

DETENTION SECURITY STEEL DOOR AND FRAME SPECIFICATIONS CSI BROADSCOPE SECTION 11190

INTRODUCTION

This document has been developed as a guide to assist professionals in the preparation of specification relating to the performance, design, manufacture and installation requirements for detention security steel door and frame products.

This specification has been prepared in accordance with the Construction Specification Institute's (CSI) and Construction Specifications Canada National Master Specification (CSC/NMS) recommended format; Part 1 - General, Part 2 - Products and Part 3 - Execution.

Products included in this specification meet or exceed the requirements of ANSI/NAAMM 863-90 performance criteria for Detention Security Hollow Metal Doors and Frames and the standards set by both the National Association of Architectural Metal Manufacturers – Hollow Metal Manufacturers Association division (NAAMM/HMMA) and the Canadian Steel Door Manufacturers Association (CSDMA).

Throughout the document notations under the heading "Spec Note" have been included in italics for the guidance of the specifier and should not appear in project specifications.

This is an "*all products*" specification and contains options not applicable to every project. It is therefore not intended to be duplicated verbatim, but to be selectively edited and compiled after due consideration of all factors relating to performance, application, function, regulatory and architectural requirements.

All dimensions referenced in this publication are nominal. Imperial (foot-pound) values are dominant, followed by the SI metric counter-part in parenthesis. Imperial and metric values may not be equal.

Steel door and frame products covered in this specification are intended for use in facilities such as jails, prisons, remand or detention centers, secured areas within hospitals, psychiatric institutions or courthouses where levels of medium, high or maximum detention security are required.

Separate Guide Specifications are also included in the Architectural Manual for Commercial Steel Doors and Frames - Section 08110 (TDS S01) and Stainless Steel Doors and Frames - Section 08130 (TDS S02).

"Short Form" specifications, covering individual Fleming door and frame series are included in the Technical Data Sheets (TDS) detailing each specific product. Refer to Sections "F" (Frame Product) and "D" (Doors).

Diskette and customized versions of this specification are available on request. Contact your local Authorized Fleming Distributor or Technical Services, Ajax for further information and/or assistance.

**DETENTION SECURITY STEEL DOOR AND FRAME SPECIFICATIONS
CSI BROADSCOPE SECTION 11190**

PART 1 - GENERAL

Spec Note Co-ordinate design and drawing requirements and Related Work of other Sections with the following publications: Fleming's "Fire Labeling Specifications".

1.1 WORK INCLUDED

Spec Note This specification covers only those products listed below. While detention security steel door and frame construction methods can be used to fabricate access panels, control room or guard enclosures, visitor booths or rooms, such products are not included in this specification.

Edit 1.1.2 to include NAAMM for US projects or CSDMA for Canadian projects

1. Products included within the scope of this Section shall be fabricated by a single manufacturer.
2. Manufacturer shall be a member in good standing of the *[National Association of Architectural Metal Manufacturers - Hollow Metal Manufacturers Association (NAAMM-HMMA) division] [Canadian Steel Door Manufacturers Association (CSDMA)]*.
3. Supply only of detention security steel frame products including frames, transom frames, sidelight and window assemblies with provision for glazed or paneled openings, fire labeled and non-labeled, as scheduled or detailed by the Architect.
4. Supply only of flush detention security steel doors, swing or sliding type, with provision for glazed, paneled or louvered openings, view ports, speaking devices, food passes, fire labeled and non-labeled, as scheduled or detailed by the Architect.
5. Supply only of detention security steel panels, similar in construction to detention security doors, with flush or rabbetted bottoms for detention security steel frames, transom frames, sidelight and window assemblies as scheduled or detailed by the Architect.

1.2 RELATED WORK

Spec Note "Related Work" details those products or services not supplied and/or installed under this Section. The Specifier should designate specific responsibility for each by including Section references for each item.

Exclude 1.2.5 - Food Passes and 1.2.6 - Speaking Devices, if not required.

Exclude 1.2.7 if speaking devices are not supplied by detention security door manufacturer.

Exclude 1.2.15 and 1.2.17 if door louvers or vents are supplied under this section.

Exclude 1.2.15 if frame louvers or vents are supplied under this section.

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|--|-------------|
| 1. Building-in and grouting detention security steel frame product into unit masonry | Section [] |
| 2. Building-in detention security steel frame product in previously placed concrete, masonry or structural steel | Section [] |
| 3. Building-in detention security steel frame product in steel or wood stud walls | Section [] |
| 4. Installation of detention security doors | Section [] |
| 5. Installation of food pass shutters | Section [] |
| 6. Supply of detention security speaking devices | Section [] |
| 7. Installation of detention security speaking devices | Section [] |
| 8. Supply and installation of commercial steel, stainless steel, wood, plastic or composite core doors | Section [] |
| 9. Supply and installation of commercial steel or stainless steel frame product | Section [] |
| 10. Supply and installation of builders', detention security or food pass hardware | Section [] |
| 11. Drilling and tapping for surface mounted, non-templated builders' or non-templated detention security hardware | Section [] |
| 12. Supply and installation of sliding door frame hoods | Section [] |
| 13. Caulking of joints between detention security frame product and other building components | Section [] |
| 14. Supply and installation of gaskets or weatherstrip | Section [] |
| 15. Supply of detention security louvers or vents | Section [] |
| 16. Installation of louvers or vents in detention security steel frame product | Section [] |
| 17. Installation of louvers or vents in detention security steel doors | Section [] |
| 18. Supply and installation of glazing materials | Section [] |
| 19. Site touch-up and painting | Section [] |
| 20. Wiring for electric or electronic hardware in detention security steel frame product | Section [] |

21. Wiring for electric or electronic hardware in detention security steel doors	Section []
22. Field Measurements	Section []
23. Insulation of perimeter members in exterior detention security steel frame product	Section []
24. Fasteners for frame product in previously place concrete, masonry or structural steel	Section []
25. Steel lintels, posts, columns or other load-bearing elements	Section []
26. Field welding	Section []

1.3 REQUIREMENTS OF REGULATORY AGENCIES

1. Install fire labeled detention security steel door and frame product in accordance with NFPA-80, current edition, unless specified otherwise.

1.4 REFERENCES

*Spec Note Exclude 1.4.9 through 1.4.11 on US projects
 Include 1.4.8, 9, 14 and 17 for US "traditional pressure" fire rated jurisdictions and Canadian projects only. (See "Spec Note" under 1.5 for additional information)
 Include 1.4.15, 16 and 18 for US "positive pressure" fire rated jurisdictions only. (See "Spec Note" under 1.5 for additional information)
 Include 1.4.16 and 1.4.19 on US projects only*

1.	ANSI/NAAMM 863-90	Guide Specifications for Detention Security Hollow Metal Doors and Frames, Third Edition
2.	ANSI A224.1-1990	Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames
3.	ASTM A653-97(M-97)	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
4.	ASTM A924-97(M-97)	Standard Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process
5.	ASTM B117-90	Method of Salt Spray (Fog) Testing
6.	ASTM C665-95	Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
7.	ASTM D1735-92	Practice for Testing Water Resistance of Coating Using Water Fog Apparatus
8.	ASTM E152-81a	Method for Fire Tests of Door Assemblies
9.	CAN4-S104-M80	Fire Tests of Door Assemblies
10.	CSA A101-M83	Mineral Fiber Thermal Insulation for Buildings
11.	CSA W59-89	Welded Steel Construction (Metal Arc Welding)
12.	ISO 9001 : 1994	Quality Systems – Model for Quality Assurance
13.	NFPA-80, 1995	Fire Doors and Windows
14.	NFPA-252, 1990	Fire Tests of Door Assemblies
15.	UBC 7-2, Part 1 (1997)	Fire Tests of Door Assemblies Under Positive Pressure
16.	UBC 7-2, Part 2 (1997)	Test for Smoke and Draft Control Door Assemblies
17.	UL10b, 8 th Edition	Fire Tests of Door Assemblies
18.	UL10c, 1 st Edition	Fire Tests of Door Assemblies Under Positive Pressure
19.	UL 1784	Air Leakage Tests of Door Assemblies
20.	Fleming Fire Labeling Specifications	
21.	Manufacturers Standard and Galvanized Sheet Gages	
22.	UL Building Materials Directory	
23.	ULC List of Equipment and Materials, Volume 2	
24.	WH Certification Listings	

*ANSI American National Standards Institute
 ASTM American Society for Testing Materials
 CSA Canadian Standards Association
 HMMA Hollow Metal Manufacturers Association
 ISO International Standards Organization
 NAAMM National Association of Architectural Metal Manufacturers
 NFPA National Fire Protection Association
 UBC Uniform Building Code
 UL Underwriters' Laboratories, Incorporated
 ULC Underwriters' Laboratories of Canada
 WH Warnock Hersey Professional Services*

1.5 TESTING AND PERFORMANCE

1. Products covered by this specification shall be tested by an independent, nationally recognized agency in strict conformance with the test methodology of ANSI/NAAMM 863-90, Section 1.06. Products shall meet each of the following NAAMM 863-90 performance criteria:
 1. Static Load Test - Under 14,000 lb (62,272N) load, maximum mid-span deflection shall not exceed 0.58" (14.7mm) and after release of load, deformation shall not exceed 0.10" (2.5mm).
 2. Rack Test - Under 7,500 lb (33,360N) corner load, maximum deflection shall not exceed 3.5" (88.9mm) and there shall be no buckling or failure of welds.
 3. Impact Load Test - After 400 impacts of 200 ft-lbs (271.2J) each on the door face, within 6" (150mm) of the lock bolt and 150 impacts within 6" (150mm) of each hinge, the door shall remain closed and locked, the assembly shall not be damaged to the extent that forcible egress can be obtained, the door shall be capable of being unlocked with the key and the door shall be operated to provide egress.
 4. Removable Glazing Stop Test - After 400 impacts of 200 ft-lbs (271.2J) each, the removable glass stops and steel plate shall remain firmly in place so that removal of the plate cannot be accomplished without removing the glazing screws and there shall be no more than one (1) broken glazing screw in the assembly.

Spec Note Builders hardware and glazing materials are available which meet detention security performance criteria but have not been evaluated from a fire protection standpoint. Co-ordination of hardware, glazing materials and other design elements, is therefore essential. A thorough review UL's "Building Materials Directory", ULC's "List of Equipment and Materials, Volume 2" and WH's "Certification Listings" should be made during the specification, scheduling and detailing process. In addition, the Architect should review Fleming's "Fire Labeling Specifications" publication to ensure profile, size and other design criteria desired are within the requirements of testing authorities. Inquiries relating to eligibility may be directed to Fleming's Technical Services Department.

Edit 1.5.2 to delete references to CAN4-S104 and ULC for US projects

Certain jurisdictions in the United States have adopted fire test standards that require the neutral pressure plane within the furnace to be located at 40" (1016mm) from the sill. This is referred to as "positive pressure" fire testing.

For projects in "positive pressure" jurisdictions, edit 1.5.2 to delete reference to UL10b/ASTM E 152/NFPA 252/CAN4-S104. Edit 1.5.2 for projects requiring "traditional" fire testing in the US and Canadian jurisdictions to delete references to UL10c and UBC 7-2.

As well, many jurisdictions throughout the US require door assemblies to be rated for "smoke and draft control" in addition to their "traditional" or "positive" pressure fire protection.

Edit 1.5.3 to delete references to UBC 7-2, Part 2 when smoke and draft control door assemblies under "traditional" fire protection are required. Delete 1.5.3 for Canadian projects.

Labels materials approved by UL, WHI and ULC include; metal drive riveted, adhesive-backed mylar or die-stamped (embossed) into the product. Label for doors under "positive pressure" list the various test standards they comply with. Smoke and draft control doors have an "S" in a box () included on the fire door label.

2. Fire labeled product shall be provided for those openings requiring fire protection ratings, as determined and scheduled by the Architect. Products shall be tested in strict conformance with [UL10(b)/ASTM E152/NFPA-252/CAN4-S104 for "traditional" pressure requirements] [UL10c/UBC 7-2, Part 1 for "positive pressure" requirements], listed by Underwriters' Laboratories, Underwriters Laboratories of Canada or Warnock Hersey under an active Factory Inspection Program and shall be constructed as detailed in Follow-Up Service Procedures issued to the manufacturer.
3. Smoke and draft control door assemblies shall be provided for those openings as determined and scheduled by the Architect. Doors shall be tested in strict accordance with UL 1784 [and UBC 7-2, Part 2]. Door assemblies shall be listed by Underwriters' Laboratories, Underwriters Laboratories of Canada or Warnock Hersey under active Factory Inspection Programs and shall be constructed as detailed in Follow-Up Service Procedures issued to the manufacturer.
4. Should any door or frame specified by the Architect to be fire rated, not qualify for labeling due to design, hardware, glazing or any other reason, the Architect shall be so advised before manufacturing commences.
5. Product shall be manufactured by a firm experienced in the design and production of detention security steel door and frame assemblies, the integration of security or electronic hardware and glazing materials and their impact on the scope of work.
6. Manufacturer shall be assessed and registered as meeting the requirements of Quality Systems under

ISO 9001.

7. Product quality shall meet standards set by the National Association of Architectural Metal Manufacturers (NAAMM)

1.6 TEST REPORTS

1. All alternates to this specification shall be submitted to the Architect for acceptance ten (10) days prior to bid date, complete with reports from independent, nationally recognized testing authorities, certifying that detention security steel door and frame assemblies furnished under this Section meet the acceptance criteria of ANSI/NAAMM 863-90, Section 1.06.
2. All reports shall include name of testing authority, date of test, location of test facility, descriptions of test specimens, procedures used in testing and indicate compliance with acceptance criteria of the test.

1.7 SUBMITTALS

1. Submit shop drawings in accordance with the General Conditions of the Contract.
2. Indicate each type of door, frame, steel, finish, core, material thickness, mortises, reinforcements, anchorages, locations of exposed fasteners, openings (glazed, paneled or louvered) and arrangement of standard builders' hardware.
3. Include a schedule identifying each unit, with door marks and numbers relating to the numbering in Architect's schedules or drawings.

1.8 WARRANTY

1. All detention security steel door and frame product shall be warranted from defects in workmanship for a period of one (1) year from date of shipment.

PART 2 - PRODUCTS

2.1 DOORS

2.1.1 Materials

Spec Note Nominal Gages referenced throughout this specification are summarized below, in accordance with National Gage Standard Tolerances.

Gage	10	12	14	16	18	20	22
Imperial	.138"	.105"	.075"	.060"	.048"	.036"	.030"
Metric (SI)	3.5mm	2.7mm	1.9mm	1.6mm	1.2mm	0.9mm	0.8mm

1. Steel:
Detention security doors shall be fabricated from tension leveled steel to ASTM A924-97(M-97), galvanized to ASTM A653-97(M-97), Commercial Steel (CS), coating designation A40 (ZF120), known commercially as paintable Galvanneal.

Spec Note Include 2.2 CSA reference in Canadian projects only

2. Doors Core:
Fiberglass - loose batt type, density 1.5 pcf (24kg/m³) minimum, conforming to ASTM C665 [and CSA A101-M83]
3. Adhesive:
Heat resistant, single component, polyurethane reactive (water) hot melt, thermoset adhesive UL/ULC/WH approved or equivalent.
4. Primer:
Rust inhibitive touch-up only.

2.1.2 Construction

Spec Note For maximum security applications specify S12 Series doors with 12 gage face sheets and 16 gage stiffeners. For medium or high security specify S14 Series doors with 14 gage face sheets and 18 gage stiffeners.

1. General:
 1. All detention security steel doors shall be as manufactured by Fleming.
 2. Doors shall be flush swing or sliding, of the types and sizes indicated on the Architects' schedules or drawings.
 3. Doors shall be 2" (50.8mm) thick.
 4. Exterior doors shall be Fleming [S12] [S14] Series with face sheets fabricated from [12] [14] gage steel.
 5. Interior doors shall be Fleming [S12] [S14] Series with face sheets fabricated from [12] [14] gage steel.
 6. Door faces shall be fabricated without visible seams, free of scale, pitting, coil brakes, buckles and waves.
 7. Formed edges shall be true and straight with a minimum radius for the thickness of steel used.
 8. Lock and hinge edges shall be beveled 1/8" in 2" (3mm in 50mm) unless security or builders' hardware dictate otherwise.
 9. Lock and hinge edges shall be continuously reinforced with 12 gage vertical formed steel stiffener, welded to the interior of both face sheets at 4" (100mm) on center maximum.
 10. Door shall be internally reinforced with [16] [18] gage continuous vertical top hat steel stiffeners spaced with interior webs no more than 4" (100mm) apart, welded to each face sheet at 6" (150mm) on center maximum. Top hat stiffeners shall be secured together with UL approved RRPC adhesive, welded at top and bottom and continuously each side, 12" (300mm) from each end.
 11. Voids between stiffeners shall be filled with 1.5 pcf (24kg/m³) density, loose batt type fiberglass material.
 12. Top and bottom of doors shall be reinforced with 12 gage continuous, inverted, steel end channels, welded to each face sheet at 3" (75mm) on center maximum and continuously welded to lock and hinge edge vertical formed steel stiffeners
 13. Top and bottom of door shall be reinforced with 12 gage continuous flush steel, non-removable channels, secured in place with 1" (25mm) welds at 3" (75mm) on center maximum and continuously welded to face sheets at bevels.
 14. Unless ineligible due to design, size, hardware or glazing specified on the Architects' or Hardware Suppliers' schedules or details, fire labeled doors shall be provided for those openings requiring fire protection ratings as determined and scheduled by the Architect.

2. Hardware Preparations:

1. Doors shall be factory blanked, reinforced, drilled and tapped for fully templated mortised hardware only, in accordance with the final approved schedule and templates provided by the hardware supplier.
2. Doors shall be factory blanked and reinforced only for mortised hardware that is not fully templated.
3. Doors shall be factory reinforced only for surface mounted hardware.
4. Templated holes .5" (12.7mm) diameter and larger shall be factory prepared, except mounting and through bolt holes, which shall be by the contractor responsible for installation, on site at the time of application. Templated holes less than .5" (12.7mm) diameter shall be factory prepared only when required for the function of the device (for knobs, levers, cylinders, thumb or turn pieces) or when these holes over-lap function holes.
5. Drilling and tapping for surface mounted hardware or mortised hardware that is not fully templated shall be by the contractor responsible for installation, on site at the time of application.
6. Hardware reinforcement gage or thickness shall be in accordance with the hardware manufacturers' templates but shall not be less than 10 gage for hinges or pivots, locking devices, concealed closers or holders, nor less than 12 gage for surface applied devices.
7. Doors shall be prepared for 4.5" (11.43mm) heavy weight (.180"/4.6mm) hinges minimum.
8. All pairs of fire labeled doors shall be provided with 12 gage steel surface mounted flat bar astragal, shipped loose for application on site by the contractor responsible for installation.

Spec Note Edit 2.1.2.2.0 to include UL for US projects or CSA for Canadian projects

9. Where electrically or electronically operated hardware is specified on the Architects' schedules or details or the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on the templates, shall be provided and inter-connected with [UL] [CSA] Approved .5" (12.7mm) diameter conduit and connectors.
10. Access plates or covers, the same thickness as the door to which they are connected, fastened with a minimum of four (4) #8-32 tamper resistant machine screws at 6" (150mm) on center maximum. shall be provided where specified on the Architects' schedules or details or the final approved schedule or templates provided by the hardware supplier.

3. Glazing:

1. Where indicated on the Architects' schedules or details, doors shall be prepared for glazing materials of the specified types, sizes and thickness.
2. Glazed openings shall be reinforced with 12 gage formed "Z" stiffeners welded to each face sheet at 5" (125mm) on center maximum and in each corner. "Z" stiffeners shall form an integral, permanent glazing stop with a minimum height of .75" (19mm) for non-security glazing, 1" (25mm) minimum height for security glazing. Integral stop shall be located on the secure side of the door, as designated by the Architect.

*Spec Note Include 3.3 when security glazing materials are specified. Include "Z" type stops for glazing materials .75" (19mm) and thicker. "Angle" type stops are utilized for glazing materials less than .75" (19mm) thick.
Include 3.4 when non-security glazing materials are required.*

3. Where security glazing materials are specified, removable 12 gage formed steel ["Z"] [angle] stops shall be provided. Corners shall be fully welded forming a one (1) piece frame. Frame shall be secured with ¼ - 20 button head, tamper resistant machine screws at 6" (150mm) on center maximum, two (2) per stop minimum. Minimum stop height shall be 1" (25mm).
4. Where non-security glazing materials are specified, removable 14 gage steel channel stops shall be provided. Corners shall be tightly fitted, with butted corners. Stops shall be secured with #8-32 counter-sunk, tamper resistant machine screws at 9" (230mm) on center maximum, two (2) per stop minimum. Minimum stop height shall be .75" (19mm).

Spec Note Include Section 2.1.2.4 - View Ports, only if appropriate to the project.

4. View Ports:

1. Where indicated on the Architects' schedules or details, doors shall be constructed with integral operable view ports, installed over glazed openings.
2. View port shutter shall be 12 gage steel plate with all edges and corners rounded and finished smooth.
3. Shutter shall be provided with two (2) 14 gage formed steel angle finger grips welded securely to the shutter face.
4. Shutter shall operate freely in 12 gage steel horizontal tracks with integral solid steel stops at each end.
5. Shutter and track shall be fabricated and installed to completely cover and expose the glazed opening when operated.
6. Tracks shall be securely mounted on the non-inmate side of the door with #12-24 tamper resistant, counter-sunk machine screws at 6" (150mm) on center maximum.

Spec Note Include Section 2.1.2.5 – Louvers, only if appropriate to the project.

5. Louvers:

1. Where indicated on the Architects' schedules or details, doors shall be constructed with integral louvers of the sizes specified.
2. Perimeter of louver opening shall be closed and reinforced with 12 gage formed steel inverted channels, continuously welded to each face sheet and ground smooth.
3. Louver blades shall be 12 gage steel inverted "V" type. Blades shall be spaced so that a flat rigid object cannot be passed through them.
4. Louvers exceeding 18" (450mm) in width shall be reinforced at their mid-point with a vertical .25" x 1.5" (6.4mm x 38.1mm) steel flat bar, welded securely to the horizontal perimeter reinforcing channels.
5. Blades shall be tightly fitted and securely welded to each vertical louver reinforcing component.

*Spec Note Include Section 2.1.2.6 - Speaking Devices, only if appropriate to the project.
Speaking devices can be fabricated by the door manufacturer as an integral part of the door skins or can be a manufactured specialty which the door is prepared to receive. Include "constructed with" in 2.1.2.6.1, "pattern" in 2.1.2.6.3 and Sections 2.1.2.6.2 and 2.1.2.6.4 when the speaking device is an integral part of the skins. Include "prepared for" in 2.1.2.6.1, "device" in 2.1.2.6.3 and delete Sections 2.1.2.6.2 and 2.1.2.6.4 when a manufactured specialty, provided by others, is specified.*

6. Speaking Devices:

1. Where indicated on the Architects' schedules or details, doors shall be [constructed with integral] [prepared for] speaking devices of the types and sizes specified.

2. Each face sheet of doors with speaking devices shall contain punched .25" (6.4mm) maximum diameter holes, spaced 1" (25mm) on center vertically and horizontally, in a rectangular pattern measuring 4" (100mm) in width and 1" (25mm) in height. Holes in each face sheet shall be aligned.
3. Perimeter of [pattern] [device] shall be reinforced with 12 gage formed inverted steel channels welded to each face sheet at 2" (50mm) on center maximum.
4. Provide 14 gage formed steel baffles between channels and locate so that no object can be passed through.

Spec Note Include Section 2.1.2.7 – Food Passes, only if appropriate to the project.

7. Food Passes:
 1. Where indicated on the Architects' schedules or details, doors shall be constructed with provision for operable food passes.
 2. Clear opening shall measure 12" (300mm) in width and 4.5" (115mm) in height minimum.
 3. Perimeter of opening shall be closed and reinforced with 10 gage continuous steel inverted channel, fully welded to each face sheet and ground smooth.
 4. Food pass shutter shall be fabricated from 10 gage steel plate, located on the non-inmate side of the door.
 5. Door and shutter shall be reinforced and prepared to accept specified mounting and locking security hardware.
 6. Pass shutter shall not be shop applied. Application to door shall be by the contractor responsible for installation, on site.
8. Finishing:
 1. Remove weld slag and spatter from exposed surfaces.
 2. All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth and uniform surfaces.
 3. On exposed surfaces where zinc has been removed during fabrication, doors shall receive a factory applied touch-up primer.
 4. Primer shall be fully cured prior to shipment.

2.2 PANELS

1. Panels shall be fabricated from the same materials, construction and finished in the same manner as doors as specified in Section 2.1.

2.3 FRAME PRODUCT

Spec Note "Frame Product" includes detention security steel frames, transom frames, sidelight and window assemblies.

2.3.1 Materials

1. Steel:
Detention security frame product shall be fabricated from tension leveled steel to ASTM A924-97(M-97), galvanized to ASTM A653-97(M-97), Commercial Steel (CS), coating designation A40 (ZF120), known commercially as paintable Galvanneal.
2. Primer:
Rust inhibitive touch-up only.
3. Door Silencers:
GJ-64 or equivalent, Single Stud rubber/neoprene type

2.3.2 Construction

1. General:
 1. All detention security steel frame product shall be as manufactured by Fleming of the types, sizes and profiles indicated on the Architects' schedules or details.
 2. Frame product shall be Fleming SF-12 Series, fabricated from 12 gage steel.
 3. Jambs, heads, mullions, sills and center rails shall be straight and uniform throughout their lengths.
 4. Frame product shall be assembled square, free of defects, warps or buckles.
 5. Corner joint faces shall be accurately mitered and tightly fitted with integral stops mitered or butted, continuously welded on the inside of the profile.
 6. Joints at mullions, sills or center rails shall be coped accurately, butted at corners and tightly fitted, with faces and soffits fully welded.

7. Exposed faces shall be filled and sanded to present a smooth, uniform surface.
8. Frame product shall be fabricated with integral stops having a minimum height of .625" (19mm).

Spec Note Cut-off stops (sanitary bases) should not be utilized on exterior or gasketed frame product.

9. Cut-off stops (sanitary bases) where indicated on the Architects' schedules or details shall be capped at 30°, terminating at the specified height. Joints below cut-off stop shall be fully welded and ground smooth with no visible seams.
 10. Insulation of open sections (jambs, heads and sills) shall be provided and installed by the contractor responsible for installation.
 11. Where required due to site access, as indicated on the Architects' schedules or details, when advised by the contractor responsible for co-ordination or installation, or when shipping limitations so dictate, frame product shall be fabricated in sections for splicing in the field.
 12. Field spliced jambs, heads and sills shall be provided with 12 gage steel splice plates securely welded into one section, extending 4" (100mm) minimum each side of splice joint.
 13. Field splices at closed sections (mullions or center rails) shall be 12 gage steel splice angles securely welded to the abutting member. Face of splice angle shall extend 4" (100mm) minimum into closed sections when assembled.
 14. Field splice joints shall be fully welded, filled and ground to present a smooth uniform surface after assembly by the contractor responsible for installation.
 15. Each door opening shall be provided with two (2) temporary steel jamb spreaders welded to the base of the jambs or mullions to maintain proper alignment during shipping and handling. Spreaders shall be removed by the contractor responsible for installation prior to anchoring of frame product to floor.
 16. Each door opening shall be prepared for GJ-64 or equivalent, single stud door silencers, three (3) for single door openings, two (2) for double door openings. Silencers shall be shipped loose for installation by the contractor.
 17. Unless ineligibile due to design, size, hardware or glazing specified on the Architects' or Hardware Suppliers' schedules or details, fire labeled frame product shall be provided for those openings requiring fire protection ratings as determined and scheduled by the Architect.
2. Hardware Preparations:
1. Frame product shall be blanked, reinforced, drilled and tapped for fully templated mortised hardware only, in accordance with the final approved schedule and templates provided by the hardware supplier.
 2. Frame product shall be factory blanked and reinforced only for mortised hardware that is not fully templated.
 3. Frame product shall be reinforced only for surface mounted hardware.
 4. Drilling and tapping for surface mounted hardware or mortised hardware that is not fully templated shall be by the contractor responsible for installation, on site at the time of application.
 5. Hardware reinforcement gage or thickness shall be in accordance with the hardware manufacturers' templates, but shall not be less than 10 gage for hinges, pivots, strikes, locking devices, concealed closers and holders, nor less than 12 gage for surface applied devices.
 6. Mortised cutouts shall be protected with 22 gage steel minimum guard boxes where frame product is installed in masonry or concrete openings.

Spec Note Edit 2.3.2.2.7 to include UL for US projects or CSA for Canadian projects

7. Where electrically or electronically operated hardware is specified on the Architects' schedules or details or the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on the templates, shall be provided and inter-connected with [UL] [CSA] Approved .5" (12.7mm) diameter conduit and connectors.
 8. Access plates or covers of 12 gage steel, fastened with a minimum of four (4) #8-32 tamper resistant machine screws at 6" (150mm) on center shall be provided where specified on the Architect's schedules or details or the templates provided by the hardware supplier.
3. Anchorage:
1. Frame product shall be provided with anchorage appropriate to floor, wall and frame construction.
 2. Frame product set in unit masonry shall be provided with 12 gage corrugated T-Strap type steel anchors. Anchor shall be designed to fill the inside of the jamb profile. Wall strap portion shall be 2" x 10" (50mm x 250mm) minimum. Frames up to 4'8" (1425mm) height shall be provided with two (2) anchors per jamb, plus one (1) for each additional 18" (450mm) of frame height or fraction thereof.
 3. Where frame product is installed prior to construction of the adjacent wall, each jamb shall be

- provided with 12 gage steel floor anchors. Each anchor shall be provided with two (2) holes for mounting to the floor and shall be securely welded to the inside of the jamb profile
4. Jamb of frames in previously placed concrete, masonry or structural steel shall be punched and dimpled to accept, .375" (9.5mm) diameter machine bolt anchors. Preparations shall be located not more than 6" (150mm) from the top and bottom of each jamb with intermediate preparations at 18" (450mm) on center maximum. Each preparation shall be reinforced with 12 gage steel channel and strap type guides, securely welded to the inside of the jamb profile.
 5. Anchor bolts and expansion shell anchors for the above preparations shall be provided by the contractor responsible for installation. After sufficient tightening of the anchor bolt, the head shall be welded and ground smooth so as to provide a non-removable application. Welded bolt and dimple shall be filled and ground to present a smooth uniform surface by the contractor responsible for installation.
 6. Where indicated on the Architects' schedules or details, channel extensions shall be provided from the top of the frame assembly to the underside of the structure above. Extensions shall be fabricated from 12 gage steel formed channel, mounting angles welded to inside of frame head and adjusting brackets. Formed channels, adjusting brackets, and fasteners shall be shipped loose. Channels shall be mechanically connected to mounting angles and adjusting brackets with supplied fasteners on site by contractor responsible for installation.
4. Glazed Openings:
1. Where indicated on the Architect's schedules or details, frame product shall be prepared for glazing materials of the types, sizes and thickness specified.
 2. Glazed openings shall be provided with continuous 12 gage steel reinforcements welded to the inside of the profile at 12" (300mm) on center maximum.
- Spec Note Include 4.3 when security glazing materials are specified. Include "Z" type stops for glazing materials .75" and thicker. "Angle" type stops are utilized for glazing materials less than .75" thick.*
Where non-security type glazing materials are specified, include 4.4
3. Where security glazing materials are specified, removable 12 gage formed steel ["Z"] [angle] stops shall be provided. Corners shall be fully welded forming a one (1) piece frame. Frame shall be secured with 1/4-20 round head, tamper resistant machine screws at 8" (200mm) on center maximum, two (2) per stop minimum. Minimum stop height shall be 1" (25mm).
 4. Where non-security glazing materials are specified, removable 14 gage steel channel stops shall be provided. Corners shall be tightly fitted with butted corners. Stops shall be secured with 12-24 counter-sunk, tamper resistant machine screws at 8" (200mm) on center maximum, two (2) per stop minimum. Minimum stop height shall be .75" (19mm).
 5. Provision shall be made to protect glazing screws and tapped reinforcements where frame members are grouted.
5. Finishing:
1. Remove weld slag and spatter from exposed surfaces.
 2. All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth uniform surfaces.
 3. On exposed surfaces where zinc has been removed during fabrication, frame product shall receive a factory applied touch-up only.
 4. Primer shall be fully cured prior to shipment.

2.4 SIZES AND TOLERANCES

1. Widths of door openings shall be measured from inside of frame jamb rebates with a tolerance of + .063", - .031" (+1.6mm, - 0.8mm).

Spec Note Finished floor is defined as the top surface of the floor, except when resilient tile or carpet is used, when it is to the top of the concrete slab.

2. Heights of door openings shall be measured from the finished floor (exclusive of floor coverings) to the head rebate of the frame with a tolerance of $\pm .047$ " (1.2mm).
3. Unless builders' hardware dictates otherwise, doors shall be sized so as to fit the above openings and allow a .125" (3mm) clearance at jambs and head. A clearance of .75" (19mm) between the bottom of the door and the finished floor (exclusive of floor coverings) shall be provided. Tolerances on door sizes shall be $\pm .047$ " (1.2mm).
4. Manufacturing tolerances on formed frame profiles shall be $\pm .031$ " (0.8mm) for faces, stop heights

and jamb depths. Tolerances for throat openings and door rebates shall be ± 0.063 " (1.6mm) and ± 0.016 " (0.4mm) respectively. Hardware cutout dimensions shall be as per template dimensions, $+0.015$ " (0.4mm), - 0.

2.5 HARDWARE LOCATIONS

1. Hardware preparations in frame product shall be as noted below and locations on doors shall be adjusted for clearances specified in Section 2.4.
2. Top of upper hinge preparation for 4.5" (114.3mm) hinges shall be located 7.5" (180mm) down from head, transom mullion or panel as appropriate. The top of the bottom hinge preparation for 4.5" (114.3mm) hinges shall be located 12.625" (310mm) from finished floor as defined in 2.4. Intermediate hinge preparations shall be spaced equally between top and bottom cutouts.

Spec Note Finished floor is defined as the top surface of the floor, except when resilient tile or carpet is used, when it is to the top of the concrete slab.

3. Strike preparation for unit, integral, cylindrical and mortise locks and roller latches shall be centered 40-5/16" (1033mm) from finished floor. Strikes for deadlocks shall be centered at 48" (1220mm) from finished floor. Strikes for panic and fire exit hardware shall be located as per the device manufacturers' templates.
4. Push and/or pulls on doors shall be centered 42" (1070mm) from finished floor.
5. Preparations not noted above shall be as per hardware manufacturers' templates.
6. Hardware preparation tolerances shall comply with the ANSI A115 Series standards.

PART 3 - EXECUTION

3.1 SITE STORAGE AND PROTECTION OF MATERIALS

1. The contractor responsible for installation shall remove wraps or covers from door and frame product upon delivery at building site.
2. All materials shall be thoroughly inspected upon receipt and all discrepancies, deficiencies and/or damages shall be immediately reported in writing to the supplier. All damages shall be noted on the carriers' Bill of Lading.
3. Contractor responsible for installation shall ensure all materials are properly stored on planks or dunnage in a dry location. Product shall be stored in a vertical position, spaced with blocking to permit air circulation between them. Materials shall be covered to protect them from damage from any cause.
4. Contractor shall notify the supplier in writing of any errors or deficiencies in the product before initiating and corrective work.

3.02 INSTALLATION

Spec Note Installation of product covered by this Specification is not the responsibility of the manufacturer. This Section is included to provide guidance to the Contractor responsible for installation.

1. Set frame product plumb, square, aligned, without twist at correct elevation.
2. Frame Product Installation Tolerances:
 1. Plumbness tolerance, measured through a line from the intersecting corner of vertical members and the head to the floor, shall be $\pm .063$ " (1.6mm).
 2. Squareness tolerance, measured through a line 90° from one jamb at the upper corner of the product, to the opposite jamb, shall be $\pm .063$ " (1.6mm).
 3. Alignment tolerance, measured on jambs, through a horizontal line parallel to the plane of the wall, shall be $\pm .063$ " (1.6mm).
 4. Twist tolerance, measured at face corners of jambs, on parallel lines perpendicular to the plane of the wall, shall be $\pm .063$ " (1.6mm).
3. Fire labeled product shall be installed in accordance with NFPA-80.
4. Brace frame product rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install wood spreaders at mid-point of frame rebate height to maintain frame widths.
5. Provide vertical support at center of head for openings exceeding 48" (1250mm) in width.
6. Remove wood spreaders after product has been built-in.
7. Secure anchorages and connections to adjacent construction.
8. Frame product in unit masonry shall be fully grouted in place.
9. Install doors, maintaining clearances outlined in Section 2.4.

10. Install builders' and security hardware in accordance with manufacturers' templates and instructions.
11. Install louvers and vents.
12. Adjust operable parts for correct clearances and function.
13. Steel surfaces shall be kept free of grout, tar or other bonding materials or sealers.
14. Any grout or other bonding material shall be cleaned from products immediately following installation.
15. Prior to site touch-up, exposed surfaces of galvanized steel to be finish painted with latex paints shall be cleaned with soap and water to remove foreign matter. When alkyd finish paints are specified, turpentine or paint thinners shall be used. Refer to paint manufacturers recommendations for additional information.
16. Exposed field welds shall be finished to present a smooth uniform surface and shall be touched-up with a rust inhibitive primer.
17. Exposed surfaces which have been scratched or otherwise marred during installation or handling shall touched-up with a rust inhibitive primer.
18. Finish paint in accordance with Section 09900.
19. Install glazing materials and door silencers.

- END OF SECTION -