

Recommended Selection and Usage Guide for Standard Steel Doors, Frames and Accessories

- A. Recommended Standard Steel Door Frame Details**
- B. Recommended Standard Details for Dutch Doors**
- C. Recommended Louver Details for Standard Steel Doors**
- D. Recommended Door, Frame and Hardware Schedule for Standard Steel Doors and Frames**
- E. Recommended Guidelines for the Use of Gasketing and Thresholds for Standard Steel Doors and Frames**
- F. Recommended Existing Wall Anchors for Standard Steel Doors and Frames**
- G. Recommended Standard Preparation for Double Type (Interconnected) Locks on Standard Steel Doors and Frames**
- H. High Frequency Hinge Preparations for Frames**



SDI-111

The information that follows represents the Standard Steel Door and Frame Industry's considered views on a number of details normally encountered in building plans and specifications. The SDI recommends that they be followed except when very unusual details necessitate special drawings. The enclosed may be used as a reference document or added directly to the job drawings.

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- B. Recommended Standard Details for Dutch Doors**
- C. Recommended Louver Details for Standard Steel Doors**
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- G. Recommended Standard Preparation for Double Type (Interconnected) Locks on Standard Steel Doors and Frames**
- H. High Frequency Hinge Preparations for Frames**

Recommended
**Standard Steel Door
Frame Details**



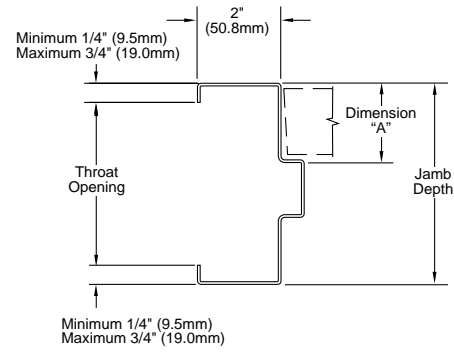
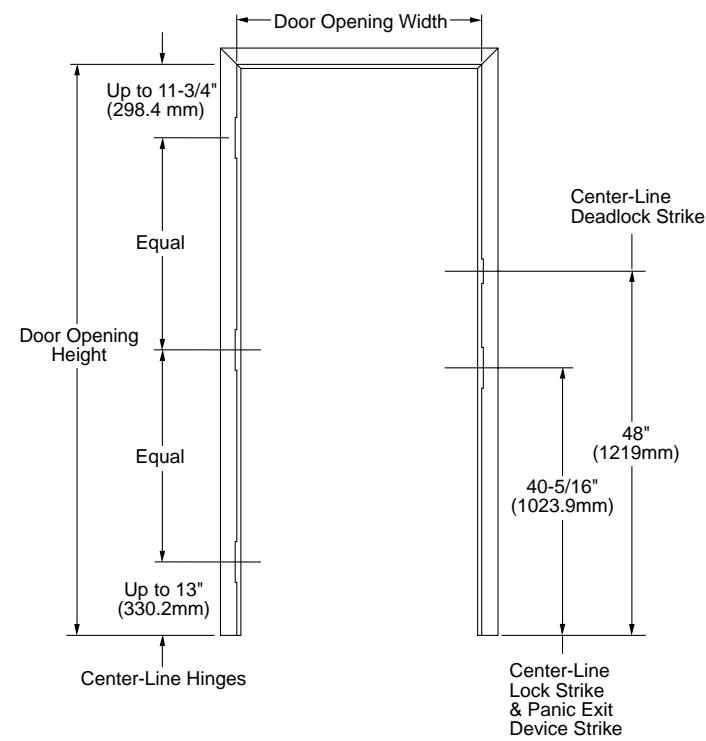
STEEL DOOR INSTITUTE

30200 DETROIT ROAD - CLEVELAND, OHIO 44145

STANDARD FRAME DETAILS

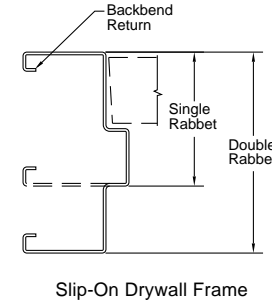
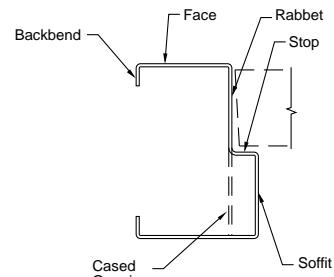
Standard Profiles

Hardware Locations



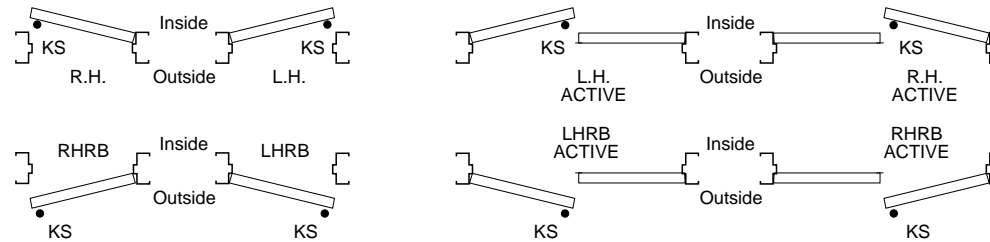
Double Rabet Frame

Door Thk.	Dim. "A"
1-3/8" (38.9mm)	1-9/16" (39.6mm)
1-3/4" (44.4mm)	1-15/16" (49.2mm)



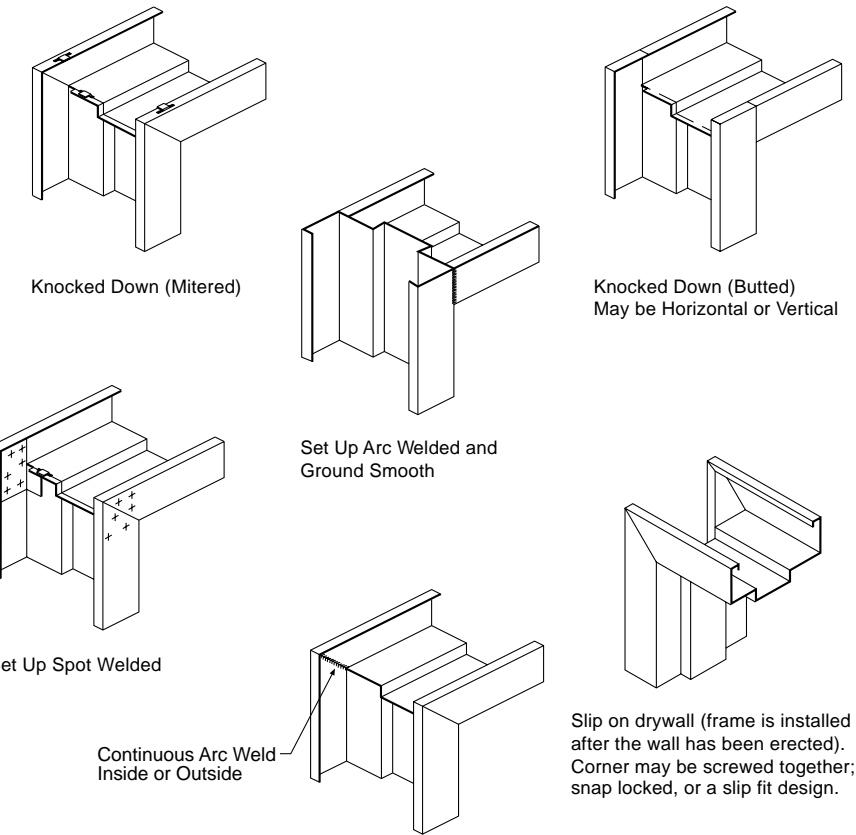
Single Rabet Frame

Handing Chart



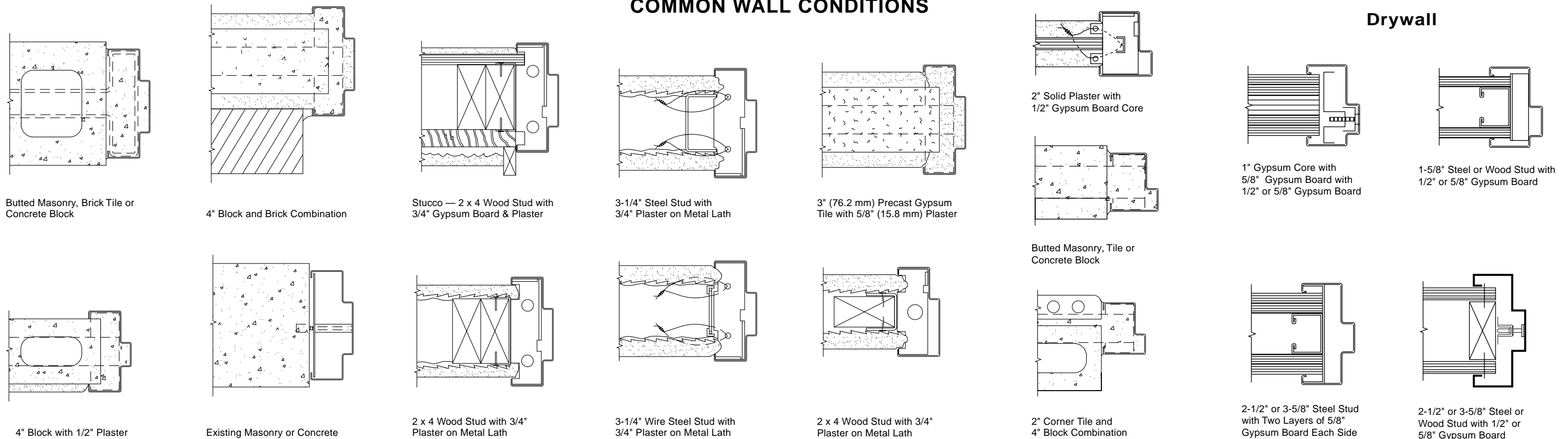
KS Indicates Keyed Side of Lockset

Corners



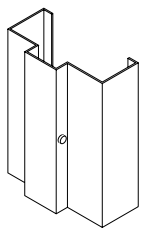
Note: Center Hinge Omitted on 6'-8" (2032mm), 1-3/8" (34.5mm) Doors, Unless Specified.

COMMON WALL CONDITIONS

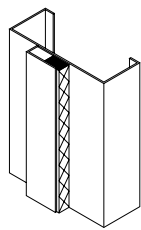


Drywall

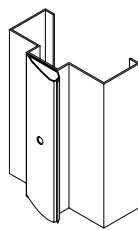
SPECIAL FRAME CONSTRUCTION DETAILS AND TYPICAL HARDWARE PREPARATIONS



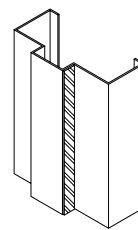
Rubber Silencers



Gasket Frame

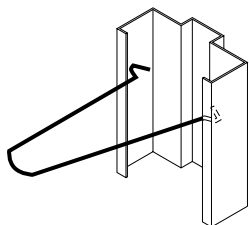


Surface Mounted Weatherstrip

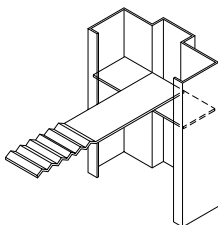


Surface Applied Pressure Sensitive Weatherstrip

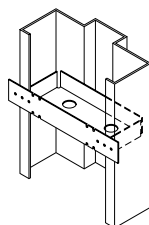
Anchor Details



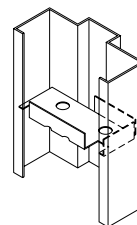
Masonry Wire Anchor



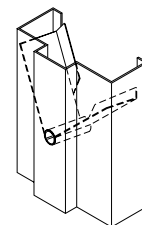
Masonry Tee Anchor



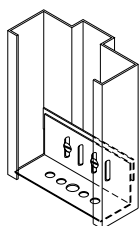
Wood Stud Anchor



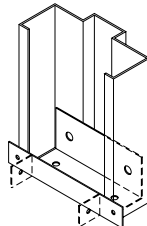
Steel Stud Anchor



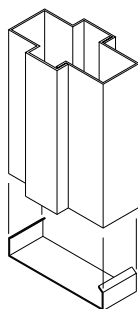
Existing Wall Anchor



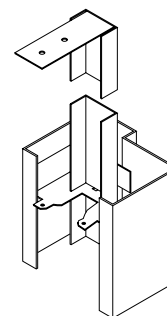
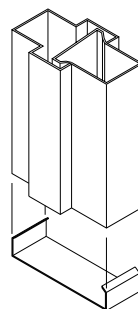
Adjustable Base Anchor



Wood Stud Base Anchor

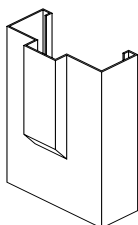


Typical Mullion Sections with Base Anchor

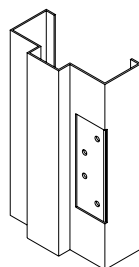


Plaster Partition Anchor
(Ceiling Strut Optional)

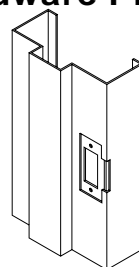
Special Frame Details



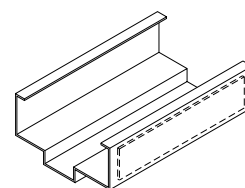
Hospital Stop



Mortise Hinge



Strike



Surface Hardware Reinforcement.
Weld-in Reinforcement Shown,
Loose Reinforcing Sleeve Available
for Field Installation.

For more information on steel doors and frames, contact any of the following members of the Steel Door Institute:

AMWELD BUILDING PRODUCTS INC.

P.O. Box 267
Garrettsville, OH 44231
(330) 527-4385
FAX (330) 527-4510

CURRIES COMPANY

P.O. Box 1648
Mason City, IA 50402-1648
(641) 423-1334
FAX (641) 423-9104

MESKER DOOR, INC.

3440 Stanwood Boulevard
Huntsville, AL 35811-9021
(256) 851-6670
FAX (888) 851-7896

SECURITY METAL PRODUCTS CORP.

5700 Hannum Avenue
Suite 250
Culver City, CA 90230
(310) 641-6690
FAX (310) 641-6601

BENCHMARK COMMERCIAL DOORS

Division of General Products Co., Inc.
P.O. Box 7387
Fredericksburg, VA 22404-7387
(540) 898-5800
FAX (540) 898-5894

DEANSTEEL MANUFACTURING CO.

111 Merchant Street
San Antonio, TX 78204-1496
(210) 226-8271
FAX (210) 226-0913

PIONEER INDUSTRIES INC.

401 Washington Avenue
Carlstadt, NJ 07072
(201) 933-1900
FAX (201) 933-9580

STEELCRAFT

IR Security & Safety
9017 Blue Ash Road
Cincinnati, OH 45242
(513) 745-6400
FAX (513) 745-6446

CECO DOOR PRODUCTS

A United Dominion Company
750 Old Hickory Boulevard
One Brentwood Commons, Suite 150
Brentwood, TN 37027-4502
(615) 661-5030
FAX (615) 370-5299

THE KEWANEE CORPORATION

P.O. Box 309
Kewanee, IL 61443-0309
(309) 853-4481
FAX (309) 853-5466

REPUBLIC BUILDERS PRODUCTS

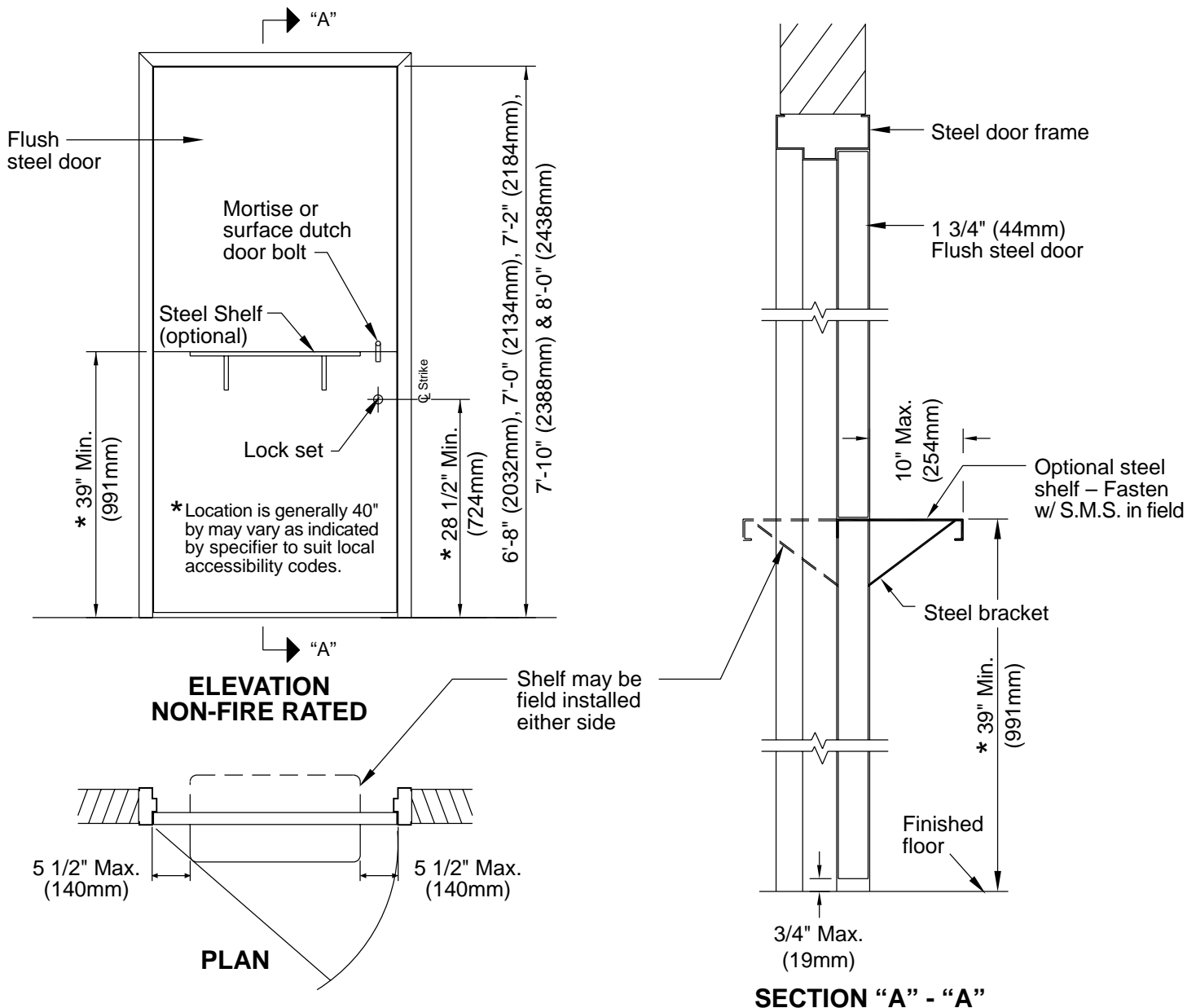
155 Republic Drive
McKenzie, TN 38201-0580
(901) 352-3383
FAX (901) 352-3001

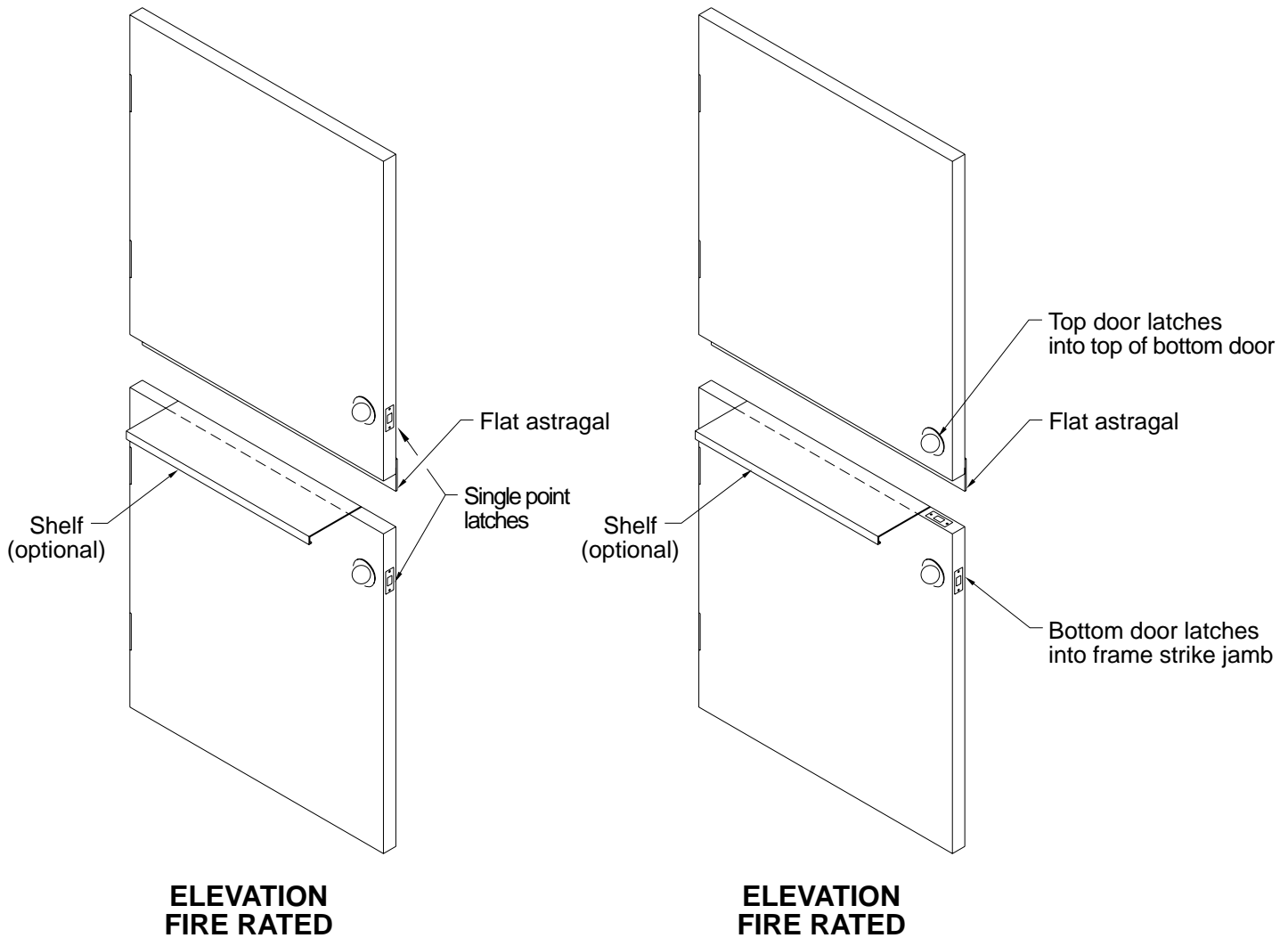


STEEL DOOR INSTITUTE

30200 DETROIT ROAD • CLEVELAND, OHIO 44145
440/899-0010 • fax 440/892-1404 • www.steeldoor.org

Recommended
Standard Details for Dutch Doors





**ELEVATION
FIRE RATED**

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www.steeldoor.org

Recommended
Louver Details
for
Standard Steel Doors



Recommended Louver Details for Standard Steel Doors

Standard steel doors can be provided with a variety of louver designs and sizes. This publication contains explanations and details of louver designs that are most commonly available within the standard door industry.

When specified, doors shall be provided with louvers at the bottom and/or top. The choice of which to use must be determined by the architect on aesthetic, functional, and economic grounds.

Function — Louvers permit free air passage, controlling the volume by their size or design. They diffuse or control direction of air flow by blade design.

Insert louvers — Louvers commonly used in standard steel doors are of the “insert” type designed to be mounted into a cutout in the door and an overlapping frame. Inverted “V” blade, “Z” blade, inverted “Y” or chevron-type blade, lightproof, adjustable blade, grille type, and fusible link self-closing fire door type are available in a wide range of sizes. Also available from some steel door manufacturers is a pierced louver design. Insert louvers intended for exterior doors or other doors where security is a consideration should have fasteners or materials specified accordingly.

Note: If a louver door is required to provide security, the steel door manufacturer should be consulted.

Bird or insect screens are available with many of the standard design louvers. Where specified, consult steel door manufacturer for availability.

Weatherproof louvers — True weatherproof designs do not exist. Some louvers are manufactured to provide a certain degree of rain protection.

Louver construction — Standard louver frames are a minimum 20 gauge steel with louver blades of a minimum 24 gauge steel. The louver blades can be welded or tenoned to the frame and the entire assembly is generally fastened to the door with moldings. Generally, one molding will be an integral part of the louver, while the other molding will be detachable. When louvers are installed, the detachable moldings should be located on the room or non-security side of the door.

Application:

Inverted “V” blade and **“Z” blade** types allow maximum free air flow with minimum static pressure differential.

Inverted “Y” or chevron blade louver, while offering less free air space, offers a higher strength factor for schools and other areas where vandalism or hard usage may occur.

Lightproof louvers are used where light transmission must be avoided. These provide a minimal free air flow.

Adjustable blade louvers are used where air flow is varied in velocity and control of flow must be provided.

Grille type louvers are normally associated with air conditioning, where air must be diffused in random flow, avoiding higher velocity air flow patterns.

Fusible link louvers are used in fire doors where flames and intense heat passage must be controlled. The link release temperature recommended is 135°F (57°C). These louvers must be labeled and may not exceed 24" x 24". Fusible link louvers are allowed only at the bottom of fire doors. Since closing is heat activated, these louvers are not to be used on smoke control doors.

Pierced louvers, available from some steel door manufacturers, offer a flush condition and may be furnished with internal insect screens. Louvers are formed by embossing the door face sheets.

Louver size determinations

As a guide, the following approximate percentages of louver size may be used to determine the free area in a given size louver:

Pierced louver	20%
Inverted “V” inserted louver	50 – 60%
Inverted “Y” (chevron) inserted louver	40 – 60%
“Z” type inserted louver	40 – 45%
Adjustable inserted louver	40 – 50%
Lightproof inserted louver	20%
Fusible link inserted louver	45%

The above percentages assume there is no air pressure drop from one side of the door to the other. On air condition grilles an air pressure drop is normal. An average 70% of the grille size can be used in computing free area on doors with air condition grilles.

The percentages noted above are approximates. Consult the individual manufacturer’s literature for the specific sizes and ratings normal to their program.

A combination of glass lites and louvers is common in steel door work. Care should be taken to avoid specifying too long a narrow lite when a louver or grille occurs in the bottom of the same unit. In addition, handicap codes may dictate the location of the louver relative to the bottom of the door.

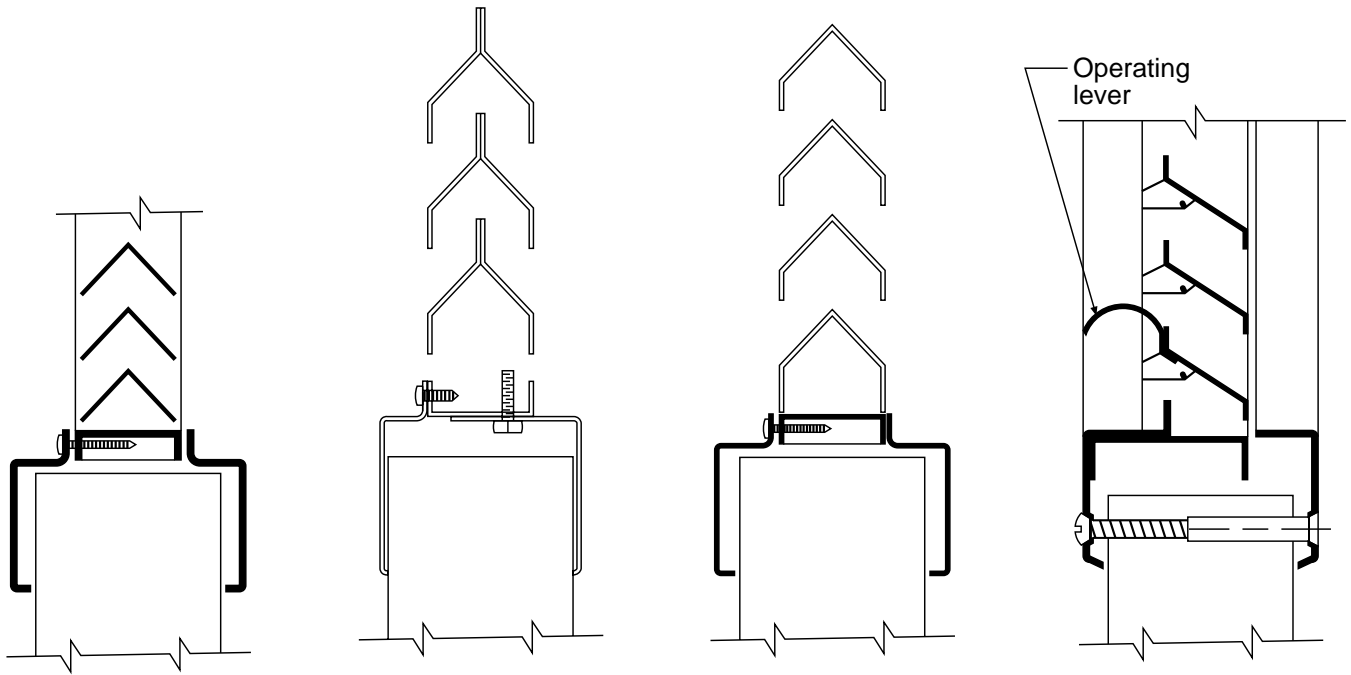
Full louver doors

A minimum 5" (127.0mm) rail occurs at the top and at the vertical edge of this type unit, a 8" (203.2mm) minimum rail occurs at the bottom. The percentages noted above on inserted louvers also apply to this type of door. Pierced louvers are not available on full louvered doors. Consult with door manufacturer for exact stile/rail dimensions.

Finish

The finish is to be prime painted, except when the louver is used in a factory prefinished door, in which case the louver will be finish painted with a color to match the door. For exterior doors, zinc coated louvers are available where specified.

Cross Section Details

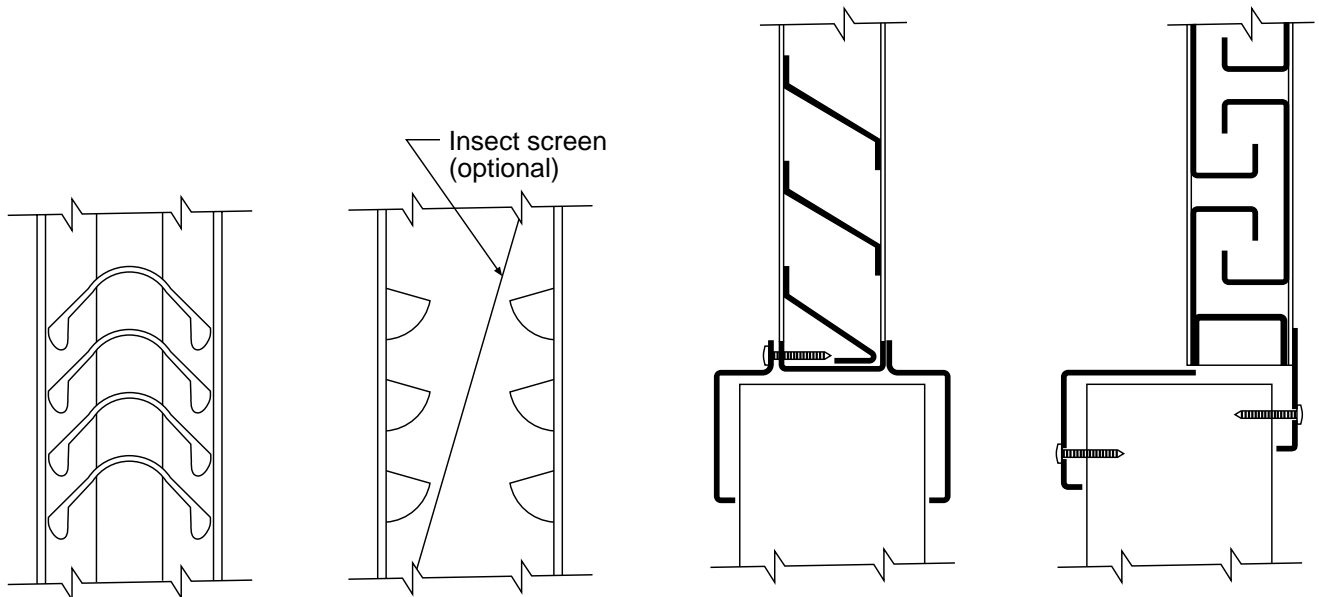


Inverted "V" Blade

Inverted "Y" Blade

Chevron or Hood-Type Blade

Fusible Link



Grille

Pierced

"Z" Blade

Lightproof

Recommended
**Door, Frame and
Hardware Schedule for
Standard Steel
Doors and Frames**

The purpose of this publication is to establish a guide for architects and those responsible for scheduling doors, frames, and hardware requirements.

Although primarily designed for steel doors and frames, this suggested schedule is flexible enough to list total door and frame requirements of a complete job.

Items not specifically covered in the schedule may be listed in the "Remarks" and extra columns near the end.



STEEL DOOR INSTITUTE

30200 DETROIT ROAD - CLEVELAND, OHIO 44145

Recommended

Guidelines for the Use of Gasketing and Thresholds for Standard Steel Doors and Frames

The attached details represent the recommendation of The Steel Door Institute in this important corollary area. This document should in no way be considered an endorsement of any manufacturer nor does it imply that any materials not shown should be considered inferior weatherstripping.

The criteria employed in the selection of these details included:

1. The experience of the Institute with the details shown.
2. The adaptability of the material shown to standard steel doors and frames.
3. The ability to maintain gasketing at the door and frame during periods of normal thermal movement to the balance of the building structure.
4. The availability of the material from normal commercial sources.
5. Ease of maintenance.



Disclaimer/Source Reference

Since the members of the STEEL DOOR INSTITUTE do not manufacture gasketing, it is strongly suggest that the BHMA Members' catalogs and BHMA documents be consulted to establish "fit and function" criteria for specifying of any gasketing. BHMA Documents are available from:

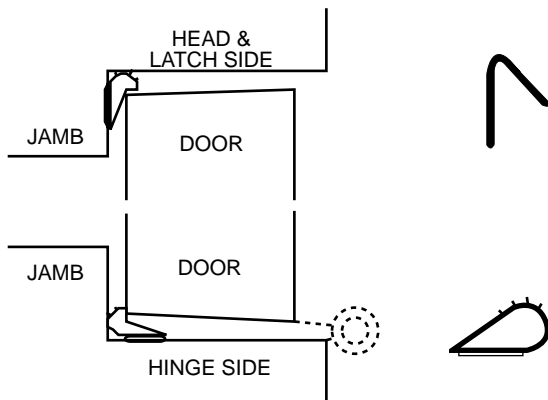
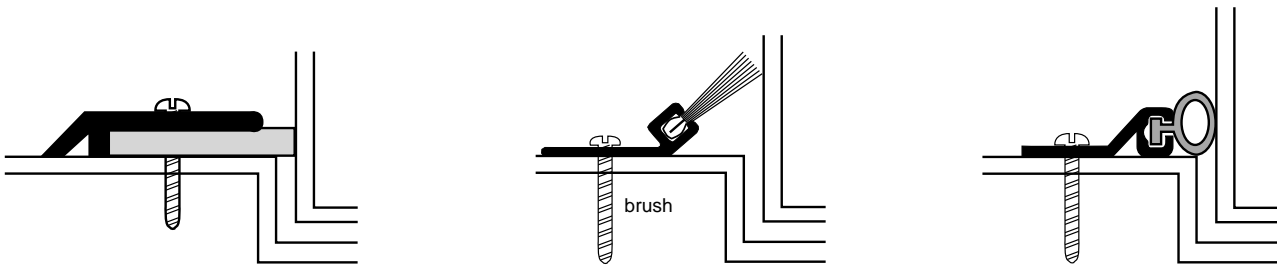
Builders Hardware Manufacturers Association
355 Lexington Avenue – 17th Floor
New York, NY 10017-6603
Phone: (212) 661-4261
Fax: (212) 370-9047

General

Gasketing and thresholds are used to control the flow of air, smoke, heat or cold, water, sound or other environmental factors through the door opening. The location or intended use of the door assembly, the environment to which it is exposed, and the performance expected will dictate the selection of gasketing and threshold products. The variety of materials, their composition, profiles, and performance are virtually limitless. These are described in ANSI/BHMAA156.21 or A156.22. Generally, gasket materials are sponge neoprene, rubber, vinyl, brushes, or magnets. Retainers are generally steel, aluminum, brass, bronze, vinyl, or other non-ferrous materials. Information in catalogs published by BHMA members aid in the selection of perimeter sealing "systems" to meet the applicable performance criteria of the door assembly.

Perimeter Seals

Sealing of gaps between door edges and the header or jambs generally has the greatest effect on performance of the door opening. The available options are as varied as their applications and their mounting surfaces e.g. steel, structural steel, or wood. Care should be taken to select materials that will assure performance under specific job requirements as well as meeting the mounting surface criteria.



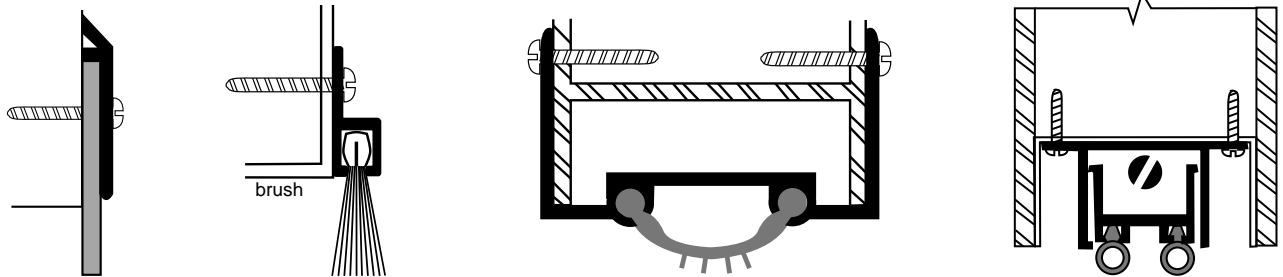
Gasketing products should never impede the operation, opening or closing of the door assembly. Simple contact is all that is required for some products. Other products for more severe installations require a slight compression. A simple test for gasket compression may be conducted by inserting a sheet of letterhead paper into the gap and closing the door. The paper should be held in place by the gasketing.

Gasketing or weather-stripping, of any kind, should be furnished and installed in accordance with manufacturers instructions.

Door Bottom Seals

In most instances, sealing of gaps between the bottom of doors and flooring or thresholds is accomplished with door bottoms or overlapping strips in metal retainers. These may be of a design that extends beyond the bottom of the door mechanically, or of a fixed protruding or overlapping design.

Door bottom gaskets must compress against a solid object to affect a proper seal. Carpeting by its pliant nature does not provide a proper seal.



Automatic Door Bottom

Astragal Seals

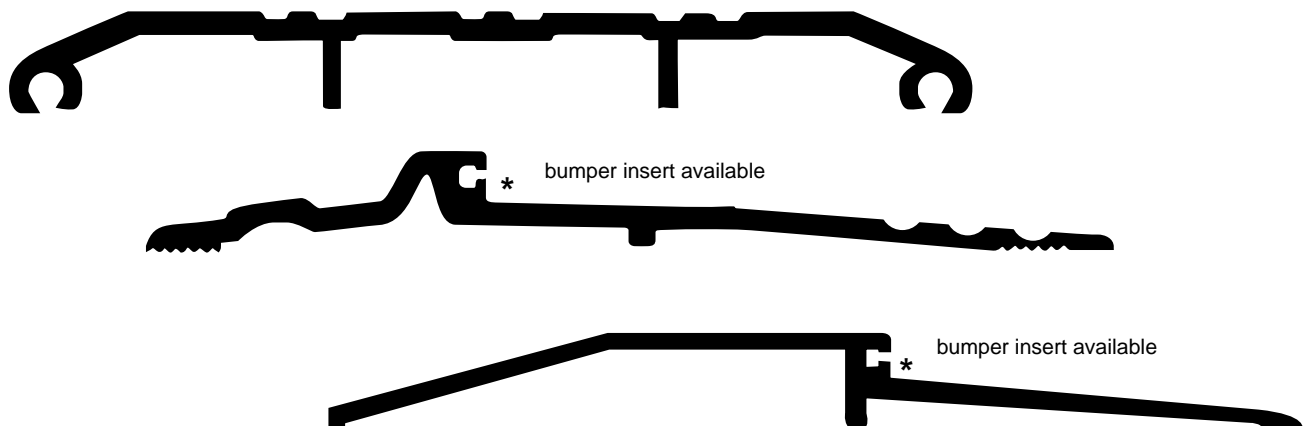
Sealing of door edges at meeting stiles, in lieu of or in addition to factory mounted astragals is accomplished by supplemental gasketing. This gasketing may be closely abutting fixed members or by overlapping strips in metal retainers.

Overlapping gasketing is normally used to avoid interference with edge mounted hardware such as locksets or flush bolts. Closely abutting gasketing is commonly used where both doors must operate simultaneously or independently as in egress doors.



Thresholds

Thresholds may be used in addition to or in lieu of door bottom seals. They may incorporate gaskets or other formed profiles to allow for exit device latching or may be prepared for flush bolt latching. Thresholds should be provided under the door and between the frame to allow for a smooth transition between floor coverings of different heights or materials. Special consideration should be given to threshold designs used in means of egress or in handicap accessible situations. The latter limitations are covered in ANSI/ICC A117.1.



Fire Door Considerations

When supplying products to be used on fire rated openings, care should be taken to maintain the proper clearances around the perimeter of the door assembly in accordance with NFPA 80. Gasketing materials must be investigated or "Listed" to determine that their installation does not adversely affect the fire resistance performance of the assembly. For example, the performance of gasketing is observed during the fire test to ensure that flaming does not occur on the exposed surface of door assemblies. It is important to note, however, that the ANSI/UL 10B, ANSI/UL 10C and ANSI/NFPA 252 standard fire tests do not include evaluation of the door assembly relative to preventing the passing of smoke or other products of combustion through or around the assembly. Openings that require a smoke seal must be tested in accordance with NFPA 105, UL 1784 or UBC 7-2 Part 11, 1997. In fire door applications it is VITAL that gasketing does not inhibit the ability of the door assembly to close and latch.

Performance Testing Criteria

Gasketing products are covered under ANSI/BHMA A156.22. Included in that standard are:

- Closing Force test
- Heat Test
- Cold Test
- Air Infiltration Test

Thresholds are covered under ANSI/BHMA A156.21. Included in that standard are:

- Weight bearing test

Definition of "STANDARD"

We call our products Standard for three reasons:

FIRST, because our products are made to conform to published standards and established dimensions.

SECOND, our products are manufactured to meet preestablished performance requirements.

THIRD, the fabrication of our products is controlled by standard manufacturing procedures which insure uniform high quality.

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FAX (210) 226-0913

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STEEL DOOR INSTITUTE

30200 DETROIT ROAD • CLEVELAND, OHIO 44145-1967
440/899-0010 • FAX 440/892-1404

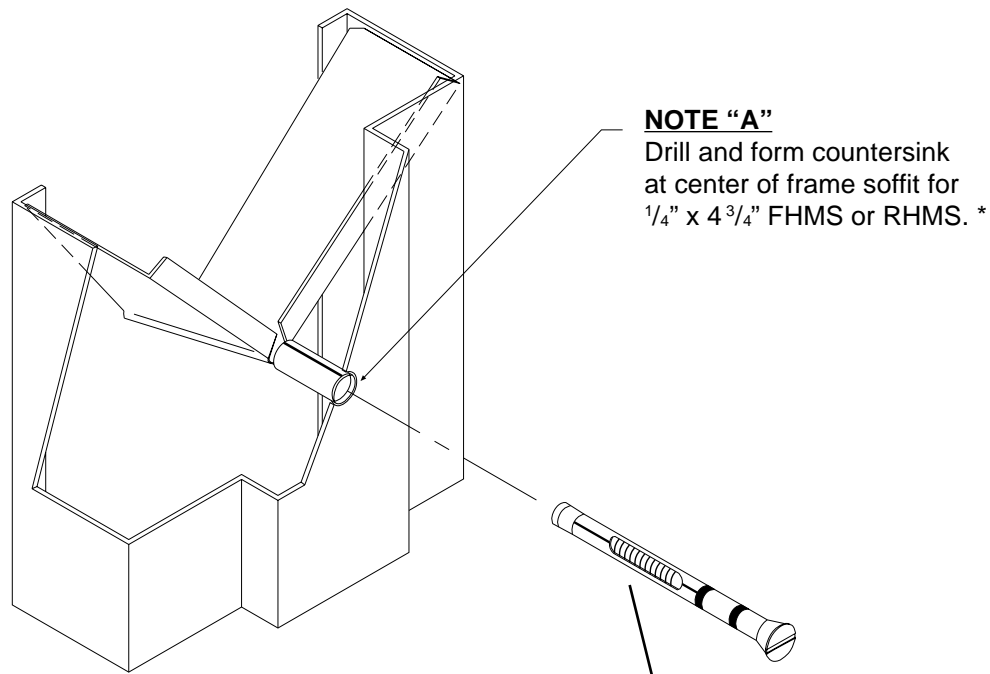
www.steeldoor.org

Recommended
Existing Wall Anchors
for
**Standard Steel Doors
and Frames**

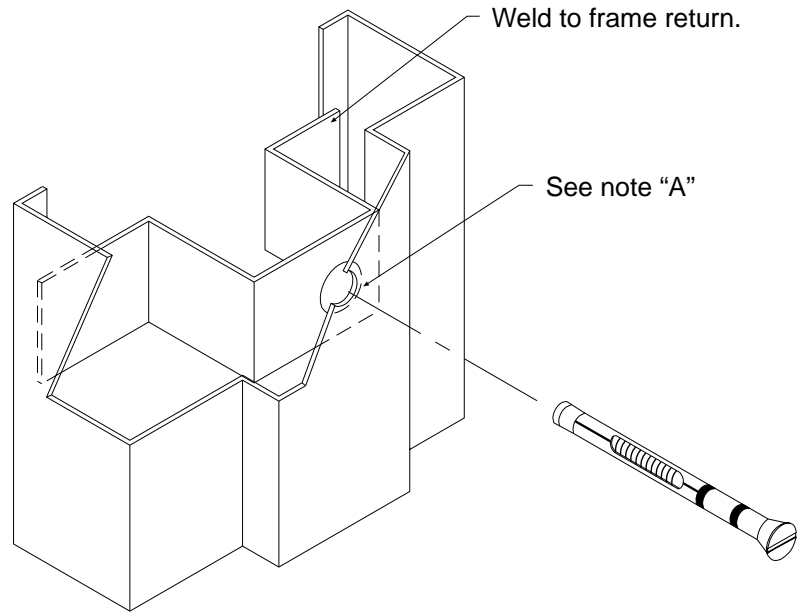
A) This standard is a guide for architects to help them recognize the available options to the traditional sub buck detail widely used in the past. The anchoring systems shown are available in regular and labeled frames.

B) The details shown are typical of those employed by the members of the Steel Door Institute, but all of the details are not made by all of the members of the Institute. A general reference to this document in your specifications should result in all of the members of the SDI and most of the non-members being able to bid on the job without a multitude of exceptions.

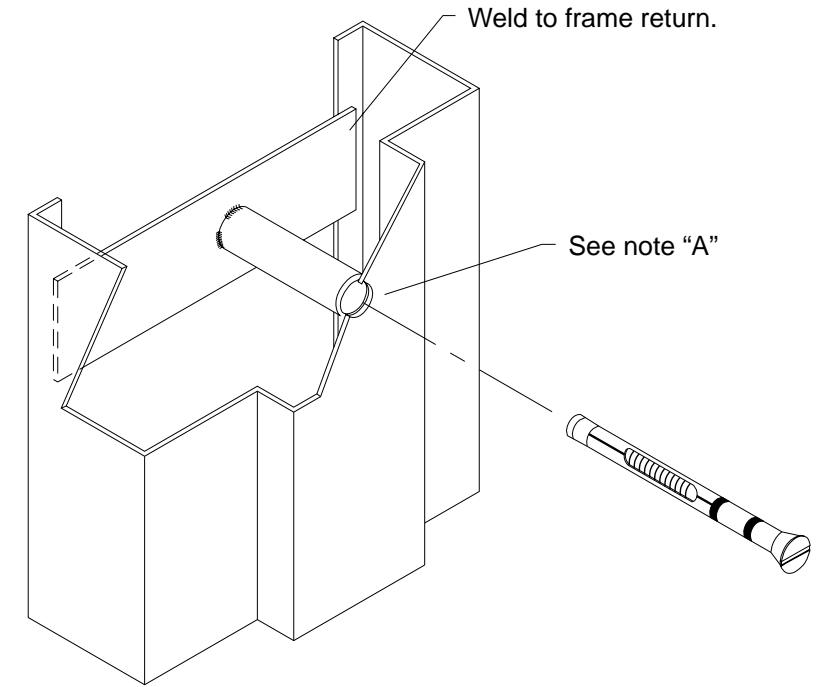




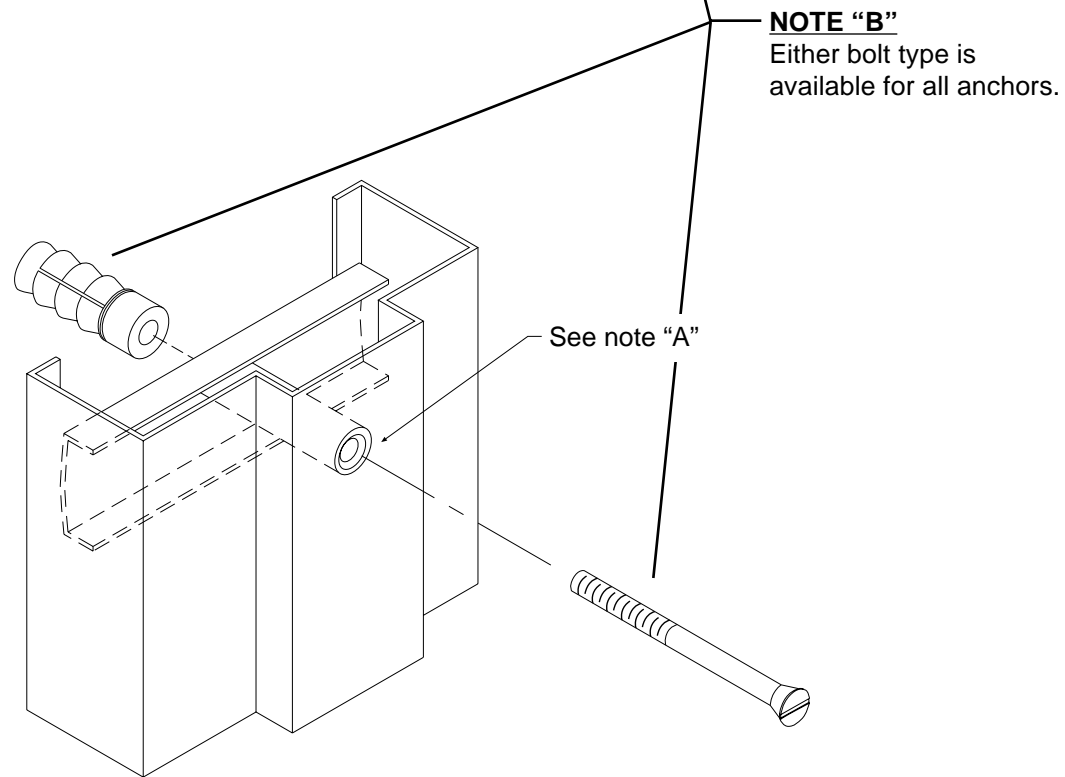
Adjustable Anchor



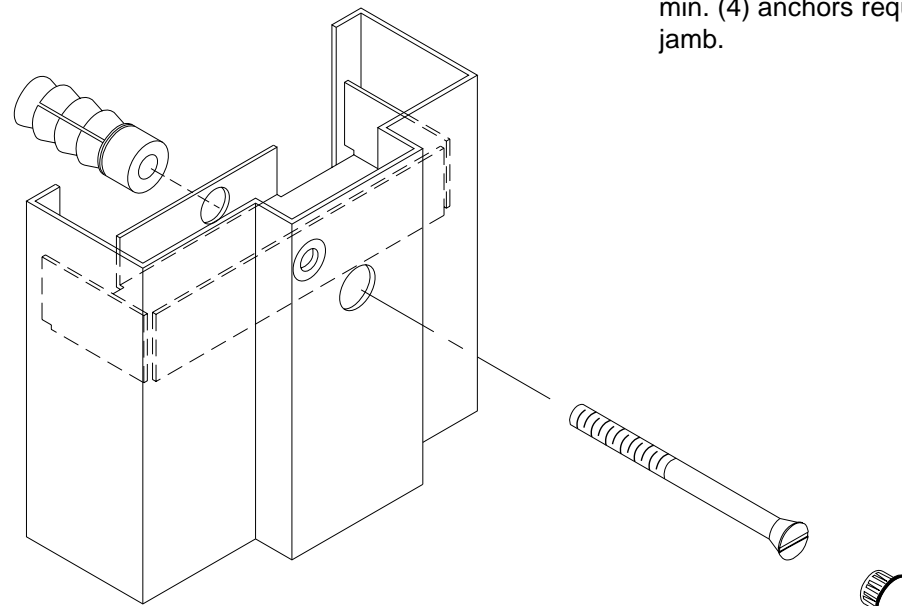
Hat Anchor



Pipe Anchor



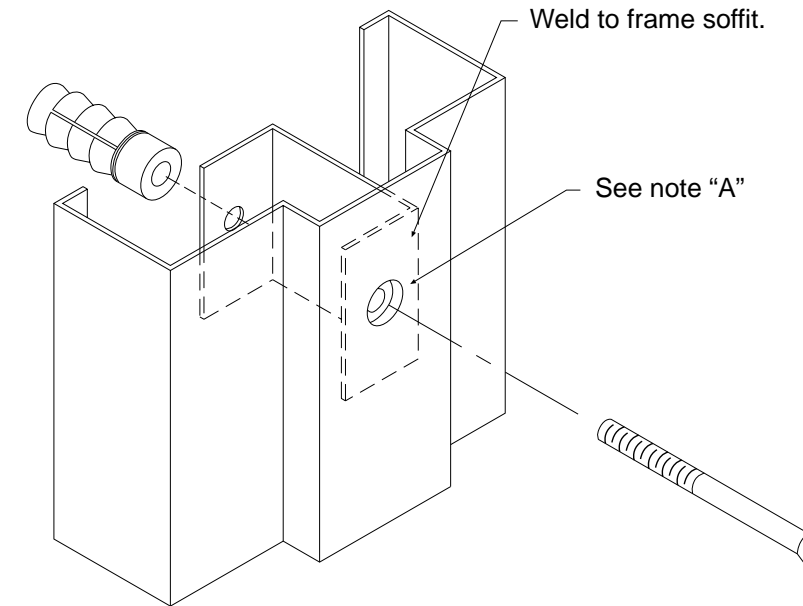
Lock-in "A" Anchor



Lock-in "B" Anchor

NOTE "C"
The head of the bolt may be filled in field with appropriate filler.

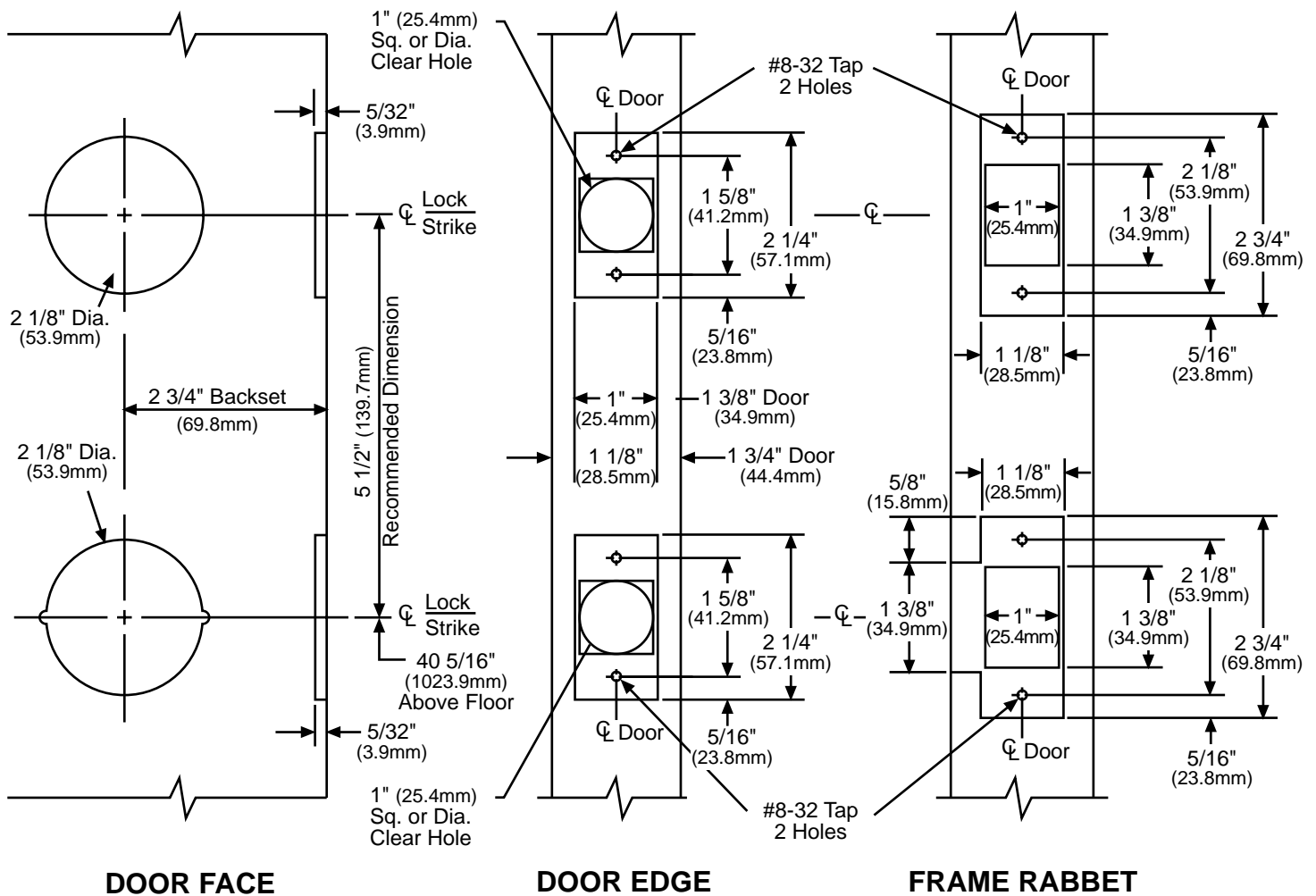
Note "D"
Up to 7'-6" (2286 mm) height, min. (4) anchors required per jamb.



"C" Anchor

*Firerated frames require 3/8" (9.5 mm) diameter bolts. Steel expansion shields must be used instead of lead shields.

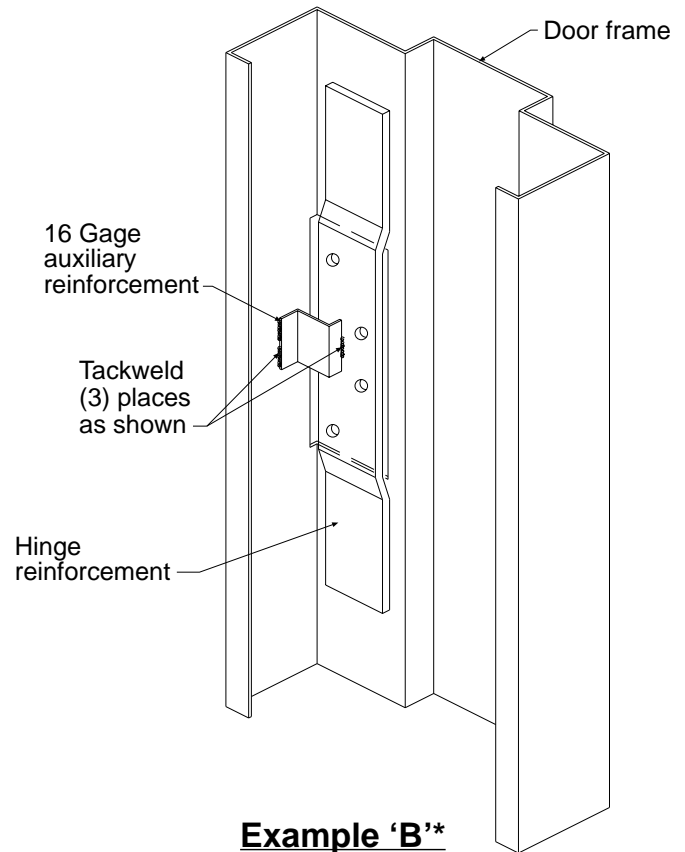
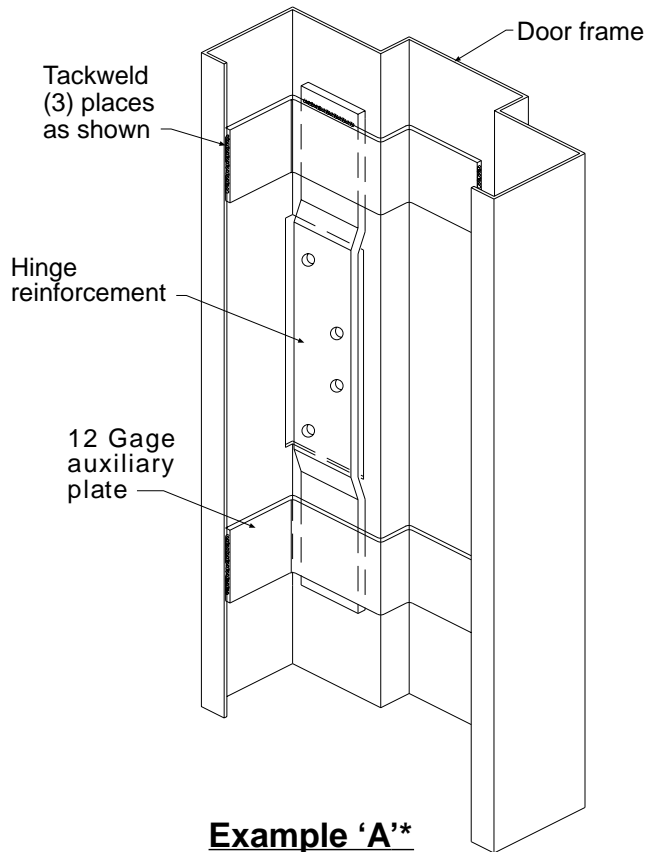
Recommended Standard Preparation for Double Type (Interconnected) Locks on Standard Steel Doors and Frames



Note: Minimum size of cutout as noted is subject to manufacturer's standard clearance tolerances.



High Frequency Hinge Preparations for Frames



Background:

There are occasions where steel frames used in extremely high frequency or high use areas need to be supplied with additional reinforcing to eliminate potential door sag. These types of openings would include: main entrances to schools, rear exits where severe wind abuse could be a factor, auditoriums, gymnasiums, and the like. When these types of installations are required, there is a method in which this can be handled, efficiently and economically, through providing auxiliary reinforcing to standard door frames. The specification for this is as follows:

Specification:

When a high frequency preparation is required, the top hinge of the door frame shall be provided with an auxiliary reinforcement as shown in example 'A' or 'B.' For additional strength, the center and bottom hinge reinforcement may also be provided with additional reinforcements.

* High frequency hinge preparations may vary between manufacturers.



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