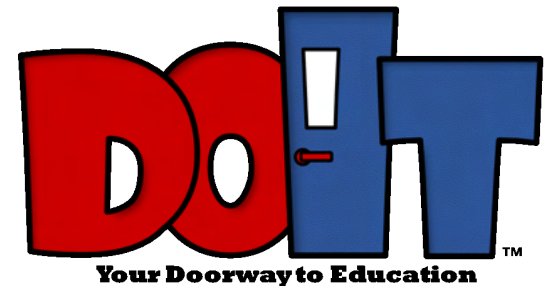


# Don't Touch That Fire Door!

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CAUTIONARY TALES OF ROGUE FIELD MODIFICATIONS



# About Me



Laura Frye Weaver, DAHC, CDC, DHT, DHC, CSI, CDT, CCS, CFDAI, QFDT, QFDI, QDOC



- ✓ Owner/President of the Door Opening Industry Training Group (DOIT).
- ✓ Over 35 years experience in the door and hardware industry.
- ✓ Became a Certified Fire Door Inspector in 2011.
- ✓ Active in building code development.
- ✓ Focus on life safety, bringing awareness and education to the opening industry and the building design, code authority, and facility management communities.

# Learning Objectives:

1. Explain the requirements outlined in NFPA 80 for fire door installations and modifications.
2. Identify common types of unsanctioned field modifications to fire doors and their potential impact on fire safety.
3. Recognize best practices for jobsite preparations according to NFPA 80 guidelines to ensure compliance and maintain fire door integrity.
4. Explore real-world installations and cautionary tales illustrating the consequences of unauthorized fire door modifications.
5. Gain insights into strategies for effective communication and collaboration among stakeholders to prevent rogue field modifications and uphold fire door safety standards.

# Fire Doors - Two Main Purposes

PROTECT PEOPLE



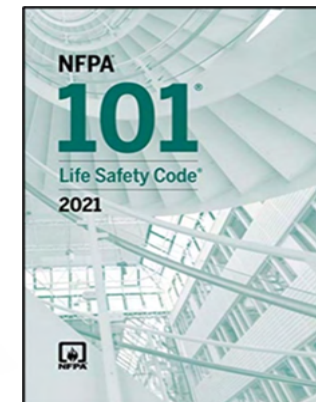
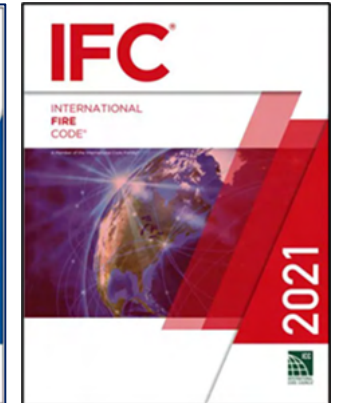
PROTECT PROPERTY





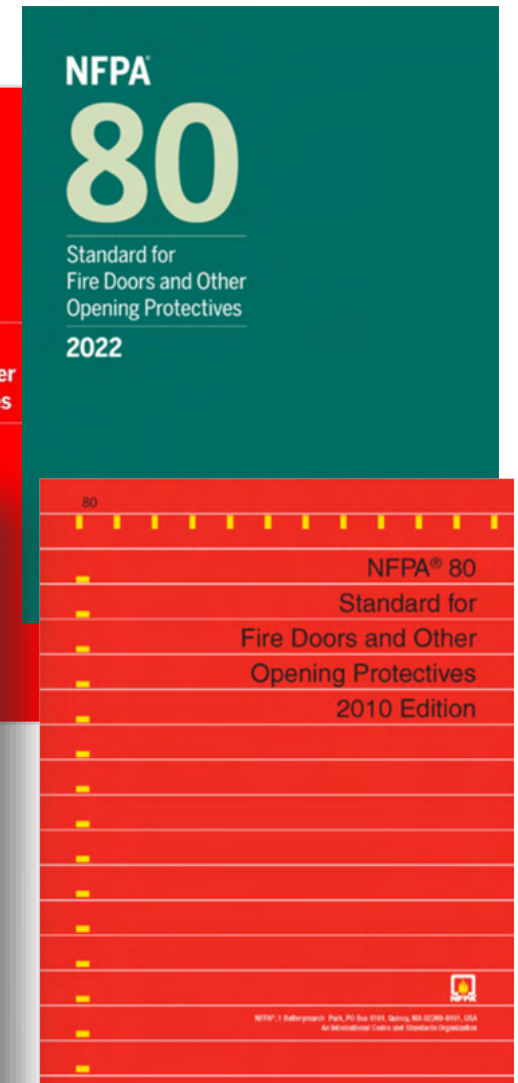
# Code Requirements for Fire Doors

- Compliance with NFPA 80:
  - International Building Code
  - International Fire Code
  - NFPA 101, Life Safety Code
  - NFPA 1, Fire Code
  - State and Local Codes



# NFPA 80 Requirements

- What is allowed to be done at the jobsite?
- What must be done under labeled services?
- What is considered a field modification that requires additional approval?



# Allowable Jobsite Preparations

- Holes for surface applied hardware.
- Function Holes for mortise locks.
- Holes for labeled viewers.
- Maximum 3/4-inch undercut for wood and composite core doors.
- Installation of protection plates.



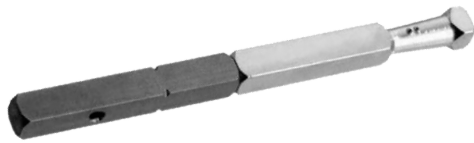
# Holes for Surface Mtd. Hardware

- Surface Vertical Rod and Rim Fire Exit Hardware
- Surface Trim for Locks and Latches
- Surface Door Closers
- Surface Automatic Operators
- Door Coordinators
- Surface Applied Gasketing



# Holes for Surface Mtd. Hardware

- Must only drill ROUND HOLES.
- Should be no greater than 1" in diameter (other than cylinder holes).
- To accommodate:
  - Cylinders
  - Spindles
  - Similar Operational Elements (thumbturns, indicators, emergency release)
  - Electrified Hardware (for thru wires)
  - Through-bolts in Doors





# Holes Exceeding 1" Diameter



Permitted when installed in accordance with BOTH:

- Door and/or Frame Manufacturers Listing
- Hardware Manufacturers Listing

Added in 2016



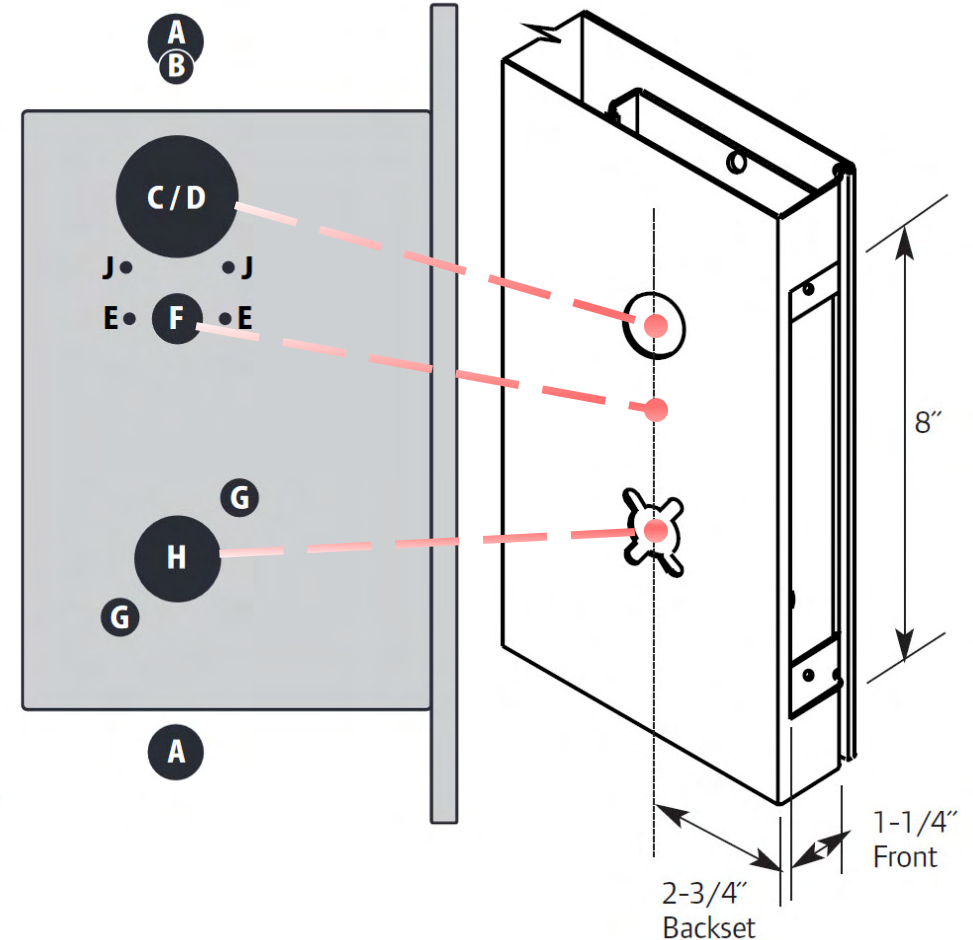


# Function Holes for Mortise Locks

Different lock functions require different hole configurations.

Holes by Function	Functions																	
	A, D, R, RHB, B5		AB, AT, B, BA, BW, HJ, T, TA, TD		AD		C, CHB, G, IND, INL, S, W, B7		H		L, LB, LT		N, NX		RD, WD		YD	
Holes to drill	I/S	O/S	I/S	O/S	I/S	O/S	I/S	O/S	I/S	O/S	I/S	O/S	I/S	O/S	I/S	O/S	I/S	O/S
<b>A</b> M & N forged trim (2 holes) <sup>†</sup>	Through door		Through door		Through door		Through door		Through door		Through door		Through door		Through door		Through door	
<b>B</b> J trim <sup>†</sup>	Through door		Through door				Through door		Through door		Through door		Through door					
<b>C</b> Standard cylinder or <b>D</b> High security cylinder <sup>‡</sup>		■		■		■	■	■		■					■	■		■
<b>E</b> H, R & S trim thumb turn mounting screw (2 holes) <sup>†</sup>				■		■			■		■							
<b>F</b> Emergency key / thumb turn access				■		■			■	■	■	■						
<b>G</b> Trim mounting (2 holes) <sup>††</sup>	■	■	■	■			■	■	■	■	■	■	■	■				
<b>H</b> Lever <sup>††</sup>	■	■	■	■			■	■	■	■	■	■	■	■				
<b>J</b> H & R trim visual indicator mounting screw (2 holes) <sup>†</sup>										■								

† Determine trim holes based on trim type.  
 ‡ To qualify for the UL 437 high security listing, use the M escutcheon and the 1E7J4 cylinder. The 1E7K4 cylinder is available for use with either M trim or sectional trim, but does not qualify for the UL437 high security listing. This option is not available for H and HJ function locks.  
 †† Because these holes pass through the mortise pocket, it is recommended that each hole be drilled separately rather than straight through.







# Holes for Labeled Viewers

- Not all viewers are labeled.



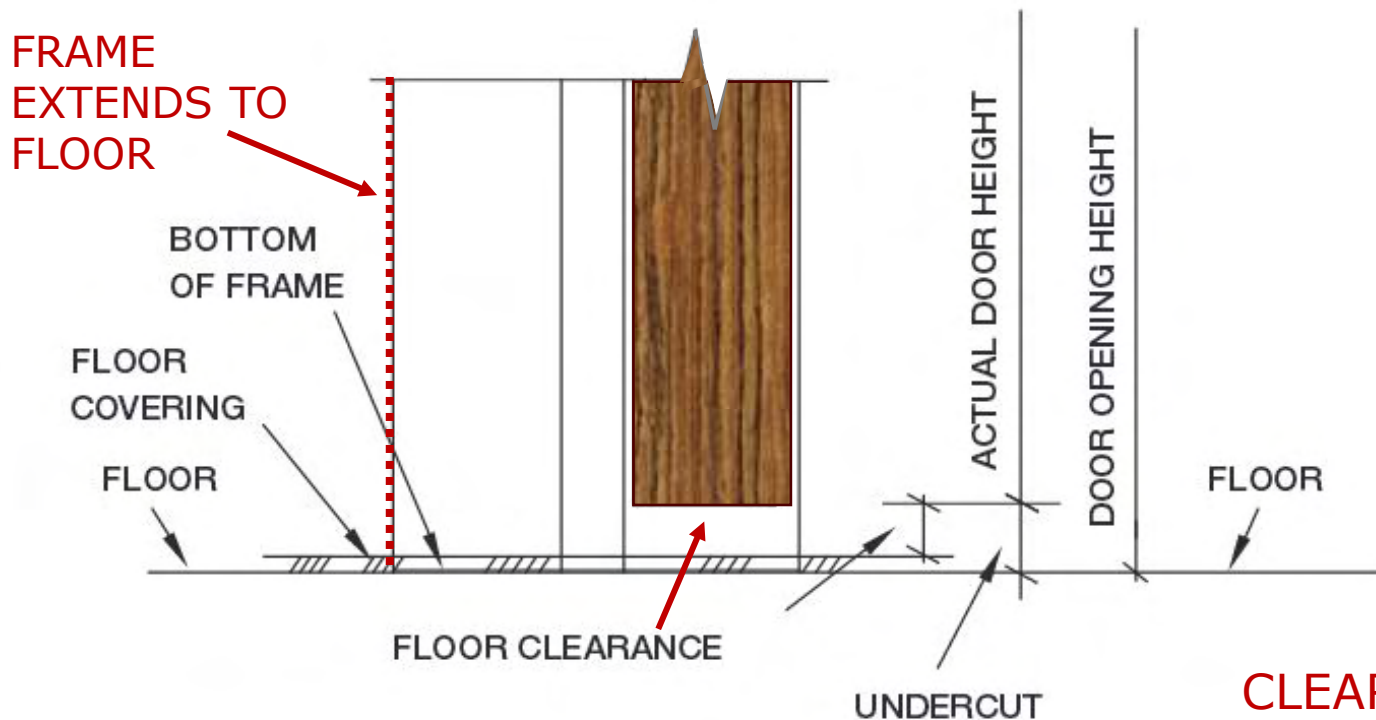
Beware of non-rated  
Knocker/Viewer Combinations





# Maximum 3/4" Undercut

- Wood and Composite Doors



**CLEARANCE** = The distance between the bottom of the door and the top of the material directly below the door.

**UNDERCUT** = The distance between the bottom of the door and the bottom of the frame.

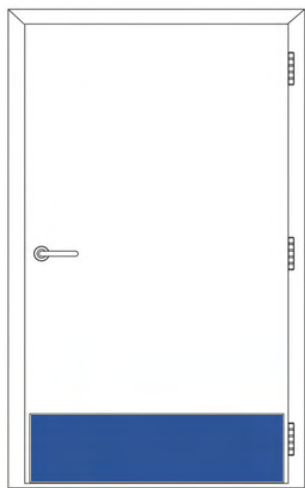
**CLEARANCE ALLOWED UNDER THE BOTTOM OF A FIRE DOOR = 3/4 IN. MAX.**

Image extracted from HMMA-810 TN01-03 Document Defining Undercuts

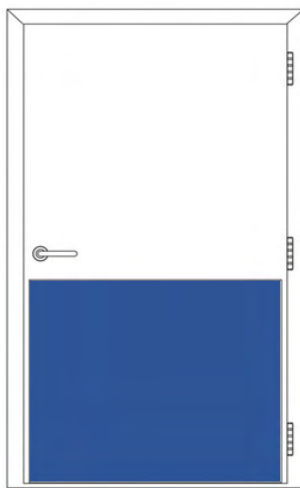


# Installation of Protection Plates

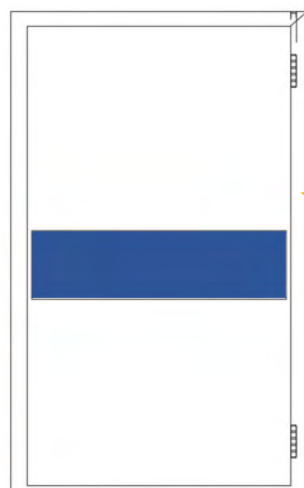
- Field-installed protection plates must be labeled and installed according to the listing of both the protection plate manufacturer and the door manufacturer.
- No label is required when mounted not more than 16" above the bottom of the door.



Kick



Armor

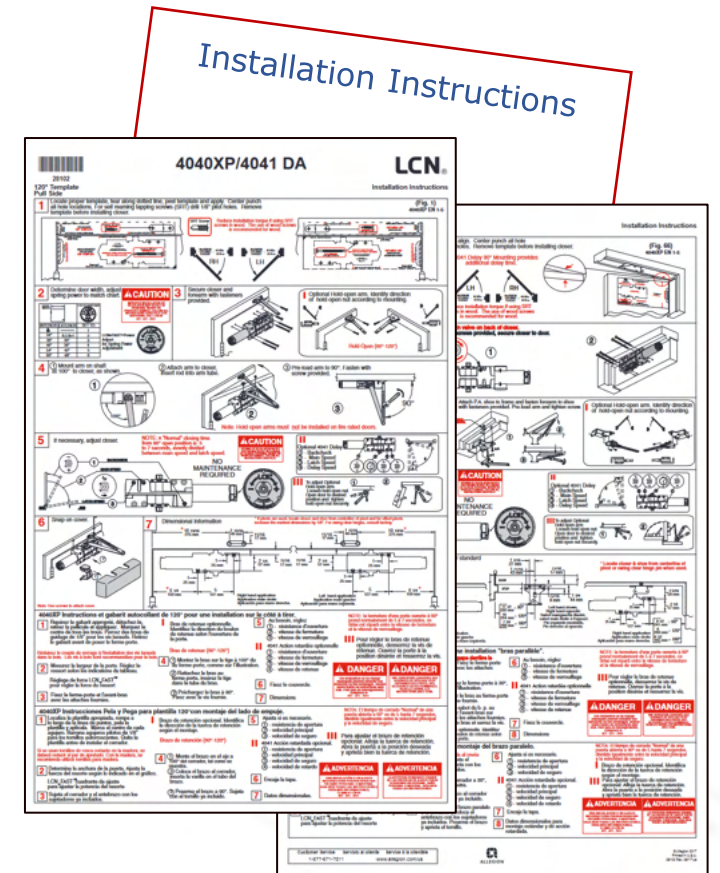
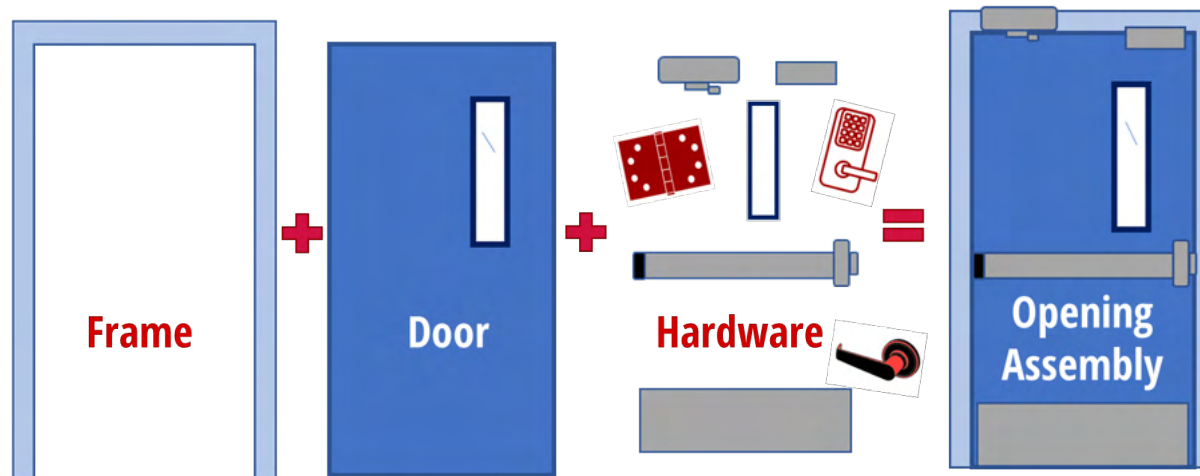


Stretcher



# Component Installation

- MUST BE INSTALLED:
  - In accordance with the manufacturer's instructions.
  - To function as indicated in the individual manufacturer listing.
  - With the manufacturer's provided fasteners as tested and listed.





# Not Allowed at the Jobsite

- Preparation of Fire Doors for:
  - Hinges
  - Locks and Latches
  - Remotely Operated or Remotely Monitored Hardware
  - Concealed Closers
  - Glass Lights and Vision Panels
  - Louvers
  - Astragals and Split Astragals
  - Application of Plant-Ons and Laminate Overlays

**MUST BE DONE** in accordance with the manufacturer's inspection service procedure and under label service.



# Label Service

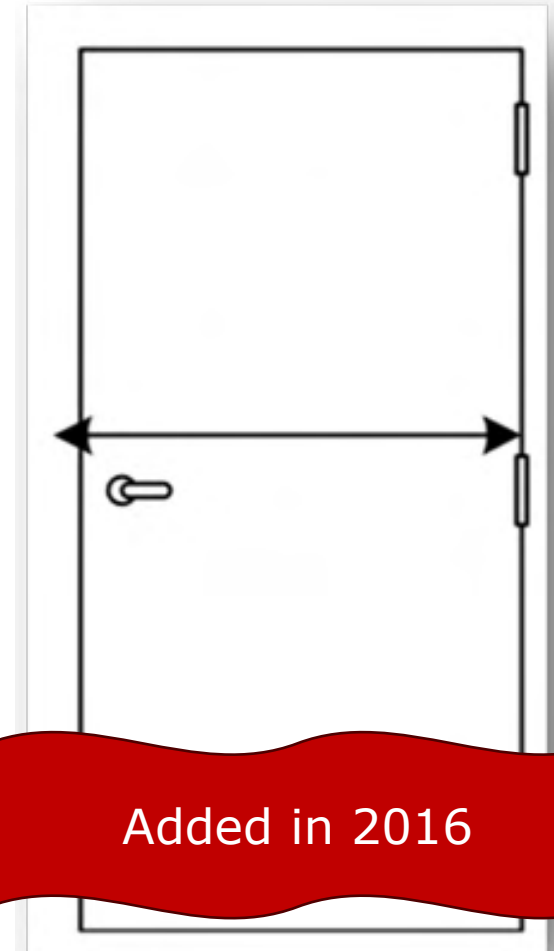
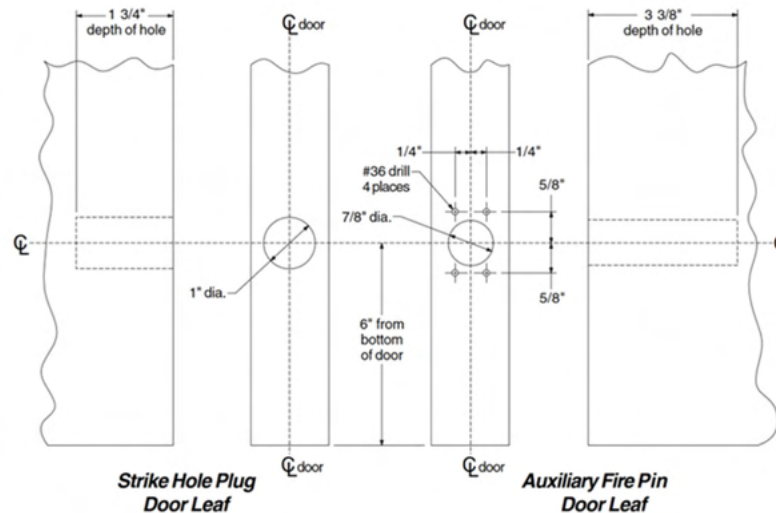
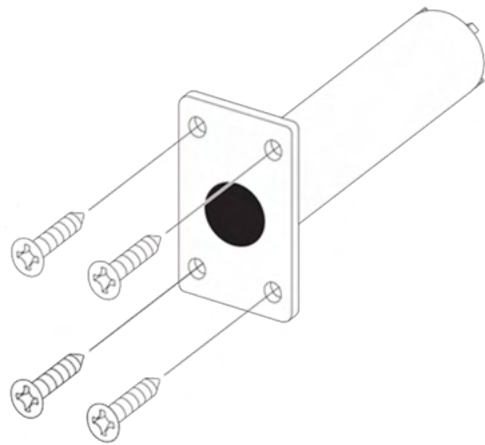
A program administered by a listing agency (like UL, Intertek/Warnock Hersey, QAI, FM) that enables a business entity under license to manufacture or further process and label products.

*The contractual agreement between the listing agency and business entity prescribes the parameters under which label service can be performed. The business entity's facility and process are subject to periodic audits by the listing agency.*



# ? Drilling Raceways (May be Allowed)

- For Wires or Fire Pins:
  - Allowed in accordance with door manufacturer's listing and when permitted by the laboratory with which the door is listed.
  - If there are no provisions for jobsite drilling, then raceways are considered a "FIELD MODIFICATION".



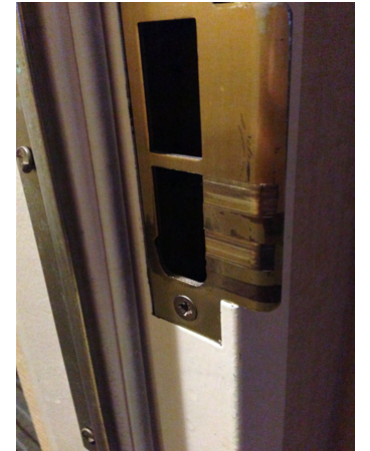
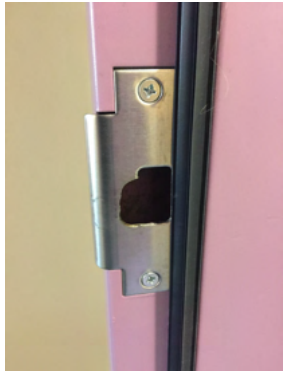
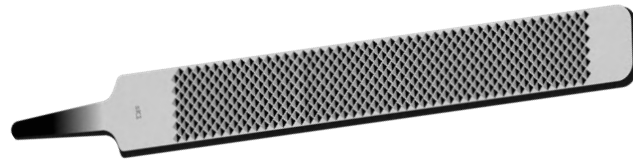


# Common Modifications

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ROGUE OR OTHERWISE...

# Filing Strikes





# Cutting In - Electric Strikes



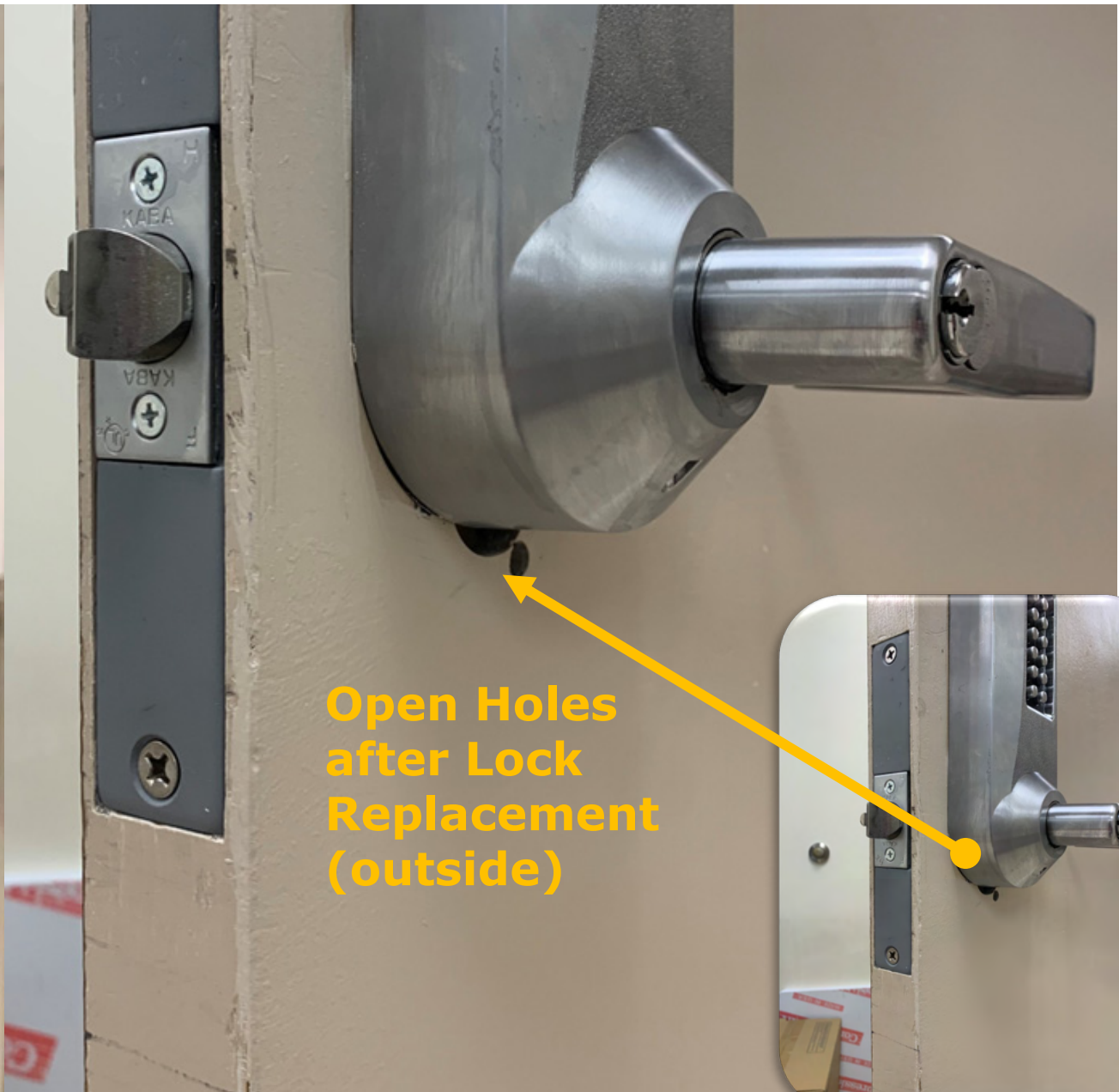


# Removal of Strikes and Other Components





**Open Holes  
after Lock  
Replacement  
(inside)**

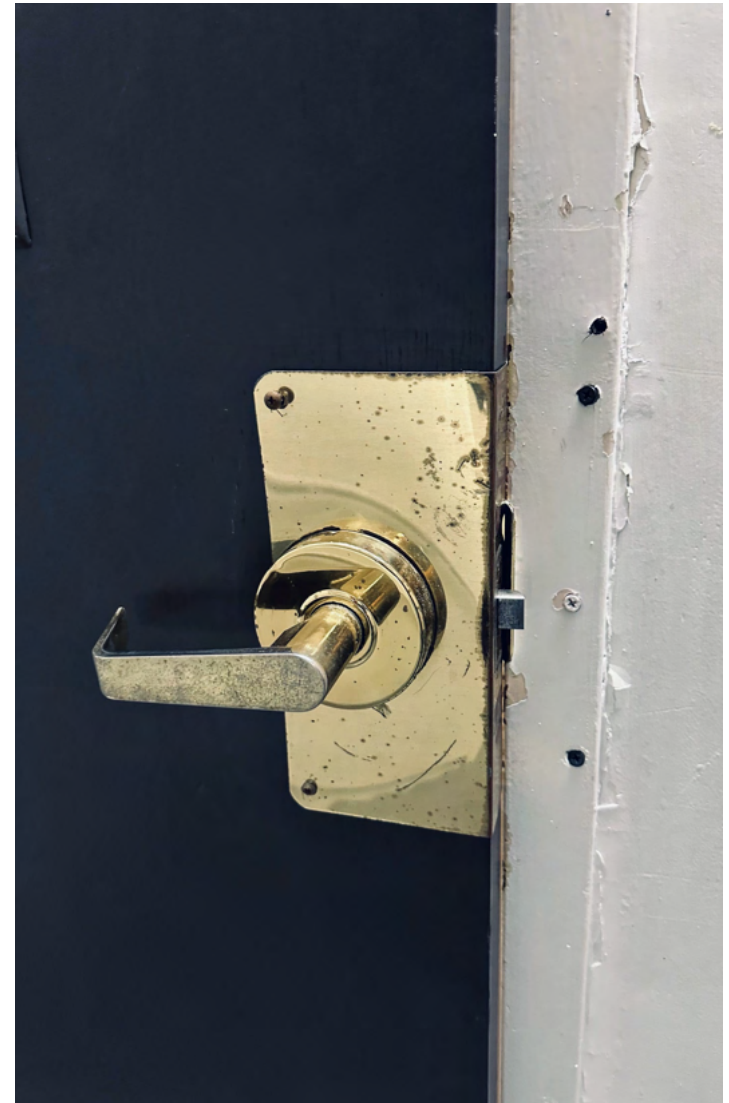


**Open Holes  
after Lock  
Replacement  
(outside)**





# Non Rated Wrap Plate Installation





# Installing Kickdown Stops





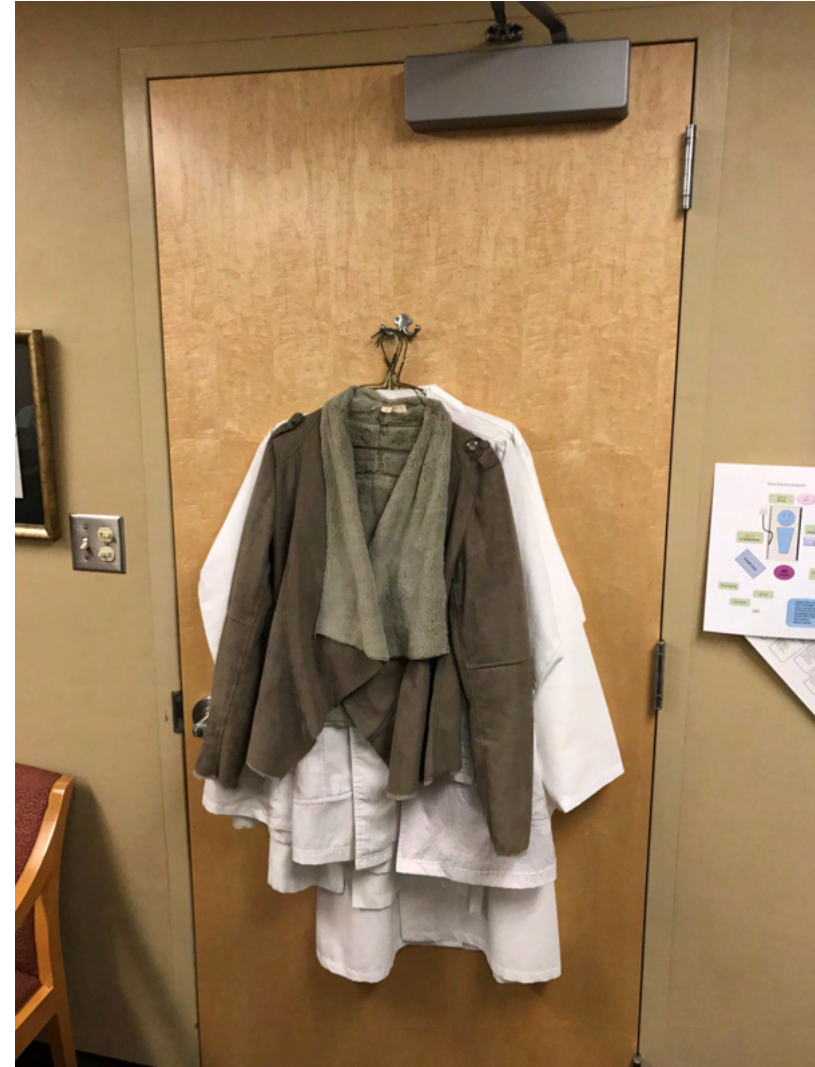


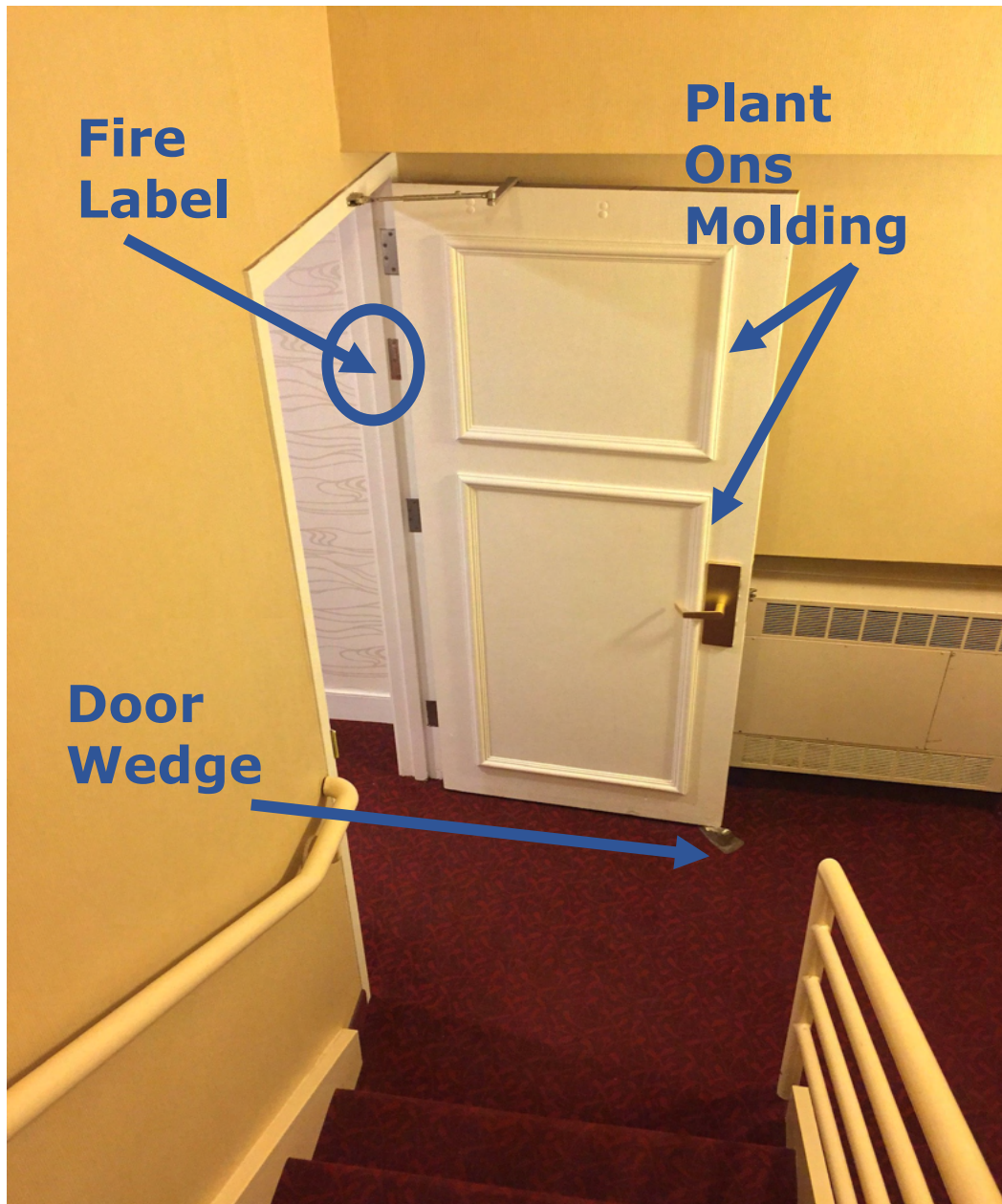
# Modified Magnetic Wall Holder Extensions





# Installation of Coat Hooks





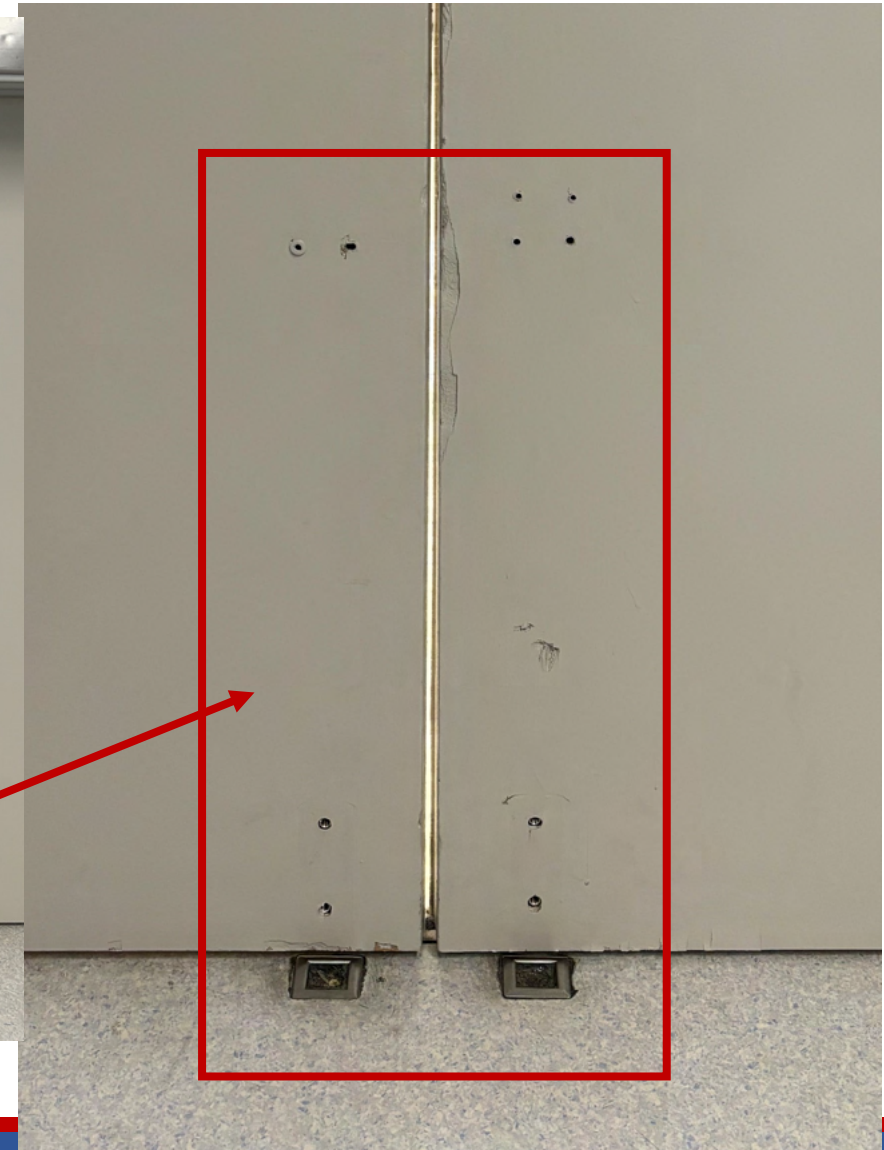
# Addition of Plant-Ons (and Overlays)

Plant-On = A decorative trim applied to the surface of a door.

- Project from the door surface.
- Flat or contoured.
- Made of metal, wood, plastic, etc.
- Attached by adhesive, screws, nails.
- Must be attached per manufacturer's listing instructions.



# Bottom Rod Removal



Less Bottom Rod

Photo Courtesy of Darren Cheatham





**Photo Courtesy of Rodney Weaver**



# Field Modifications

- When a field modification to a fire door or fire door assembly in the field is needed:
  - Contact the manufacturer of the component being modified.
  - The manufacturer will provide a written or graphic description of the modification to the listing laboratory for approval.
  - The laboratory can approve or disallow the modification.
  - If the manufacturer is no longer in business, contact the laboratory directly for an engineering evaluation.

**MUST BE APPROVED IN ADVANCE.**

**MAY BE ABLE TO BE DONE WITHOUT RELABELING.**



# Field Modifications Gone Rogue



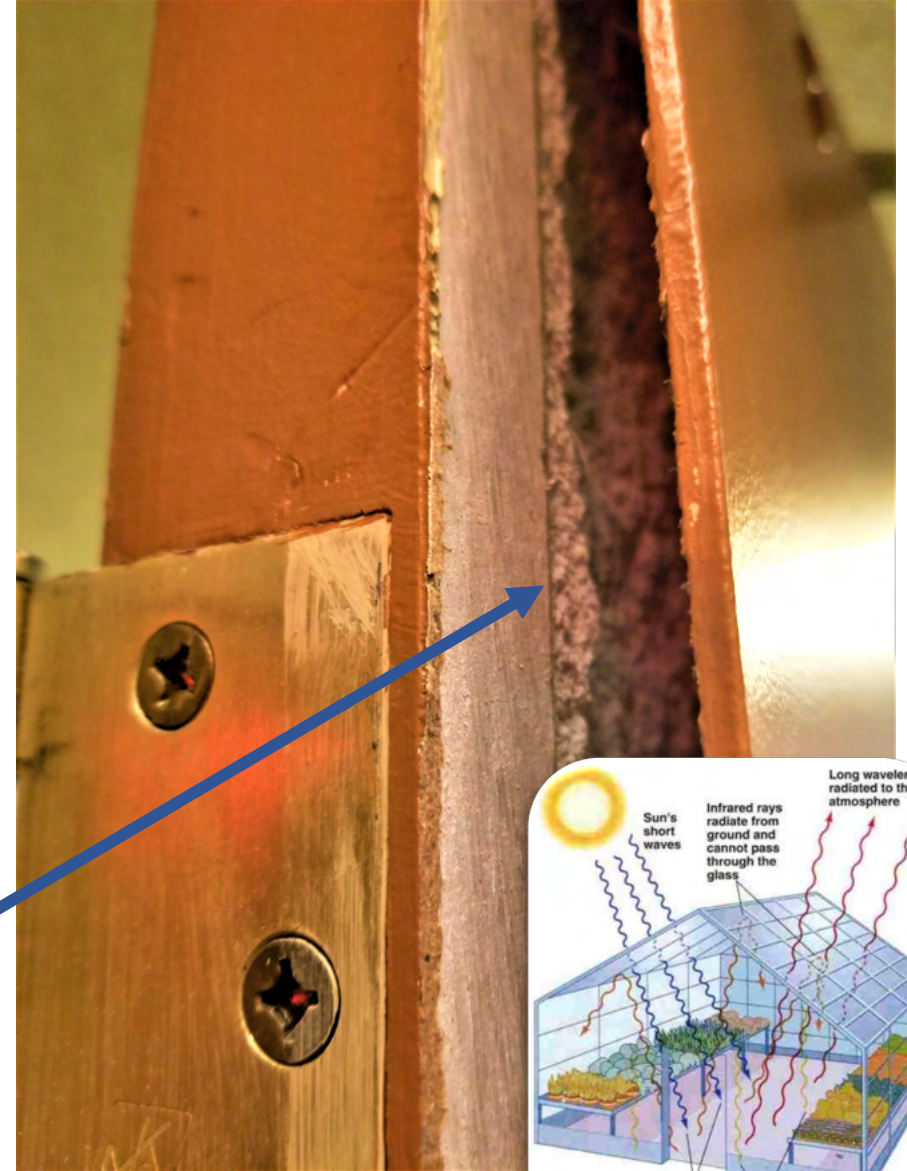
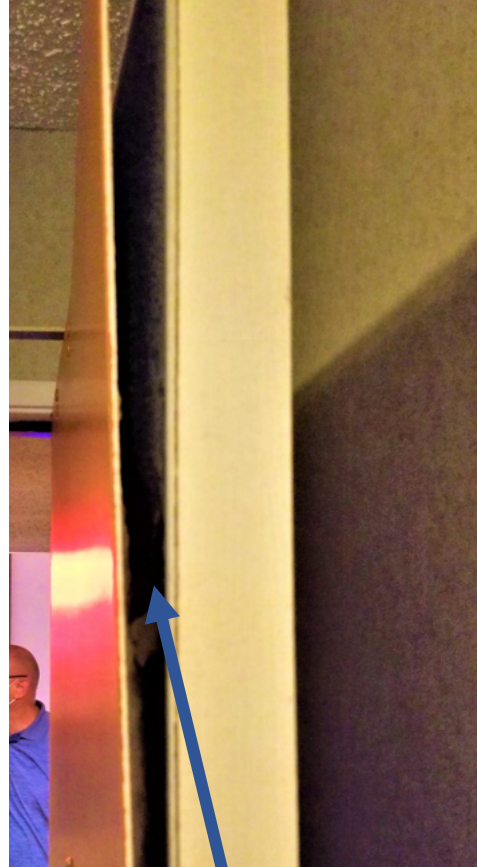
**Door  
Core  
Material**



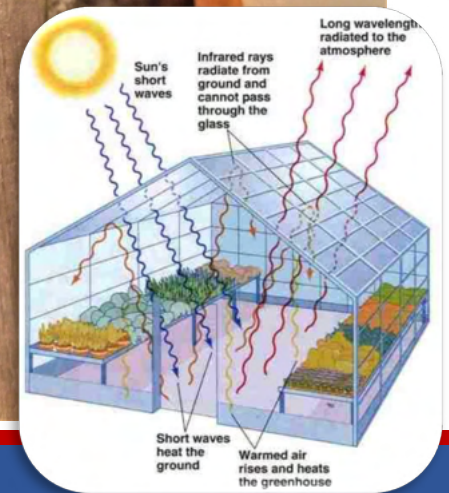
**Photo Courtesy of Wally Berry**



# Photos Courtesy of Wally Berry



**Face  
Delamination  
Exposing  
Door Core**







**Fire Door  
Clad in  
Wood**



**Photos Courtesy of Russ Hooker**



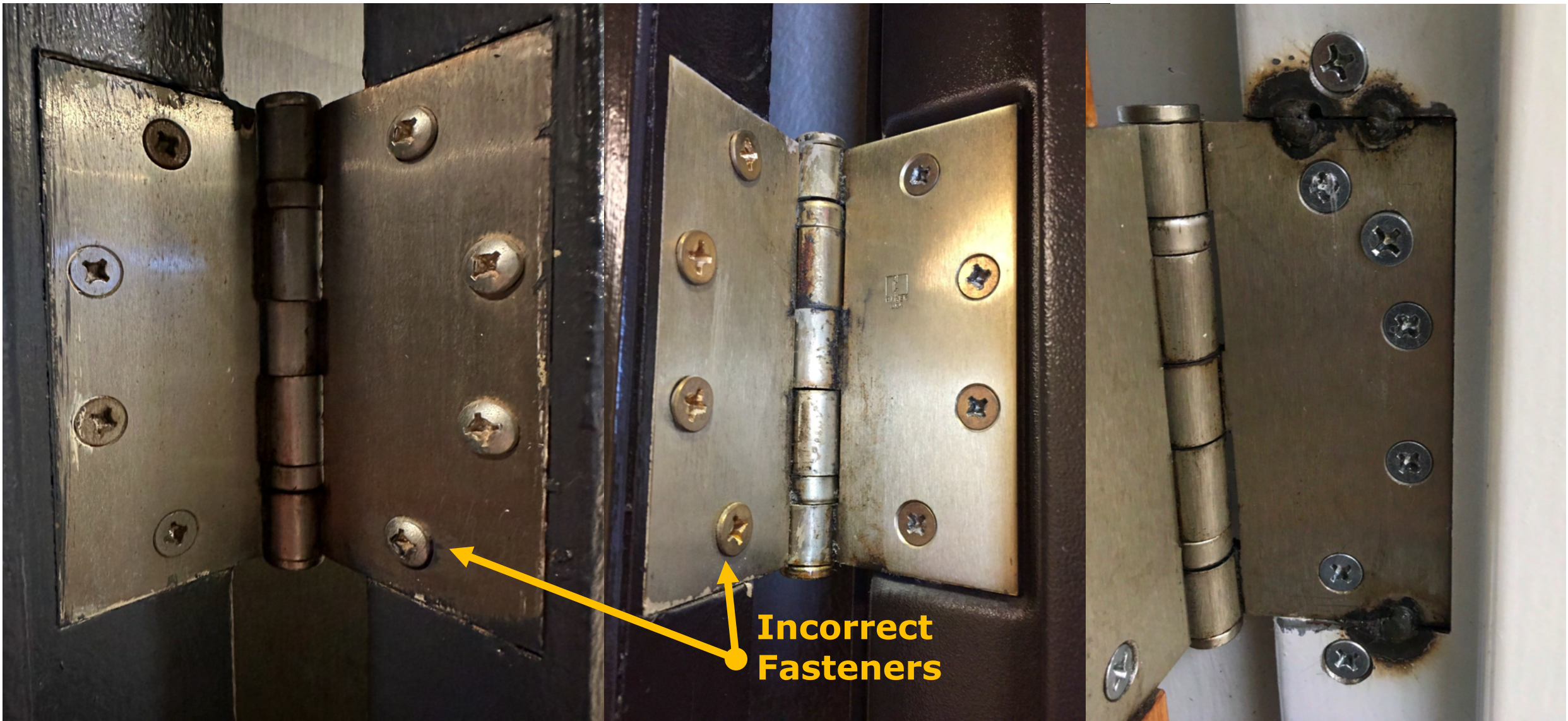




**6.4.3.4 Shimming.** When required to meet the clearances stated in 6.3.1.7, the shimming of hinges using steel shims shall be permitted.







**Incorrect  
Fasteners**

**Photo Courtesy of Paul Anderson**

# Prepping for Hinges Not Allowed



**Cutting in or  
modifying  
hinge  
preparations**

**Photos Courtesy of Darren Cheatham**



# Modifying Hinges Not Allowed



**Cutting Hinge to Reveal Fire Label**





# Prepping for Locks/Latches Not Allowed





# Cutting In - Lite Kits – Not Allowed

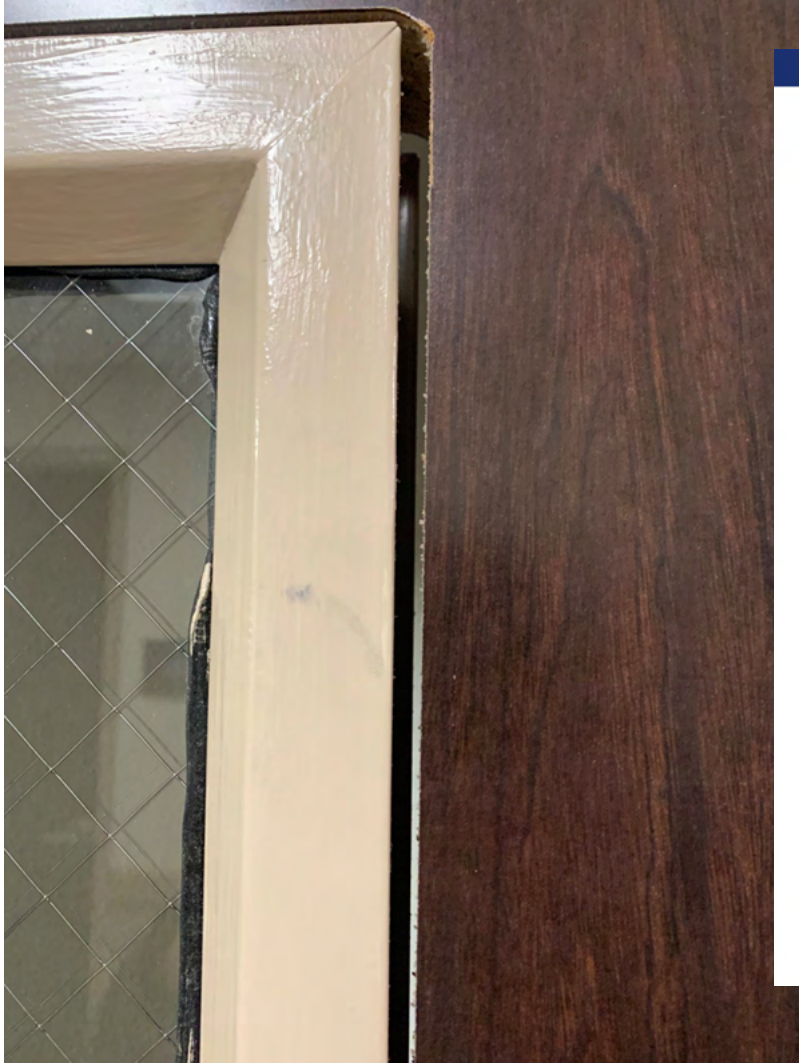


Photo Courtesy of Darren Cheatham

**INSTALLATION INSTRUCTIONS FOR VISION LITE KITS**  
UL LABELED PRODUCTS ONLY

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**Installation Instructions for Models VSL (Slimline), VSIG, Frames**  
**UL10B or UL10C Positive Pressure:**

1. Read and follow the installation requirements of the door manufacturers.
2. Cut the hole in the door to correspond to the order size of the vision frame. Assume that the opening is plumb and square.
3. Prepare the cutout if required, per the door manufacturers installation instructions.
4. Carefully inspect the glass edges. Superficial chips smaller than 5/32" (4mm) are acceptable, however, deeper chips (with V profile) are not acceptable and should not be installed.
5. Install glazing tape or frame and/or glass per instructions below.
  - a. **UL10B:** Installation apply 1/16" glazing tape to glass on both sides
  - b. **UL10C for VSL (Slimline), 20-minute Wood Doors:** Use 1/8" thick glazing tape; tighten vision kit screws to 25 inch-pounds of torque. Intumescent glazing tape is not required.
  - c. **UL10C for VSL (Slimline) Non-20-Minute Doors:** Apply intumescent tape in addition to 1/16" thick glazing tape, as shown in diagrams.
  - d. **UL10C for VSIG:** Apply intumescent glazing tape, in addition to 1/16" thick glazing tape, as shown in diagrams.
6. Insert the corridor side frame in the cutout, squaring to door.
7. Insert glass into frame, seating firmly, using setting blocks as needed. Install so that the appropriate or (UL) markings on the glass remain permanently visible.
8. Inserting 2 of the screws provided in the countersunk holes, carefully align the room side of the frame to the holes in the corridor side of the frame. Screw in enough to hold frame in place for alignment, then insert the other screws lightly. Tighten the screws alternately in a criss-cross pattern to avoid putting more pressure on one side than the other. Do not tighten to the point of deflecting the frame.

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**Installation Instructions for Models VLF, VLFIG, VLF Shapes, VLFEZ & VLFEZIG Frames**  
**UL10B or UL10C Positive Pressure:**

1. Read and follow the installation requirements of the door manufacturers.
2. Cut the hole in the door to correspond to the order size of the vision frame. Assume that the opening is plumb and square.
3. Prepare the cutout if required, per the door manufacturers installation instructions. For UL compliance in 3 hour applications the vision kit opening must be channeled prior to vision kit installation.
4. **VLF Only:** Using the vision frame mounting hole as a template, drill holes in the door for the thru-bolt.
5. Carefully inspect the glass edges. Superficial chips smaller than 5/32" (4mm) are acceptable, however, deeper chips (with V profile) are not acceptable and should not be installed.
6. Install tape or to frame and or glass per instructions below.
  - a. **UL10B:** Installation apply 1/16" glazing tape to glass on both sides
  - b. **UL10C:** Apply intumescent glazing tape, in addition to 1/16" thick glazing tape, as shown in diagrams.
7. Insert the corridor side frame in the cutout, squaring to door.
8. Insert glass into frame, seating firmly, using setting blocks as needed. Install so that the appropriate or (UL) markings on the glass remain permanently visible.
9. Inserting 2 of the screws provided in the countersunk holes, carefully align the room side of the frame to the holes in the corridor side of the frame. Screw in enough to hold frame in place for alignment, then insert the other screws lightly. Tighten the screws alternately in criss-cross pattern to avoid putting more pressure on one side than the other. Do not tighten to the point of deflecting the frame.

---- UL Installations Only | See Other Side for Warnock Hersey Instructions ----

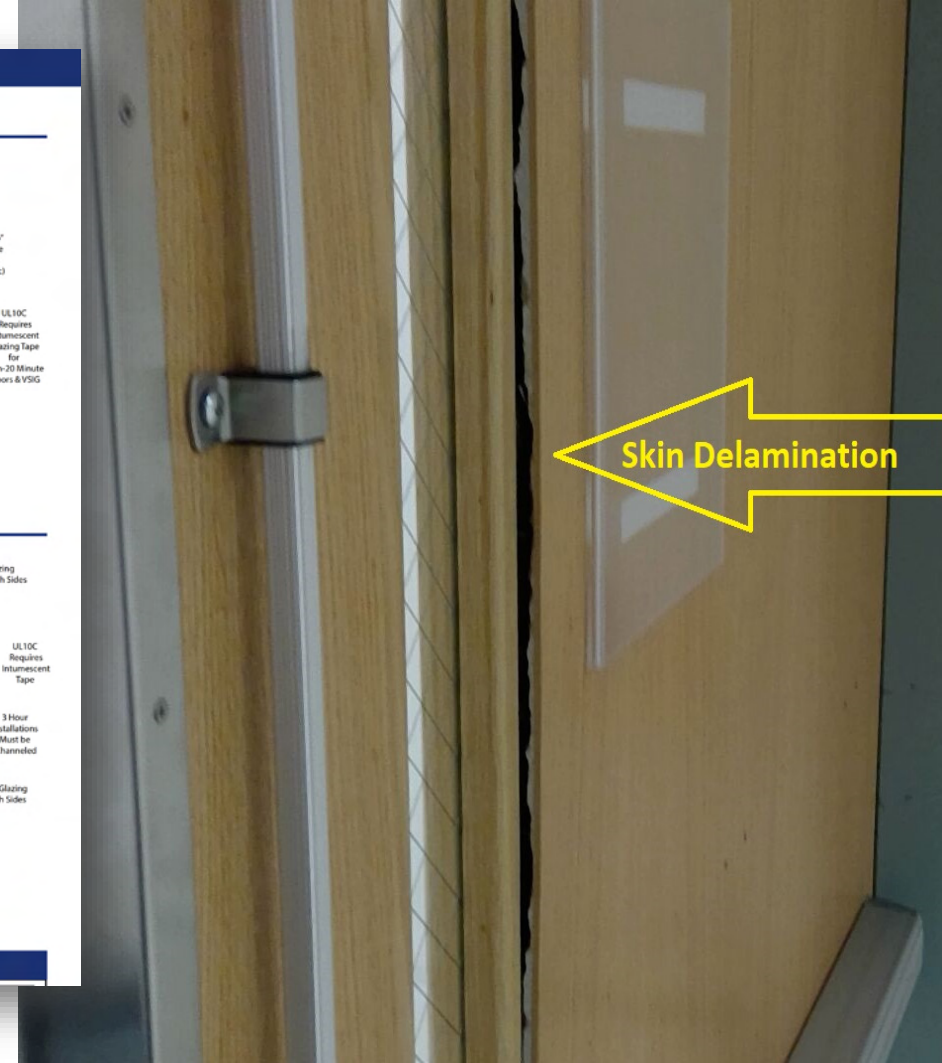


Photo Courtesy of Paul Anderson

# Field Labeling

Field labeling shall be performed by the listing agency that maintains periodic inspections of production of the labeled equipment or materials under review and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.





# Field Labeling

Field modifications to a non-fire-rated door assembly to make it fire-rated are NOT PERMITTED unless the field modification is completed under label services.

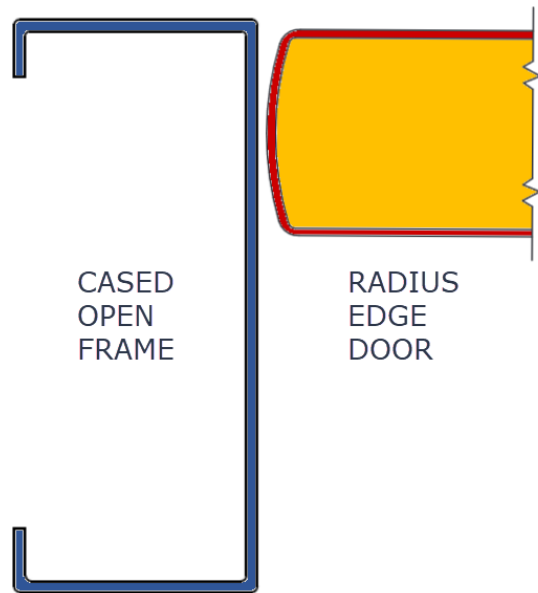


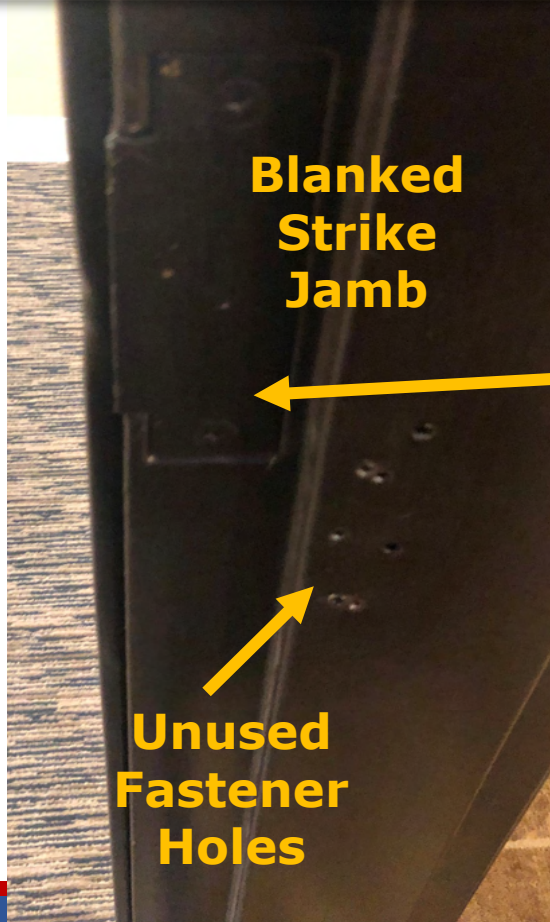
Photo Courtesy of Russ Hooker

# Don't Ignore Rogue Stairwells

- Stairwells are one of the most essential features for surviving a building fire.
- Enclosed fire-rated stairwells protect from fire and smoke for evacuation and staging until firefighters can assist in vertical evacuation.







**Blanked  
Strike  
Jamb**

**Unused  
Fastener  
Holes**



**"No  
Positive  
Latching"**



**Modified  
Operable  
Hardware.  
No Latchbolt  
Installed.**

**Fire doors  
shall close  
and latch**





**Excessive Gapping**



**"No Positive Latching"**



**Latchbolt Removed**



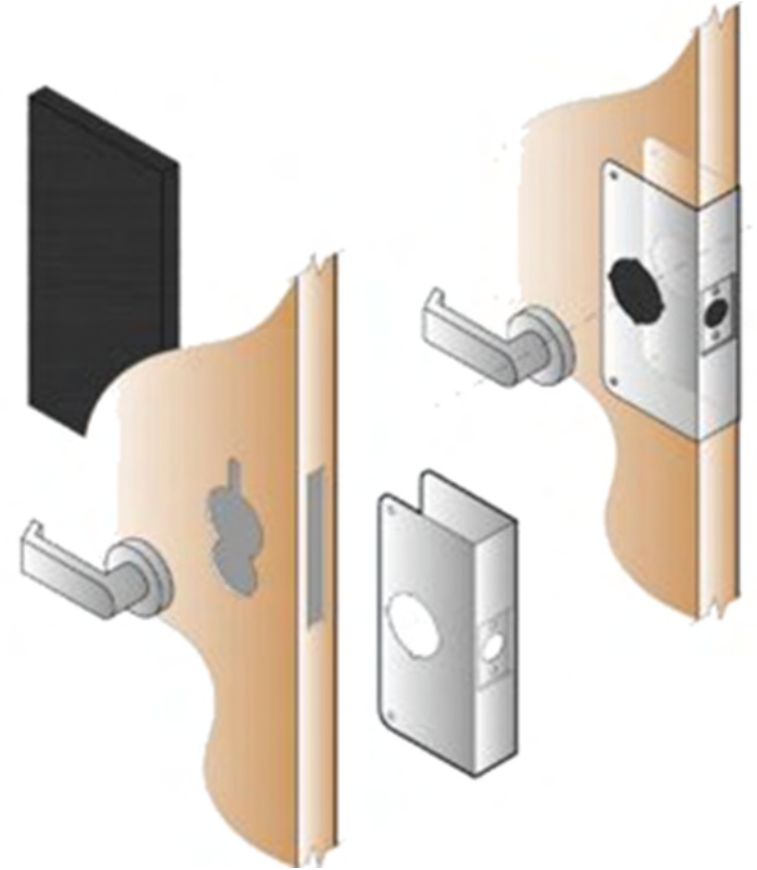


# Back to Compliance Solutions

- NFPA 80 does not prohibit the development of new, modified, or improved devices that meet the standard's intent.
- Manufacturers play a crucial role in ensuring the continued effectiveness of NFPA 80. They are responsible for supplying the information needed to update the requirements for these improved devices.
- For devices not covered in the standard, the AHJ should request info from manufacturers provided by a testing lab about acceptable methods for field installation based on fire tests and engineering studies for operation and maintenance considerations, where applicable.



# Mortise Hardware Prep Filler

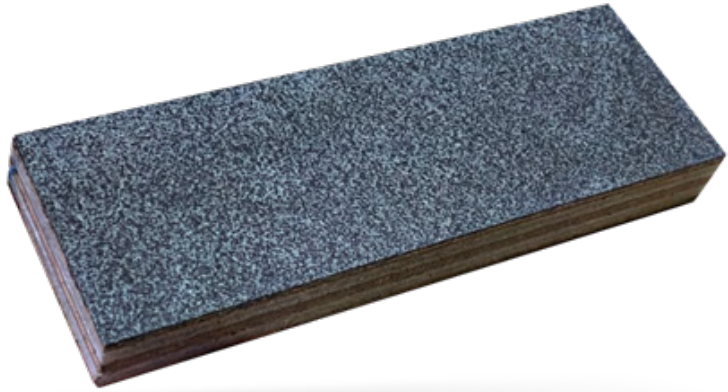


# Cylindrical Hardware Prep Filler

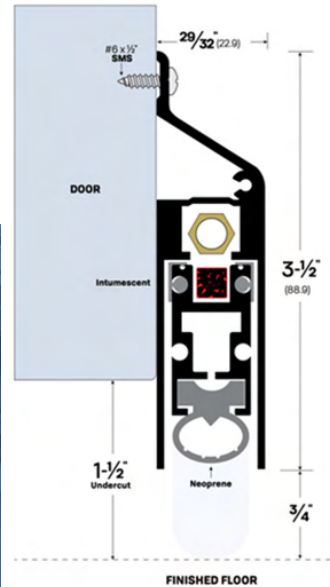
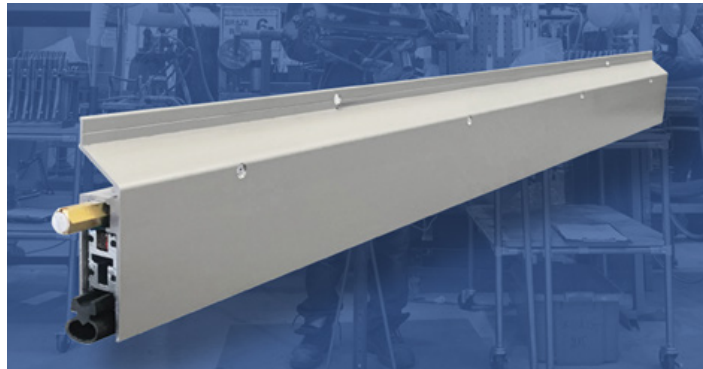




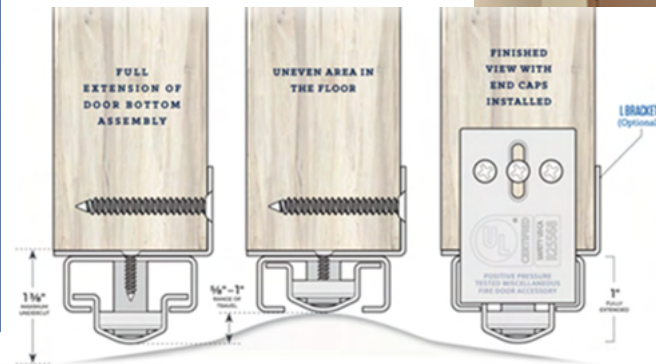
# Flush Bolt Hardware Filler and Other Holes



# Bottom of the Door Solutions



**4.8.4.2\*** Products evaluated for fire doors with a bottom clearance in excess of 3/4 in. and listed for use at or under the bottom of the fire door shall be permitted where installed in accordance with their listing.



Added in 2016



# Top of Door Solutions



# Top of Door Solutions

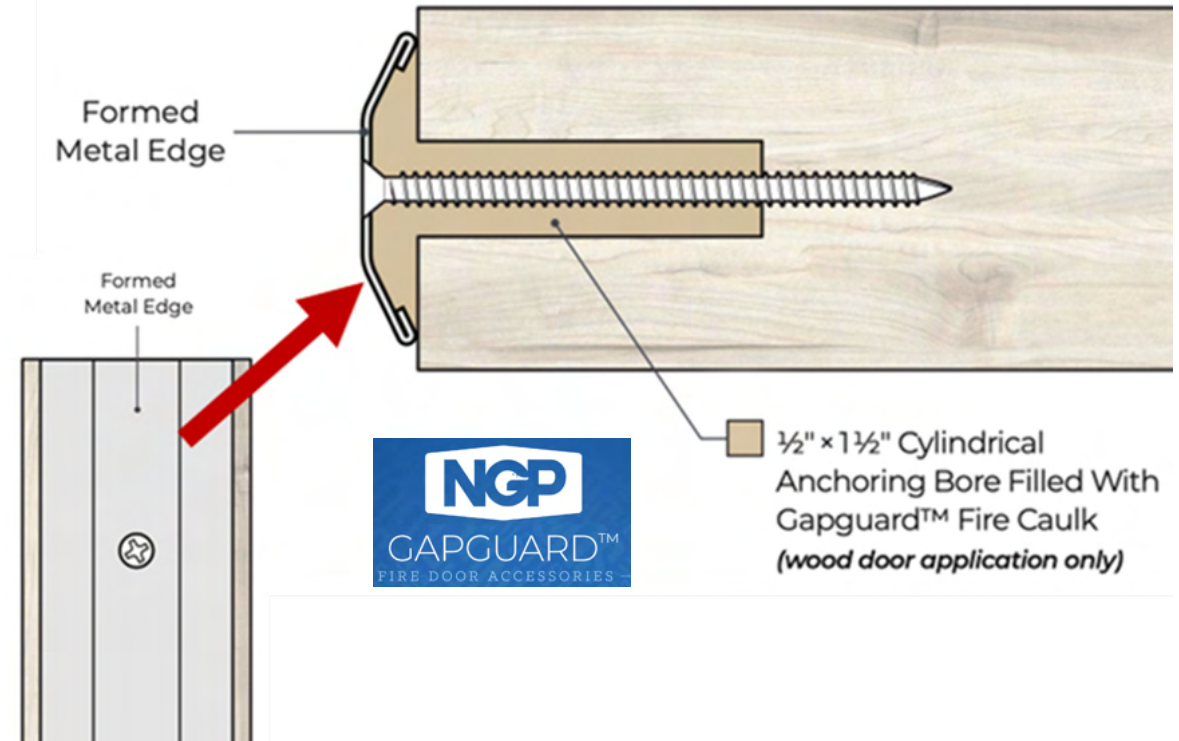
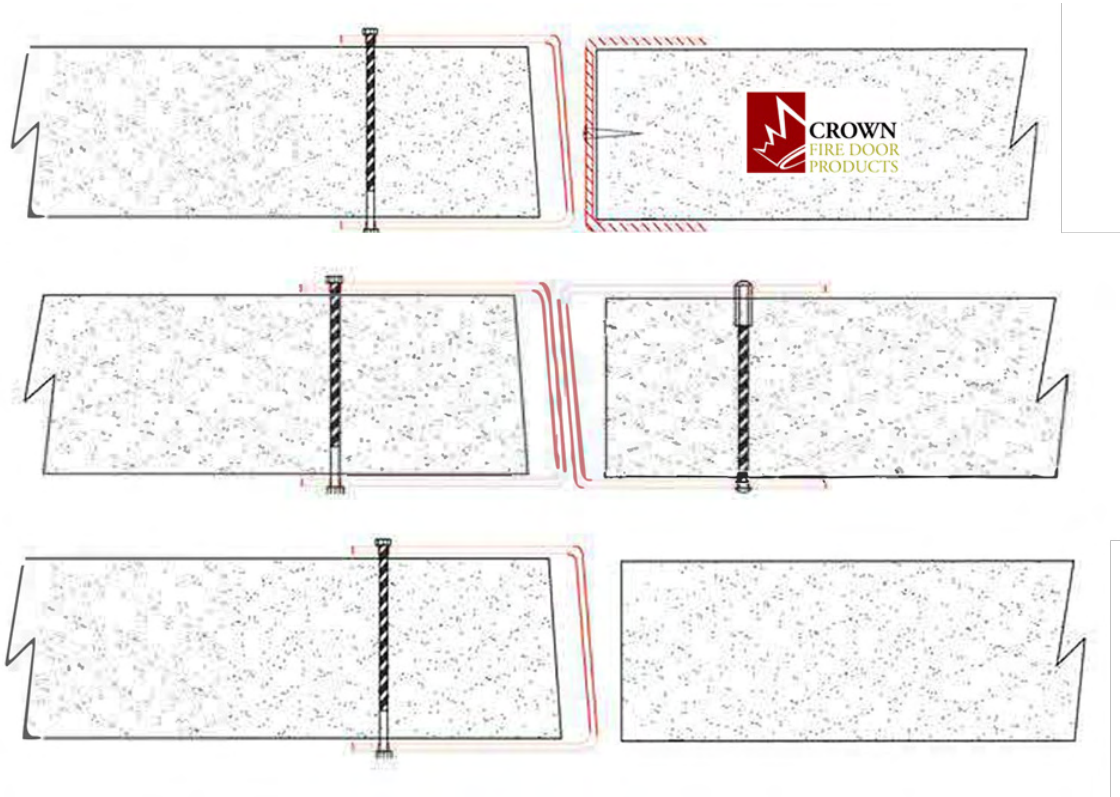




# Vertical Edge Solutions

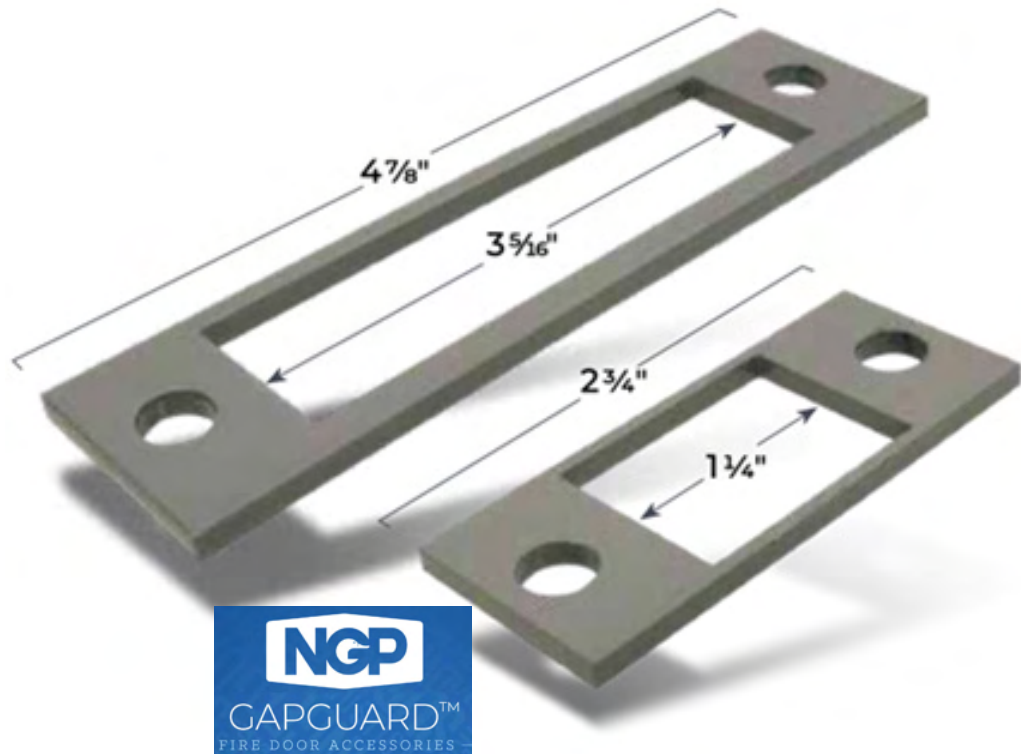


# Meeting Edge Solutions





# Strike Engagement Solutions



# Not All Fire Caulk is the Same

- Must be listed for use on fire doors and frames to seal through holes.
- Be sure that hole size, fire rating, and door/frame material comply with the manufacturer's listing.

**5.5.7 (3)** Fill holes with material listed for this use and installed in accordance with the manufacturer's procedures.

Added in 2016





# Open Holes



# DON'T Modify a Fire Door

- DON'T cut into or otherwise modify a:
  - Fire-Rated Door
  - Fire-Rated Door Frame
  - Door Hardware (attached to a Fire-Rated Door/Frame)
- REMEMBER: Allowable cutouts in fire doors are limited in size to 1-inch diameter ROUND HOLES.

**CHANGES OR MODIFICATIONS TO A FIRE DOOR ARE LIKELY TO VOID THE FIRE DOOR RATING AND MAKE THE DOOR UNLIKELY TO PROVIDE THE NECESSARY PROTECTION.**




# Must be Always Ready and Able to Perform

- Swinging fire doors are always in operation.
- Deteriorate from use and age.
- Must be ready to perform their two main functions:
  - PROTECTING PEOPLE
  - PROTECTING PROPERTY



# Resources and Handouts




**FIRE DOORS HAVE TWO MAIN FUNCTIONS, PROTECTING PEOPLE, AND PROTECTING PROPERTY!**

Know the DO'S and DON'TS of maintaining your fire doors.


- DON'T** prop open fire doors with wedges, kickdown stops or other mechanical hold open devices. Fire doors must be closed, or be able to close on their own, in the event of a fire.
- DON'T** hold back latches or cover strike plates with things like magnets or tape to keep fire doors from latching. Fire doors must be able to securely latch into the strike plate in the frame or adjacent door, to allow the door to act as a barrier to fire, smoke, and dangerous gases during a fire.
- DON'T** decorate your fire doors. Signs that are hung on fire doors are limited to just 5-percent of the face of the door, and must be attached without mechanical fasteners. Adding signs, wreaths, decorations or even coat hooks, adds fuel to a fire door which can cause flaming, fire spread and failure of your fire doors so that they cannot provide the fire protection they were designed for.
- DON'T** hang signs, paper, curtains or blinds directly on or over fire protection rated glass in fire doors. Fire protection rated glass does not protect from the transfer of dangerous radiant heat. During a fire, items attached to glass and glazing could ignite, allowing fire to spread to other parts of the building.
- DON'T** cut in to or otherwise modify a fire door, door frame or the hardware attached to a fire door without consulting a professional. Cutouts in fire doors are limited in size to 4-inch diameter round holes. Changes made, or modifications done, to a fire door at your facility, are likely to void your fire door rating and make the door unable to provide the necessary protection.
- DON'T** shim hinges or other hardware installed on fire doors with wooden, plastic or nylon materials. Fire doors can only be shimmed with steel shims so that doors and hardware stay aligned when exposed to heat and fire conditions.
- DON'T** paint over, conceal, remove or damage fire labels on fire doors, door frames or door hardware while doing maintenance work or cleaning. Labels must be readily visible at all times for the Authority Having Jurisdiction (AHJ) to identify and inspect your fire doors.
- DON'T** install barricade devices, that prevent escape or access, on fire doors. A fire doors main function is to protect people. Free and immediate egress must be allowed for all building occupants to be able to escape from the heat, flames and deadly gases that result from a fire, and first responders need to be able to access building occupants who may need assistance.

To understand your facilities doors better, including your fire doors, check out our Door Opening Industry Training Group programs at [www.Educate-doit.com](http://www.Educate-doit.com)



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**FIRE DOORS HAVE TWO MAIN FUNCTIONS, PROTECTING PEOPLE, AND PROTECTING PROPERTY!**

NFPA 80 requires swinging doors with builders hardware to be inspected not less than annually.

**Top Ten Fire Door Assembly Deficiencies**  
Based on over 250,000 doors inspected in North America and the Middle East

- 1. Non-Compliant Clearance at the Top of Door(s) and Frame**  
Clearances at the top of the door and frame must comply with the clearances listed in NFPA 80.
- 2. Non-Compliant Clearance on Lock Edge**  
Clearances at the lock edge of the door and frame must comply with the clearances listed in NFPA 80.
- 3. Missing or Illegible Label on Door Frame**  
Labels are required to be clearly visible and legible.
- 4. Missing or Damaged Gasketing**  
When gasketing is required, it must be present, continuous, and intact.
- 5. Non-Compliant Clearance on Hinge Edge**  
Clearances at the hinge edge of the door and frame must comply with the clearances listed in NFPA 80.
- 6. Missing or Illegible Label on Door**  
Labels are required to be clearly visible and legible.
- 7. The Door Does Not Securely Latch**  
Latching hardware must operate and secure the door when it is in the closed position. Any auxiliary hardware items that interfere with the operation of the door is not allowed.
- 8. Unused Fastener Holes**  
No open holes are allowed on the surface of fire doors or frames.
- 9. The Door Does Not Completely Close**  
Closing devices must be operational.
- 10. Excessive Damage on Door(s)**

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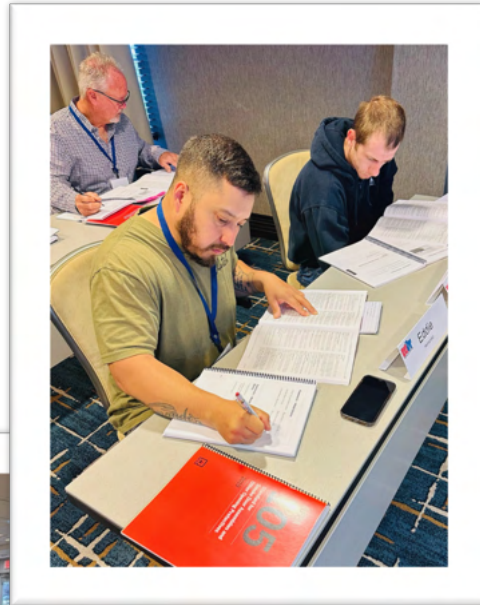


# Upcoming Fire Door Training

DOIT's Skill Building Fall Training

Charlotte, NC

September 16 - 20



# Questions?

## Contact Information:

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