

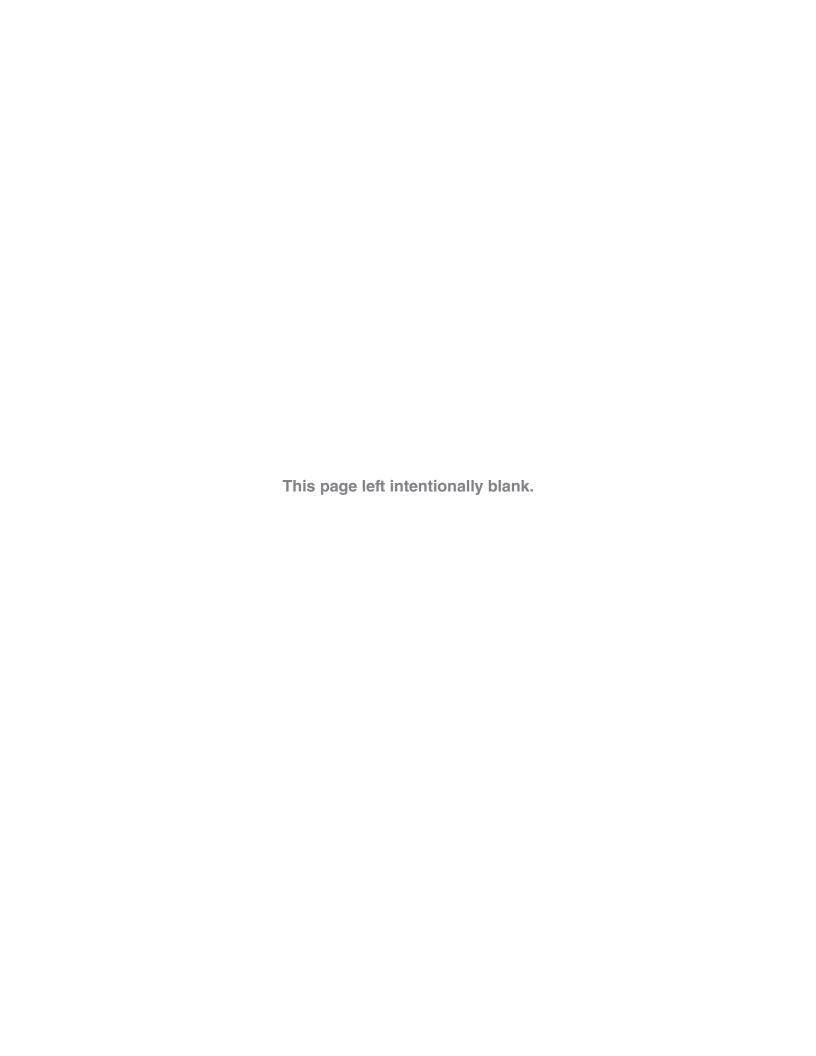
Hardware Preparation in Steel Doors and Steel Frames



Sponsor
Steel Door Institute

Approved July 28, 2023





# ANSI/SDI ® A250.14-2023 Revision and Redesignation of ANSI/BHMA A156.115-2016

|          |             |          | American I | National | Standard      |
|----------|-------------|----------|------------|----------|---------------|
| Hardware | Preparation | in Steel | Doors and  | Steel    | <b>Frames</b> |

Secretariat

**Steel Door Institute** 

Approved July 28, 2023

**American National Standards Institute, Inc.** 

## **National** Standard

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ANSI/SDI A250.14-2023

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This Standard was first published by the Door and Hardware Institute in a series of individual standards for wood and steel doors, and designated as A115. In 2001, the Builders Hardware Manufacturers Association reactivated the Joint Door and Hardware Standards Committee for the purpose of updating and promulgating the ANSI A115 standards for steel doors and frames. The development of the BHMA standard - ANSI/BHMA A156.115 Hardware Preparation in Steel Doors and Steel Frames - was a joint effort by members of the Steel Door Institute, Window and Door Manufacturers Association, Door and Hardware Institute, Hollow Metal Manufacturers Association, Builders Hardware Manufacturers Association and the Canadian Steel Door Manufacturers Association. The effort was chaired by SDI Technical Committee member Allan Ashachik.

On March 24, 2020 BHMA forfeited the maintenance of ANSI/BHMA A156.115 to SDI's Accredited Standards Committee A250 via Project Initiation Notification (PINS) form submitted to and approved by ANSI. It has since been revised and published by SDI in 2023 and is now designated as ANSI A250.14Suggestions for improvement gained in the use of this standard will be welcome. They should be sent to the Steel Door Institute, 30200 Detroit Road, Cleveland, OH 44145-1967.

The organizations that have approved this standard are part of the ANSI A250 Accredited Standards Committee, formed February 8, 1991, and are as follows:

A250 Accredited Standards Committee
Builders Hardware Manufacturers Association
Canadian Steel Door Manufacturers Association
Cedar Valley Associates
D.H. Pace Company
Door Control Services
ESTM Technical Services, LLC
HMMA/Division of NAAMM
Intertek
MasterSpec
Ray and Associates
Steel Door Institute
UL Solutions
Vetrotech/Saint-Gobain

The Technical Committee of the Steel Door Institute, which developed this standard, had the following personnel at the time of approval:

### Craig Ordmandy, *Chairman* J. Jeffery Wherry, *Manager*

| Organization Represented Allegion             | Name of Representative Tim Weller                                     |  |
|---|---|--|
| Builders Hardware Institute                   | Michael Tierney   |  |
| Canadian Steel Door Manufacturers Association | . Dwayne Charlton<br>. Stan Horsfall<br>. David Bill<br>. Claus Heide |  |
| Ceco Door Products                            |   |  |
| Cedar Valley Associates                       |   |  |
| Curries Company                               |   |  |
| Deansteel                                     |   |  |
| De La Fontaine Industries, Inc                |   |  |
| DCI   | Henry Ray   |  |
| D.H. Pace                                     | Jerry Rice  |  |
| Door Control Services                         | Craig Ordmandy  |  |
| ESTM Technical Services, LLC                  | Michael Kolovich  |  |
| Hollow Metal Xpress (HMX)                     | Adam Matusz   |  |
| HMMA/Division of NAAMM                        | Russell Tauscher  |  |
| Intertek                                      | Justin Hendricks  |  |
| MasterSpec                                    | Rick Howard   |  |
| Mesker Door                                   | Mike Mehaffy  |  |
| MPI   | David McConnell   |  |
| Pioneer Industries                            | Kamal Sheikh  |  |
| Premier Steel Doors & Frames                  | Joey Meggs  |  |
| Ray and Associates                            | Ron Ray   |  |
| Republic Doors and Frames                     | Marilyn Latham  |  |
| Steel Door Institute                          | J. Jeffery Wherry   |  |
| Stiles Custom Metal                           | . Steve Stiles  |  |
| UL Solutions                                  | Michael Nicasio   |  |
| Vetrotech/Saint-Gobain                        | Kevin Norcross  |  |

#### American National Standard

### Hardware Preparation in Steel Doors and Steel Frames

#### 1. Scope and Purpose

- **1.1** This standard covers all significant dimensional attributes for mounting common hardware products in steel doors and frames. All dimensions shall be as shown on the accompanying drawings.
- 1.2 This standard was developed to show only the most commonly used preparations for door hardware, and provide targets for standardization. Where multiple configurations are in common usage, separate drawings are provided. For other configurations, it is recognized that these standards may be used in part, or with exceptions, while still providing some degree of basic guidance and standardization.

#### 2. General Requirements

- **2.1** Preparations covered by this standard are intended for use in doors 1-3/4 inches and 1-3/8 inches in thickness unless otherwise specified.
- **2.2** The center line of the lock in the door shall be located in reference to the center line of its strike.
- **2.3** Location of operable parts in accessible openings shall be between 34 and 48 inches unless otherwise specified. Consult local building codes and Authority Having Jurisdiction for exceptions.
- **2.4** Door Edge Doors shall be furnished with a beveled lock edge unless otherwise specified.
- **2.5** Door Reinforcement Doors shall be reinforced to support the requirements of the hardware application.
- **2.6** Tolerances for preparations are shown on individual drawings.

#### 3. Definitions

- **3.1 Bored Locks** Bored lock is used herein to designate locks having cylindrical shaped bodies which are mounted in holes bored in the door
- **3.2 Dead-latch** A spring-bolt latch in which the bolt is deadlocked against end pressure but may be retracted by either the knob or key.
- **3.3 Door Edge** The vertical surfaces of a door to which hinges, locking or latching hardware is attached.
- **3.4 Beveled Edged** A vertical door edge having a 1/8" in 2" slope from a plane perpendicular to the pull-side face of the door.
- **3.5 Door Face** Surface of the door exposed to view when the door is closed.
- **3.6 Face Cut Out** A piercing of the door face for hardware, lites, louvers or accessories.
- **3.7 Flush Bolt** A locking device for the inactive leaf of a pair of doors that latches and unlatches either automatically or manually
- **3.8 Frame** Frame is that portion of an opening which gives a finished appearance to a cutout in a wall and provides a square and plumb opening on which to hang a door.
- **3.9 Grout Guard** A metal cover attached to a frame behind reinforcement for mortised or recessed hardware items, to prevent grout from entering the mounting holes. Also referred to as Dust Cover Guard, Masonry Guard, Mortar Guard, or Plaster Guard.
- **3.10 Head** Horizontal frame member atop of opening or top of transom frame.
- **3.11 Hinge Face** That face of the door viewed when observing the hinge knuckles on the door and frame.

- **3.12 Interconnected Lock** A mechanically interconnected locking mechanism having a separate latch bolt or dead locking latch bolt and dead bolt designed for installation in round bored openings in the edge and face of a door.
- **3.13 Junction Box** A metal cover provided to allow for the connection or termination of electrified hardware component wiring.
- **3.14 Lock Backset** The horizontal distance from the door edge centerline measured at the door thickness, to the centerline of the lock hub or cylinder.
- **3.15 Lock Case** The main body of a mortise lock containing the working mechanism which operates the latch bolt and deadbolt.
- **3.16 Lock Front** A plate fastened to the edge of a door through which the bolt(s) pass.
- **3.17 Strike** A mortised or surface mounted plate fastened to the door frame into which the bolts project.
- **3.18 Lock Support** Component inside the door used to keep the hardware in alignment.
- **3.19 Mortise Lock** A lock or latch fitting into a mortised cavity prepared in the edge of a door. The bolts are operated by knobs, levers, turns, thumb pieces, paddles or cylinders engaging the mortise lock or latch through holes prepared in the faces of the door.
- **3.20 Open Back Strike** A lock strike for use on pairs of doors permitting the inactive leaf to be opened or closed independently, eliminating the need for an astragal or coordinator.

- **3.21 Preassembled Lock** A lock fitting into a notched cutout in a door.
- **3.22 Reinforcement** Additional door material which provides structural support for hardware.
- **3.23 Square Edged Doors** The lock and hinge edge of the door is 90 degrees to the face of the door. Also called Universal Edged Doors.
- **3.24 Stop Face** That side of a door viewed when observing the stop side of a frame.

#### 4. SDI Document Disclaimers

#### 4.1 Tolerances

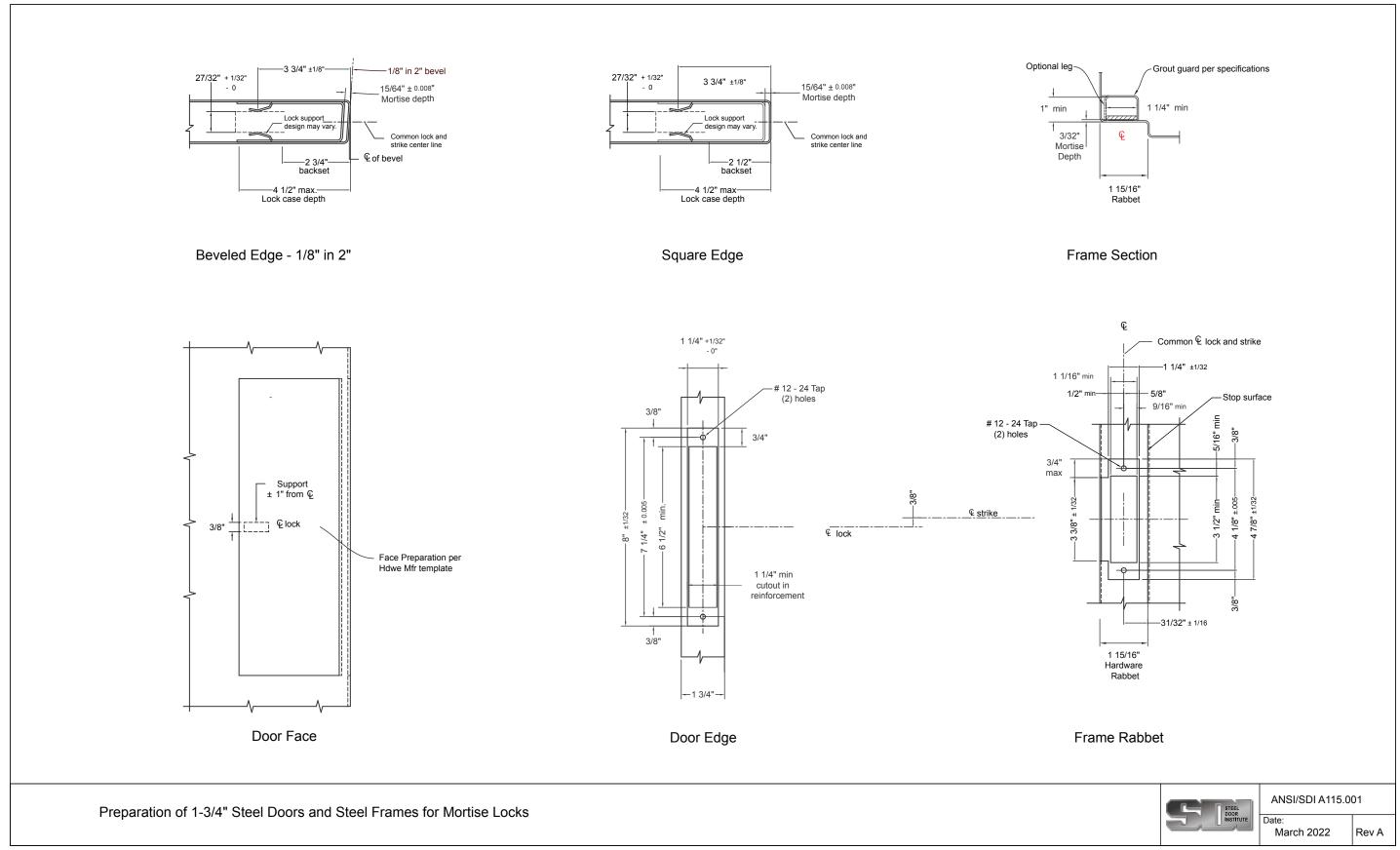
All values which do not carry specific tolerances or are not marked maximum or minimum shall have the following tolerances: Linear dimensions shall be  $\pm$  1/16 inches. Weight or force shall be  $\pm$  2%. Angles shall be  $\pm$  2 degrees. Where only minus tolerances are given, the dimensions are permitted to be exceeded at the option of the manufacturers.

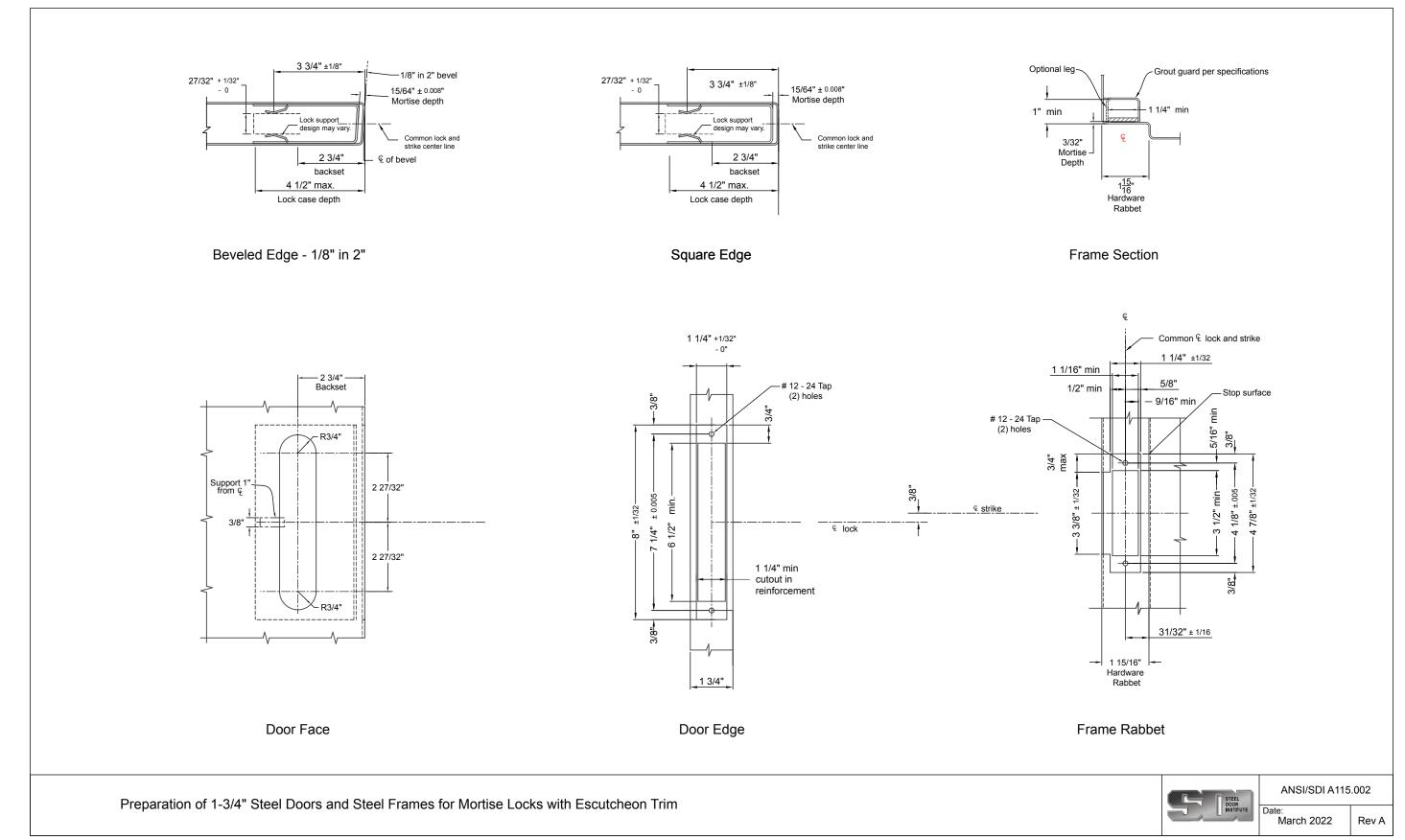
#### 4.2 Gauge vs. Thickness

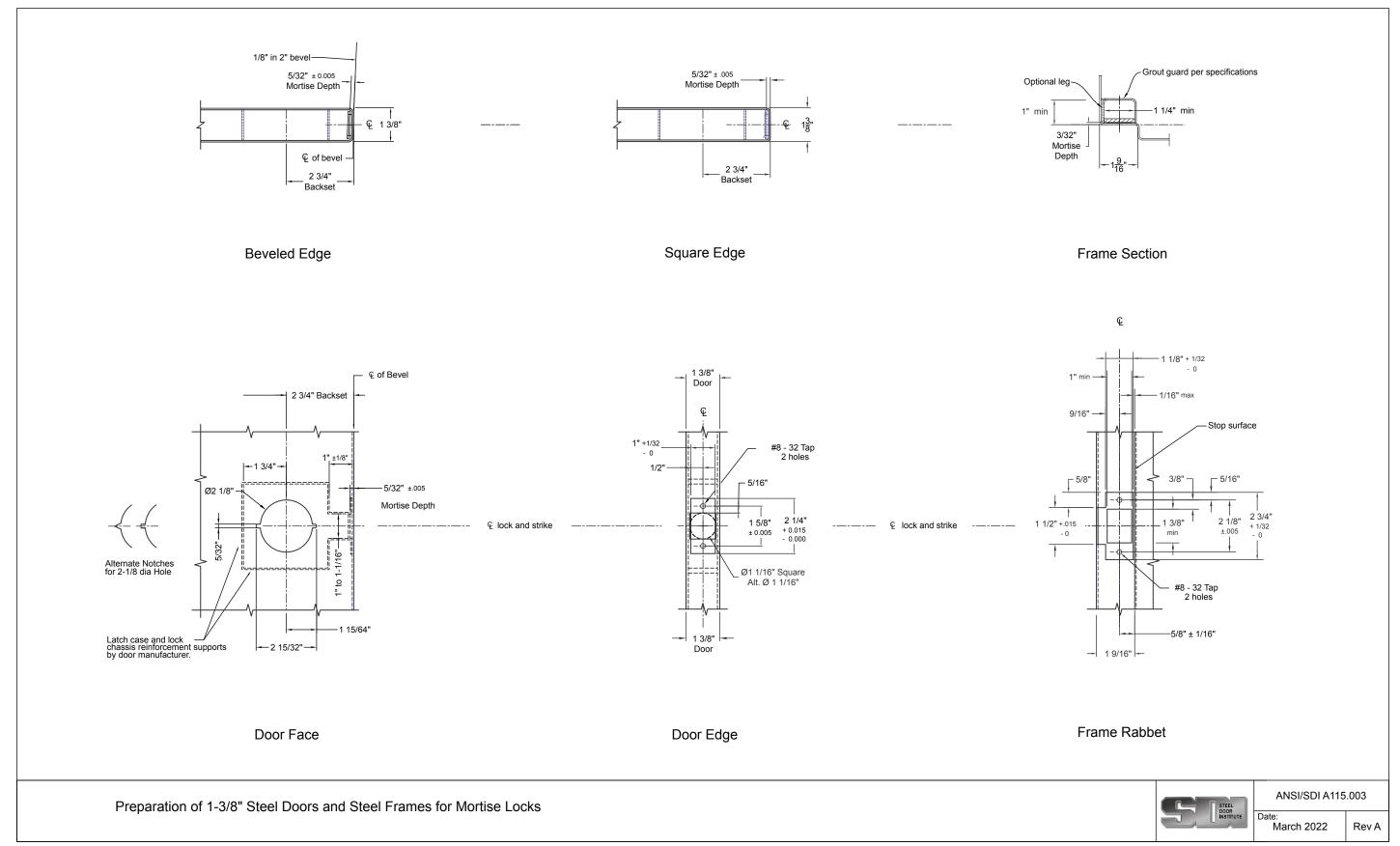
While the term 'gauge' is no longer common for defining material thickness it is still used to specify doors and frames for ordering purposes. The term 'thickness' is used when defining the actual dimension of an item, and the term 'gauge' is used in the context of specifying a particular door or frame.

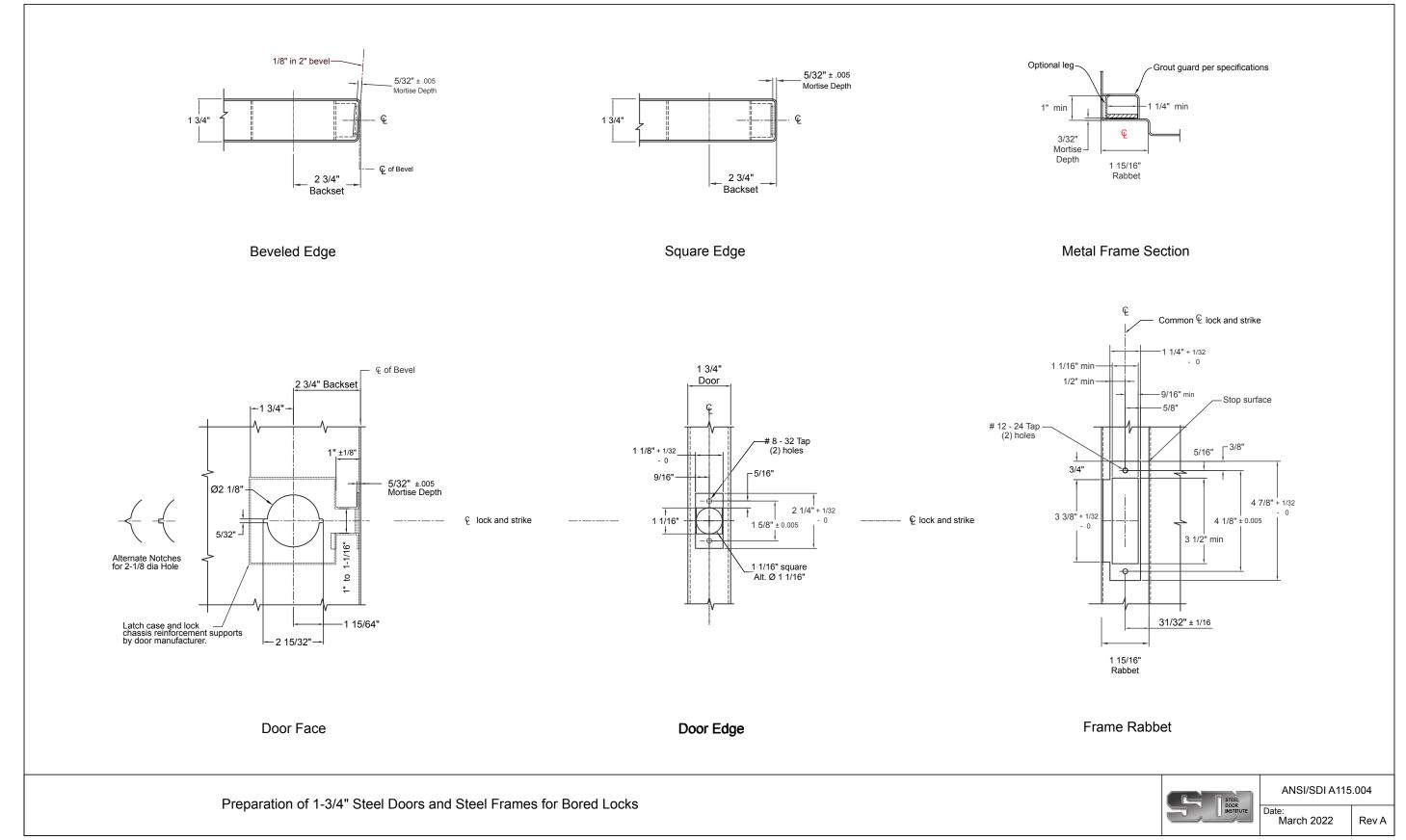
#### 4.3 Drawing

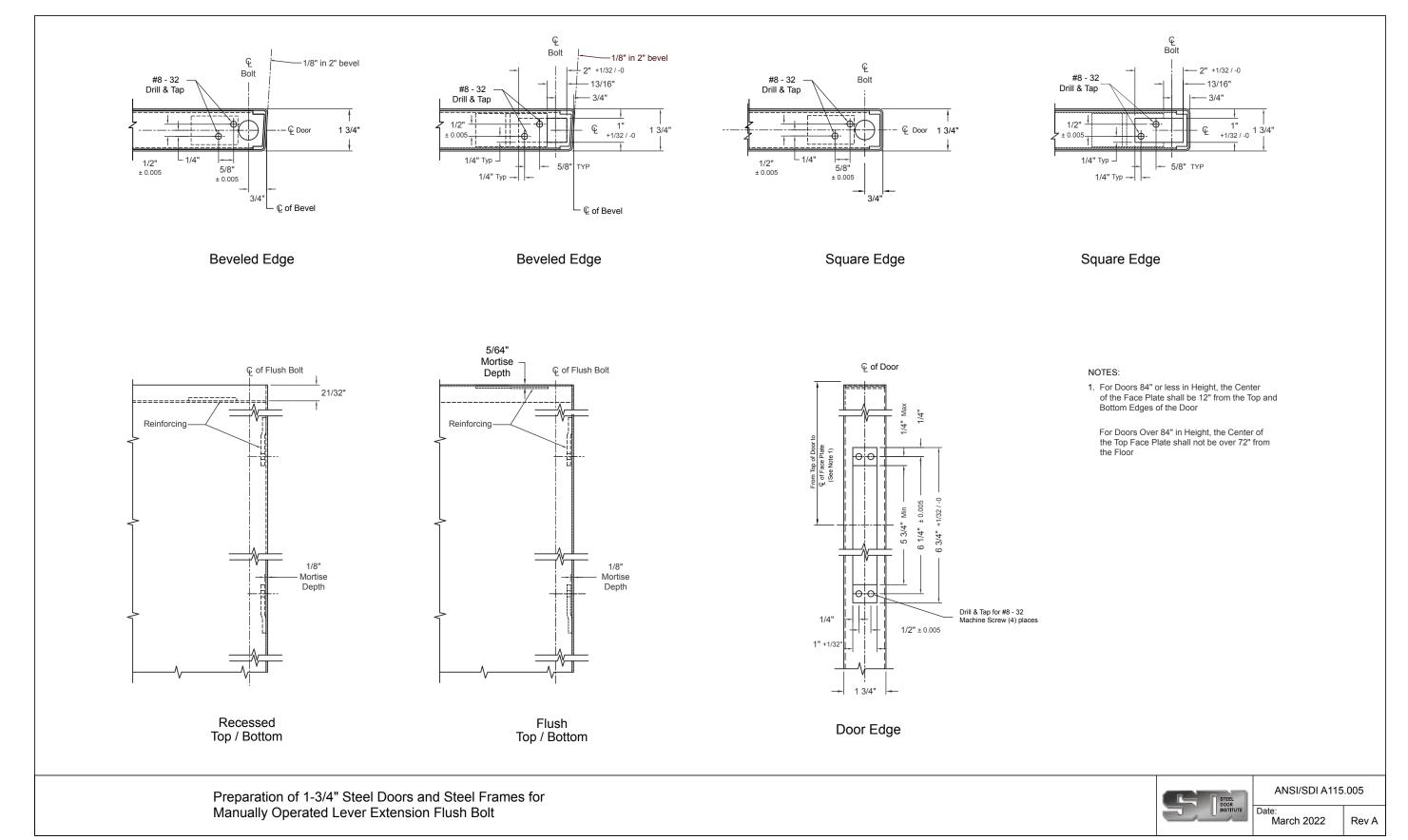
It is recommended that the individual manufacturer's specifications be reviewed to confirm compliance with these drawings.

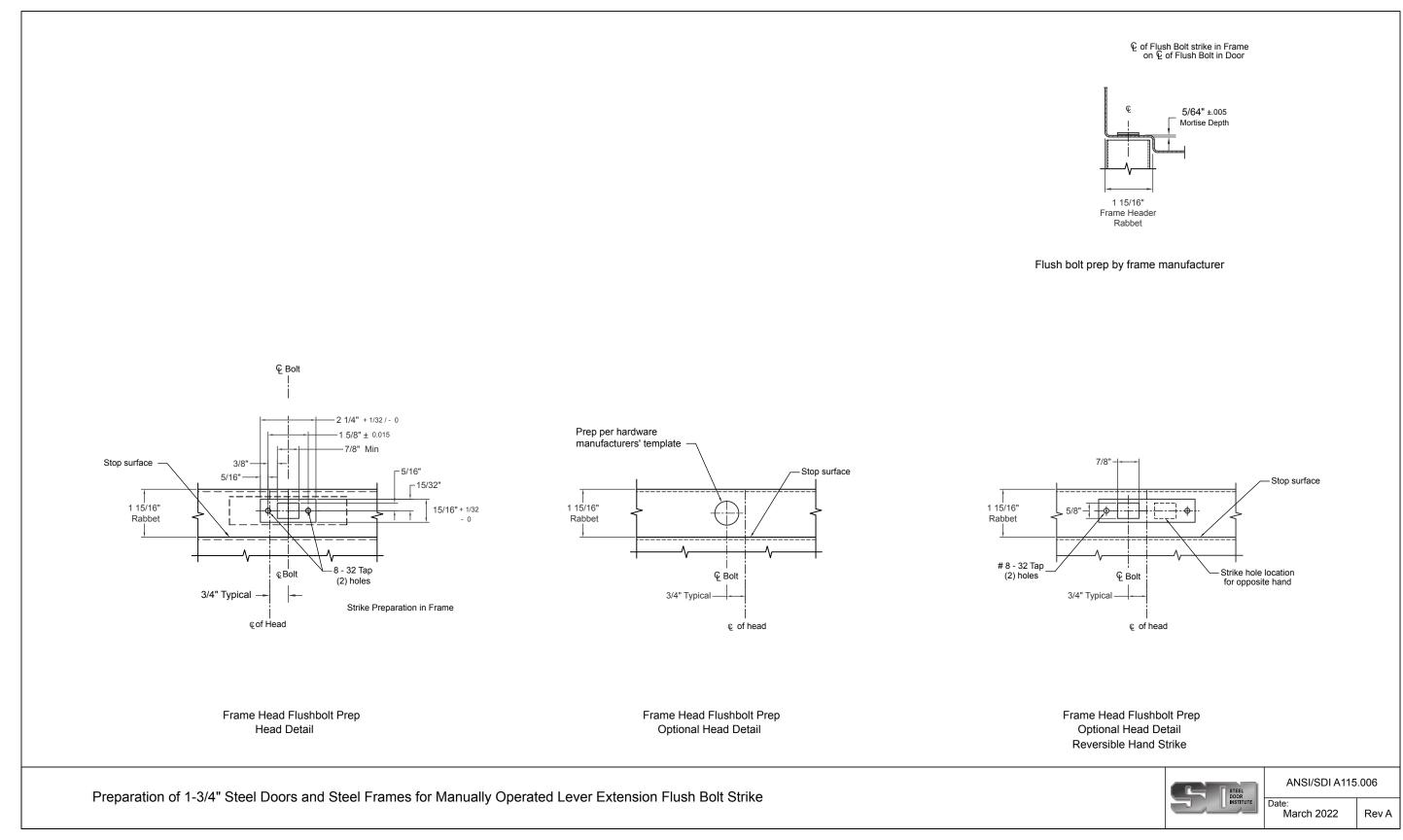


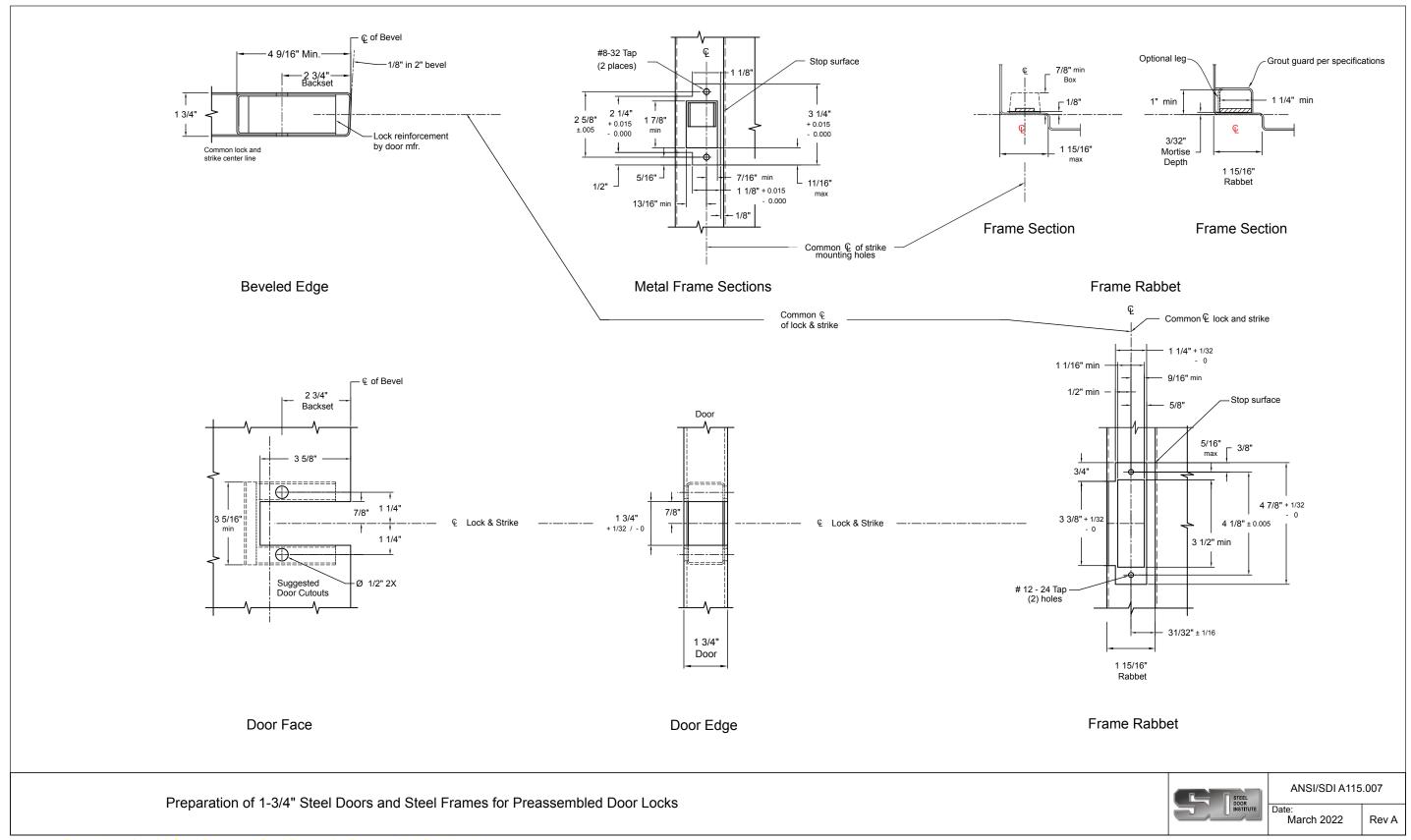


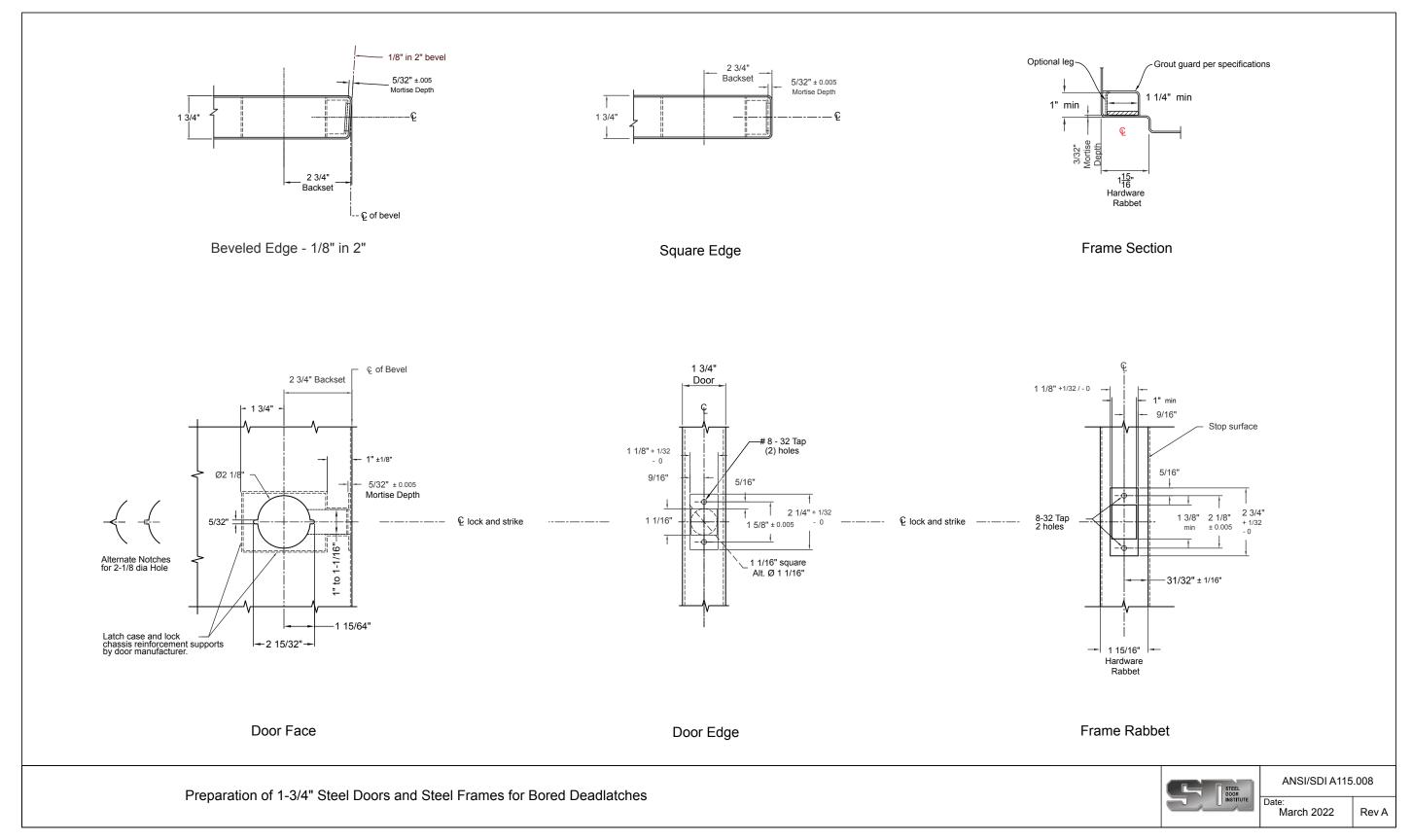


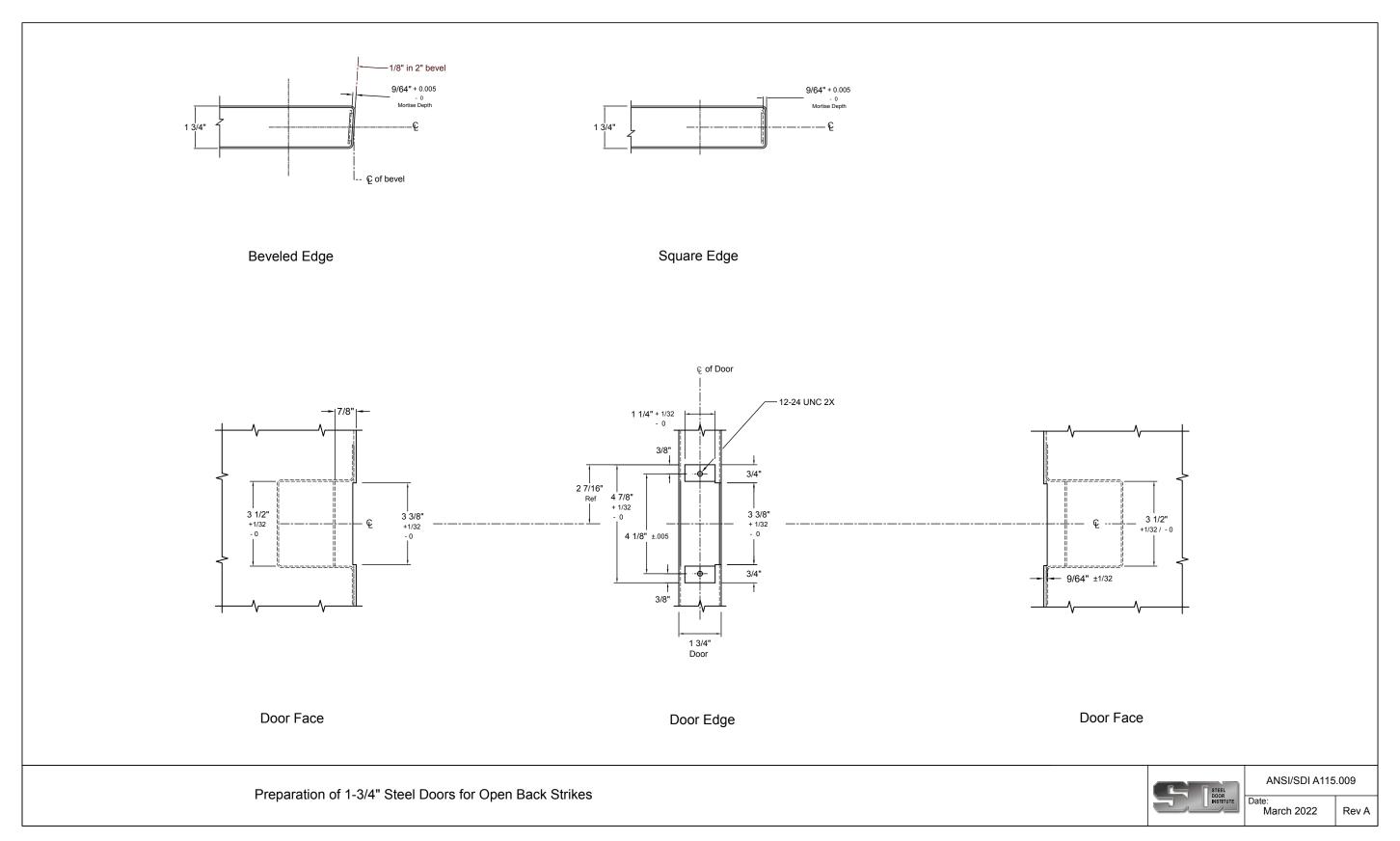


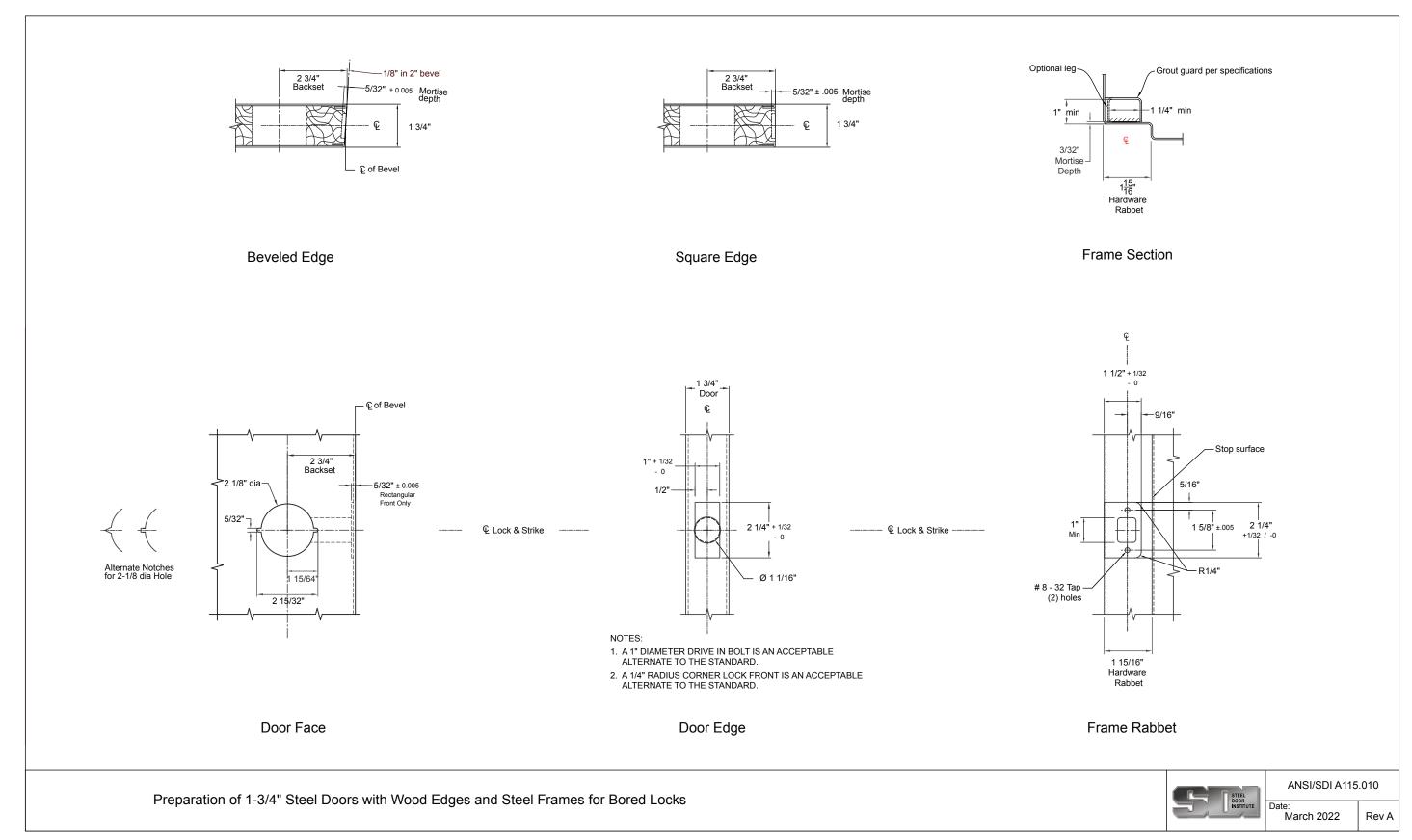


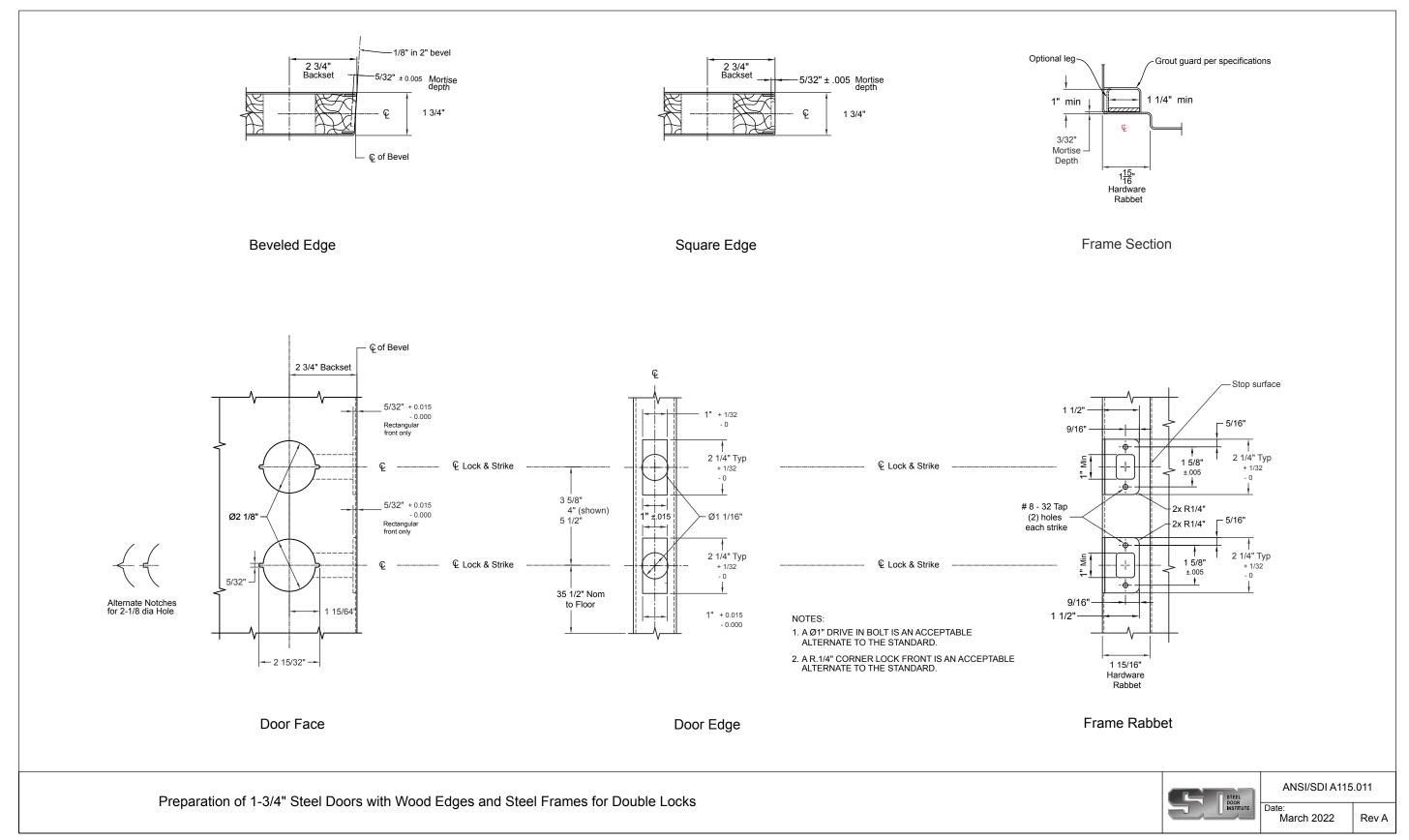


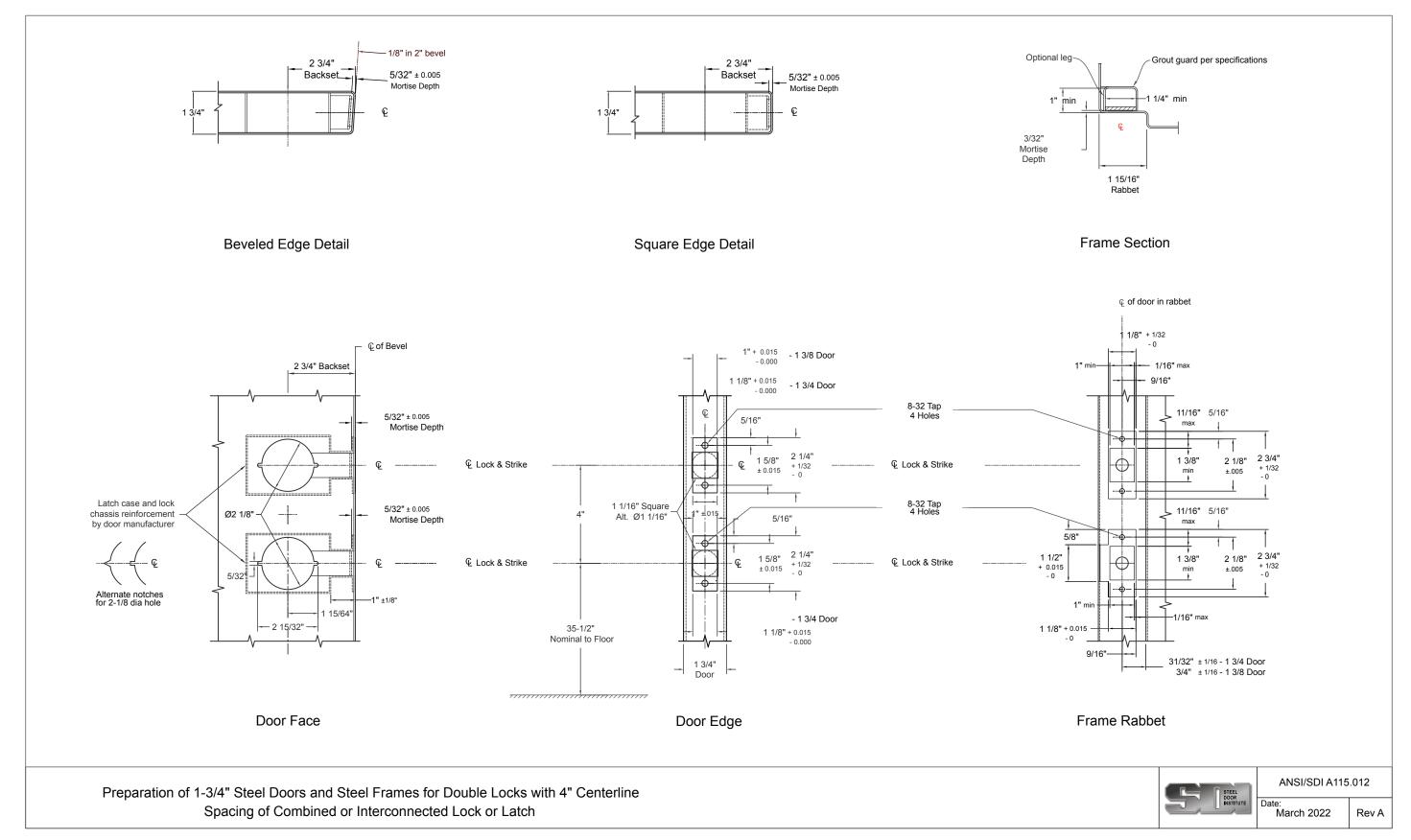


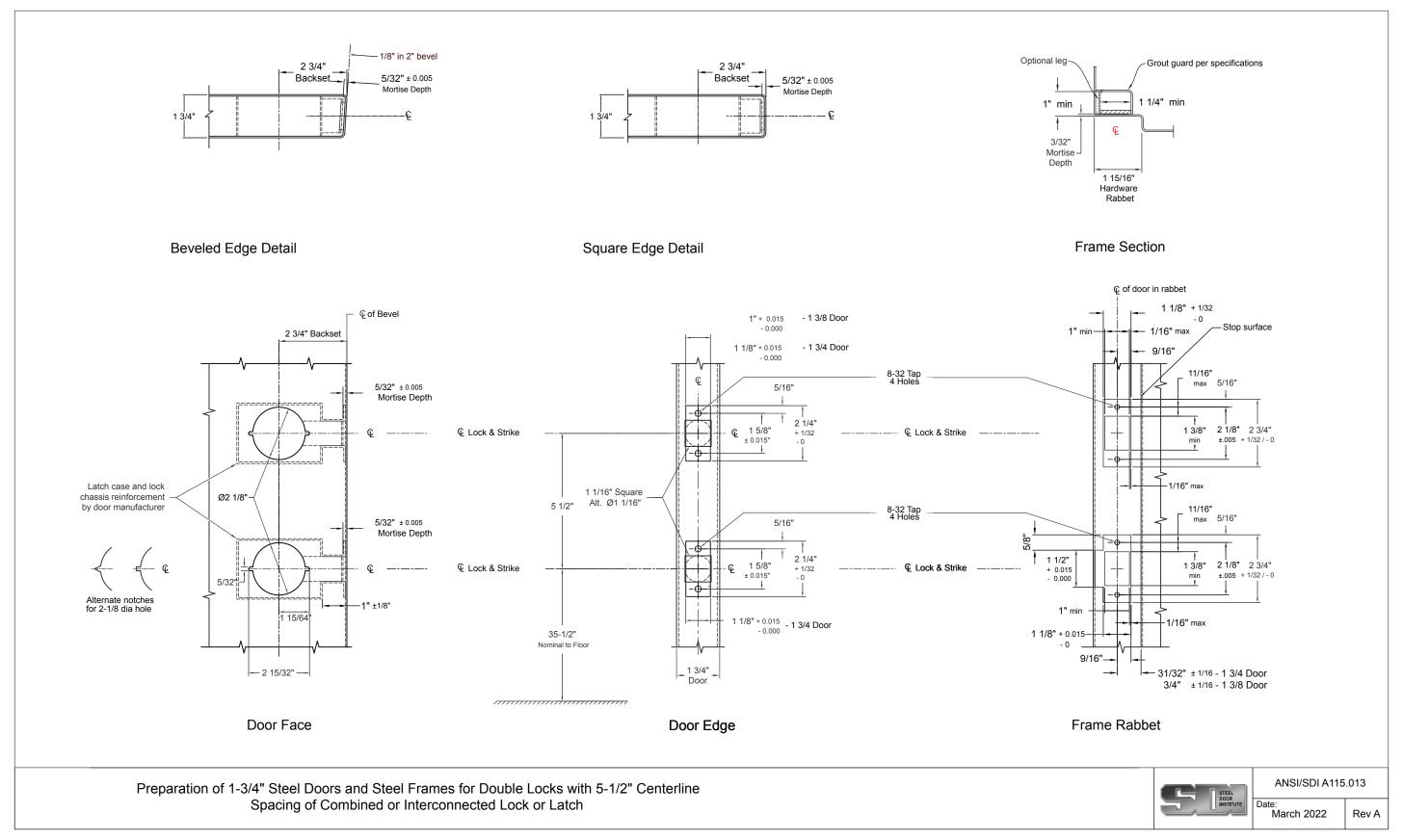


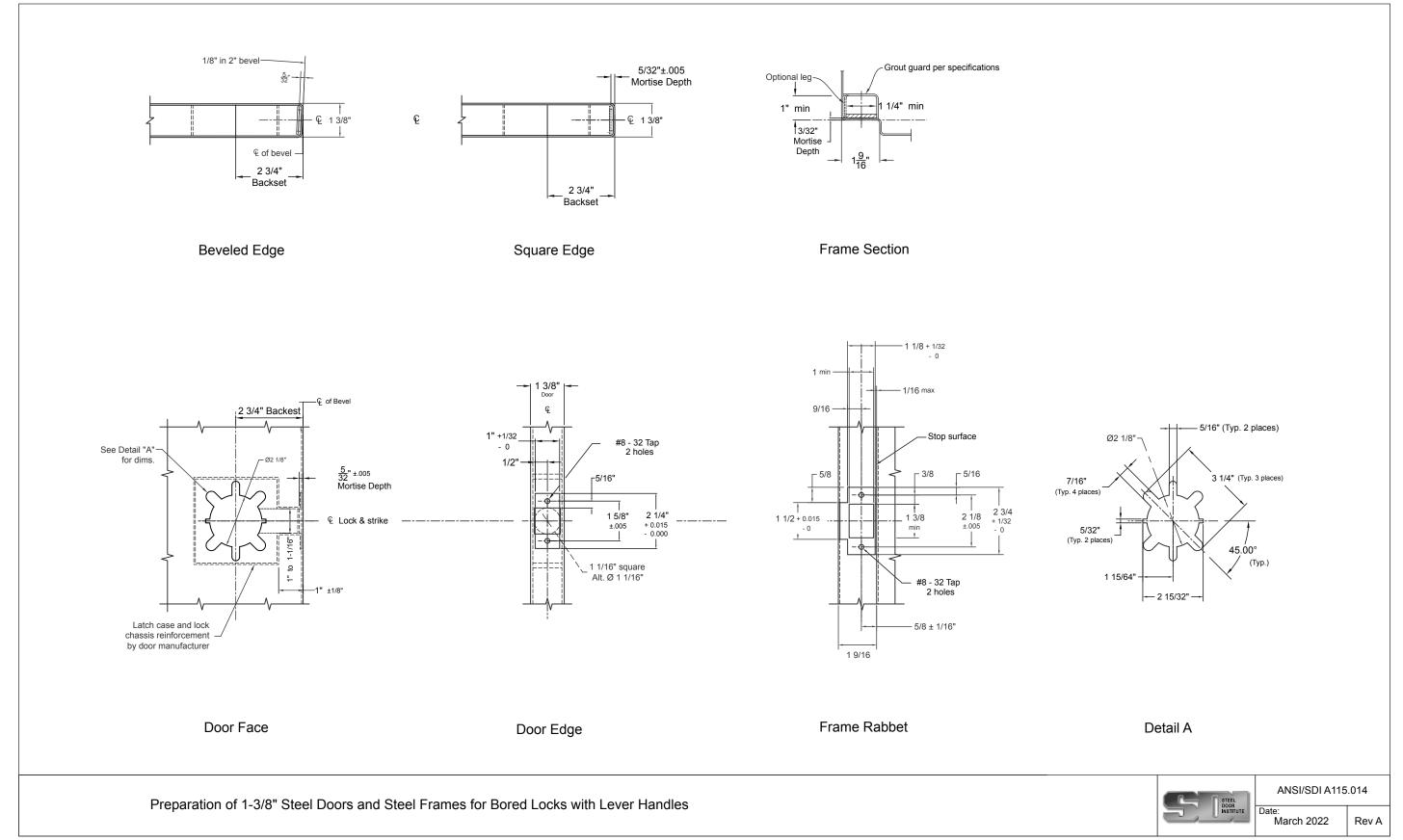


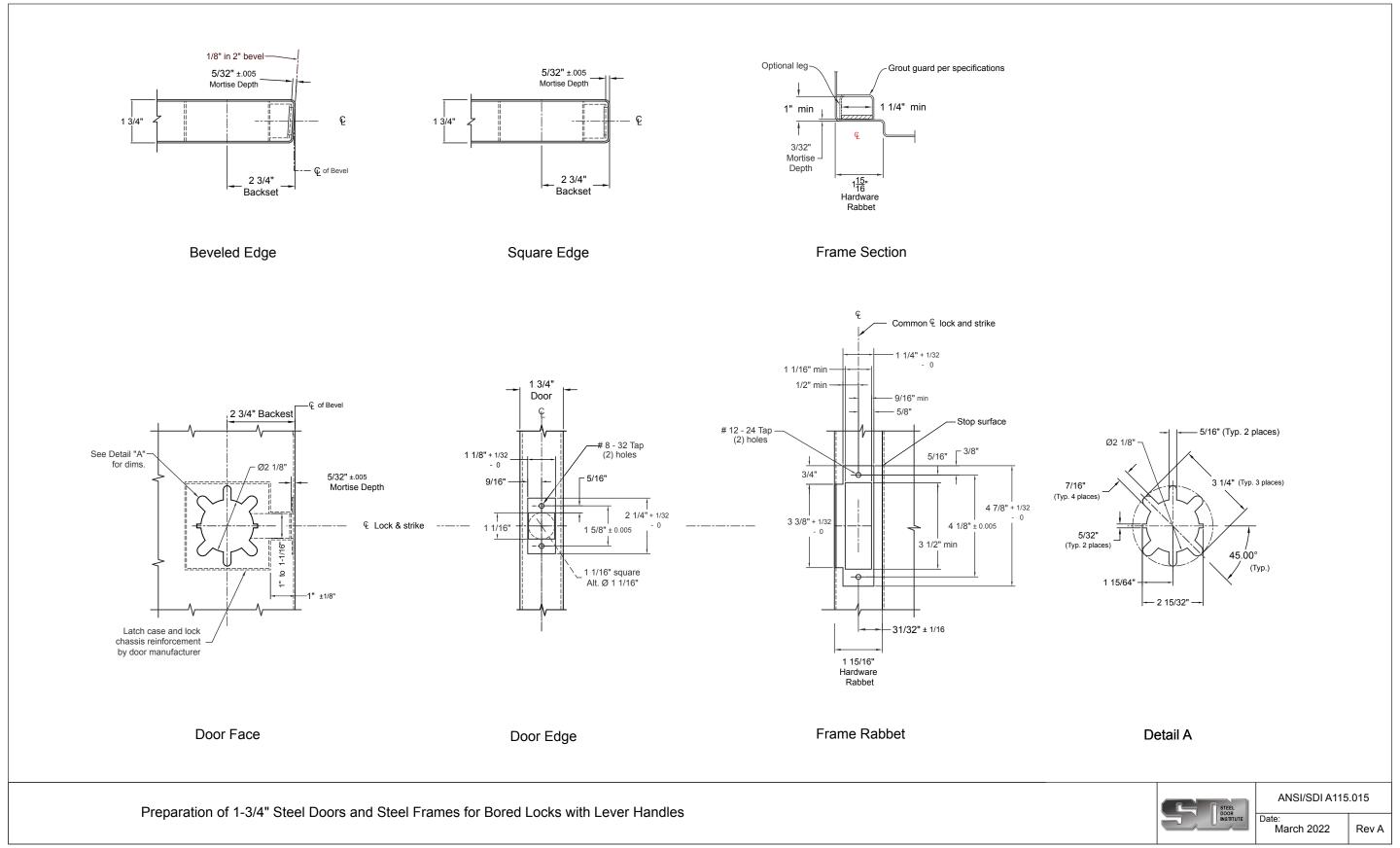


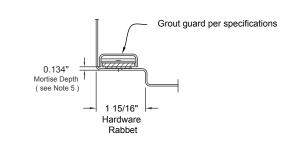


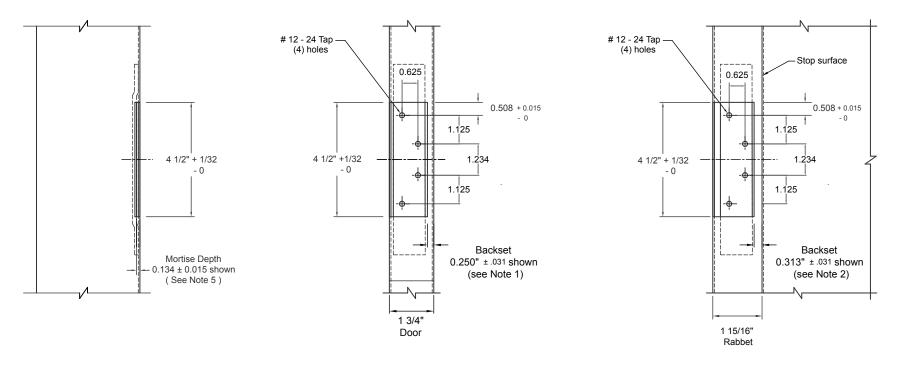












Note 1: The hinge backset on doors varies by manufacturer, from 3/16" to 1/4"

Note 2: The hinge backset on frames varies by manufacturer, from 5/16" to 3/8".

Note 3: Extra holes may be present in the reinforcement for tooling and weld fixturing

Note 4: Manufacturers may offer a removable shim or embossed standoff which allows conversion of a standard weight preparation to a heavy weight butt hinge application.

Note 5: Typical mortise depths are in accordance with ANSI/BHMAA 156.1 as follows:

Standard weight butt hinge: 0.134

Heavy weight butt hinge : 0.180"

Note 6: Tolerance ±0.005" unless otherwise specified.

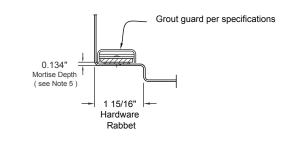
Door Face Door Edge Frame Rabbet Notes

Preparation of 1-3/4" Handed Steel Doors and Steel Frames for 4-1/2" Full Mortise Hinge

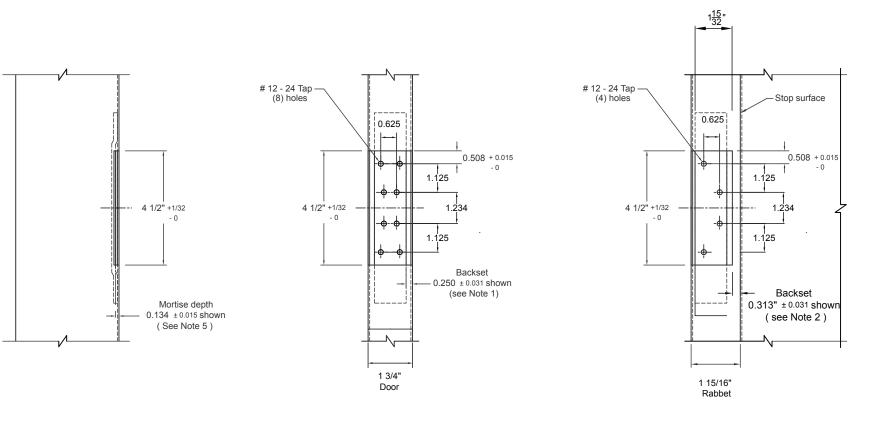


March 2022

2022 Rev A



Frame Rabbet



Door Edge

Note 1: The hinge backset on doors varies by manufacturer, from 3/16" to 1/4"

Note 2: The hinge backset on frames varies by manufacturer, from 5/16" to 3/8".

Note 3: Extra holes may be present in the reinforcement for tooling and weld fixturing

Note 4: A shim with a lip may be used to conceal the edge of the hinge leaf after the desired door handing is selected Manufacturers may offer a removable shim or embossed standoff projection which allows conversion of a standard weight preparation to a heavyweight butt hinge application.

Note 5: Typical mortise depths are in accordance with ANSI/BHMA A 156.1 as follows:

Standard weight butt hinge: 0.134"

Heavy weight butt hinge:

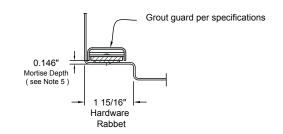
Note 6: Tolerance ± 0.005" unless otherwise specified.

Preparation of 1-3/4" Non-Handed Steel Doors and Steel Frames for 4-1/2" Full Mortise Hinge

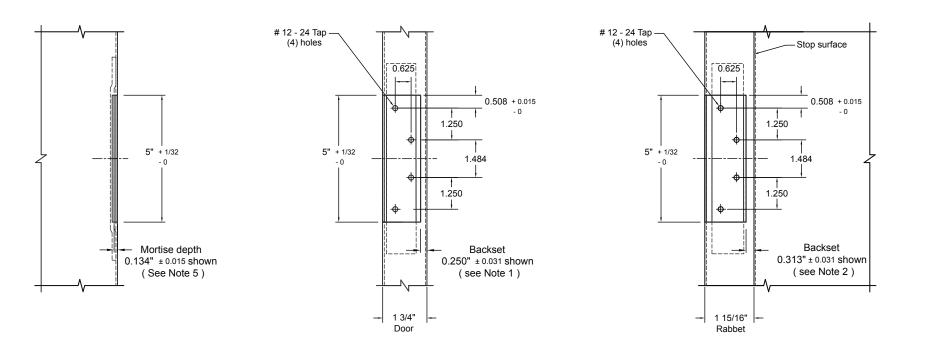


Rev A

Door Face



Frame Rabbet



Door Edge

- Note 1: The hinge backset on doors varies by manufacturer, from 3/16" to 1/4"
- Note 2: The hinge backset on frames varies by manufacturer, from 5/16" to 3/8".
- Note 3: Extra holes may be present in the reinforcement for tooling and weld fixturing.
- Note 4: Manufacturers may offer a removable shim or embossed standoff which allows conversion of a standard weight preparation to a heavy weight butt hinge application.
- Note 5: Typical mortise depths are in accordance with ANSI/BHMA A 156.1 as follows:

Standard weight butt hinge: 0.146"

Heavy weight butt hinge : 0.190"

Note 6: Tolerance ± 0.005" unless otherwise specified.

Notes

Preparation of 1-3/4" Handed Steel Doors and Steel Frames for 5" Full Mortise Hinge

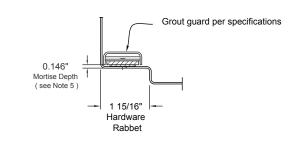


ANSI/SDI A115.018

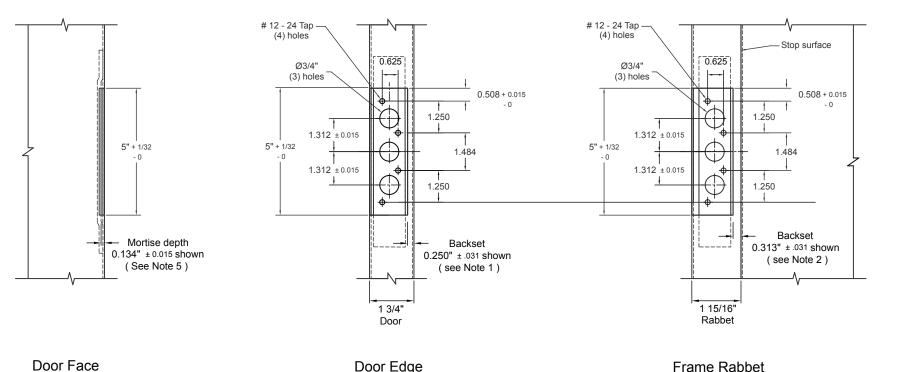
March 2022

22 Rev A

Door Face



Frame Rabbet



Door Edge

- Note 1: The hinge backset on doors varies by manufacturer, from 3/16" to 1/4"
- Note 2: The hinge backset on frames varies by manufacturer, from 5/16" to 3/8".
- Note 3: Extra holes may be present in the reinforcement for tooling and weld fixturing.
- Note 4: Manufacturers may offer a removable shim or embossed standoff which allows conversion of a standard weight preparation to a heavy weight butt hinge application.
- Note 5: Typical mortise depths are in accordance with ANSI/BHMA A 156.1 as follows:

Standard weight butt hinge:

Heavy weight butt hinge:

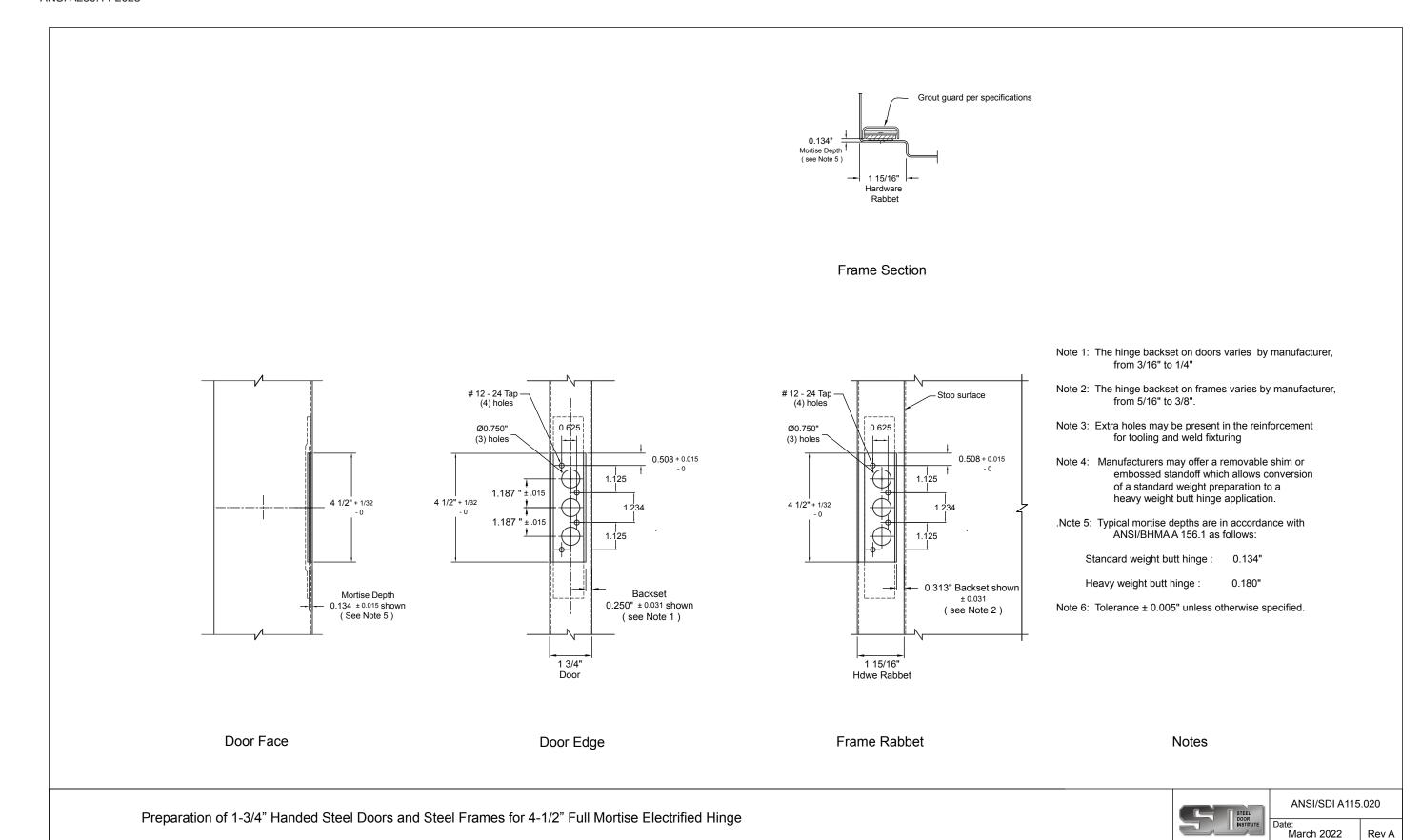
Note 6: Tolerance ± 0.005" unless otherwise specified.

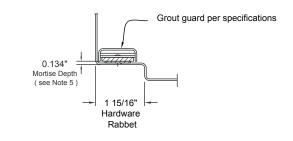
Notes

0.190"

Preparation of 1-3/4" Handed Steel Doors and Steel Frames for 5" Full Mortise Electrified Hinge

ANSI/SDI A115.019





Stop surface

1.125

1.125

Backset

0.313 ± 0.031 shown

(see Note 2)

0.508 + 0.015

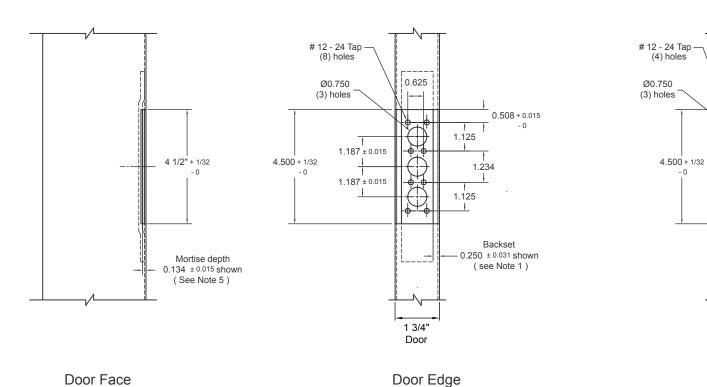
Frame Section

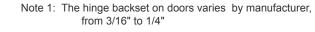
0.625

1 15/16"

Rabbet

Frame Rabbet





- Note 2: The hinge backset on frames varies by manufacturer, from 5/16" to 3/8".
- Note 3: Extra holes may be present in the reinforcement for tooling and weld fixturing
- Note 4: A shim with a lip may be used to conceal the edge of the hinge leaf after the desired door handing is selected Manufacturers may offer a removable shim or embossed standoff projection which allows conversion of a standard weight preparation to a heavyweight butt hinge application.
- Note 5: Typical mortise depths are in accordance with ANSI/BHMA A 156.1 as follows:

Standard weight butt hinge: 0.134"

Heavy weight butt hinge :

Note 6: Tolerance ± 0.005" unless otherwise specified.

Preparation of 1-3/4" Non-Handed Steel Doors and Steel Frames for 4-1/2" Full Mortise Electrified Hinge



March 2022

Rev A

#### **AVAILABLE PUBLICATIONS**

**Specifications** 

ANSI/SDI A250.6 Recommended Practice for Hardware Reinforcing on Standard Steel

Doors and Frames

ANSI/SDI A250.8 Specifications for Standard Steel Doors and Frames (SDI-100)

ANSI/SDI A250.14 Hardware Preparation in Steel Doors and Steel Frames

SDI-108 Recommended Selection & Usage Guide for Standard Steel Doors

SDI-118 Basic Fire Door, Fire Door Frame, Transom/Sidelight Frame, and

Window Frame Requirements

SDI-128 Guidelines for Acoustical Performance of Standard Steel Doors and

Frames

SDI-129 Hinge and Strike Spacing

SDI-133 Guideline for Specifying Steel Doors & Frames for Blast Resistance

SDI-136 Guideline for Specifying Windstorm Products

**Test Procedures** 

ANSI/SDI A250.3 Test Procedure & Acceptance Criteria for Factory Applied Finish

Coatings for Steel Doors and Frames

ANSI/SDI A250.4 Test Procedure & Acceptance Criteria for Physical Endurance for

Steel Doors, Frames and Frame Anchors

ANSI/SDI A250.10 Test Procedure & Acceptance Criteria for Prime Painted Steel

Surfaces for Steel Doors and Frames

ANSI/SDI A250.13 Testing and Rating of Severe Windstorm Resistant Components for

Swinging Door Assemblies for Protection of Building Envelopes (Not applicable for FEMA 320/361 or ICC-500 Shelters)

(Not applicable for 1 EMA 020/001 of 100 300 officiers)

Standard Practice for Determining the Steady-State Thermal Transmittance of Steel Door and Frame Assemblies

SDI-131 Accelerated Physical Endurance Test Procedure for Steel Doors

**Construction Details** 

**SDI-113** 

ANSI/SDI A250.11 Recommended Erection Instructions for Steel Frames

SDI-110 Standard Steel Doors & Frames for Modular Masonry Construction

SDI-111 Recommended Details for Standard Steel Doors, Frames,

Accessories and Related Components

SDI-122 Installation Troubleshooting Guide for Standard Steel Doors & Frames

**Miscellaneous Documents** 

SDI-112 Zinc-Coated (Galvanized/Galvannealed) Standard Steel Doors and

Frames

SDI-117 Manufacturing Tolerances for Standard Steel Doors and Frames

SDI-124 Maintenance of Standard Steel Doors & Frames

SDI-127 Industry Alert Series (A-L)
SDI-130 Electronic Hinge Preparations

SDI-134 Glossary of Terms for Hollow Metal Doors and Frames

SDI-135 Guidelines to Measure for Replacement Doors in Existing Frame

Openings



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