

SECTION 08 11 00

METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

- A. Comply with Division 1, General Requirements.
- B. Door Hardware: As specified in Section 08 71 00, Door Hardware and as indicated in Door Hardware Schedule.

1.2 REFERENCES

- A. Comply with the latest edition of the following statutes codes and standards and all amendments thereto.
 - 1. Specifications for Commercial Steel Doors and Frames published by the Canadian Steel Door and Frame Manufacturers Association (CSDMA).
 - 2. ASTM A167 Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - 3. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 4. ASTM A924/A924M Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - 5. CAN/CGSB 1.181 Ready-Mixed Organic Zinc-Rich Coating.
 - 6. CAN/CSA G164-M Hot Dip Galvanizing of Irregularly Shaped Articles.
 - 7. CSA W59 Welded Steel Construction (Metal Arc Welding).
 - 8. NFPA 252 Fire Tests of Door Assemblies.
 - 9. ULC/CAN4-S104 Standard Method for Fire Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Submit shop drawings showing type of door, type of frame, material being supplied, thickness of materials, cutouts and reinforcements, anchors and location of fastenings, door hand, location of hardware and door edge detail.
- B. Submit information on standard shop drawing sheets approved by the Canadian Steel Door and Frame Manufacturers Association.
- C. Submit certificate to substantiate design and construction of fire rated assemblies, if requested.

1.4 WARRANTY

- A. Submit a three-year warranty for work of this Section against defects in materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. S.W. Fleming Ltd.
- B. Baron Metal Industries Inc.
- C. Metal Door Ltd.

2.2 MATERIALS

- A. Steel sheet: ASTM A653, CS, Type B, Coating Designation ZF75 (A25) minimum.
- B. Galvanized steel: CSA G164 unless otherwise specified hot-dip zinc coating.
- C. Stainless steel: ASTM A167 Type 316 stainless steel.
- D. Thermal Insulation: Glass fibre insulation minimum density 24 kg/m³.
- E. Primer: CGSB 1.181, zinc rich primer.

2.3 FABRICATION - GENERAL

- A. Fabricate units to comply with CSDMA Specifications and additional requirements specified, welded construction.
- B. Thickness of members:
 - 1. Door facings, rails and stiles: 1.6 mm thick steel sheet.
 - 2. Vertical steel stiffeners: 0.9 mm thick, steel sheet.
 - 3. Frame members: 1.6 mm thick steel sheet.
 - 4. Hinge reinforcements: 3.4 mm thick galvanized steel high frequency reinforcement.
 - 5. Other reinforcements: 2.7 mm thick galvanized steel.
 - 6. Glazing stops: 0.9 mm thick galvanized steel with square profile.
 - 7. Frame anchors: Galvanized steel.
 - a. Anchors for frame to be grouted in: Wire type, 4.0 mm thick.
 - b. Anchors for frame in masonry walls: Type "T" strap anchor 1.6 mm thick.
 - c. Anchors for frame in concrete wall, existing wall or at structural steel member: Countersunk head, galvanized screws [stainless steel] of size to effect sufficient embedment in jamb 1.6 mm thick.
 - d. Anchors for frame in metal stud partition: Door manufacturer's standard, 0.9 mm thick minimum.
 - 8. Guard boxes: 0.8 mm thick minimum.
 - 9. Jamb spreaders: 1.2 mm thick minimum.
- C. Form profiles accurately to details indicated.

- D. Weld hinge reinforcement in place, with not less than 8 welds per reinforcement
- E. Sand welded joints to smooth uniform finish and touch-up with primer.
- F. Blank, reinforce, drill and tap units to receive hardware.
- G. Protect strike reinforcements and guard box welded to frames.
- H. Fasten glazing stops with countersunk screws at 150 mm o.c.
- I. Perform welding to CSA W59.
- J. Factory apply primer to areas where zinc coating has been damaged during fabrication.
- K. Fabricate cut-outs and concealed reinforcement in door and frame as required for installation of security alarm system. Weld standard electrical junction box frame, centred over cut out.

2.4 FABRICATION - DOOR AND TRANSOM PANEL

- A. Doors: Hollow, welded stiffener construction. Laminated or honeycomb core construction is not acceptable.
- B. Assemble components of door by means of spot welding with vertical stiffeners spaced 150 mm maximum o.c. and welded at 150 mm o.c.
- C. Continuously weld door edge seams, body fill, and grind smooth. Face seams in finished product are not acceptable.
- D. Fabricate steel flush closed ends on edges, top and bottom of doors.
- E. Door Thickness: 45 mm and 50 mm as required for oversized doors.
- F. For pair of doors scheduled to be weatherstripped tack weld to each leaf 38 by 3 mm steel astragal full height of door with 3 mm thick continuous spacer. Continuously weld between door and astragal. Body fill, grind smooth and touch-up with primer.
- G. Transom Panel: Of same materials, construction and thickness as door.
- H. Transom Panel in Labeled Door Assembly: Of same materials and construction as door.
- I. Thermal Insulation: Full thickness of door. Fill all voids in door including stiffeners. Insulate all exterior doors.

2.5 FABRICATION - FRAMES AND SCREENS

- A. Mitre frame accurately and weld continuously on inside of frame profile.

- B. Prepare frame for rubber silencers. Use three silencers per standard height door. For doors higher than 2250 mm add one silencer for every additional 750 mm of height or part thereof.
- C. Use a minimum of two welded channel or angle spreaders per frame to ensure alignment.
- D. Terminate frame at top of concrete slab [or topping.] Weld floor plates to frame for anchorage to slab. Verify depth of extension of finished floor to concrete slab.
- E. For frames up to 2250 mm in height secure on each jamb 3 adjustable anchors for masonry wall, 4 welded or wedged anchors for stud partition, 3 pre-drilled holes with shallow dimples and with welded spacers behind for concrete wall, existing wall and structural steel member. Fabricate an additional anchor for each additional 750 mm of height or part thereof.
- F. Fabricate frames with sidelights/transoms as indicated.
- G. Fabricate interior screen frames as indicated.
- H. Fabricate frames scheduled for installation in existing openings or cast-in-place concrete walls with spacers and recessed anchors. Site measure existing openings before fabrication.
- I. Factory install transom panel in frame.
- J. Form continuous drip to exterior frame head as detailed.

2.6 FABRICATION - RATED ASSEMBLIES

- A. Fabricate ULC or WHI labelled doors, transom panels and frames of rating indicated in Door and Hardware Schedule.
- B. Fabricate fire labelled products tested in conformance with ULC/CAN4-S104 or NFPA 252 and listed by a nationally recognized agency having factory inspection service and constructed as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by the listing agency to individual manufacturers. Meet fire rating shown and provide fire protection rating and time/temperature rise label as required by the authorities having jurisdiction. Door core as per tested assembly.
- C. Continuously weld 38 by 3 mm steel astragal to inactive leaf of pair of doors scheduled for fire resistance rating.
- D. Affix appropriate labels on doors and frames, at concealed locations.

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

- A. Comply with Division 1, General Requirements.

1.2 SUBMITTALS

- A. Comply with Division 1, General Requirements.

1.3 SUBMITTALS

- A. Manufacturer's instructions: Submit three copies of installation and maintenance instructions for each item of hardware.
- B. Hardware schedule: Submit schedule indicating hardware and each manufacturer. Include catalogue cuts of each hardware.
- C. Submit templates and template information drawings when requested.

1.4 WARRANTY

- A. Submit manufacturers' warranty against defects in materials and workmanship for the following items:

Hardware Item	Length of Warranty
Hinges	Lifetime
Locks (Cylindrical)	7 years
Locks (Mortise)	3 years
Keypad Locks	1 year
Exit Devices	3 years
Door closers – mechanical	10 years
Door Operators – Electro mechanical	2 years
Overhead stops/holders	1 year
Floor/Wall stops	1 year
Electric Strikes/Key Switches/Power Supplies	1 year
Electromagnetic Locks	Lifetime

PART 2 PRODUCTS

2.1 GENERAL

- A. Manufacturers' catalogue numbers specified, denote quality, style and function of items required.
- B. Hardware finish: BMHA symbols as specified. Finish of fastenings: Complementary to related hardware.
- C. Hardware for Fire-Rated Openings: Listed by ULC or WHI including Building Code time/temperature rise requirements where required. UL listed hardware is acceptable only where authorities having jurisdiction approve such hardware.
- D. Package each item of hardware complete with trim, fastenings and accessories, marked as to contents and appropriate use.
- E. Package items of hardware subject to handling when installed, with easily removable protective covering.

2.2 FASTENERS

- A. Stainless steel.

2.3 BUTT HINGES

- A. Quantity per Door Leaf (Minimum):

Door Height	Hinges
Up to 1500 mm	1 pair
Over 1500 mm to 2310 mm	1-1/2 pair
Over 2310 mm to 3000 mm	2 pairs
Over 3000 mm to 3800 mm	2-1/2 pairs

- B. Hinge Height (Minimum):

Door Width	Hinge Height
Up to 900 mm	114 mm
Over 900 mm to 1200 mm	125 mm
Over 1200 mm	150 mm

- C. Width: Minimum for clearance of trim and 180-degree swing.
- D. Joint Tolerance: 0.03 mm maximum, gauged in closed position.
- E. Finish: [Satin stainless steel No. 630.]. [Satin bronze No. 612.] [Satin chromium-plated brass or bronze No. 626.] [Satin chromium-plated steel No. 652.] [Primed for paint No. 600.] [As indicated for each type.]

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F. For Exterior and Lockable Outswinging Doors: Non-removable pin (NRP).

G. Types and Manufacturers:

No.	Type Description	Stanley	McKinney
H1	Regular weight, two ball-races, full mortise, [brass, bronze [steel [stainless steel	FBB191 FBB179 FBB191-32D	TA2314] TA2714] TA2314-32D]
H2	Plain bearing, full mortise, [brass or bronze [steel [stainless steel	F191 F179 F191-32D	T2314] T2714] T2314-32D]
H3	Hinges or pivots furnished by door manufacturer		
H4	Extra heavy-weight, four ball races, full mortise, stainless steel	FBB199-32D	T4A3386-32D
H5	Heavyweight, four ball races, half mortise, stainless steel	FBB98	T4A3384-32D
H6	Heavyweight, four ball races, half mortise, stainless steel	FBB113	T4A3382-32D

2.4 LOCKSET AND LATCH SETS

A. Cylindrical or Bored Locks:

1. Trim: Wrought or cold-forged metal knobs and roses.
2. Core Cylinders: Interchangeable, removable; minimum of six pins.
3. Strikes: Lip dimensions to fit configuration of trim.
4. Bolt Throw: 20mm minimum, on latchbolts for pair of doors.
5. Knob Backset: [95] 70 millimeters.
6. Manufacturers and Products:
 - a. Sargent; BC.
 - b. Schlage; Plymouth.
 - c. Best; 4C Washington.

B. Mortise Locks:

1. Materials: Brass or stainless steel.
2. Trim: Wrought or forged lever handles and roses.
3. Core Cylinders: Interchangeable, removable; minimum of six pins.
4. Bolt Throw: 16 mm minimum.
5. Lever Backset: 70 mm.
6. Manufacturers and Products:
 - a. Sargent; LNJ.
 - b. Schlage; 03.
 - c. Best; 3H Fairbanks.

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- C. Tactile Warning: Knurl knob backs and lever handles for touch identification.
- D. Finish:
 1. Satin stainless steel No. 630.] [Satin chromium-plated No. 626.
- E. Locks and Latches: Match existing in manufacturer, design, finish, and keying. No substitutions allowed.
- F. Types and Manufacturers:

No.	Type Description	Best	Sargent	Schlage
L1	Mortise entrance lock with lever handle	35H7F3H	8245-LNJ	L9456P-03
L2	Bored, entrance lock	84K7AB4C	9G05	C53PD
L3	Mortise latch with lever handle	35H0N3H	8215-LNJ	L9010-03
L4	Bored latch	84K0N4C	9U15	C10S
L5	Mortise utility room lock with lever handle	35H7EW3H	8204-LNJ	L9080-03
L6	Bored, utility room lock	84K7D4C	9G04	C80PD
L7	Mortise office lock with lever handle	35H7E3H	8205-LNJ	L9050-03
L8	Mortice privacy lock with lever handle	35H7LF3H	8265-LNJ	L9040-03
L9	Bored, privacy lock	84K0L4C	9U65	D40S
L10	Cabinet lock, drawer and door	3L7RD	1654	46-002
L11	Lock by door manufacturer; furnish cylinders for keying to other locks as required			
L12	Bored, exit only, lock	84K0Y4C	9G13	C12D
L13	Padlock	61BRT	758HS	45-101
L14	Fixed knob pull and roller; Latch: Ives 336, Stanley C44S	84K1DT4C	9U93	D170
L15	Push-pull latch		115	Corbin 1860

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No.	Type Description	Best	Sargent	Schlage
L16	Lock by exit device manufacturer; furnish cylinders for keying to other locks as required			
L17	Dummy Trim			C172
L18	Deadlock	83T7K	485	B560

- G. Recessed strike plates to receive dead bolts.
- H. Open back strike for labelled pair of door.
- I. 2 point/3 point latch for labelled door.
- J. Keying:
 1. Lock Cylinders: Operate by a [grand] master key system that allows for future expansion.
 2. Keylocks: [As indicated in the Door and Hardware Schedule.] [Key new locks into existing [Best] master key system.] [As directed by The City.]
 3. Keys: Two per lock; tag with schedule information.
 4. Master Keys: Four; send by registered mail to [Contract Administrator.] [The City.]
 5. [Key cabinet and casework locks into building system.]
 6. [Furnish lock manufacturer's removable core maximum security keying system.]

2.5 CONSTRUCTION KEY SYSTEM

- A. Removable construction core system for locks.
- B. See Article Manufacturer's Services under Part 3, Execution.
- C. Assemble permanent cylinders with construction inserts into and ship with all lock sets by registered mail to Contract Administrator.
- D. Change Keys: Pack in separately identified envelopes and ship by registered mail to Contract Administrator The City.
- E. Construction Keys: Pack in cartons marked "packing list" and ship by registered mail to Contract Administrator..
- F. Construction Insert Extractor Keys, Master Keys, and Grand Master Keys: Ship by registered mail to Contract Administrator.
- G. On completion of the job, deliver construction keys to The City.

2.6 MASTER KEY SYSTEM

- A. Supply three change keys per lockset and cylinder in addition to required master keys.
- B. Key certain locksets alike in groups in addition to master keying.
- C. Provide cylinders with six pins minimum, paracentric keyway [to match existing.]
- D. Key cylinders for Master Key system to match existing.
- E. Hand over keys to the Contract Administrator [The City].

2.7 EXIT DEVICES

- A. Furnish fire exit devices at fire-rated doors.
- B. Removable Mullion: By exit device manufacturer.
- C. Trim:
 - 1. Knobs: Sargent PRK; Von Duprin K.
 - 2. Levers: Sargent ETJ; Von Duprin 03.
- D. Finish:
 - 1. Exit Device: Satin chromium-plated No. 626.
 - 2. Removable Mullion: Wrought steel or aluminum with prime coat, 980.
- E. Types and Manufacturers:

No.	Type Description	VonDuprin	Sargent	Yale
X1	Rim type, Key locks/unlocks Knob (Lever)	Knob: 991K Lever: 992L	Knob: 8813 PRK Lever: 8813 ETJ	
X2	Rim type, Knob/Lever always active	Knob: 991K-BE Lever: 992L-BE	Knob: 8815 PRK Lever: 8815 ETJ	
X3	Rim type, Exit Only	99EO	8810	
X4	Concealed Vertical Rod, Key locks/unlocks Knob (Lever)	Knob: 9947K Lever: 9947L	Knob: Not available Lever: 8613 ETJ	
X5	Concealed Vertical Rod, Knob/Lever always active	Knob: 9947K-BE Lever: 9947L-BE	Knob: Not available Lever: 8615 ETJ	
X6	Concealed vertical rod, exit only	9947EO	8610	

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No.	Type Description	VonDuprin	Sargent	Yale
X7	Dummy Trim Knob/Lever Rigid (Pull operation only)	Knob: 991K-DT Lever: 992L-DT	Knob: 819-PRK-DT Lever: 710-DT-ETJ	

2.8 CLOSERS

- A. Size closers in accordance with manufacturer's standards.
- B. Finish: Satin chromium-plated No. 626.
- C. Types and Manufacturers:

No.	Type Description	LCN	Sargent	Norton
C1	Regular arm	4010 Series	350 Series	7500
C2	Parallel arm	4110 Series	350-P Series	PR7500
C3	Regular arm with hold-open	4010H Series	350-H Series	7500IT
C4	Parallel arm with integral stop	4110 Cush-N-Stop Series	350-PS Series	CLP7500
C5	Parallel arm with hold-open	4110H Series	350-PH Series	PR7500H
C6	Parallel arm with integral stop and hold-open	4110H Cush-N-Stop Series	350-PSH Series	CLP-7500T
C7	Closer furnished by door and frame manufacturer	-	-	-
C8	Regular arm	-	-	7500 SS
C9	Parallel arm	-	-	P7500SS
C10	Parallel arm with integral stop	-	-	CLP7500SS

- D. Size closer for one standard size larger than actual door size in accordance with manufacturer's recommended standard.

2.9 DOOR STOPS AND HOLDERS

- A. Machine Screws: In threaded anchors at concrete or masonry.
- B. Self-Tapping Screws: At stud partitions, wood, or metal mountings.
- C. Metal Risers: For mounting at carpet floors.

D. Finish: Satin chromium-plated No. 626.

E. Types and Manufacturers for Each Leaf:

No.	Type Description	BBW or GJ	Baldwin	
S1	Floor stop	F121X	4086	
S2	Wall bumper	[WC9X [WC9T	4031] 4032]	
S7	Heavy-duty overhead stop	GJ79HDS		

2.10 RAINDRIP

A. Raindrip: Zero 11 aluminum mill finish, for exterior side of frame head door by Zero International Inc. Provide raindrip on all exterior doors unless noted otherwise.

2.11 DOOR BOTTOM SWEEP

A. Door bottom sweep: W-13S heavy duty surface mounted anodized extruded aluminum with black solid neoprene seal for each leaf by K.N. Crowder Mfg. Inc. Finish: to match door finish. Provide door bottom sweep for each door location where threshold has not been scheduled.

2.12 BOLTS

A. Finish: Bright nickel No. 645.

B. Types and Manufacturers:

No.	Type Description	Stanley	Lawrence	
B1	Top and bottom flush bolts	393-1/2	280	

2.13 KICKPLATES

A. Solid metal, not plated. Bevel four edges.

B. Width of door leaf less 37 mm at single leaf and less 25 mm at pairs.

C. Finish: Satin stainless steel No. 630.

D. Types and Manufacturers: Builders Brass Works, Baldwin, or Cipco as follows:

1. K1 250 mm high by [1.27] [3.18] mm thick.
2. K2 900 mm high by [1.27] [3.18] mm thick.

2.14 THRESHOLD

- A. Thresholds: One-piece full width of opening.
- B. Provide with stainless steel self tapping screws in threaded expansion anchors.
- C. Finish: [Dark bronze anodized] aluminum, unless indicated otherwise.
- D. Types and Manufacturers:

No.	Type Description	Pemko	Reese	K.N. Crowder
T1	Saddle (smooth, 125 mm x 12 mm)	175A	S104A	CT-10
T2	Half Saddle	227A	S284A	CT-18
T3	Thermal break saddle (155 mm x 12 mm)	253X3AFG	S473A	CT-45

2.15 AUTOMATIC DOOR BOTTOM AND GAS-TIGHT SEAL

- A. Automatic door bottom (A1): CT-50 by K.N. Crowder Mfg. Ltd. Heavy duty anodized extruded aluminum with closed cell sponge neoprene seal.

2.16 WEATHERSTRIPPING

- A. Finish: [Clear] [Dark bronze] anodized aluminum, unless indicated otherwise.
- B. Seal Types and Manufacturers:

No.	Type Description	Pemko	Reese	KN Crowder
W2	Rubber or vinyl bulb at jambs and head, and at meeting stiles of pairs	S88D	797B	

2.17 SILENCERS

- A. Ives, Glynn-Johnson.
- B. At metal frame of each hinged door that does not have seals scheduled.
- C. Three at single leaves and two at pairs.

2.18 NAMEPLATES

- A. Material: Plastic plate; 3 mm thick with beveled edges.
- B. Types and Manufacturers: Builders Brass Works, Trimco, and as follows:

N1	50 mm high black plate with 25 mm high white Helvetica medium letters in text noted in Door and Hardware Schedule
N2	Same as N1 with addition of barrier-free pictorial symbol

2.19 TEMPLATES

- A. Fabricate to template hardware applied to metal doors and frames.
- B. Ensure that required templates are furnished to the various manufacturers for fabrication purposes.
- C. Templates: Make available not more than 10 days after receipt of approved Hardware Schedule.

2.20 FIRE RATED DOORS

- A. Hardware for Fire Rated Doors: Underwriters Laboratories of Canada, Fire Protection Equipment List.

PART 3 EXECUTION

3.1 MANUFACTURER'S SERVICES

- A. Deliver permanent lock core to the site.
- B. Remove temporary construction cores and insert permanent cores.
- C. Inspect each lock set to ensure permanent cores are operating satisfactorily.
- D. Delivery to The City change and control keys for the permanent system.
- E. Return temporary construction cores to the manufacturer.
- F. Coordinate electrified hardware with security system provider. Coordinate electrified hardware with Division 26 Specification Section 28 05 01, Electronic Security Systems.
- G. Furnish manufacturer's representative for the following services at site or classroom as designated by The City, for minimum person-days listed below, travel time excluded:
 - 1. 2 person-days for installation assistance, inspection, and Manufacturer's Certificate of Proper Installation.
 - 2. 2 person-days for functional and performance testing.

END OF SECTION