

# **FCIA Webinar Series**

# **Protecting Recessed Boxes in Fire-Resistive Construction**

**Rich Walke, CTI, Consultant to FCIA**

# **FCIA – Firestop Contractors International Association**

---



- **Fire Exits??**
- **Thanks to FCIA Members – Dues = Programs**
  - Firestop Contractors
  - Manufacturers, Consultants
  - Firestop Distributors, Reps, Friends

# Welcome, Thanks, From FCIA.....

---

**Firestop Contractors International Association**  
**FREE PDF MOP, SPECIFICATIONS & Life Safety**  
**Digest for Code Officials, Fire Marshals,**  
**& Specifiers with Design Firms**



**Info@FCIA.org**  
**www.FCIA.org**



# FCIA Actions - 2022

- Conferences - HYBRID
  - FCIA ECA @ Nashville, USA – May 18-20
  - FCIA ME @ Doha, Dubai – June 19-25
  - FCIA CAN @ VANCOUVER – Early Oct. 3-4
  - **FCIA FIC @ Amelia Island, FL – Nov. 2-4**
- Webinars & Symposiums
- Code Development & Standards Discussions
- Committee Action
- International Discussions
- ***NEW Education for Careers in Firestopping!!***
  - ***FCIA's Firestop Certificate of Achievement & Education Program***

- ***NEW Education for Careers in Firestopping!!***
  - ***FCIA's Firestop Certificate of Achievement***
    - ***4 Levels***
      - ***Level 1 – General Knowledge Certificate***
      - ***Level 2 – In Depth Materials & Systems Certificate***
      - ***Level 3 – SOON***
      - ***Level 4 - SOON***
    - ***Career Path Education***
  - ***FCIA Education Respected Worldwide***

# FCIA – Firestop Contractors International Association

---

- **FREE Life Safety Digest**
- **UL/ULC, FM 4991 Contractor Programs**
  - DRI's
- **IAS AC 291 Inspection Agency Program**
  - Responsible Individuals / Competence
- **ASTM Inspection Standards – ASTM E2174 & ASTM E2393**
  - High Rise, Category III & IV, R>250 ('21), NFPA 1, NFPA 101 Appx. Specs Worldwide
- **Tools @ FCIA.org** for Specifiers, AHJ's, Building Owners, Firestop Contractors & Inspection Agencies
- **Watch FCIA.org for Webinar Announcements!**



# Systems & Materials....

---

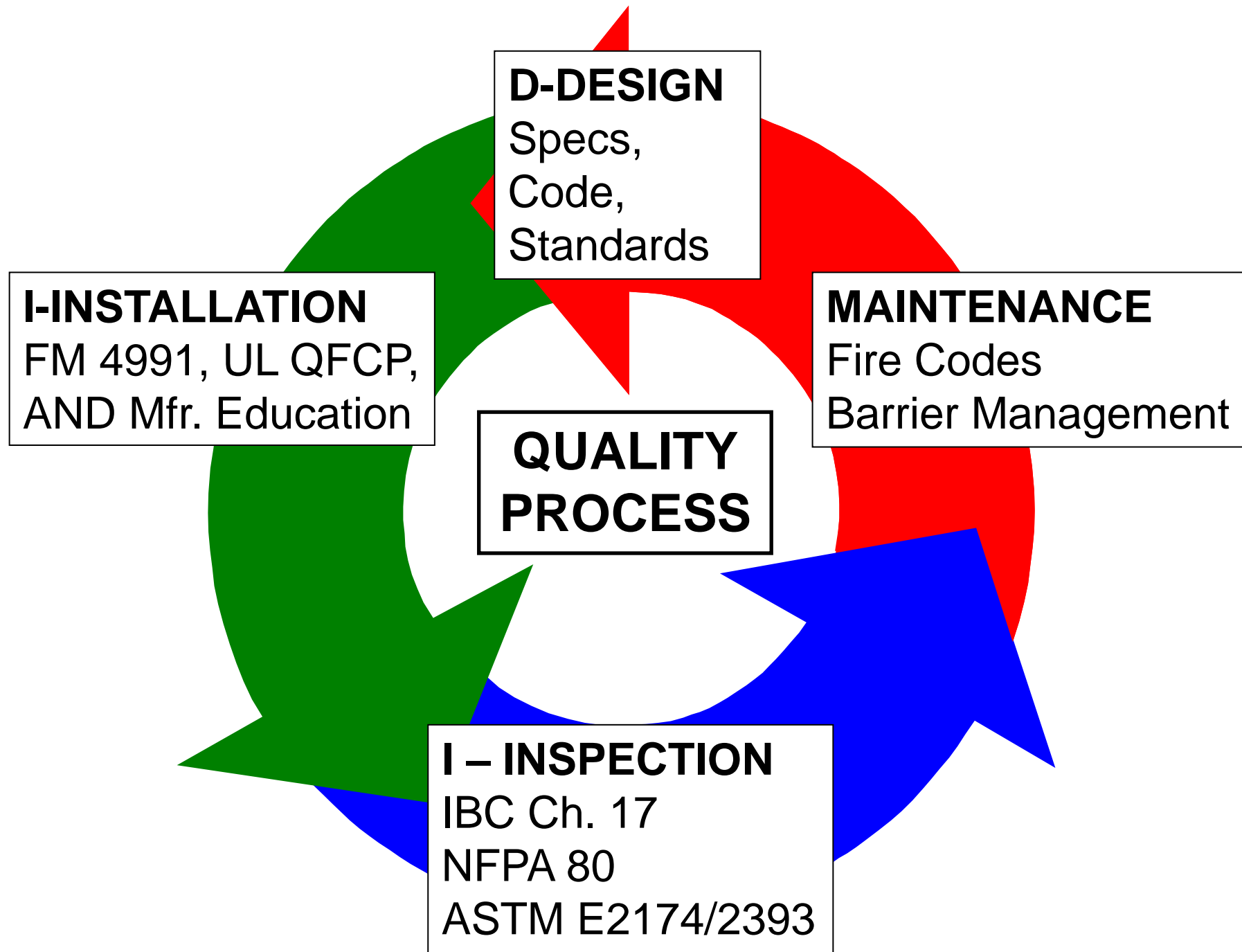


# “TOTAL FIRE PROTECTION”

---

- Effective Compartmentation
  - Fire Barriers, Fire Walls, Floors, Smoke Barriers
  - Firestopping, Fire Dampers, Swinging and Rolling Fire Doors, Fire Rated Glazing
- Detection & Alarm Systems
- Sprinkler Suppression Systems
- Education & Egress –
  - Building Owners & Managers, Building Occupants and Firefighters





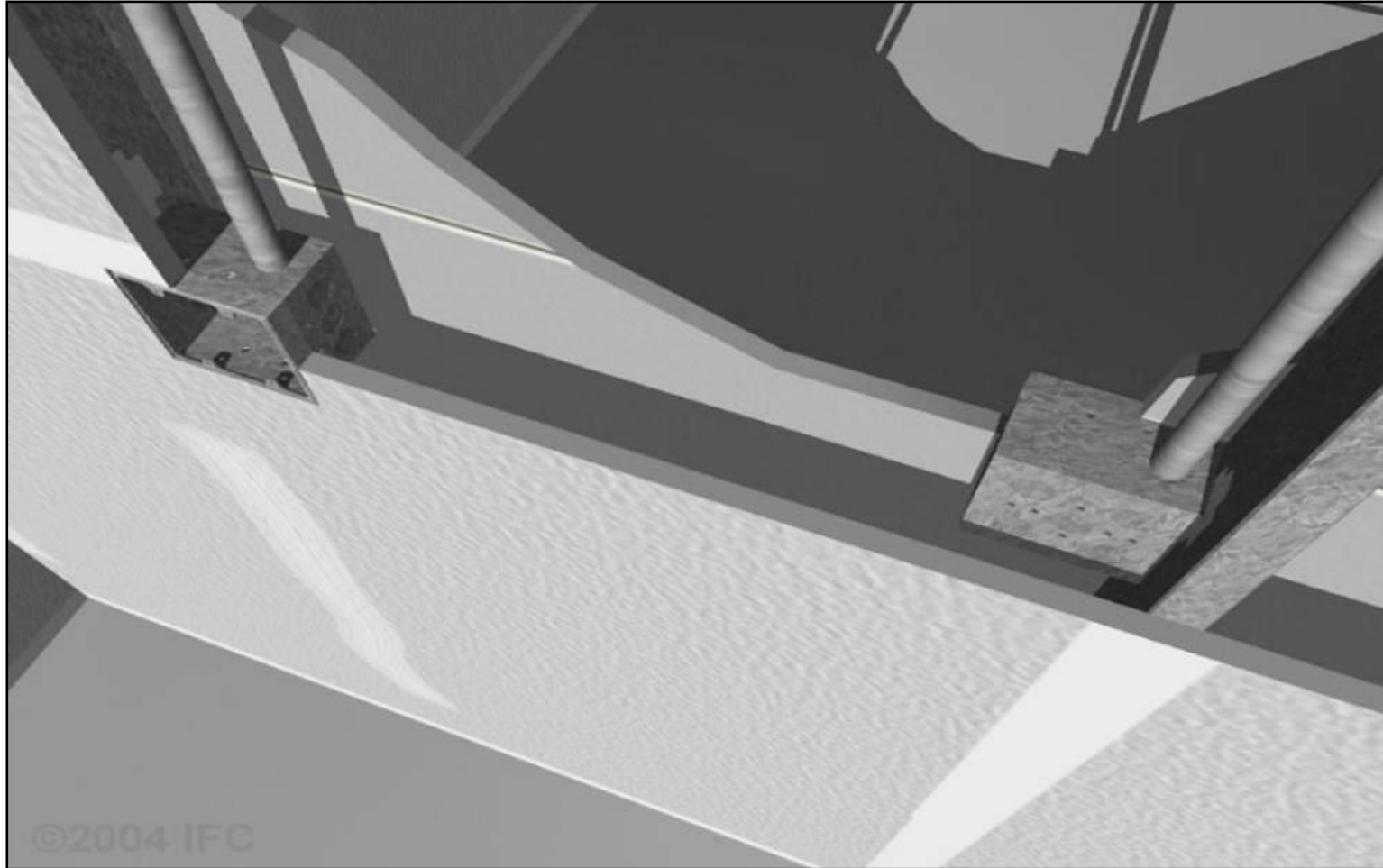
# **FCIA Webinar Series**

# **Protecting Recessed Boxes in Fire-Resistive Construction**

**Rich Walke, CTI, Consultant to FCIA**

# Recessed Box Penetrations

---



# Code Requirements for Recessed Boxes

---

- Wall Assemblies
  - Section **714.4.2** of the 2021 IBC
    - Covers metallic and nonmetallic electrical boxes
    - Boxes other than electrical boxes
- Horizontal Assemblies
  - Section **714.5.2** of the 2021 IBC
    - Covers metallic and nonmetallic electrical boxes
    - Boxes other than electrical boxes
    - Luminaires or luminaire protected by *listed* materials

# Prerequisites to Installation of All Electrical Boxes

---

- Electrical boxes must be electrically *listed*
- Where IBC Sections **714.4.2** and **714.5.2** refer to *listed* boxes, intent is *listed* to fire-resistance requirements
  - Metallic boxes are never *listed* to fire-resistance requirements
  - Nonmetallic boxes are always required to be *listed* to fire-resistance requirements
- *Listed* boxes and *listed* protection materials shall be installed in accordance with their manufacturer's installation instructions and their *listing*

# Code Requirements

## Wall Assemblies

---

- Section 714.4.2 of the 2021 IBC
- **714.4.2 – Membrane penetrations.** *Membrane penetrations* shall comply with Section 714.4.1. **Where walls or partitions are required to have a *fire-resistance rating*, recessed fixtures shall be installed such that the required *fire resistance* will not be reduced.**

# Code Requirements

## Wall Assemblies

---

- **714.4.2 Cont.**

- Exceptions:

1. Metallic electrical boxes  $\leq 16$  sq in., installed per prescriptive information, or as protected using tested and *listed* methods
2. *Listed* electrical boxes of any material, installed as tested, or as protected with putty pads or other tested and *listed* methods
3. Electrical boxes of any size or type installed as protected using wall opening protective materials

# Code Requirements

## Wall Assemblies

---

- **714.4.2 Cont.**

- Exceptions:

- 4. Boxes other than electrical boxes, protected with membrane firestop system having an F and T Rating not less than rating of wall
    - 6. Metallic electric boxes > 16 sq in., protected by *listed* putty pads or other tested and *listed* methods



# Metallic Electrical Boxes in Walls

## Exception 1

---

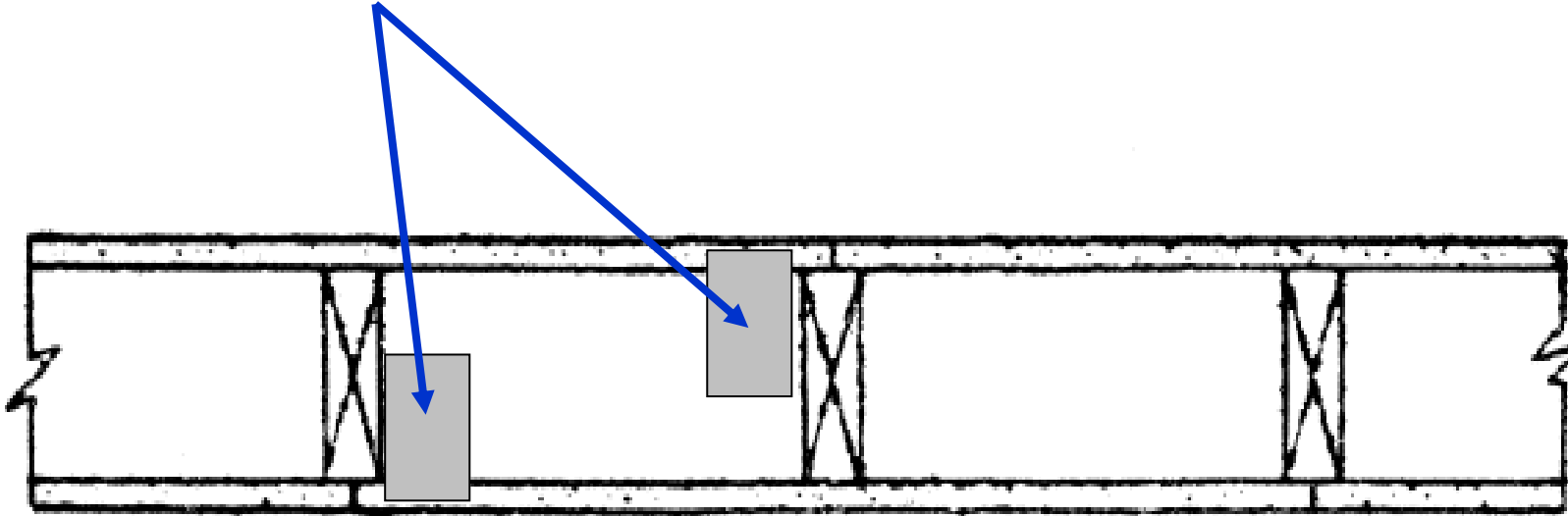
- Metallic boxes installed per prescriptive code
  - Maximum 16 sq in. electrical box
  - Maximum 100 sq in. of opening on each side of wall per 100 sq ft of wall area
  - Maximum 1/8 in. annular space between wall membrane and box
  - Boxes on opposite sides of wall shall be either separated horizontally by minimum 24 in., or protected by some type of heat barrier

# Metallic Electrical Boxes $\leq 16$ sq in. in Walls

## Exception 1 – Less than 24 in. Spacing

---

Electrical Boxes



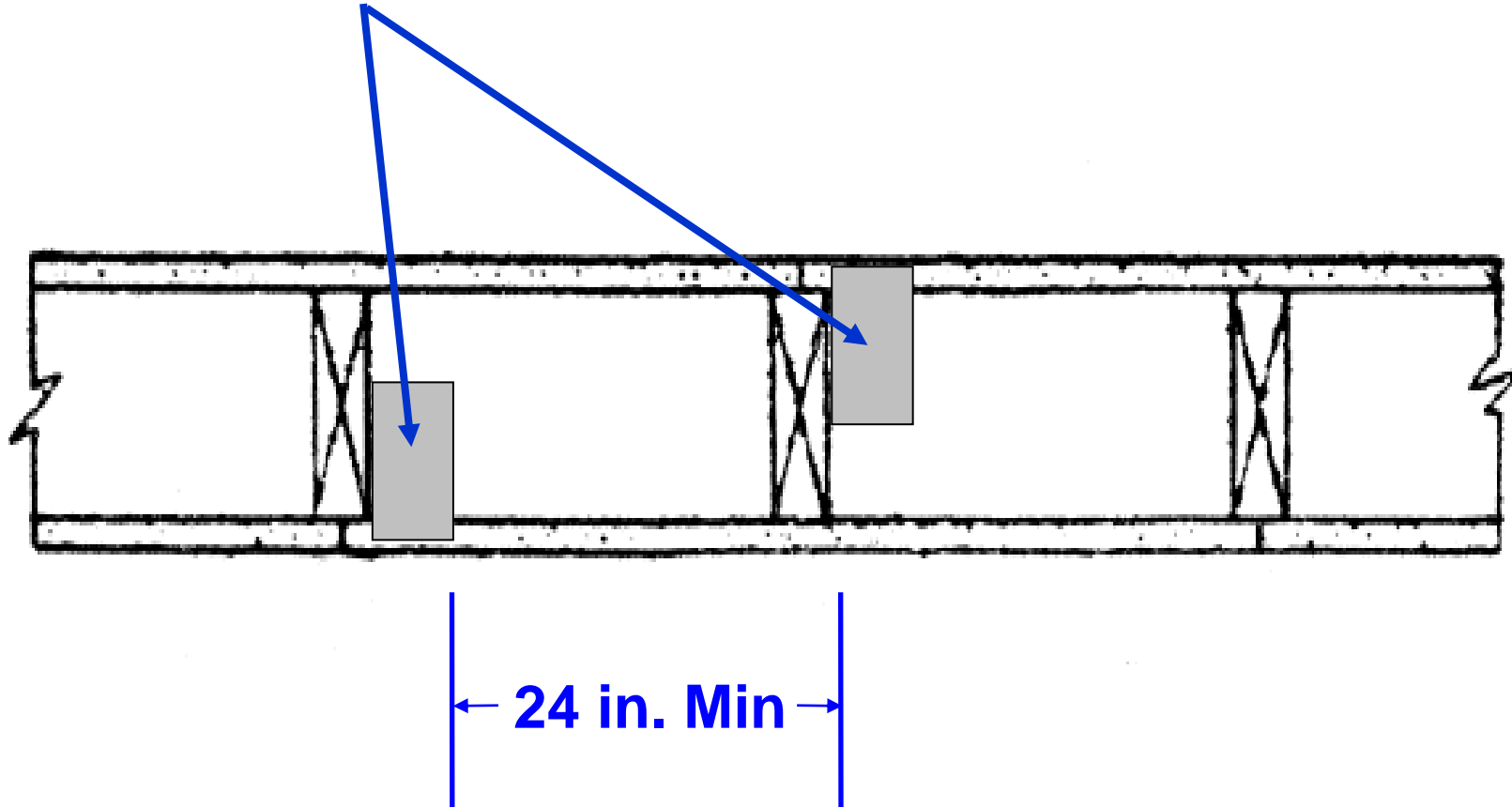
**Non-Compliant**

# Metallic Electrical Boxes $\leq 16$ sq in. in Walls

## Exception 1 – Not Less than 24 in. Spacing

---

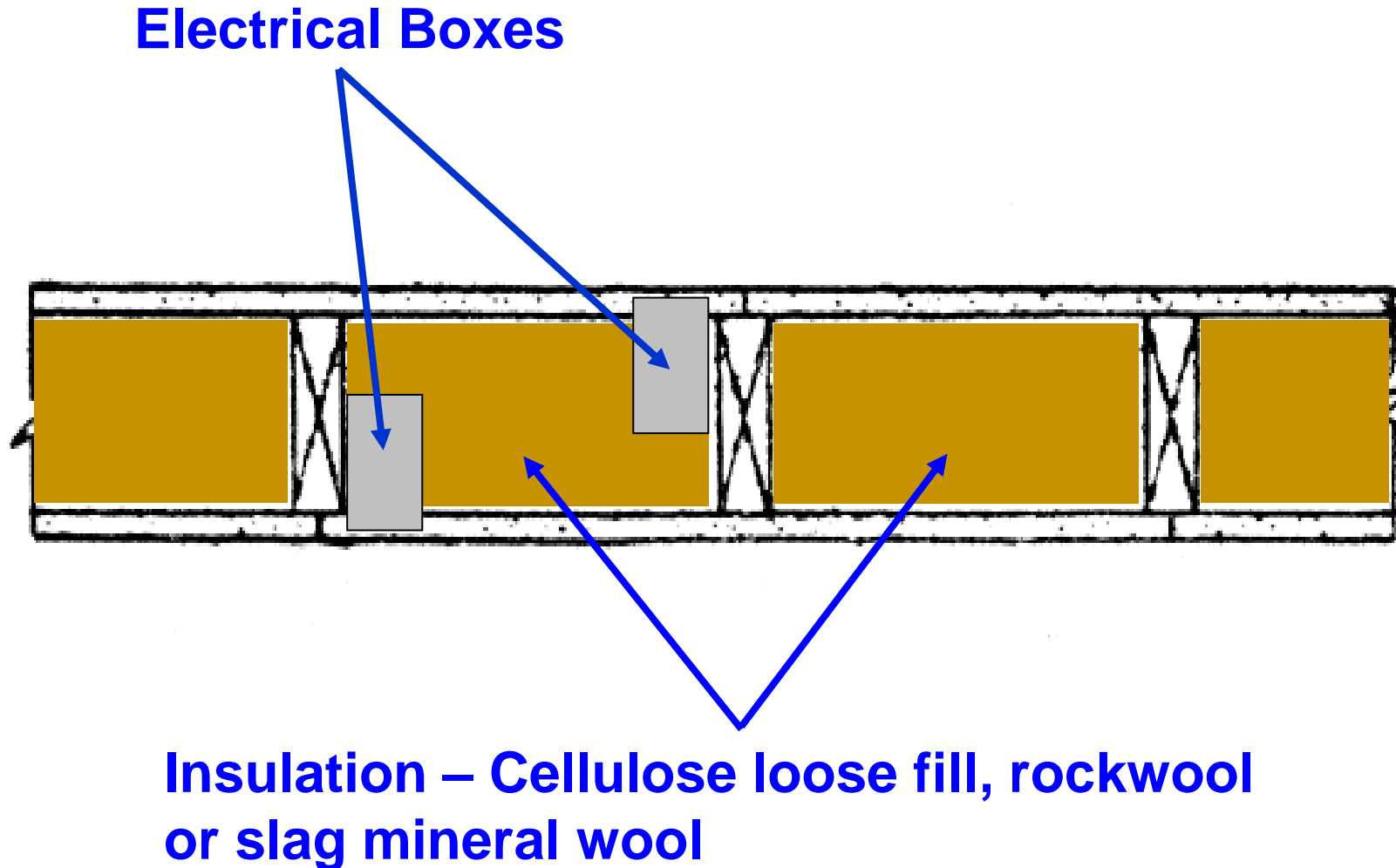
Electrical Boxes



# Metallic Electrical Boxes $\leq 16$ sq in. in Walls

## Exception 1 – Cavity Filled with Insulation

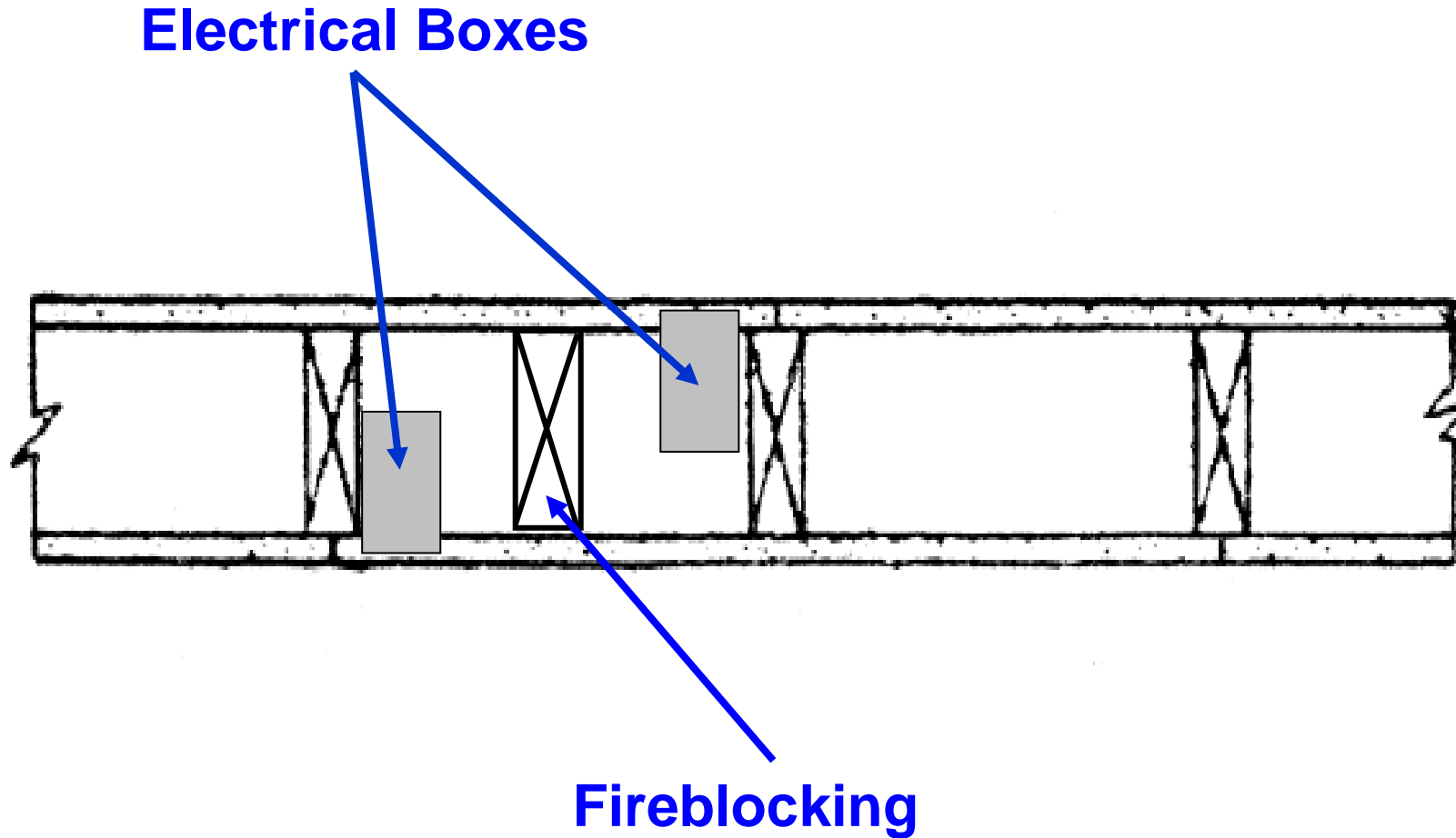
---



# Metallic Electrical Boxes $\leq 16$ sq in. in Walls

## Exception 1 – Fireblocking

---



# Metallic Electrical Boxes $\leq$ 16 sq in. in Walls

## Exception 1

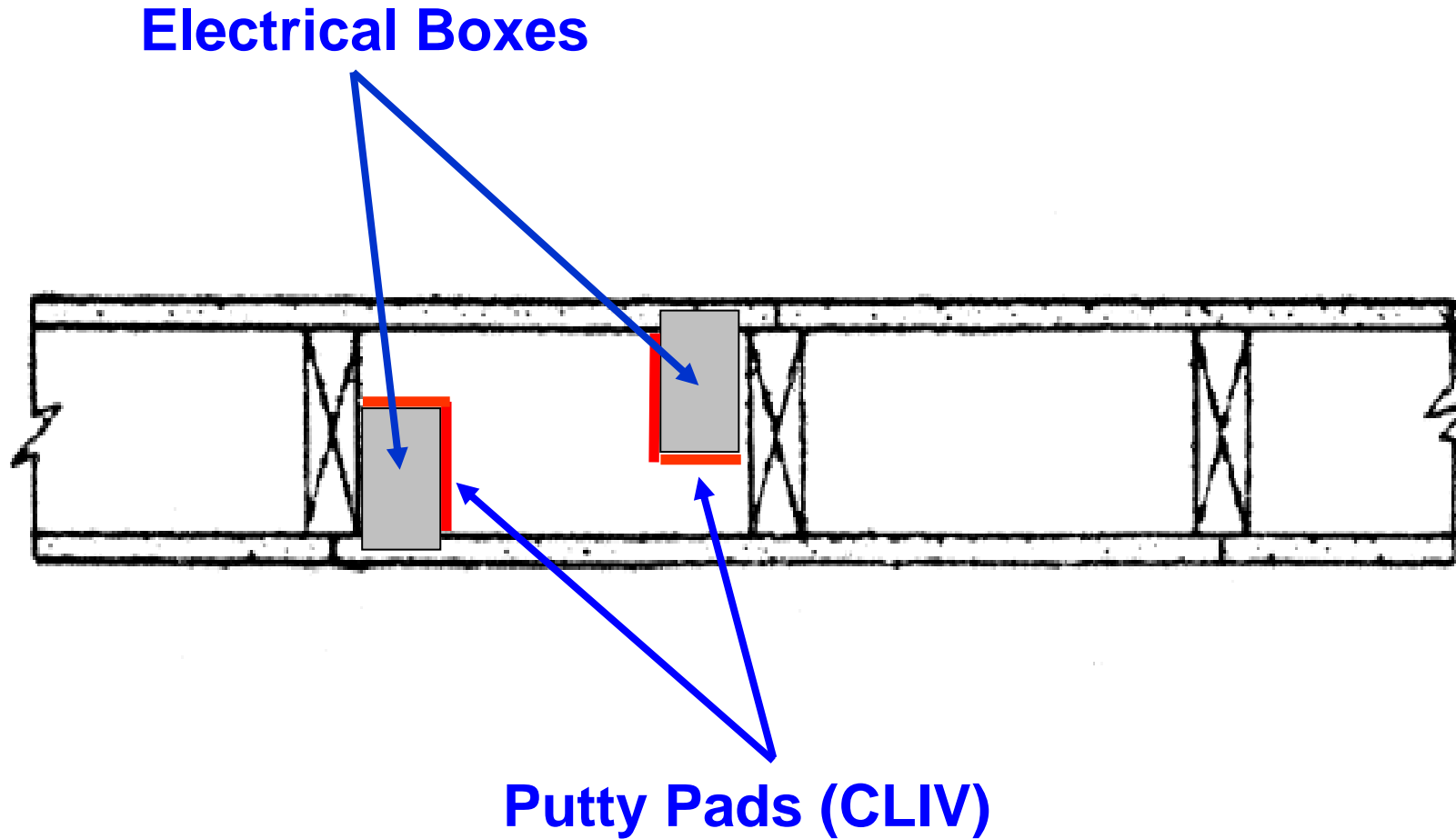
---

- Installation not complying with these prescriptive requirements shall be installed as tested and *listed*

# Metallic Electrical Boxes $\leq 16$ sq in. in Walls

## Exception 1 – *Listed* Putty Pads

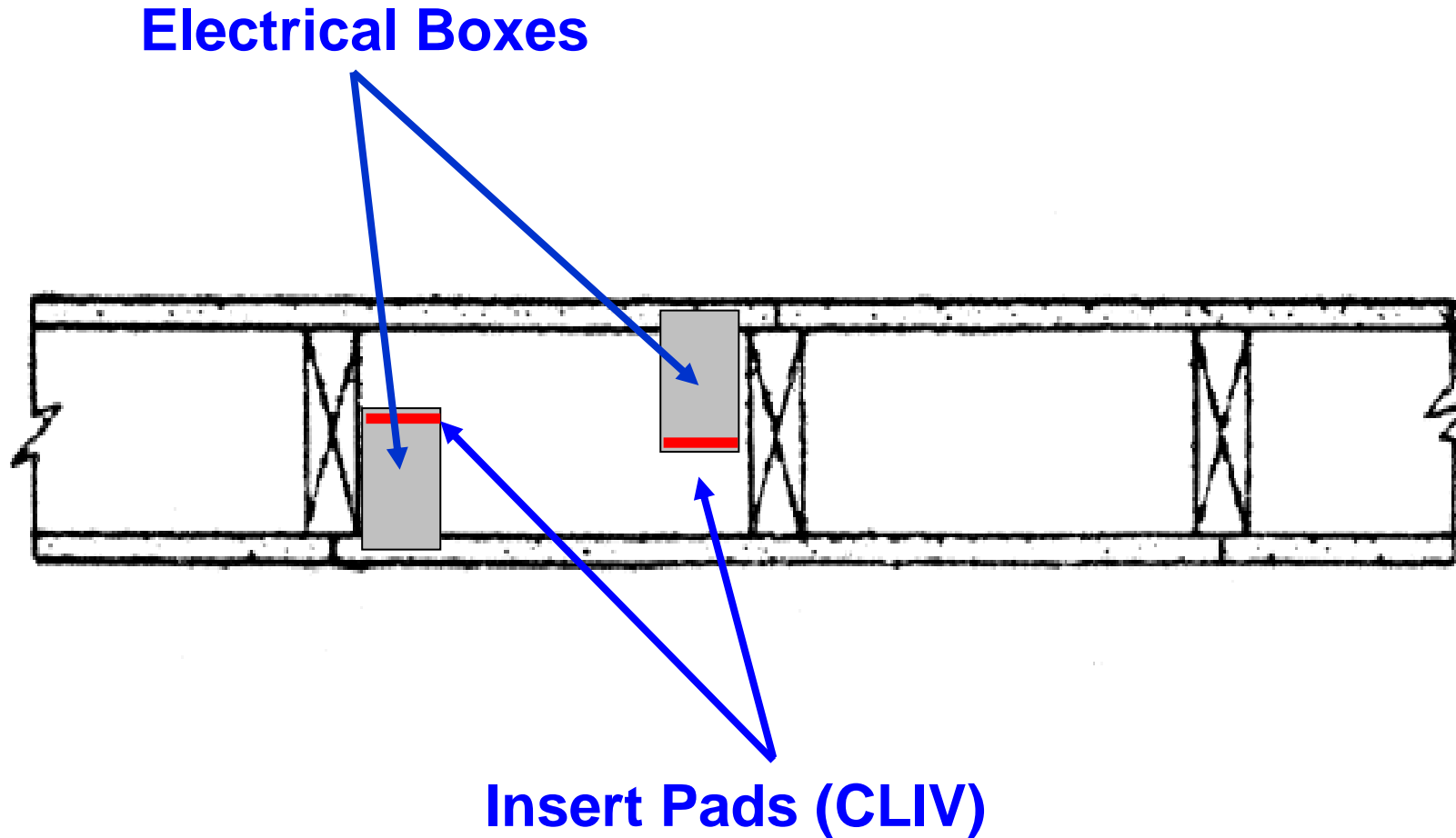
---



# Metallic Electrical Boxes $\leq 16$ sq in. in Walls

## Exception 1 – Other *Listed* Materials or Methods

---

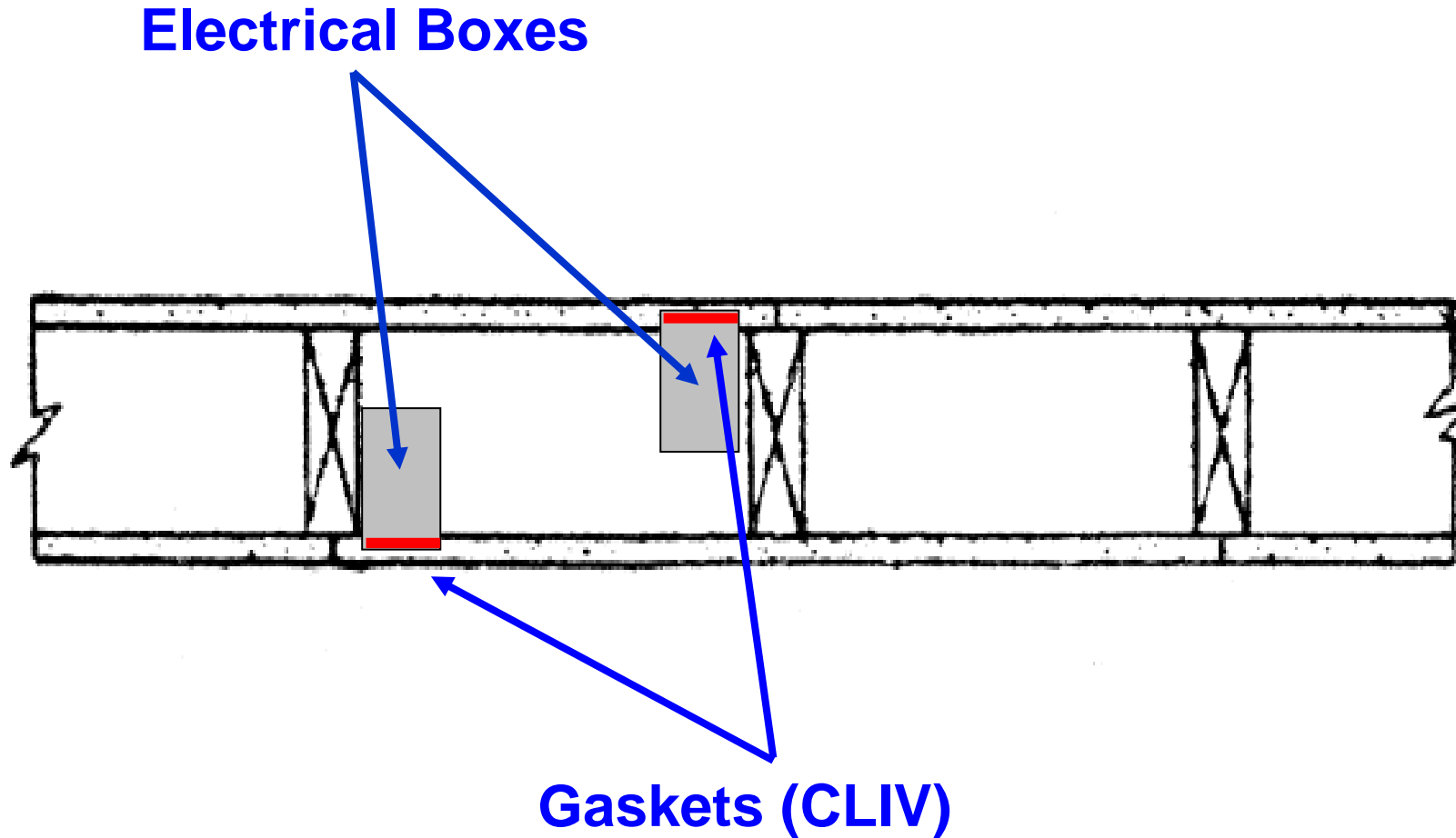




# Metallic Electrical Boxes $\leq 16$ sq in. in Walls

## Exception 1 – Other *Listed* Materials or Methods

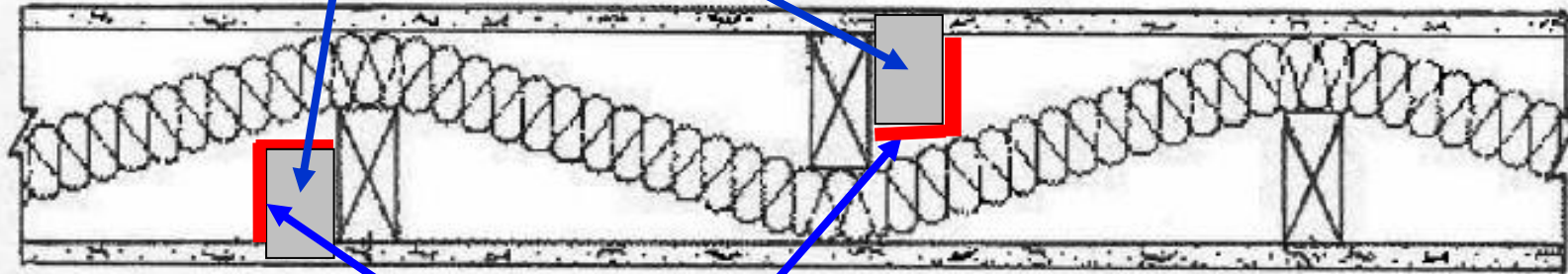
---



# Metallic Electrical Boxes $\leq 16$ sq in. in Staggered Stud Walls – Exception 1 with Protection per Listing

---

**Electrical Boxes**



**Insulation, Fireblocking, Putty Pads,  
Insert Pads or Gaskets (CLIV)**

# ***Listed* Electrical Boxes of Any Material in Walls**

## **Exception 2**

---

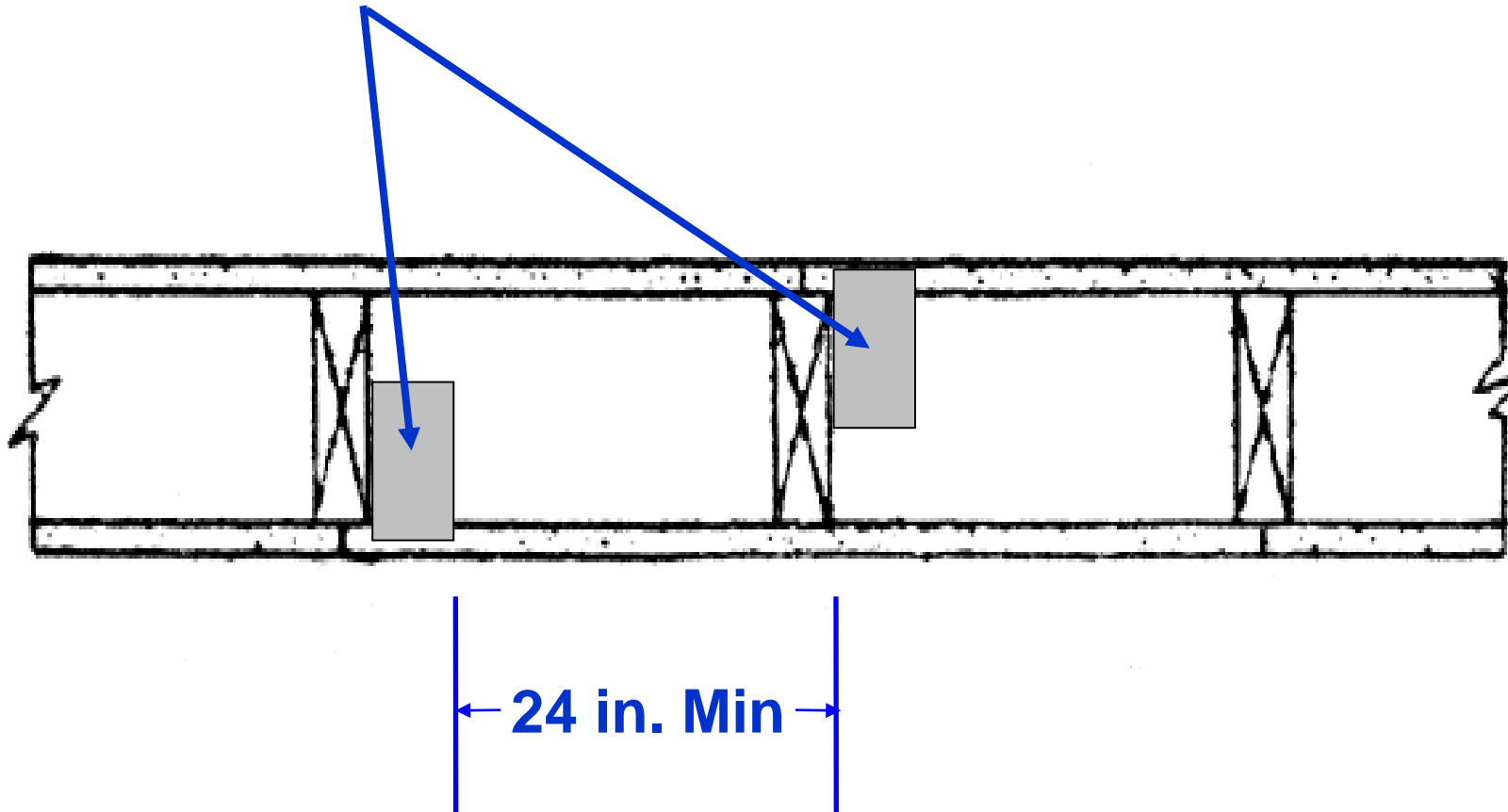
- *Listed* boxes of any material installed per code
  - Installed in accordance with *listed* box manufacturer's installation instructions and *listed* protection material manufacturer's instructions if provided with supplemental protection
  - Maximum 1/8 in. annular space between wall membrane and box
  - Boxes on opposite sides of wall need to be either separated horizontally per their listing, or protected by some type of heat barrier

# ***Listed* Electrical Boxes of Any Material in Walls**

## **Exception 2 – Min 24 in. Spacing per Listing**

---

**Electrical Boxes**

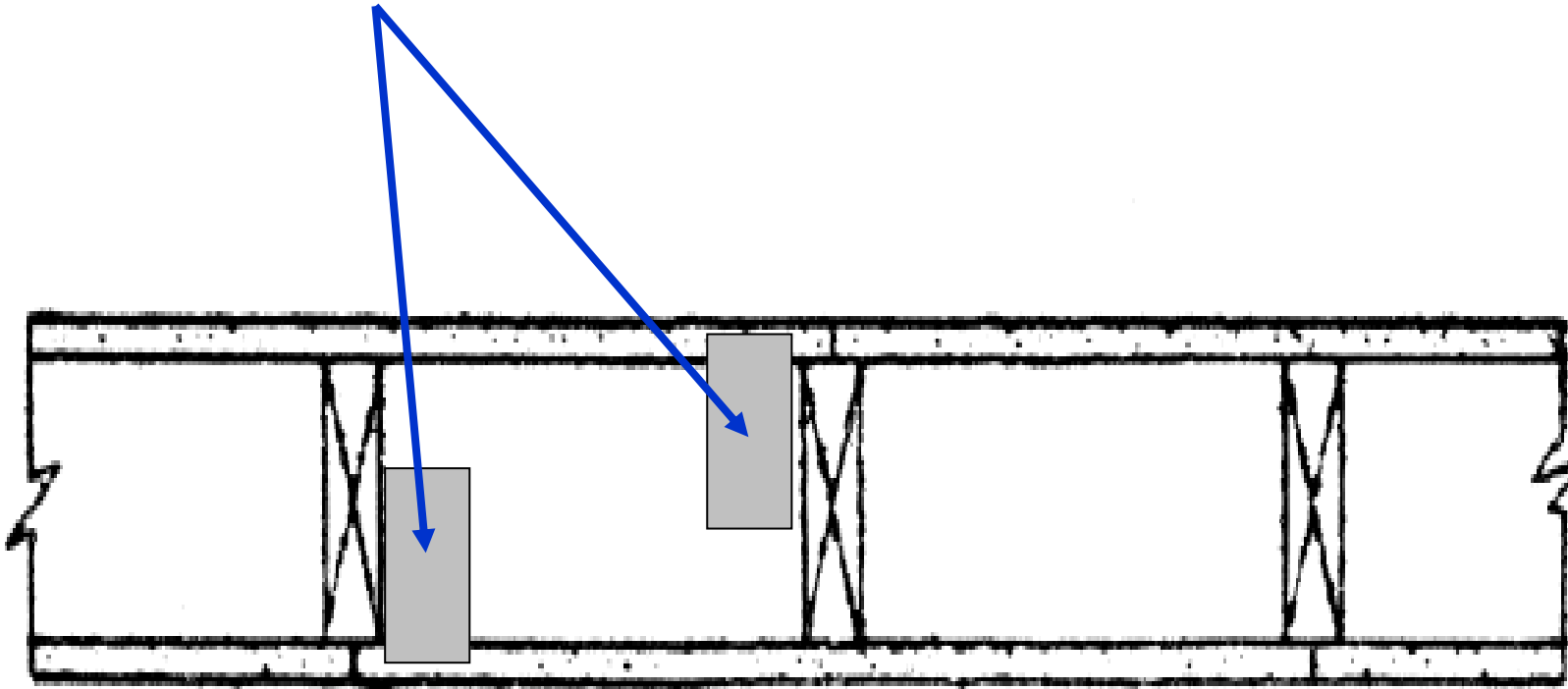


# ***Listed* Electrical Boxes of Any Material in Walls**

## **Exception 2 – Reduced Spacing per Listing**

---

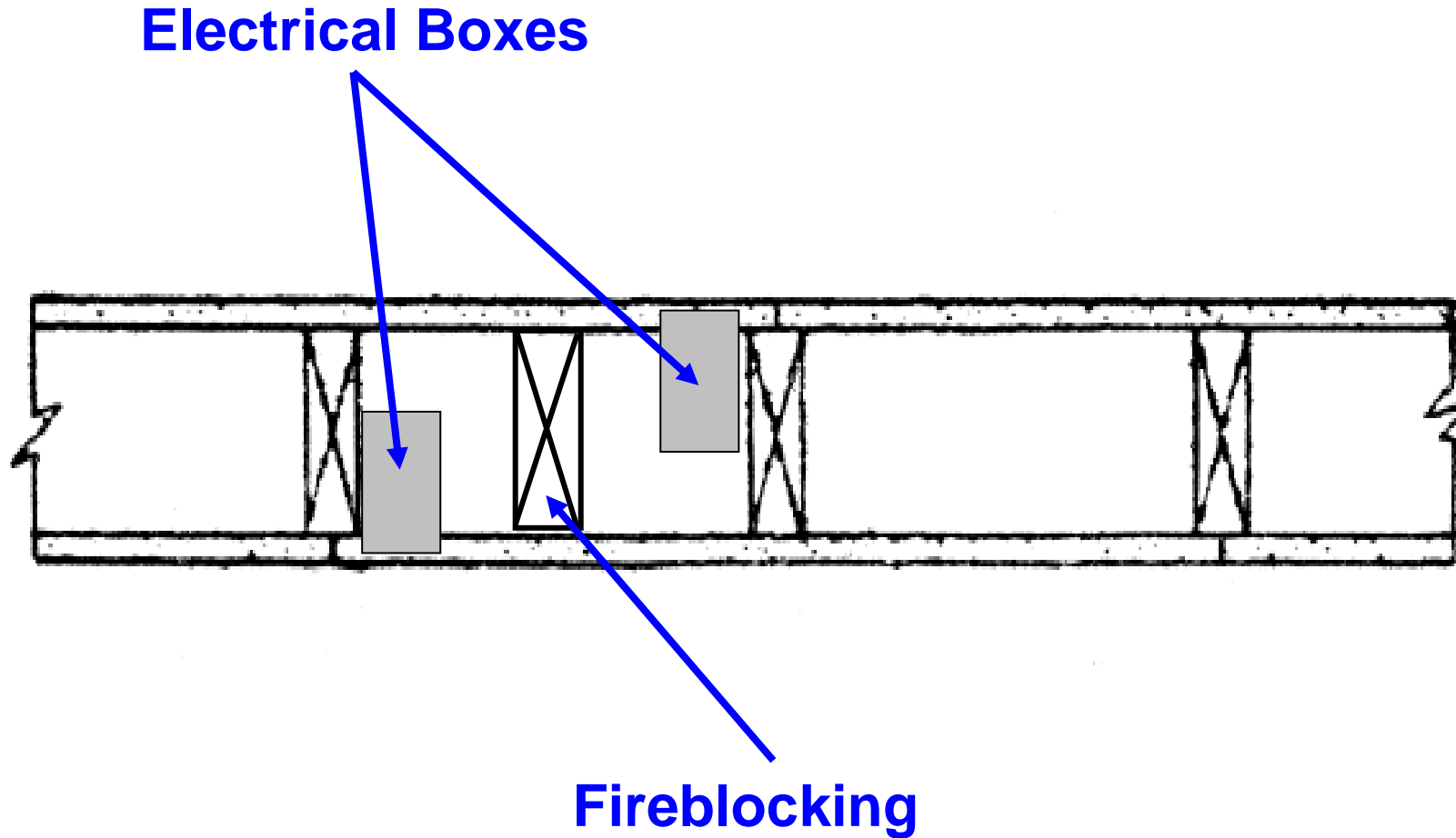
**Electrical Boxes**



# ***Listed* Electrical Boxes of Any Material in Walls**

## **Exception 2 – Fireblocking**

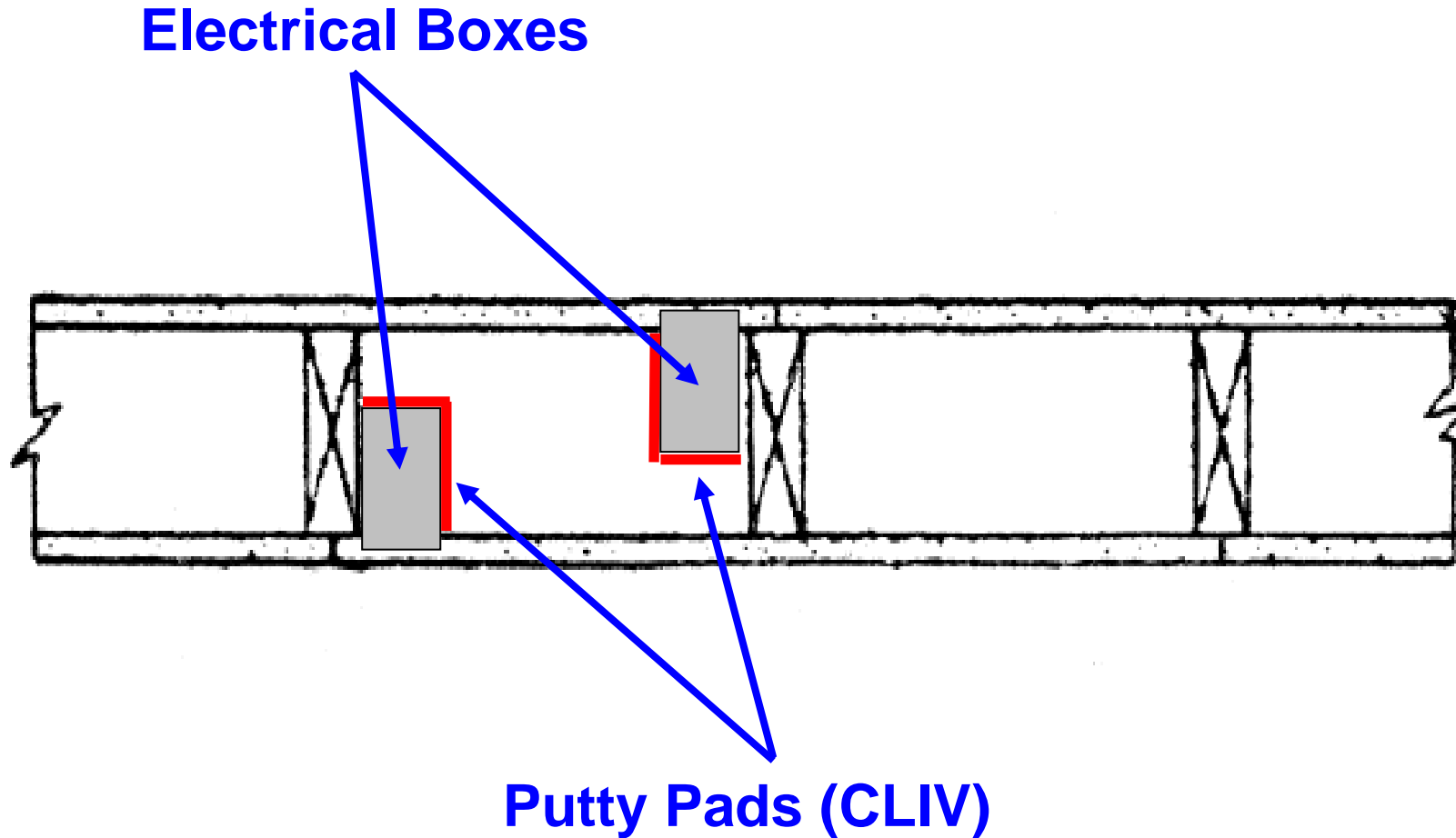
---



# ***Listed* Electrical Boxes of Any Material in Walls**

## ***Exception 2 – Listed Putty Pads***

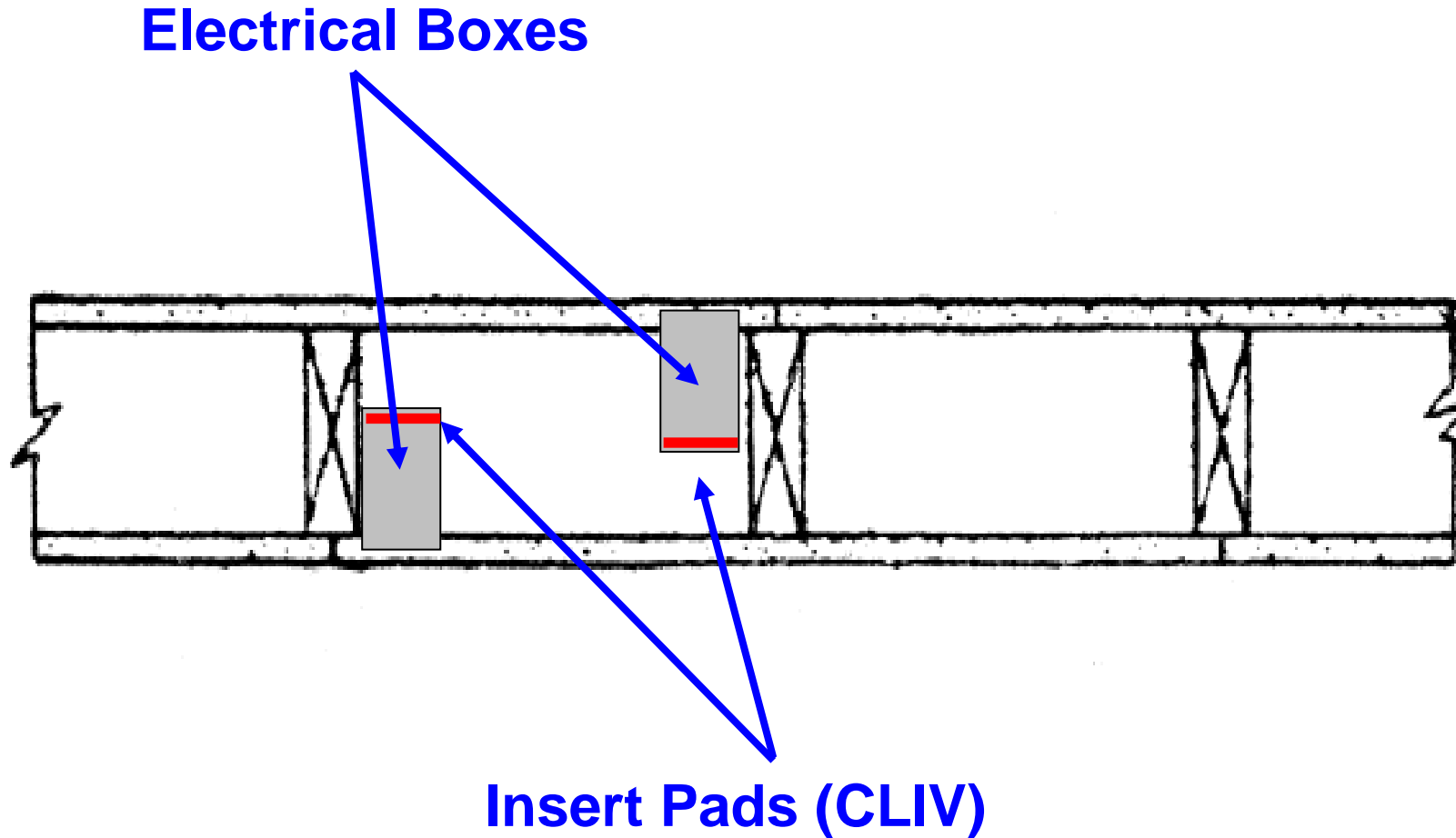
---



# ***Listed* Electrical Boxes of Any Material in Walls**

## **Exception 2 – Other *Listed* Materials or Methods**

---

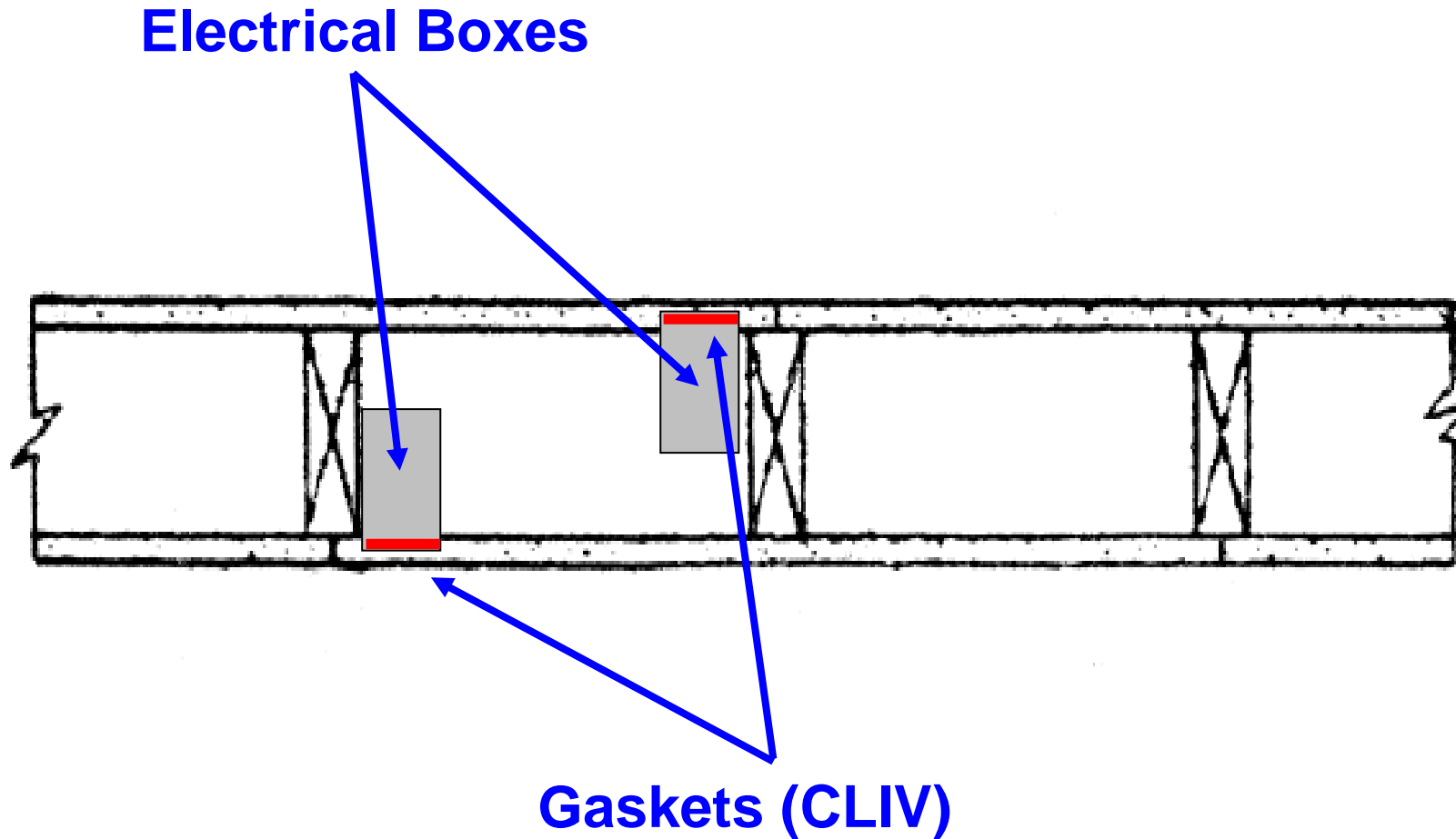




# ***Listed* Electrical Boxes of Any Material in Walls**

## **Exception 2 – Other *Listed* Materials or Methods**

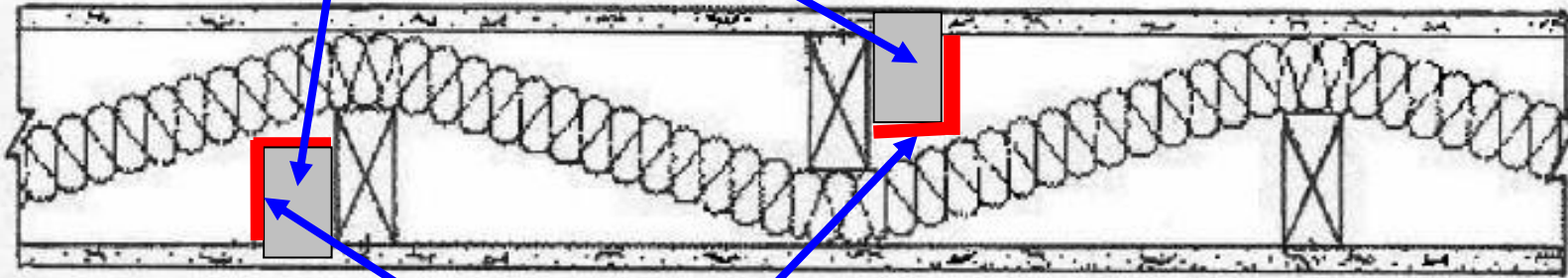
---



# ***Listed* Electrical Boxes of Any Material in Staggered Stud Walls – Exception 2 – With Protection per Listing**

---

**Electrical Boxes**

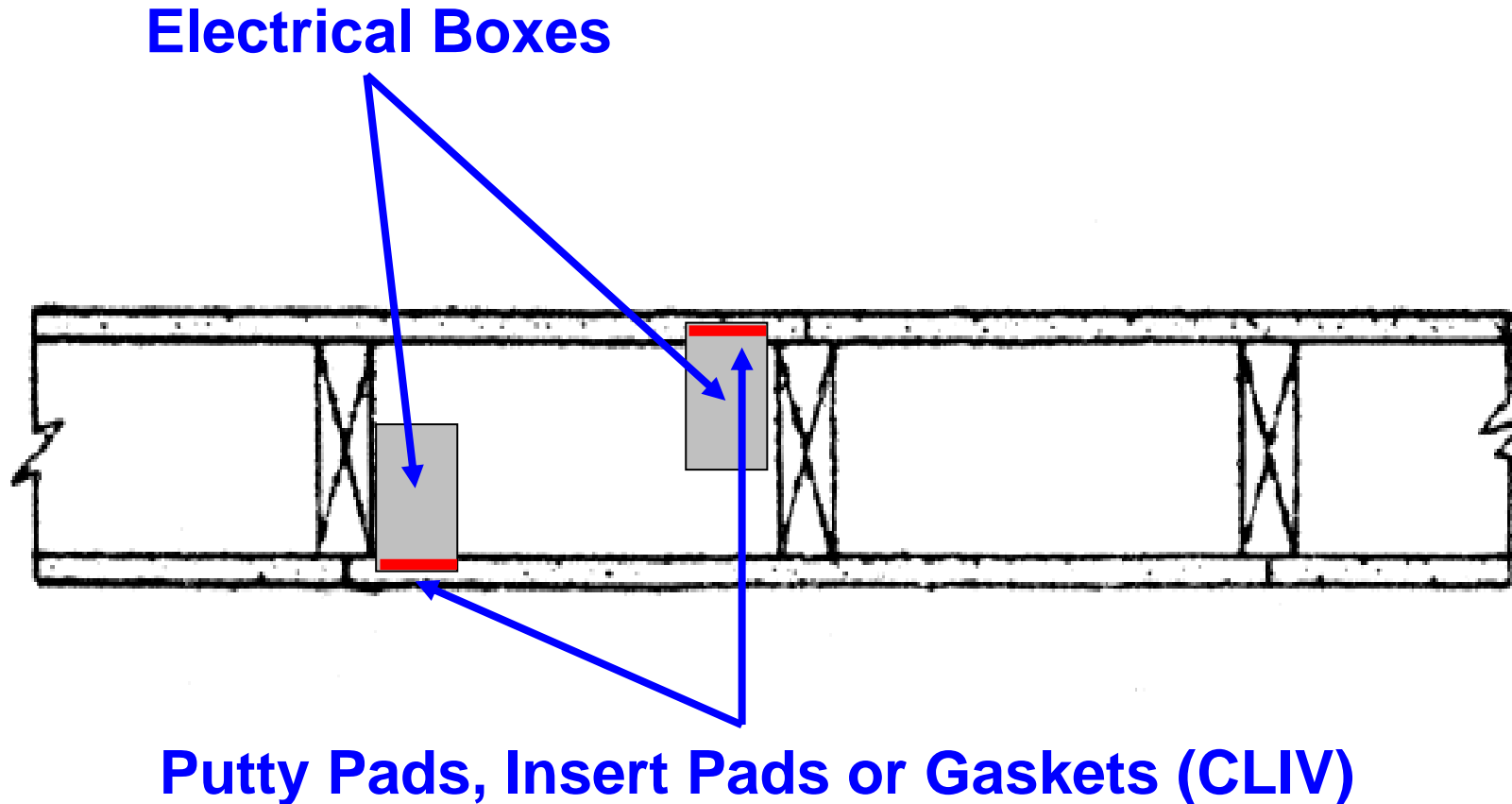


**Putty Pads, Insert Pads or Gaskets (CLIV)**

# Electrical Boxes of Any Size or Type in Walls

## Exception 3 – Wall Opening Protective Materials

---



# Boxes Other than Electrical Boxes in Walls

## Exception 4 – Requires F and T Ratings

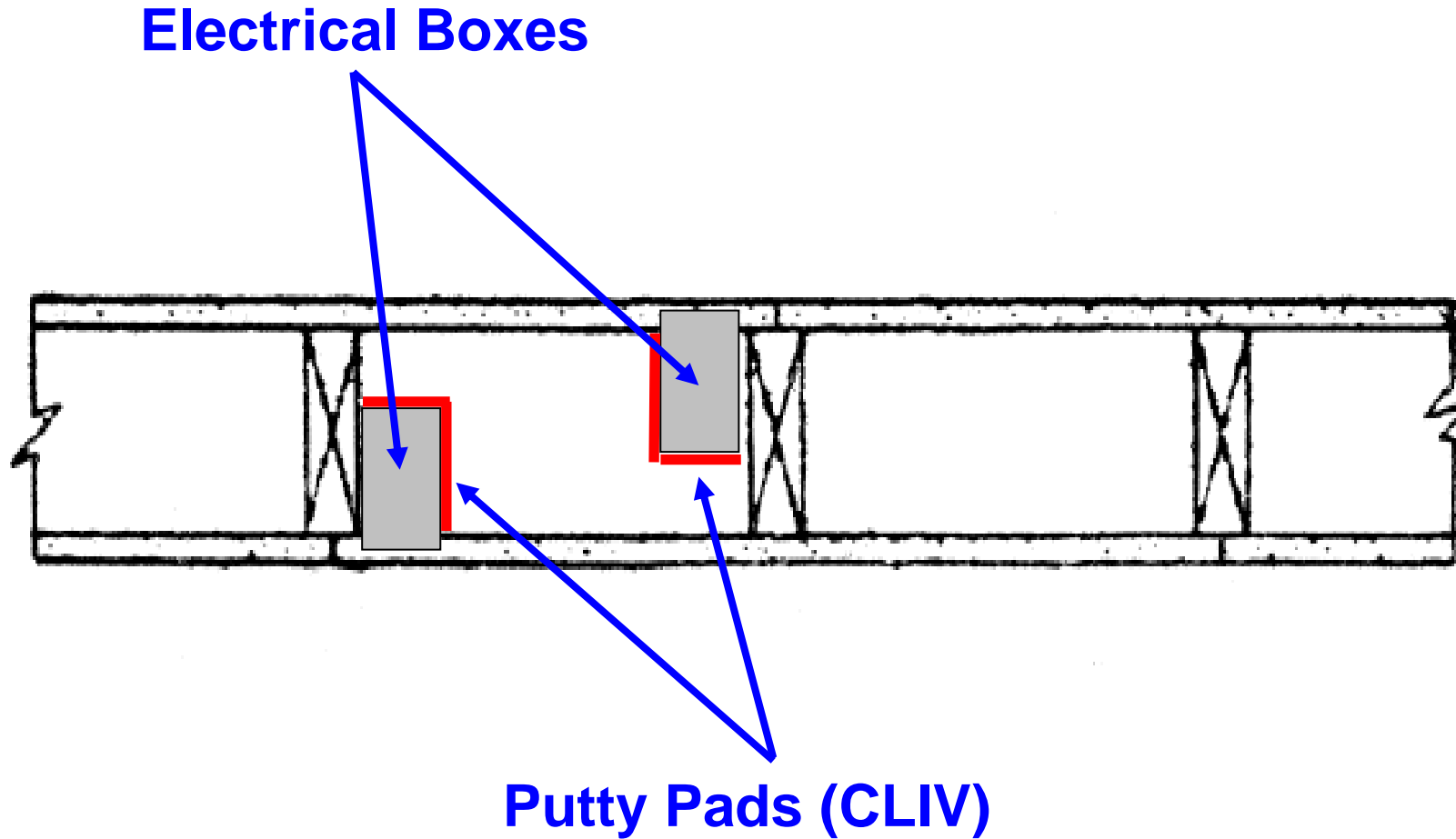


Examples of UL Firestop Systems:  
W-L-7004, W-L-7005, W-L-7129, W-L-7167, W-L-7168, W-L-7193, W-L-7207, W-L-7249, etc.

# Metallic Electrical Boxes > 16 sq in. in Walls

## Exception 6 – Putty Pads

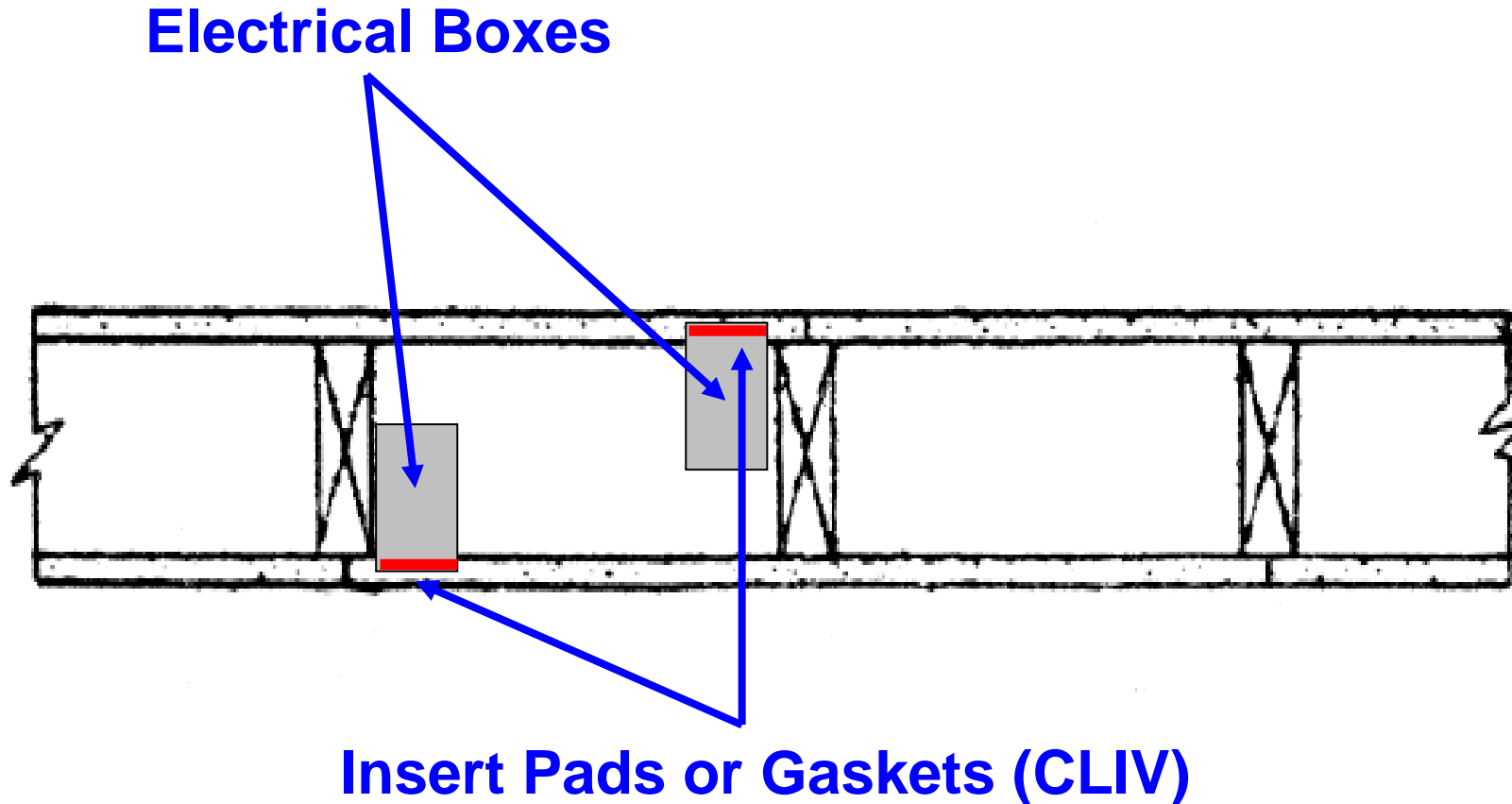
---



# Metallic Electrical Boxes > 16 sq in. in Walls

## Exception 6 – Other *Listed* Materials or Methods

---



# Code Requirements

## Horizontal Assemblies

---

- Section **714.5.2** of the 2021 IBC
- **714.5.2 – Membrane penetrations.** Penetrations of membranes that are part of a *horizontal assembly* shall comply with Section 714.5.1.1 or 714.5.1.2. **Where floor/ceiling assemblies are required to have a *fire-resistance rating*, recessed fixtures shall be installed such that the required *fire resistance* will not be reduced.**

# Code Requirements

## Horizontal Assemblies

---

- **714.5.2 Cont.**

- Exceptions:

2. Metallic electrical boxes  $\leq 16$  sq in., installed per prescriptive information
3. Electrical boxes of any size or type installed as protected using opening protective materials
4. *Listed* electrical boxes of any material, installed in accordance with *listing*
8. Ceiling membrane penetrations by *listed* luminaires or luminaires protected with *listed* materials tested for fire-resistance



# Metallic Electrical Boxes in Ceilings

## Exception 2

---

- Metallic boxes installed per prescriptive code
  - Maximum 16 sq in. electrical box
  - Maximum 100 sq in. of penetrations per 100 sq ft of ceiling area
  - Maximum 1/8 in. annular space between ceiling membrane and box
- Installation not complying with these prescriptive requirements shall be installed as tested and *listed*

# Electrical Boxes of Any Size or Type in Ceilings

## Exception 3 – Opening Protective Materials

---

- Electrical boxes of any size or type
  - Protected using *listed* opening protective materials
    - Putty pads
    - Insert pads
    - Gaskets
  - Installed in accordance with *listed* protection materials manufacturer's installation instructions

# ***Listed* Electrical Boxes of Any Material in Ceilings – Exception 4**

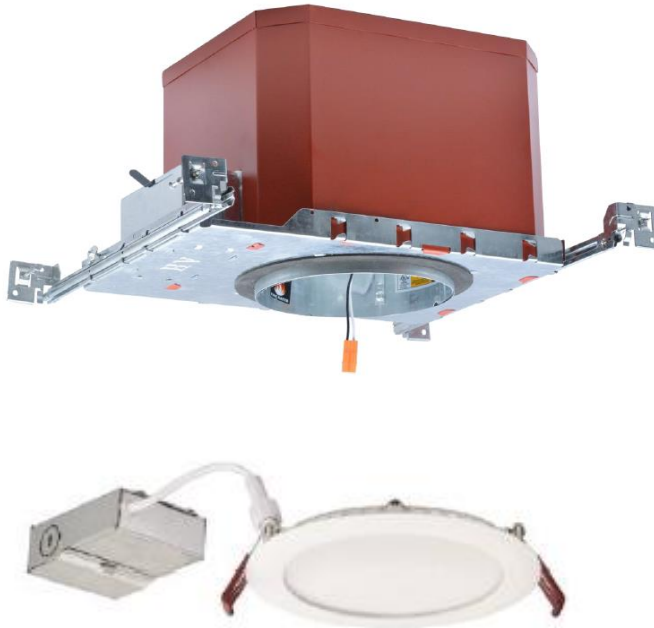
---

- *Listed* boxes of any material installed per code
  - Installed in accordance with *listed* box manufacturer's installation instructions and *listed* protection material manufacturer's instructions if provided with supplemental protection
  - Maximum 1/8 in. annular space between wall membrane and box

# ***Listed* Luminaires or Luminaires Protected with *Listed* Materials – Exception 8**

---

- Tested for use in fire-resistance-rated assemblies
- Installed in accordance with the *listed* luminaire or *listed* protection material manufacturer's installation instructions



# For the Contractor

System No. W-L-7190

December 05, 2013

F Ratings — 1 and 2 Hr (See Item 1)

T Ratings — 1 and 2 Hr (See Item 1)

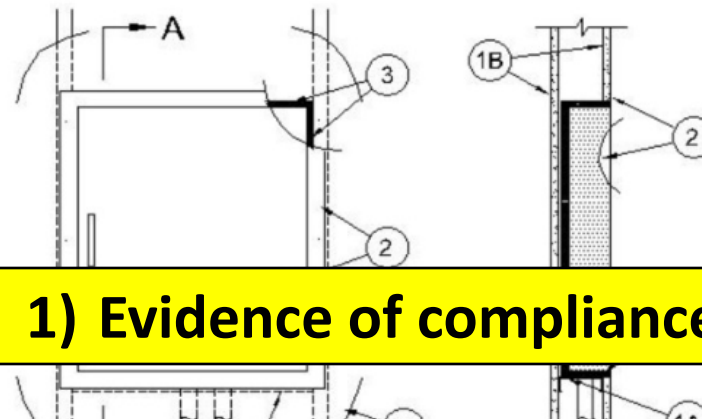
**UL System or Listing serve two roles:**

2 Hr (See Item 1)

2 Hr (See Item 1)

FH Ratings — 1 and 2 Hr (See Item 1)

FTH Ratings — 1 and 2 Hr (See Item 1)



**1) Evidence of compliance**

**2) A set of build-instructions**

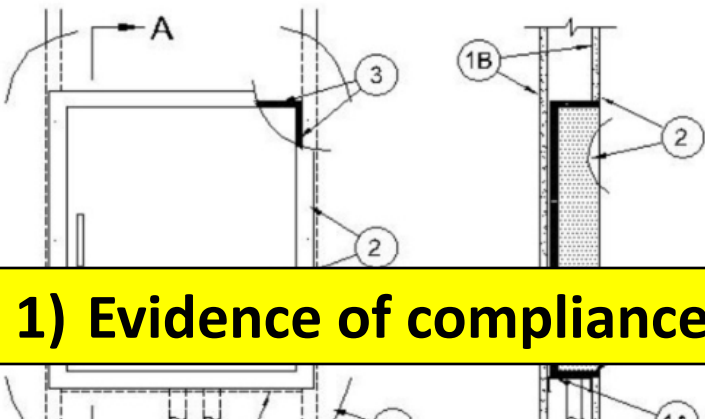
1. **Wall Assembly** — The 1 or 2 hr fire rated framed gypsum board wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. **Studs** — Wall framing shall consist of steel channel studs or wood studs. Steel studs to be min 6 in. (152 mm) wide and spaced max 24 in. (610 mm) OC. Wood studs to be nom 2 by 6 in. (51 by 152 mm) or larger and spaced max 16 in. (406 mm) OC. An additional framing member shall be used to form a shelf within the wall cavity to support the steel box (Item 2) and mat fill material (Item 3). The framed opening is to be 1 in. (25 mm) wider than the width of the steel box.

# For the Code Official

**System No. W-L-7190**  
December 05, 2013

F Ratings — 1 and 2 Hr (See Item 1)	<b>UL System or Listing serve two roles:</b>	2 Hr (See Item 1)
T Ratings — 1 and 2 Hr (See Item 1)		2 Hr (See Item 1)
		FH Ratings — 1 and 2 Hr (See Item 1)
		FTH Ratings — 1 and 2 Hr (See Item 1)



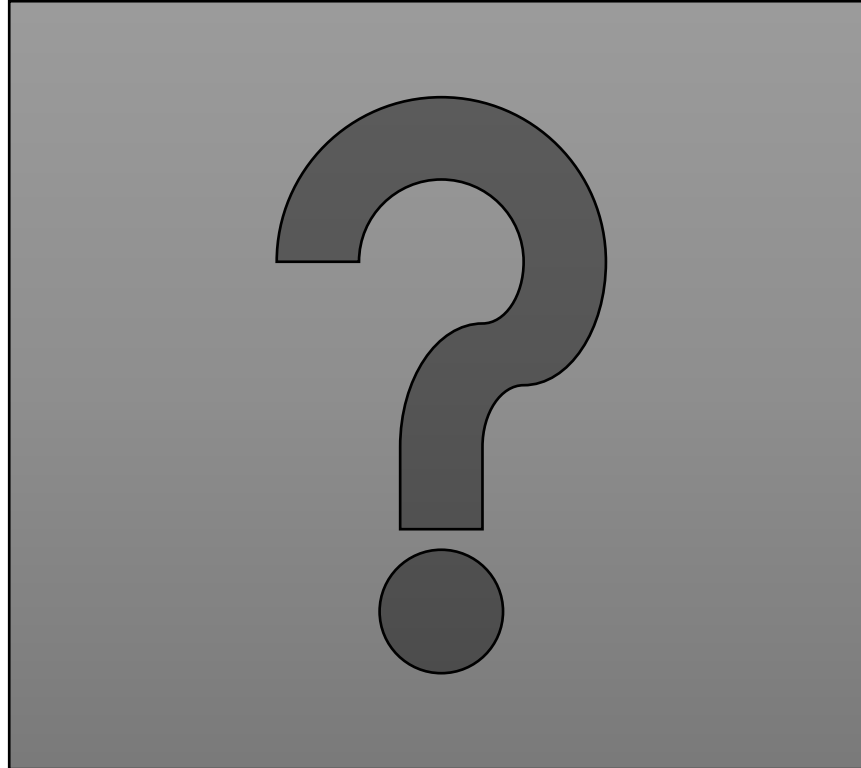
**1) Evidence of compliance**

**2) Document by which to inspect**

1. **Wall Assembly** — The 1 or 2 hr fire rated framed gypsum board wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. **Studs** — Wall framing shall consist of steel channel studs or wood studs. Steel studs to be min 6 in. (152 mm) wide and spaced max 24 in. (610 mm) OC. Wood studs to be nom 2 by 6 in. (51 by 152 mm) or larger and spaced max 16 in. (406 mm) OC. An additional framing member shall be used to form a shelf within the wall cavity to support the steel box (Item 2) and mat fill material (Item 3). The framed opening is to be 1 in. (25 mm) wider than the width of the steel box.

# Questions??



**Rich Walke, Consultant to the FCIA**  
Firestop Contractors International Association  
4415 W. Harrison St., #540  
Hillside, IL 60162  
+1-708-202-1108