

# FCIA DIIM – An Executive Summary

FCIA - Hillside, IL USA

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# Outline

- FCIA – DIIM – Firestopping
  - Who is FCIA?
  - Total Fire Protection
  - Design - Specs, Codes, Testing, Products
  - Installation – FM, UL/ULC Programs
  - Inspection – ASTM Inspection Standards  
IAS AC 291, Inspector Qualifications
  - Maintenance – Fire Codes
  - Firestopping for Safety – A Quality Protocol
    - DIIM

# FCIA – Firestop Contractors International Association

- FCIA Members
  - Firestop Contractors
  - Firestop Manufacturers
  - Firestop Consultants, Firestop Distributors, Etc.
- Advocate for Fire & Life Safety
- Firestopping & Barrier Management Services
- 3<sup>rd</sup> Party Contractor/Inspection Company Accreditation Programs
- **FREE TOOLS**
  - MOP & Spec - Specifiers @ AE, Independent, Building Officials, Fire Marshals
  - FREE Life Safety Digest



# “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

# Firestopping for Safety“DIIM”

- Properly *Designed* and Specified Firestopping FCIA  
- 07-84-00 - Specification
- *Tested and Listed Systems* - ASTM E 814 / UL 1479  
– ASTM E 1966/UL 2079, FM 4990, ULC-S-115,  
ASTM E2837, E2307, E3037, more
- Professional *Installation* – FCIA Member,  
FM 4991 Approved, UL/ULC Qualified Contractors
- Properly *Inspected* - ASTM E 2174 / 2393 Protocol  
by IAS AC 291 Accredited Inspection Agencies
- *Maintained & Managed* - Annually - FCIA  
Members – NFPA 1, 101, International Fire Code

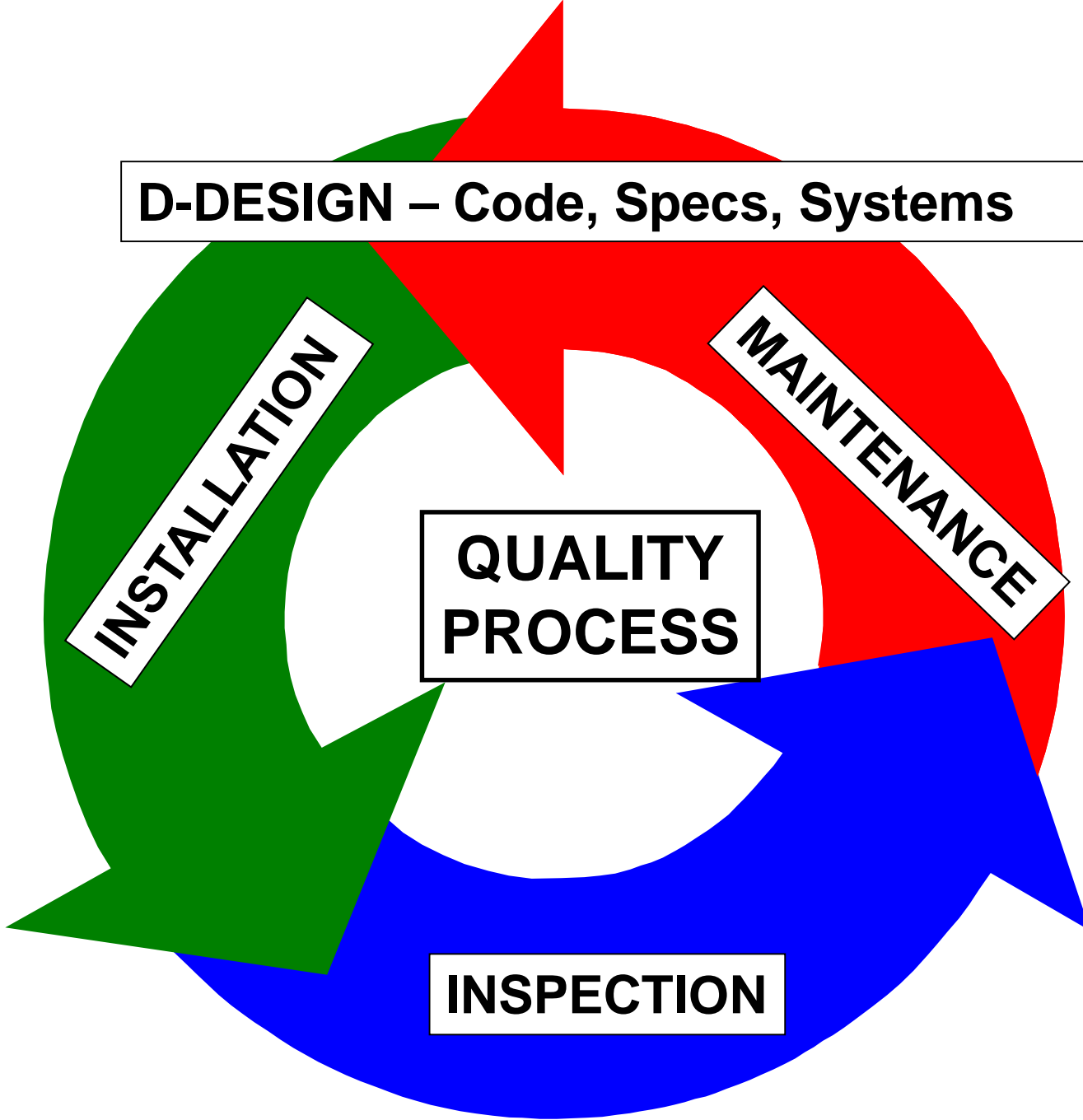
**D-DESIGN – Code, Specs, Systems**

**INSTALLATION**

**MAINTENANCE**

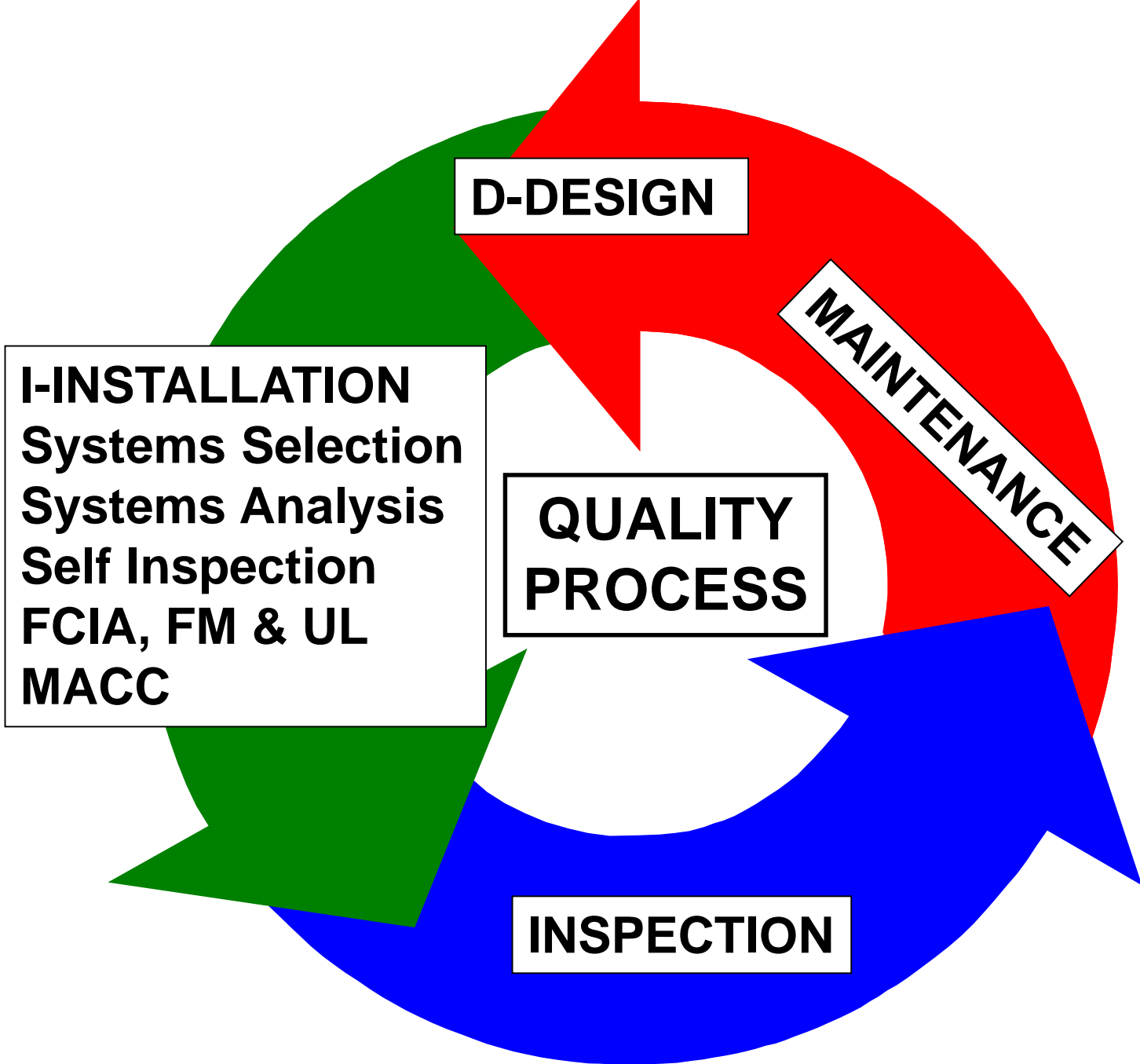
**QUALITY  
PROCESS**

**INSPECTION**



# Building & Fire Code Requirements

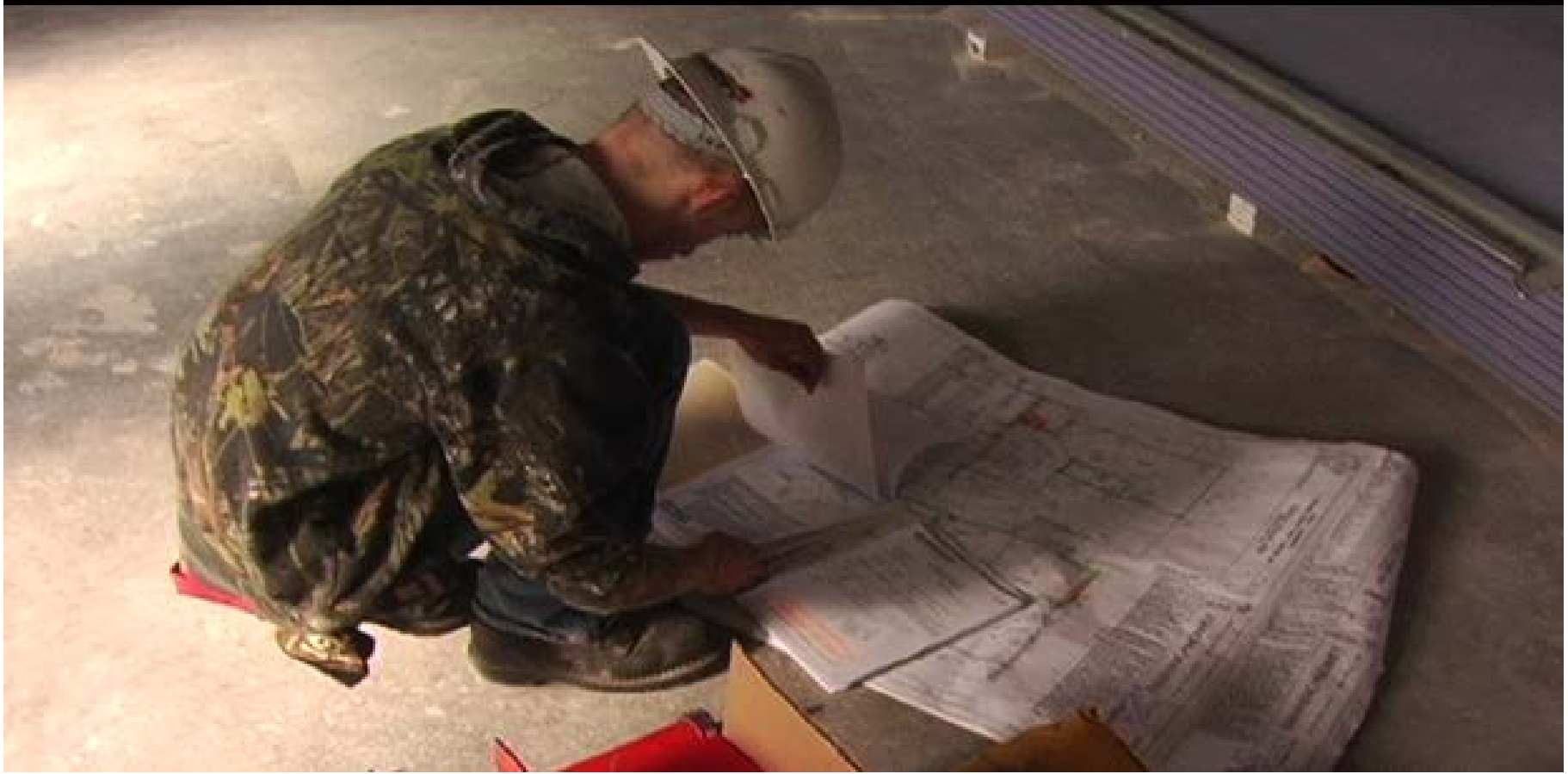
- International Codes –
  - New and Existing Buildings International Building Code – Chapter 7
  - International Fire Code – Chapter 7
- NFPA 5000 – 101- Chapter 8
- National Building Code – Canada
- UAE Fire and Life Safety Code – Chapter
- *Minimum requirements - Construction & Maintenance*





# Firestopping for Continuity

## I – Install Listed Systems



# Firestopping for Continuity

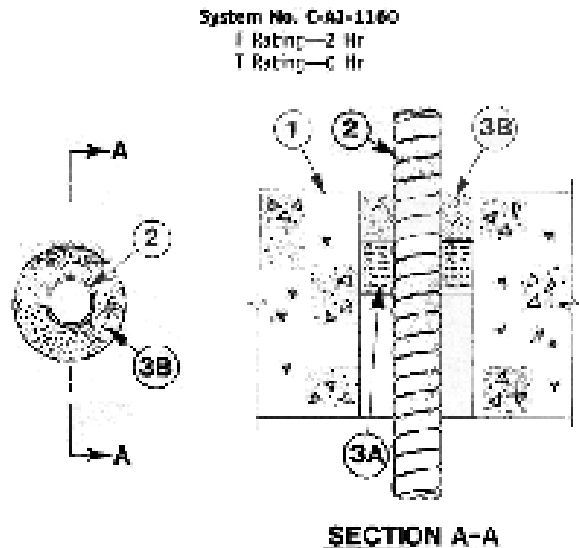
## Firestop Products

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



# Firestopping for Continuity

## I – Install Listed Systems



- Floor or Wall Assembly**—Min. 4-1/2 in. thick lightweight or normal weight (100 to 150 pcf) concrete. Will may also be constructed of any UL Classified Concrete Block\*. Diam. 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 (LAC) category in the Fire Resistance Directory for names of manufacturers.
- Through Penetrating Product**—Max. 4 in. diam. (or smaller) pipe, or max. 3/4 in. diam. (or smaller) aluminum Flexible Metal Conduit. 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.
- Packing Material**—Nom. 1 in. thickness of organic (plum tree stick) fiber Matkell or mineral wool batt insulation. Fully packed area spanning as a permanent form. Packing material to be recessed min. 1 in. from top surface of floor or from both surfaces of wall.
- FILL, Void or Cavity Material**—CAULK—Applied to fill the annular space around the flexible metal conduit. In floors, a min. 2 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.—TF 2500B

\*Bearing the UL Classified Marking  
 (Bearing the UL Listing Mark)

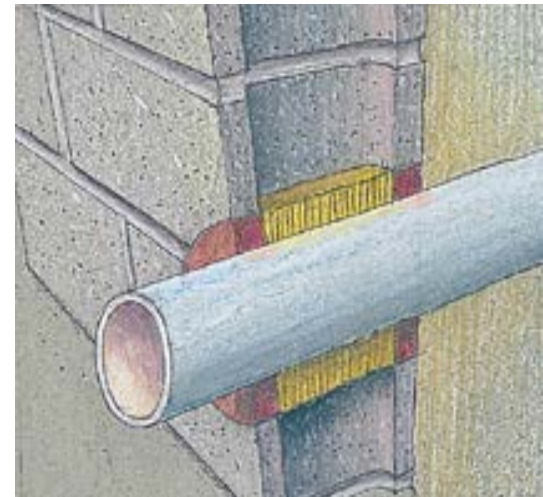


Pro-Firestop Image

# How do Contractors Select Systems & Inspection Agencies Analyze?

- Wall or Floor Construction Type, Rating
- Wall or Floor Thickness
- Penetrating Item, Coverings
- Size, Type, Thickness
- Annular Space Sizes
- Joint / Gap Sizes
- Backing Materials
- Fill Material(s)

***= Rated Firestop System***



# Firestopping for Continuity Products become Systems

- **Firestop Systems Directories –**
  - UL
  - Intertek
  - FM Approvals

*Systems Selection & Analysis...Not as easy as it looks...*

UL Product iQ™ SEARCH MY SEARCHES M

Dashboard / Search / THROUGH-PENETRATION FIRESTOP SYSTEMS | UL Product iQ

## XHEZ.C-AJ-8038 - THROUGH-PENETRATION FIRESTOP SYSTEMS

DETAILS RESOURCES TAGS

Intertek Listed Product Directories

Warnock Hersey Mark Directory

Enter Search Terms:

Company: Nothing Selected  
Listing Section: THROUGH SYSTEMS  
CSI Code: Nothing Selected  
Standard: Nothing Selected

Keyword Text: [Search] [Reset]

Company	Title	Standard
3M (Minnesota Mining and Manufacturing)	3M Fire Barrier Duct Wrap 615	ASTM E814; SO 9944
3M (Minnesota Mining and Manufacturing)	3M Fire Barrier Duct Wrap 615	ASTM C638; ASTM E119; ASTM E136; ASTM E2386; ASTM E814; ICC-ES ESR-1501; ISO 8846
3M (Minnesota Mining and Manufacturing)	3M Fire Barrier™ 1000 NS Silicone Joint Sealant	ASTM E1399; ASTM E2207; ASTM E2386; ASTM E814; ICC-ES ESR-1501; ISO 8846; UL 2079
3M (Minnesota Mining and Manufacturing)	3M Fire Barrier™ 1003 SL Silicone Joint Sealant	ASTM E2207; ASTM E2386; ASTM E814; ICC-ES ESR-1501; ISO 8846; UL 2079
3M (Minnesota Mining and Manufacturing)	3M Fire Barrier™ 2000 and 2003 Silicone Joint Sealant	ASTM E119; ASTM E814
3M (Minnesota Mining and Manufacturing)	3M Fire Barrier™ 2000 and 2003 Silicone Joint Sealant	ASTM E2386; ASTM E814; ICC-ES ESR-1501

[Print Report] [Public Listing for Product]

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# Firestop Contractor Qualifications?

- 1. Manufacturer Trained Individuals & Companies**
  - 1, 2, 4, 8 or 12 hour programs
- 2. FCIA Member in Good Standing**
- 3. FM 4991 Approved, UL/ULC Qualified Companies**
  - 3<sup>rd</sup> Party Verified *Company Management System*
  - *Individuals* Pass 3<sup>rd</sup> Party FM or UL Firestop Exam
  - *Individual* Knowledge – FCIA MOP, Listings,
  - All Manufacturers Products Covered
  - *Company gets Approved or Qualified, not Individual*

# Firestop Contractor Qualifications

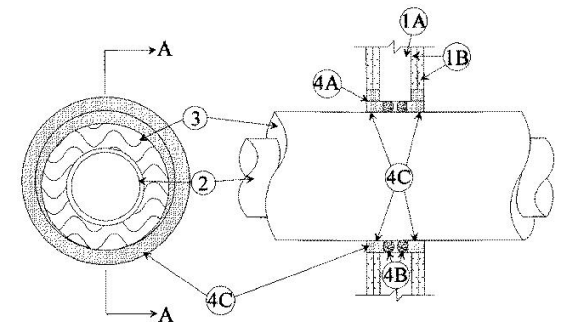
## FM 4991 & UL/ULC – 4 Parts

1. Office Facility Quality Management System Audit
2. Field – Jobsite Audit
3. Employ a person
  - UL/FM Firestop Exam @ 80% or better
  - DRI if employed by Approved/Qualified Firm,
    - *Designated Responsible Individual (DRI)*
4. Annual Audit



# 1. FM, UL/ULC Company Audit of Management System (MS)

- Employee Training & Education
- Systems Selection
- Communicate systems to Field
- Material Controls
- Systems installation “protocol”
- Labeling
- Record keeping - Variance Procedures
- Non-Conformances
- Documentation
- Project closeout





## 2. *Company MS Jobsite Audit* by **UL/ULC, FM or**

- Verification of firestop systems Processes
- Verify Management System Works
- Verify Company “communication”
  - Office to field, field to office
- “Culture of Quality...”

»

Adler Photo



# 3. **DRI** – Company Appoints DRI if ....

- **Pass Rigorous Firestop Examination**
  - FCIA Firestop Manual of Practice
  - Firestop Systems Selection & Protocol
  - Management System Knowledge
- Keep CEU's
- Retested every 3 years if not enough CEU's
- One DRI per Approved Contractor Location



# 4. Annual Audit

## FM 4991 UL / ULC

### Contractor Company Personnel

- Continued satisfactory performance
  - Quality Manual Implementation
- Documented - Archived record keeping
- Employee Training Documentation
- Jobsite Visit
- DRI CEU Verification
- **Find @ [www.fcia.org](http://www.fcia.org)**

# Master Audit Certificate of Compliance Program

A Jobsite Specific Management System Audit – Our audit provides verified processes were followed to properly installed firestop systems.

A Renewable Jobsite Specific Certificate – After completion of a successful audit, we issue a jobsite specific certificate that is renewable for the building owner.

Improved Firestop Systems Documentation – The MACC certificate in conjunction with the firestop systems documentation, builds the fire-resistance inventory required by the 2018 International Fire Code for fire and smoke protection features



 **Qualified Firestop Contractor Program**  
**Master Audit**  
**Certificate of Compliance**

Certificate Number: 1000-0001  
Audit Date: 08/03/2018  
Expiration Date: 12/31/2019

This certificate reports the findings of an audit by UL to the management system requirements of the Qualified Firestop Contractor Program. The audit was conducted to the requirements specified in the Qualified Firestop Contractor Program requirements. The UL qualified contractor was found to be in compliance with the requirements at the time of the site audit.

Structure Name: Underwriters Laboratories  
Job Number: 0001  
Address: 333 Pflanzgen Rd.  
Northbrook, IL 60062

Qualified Contractor: FCTA  
Address: 5415 W. Harrison Street, Suite 540  
Hitland, IL 60162

Qualified Contractor Scope of Work:  
For Project # 0001 Firestopping Head and Bottom of Interior Fire Walls and all Trade Penetrations / Except Cable Tray

UL LLC makes no representations or warranties, expressed or implied, that the installed firestop system will prevent any loss or damage in the event of a fire or similar event, or that the system will in all cases provide the protection for which it is installed or intended. The certificate is evidence that the working contractor's management system was in compliance with the applicable requirements of the Qualified Firestop Contractor Program.  
UL LLC is not an insurer and does not assume any obligation or undertake to discharge any liability of the Qualified Working Contractor, or any other party for any loss, which may result in future, insurance settlements, non-compliance or requirements, qualifications of this certificate, or undertaken by the Qualified Working Contractor from the Qualified Firestop Contractor Program.  
Any modification to any firestop system of the structure will affect the complete firestop system and may render protection offered by the system ineffective. Any changes will invalidate this certificate unless they meet the requirements set. It is the building owner's responsibility for an annual visual inspection of the integrity of the fire-resistance-rated and smoke-resistance assemblies as required by the International Fire Code or other adopted codes. Please contact your local UL Qualified Firestop Contractor or visit [www.ul.com/firestopcontractor](http://www.ul.com/firestopcontractor) for a complete list of qualified contractors.

UL and the UL Logo are Trademarks of UL LLC © 2018  
Unauthorized reproduction or modification to this certificate constitutes fraud.  
This certificate is for reference use only.  
To verify Site Audit Certificate or Audit Requirements, please refer to website:  
[www.ul.com/firestopcontractor](http://www.ul.com/firestopcontractor)

 Certificate Number:1000

**QUALIFIED FIRESTOP CONTRACTOR CERTIFICATE**

Company Name: Underwriters Laboratories Inc. File number: R12345 Issued: January 31, 2019  
Address: 333 Pflanzgen Rd. Expires: December 31, 2019  
Telephone: 480.790.6985 Email Address: Rabon.SandovalJr@UL.com

This company has demonstrated that it complies with UL's Qualified Firestop Contractor Program Requirements. This certificate is not transferable and expires on December 31 of the following Year. This certificate may be displayed, copied and shared with others but must be used in its entirety.

Only those companies listed in UL's online Directory for the Qualified Firestop Contractor Program at [www.ul.com/contractor](http://www.ul.com/contractor) are considered eligible for this program and to use this Certificate and the UL Qualified Firestop Contractor Program Marking (shown here) in its advertising and promotional material in accordance with marking guidelines provided at [www.ul.com/contractor](http://www.ul.com/contractor).

 Underwriters Laboratories  
Qualified Firestop Contractor Program

Underwriters Laboratories reserves the right to void this certificate at any point. This certificate does not indicate compliance with any UL product certification program.

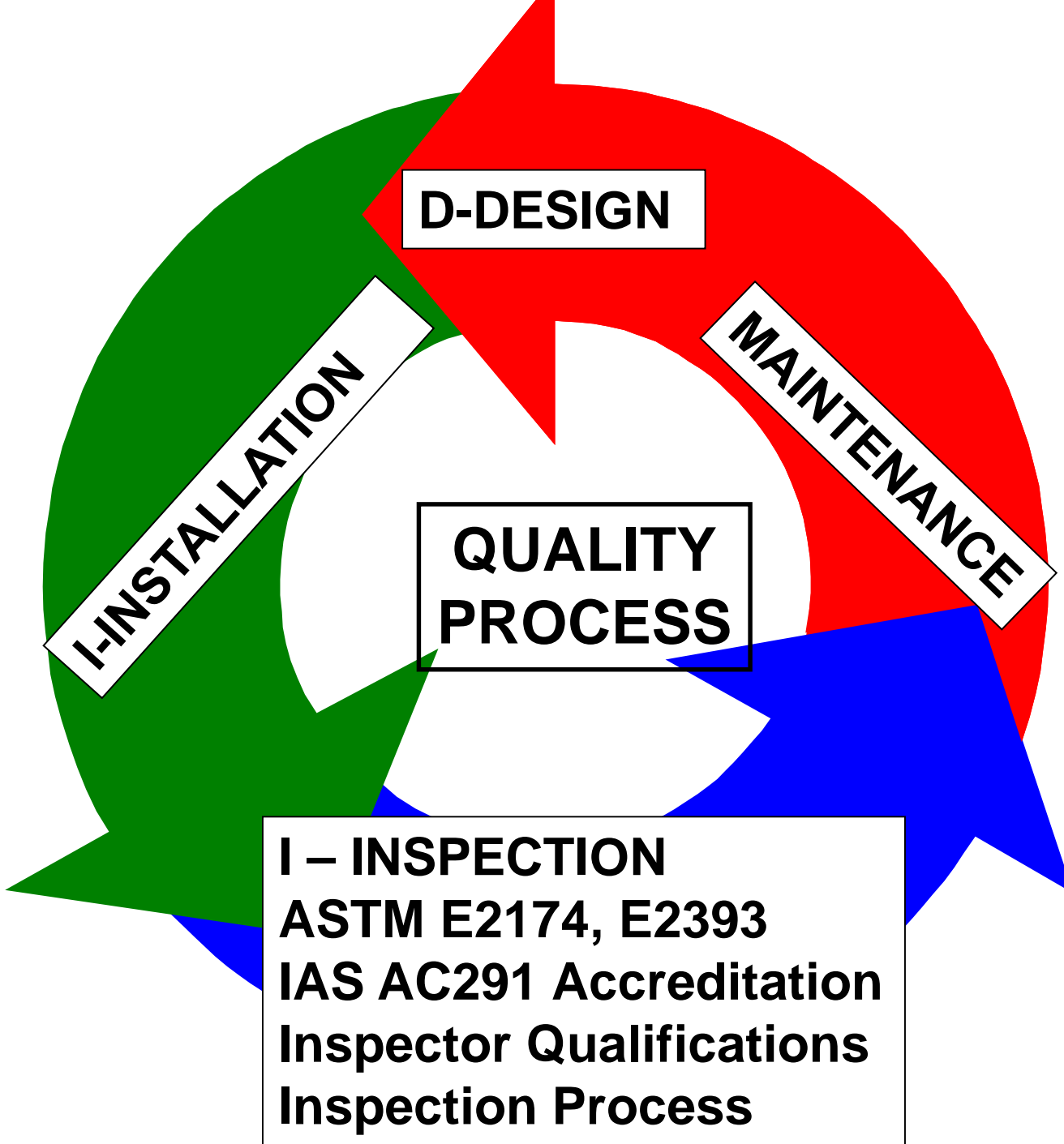
For additional information regarding the Qualified Firestop Contractor Program, please visit [www.ul.com/contractor](http://www.ul.com/contractor)

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UL Slide

# 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**



# Why Inspection?

## Firestop Installation Methods

- **Each Construction Discipline – MEP, etc.**
  - “He/She who pokes hole, fills hole”
- **Multiple Contracts**
  - Firestop Contractors, Trades
- **Single Source Firestop Contractor**
  - *FCIA Member in Good Standing*
  - *UL/ULC Qualified, or FM 4991*



Affinity Firestop Photo





Affinity Firestop Photo



3" ProRoc TYPE X TE  
1222 C 15:34 MADE IN CANADA





Affinity Firestop Photo

- Now the good Firestop ....
- Using Systems.....

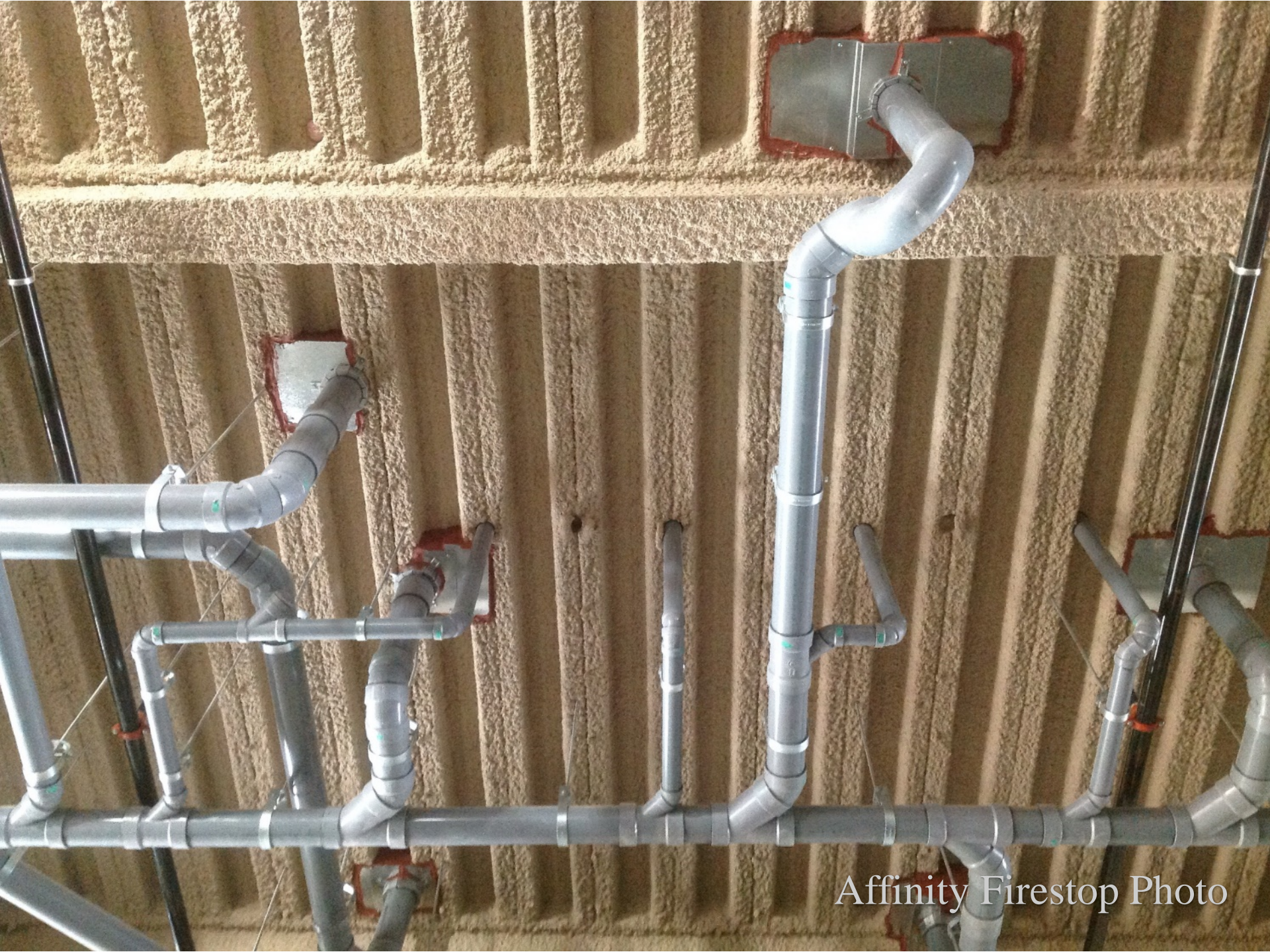


 **AFFINITY FIRESTOP LTD**  
117 GERRARD ST. W. TORONTO ONT. M5H 2C1  
TEL: 416-491-1840, WWW: WWW.AFFINITYFIRESTOP.COM

DATE	
TIME	
BY	
PROJECT	
JOB NO.	

**CAUTION! FIRESTOP SYSTEM**

Affinity Firestop Photo



Affinity Firestop Photo



Affinity Firestop Photo



# Firestop Inspection Standards & Professional Contractor = Success

- ASTM E 2174/ ASTM E 2393 Standard Practice



# I – Inspection – Mandatory

**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**.

# Agency & Individual 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 ...**

# IAS AC 291 Must be Specified


- **IAS AC 291 Quantified Qualifications**
  - Helps AHJ with “Approved Agency”
  - Not in ASTM Standards, Code
- **Individual Competencies - Exams**
  - FM Firestop Exam
  - **OR**
  - UL Firestop Exam
  - **AND**
  - IFC Exam

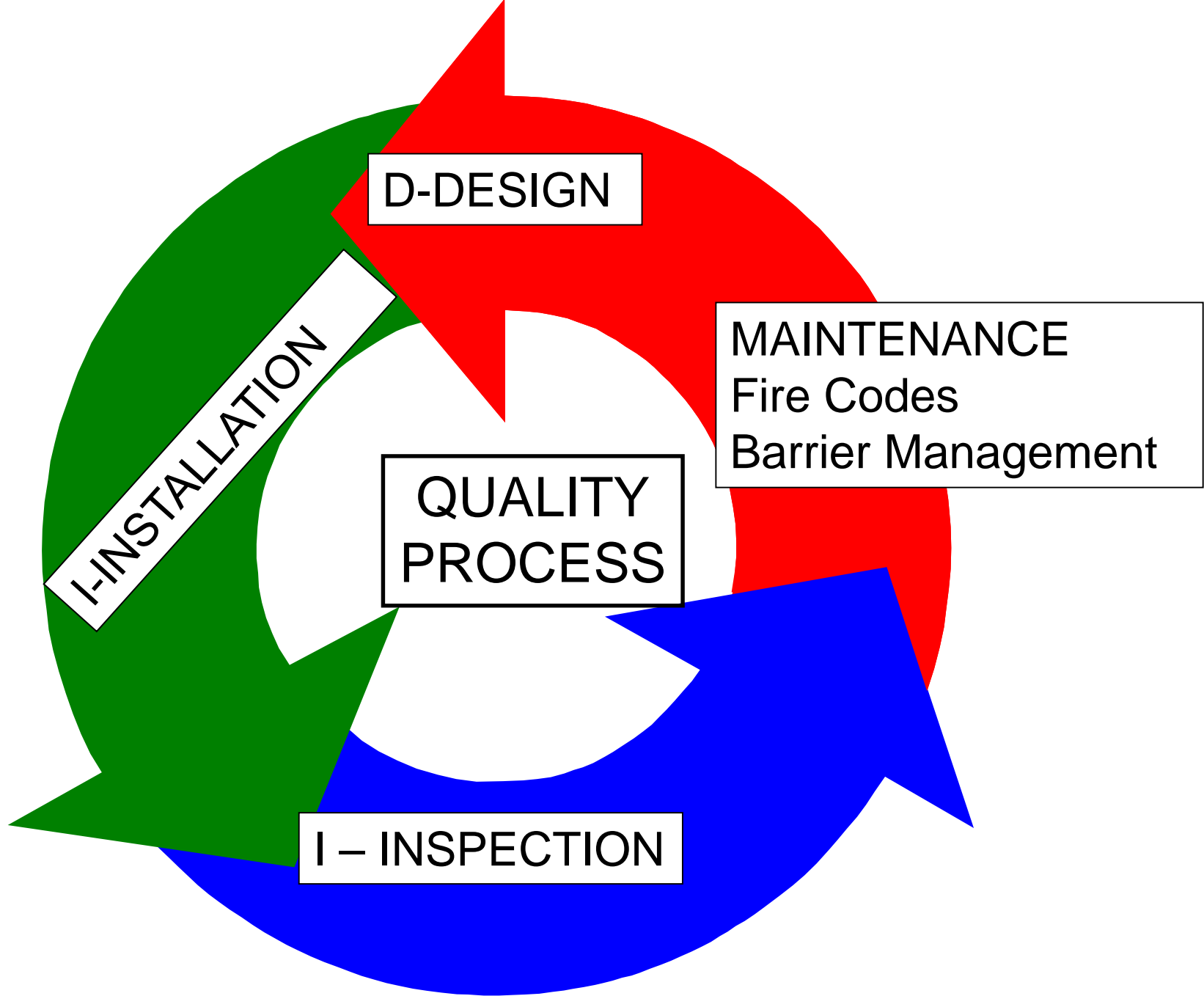
# Firestop Inspection Process

## ASTM E 2174 - ASTM E 2393

- Pre-Construction Meeting
- Review Documents
- Inspection Schedule
- Observation or Destructive
  - By System, By Scope of Work
- Report, not Supervise

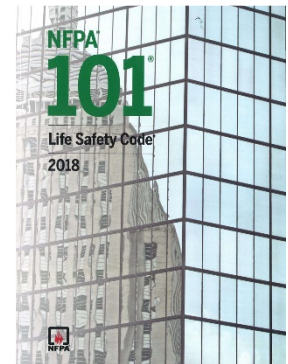
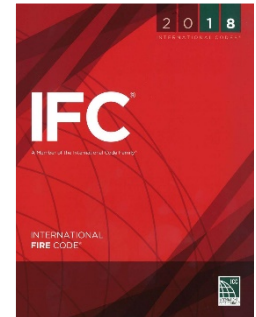


FIRESTOP CONTRACTOR (204) 555-0101		WARNING	
This is an approved Firestop System and shall NOT be disturbed except by Authorized Personnel.			
Wall/Pipe Penetration No. <u>MF-23551-1</u>	Fire Rating Required: <u>15 F</u>		
Floor Level: <u>LEVEL 200</u>	Room No. <u>201</u>		
Installer's Name: <u>JOBK SMITH</u>	Product: <u>FS-ONE</u>		
Installation Date: <u>APRIL 1, 2015</u>	System Design No.: <u>C-AJ-5522x</u>		
Re-permited by:			
Company	Installer	Date	



# Fire Codes Require Maintenance

- **NFPA 101**
- **NFPA 1**
- **International Fire Code**
- **Minimum Requirements Stated**
- **Frequency**



# National Fire Protection Association - NFPA 1-2018

- **12.3.2\* Quality Assurance for Penetrations and Joints.** In new buildings three stories or greater in height, a quality assurance program for the installation of devices and systems installed to protect penetration and joints shall be prepared and monitored by the RDP responsible for design. Inspections of firestop systems and fire-resistive joint systems shall be in accordance with 12.3.2.1 and 12.3.2.2.



# 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.**

# National Fire Protection Association - NFPA 101-2012

- **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. [101:4.6.12.1]

# 2015 International Fire Code Maintenance

## SECTION 703

### FIRE-RESISTANCE-RATED CONSTRUCTION

**703.1 Maintenance.** The required *fire-resistance rating* of fire-resistance-rated construction, including, but not limited to, walls, firestops, shaft enclosures, partitions, *smoke barriers*, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and fire-resistant joint systems, shall be maintained. Such elements **shall be visually inspected by the *owner* annually and properly repaired, restored or replaced where damaged, altered, breached or penetrated. Records of inspections and repairs shall be maintained..**



# 2018 International Fire Code

- **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.*

# 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...
- **FCIA Manual of Practice – Appendix, Maintenance**  
FCIA recommends Barrier Management for Effective Compartmentation and Structural Protection



# M–Barrier Management Systems

- **Barrier Management Starts at New Construction Specification.....**



# M–Barrier Management Systems Starts @ NEW CONSTRUCTION

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



# M–Barrier Management Systems Starts with CONSTRUCTION

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

# **M–Barrier Management Systems Starts with CONSTRUCTION**

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

# M–Barrier Management Systems Starts with CONSTRUCTION

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

# Built Right = Maintain Right WHEN SPECIFIED

- **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**

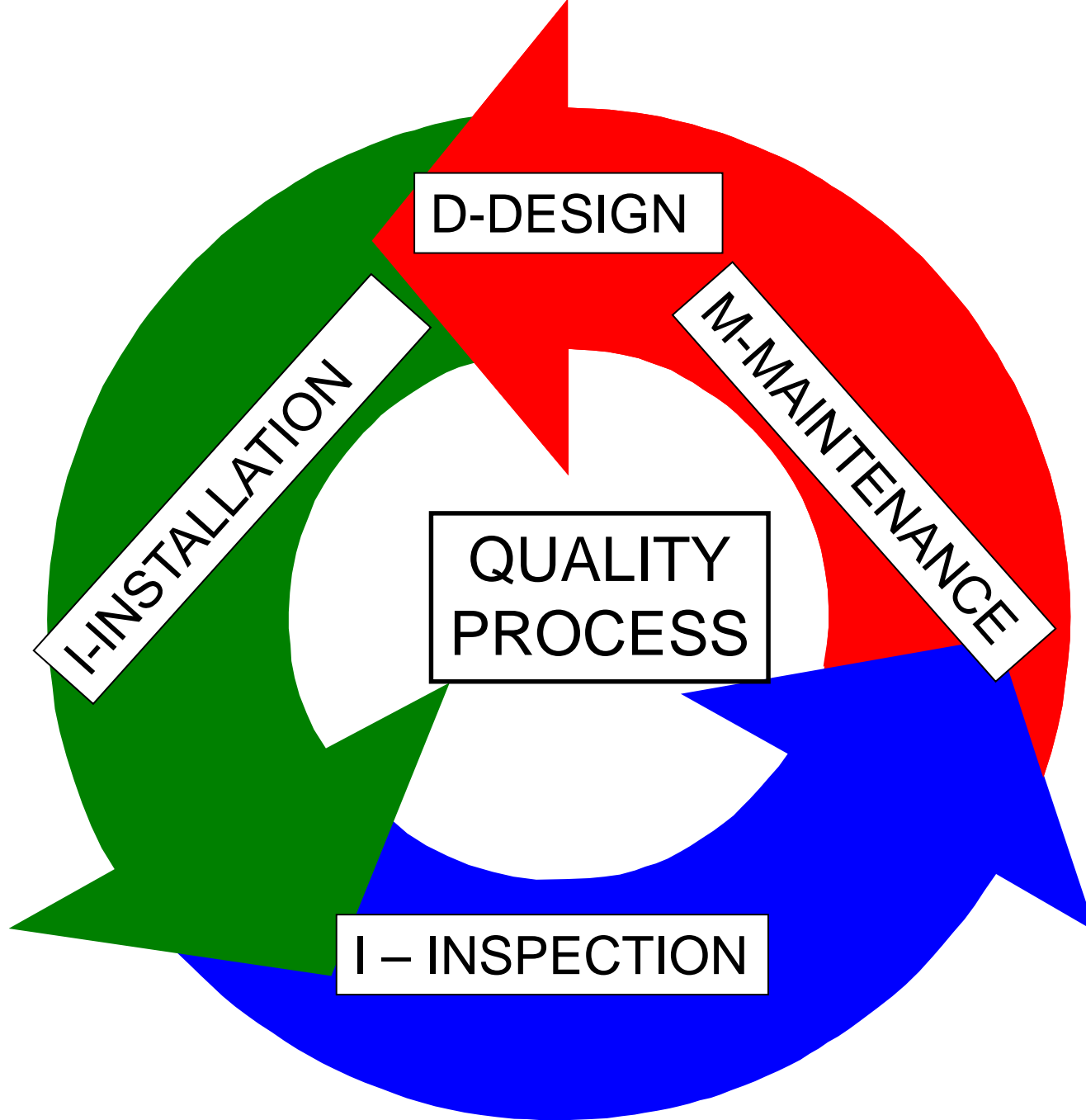
# M–Barrier Management Systems

- **Barrier Inventory Elements & Policy...**
  - **Life Safety Drawings**
  - **Listings, Manufacturers Installation Instructions**
  - **Existing Conditions Documented**
  - **Ongoing Survey Records**
  - **Deficiency Reports**
  - **Systems Documentation Control, Retrieval**
- **ALL FIRE PROTECTION FEATURES**

# M–Barrier Management Systems

## Policy Topics

- **Advise Clients – Create a Budget to Meet Code Requirements**
- **Inventory – What Info?**
- **Implement Fire Resistance Management**
  - **In House (Rules)**
  - **Outside Contractor (Rules)**
- **Monitor Process**
- **Barrier Management Services Contractor**





# Effective Compartmentation is a SYSTEM



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