

**FCIA
Webinar
Series**

**Firestopping
One- and Two-
Family Dwellings
and Townhouses**

**Dr. Gabby Peck, Technical Director of FCIA
Rich Walke, CTI, Consultant to the FCIA**



Firestop Contractors International Association

MONTHLY WEBINAR



WELCOME & INTRODUCTIONS



OUR MISSION



EDUCATE



ADVOCATE



ADVANCE THE PASSIVE

FIRE INDUSTRY GLOBALLY

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WHERE ARE WE

01 USA & Canada



04 India



02 Mexico



05 Saudi Arabia



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05 Panama & Central America



03 United Arab Emirates



AND MORE...

03 Australia & New Zealand



WHAT:



**To educate & advocate for the
passive fire industry**

Speak, Write, Advocate & Promote

ICC

CSI

CSC, FFMIA, ON

BOA, ON FMIA

RAIC

NFPA

Centre for Campus Fire Safety

Fire Marshalls

Code officials

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ADDITIONAL FCIA PRESENTATIONS & PROGRAMS

2022

'Protecting Recessed Boxes in Fire-Resistance-Rated Construction' for the NYS Department of Health - VIRTUAL - October 2022

Presented for the NY State Department of Health, Division of Nursing Home and ICF/IID Surveillance

'Design Installation Inspection Maintenance & Management' for the Ontario Building Officials Association - Niagara Falls, ON - July 2022

Presented for the Ontario Building Officials Association

2019

'A Study on the 'DIIM' of Firestopping' at the Office of General Services – Albany, NY – September 2019

Presented at the Office of General Services – Albany, NY

'Fire Separations – Fire Resistance & Firestopping Design, Installation, Inspection and Maintenance' at Canada CSC – May 2019

Presented at CSC's Regina Conference

2018

Role of Passive Fire Protection Systems in Maintaining Building Fire- & Life-Safety – December 2018

Presented at BNP's Webinar On-Demand

FCIA's 'DIIM' Canada CSC – DECEMBER 2018

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07-84-00 SPECIFICATION



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The Construction Specifications Institute (CSI) and Construction Specifications Canada documents state, 'State it once, refer to section when needed from other sections'.

Penetrations, Joints and Perimeter Fire Containment in One Section – 07-84-00 –

FCIA ASTM/UL Standards Firestopping Specification:

- [FCIA 07-84-00 Suggested Spec – PDF](#)
- [FCIA 07-84-00 Suggested Spec – WORD](#)

FCIA Canada Standards Specification – English

- [FCIA 07-84-00 CANADA Suggested Spec – ENGLISH PDF](#)
- [FCIA 07-84-00 CANADA Suggested Spec – ENGLISH WORD](#)

FCIA Canada Specification – French – Updated September 2019

- [FCIA 07-84-00 CANADA Suggested Spec – FRENCH PDF](#)
- [FCIA 07-84-00 CANADA Suggested Spec – FRENCH WORD](#)

As a service to the industry, FCIA offers the **FCIA Manual of Practice*** FREE to:

- Architects with Design Firms
- Specifiers in practice with Architectural Firms
- Governmental AHJ Building Officials
- Governmental AHJ Fire Marshals, Fire Service, and Fire Officials
- Government Officials

To see if you qualify, email Cathy@FCIA.org, including name, job title, company, address, phone, fax and email.

***Note: The FCIA Firestop Materials & Systems Guide Manual is NOT part of the FREE MOP offer.**

FREE

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TECHNICAL RESOURCES



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FCIA Standard Answer Series, Technical Resources from the FCIA Firestop Manual of Practice, and More...

Below you will find additional technical resources for the industry. Follow the links to read the document online or download in MS Word format.

Position Papers

[The Global Language of Passive Fire Protection: Understanding the 'DIIM'TM Way](#)

Technical Info – General

[Using Contracts to Manage Volatile Material Availability and Pricing, June 2021](#)
[Managing Volatile Materials Pricing, April 2021](#)

Technical Info – General Firestopping

[ASTM E3456 - Standard Practice for On-Site Identification of Firestop Systems and Judgements](#)
[ASTM E3456 - Standard Practice for On-Site Identification of Firestop Systems and Judgements](#)

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FIRESTOP EDUCATION PROGRAM



LEVEL 0

'Firestopping 101: The Basics'

The Basics' Program is the perfect starting point for anyone new to the firestop industry before advancing to more technical content.



LEVEL 1

'The 'DIIM' of Firestop for Fire and Life Safety'
The Level 1 program covers the 'DIIM' of Firestopping™: proper 'D'esign, 'I'nsallation, 'I'nspection, and then 'M'aintaining Firestop Protection.



LEVEL 2

'Firestop Materials and Systems'
With 13 courses comprised of 20+ modules, the **Firestop Level 2 'Firestop Materials and Systems' Program** dives deep into firestopping and effective compartmentation.



LEVEL 3

'Specifications, Estimating, and Project Management'
'Specifications, Estimating, and Project Management', the Firestop Level 3 Program, covers the fundamental basics every Estimator and Project Manager must know.



LEVEL 4

COMING SOON!

OUR EVENTS '26...

01 PFP CON

Las Vegas, NV

March 30th

to

April 3rd



02 PFP'CON CANADA

Dartmouth, NS

September 1st

to

September 4th



03 FIC CONFERENCE & TRADESHOW

Dallas, FW, TX

November 2nd

to

November 5th



TO OUR MEMBERS,
FRIENDS,
SPONSORS
SUPPORTERS &
BOARD



Welcome to TODAY'S SESSION

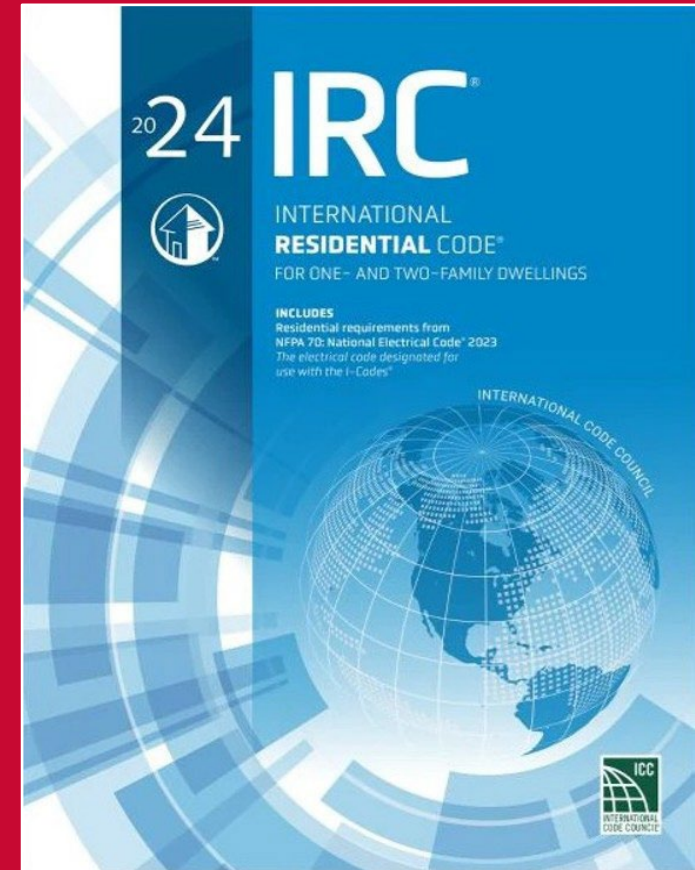
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**Firestopping
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Fire-Resistive Construction

International Residential
Code Requirements for Fire-
Resistance, Firestopping,
Fireblocking and
Draftstopping



What Does the IRC and IBC Cover?

- **(IRC) R101.2: Scope.** The provisions of this code shall apply to ... detached one- and two-family *dwelling*s and *townhouses* not more than three *stories above grade plane* in height.
- **(IBC) 101.2 Scope.** The provisions of this code shall apply to the construction, *alteration*, relocation, enlargement, replacement, *repair*, equipment, use and occupancy, location, maintenance, removal and demolition of every *building* or *structure* or any appurtenances connected or attached to such *buildings* or *structures*.

Exception: Detached one- and two-family *dwelling*s and *townhouses* not more than three *stories above grade plane* in height with a separate *means of egress*, and their accessory *structures* not more than three *stories above grade plane* in height, shall comply with this code or the *International Residential Code*.

What Does the IRC Cover?

- **Definitions**

- **Townhouse.** *A building that contains three or more attached townhouses units. (IRC)*
- **Townhouse Unit.** *A single-family dwelling unit in a townhouse that extends from foundation to roof and that has a yard or public way on not less than two sides. (IRC)*
- **Dwelling.** *Any building that contains one or two dwelling units used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes. (IRC)*
- **Dwelling Unit.** *A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation. (IRC)*

Two-Family Dwelling versus Townhouse



Townhouse



Two-Family Dwelling (i.e. Duplex)

R302.2 – Fire-Resistant Construction – Townhouses

- **R302.2 Townhouses.** Walls separating *townhouse units* shall be constructed in accordance with Section R302.2.1 or R302.2.2 and shall comply with Sections R302.2.3 through R302.2.6.
 - **R302.2.1 Double walls.** Each *townhouse unit* shall be separated from other *townhouse units* by two 1-hour fire-resistance-rated wall assemblies tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the *International Building Code*.
 - [Section 703.2.2 of the IBC covers analytical methods](#)

R302.2 – Fire-Resistant Construction – Townhouses

- **R302.2.2 Common walls.** Common walls separating *townhouse units* shall be assigned a fire-resistance rating in accordance with Item 1 or 2 and shall be rated for fire exposure from both sides. Common walls shall extend to and be tight against the exterior sheathing of the exterior walls, or the inside face of exterior walls without stud cavities, and the underside of the roof sheathing. The common wall shared by two *townhouse units* shall be constructed without openings, plumbing or mechanical equipment, ducts or vents, other than water-filled fire sprinkler piping in the cavity of the common wall. Electrical installations shall be in accordance with Chapters 34 through 43. (i.e. as specified in [Section R302.4](#)) Penetrations of the membrane of common walls for electrical outlet boxes shall be in accordance with Section R302.4.

R302.2 – Fire-Resistant Construction – Townhouses

- Required rating:
 - 1 hr fire-resistance rating if building is sprinklered
 - 2 hr fire-resistance rating if building is not sprinklered
- **Exception:** Common walls are permitted to extend to and be tight against the inside of the exterior walls if the cavity between the end of the common wall and the exterior sheathing is filled with a minimum of two 2-inch nominal thickness wood studs.

R302.3 – Fire-Resistant Construction – Two-Family Dwelling

- **R302.3 Two-family dwellings.** *Dwelling units* in two-family dwellings shall be separated from each other in accordance with Sections R302.3.1 through R302.3.5, regardless of whether a lot line exists between the two *dwelling units*.
 - **R302.3.1: Dwelling unit separation.** The two *dwelling units* shall be separated by fire-resistance-rated assemblies that are vertical, horizontal or a combination thereof.
 - Reference to vertical and horizontal separations implies the individual dwelling units may be side by side, or stacked

R302.3 – Fire-Resistant Construction – Two-Family Dwelling

- **R302.3.2 Two-family dwellings.** Vertical and horizontal assemblies separating *dwelling units* shall have a fire-resistance rating of 1 hour, or a fire-resistance rating of one-half hour in buildings equipped throughout with an automatic sprinkler systems installed in accordance with Section P2904. Fire-resistance rating shall be based on testing in accordance with ASTM E119, UL 263 or an analytical method in accordance with Section 703.2.2 of the *International Building Code*.

R302.3 – Fire-Resistant Construction – Two-Family Dwelling

- **R302.3.3 Continuity.** Vertical and horizontal assemblies separating *dwelling units* shall be constructed in a manner that provides continuity of the fire-resistance rating between *dwelling units*.
 - Requires vertical and horizontal continuity

R302.3 – Fire-Resistant Construction – Two-Family Dwelling

- **R302.3.4 Supporting construction.** Vertical and horizontal assemblies separating *dwelling units* shall be supported by construction having an equal or greater fire-resistance rating.
- **R302.3.5 Vertically stacked dwelling units.** Where one *dwelling unit* in a two-family *dwelling* is located above the other and an automatic sprinkler system complying with P2904 is not provided in both *dwelling units*, both of the following shall apply:
 1. Horizontal and vertical assemblies separating the *dwelling units*, including an interior *stairway serving as the means of egress for the upper dwelling unit*, shall be constructed in a manner that limits the transfer of smoke.
 2. A notification appliance connected to smoke alarms in the other *dwelling unit* shall be provided in each *dwelling unit*.

R302.4 – Protection of Penetrations

- **R302.4 Dwelling unit rated penetrations.** Penetrations of wall or floor-ceiling assemblies required to be fire-resistance rated in accordance with Section R302.2 (i.e. *Townhouses*) or R302.3 (i.e. *Two-Family Dwellings*) shall be protected in accordance with this section.
 - Covers through and membrane penetrations of *townhouse* double walls
 - Covers through penetrations of *townhouse* common walls and membrane penetrations of *townhouse* common walls by items other than plumbing or mechanical equipment, ducts or vents
 - Covers through and membrane penetrations of *dwelling unit* separations of two-family *dwellings*

R302.4 – Protection of Penetrations

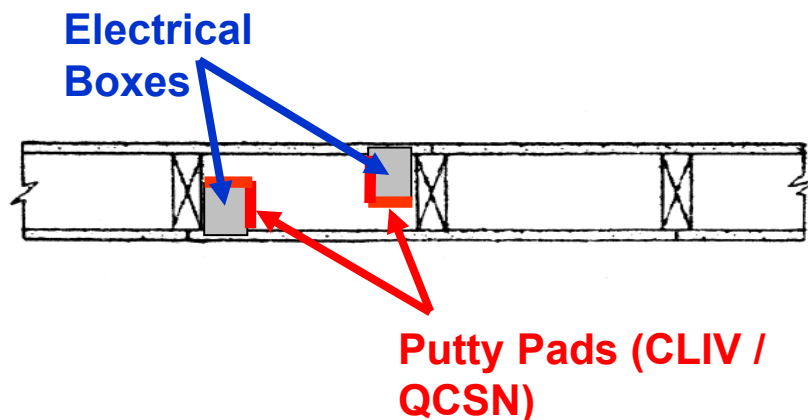
- **R302.4.1 Through penetrations.** Through-penetrations of fire-resistance-rated wall or floor assemblies shall comply with Sections R302.4.1.1 or R302.4.1.2.
 - Exceptions:
 1. Where the penetrating items are steel, ferrous or copper pipes, tubes or conduit, the annular space shall be protected as follows:
 - 1.1 Concrete, grout or mortar exception
 - 1.2 Annular space protection material exception
Removed from 2027 IRC.
 2. The annular space created by the penetration of water-filled sprinkler piping, providing that the annular space is filled using a material complying with Item 1.2 of Exception 1. (i.e. Annular Space Protection Materials – 2027 IRC will require protection based on R302.4.1.1 or R302.4.1.2)

R302.4 – Protection of Penetrations

- **R302.4.1.1 Fire-resistance-rated.** Penetrations shall be installed as tested in the approved fire-resistance-rated assembly.
- **R302.4.1.2 Penetration firestop system.** Penetrations shall be protected by an approved penetration firestop system installed as tested in accordance with ASTM E814 or UL 1479, with a positive pressure differential of not less than 0.01 in. of water (3 Pa) and shall have an F rating of not less than the required fire-resistance rating of the wall or floor-ceiling assembly penetrated.

R302.4 – Protection of Penetrations

- **R302.4.2 Membrane Penetrations.** Membrane penetration shall comply with Section R302.4.1 (i.e. through penetrations). Where walls are required to have a fire-resistance rating, recessed fixtures shall be installed so that the required fire-resistance rating will not be reduced.
 - As specified in R302.4.1 (i.e. through penetrations)
 - Recessed fixtures shall be installed so as not to reduce the required fire resistance



R302.4 – Protection of Penetrations

- **Exceptions:**

- Steel electrical boxes installed per prescriptive requirements or protected with *listed* materials and methods
- *Listed* electrical boxes of any material installed per their *listing* or protected with *listed* materials and methods
- Annular space created by fire sprinklers or water filled sprinkler piping covered by escutcheon plates
- Ceiling membranes penetrations by *listed* luminaires or by luminaires protected by *listed* materials installed in accordance with the manufacturer's installation instruction and their listing.

R302.5 Dwelling Unit – Garage Penetration Protection

- **R302.5 Dwelling unit garage opening and penetration protection.** Openings and penetrations through the walls or ceilings separating the *dwelling unit* from the garage shall be in accordance with Sections R302.5.1 through R302.5.3.
 - **R302.5.1 Opening protection.** Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than 1-3/8 in. in thickness, solid or honeycomb-core steel doors not less than 1-3/8 in. thick, or 20-minute fire-rated doors. Doors shall be self-latching and equipped with a self-closing or automatic-closing device.

Code Requirements

Wall Assemblies Cont.

- **R302.5.2 Duct penetration.** Ducts in the garage and ducts penetrating the walls or ceilings separating the *dwelling units* from the garage shall be constructed of a minimum No. 26 gage sheet steel or other *approved* material and shall not have openings into the garage.
- **R302.5.3 Other penetrations.** Penetrations through the separation required in Section R302.6 (*dwelling unit garage separations*) shall be protected as required by Section R302.11, Item 4. (*i.e. fireblocking around vents, pipes, ducts, cables and wires using approved materials*)

Code Requirements

Wall Assemblies Cont.

- **R302.6 Dwelling unit garage fire separation.** The garage shall be separated as required by Table R302.6. Openings in garage walls shall comply with Section R302.5. Attachment of gypsum board shall comply with Table R702.3.5. The wall separation provisions of Table R302.6 shall not apply to garage walls that are perpendicular to the adjacent *dwelling unit* wall.

TABLE R302.6 DWELLING UNIT GARAGE SEPARATION



SEPARATION	MATERIAL
From the <i>dwelling unit</i> and attics	Not less than 1/2-inch gypsum board or equivalent applied to the garage side
From <i>portions of the dwelling unit</i> above the garage	Not less than 5/8-inch Type X gypsum board or equivalent
Structure supporting floor/ceiling assemblies used for separation required by this section	Not less than 1/2-inch gypsum board or equivalent
Garages located less than 3 feet from a dwelling unit on the same lot	Not less than 1/2-inch gypsum board or equivalent applied to the interior side of exterior walls that are within this area

Code Requirements

Fireblocking

- **R302.11 Fireblocking.** In combustible construction, fireblocking shall be provided to cut off both vertical and horizontal concealed draft openings and to form an effective fire barrier between stories, and between a top story and the roof space.

Fireblocking shall be provided in wood-framed construction in the following locations:

Code Requirements

Fireblocking Cont.

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows:
 - 1.1. Vertically at the ceiling and floor levels.
 - 1.2. Horizontally at intervals not exceeding 10 feet.
2. At interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R302.7.

Code Requirements

Fireblocking Cont.

4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an *approved* material to resist the free passage of flame and products of combustion. The material filling this annular space shall not be required to meet the ASTM E136 requirements.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family *dwelling* is required at the line of *dwelling unit* separation.

Code Requirements

Fireblocking Cont.

- **R302.11.1 Fireblocking materials.** Except as provided in Section R302.11, Item 4, fireblocking shall consist of the following materials.
 1. Two-inch nominal lumber.
 2. Two thicknesses of 1-inch nominal lumber with broken lap joints.
 3. One thickness of 23/32-inch *wood structural panels* with joints backed by 23/32-inch (18.3 mm) *wood structural panels*.
 4. One thickness of 3/4-inch particleboard with joints backed by 3/4-inch (19.1 mm) particleboard.
 5. One-half-inch gypsum board.

Code Requirements

Fireblocking Cont.

6. One-quarter-inch cement-based millboard.
 7. Batts or blankets of mineral wool or glass fiber or other *approved* materials installed in such a manner as to be securely retained in place.
 8. Cellulose insulation installed as tested in accordance with ASTM E119 or UL 263, for the specific application.
- **R302.11.1.1 Batts or blankets of mineral or glass fiber.** Batts or blankets of mineral or glass fiber or other *approved* nonrigid materials shall be permitted for compliance with the 10-foot horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs.

Code Requirements

Fireblocking Cont.

- **R302.11.1.2 Unfaced fiberglass.** Unfaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a height of not less than 16 inches measured vertically. Where piping, conduit or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction.
- **R302.11.1.3 Loose-fill insulation material.** Loose-fill insulation material shall not be used as a fireblock unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.
- **R302.11.2 Fireblocking integrity.** The integrity of fireblocks shall be maintained.

Code Requirements

Draftstopping Cont.

- **R302.12 Draftstopping.** In combustible construction where there is usable space both above and below the concealed space of a floor-ceiling assembly, draftstops shall be installed so that the area of the concealed space does not exceed 1,000 square feet. Draftstopping shall divide the concealed space into approximately equal areas. Where the assembly is enclosed by a floor membrane above and a ceiling membrane below, draftstopping shall be provided in floor-ceiling assemblies under the following circumstances:
 1. Ceiling is suspended under the floor framing.
 2. Floor framing is constructed of truss-type open-web or perforated members.

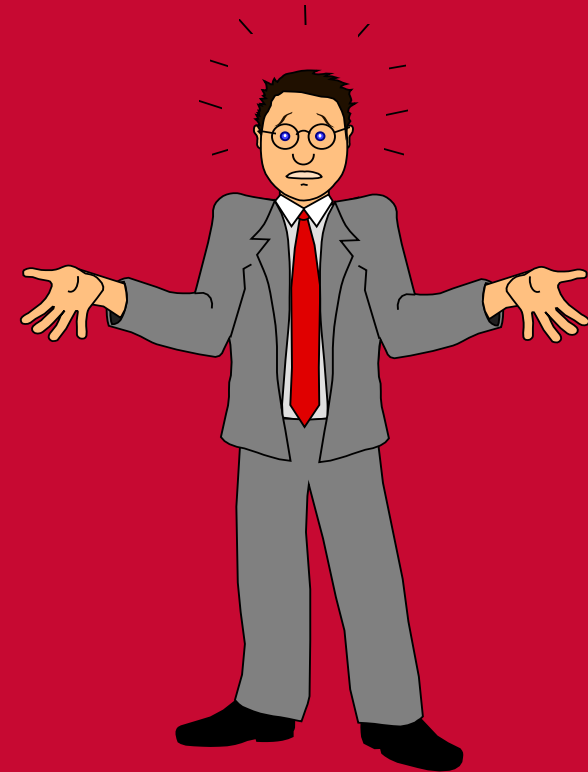
Code Requirements

Draftstopping Cont.

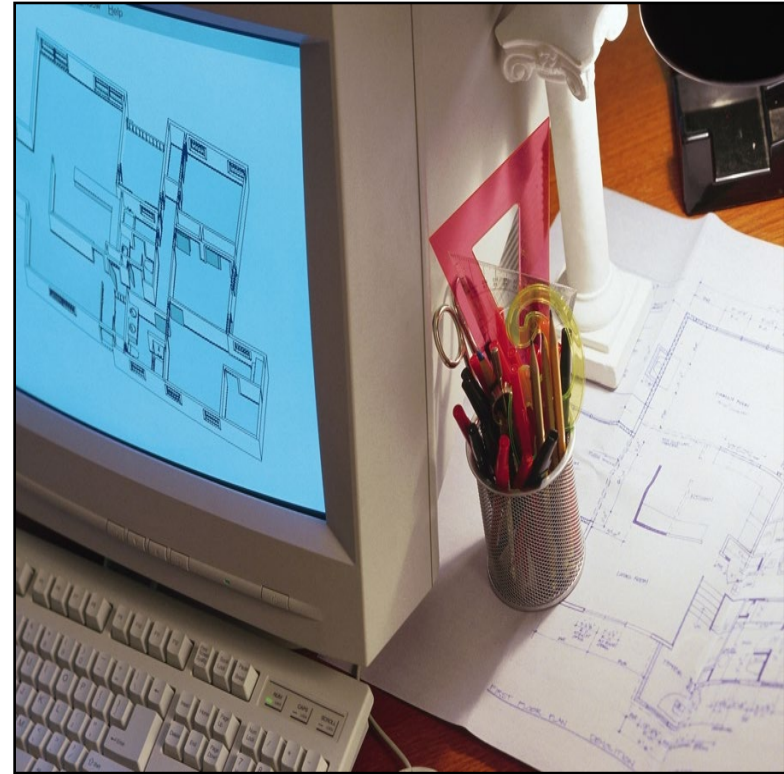
- **R302.12.1 Materials.** Draftstopping materials shall be not less than 1/2-inch gypsum board, 3/8-inch *wood structural panels* or other *approved* materials adequately supported. Draftstopping shall be installed parallel to the floor framing members unless otherwise *approved* by the *building official*. The integrity of the draftstops shall be maintained.

R302 – IRC Applications

- What's the difference?
 - Firestopping?
 - Fireblocking?
 - Draftstopping?



Key Points About Firestopping



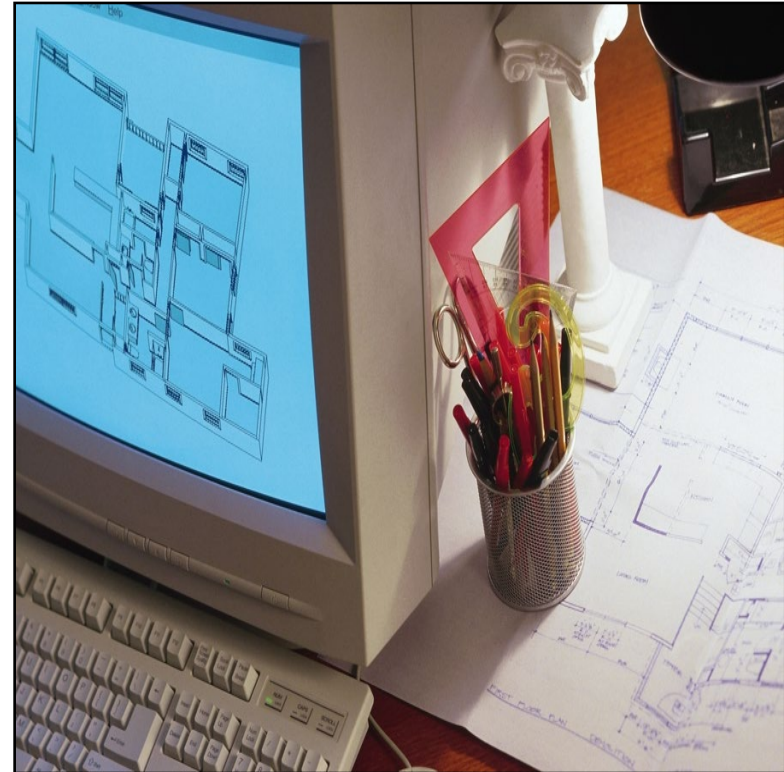
Firestopping

- Applies to rated construction only
- IRC requires firestop systems to be tested in accordance with the following standards:
 - ASTM E814 or UL 1479
- ASTM E814 and UL 1479 establishes two fire-related ratings:
 - F Rating – Passage of flames, and successful hose stream test for some hourly rating period
 - T Rating - Passage of flames, limitation on temperature rise on unexposed side, and successful hose stream test for some hourly time period
- IRC requires only an F Rating

Firestopping

- Testing in accordance with ASTM E814 / UL 1479 establishes a firestop system which describes the overall construction of the system tested. System describes barrier penetrated, penetrating item, method of protection and ratings achieved.
 - Construction in the field must match the system in order for the rating to apply. Any variation between published system and field construction must be evaluated through the engineering judgment process.

Key Points About Fireblocking



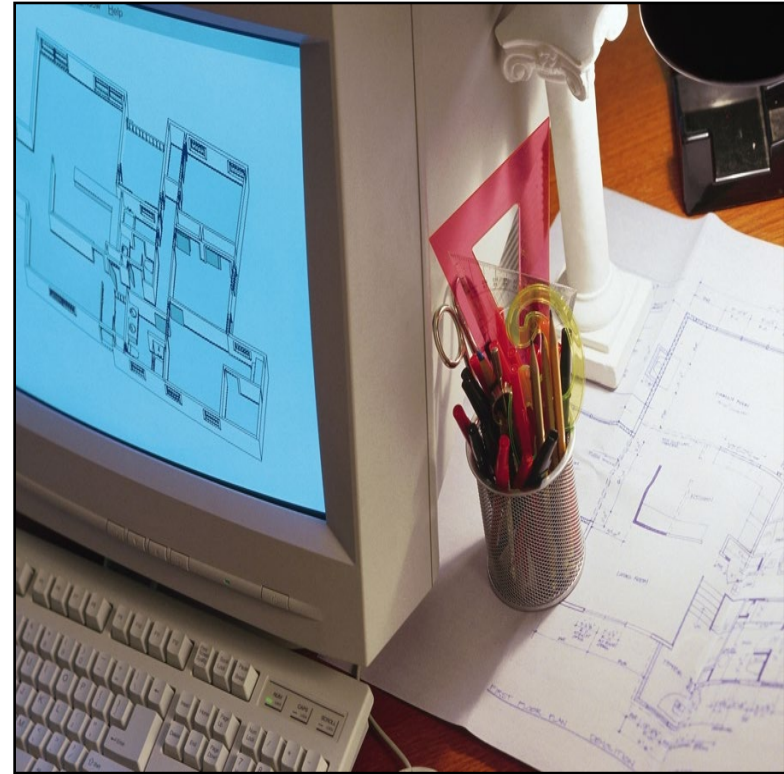
Fireblocking

- In combustible construction, fireblocking is used to cut off both vertical and horizontal concealed openings to provide an effective fire barrier between stories, and between the top story and the roof space
 - Applies to rated and non-rated construction
- Other than the method of protecting openings around vents, pipes, ducts, cables and wires at the top and bottom plates in non-rated combustible construction, fireblocking uses materials prescriptively described in the IRC. No testing or listings are needed.

Fireblocking Cont.

- Openings around vents, pipes, ducts, cables and wires at the top and bottom plates in non-rated combustible construction, shall be protected with an *approved* material to resist free passage of flames and products of combustion.
 - One method of approving a protection method is through the use of an Evaluation Report issued by ICC-ES, Intertek or UL. Code official is not obligated to accept an Evaluation Report!

Key Points About Draftstopping

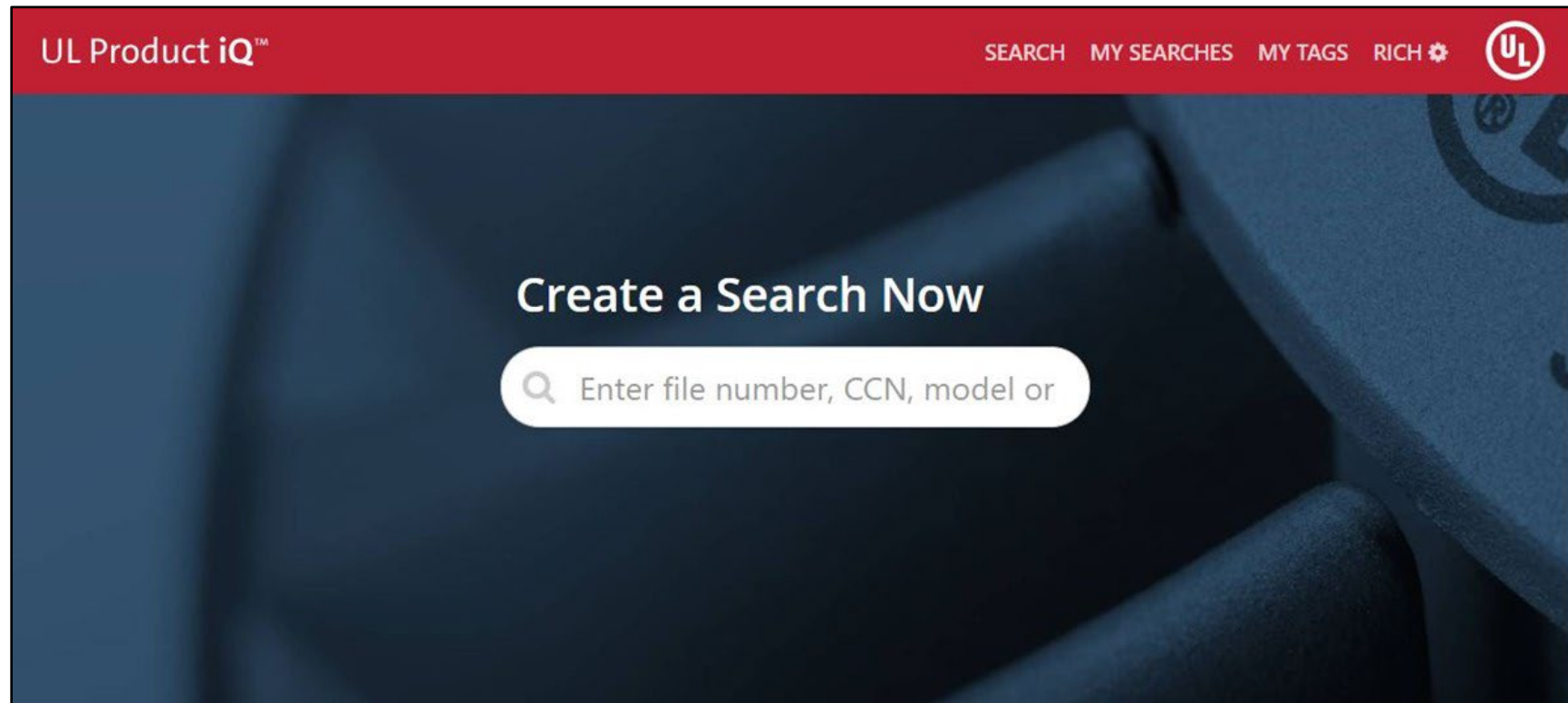


Draftstopping

- Draftstopping installed in communicating concealed spaces to prevent fire migration with the concealed spaces
 - Applies to rated and non-rated construction
- Draftstopping uses materials prescriptively described in the IRC. No testing or listings are needed.

Where Can I Find The Most Current Listings?

UL Product iQ at www.ul.com/PiQ



Product Categories

- **BXUV** – Fire Resistance Ratings – ANSI/UL 263
 - Includes approximately 2025 individual designs
 - Proprietary products specified in these designs are covered in 58 individual product categories
- **XHEZ** – Through-Penetration Firestop Systems
 - Includes approximately 7370 individual systems
 - Proprietary products specified in these designs are covered in 8 individual product categories

Fire-Resistance-Rated Construction

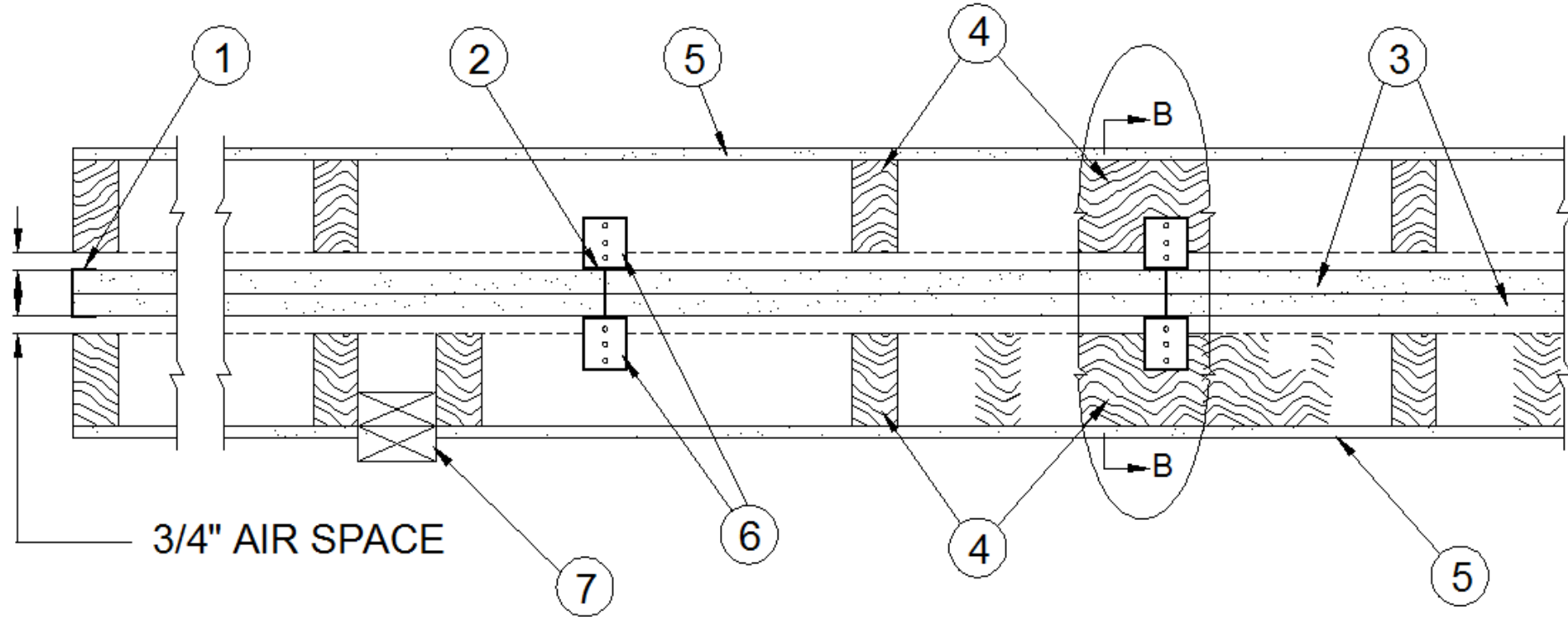
ICC Code Proposal
RB63-25 Relating to
Townhouse Separation
Walls



IBC Proposal RB63-25

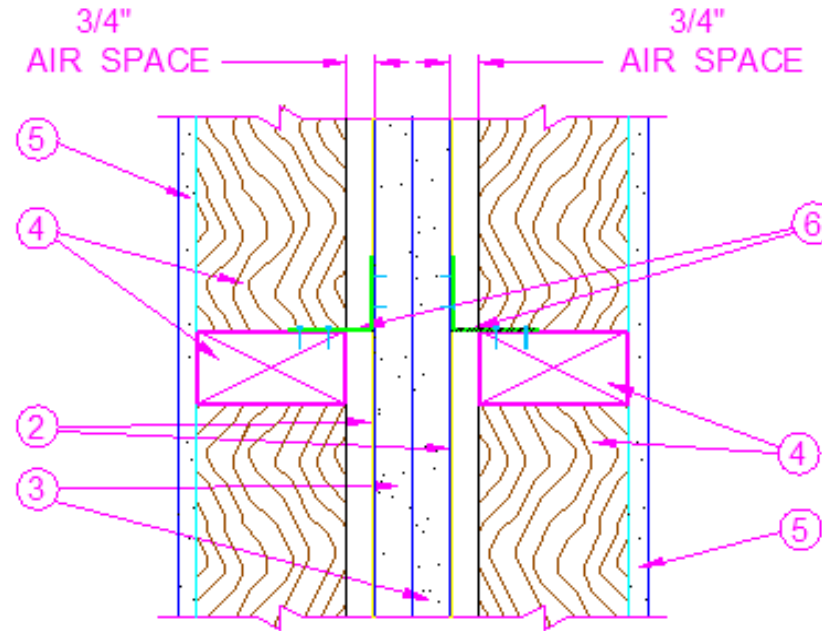
- Comprehensive proposal relating Townhouse separations and unique firestopping provisions when Area Separation Walls (ASW) are used
- Intended to incorporate unique provisions for the penetrating ASW
- Intended to bring in prescriptive fire-resistance-rated assemblies from the IBC into the IRC
- Multiple special interest groups issued Comments and Public Comments pushing their positions

U336, U347, U366, U373, U375, U388, V345, V350 and V351 Style Area Separation Walls



Horizontal Cross-Section

U336, U347, U366, U373, U375, U388, V345, V350 and V351 Style Area Separation Walls



Vertical Cross-Section

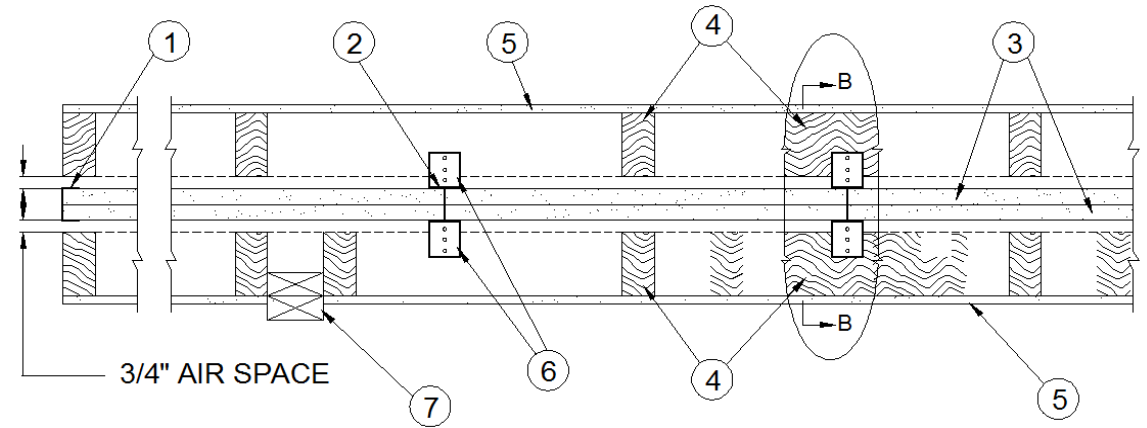
U336, U347, U366, U373, U375, U388, V345, V350 and V351 Style Area Separation Walls

- Separation Wall:
 - Two layers 1 in. liner boards retained in H Channels
 - Liner boards provide primary fire performance
 - Non-load-bearing
 - Structural support provided by adjacent stud walls through aluminum angle clips
 - In symmetrical applications, stud wall on one side can collapse without impacting structural integrity of separation wall

U336, U347, U366, U373, U375, U388, V345, V350 and V351 Style Area Separation Walls

- Protected Wall:

- Load-bearing or non load-bearing
- Wood and/or steel studs as specified
- “Non-rated” or “Type X” gypsum board
- Allows overall assembly to meet heat transmission requirements at H channels of Separation Wall
- *May not be intended to support rated horizontal assemblies due to need to rate the load path supporting horizontal assemblies (Section R302.3.4 of 2024 IRC)*



IBC Proposal RB63-25

- Very heated discussion at CAH #2 and PCH
- One Comment was intended to remove antiquated references prohibiting certain types of penetrations through Common Walls
 - Comment was not approved
- Final approved language will create confusion when adopted
 - **R302.2.5 Additions to walls.** The provisions of Sections R302.2.1 through R302.2.5 regulating openings, plumbing or mechanical equipment, ducts, or vents shall not apply to cavities in walls that are attached to, but not part of, the fire-resistance rated wall or assembly.
 - FCIA argued that the Protected Walls are an integral part of the ASW. Without the Protected Wall, the ASW will not meet the published rating of these walls. As such, it is not just an “addition”.

Questions??



Thanks for Attending!!!

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