Indicate each type frame material, core thickness, reinforcements, location of anchors and exposed fastenings and reinforcing fire rating finishes.
  - .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on Drawings and door schedule.
  - .4 Submit test and engineering data, and installation instructions.
- .4 Provide samples in accordance with Section E4 –Shop Drawings.
- .5 Submit one 300 x 300 mm corner sample of each type of frame.

## 1.4 Closeout Submittals

- .1 Submit in accordance with Section 01 78 00 – Closeout Submittals.
  - .1 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

## 2. PRODUCTS

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## 2.1 Attic Access Door

- .1 900 mm x 550 mm, pre-finished, insulated, sealed, exposed flange, Profile cylinder lock, keyed as specified in Section 08 71 00.

## 2.2 Materials

- .1 Hot dipped galvanized steel sheet: to ASTM A653M, Z275, 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.

## 2.3 Door Core Materials

- .1 Honeycomb construction:
  - .1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m<sup>3</sup> minimum sanded to required thickness.
  - .2 Stiffened: face sheets welded, insulated core.
  - .3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250°C at sixty (60) minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

## 2.4 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.

## 2.5 Primer

- .1 Touch-up prime MPI #18 Zinc Rich Organic Primer.

## 2.6 Paint

- .1 Field paint steel doors and frames in accordance with Sections 09 91 00. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

## 2.7 Accessories

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior and interior top and bottom caps: steel.
- .3 Door bottom seal: to Section 08 71 00, Clause 2.1.8.

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- .4 Metallic paste filler: to Manufacturer's standard.
  - .5 Fire labels: metal riveted.
  - .6 Sealant: appropriate sealant as described in Section 07 92 00.

## **2.8 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: 2.0 mm thermally broken type construction.
- .4 Interior frames: 2.0 mm welded type construction.
- .5 Blank, reinforce, drill and tap frames for mortised, templated 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, three (3) for single door, two (2) at head for double door.
- .8 Manufacturer's nameplates on frames and screens are not permitted.
- .9 Conceal fastenings except where exposed fastenings are indicated.
- .10 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .11 Insulate exterior frame components with polyurethane insulation.

## **2.9 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 two (2) anchors for rebate opening heights up to 1,520 mm and one (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 jamb and intermediate at 660 mm on centre maximum.

## **2.10 Frame: 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.

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- .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 two (2) temporary jamb spreaders per frame to maintain proper alignment during shipment.

#### **2.11 Door Fabrication General**

- .1 Doors: swing type, flush, with provision for louvre openings as indicated.
- .2 Exterior doors: Laminated core construction. Interior doors: Welded stiffener 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
- .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 labeled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104 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 not permitted.

#### **2.12 Doors: Honeycomb Core Construction**

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

#### **2.13 Doors: Hollow Steel Construction**

- .1 Form face sheets for exterior doors from 1.6 mm sheet steel.
- .2 Reinforce doors with vertical stiffeners, securely laminated to face sheets at 150 mm on centre maximum.
- .3 Fill voids between stiffeners of exterior doors with polyurethane core.
- .4 Fill voids between stiffeners of interior doors with honeycomb core.

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## **2.14 Thermally Broken 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 ASTM D4726.
- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 Apply insulation.

## **3. EXECUTION**

### **3.1 Installation General**

- .1 Install labeled 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.

### **3.3 Door Installation**

- .1 Install doors and hardware in accordance with hardware templates and Manufacturer's instructions and Section 08 71 00 - Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
  - .1 Hinge side: 3 mm.
  - .2 Latchside and head: 3 mm.
  - .3 Finished floor for non-rated assemblies: 6 mm, unless otherwise indicated.
  - .4 Finished floor for rated assemblies: to NFPA 80.

.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**

**1.1 GENERAL**

**1.2 References**

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
  - .1 ANSI/BHMA A156.1, American National Standard for Butts and Hinges.
  - .2 ANSI/BHMA A156.2, American National Standard for Bored and Preassembled Locks and Latches.
  - .3 ANSI/BHMA A156.3, American National Standard for Exit Devices.
  - .4 ANSI/BHMA A156.4, American National Standard for Door Controls - Closers.
  - .5 ANSI/BHMA A156.5, American National Standard for Auxiliary Locks and Associated Products.
  - .6 ANSI/BHMA A156.6, American National Standard for Architectural Door Trim.
  - .7 ANSI/BHMA A156.8, American National Standard for Door Controls - Overhead Stops and Holders.
  - .8 ANSI/BHMA A156.12, American National Standard for Interconnected Locks and Latches.
  - .9 ANSI/BHMA A156.13, American National Standard for Mortise Locks and Latches Series 1000.
  - .10 ANSI/BHMA A156.16, American National Standard for Auxiliary Hardware.
  - .11 ANSI/BHMA A156.18, American National Standard for Materials and Finishes.
  - .12 ANSI/BHMA A156.21, American National Standard for Thresholds
  - .13 ANSI/BHMA A156.22, American National Standard for Door Gasketing and Edge Seal Systems
- .2 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)
  - .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames.

**1.3 Action and Informational Submittals**

- .1 Submit in accordance with Section E4 –Shop Drawings.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for door hardware and include product characteristics, performance criteria, physical size, finish and limitations.



- .3 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
  - .4 After approval samples will be returned for incorporation in Work.
- .4 Hardware List:
  - .1 Submit contract hardware list.
  - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
  - .5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
  - .6 Manufacturer's Instructions: submit manufacturer's installation instructions.

#### **1.4 Closeout Submittals**

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

#### **1.5 Maintenance Materials Submittals**

- .1 Extra Stock Materials:
  - .2 One (1) extra of all hardware listed within.
- .3 Tools:
  - .1 Supply 2 sets of wrenches for door closers, locksets, and fire exit hardware.

#### **1.6 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 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Architectural Hardware Consultant (AHC): Provide services of an AHC for preparation of hardware shop drawings, keying, coordination with other Sections, consultation with the Contract Administrator for on Site inspections.

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## 2. PRODUCTS

### 2.1 Door Hardware

- .1 Locks and latches:
  - .1 Bored and preassembled locks and latches: to ANSI/BHMA A156.2, series 4000 bored lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
  - .2 Mortise locks and latches: to ANSI/BHMA A156.13, series 1000 mortise lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
  - .3 Lever handles: plain design.
  - .4 Escutcheons: square.
  - .5 Normal strikes: box type, lip projection not beyond jamb.
  - .6 Cylinders: key into keying system as directed.
  - .7 Finished to 630.
- .2 Butts and hinges:
  - .1 Butts and hinges: to ANSI/BHMA A156.1, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.
  - .2 All hinges to be NRP.
- .3 Exit devices: to ANSI/BHMA A156.3.
  - .1 ED - 1: type 3UL, function 03, grade 1, conventional design, finished to US32D.
  - .2 ED - 2: type 3UL, function 03, grade 1, conventional design, finished to US32D.
  - .3 Auxiliary item: door co-ordinator, type 21, for pairs of doors with overlapping astragals.
- .4 Door Closers and Accessories:
  - .1 Door controls (closers): to ANSI/BHMA A156.4, designated by letter C and numeral identifiers listed in Hardware Schedule, size 5 in accordance with ANSI/BHMA A156.4, table A1, finished to 639.
  - .2 Door co-ordinator: concealed for pairs of doors with overlapping astragal.
- .5 Auxiliary locks and associated products: to ANSI/BHMA A156.5, designated by letter E and numeral identifiers listed in Hardware Schedule, finished to 630.
  - .1 Dead bolt, type E2171, finished to 626. Key into keying system as directed.
  - .2 Cylinders: type E09211A, finished to 626, for installation in deadlocks provided with special doors as listed in Hardware Schedule. Key into keying system as directed.
- .6 Kick Plates: to ANSI/BHMA A156.6, finished to 630.

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- .1 Door protection plates: 1.27 stainless steel, 1 edges, 850 x 450 mm, finished to 630.
  - .7 Auxiliary hardware: to ANSI/BHMA A156.16, designated by letter L and numeral identifiers as listed below, finished to 630.
    - .1 Stop, wall mounted: type L52251, finished to US32D.
    - .2 Flush bolt, type L04201, finish to 626. In-Active Door Only.
    - .3 Door silencer: type L03011.
    - .4 Chain door guard: type L12231. Exterior Doors Only.
  - .8 Door bottom seal: heavy duty, door seal of extruded aluminum frame and hollow closed cell neoprene weather seal, recessed in door bottom, closed ends, adjustable, clear anodized finish.
  - .9 Thresholds: to ANSI/BHMA A156.21
    - .1 Threshold Type 1 (TT1): 203 mm wide x full width of door opening, stainless steel mill finish, plain surface.
  - .10 Weatherstripping: to ANSI/BHMA A156.22
    - .1 Seals:
      - .1 Seal UL (fire rated): extruded aluminum frame and hollow closed cell neoprene insert, clear anodized finish.
      - .2 Seal: extruded aluminum frame and hollow closed cell neoprene insert, clear anodized finish.
      - .3 Adhesive backed neoprene material.
    - .2 Sweeps:
      - .1 Sweep UL (fire rated): extruded aluminum frame and closed cell neoprene sweep, clear anodized finish.
      - .2 Sweep 1: extruded aluminum frame and closed cell neoprene sweep, clear anodized finish.
    - .3 Astragals, finished to 630
      - .1 Exterior: overlapping, frame with neoprene insert and lip, finished to match doors.
      - .2 Design Standard: Model #383AA by Zero International.

## **2.2 Fastenings**

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.
- .2 Exposed fastening devices to match finish of hardware.

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- .3 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.

### **2.3 Keying**

- .1 Doors, padlocks and cabinet locks to be as directed. Prepare detailed keying schedule in conjunction with The City.
- .2 Supply keys in duplicate for every lock in this Contract.
- .3 Supply 3 master keys for each master key or grand master key group.
- .4 Stamp keying code numbers on keys and cylinders.
- .5 Supply construction cores.
- .6 Hand over permanent cores and keys to The City.

## **3. EXECUTION**

### **3.1 Installation**

- .1 Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).
- .2 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .3 Install key control cabinet.
- .4 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .5 Remove construction cores when directed by the Contract Administrator.
  - .1 Install permanent cores and ensure locks operate correctly.

### **3.2 Field Quality Control**

- .1 Have hardware manufacturer's representative visit Site and submit written report of each visit to Site, giving storage conditions and installation details, date and name of hardware manufacturer's representative.

### **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.
  - .1 Adjust door hardware to ensure tight fit at contact points with frames.

**3.4 Hardware Schedule**

Door	Threshold	Sweep	Seal	Astragal	Co-ordinator	Kick Plates	Hinges	Dead bolt	Exit Device	Trim	Closure
D201	TT1	Sweep 1 Inside & Outside	Seal	*	*	Each Side	A5131	*	ED-1	990NL-R/V	C02011UL Active Door Only
D202	-	Sweep UL	Seal UL	-	-	Each Side	A5131	-	ED-2	990NL-R/V	C02011UL

**END OF SECTION**