Fire Separations – Fire Resistance & Firestopping Design, Installation, Inspection and Maintenance

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DIIM

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FCIA = Trade Association

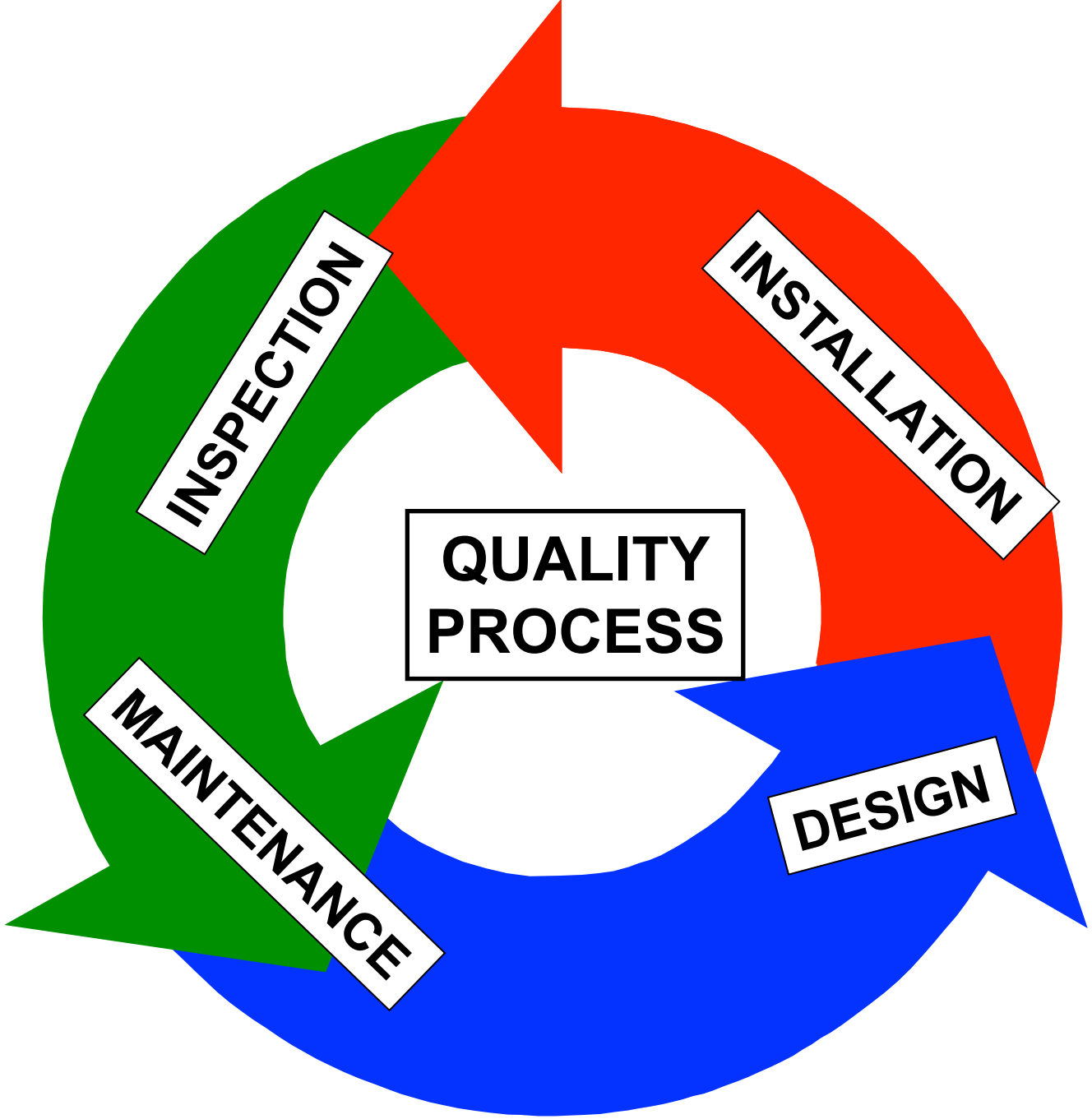
- Active Committees
- FCIA.org 07-84-00 Spec for Canada
- FCIA MOP FREE PDF
- FREE Life Safety Digest
- Member Lists
- Conferences in Canada
- Conferences USA, ME
- Relationships

“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

"DIIM"

- Fire Resistance & Smoke Resistant Systems
  - Properly ***Designed*** and Specified Firestopping FCIA - 07-84-00 – Specification – ***RSW, CCS***
  - ***Tested and Listed Systems*** **- ULC-S-101, S-115, S-112, S-104, ASTM E2307, E2837….Movement, Smoke (L), Water (W)**
  - Professional ***Installation*** – FCIA Member, ULC Qualified Contractors, FM 4991 Approved,
  - Properly ***Inspected*** – to….ASTM E 2174 / 2393 Protocol by IAS AC 291 Accredited Inspection Agencies, ULC, IFC, FM Firestop Exams.
  - ***Maintained*** - Annually – by FCIA Members – **National Fire Code of Canada**
  - **http://www.constructioncanada.net/firestopping-and-effective-compartmentation/**


INSPECTION
INSTALLATION
QUALITY
PROCESS
MAINTENANCE
DESIGN

FCIA's 2020 Proposals – National Building Code of Canada

- **Add New Requirements**
  - ULC Qualified Firestop Contractors
  - FM 4991 Approved
  - ASTM E 2174 and ASTM E 2393 Standards for On-Site Firestop Inspection
- Add "Breach" Term to the Code…
- Change "Fire Stop to "Firestop"

FCIA's 2020 Proposals – National Building & Fire Code of Canada

- Require an **"Inventory";** Annual Visual Inspection
  - Fire Separations
  - Firestops, Fire Doors, Fire Dampers, Firestop Systems…for building maintenance.
- Existing Buildings
  - **Repair Damage** to Fire Separations – Damage?
  - **Require Documentation** of Fire Separations, etc.

FCIA's 2020 Proposals – National Building Code of Canada

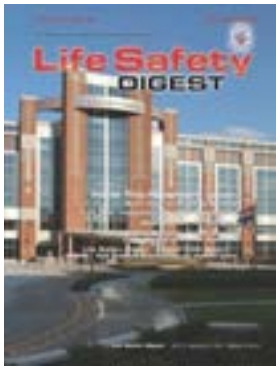
Pro Firestop Photos

FCIA's 2020 Proposals – National Building Code of Canada

Pro Firestop Photo

M–Barrier Management Systems Starts @ NEW CONSTRUCTION

- **NEW Buildings – 07-84-00 Specs**
  - **www. FCIA .org**
- **Part I – Focus on**
  - **Systems, Listings**
  - **Not Products**
  - **Manufacturers Installation Instructions**
- **EJ's/EFRRA's –**
  - **"Single Manufacturer to the greatest extent possible……."**



M–Barrier Management Systems Starts with SPECS

- **NEW Buildings – 07-84-00 Specs**
  - **www. FCIA .org**
- **Part II – Contractor Qualifications**
  - **FCIA Member in Good Standing, AND**
  - **UL/ULC Qualified Firestop Contractor Program,**
  - **OR**
  - **FM 4991, Standard for the Approval of Firestop Contractors**
  - **AND**
  - **Manufacturer Accredited, Approved, Trained**

M–Barrier Management Systems Starts with SPECS

- **NEW Buildings – 07-84-00 Specs**
  - **www. FCIA .org**
- **Part II – Qualifications – Inspection**
  - **Special Inspection Agency –**
    - **IAS AC 291 Accredited Special Inspection Agencies**
  - **Special Inspector Qualifications**
    - **FM Firestop Exam**
    - **UL Firestop Exam**
    - **AND**
    - **IFC Exam – ASTM E 3038**

M–Barrier Management Systems Starts with SPECS

- **NEW Buildings – 07-84-00 Specs**
- **Part III – Execution**
  - **Firestop Inspection**
    - **ASTM E 2174 - Penetrations**
    - **ASTM E 2393 - Joints**

Building & Fire Code Requirements

- NFPA 5000 – 101- Chapter 8
- **National Building Code – Canada**
- UAE Fire and Life Safety Code – Chapter
- International Codes –

- ***Minimum requirements - Construction & Maintenance***

National Fire Code of Canada

National Fire Code of Canada

- ***Division B – Part 2, Building and Occupant Fire Safety***
  2.2.1.2 – Damage to Fire Separations – where *fire separations* are damaged so as to affect their integrity, they shall be repaired so that the integrity of the *fire separation* is maintained…

Includes Fire Dampers, Fire Doors…and Continuity

Compartmentation Codes – NBC

- **Back to the Basics – Fire-Resistance Rating is…**
- **Division A, 1.4.1.2**
- ***Fire resistance rating means the*** *time in minutes or hours that a material or assemblies of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions of test and performance criteria, or as determined by extension or interpretation of information derived therefrom as prescribed in this Code.*

- ***CAN/UL-S101 -*** *Standard Methods of Fire Endurance Tests of Building Construction Materials*

Compartmentation Codes – NBC

Compartmentation Codes

NBCC - 3.1.8.1.(1)(b)

Although a fire separation is not always required to have a fire-resistance rating, the **fire separation** should act as a **barrier to the spread of smoke and fire** until some response is initiated.

If the fire-resistance rating of a fire separation is waived on the basis of the presence of an automatic **sprinkler system**, it is intended that the ***fire separation will be constructed so that it will remain in place and act as a barrier against the spread of smoke for a period of time*** until the sprinklers have actuated and controlled the fire.

- **CAN/UL-S115** Listed Systems – **NOTE:**
- **L-Rating ALWAYS?**

Compartmentation Codes – NBC

- 3.1.8.1 – Barrier to control Smoke Spread

  Although a fire separation is not always required to have a fire resistance rating, ***the fire separation should act as a barrier to the spread of smoke and fire until some response is initiated****. If the fire resistance rating of a fire separation is waived on the basis of the presence of* ***an automatic sprinkler system, it is intended that the fire separation will be constructed so that it will remain in place and act as a barrier against the spread of smoke f****or a period of time until the sprinklers have actuated and controlled the fire."*

CAN/UL-S115 - “L” Rating

Compartmentation Codes – NBC

NBCC - 3.1.8.1. - General Requirements

1) Any wall, partition or floor assembly required to be a fire separation shall

a) except as permitted by Sentence (2), be constructed as ***continuous*** element, and

b) as required in this part, have a fire-resistance-rating as specified (see appendix A)

2) Openings in a *fire separation* shall be protected with closures, shafts or other means in conformance with Articles 3.1.8.4-7.

Compartmentation Codes – NBC

- 3.1.8.3 – Continuity
  - **The continuity of a *fire separation shall be maintained where it abuts another fire separation, a floor, a ceiling, a roof or an exterior wall assembly. (Appendix A, 3.1.8.3)***

  - *9.10.9.2 Continuous Barrier*

Compartmentation Codes – NBC

3.1.7.5. Rating of Supporting Construction

1) Except as permitted by Sentence (2) and by Articles 3.2.2.20. to 3.2.2.88. for mixed types of construction, all *load bearing* walls, columns and arches in the ***storey*** **immediately below a floor or roof assembly required to have a *fire-resistance rating* shall have a *fire-resistance rating* not less than that required for the supported floor or roof assembly.**

Compartmentation Codes – NBC

- ***3.1.8.3 (4) Fire Separation Continuity –***

The continuity of a fire separation where it abuts against another fire separation, a floor, a ceiling or an exterior wall assembly is maintained by filling all openings at the juncture of the assembles with a material that will ensure the integrity of the fire separation at that location.

- *9.10.9.2 Continuous Barrier*

Compartmentation Codes – NBC

3.1.9.1.Fire Stopping of Service Penetrations

Except as required by Sentences (2) and (3), and permitted by sentences (4) and (5), penetrations of a fire separation or membrane forming part of an assembly required to have a fire resistance rating shall be

a) ***sealed by a fire stop system*** that, when subjected to the fire test method in **CAN/UL-S115, "Fire Tests of Firestop Systems,"** has an F rating not less than the fire-protection rating required for closures in the fire separation in conformance with Table 3.1.8.4., or **(50pa, plastics)**

b) ***cast in place*** (see Appendix A).

SEE ALSO 3.1.9.4, penetrations by combustible drain, waste and vent piping.

Compartmentation Codes – NBC

- **Change for 2010….**
- **Definition of Fire Stop**

'System consisting of a material, component and means of support used to fill gaps between fire separations or between fire separations and other assemblies, or used around items that wholly or partially penetrate a fire separation'

Compartmentation Codes – NBC

3.1.9.1.Fire Stopping of Service Penetrations

3) Penetrations of a *fire separation* in conformance with Article 3.6.4.2 (2) shall be sealed by a fire stop that, when subjected to the fire test method CAN/ULC-S115, “Fire Tests of Firestop Systems”, has an FT Rating not less than the *fire-resistance rating* of the *fire separation*.

Compartmentation Codes – NBC

3.1.9.1.Fire Stopping of Service Penetrations

b) ***cast in place*** (see Appendix A).

- Concrete, Grout…Full Thickness of the Assembly

Compartmentation Codes – NBC

4) Sprinklers are permitted to penetrate a *fire separation* or a membrane forming part of an assembly required to have a *fire-resistance rating* without having to meet the *fire stop* requirements of sentences (1) to (3), provided that the annular space created by the penetration of a fire sprinkler is covered by a metal escutcheon plate in accordance with NFPA 13, “Installation of Sprinkler Systems”.

Compartmentation Codes – NBC

5) **Unless specifically designed with a *fire-stop*, *fire dampers* are permitted to penetrate a *fire separation* or a membrane** forming part of an assembly required to have a *fire-resistance rating* without having to meet the *fire stop* requirements of Sentences (1) to (3), provided the *fire dampers* is installed in conformance with NFPA 80, “Fire Doors and Other Opening Protectives”

Compartmentation Codes – NBC

3.1.9.4 – Combustible Piping Penetrations

4) Combustible drain, waste and vent piping is permitted to penetrate a *fire separation* required to have a *fire-resistance rating* or membrane that forms part of an assembly required to have a *fire-resistance rating,* provided

a. the piping is sealed at the penetration by a *fire stop* that has an F rating not less than the *fire-resistance rating required for the fire separation* when subjected to the fire test method in CAN/ULC-S115, Fire Tests of Firestop Systems", with a pressure differential of 50 Pa between the exposed and unexposed sides, with the higher pressure on the exposed side, and

b. the piping is not located in a vertical service space.

Compartmentation Codes – NBC

3.1.5.16 – Combustible Piping Penetrations

NEW for 2010….

3) Polypropylene pipes and fittings are permitted to be used for drain, waste and vent piping for the conveyance of highly corrosive materials and for piping used to distribute distilled or dialized water in laboratory and hospital facilities in a building required to be of non combustible construuction provided:

Compartmentation Codes – NBC

- **Division A, 1.4.1.2**
- ***Fire-protection rating*** means the time in minutes or hours that a ***closure*** will withstand the passage of flame when exposed to fire under specified conditions of test and performance criteria, or as otherwise prescribed in this Code.
- ***Flame-spread rating*** means an index or classification indicating the extent of spread-of-flame on the surface of a material or an assembly of materials as determined in a standard fire test as prescribed in this Code.

Compartmentation Codes – NBC

A-2.2.6.2.(1) **Information Required on Drawings and Specifications.** Examples of information that should be shown on architectural drawings and drawings for heating, ventilating and air-conditioning systems are..

(n) the location and fire-resistance rating of required fire separations.

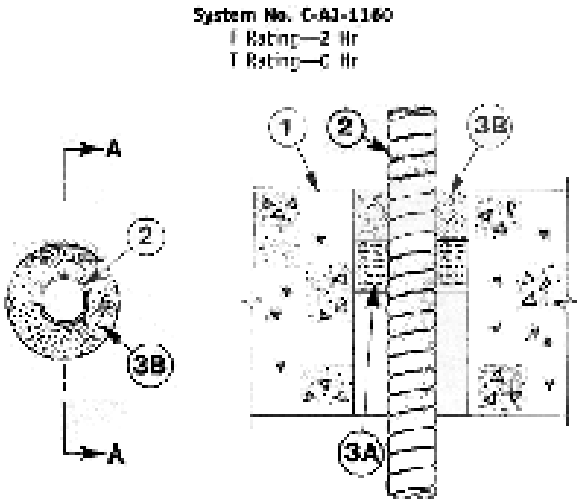
NOTE: This is the root of the National Fire Code Change…

Continuity

Effective Compartmentation Features

New UL test standards for Life Safety Dampers will take effect in July 2002

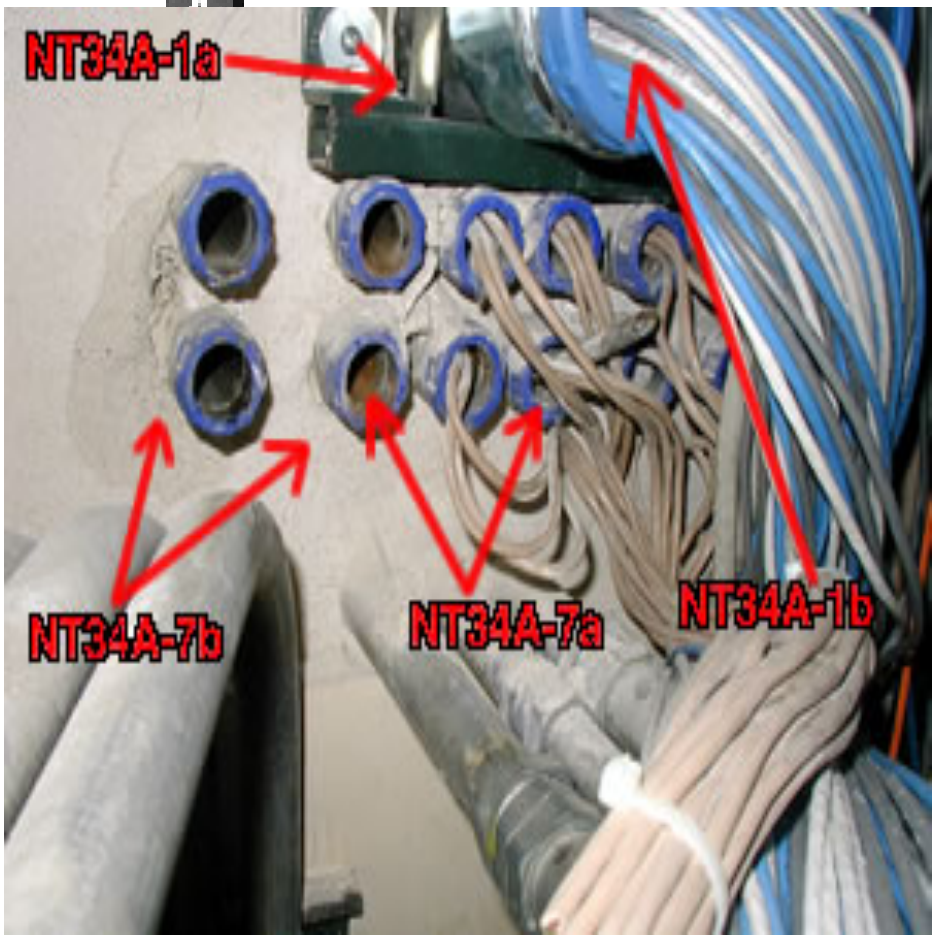
Firestopping for Continuity
I – Classified Systems



SECTION A–A

1. Floor or Wall Assembly—Min 4-1/2 in. thick lightweight or normal weight (100 to 150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Size of circular through opening in floor or wall assembly to be 1/8 in. to 1-1/2 in. larger than diam of flexible metal conduit (Item 2) installed in through opening. Max diam of opening is 6 in.
   See Concrete Block (CAJU) category in the Fire Resistance Directory for names of manufacturers.
2. Through Penetrating Product*—Max 4 in. diam (or smaller) steel, or max 3-1/2 in. diam (or smaller) aluminum Flexible Metal Conduits. Max one flexible metal conduit to be installed near center of circular through opening in floor or wall assembly. Flexible metal conduit to be rigidly supported on both sides of floor or wall assembly.
   Alliance Cable Corp.
3. Packing Material—Min 1 in. thickness of ceramic (alumina silica) fiber blanket or mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed min 1 in. from top surface of floor or from both surfaces of wall.
4. FILL, Void or Cavity Material*—Caulk—Applied to fill the annular space around the flexible metal conduit. In floors, a min 1 in. depth of fill material to be installed flush with top surface of floor. In walls, a min 1 in. depth of fill material to be installed flush with wall surface on both sides of wall assembly.
   Minnesota Mining & Mfg. Co.—[illegible]

*Bearing the UL Classification Marking
†Bearing the UL Listing Mark



Barrier Continuity SYSTEMS

- **Products Become Systems – Test Standards**
  - **Fire & Smoke Barriers – Fire Separations**
    - CAN/ULC S-101; ASTM E119, UL 263
    - **Firestopping - CAN4/ULC-S-115,** ASTM E 814 / UL 1479, UL 2079, E-1966, E-2307, E-2837, **…**test method…"
  - **Fire/Smoke Dampers – CAN4/ULC-S 112,** UL 555, UL 555S
  - **Swing/Rolling Fire Doors – CAN4/ULC-S104,** S-105 Frames; S-113 for 20 minute wood doors, UL10B/C….
  - **Fire Rated Glazing – CAN4/ULC-S 106,** UL 9
- **SYSTEM Testing = Suitability statement**

Firestopping for Continuity
Products become SYSTEMS

- **'Field Erected Construction…Tested to…'**
  - Standards - **ULC S-115**, ASTM E814/UL 1479–UL 2079, ASTM E 1966, ASTM E 2837, ASTM E 2307, FM 4990
  - **F Rating - Flame**
  - FT Rating – Temperature
  - FH Rating – Hose
  - FTH Rating
  - **L Rating – Smoke**
  - W Rating – Water

Graphics – 3M

Products become Systems
Hose Stream = Shock Test

UL Photo, Rich Walke

Building & Fire Worldwide Code Requirements

- *Chemical, Biological, Radiation, Explosion, etc.*
  - Standards?
    - R - Nuclear Power Plant Standards
    - E – Blast Strength? Check with manufacturer
    - C – Which Chemicals? Check with manufacturer
    - B – Which Agents? Check with manufacturer
    - G – Germ – Check with manufacturer & industrial hygenist
  - How to Regulate for Unexpected Events?
  - Due Diligence - Review Required by code?

Firestop Perimeter Fire Containment Systems

- Firestop Perimeter Systems
  Definition – ASTM E 2307
  - "A Perimeter Fire Containment System is **a specific field erected construction** consisting of a floor with a fire resistance rating, and an exterior curtainwall with no hourly resistance rating, and the fill material installed between the floor and the curtain wall to prevent the vertical spread of fire in a building."

Superl Photo

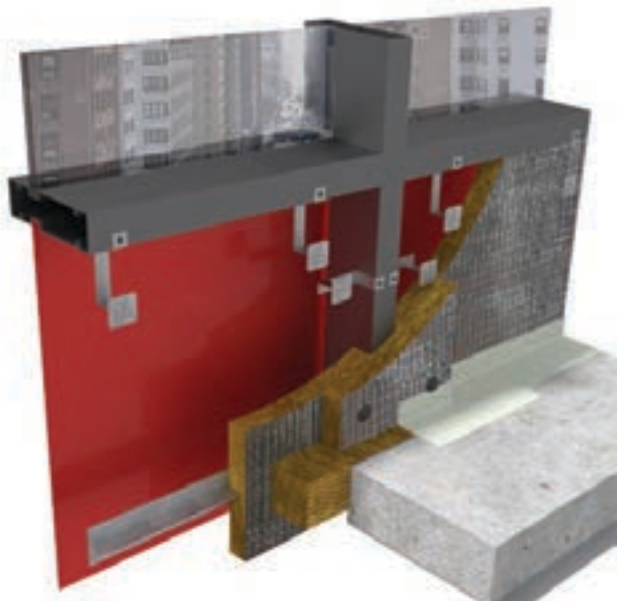
IBC & Curtain Walls

ASTM E 2307

Prevent Fire Spread – Interior Safing Slot

- **Interior Flame**
- **Exterior Flame Plume from Window**
- **Time & Temperature**
- **Tested Systems….**

•Leapfrog Testing?



Thermafiber Image

Exterior Wall Testing

Metal Composite Materials – (MCM)

NFPA 285 & ASTM E 2307?

Tamweel Towers, Dubai
Perimeter Fire Protection
Gulf News: A discarded cigarette ???

Gulf News Photos

Barrier Continuity
Products become SYSTEMS

- **Fire Rated Systems Directories –**
  - **FM Approvals**
  - **Intertek**
  - **UL Fire Resistance Directory**

Systems Selection & Analysis…Not as easy as it looks…

Engineering Judgments/EFRRA

- Variances to Systems at Site ? – Now What…
  - **First Action in Process**
    - **Find another system** – Same Manufacturer
    - **Find another system –** Different Manufacturer
    - **If no system exists in either case**….
  - **Second Action –**
    - ***Engineering Judgment* – "EJ"**
    - ***Equivalent Fire Resistance Rated Assembly – "EFRRA"***
  - ***Based on engineering, IFC Protocol***

International Firestop Council – Manufacturers – firestop.org

IFC Guidelines for Evaluating Engineering Judgment Guidelines

‘Construction industry professionals, building officials, fire officials, firestop contractors and other stakeholders need appropriate guidelines for evaluating and using such judgments.’

As such, IFC developed *Recommended IFC Guidelines for Evaluating FireStop Systems in Engineering Judgments*.

IFC EJ Guidelines - Engineering Judgments for firestop systems should:

1. Not be used in lieu of tested systems when available;

2. Be issued only by a firestop manufacturer's qualified technical personnel or in concert with the manufacturer by a knowledgeable registered Professional Engineer, Fire Protection Engineer, or an independent testing agency that provides listing services for firestop systems;

3. Be based upon interpolation of previously tested firestop systems that are either sufficiently similar in nature or clearly bracket the conditions upon which the judgment is to be given.

Additional knowledge and technical interpretations based upon accepted engineering principles, fire science and fire testing guidelines (e.g. ASTM E 2032 – Standard Guide for Extension of Data from Fire Endurance Tests, ULC Subject C263E – Criteria for Use in Extension of Data from Fire Endurance Tests, or ASTM E2750 – Standard Guide for Extensions of Data for Penetration Seals) may also be used as further support data;

….plus another several pages..

IFC EJ Guidelines

Engineering Judgments for firestop systems should:

4. Be based upon full knowledge of the elements of the construction to be protected, the understanding of the probable behavior of that construction and the recommended firestop system protecting it were they to be subjected to the appropriate Firestop Standard Fire Test method for the rating indicated on the Engineering Judgment;

5. Be limited only to specific conditions and configurations upon which the engineering judgment was rendered and should be based upon reasonable performance expectations for the recommended firestop system under those conditions;

6. Be accepted only for a single, specific job and project location and should not be transferred to any other job or project location without thorough and appropriate review of all aspects of the next job or location's circumstances.

IFC EJ Guidelines - Basic Presentation Requirements

Proper EJ's should:

1. Be presented in appropriately descriptive written form with or without detail drawings where appropriate;

2. Clearly indicate that the recommended firestop system is an EJ;

3. Include clear directions for the installation of the recommended firestop system;

4. Include dates of issue and authorization signature as well as the issuer's name, address and telephone number;

5. Reference tested system(s) upon which design (EJ) is based on;

6. Identify the job name, project location and firm EJ is issued to along with the non-standard conditions and rating supported by the EJ;

IFC EJ Presentation Guidelines – What's Seen?

7. Have proper justification (i.e. UL, Intertek or other independent laboratory system(s) and or opinions);

8. Provide complete descriptions of critical elements for the firestop configuration. These should include, but not be limited to the following:

a. Basic, Common

- **Type(s) of assembly used or being penetrated;**
- **Rating supported by the EJ.**

b. Through Penetrations

- **Penetrating item(s) (type, size, etc.);**
- **Annular space requirements, (minimum, maximum, actual, nominal, etc.)**
- **Opening size;**
- **Firestop product(s) to be used, type and amount (thickness if applicable);**
- **Accessory items(s) (i.e. anchors, backing material, etc.)**

c. Joints

- **Joint Width (installed width, nominal)**
- **Movement Capability;**
- **Movement Class (thermal wind sway, seismic);**
- **Accessory item(s) (i.e. insulation type, thickness and compression, etc.)**

IFC EJ Presentation Guidelines – What's Seen?

d•Duct Enclosure Systems – SEE www.Firestop.org

e• Firestop System – annular space dimensions, floor/wall construction, design number, components, installed thickness.

f. Perimeter Fire Barrier Systems –

- Type(s) of assembly used or being penetrated;

- Hourly Rating required

- Closest Listed System upon which the EJ is based

- Joint Width

- Static or Dynamic

- Safing Insulation Types), thickness and compression, etc.

- Five Basic Principles

1. Mechanical Attachment of the Spandrel Insulation

2. Protection of the Mullions

3. Compression Fitting and Orientation of the Safing Insulation

4. Installation of a Reinforcement Member(s), stiffener, at the safe-off area behind the spandrel insulation.

5. Firestop Coating, type, thickness,

IFC EJ Presentation Guidelines – What's Seen?

f• Continuity Head-of-Wall Joints

- ***Joint Width, (installed width, nominal)***
- ***Movement Capability***
- ***Movement Class – (thermal, wind sway, seismic)***
- ***Accessory Item(s) (i.e. insulation type, thickness, compression, etc.)***

IFC recommends that these guidelines be considered when evaluating whether any firestop system engineering judgment meets minimal requirements. *Questions concerning the EJ request should be addressed to the initiator of the judgment.*

INSTALL FIRESTOP SYSTEM

Firestop Sealant, MW installation to Tested and Listed System Limits

= Firestop System

Pack

1

Apply Sealant

2

Tool/Smooth

3

Walls - BOTH SIDES

STI Graphic

Joints and Seams

Head of Wall

Graphics – Firestop Solutions

Joints and Seams

I-Beam to Fluted Deck

Graphics – Firestop Solutions

Sleeved Pipes

Fire/Smoke Dampers & Firestops

- Dampers – ULC-S112, UL 555, 555S
  - Listings - ***Systems***
  - Installed to manufacturer's written instructions (Systems – Angles…no sealants)
- Firestop sealants – ULC S-115, UL 1479
  - Improper hole sizing or poor installation…

Consult the Damper Manufacturer & the Authority Having Jurisdiction

Graphics - Greenheck

Fire/Smoke Dampers
Firestop Installation

- Combination Fire Smoke Dampers
- Multi-blade Fire Dampers
- Underfloor applications
- Max. size 72” W x 96” H
- SYSTEM…AHJ

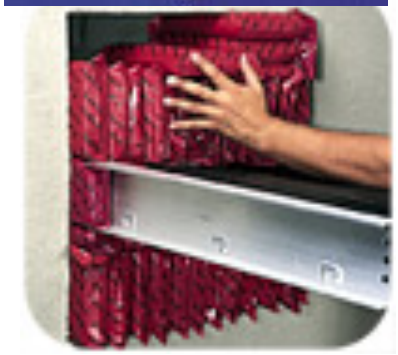
- Greenheck Graphic

Firestopping for Continuity Firestop Products

- **Sealants**
  - Silicone, Latex, Intumescent
- **Wrap Strips**
  - "Thick, Thin, Wide, Less Wide"
- **Putties**
- **Pillows**
- **Composite Sheets**
- **Bricks / Plugs**
- **Pre Fabricated Kits**
- **Mortar**
- **Spray Products**







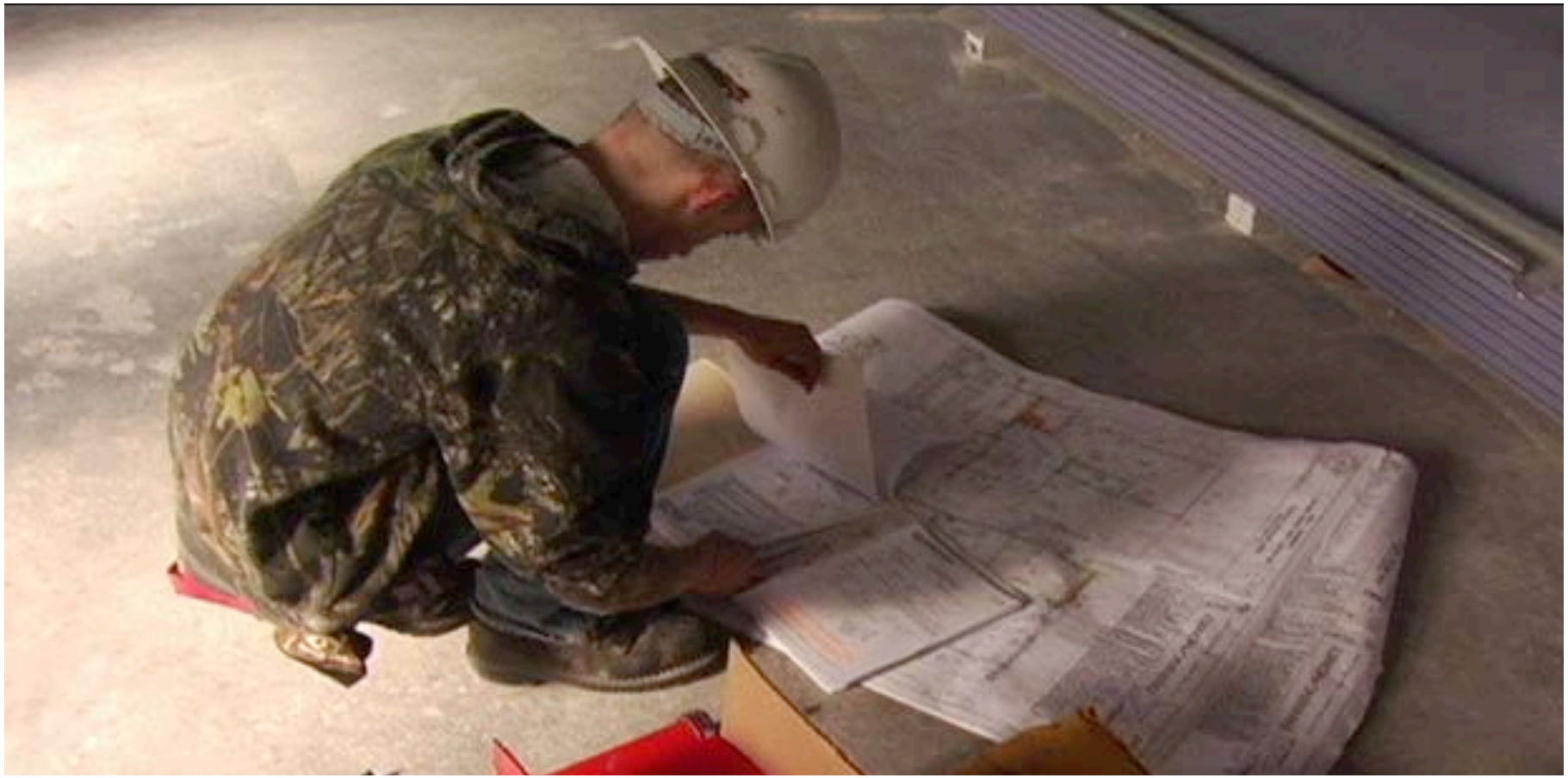

Graphics, STI,3M, AD, HILTI, Nelson

Firestop Materials, Systems Spec Physical Properties Needed

- **Serve Building Needs**
  - **Smoke**
  - **Germs**
  - **Chemical Resistance – Cleaning?**
  - **Chemical, Biological, Radiation?**
- **Product Types**
  - **Intumescent, Latex, Silicone**
  - **Ablative**
  - **Endothermic**

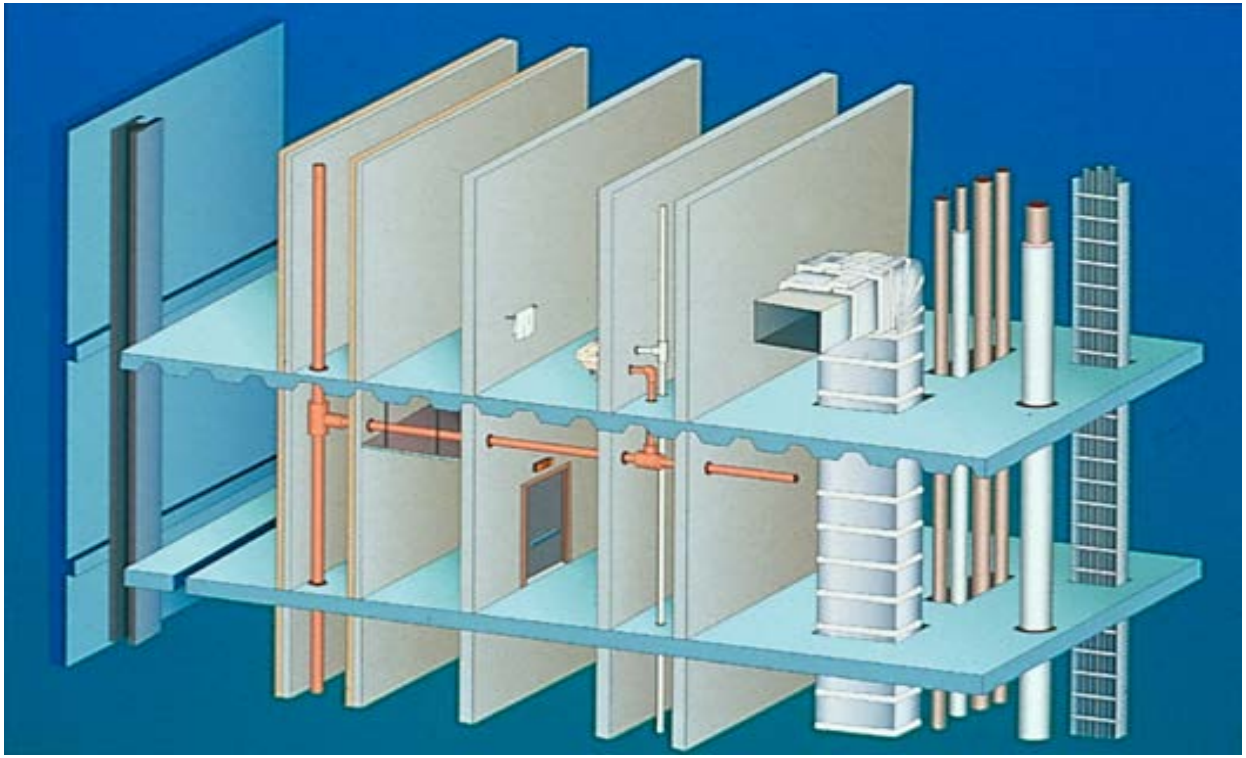
Graphics – 3M, STI, Nelson

Barrier Continuity
I – Installation – Listed Systems



I- Installation

Who's Responsible, How to Choose???



Graphics – STI

Installation – Who?

- Firestopping wrong, missing
- Systems Documentation?
- As Built Documentation??

Conclusion –

Without Single Firestopping Trade….

fire & life safety risks

Adler Photo

3 Firestop Installation Methods

- **Each Trade**
  - "He/She who pokes hole, fills hole"
- **Multiple Contracts**
  - Firestop Contractors, Trades
- **Single Source Firestop Contractor**
  - ***FCIA Member in Good Standing***
  - ***FM 4991, UL, ULC Qualifiied***

Why Contractor Qualifications?

- **Firestopping Ratings - F, T, H, L W**
- **Zero Tolerances?**
  - **Annular Space Sizes, Gap Sizes**
- **Product Properties**
  - **Movement**
  - **Compatibility**
  - **Storage, Application, Curing Temps**
- **SYSTEMS DOCUMENTATION**

Spec Contractor Qualifications

- **FM 4991 – Standard for the Approval of Firestop Contractors**
- **UL Qualified Firestop Contractors**
- **Other Industries???**
- ***FM 4991/UL-ULC CONTRACTORS UNDERSTAND SYSTEMS, INVENTORY & DOCUMENTATION***

Underwriters' Laboratories of Canada
Laboratoires des Assureurs du Canada
Qualified Firestop Contractor Program

Why Contractor Qualifications?

- **Built right the first time…**
- **Documentation**
- **SYSTEMS Selection, Analysis, As-Builts**
  - **F, T, L, W Rated Systems**
  - **Tolerances - Annular Space Sizes, Angles**
  - **Gap Sizes - Undercuts - Framing**
  - **Anchors - Spacing – Hardware**
  - **Closers - Activation Sensors, more…**

FM 4991 & ULC QFC

- **ULC Firestop Exam @ 80% min.**
- **Management System (MS) Written**
- **MS Procedures implemented**
- **Audit**
  - **Contractor Office - Records & Documents**
  - **Jobsite – Observation, possible destructive.**
- **DRI – Appointed by Contractor, CEU's**

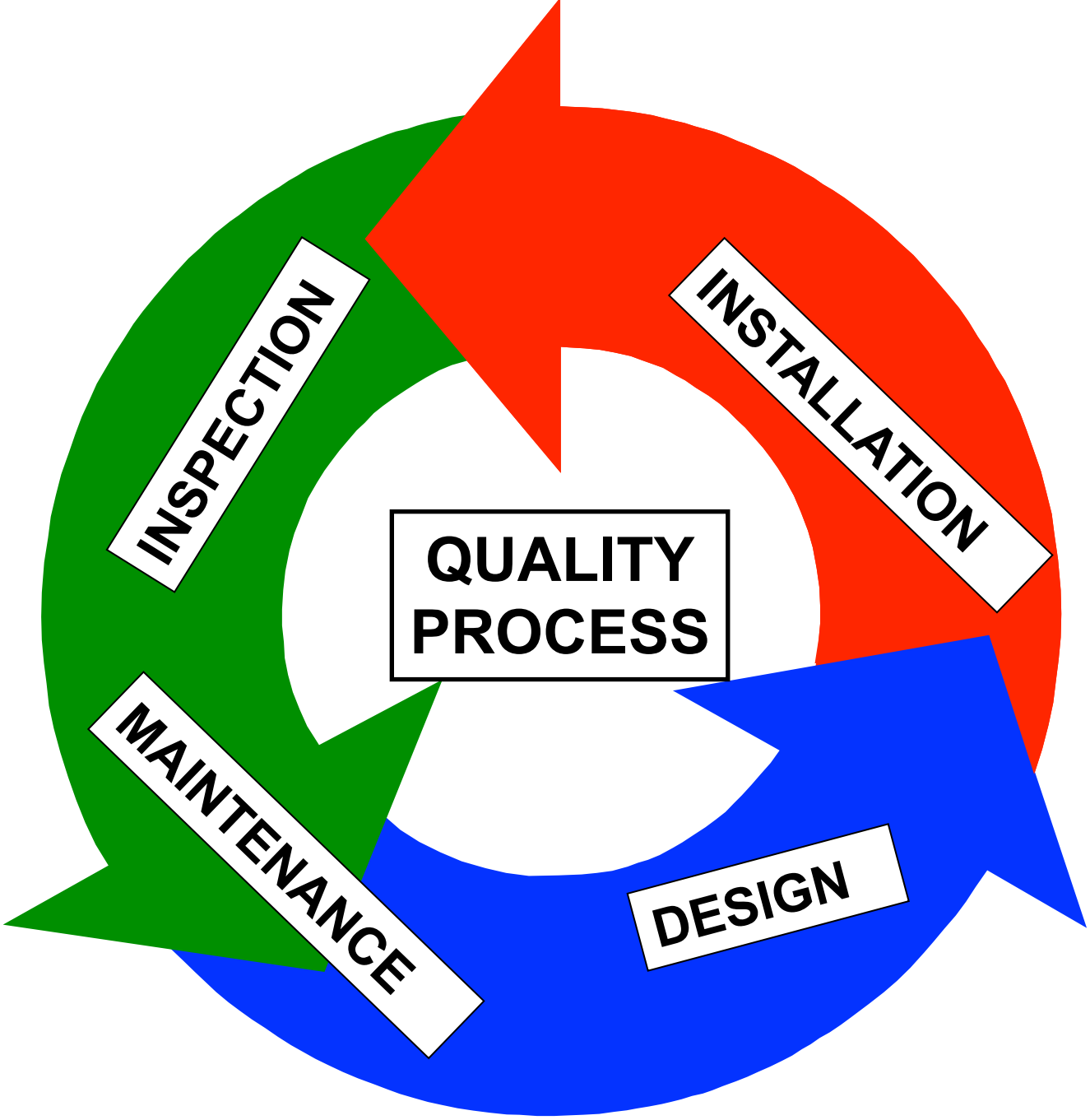
Listed at www.UL.com – www.FCIA.org

Management System – ULC, FM

- **Facility Tour**
- **Review MS Manual**
- **Construction Documents Reqt's and Review**
  - **Systems Selection & Analysis**
- **Procurement**
- **Storage, Handling, Preservation and Delivery**
- **Installation, Application and Field Quality Assurance Procedures**
  - **Systems Installation, Self Inspection/Survey**

Management System – ULC, FM

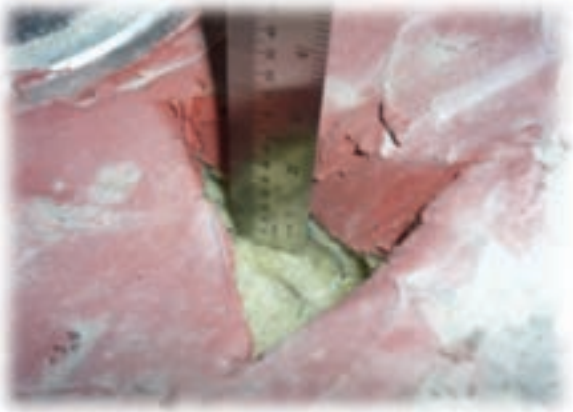
- **Inspection, Testing and Calibration**
  - **Tape Measures**
- **Control of Nonconforming Product**
- **Training and Qualification of Staff**
  - **DRI's, Workforce**
- **Corrective/Preventive Action**
- **Quality System Monitoring and Improvement**
- **Documentation and Record Keeping**
  - **7 years**


INSPECTION
INSTALLATION
QUALITY
PROCESS
MAINTENANCE
DESIGN

Firestop Installation & Inspection

- ASTM E 2174/ ASTM E 2393 –
  "Inspection Process"





I – Inspection – Options

- **Contractor Self Inspection**
  - Verify Management System validity
  - Not 2%, 10%
  - Required for FM & UL, ULC Contractors
- **Manufacturer Inspection**
  - Does not exist … Survey, maybe
- **ASTM E 2174 & ASTM E 2393 –**
  - Independent 3rd Party
  - Destructive, Non Destructive
  - Specified Frequency

I – Inspection – Scope

- **ASTM E 2174 & ASTM E 2393 –**
  - Firestopping
- Other Scopes—Possibilities for IA's
  - Walls, Horizontal Assemblies
  - Fire Dampers
  - Fire Rated Glazing
  - Fire Doors

I – Inspection – IBC Code Requirements (Not in NBC)

Required, International Fire Code – Chapter 17

NBC Code Proposal – HAPPENING NOW

IBC Sections on Inspection…

Chapter 1 - General

Chapter 17 – Special Inspections

I – Inspection –
IBC Code Requirements
Definitions – Chapter 17, IBC

[A] APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved*. [IBC 202. Definitions]

[A] APPROVED. Acceptable to the *building official* or authority having jurisdiction.

[IBC 202 Definitions]

I – Inspection –
IBC Code Requirements

SPECIAL INSPECTOR. A qualified person employed or retained by an *approved* agency and *approved* by the *building official* as having the competence necessary to inspect a particular type of construction requiring *special inspection.*

[IBC 202. Definitions]

I – Inspection – IBC Code Requirements

1705.16 Fire-resistant penetrations and joints. In high-rise buildings or in buildings assigned to Risk Category III or IV in accordance with Section 1604.5, special inspections for through-penetrations, membrane penetration firestops, fire resistant joint systems, and perimeter fire barrier systems that are tested and listed in accordance with Sections 714.3.1.2, 714.4.1.2, 715.3 and 715.4 shall be in accordance with Section 1705.16.1 or 1705.16.2. **[IBC 1705.16]**

I – Inspection – Code Requirements

1705.16.1 Penetration firestops. Inspections of penetration firestop systems that are tested and listed in accordance with Sections 714.3.1.2 and 714.4.1.2 shall be conducted by an approved inspection agency in accordance with ASTM E 2174.

1705.16.2 Fire-resistant joint systems. Inspection of fire resistant joint systems that are tested and listed in accordance with Sections 715.3 and 715.4 shall be conducted by an approved inspection agency in accordance with ASTM E 2393.

[IBC 1705.16.1, 2]

Firestop Inspection in Codes ASTM E 2174 - ASTM E 2393

- NFPA 101 / 5000 - Chapter 8 - Annex
- 2012 – 2018 International Building Code
  - CH 17 – Special Inspections
    - Buildings 75’ & higher above Fire Department Access
    - Occupancy Type III, IV, Chapter 16 Table 1604.5
- Abu Dhabi International Building Code

Firestop Inspection in Codes

- **Table 1604.5 – Risk III** - *Buildings and other structures that represent a substantial hazard to human life in the event of failure, include but are not limited to:*
  - *Public **Assembly, Occupant Load >300***
  - *Bldgs. Containing **Elem.,2nd'ary', day care, >250***
  - I-2, >50, no surgery, emergency
  - I-3
  - Occupancy load >5,000
  - **Power-gen, H2O treatment,** wastewater treatment, public utilities, not in IV
  - Buildings not in IV, with toxic or explosives
  - **[IBC 1604.5]**

Firestop Inspection in Codes

- **Table 1604.5 – Risk IV** - *Buildings and other structures designated as essential facilities, including but not limited to:*
  - *Group **I-2 occupancies having surgery or emergency** treatment facilities.*
  - *Fire, **rescue, ambulance/police stations**, emergency vehicle garages.*
  - *Designated earthquake, hurricane or other **emergency shelters.***
  - *Designated emergency prep, communications and operations centers and other **facilities required for emergency response**.*
  - *Power-generating stations and other public utility facilities required as emergency backup facilities for*
- **[IBC 1604.5]**

Firestop Inspection in Codes

- **Table 1604.5 – Risk IV** - *Buildings and other structures designated as essential facilities, including but not limited to:*
  • Buildings and other structures containing quantities of highly toxic materials that:
  - *Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the International Fire Code, and are sufficient to pose a threat to the public if released.*
  - *Aviation control towers, air traffic control centers and emergency aircraft hangars.*
  - *Buildings and other structures having critical national defense functions.*
  - *Water storage facilities and pump structures required to maintain water pressure for fire suppression.*
  - **[IBC 1604.5]**

Firestop Systems Inspection ASTM E 2174 - ASTM E 2393

- "Standard Practice for On-Site Inspection of Installed Fire Stops – Penetrations - Joints"
  - Standard Inspection Procedure
  - Special Inspection Agency Companies
  - Other Qualified Firms
  - Hired by & Report to Building Owner, Architect, Owners Rep, other than GC.

    = Authorizing Authority

Firestop Inspection Firm & Indvidual Qualifications – ASTM E 2174 - ASTM E 2393

- Inspector Firm & Inspectors
  - **'Independent of, and Divested from** ' Installing firm, Distributor, Manufacturer, Competitor, Supplier…
  - **'Not a Competitor** of the Installer, contractor, manufacturer, or supplier ….
  - **Other than the contractor**…
  - **Submit notarized statements** of …

Firestop Inspection Firm & Individual Qualifications ASTM E 2174 - ASTM E 2393

- Inspector Personnel meet at least one criteria…..
  - 2 years experience (Construction, Field), education, and credentials acceptable to AHJ
  - Accredited by AHJ
  - Meet ASTM E699

- **Inspection Agency *Company* Qualification – IAS AC 291 – W/Individual Certs.**

INTERNATIONAL ACCREDITATION SERVICE®

Firestop Inspection Firm and Individual Qualifications – IAS AC 291

- **Inspection Firm shall have staff..**
  - PASS UL or FM Firestop Exam, IFC Exam
  - 1 year Quality Assurance

    Or…
  - PASS UL/FM Firestop Exam, IFC Firestop Exam, *and* PE, FPE, Registered Architect, or
  - PASS UL/FM Firestop Exam, IFC Firestop Exam, *and* Education by Certified Agency

Firestop Firm and Individual Qualifications - IAS AC 291

- **Specify IAS AC 291 –**
  - Quantified Qualifications
  - Helps AHJ with “Approved Agency”
  - Not in ASTM Standards, Code
- **Specify Individual Certifications**
  - 3rd Party, Independent Exams verify Knowledge
    - FM Firestop Exam
    - UL Firestop Exam
    - IFC Exam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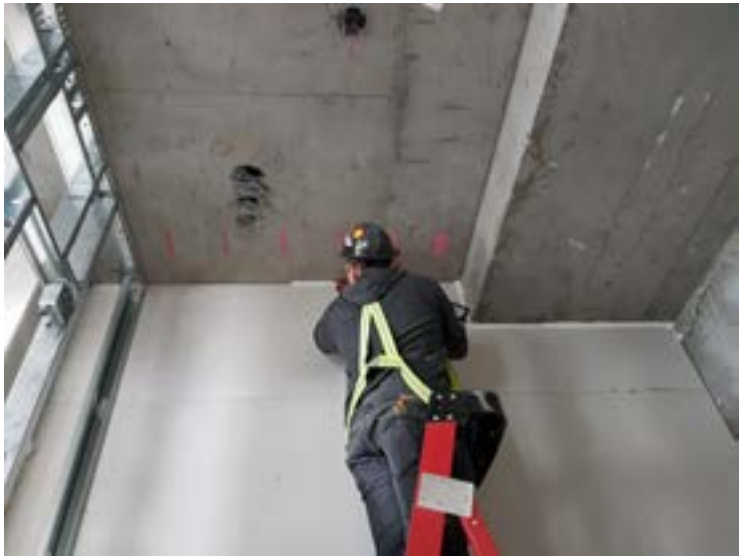

Professional Installations

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Firestop Inspection Process

- Inspection Agency & Inspector
  - Independent
  - Hired after systems submitted, etc.
  - Hired by building owner and manager or representative
  - Scope of work directed by AA
  - AHJ approval

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Firestop Inspection Process ASTM E 2174 - ASTM E 2393

- Pre-Construction Meeting
  - Review Documents
  - Identify Conflicts
  - Review Materials Systems
    - **ASTM E 814 or UL 1479, FM 4990, ASTM E 1966, UL 2079, ASTM E 2307 Systems, ULC S-115**

Firestop Inspection Process ASTM E 2174 - ASTM E 2393

- Inspection Documents
  - Specifications and Drawings
  - Manufacturer Product Data Sheets and Installation Instructions
  - Listed Systems and EJ's/EFRRA's

Firestop Inspection Process ASTM E 2174 - ASTM E 2393

- Pre-Construction Meeting
  - Mock Up Review
  - Observation or Destructive Review (Testing)
  - Inspection Type Methodology
    - Frequency of reviews
    - Description of reviews
    - Specification and drawings
- Meeting(s) are required
  - During and Post Inspection

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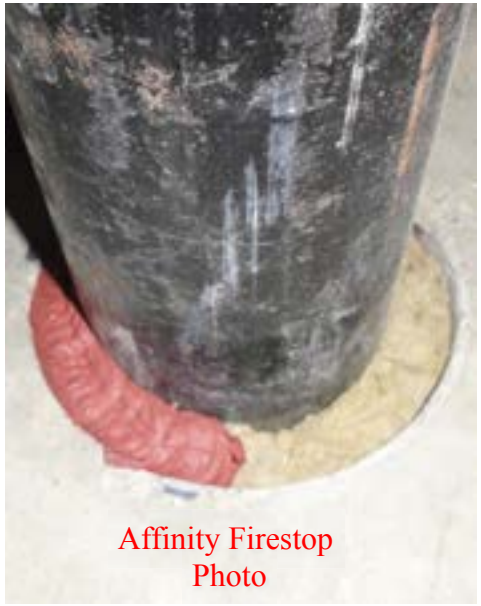
Firestop Inspection Process ASTM E 2174 - ASTM E 2393

- Inspection Schedule
  - Notifies Inspector
  - Inspections within 2 days
  - Inspector verifies installation
    - Is in accordance with Documents
    - Meets Manufacturers Installation Instructions

Firestop Inspection Process ASTM E 2174 - ASTM E 2393

- Observation Reviews
  - **Performed during construction**
  - **Witnessed randomly of the installed systems on each floor**
  - **2174 - 10%, each type** of Service Penetration Firestop System
    - **Type = By System, By Contractor**
  - **2393 - 5% of Total Lineal Feet** for each type of Fire Resistance Rated Joint System
    - **Type = By System, By Contractor**



Affinity Firestop Photo

Firestop Inspection Process ASTM E 2174 - ASTM E 2393

- Destructive Reviews (Testing)
  - Performed Post-Construction
  - 2174 - Minimum 2% , no less than 1, each type per 930 m2 (10,000 SF) of floor area
    - **Type = By System, By Contractor**
  - 2393 - Minimum 1 / 152 LM (500 LF) of Joint Area, by type, mandatory; Exception mechanical joints
    - **Type = By System, By Contractor**

Affinity Firestop Photos

Firestop Inspection Process
ASTM E 2174 - ASTM E 2393

- Variances / Deviations
- ASTM E 2174 & ASTM E 2393
  - FS Contractor is notified of any deficiencies within one day
  - IBC 1704.2.4
    - Work is in conformance to the documents
    - Otherwise it is immediately brought to the attention of the FS Contractor
    - If not corrected, AHJ and AA will be informed to take action

Firestop Inspection Process ASTM E 2174 - ASTM E 2393

- Both Methods
  - If any type does not comply
    - Repair
    - Replace
    - 1 additional inspection
  - If 10% variance per firestop type
    - Inspection stops
    - Installer inspects, repairs
    - Inspector re-inspects
- Document all Deficiencies

Affinity Firestop Photos

Firestop Inspection Process ASTM E 2174 - ASTM E 2393

- Inspectors shall
  - **Not supervise or direct FS Contractors**
  - Commence reviews at the start of FS installation
  - Review installation based on manufacturers and system requirements

Affinity Firestop Photo

Firestop Inspection
ASTM E 2174 - ASTM E 2393

- Equipment –
  - Tapes
  - Tablets w/Systems
  - Borescope to explore areas that are concealed or partially
  - NOT MICROMETERS

Firestop Evaluation & Repairs

- Evaluations of Manufacturers Installation Instructions
  - Manufacturers instructions evaluating installed systems
  - Acceptable methods to review installed systems
  - Listed SYSTEM requirements for installations
  - ***IFC Document on Sealant Thickness Measurement***

ASTM INTERNATIONAL

UL

Firestop Contractors FCIA International Association

IFC International FireStop Council

Firestop Repairs

- Repairs
  - Instruction requirements by manufacturer
  - Listed systems
  - Patch/infilling
    - Adhesion
    - Movement
    - T, L, W Ratings
    - ***As recommended by MFR***

Affinity Firestop
Photo

Firestop Inspection Forms Variance Notices

- Minimum one FS system for each type;
- ***(By Type of System, By Contractor)***
- Submit reports one day after review to AA; ASTM E 2174 and ASTM E 2393 vs.
- **IBC requires IMMEDIATE NOTICE**
- Numbered – Controlled
- Required – During/post construction methods

Firestop Inspection Final Report ASTM E 2174 - ASTM E 2393

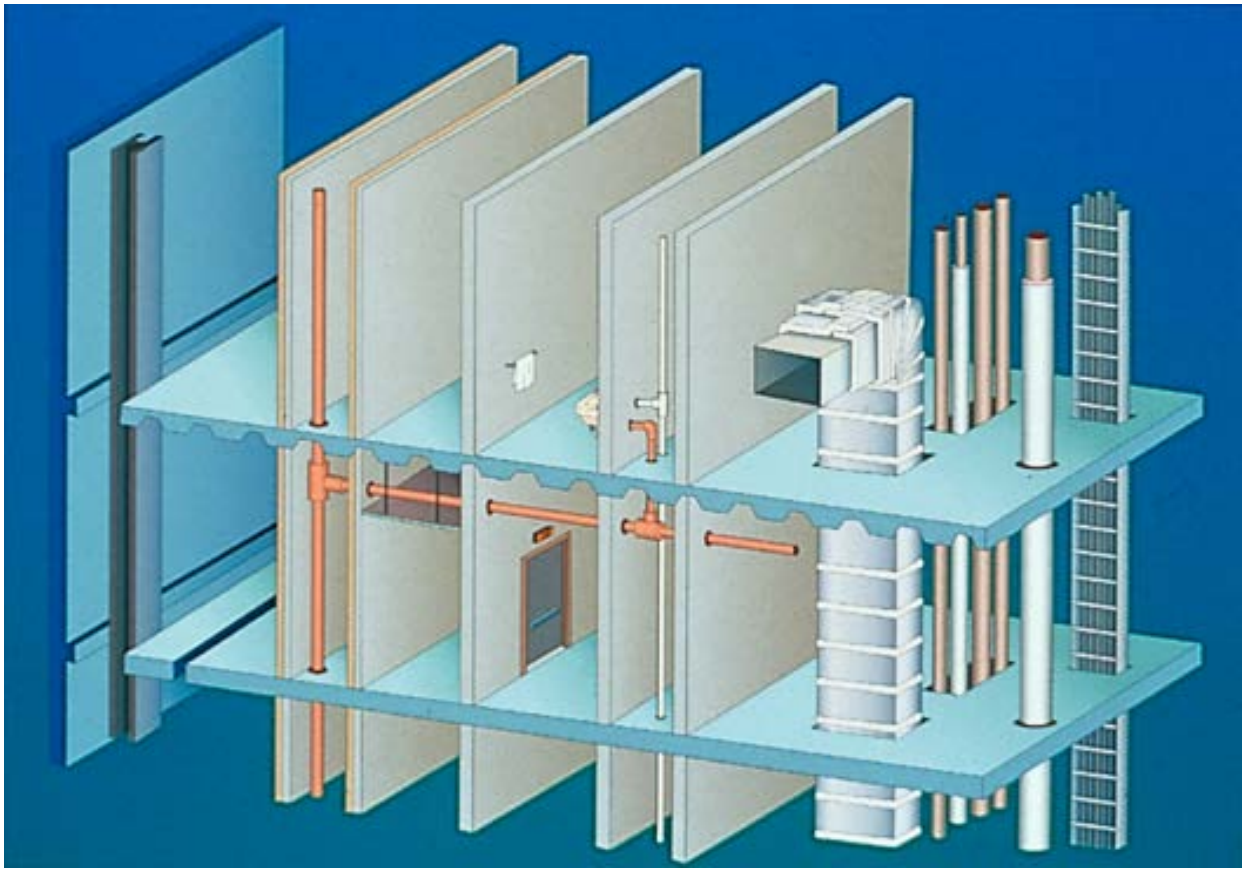
- Project name and location
- Project team contact info
- Firestops reviewed (inspected)
  - Type and quantity
  - Verification method
  - Percentage of total deficiencies
- All documents submitted to AA

Affinity Firestop Photo

Firestop Special Inspection ASTM E 2174 - ASTM E 2393

- Inspection Documents
  - Identify System, Materials
- Identification Systems (Labels)
  - Firestop Contractor Installed
  - Speeds System Evaluation

M – Maintenance
Starts at S - SPECS



National Fire Code of Canada

National Fire Code of Canada

- ***Division B – Part 2, Building and Occupant Fire Safety***

- ***Fire Separation & Features of Protection***
- ***Gypsum Wallboard, Concrete Block, Concrete, Other Assemblies***
- ***Fire Dampers***
- ***Fire Rated Swinging & Rolling Doors***
- ***Fire Rated Glazing***
- ***Firestopping***

National Fire Code of Canada

National Fire Code of Canada

- ***Division B – Part 2, Building and Occupant Fire Safety***
  2.2.1.2 – Damage to Fire Separations – where *fire separations* are damaged so as to affect their integrity, they shall be repaired so that the integrity of the *fire separation* is maintained…

Includes Fire Dampers, Fire Doors…and Continuity

National Fire Code of Canada

National Fire Code of Canada

- ***Division B – Part 2, Building and Occupant Fire Safety***
- ***Fire Separation Integrity Maintained - How Often?***
  - ***Yearly?***
  - ***Weekly?***
  - ***Monthly?***
  - ***Maintain Integrity***

- ***Fire Separation Repaired with what?***
  - ***Original Construction Code?***
  - ***Current Technology?***
  - ***Mud and Tape? Non Firestop Foam?***
  - ***Systems…or to as originally permitted.***

- ***Who's Responsible ? More later if time…***

National Fire Protection Association NFPA 101-2012 – NL, Labrador

- **SECTION 4.5.8 Maintenance, Inspection, and Testing.**
- **4.5.8.1** **Whenever or wherever any device**, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or any other feature **is required for compliance** with the provisions of this Code, **such device**, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or other feature ***shall thereafter be continuously maintained*** in accordance with applicable NFPA requirements or requirements developed as part of a performance-based design, or as directed by the AHJ. [NFPA 101-2012:4.6.12.1]

NFPA 101-2012

- **4.5.8.2 No existing life safety feature *shall be removed or reduced*** where such feature is a requirement for new construction. [101:4.6.12.2]
- **4.5.8.3*** **Existing life safety features obvious to the public, if not required by the Code, *shall be either maintained or removed*.** [101:4.6.12.3]
- **4.5.8.4 Any device**, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or any other feature **requiring periodic testing, inspection, or operation** to ensure its maintenance ***shall be tested, inspected, or operated*** as specified elsewhere in this Code or as directed by the AHJ. [101:4.6.12.4]
- **4.5.8.5 Maintenance, inspection, and testing *shall be performed under the supervision of a responsible person who shall ensure*** that testing, inspection, and maintenance ***are made at specified intervals*** in accordance with applicable NFPA standards or as directed by the AHJ. [NFPA 101-2012:4.6.12.5]

National Fire Protection Association - NFPA 1-2018

- **12.2* Construction.**
- 12.2.2 Fire safety construction features for new and existing occupancies shall comply with **this Code and the referenced edition of NFPA 101.**
- **12.3 Fire-Resistive Materials and Construction.**
- 12.3.1 The design and construction of fire walls and fire barrier walls that are required to separate buildings or subdivide a building to prevent the spread of fire shall comply with Section 12.3 and NFPA 221.

National Fire Protection Association - NFPA 1-2018

- 12.3.3* Maintenance of Fire-Resistive Construction, Draft-Stop Partitions, and Roof Coverings.

12.3.3.1 Required fire-resistive construction, including fire barriers, fire walls, exterior walls due to location on property, fire-resistive requirements based on type of construction, draftstop partitions, and roof coverings, *shall be maintained and shall be properly repaired, restored, or replaced where damaged, altered, breached, penetrated, removed, or improperly installed.*

National Fire Protection Association - NFPA 1-2018

- 12.3.3.2 Where required, **fire-rated gypsum wallboard** walls or ceilings that are damaged to the extent that through openings exist, the damaged gypsum wallboard shall be **replaced or returned to the required level of fire resistance using a listed repair system or using materials and methods equivalent to the original construction.**
- **12.3.3.3 Where readily accessible, required fire-resistance rated assemblies in high-rise buildings shall be visually inspected for integrity at least once every 3 years.**

National Fire Protection Association - NFPA 1-2018

- 12.3.3.3.1 The person responsible for conducting the visual inspection shall demonstrate appropriate **technical knowledge and experience in fire-resistance-rated design and construction** acceptable to the AHJ.
- **12.3.3.3.2 A written report prepared by the person responsible for conducting the visual inspection shall be submitted to the AHJ documenting the results of the visual inspection.**

2018 International Fire Code

- **701.6 Records of inspections and repairs** shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the *owner* ***unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling*** **tile** or similar movable entry to the space.

[IFC 2018]

2015 International Fire Code
703.1 Maintenance

SECTION 703 - FIRE-RESISTANCE-RATED CONSTRUCTION

703.1 Maintenance. (continued) Where concealed, such elements shall not be required to be visually inspected by the *owner* unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling tile or similar movable entry to the space. Openings made therein for the passage of pipes, electrical conduit, wires, ducts, air transfer openings and holes made for any reason **shall be protected with *approved* methods** capable of resisting the passage of smoke and fire. Openings through fire-resistance-rated assemblies shall be protected by self- or automatic-closing doors of *approved* construction meeting the fire protection requirements for the assembly.

2015 International Fire Code
703.1 Maintenance

SECTION 703 -FIRE-RESISTANCE-RATED CONSTRUCTION

703.1 Maintenance. (continued) 703.1.1 Fireblocking and draftstopping. Required *Fireblocking* and draftstopping in combustible concealed spaces shall be maintained to provide continuity and integrity of the construction.

703.1.2 Smoke barriers and smoke partitions. Required *smoke barriers* and smoke partitions shall be maintained to prevent the passage of smoke. Openings protected with *approved* smoke barrier doors or smoke dampers shall be maintained in accordance with NFPA 105.

703.1.3 Fire walls, fire barriers and fire partitions. Required *fire walls*, *fire barriers* and *fire partitions* shall be maintained to prevent the passage of fire. Openings protected with *approved* doors or fire dampers shall be maintained in accordance with NFPA 80.

2018 International Fire Code

- **701 General – ALL Fire Resistance**
  701.6 Owner's responsibility. The owner shall maintain an inventory of all required *fire-resistance-rated and smoke resistant* construction, and the construction included in Sections 703 through 707 and such construction shall be visually inspected by the *owner annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated.*

2018 International Fire Code

- **701.6, Continued…PC2**
- **Records of inspections and repairs** shall be maintained. Where concealed, such elements shall not be required to be visually inspected by the *owner unless the concealed space is accessible by the removal or movement of a panel, access door, ceiling* tile or similar movable entry to the space.

2018 International Fire Code Documentation Required

- **703.1 … Continued. PC 1**
  The materials and firestop systems shall be securely attached to or bonded to the construction being penetrated with no openings visible through or into the cavity of the construction. Where the system design number is known, the system shall be inspected to the listing criteria and manufacturer's installation instruction.

UAE Fire and Life Safety Code of Practice
Maintenance & Management

Chapter 1, SECTION 21
Firestopping

21.15.2 The required fire resistance rating of installed firestop systems shall be *visually inspected by the owner or owner's inspection agency annually.* Damaged, altered or breached firestop systems shall be properly repaired, restored or replaced to comply with applicable codes as per the guidelines of Civil defense.

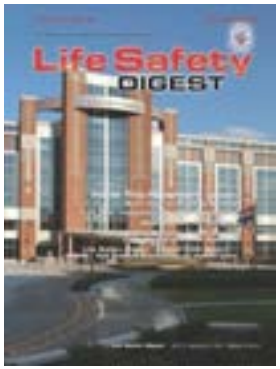
21.15.3 Any new Openings made therein for the passage of through penetrants, shall be protected with approved firestop system to comply with applicable codes as per the guidelines of Civil defense.

Building & Fire Code Requirements

- ***Build it Right***
  - **Walls / Horizontal Assemblies – Continuity**
    - Firestop Products Become Firestop Systems
      - Penetrations
      - Joints – Head /Bottom of Wall – Perimeter Fire Barriers
    - Fire & Smoke Damper Duct Systems
    - Fire Doors and Hardware Systems
      - Rolling & Swinging
    - Fire Rated Glazing

M–Barrier Management Systems Starts @ NEW CONSTRUCTION

- **NEW Buildings – 07-84-00 Specs**
  - **www. FCIA .org**
- **Part I – Focus on**
  - **Systems**
  - **Not Products**
  - **Manufacturers Installation Instructions**
- **“Single Manufacturer to the greatest extent possible” – EJ’s**



M–Barrier Management Systems Starts with SPECS

- **NEW Buildings – 07-84-00 Specs**
  - **www. FCIA .org**
- **Part II – Contractor Qualifications**
  - **FCIA Member in Good Standing, AND**
  - **FM 4991, Standard for the Approval of Firestop Contractors, OR**
  - **UL/ULC Qualified Firestop Contractor Program**
  - **AND**
  - **Manufacturer Accredited, Approved, Trained**

M–Barrier Management Systems Starts with SPECS

- **NEW Buildings – 07-84-00 Specs**
  - **www. FCIA .org**
- **Part II – Qualifications – Inspection**
  - **Special Inspection Agency –**
    - **IAS AC 291 Accredited Special Inspection Agencies**
  - **Special Inspector Qualifications**
    - **FM Firestop Exam**
    - **UL Firestop Exam**
    - **AND**
    - **IFC Exam – ASTM E 3038**

M–Barrier Management Systems Starts with SPECS

- **NEW Buildings – 07-84-00 Specs**
- **Part III – Execution**
  - **Firestop Inspection**
    - **ASTM E 2174 - Penetrations**
    - **ASTM E 2393 - Joints**

Built Right = Maintain Right Starts with SPECS

- **Reference 01-78-00 Closeout Submittals**
  - **01 78 13 Completion and Correction List**
  - **01 78 19 Maintenance Contracts**
  - **01 78 23 Operation and Maintenance Data**
  - **01 78 23.13 Operation Data**
  - **01 78 23.16 Maintenance Data**
  - **01 78 23.19 Preventative Maintenance Instructions**

Built Right = Maintain Right
Starts with SPECS

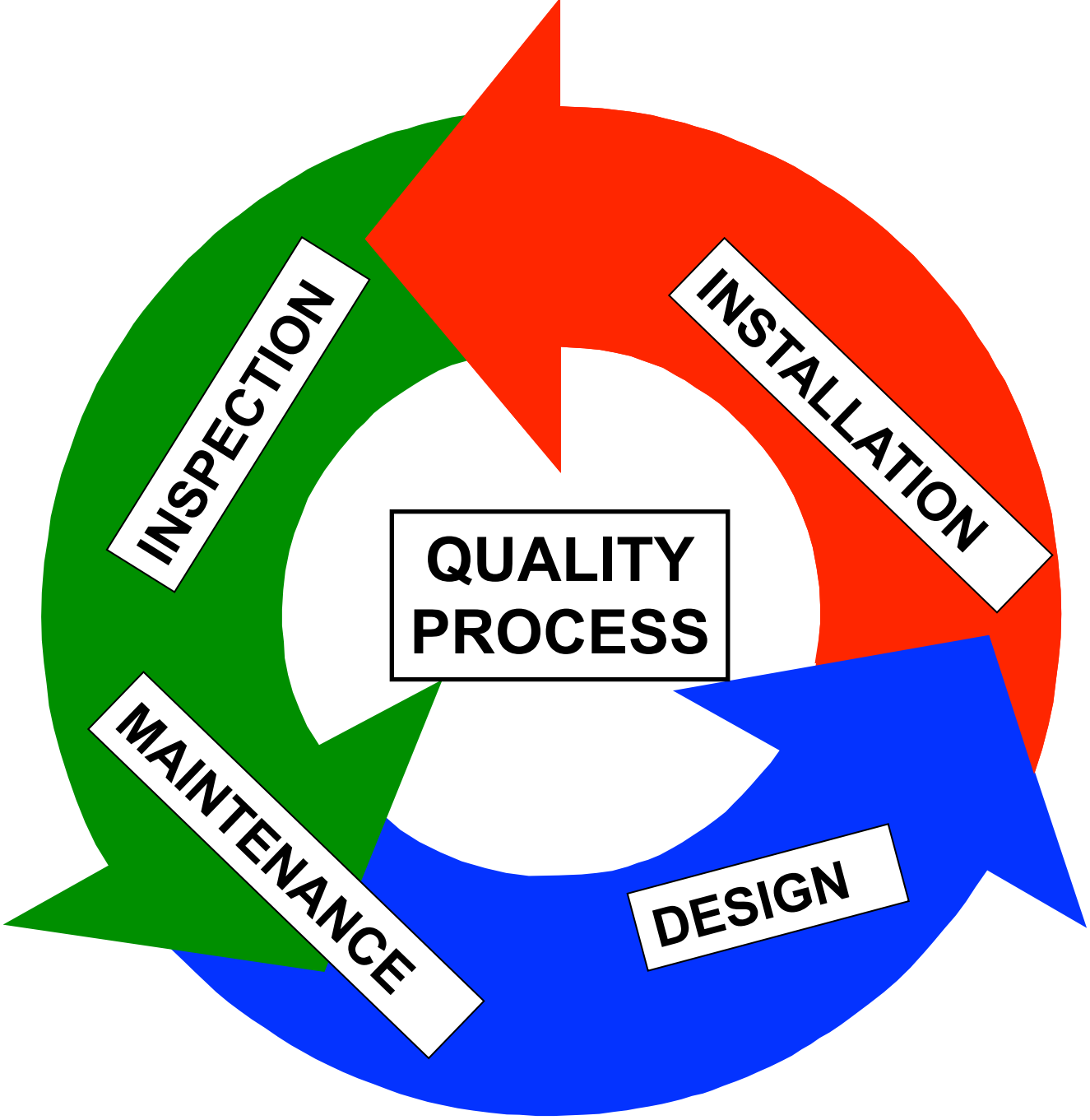
- **Reference 01-78-00 Closeout Submittals**
  - **01 78 29 Final Site Survey**
  - **01 78 33 Bonds**
  - **01 78 36 Warranties**
  - **01 78 39 Project Record Documents**
  - **01 78 43 Spare Parts**
  - **01 78 46 Extra Stock Materials**
  - **01 78 53 Sustainable Design Closeout Documentation**

Built Right = Maintain Right
Starts with SPECS

- **Why Specifications Division 01-78-39**
  - **Fire Resistance Inventory STARTS HERE**
    - **Fire Rated Walls & Floors**
    - **Firestop Systems**
    - **Fire & Smoke Dampers**
    - **Fire Rated Rolling & Swinging Doors**
    - **Fire Rated Glazing**

“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


INSPECTION
INSTALLATION
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DESIGN

FCIA DIIM & Firestopping

Proper ***'DCIIM'*** Means Reliable Systems…

- **Properly *Designed -*** A/E - Consultant
  - Tested and Listed Systems, FCIA Member Mfr's., Compartments to NBC/NFC, Provincial Mods
  - ***Specified by RSW, CCS,CDT***
- Properly ***Coordinated & Installed***
  - **FCIA Member, FM 4991, or ULC *Qualified Contractors***
- Properly ***Inspected***
  - ASTM E 2174 & ASTM E 2393,
  - ***Inspectors, who Passed the FM or UL Firestop Exam, IFC***
  - ***IAS AC 291 Accredited Inspection Firms***
- Properly ***Maintained & Managed*** –
  - FCIA Member, FM 4991, or UL-ULC Qualified Firms
  - Surveys by FCIA Member, FM, UL Qualified, IAS Accredited

Effective Compartmentation is a SYSTEM

FCIA = Trade Association

- Active Committees
- FCIA.org 07-84-00 Spec for Canada
- FCIA MOP FREE PDF
- FREE Life Safety Digest
- Member Lists
- Conferences in Canada
- Conference USA, ME
- Relationships

Contacts

Firestop Contractors International Association

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