

## 1 ASSEMBLY - GENERAL

1.1 The work of this section includes the provision of all design, labour, materials, equipment and services required to fabricate and install interior doors as required for a complete project. The work includes, but is not necessarily limited to, the items referenced herein:

- 1.1.1 Interior swinging doors
- 1.1.2 Interior entrance doors
- 1.1.3 Interior coiling counter doors
- 1.1.4 Interior door hardware.

1.2 Coordinate provision of interior doors with space data sheets.

## 2 ASSEMBLY DESIGN CRITERIA

2.1 All main public access door leaf sizes to be 900 x 2150mm min. throughout. Provide removal mullions, for multiple leaf doors located in corridors wherever possible, to facilitate material handling throughout the facility.

2.2 Doors with sidelight units are preferred throughout, where appropriate. Typical sidelight units to be 400mm width, full height of door. All glazing to be tempered safety glass or ULC rated Georgian wired glass where applicable.

2.3 Glazing for hollow metal frames shall be the same as doors within the screen. Where possible, provide detailing which will discourage the use of metal frames for storage (i.e. placing of coffee cups on glazed frames).

2.4 Stairwells are to be provided with glazed frames or doors to provide visibility and security to stairwells.

2.5 All hollow metal frames in masonry or concrete walls shall be filled with grout. All metal doors and frames painted.

2.6 Provide acoustic and/or fire-ratings to doors, frames and hardware as required. Where doors are fire-rated or ULC and/or STC rated, door frames and hardware shall match.

2.7 Undercut doors to janitor closets and electrical rooms.

2.8 Provide door caps across head of exterior, stair and security doors.

2.9 Provide sealant around all hollow metal frames, both sides.

2.10 All public entrance doors to be handicapped accessible with automatic door operators.

- 2.11 Doors must be operable by a single-handed operation (lever handles where possible) and must operate with a minimum pressure of 22N for interior doors and 38N for exterior doors.
- 2.12 Where design permits, all major interior corridor doors are to utilize electronic hold open devices, which are tied into the fire alarm system.
- 2.13 Doors must be located in an area with sufficient space on both sides to manoeuvre a wheelchair.
- 2.14 Where possible, doors should not open onto halls and corridors.
- 2.15 The distance between two hinged doors in series must be a minimum of 1200mm plus the width of any door swinging into this space.
- 2.16 All classrooms, labs and offices should be fitted with hardware, which cannot be locked from the inside.
- 2.17 Coordinate door design and installation with requirements for security devices and hardware provided by Owner.
- 2.18 In general, the door material standards are as follows:

Room Type	Door Type	Frame Type	Duty
Stairwells/Public corridors	HMD	HMF	H
Classrooms	SWC	HMF	M
Computer Labs	SWC	HMF	M
Offices	SWC	HMF	M
Storage/Janitorial	SWC	HMF	M
Service Rooms	HMD	HMF	M
Public Washrooms	SWC	HMF	H
Showers/locker rooms	HMD	HMF	M
Mechanical Rooms	IMD	HMF	M

Abbreviations:

<b>SWC</b> Solid Wood Core Door	<b>HMF</b> Hollow Metal Frame	<b>H</b> Heavy Duty
<b>HMD</b> Hollow Metal Door	<b>AMF</b> Acoustic Metal Frame	<b>M</b> Medium Duty
<b>IMD</b> Insulated Metal Door		<b>L</b> Light Duty
<b>ACD</b> Acoustic Rated Door		

### 3 ASSEMBLY COMPONENTS

#### 3.1 HOLLOW METAL INTERIOR DOORS AND FRAMES

3.1.1 **General:**

3.1.1.1 Submittals: in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups. Indicate each type of door, material, steel core thickness, mortises, reinforcements, location of exposed fasteners, openings, glazing, louvres, arrangement of hardware and fire rating. Indicate each type frame material, core thickness, reinforcement, glazing stops, location of anchors and exposed fastenings and finishes.

3.1.1.2 Submittals: one 300 x 300mm corner sample of each type door and frame in accordance with Section 01340.

3.1.1.3 Operations & Maintenance Manuals: Provide maintenance data for cleaning, and maintenance of doors for incorporation into manual. Brief maintenance staff regarding proper care, cleaning, and general maintenance. Provide operation and maintenance data for door closers, locksets, door holders and fire exit hardware for incorporation into manual.

3.1.2 **Design:**

3.1.2.1 Steel fire rated doors and frames: labeled and listed by an organization accredited by Standards Council of Canada in conformance with *[CAN4 S104M-80 revised 1985]* and *[CAN4 S105M-1985]* for ratings specified or indicated.

3.1.2.2 Install labeled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

3.1.2.3 Provide acoustic labelled doors and frames to meet or exceed STC rating required in conformance with *[ASTM E90-83/87/90]*.

3.1.3 **Materials/Finishes:**

3.1.3.1 Galvanized steel sheet: commercial quality to *[ASTM A568]*, Class 1, hot dip, galvanized to *[ASTM-A527-80]*. Coating designation known commercially as 'Colourbond', 'Satincoat' or 'Gavanneal'.

3.1.3.2 **Doors:**

3.1.3.2.1 Door face sheets to interior doors 16ga base thickness.

3.1.3.2.2 Door face sheets to butt side of door 16ga base thickness.

3.1.3.2.3 Door face sheets to non-butt side of door 16ga base thickness.

3.1.3.3 Door Core, hollow steel, vertically stiffened with steel ribs and all voids filled with semi-rigid fibrous insulation minimum density 24kg/m<sup>3</sup> polystyrene or polyurethane.

- 3.1.3.4 Steel frames to openings 1200mm or less in unsupported width 16ga base thickness. Steel frames to openings over 1200mm unsupported width 14ga base thickness.
- 3.1.3.5 Provide other door and frame components in accordance with CSDFMA requirements.
- 3.1.3.6 Primer for galvanized steel sheet: *[CGSB 1-GP-181M-77+Amdt-Mar-78]*.
- 3.1.3.7 Exterior top caps: rigid PVC extrusion conforming to *[CGSB 41-GP-19ma]*, for all exterior doors and stairway doors.
- 3.1.3.8 Welding: conform to *[CSA W59-84]*.
- 3.1.3.9 On acoustic doors and frames, supply and install the following hardware as necessary to meet the required STC ratings:
  - 3.1.3.9.1 Cam lift hinges: to door manufacturer's standard.
  - 3.1.3.9.2 Thresholds: KSP-1A
  - 3.1.3.9.3 Noise control seals: neoprene compressor seal in fully adjustable retainer assembly.
  - 3.1.3.9.4 Door bottom seal: semi-mortised fully adjustable with extruded neoprene insert the full width of door.
  - 3.1.3.9.5 Astragals: neoprene compression astragal.
- 3.1.4 **Fabrication/Installation:**
  - 3.1.4.1 Fabricate doors and frames as detailed, to Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA) Canadian Manufacturing Specifications for Steel Doors and Frames, 1982; except where specified otherwise. Reinforce door and frames to suit hardware requirements.
  - 3.1.4.2 Blank, reinforce, drill and tap doors and frames for mortised hardware. Reinforce doors and frames for surface mounted hardware.
  - 3.1.4.3 Shop prime cold rolled steel sheet. Apply, at factory, touch up primer to doors and frames manufactured from galvanized steel where coating has been removed during fabrication.
  - 3.1.4.4 Provide fire labelled doors and frames, tested in strict conformance with *[CAN4-S104]*, *[ASTM E-152]* or *[N.F.P.A. 252]* and listed by a recognized agency having a factory inspection service.
  - 3.1.4.5 Make provision for glazing as required and provide necessary glazing stops.
  - 3.1.4.6 Construct rail and stile doors in same manner as flush doors. Construct matching panels in same manner as doors.

- 3.1.4.7 Fabricate doors with longitudinal edges seamless, welded, filled and sanded flush. Fabricate doors with top and bottom channels flush and filled solid, extending full width of door and welded to both faces. Provide P.V.C. top caps to all exterior and stairway doors. Fabricate transom panels similar to doors.
- 3.1.4.8 Frames: Cut mitres and joints accurately and weld continuously on inside of frame profile. Grind welded corners and joints to flat plane, fill with metallic paste filler and sand to uniform smooth finish.
- 3.1.4.9 Provide adjustable jamb anchors for fixing at floor and wall. Locate wall anchors immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on strike jamb.
- 3.1.4.10 Install 3 bumpers on strike jamb for each single door and 2 bumpers at head for pairs of doors.
- 3.1.4.11 Provide anchors not more than 150mm from top and bottom of each jamb, and intermediate anchors at 660mm on centre maximum, for frames in previously placed concrete, masonry or structural steel.
- 3.1.4.12 Butt joints of mullions, transom bars, centre rails and sills and cope accurately, securely welded.
- 3.1.4.13 Make provisions for glazing as required and provide necessary formed channel glazing stops, minimum 16mm height. Accurately fit, butted corners and fastened to frames with counter sunk oval head sheet metal screws.
- 3.1.4.14 Install electrical box and 12mm dia. conduit, spot-weld into the frame to accommodate electric wiring to electrical devices. Stub conduit 150mm above top of frame.
- 3.1.4.15 Install in accordance with National Fire Codes, Volume 4, produced by National Fire Protection Association (NFPA) 80.
- 3.1.4.16 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows:
- 3.1.4.16.1 Hinge side: 1.0 mm.
  - 3.1.4.16.2 Latchside and head: 1.5 mm.
  - 3.1.4.16.3 Finished floor, top of carpet, noncombustible sill and thresholds: 13 mm.
- 3.1.4.17 Set frames plumb, square, level and at correct elevation. Secure anchorages and connections to suit adjacent construction. Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

- 3.1.4.18 All hardware to be supplied and installed to meet or exceed required STC/ULC ratings and as per manufacturer's instructions.

## 3.2 WOOD DOORS

### 3.2.1 **General:**

- 3.2.1.1 Submittals: Submit samples in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups. Submit one 300 x 300mm corner sample of each type wood door. Show door construction, core, glazing detail and faces.
- 3.2.1.2 Submit shop drawings in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups. Indicate door types and cutouts for lights.
- 3.2.1.3 References: *[CSA 0132.2-M1977]* Wood Doors.
- 3.2.1.4 Regulatory requirements: Fire-resistance rated for wood doors: certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- 3.2.1.5 Warranties: *[Design Builder]* hereby warrants that wood doors will not warp, twist, show core lines, split, delaminate or sag in accordance with AWMAC Premium Standards but for three (3) years.
- 3.2.1.6 Operations & Maintenance Manuals: provide material and product data for incorporation into Section 01730.

### 3.2.2 **Design:**

- 3.2.2.1 Not Applicable.

### 3.2.3 **Materials/Finishes:**

- 3.2.3.1 Door materials: to *[CSA 0132.2]*.
- 3.2.3.2 Solid core: 45mm thick.
- 3.2.3.3 Particleboard core: 449kg/m<sup>3</sup> to *[CAN3-0188.1-M78]*, Grade T.
- 3.2.3.4 Face: select grade, flat sliced, book matched maple veneers.
- 3.2.3.5 Stiles: 115mm solid wood.
- 3.2.3.6 Top and bottom rails: 70mm solid wood.
- 3.2.3.7 Cross band: 1.6mm veneer.
- 3.2.3.8 Edge strips: minimum 16mm maple wood to match face veneer.
- 3.2.3.9 Transom and side panels: to match adjacent door.
- 3.2.3.10 Meeting edges of doors and transom panels: square.

3.2.3.11 Veneer of doors and transom panels: grain through, colour matched.

3.2.4 **Fabrication/Installation**

3.2.4.1 Fabricate doors and panels in accordance with [CSA 0132.2].

3.2.4.2 Vertical edge strips to match face veneer. Bevel vertical edges of single acting doors 3mm in 50mm on lock side and 1.5mm in 50mm on hinge side.

3.2.4.3 Install doors and hardware in accordance with manufacturer's printed instructions. Adjust hardware for correct function.

3.3 COILING COUNTER DOORS

3.3.1 **General:**

3.3.1.1 Submittals: Submit shop drawings in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups. Indicate each type of coiling counter door, arrangement of hardware, operating mechanism and required clearances. Indicate materials and details for head, jamb and sill, profiles of components. Indicate panel construction, hinging, arrangement, track and trolley assembly hardware and required clearances, elevations of unit, anchorage details, description of related components and exposed finishes fasteners.

3.3.1.2 Provide operation and maintenance data for overhead coiling counter doors and hardware for incorporation into manual specified in Section 01730 - Operation and Maintenance Manual.

3.3.2 **Design:**

3.3.2.1 Not applicable.

3.3.3 **Materials/Finishes:**

3.3.3.1 Assemble coiling counter door curtain of 60mm wide x 12mm deep x 1.5mm thick flat roll formed steel, extruded aluminum interlocking slat sections.

3.3.3.2 Provide bottom bar of extruded aluminum section.

3.3.3.3 Form guides of extruded aluminum sections with upset shoulders for curtain retention. Guides complete with rigid vinyl liners to reduce noise.

3.3.3.4 Construct counterbalance assembly consisting of torsion spring with 25% overload factor. Enclose spring in steel pipe to support door curtain and counterbalance mechanism with maximum deflection of 1/360th of opening width. Provide ball bearings at rotating points. Provide spring tension adjusting wheel, accessible for setting.

- 3.3.3.5 Support counterbalance assembly on 5mm minimum thickness steel plate brackets, forming end enclosures. Enclose counterbalance assembly with aluminum sheet formed hood.
- 3.3.3.6 Equip coiling doors for locking from inside with slide bolts and padlocking cylinder locks for masterkeyed cylinder.
- 3.3.3.7 Acceptable material (or equal): [*Heavy duty, Slim-line 'V' slat counter shutter by Dynamic Closures*].
- 3.3.3.8 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes. Clear anodic finish: designation AA-M21-C22-A41. Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative shall meet requirements of [*CGSB 63-GP-2M*], for coating Classes 1, 2 and 3 respectively.
- 3.3.3.9 Equip coiling counter doors for operation by:
  - 3.3.3.9.1 Hand, install two lift handles at coiling counter door bottom on inside face of coiling counter door.
  - 3.3.3.9.2 Automatic closing mechanisms activated by fusible links and tied to fire alarm system for closing upon fire alarm trouble signal if applicable.

3.3.4 **Fabrication/Installation:**

- 3.3.4.1 Install coiling counter door in accordance with manufacturers' printed instructions. Install masterkeyed cylinders. Adjust operable parts for correct function and smooth operation.

3.4 FINISH HARDWARE

3.4.1 **General:**

- 3.4.1.1 Submittals: Submit samples in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups. Submit duplicate samples of each type of hardware listed in finishing hardware schedule.
- 3.4.1.2 Submit shop drawings in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups. Submit duplicate copies of Finishing Hardware Schedule complete with catalogue cuts for review by Owner. Clearly identify hardware listed by manufacturer's name, product catalogue number and finish.
- 3.4.1.3 Quality Assurance: The [*Design Builder*] shall prepare a detailed keying schedule in co-operation with the Owner.

- 3.4.1.4 Warranties: All hardware supplied under the Hardware Schedule will be guaranteed for a period of one (1) year after final acceptance of the project. Door closers will be guaranteed for a period of ten (10) years.
- 3.4.1.5 Operations & Maintenance Manuals: provide material and product data for incorporation into Section 01730.
- 3.4.1.6 Maintenance Materials: provide maintenance materials in accordance with Section 01731 -Maintenance Materials, Special Tools and Spare Parts. Supply two sets of wrenches for door closers, locksets and fire exit hardware.
- 3.4.2 **Design:**
  - 3.4.2.1 All locks shall be keyed into an existing 'Best Lock' keying system as follows:
    - 3.4.2.1.1 Construction Master Keyed
    - 3.4.2.1.2 Grand Master Keyed
    - 3.4.2.1.3 Master Keyed
    - 3.4.2.1.4 Keyed alike or different as required.
    - 3.4.2.1.5 Supply 12 Construction Master Keys
    - 3.4.2.1.6 Supply of Master Keys by Owner.
    - 3.4.2.1.7 Supply of Change Keys by Owner.
  - 3.4.2.2 Exposed fastening devices to match finish of hardware.
  - 3.4.2.3 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 plates to cover fasteners.
  - 3.4.2.4 Wall stops are to be used wherever possible. Provide proper blocking to prevent damage.
  - 3.4.2.5 Provide Roton hinges on all exterior main entrances and doors subject to heavy usage.
  - 3.4.2.6 Provide alarm contacts on all main entrance doors.
  - 3.4.2.7 Provide handicapped accessible automatic door openers on all main entrance doors.
  - 3.4.2.8 For acoustic rated doors, provide acoustic perimeter door seals, automatic door bottoms, and other finishing hardware to achieve required STC ratings.

- 3.4.2.9 Provide stainless steel kickplates on all doors to/from washrooms, public corridors, public areas, exit stairs/entrances, and classroom doors.
- 3.4.2.10 Provide lever action latch sets throughout.
- 3.4.2.11 Handicapped accessibility:
  - 3.4.2.11.1 Delayed action closers
  - 3.4.2.11.2 Thresholds
  - 3.4.2.11.3 Automatic door operators with button controls.
- 3.4.2.12 Classroom doors equipped with keyed locks on master key system. Doors to be operable from inside without keys.
- 3.4.2.13 Provide construction cores for the project to coordinate security requirements of the Owner.

3.4.3 **Materials/Finishes:**

- 3.4.3.1 Acceptable Products and Manufacturers: The following is a list of hardware to be used on this project. Use only ULC listed and labelled hardware for fire-rated doors. The Owner has selected specific hardware, which meets their standards. Economy grade, unpolished hinges and mortise lock 'spec-rite' trim or equivalents is not acceptable. All finishing hardware shall be as specified, with no substitutions.

Hinges	Hagar Hinge Canada Ltd.
Continuous Hinges	Roton
Mortise Locksets	Best Lock
Cylinders	Best Lock
Panic Sets	Von Duprin
Removable Mullions	Von Duprin
Door Pulls	Standard Metal Hardware
Flush Bolts	Standard Metal Hardware
Flush Bolts, ULC	Ives
Door Closers	L.C.N.
Push & Kick Plates	Standard Metal Hardware
Floor/wall Stops	Standard Metal Hardware
Overhead Stops	Glynn Johnson
Thresholds	K.N. Crowder

Thresholds NGP	National Guard Products Inc.
Weatherstripping	K.N. Crowder
Lite Seal	Zero
Surface Bolts	Glynn Johnson
Electric Strikes	Von Duprin & Folger Adam Co.

3.4.3.2 Acceptable Finishes:

Hinges	C15	Satin Nickel, polished
Hinges	C28	Clear Satin Aluminum
Locksets	630	Stainless Steel, Satin
Panic Sets	630	Stainless Steel, Satin
Door Closers	689	Sprayed Aluminum
Kick Plates	C32D	Stainless Steel, Satin
Floor/wall Stops	C15	Satin Nickel, polished
Thresholds	AL	Clear Anodized Aluminum

3.4.4 **Fabrication/Installation:**

- 3.4.4.1 Install all hardware as per manufacturer's instructions, using tradesmen competent in the installation of finishing hardware. Clean, adjust and make good all installations to the satisfaction of the Owner.

***End of Section***