This manual was developed by representative members of the Hollow Metal Manufacturers Association Division (HMMA) of the National Association of Architectural Metal Manufacturers (NAAMM) to provide information and guidance on the installation and storage of hollow metal doors and frames. This manual contains advisory information only and is published as a public service by NAAMM and its HMMA Division.

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HOLLOW METAL FRAMES

The primary function of the door frame is to provide support for the door and the components required for proper operation of the opening. Hollow metal frames serve other aesthetic or functional purposes, such as trimming a wall opening having no door, or enclosing glazed areas that provide through-wall visibility or admitting light and/or air. Hollow metal frames, which are strong, sturdy and durable, serve all such functions economically. Custom hollow metal frames are available in a broad array of configurations. Illustrated below are some of the more common and representative types, and on the following pages are shown the typical details of frame construction and assembly.
Panels may be used in lieu of glazing at sidelight frames.

SIDELIGHT FRAMES

SIDELIGHT FRAMES WITH TRANSOMS
Any face profile may be combined with any backbend profile.

**FRAME PROFILE NOMENCLATURE**

1. **return**
2. **back bend**
3. **nail flange**
4. **reveal flange**
5. **reveal flange with return**
6. **plaster return**
7. **hemmed return**
8. **STOP**
9. **RETURN**
10. **THROAT**
11. **JAMB DEPTH**
12. **FACE**
13. **SOFFIT**
14. **RABBET**
15. **SINGLE RABBET**

**DOUBLE RABBET**

See optional profiles below

**OTHER DESIGNS AVAILABLE**

Two piece slip-on frame

**REPRESENTATIVE FRAME PROFILES**
HORIZONTAL FRAME DIMENSIONS

ROUGH OPENING WIDTH
(overall frame width + 1/2")

DOOR OPENING WIDTH

VERTICAL FRAME DIMENSIONS
For information on undercuts see
HMMA-810 TN01-03 "Defining Undercuts"

FACE VIEW
BACKSIDE VIEW

HINGE PREPARATION

STRIKE PREPARATION

FRAME ASSEMBLY

TEMPORARY SPREADER
(remove prior to installation)

HEAD

CLOSER REINFORCEMENT
(if closer used)

HINGE JAMB
STRIKE JAMB

HINGE CUTOUT & REINFORCEMENT

STRIKE CUTOUT & REINFORCEMENT

Floor Anchor

Floor Covering

Floor / Finish Floor

Reinforcement
For information about the choice of anchor type see HMMA 840, "Installation and Storage of Hollow Metal Doors and Frames".

**COMMON TYPES OF JAMB ANCHORS.**

**OTHER TYPES ARE AVAILABLE.**

- **STRAP & STIRRUP (MASONRY)**
- **T-STRAP (MASONRY)**
- **WIRE (MASONRY)**
- **WOOD STUD TWO PIECE**
- **DOUBLE EGRESS WOOD STUD TWO PIECE**
- **POUR IN PLACE (CEMENT)**
- **FLOOR ANCHOR**
- **ADJUSTABLE FLOOR ANCHOR**
- **COMPRESSION ANCHOR FOR SLIP-ON DRYWALL FRAMES**
- **FLOOR ANCHOR FOR SLIP-ON DRYWALL FRAMES**
- **EXISTING WALL ANCHORS**
May be used with either cutoff or full length stops

Fixed Mullion Anchor
Design may vary by manufacturer

Stainless steel wrap-around covering

Stainless steel same thickness as frame and flush with all jamb surfaces

Floor Stilt
Terrazzo or other base mtl.

Spats

Head
Anchor

Plinth

Head Reinforcements

Fixed Mullion Anchor

Head Adapter
For frames extending from slab to slab

Head Reinforcements

Sound Control Frame

Lead-Lined Frame

Cutoff (Sanitary) Stops
6” maximum height at fire rated openings

Channel

Angle

Head Reinforcements

Sound Control Frame

Lead-Lined Frame

Cutoff (Sanitary) Stops
6” maximum height at fire rated openings
KEY ELEVATIONS

TYPICAL HEAD SECTIONS
"A"

ALTERNATIVE HEAD SECTION

TYPICAL JAMB SECTIONS
"B"

"C"
JAMB SECTION FOR POCKET PIVOT OR SWING CLEAR HINGE APPLICATIONS,

DETAILS FOR DOUBLE EGRESS FRAME
METHODS OF JOINING FACES OF UNEQUAL WIDTHS

MACHINE-MITERED, CONTINUOUS WELD

All exposed welds ground and finished smooth

SAW-MITERED OR "FULL MITERED" (METHOD C)

METHODS OF JOINING FACES OF UNEQUAL WIDTHS

OTHER METHODS ALSO USED - SYSTEMS VARY WITH MANUFACTURER
TRANSOM PANEL FRAMES WITHOUT TRANSOM BARS

KEY ELEVATION
ALTERNATIVES - SECTION A - HOLLOW METAL PANELS

HOLLOW METAL DOORS
ALTERNATIVES - SECTION B

FIELD SPLICES FOR LARGE MULTI-OPENING FRAMES

ANCHORING AND ATTACHING REMOVABLE MULLIONS VARIES PER MANUFACTURER

TYPICAL DETAILS FOR FRAME PRODUCT
Butted and face-welded assembly joints

All welds ground and finished smooth

For more information on welding see Appendix B, HMMA-820 TN02, Continuously Welded Frames

Note: See page 9 for details F, G and H, I.
SIDELIGHT FRAME ELEVATION WITH REPRESENTATIVE DETAILS

OPTIONALIndented MULLION AND SILL SECTIONS @ 4A, 4B AND 5A

Glazing material shown door side, glazing material can be installed on opposite side

Note: Minimum indent is 1/8 in., maximum is governed by rabbet depth, glass thickness etc.
SEGMENTED Sidelight / Borrowed Light Frame
With Corner Mullion Posts

Corner Mullion Sections

A

B

C

1 2 3 4
Grouting Hollow Metal Frames

Grout, when used in accordance with industry guidelines, can improve frame durability, sound deadening, and, depending on wall construction, increase frame anchorage strength. Grouting of the frame does not increase door durability, nor is it required for fire-rated frames. For most commercial applications, grouting of mullions and other closed sections is not recommended.


Grout is a water-based product. If not used properly, it can destroy the opening in a very short time. Grout can be either “mortar”, which is a masonry mixture of lime, cement, sand, and water, or “plaster”, which is a gypsum-based product.

Plaster grout dries by exposure to air. When a frame member is filled solid with plaster grout, only those areas exposed to air will dry and harden, while the center remains wet (uncured). The water remaining in the plaster grout can rust the frame from the inside. Plaster grout should not be used.

Mortar grout cures by chemical reaction and hardens throughout. Use mortar grout.

Frames are not designed to act as forms for grout. Grout must have a maximum 4 in. slump and be hand troweled in place. Bracing of the frame may be necessary prior to grouting to prevent sagging of the header or bowing of the jamb due to weight or pressure of the grout. Grout should not be installed after gypsum wallboard is installed, as the liquid within the grout will deteriorate the wallboard.

When dictated by temperatures, anti-freezing agents for mortar may be recommended by specifications. These agents can adversely affect metal, and all surfaces in contact with the grout must be coated with a corrosion resistant material.

It is recommended that the contractor be responsible for the grouting and for any required barrier coating. It is also his responsibility to use care in the application of the grout.
Continuously Welded Frames

Also called Full, Fully and or Full Profile Welded.

Established definitions and nomenclature:

1. FRAME MEMBER – A part of a frame such as a head, jamb, mullion or sill, also called frame profile, see Figure #1.

   ![Figure #1](image1)

   **Figure #1**

2. FRAME ELEMENTS – Specific parts of a frame member such as soffit, stop, rabbet, face and return. See Figure #2. A double rabbeted frame shown for illustration purposes only; alternate designs use the same nomenclature.

   ![Figure #2](image2)

3. PERIMETER JOINT – The intersection of two or more frame members or elements that are accessible through the throat or from the unexposed side of the frame member. As perimeter applies, this is the outside boundary of the frame.

   Perimeter joints of a continuously welded frame shall have all elements of the frame member continuously welded; soffits, stops, rabbets, faces and returns. Faces and returns may be welded either internally or externally. Soffits, stops, and rabbets shall be welded internally. Figures #3A – #3D illustrates typical perimeter joints; Figure #3A illustrates a saw and punched mitered corner joint.

   ![Figure #3A](image3a)

SEQ: 14
With many frame configurations the frame perimeter may not be square or rectangular, permitting a mitered corner. Figures #3B – #3D illustrate butted flush perimeter joints.

Figure #3B illustrates a typical sidelight frame where the sidelight does not extend to the floor.

Figure #3C illustrates a sidelight frame where the sidelight extends to the floor.

Figure #3D illustrates a sidelight or smokescreen, where the vertical mullion is designed to extend to the floor.

Occasionally the sill, as with other frame members, is intended to be indented. As this is a perimeter joint, all elements of the frame members should be continuously welded, but due to design and/or construction requirements this is not feasible. Therefore, it is necessary to alter construction methods.

Figure #4A illustrates an indented sill that is continuously welded.
Figure #4B, although drawn similar to Figure #4A, illustrates an indented sill that is reinforced with angles at the faces in lieu of continuously welding. These angles run the full height of the joint and are welded to both frame members. The rabbets, stops and soffit are continuously welded.

Internal flush joints shall be face welded only. Joints at soffits, stops and rabbets are not welded and appear as a hairline seam. Figures #5A, #5B and #5C all illustrate internal joints. Note at Figures #5A & #5B that the internal frame member is not accessible from the inside throat of the perimeter frame member. This is the same situation whether it be a mullion and header, two mullions, or mullion and sill as shown in Figure #5C. At Figure #5C the etched line represents where the face joint would be welded. This, of course, would be finished smooth.

Figure #4B

Referring to Figure #3D, if this same horizontal frame member is not accessible through the throat or from the unexposed side of the frame member then this would be considered an internal joint, see Figure #5A.

Figure #5A

Figure #5B

Figure #5A

Figure #5B

Figure #5C
Indented joints at internal frame members shall be internally reinforced and welded. Joints at faces, soffits, stops and rabbets are not welded and appear as hair line seams. Mullions are constructed with an overlapping seam. This seam is internally connected and appears as a hairline seam. See Figure #6.
RECOMMENDED GUIDE SPECIFICATIONS FOR HMMA HOLLOW METAL DOORS AND FRAMES

HMMA 860 — Hollow Metal Door and Frames

ANSI/NAAMM
HMMA 861 — Commercial Hollow Metal Doors and Frames

ANSI/NAAMM
HMMA 862 — Commercial Security Hollow Metal Doors and Frames

ANSI/NAAMM
HMMA 863 — Detention Security Hollow Metal Doors and Frames

ANSI/NAAMM
HMMA 865 — Swinging Sound Control Hollow Metal Doors and Frames

ANSI/NAAMM
HMMA 866 — Stainless Steel Hollow Metal Doors and Frames

ANSI/NAAMM
HMMA 867 — Commercial Laminated Core Hollow Metal Doors and Frames