

FCIA Webinar Series
Bill McHugh
FCIA Executive Director
Bill@FCIA.org

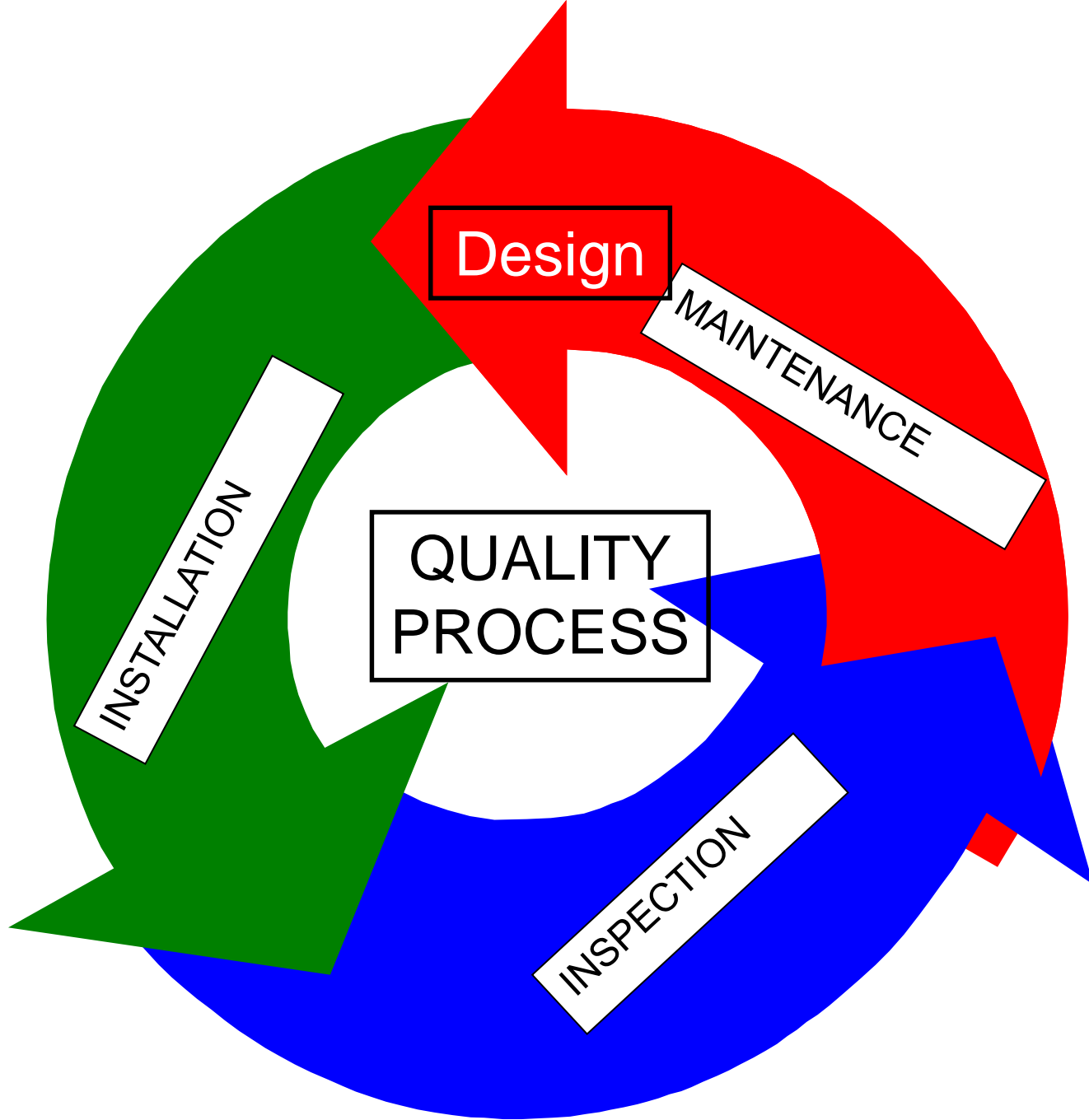
December 21, 2016



Outline

- FCIA – A Trade Association
 - Total Fire Protection & Effective Compartmentation
 - Codes, Testing, Products - Materials
 - Firestopping for Safety – A Quality Protocol
 - DIIM





Design

MAINTENANCE

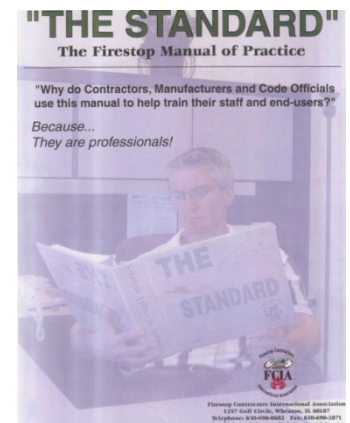
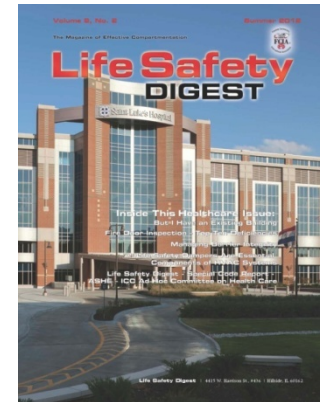
QUALITY
PROCESS

INSPECTION

INSTALLATION

Firestop Contractors International Association

- FCIA – Worldwide Association
- Firestop Contractors, Manufacturers, Consultants, Reps, Distributors,
- Life Safety Digest
- FCIA Website Resources - FREE
- FCIA MOP on PDF FREE to Specifiers, Architects, Governmental Bldg./Fire Officials, worldwide..
 - www.fcia.org



Building & Fire Code Requirements

- Compartmentation Codes – US –
 - *Ch. 8 – NFPA – ASTM E 119, UL 263, NFPA 220*
 - **Ch. 7 – IBC - Fire Barrier** – Hourly Rated – IBC
 - **Ch. 7 IBC - Fire Wall** – Fire rating, structural independence
 - **Ch. 8 NFPA – NFPA 221 – High Challenge Fire Walls**
 - **IBC – Fire Partition** – Rated, not continuous.

Building & Fire Code Requirements

- Fire Barriers
 - Fire Area Separations
 - Mixed Use Occupancies
 - Incidental Uses
 - Hazardous Area Separations
 - Exit Enclosures
 - Shaft enclosures
 - Horizontal Exits
 - Corridor Walls - NFPA

Building & Fire Code Requirements

- *Chemical, Biological, Radiation, Explosion, etc.*
 - Standards?
 - R - Nuclear Power Plant Standards
 - E – Blast Strength? Check with manufacturer – 2psf
 - C – Which Chemicals? Check with manufacturer
 - B – Which Agents? Check with manufacturer
 - G – Germ – Check with manufacturer & industrial hygienist
 - How to Regulate for Unexpected Events?
 - Due Diligence - Review Required by code?

Buildings are Safe Because....

- ***Total Fire Protection Stats -
North America High Rise***
 - ***11,025 Tall Buildings - 20 + stories***
 - ***70% in NY, SF, LA, CHI, HI, Toronto...***
 - ***2/3 Canada's high rise built before 1985***
- = Compartmentation Primary in Older Structures***
- ***Chicago, NY, Toronto – Older stock of buildings***
 - ***SF, LA, HON – Earthquakes***

» *Source, Emporis.com*

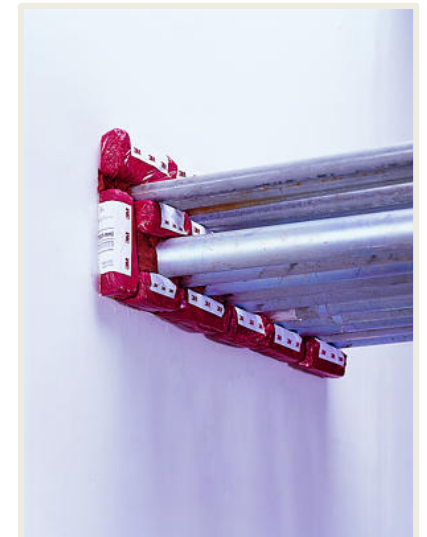


Continuity

Effective Compartmentation Features

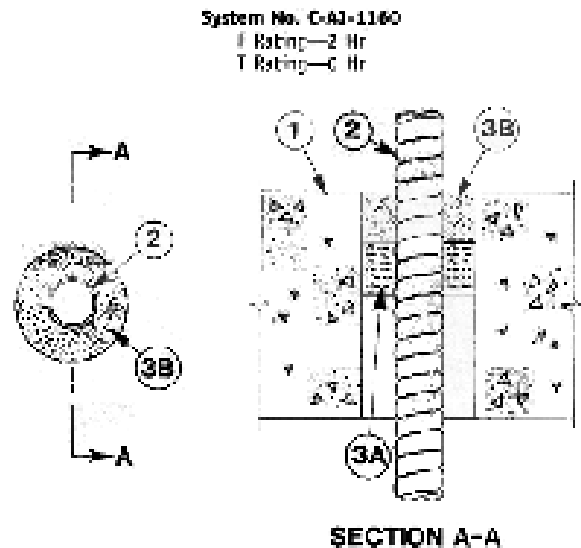


New UL test standards for Life Safety Dampers will take effect in July 2002



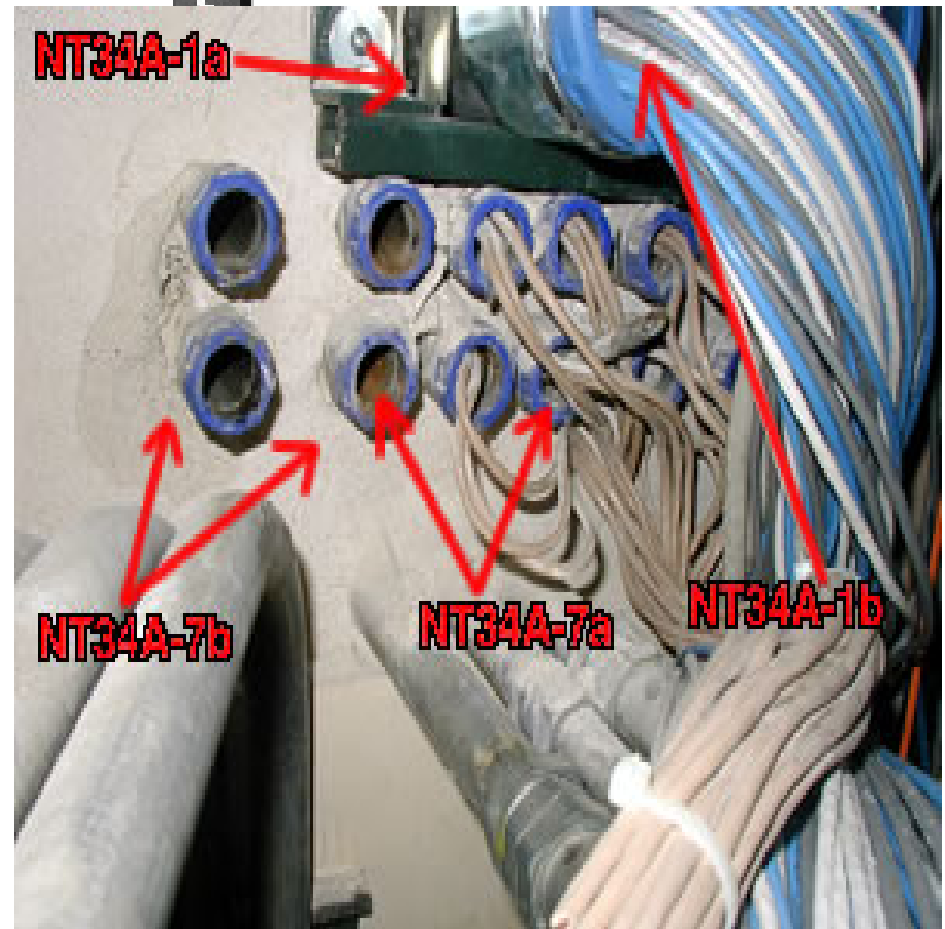
Firestopping for Continuity

I – Classified Systems



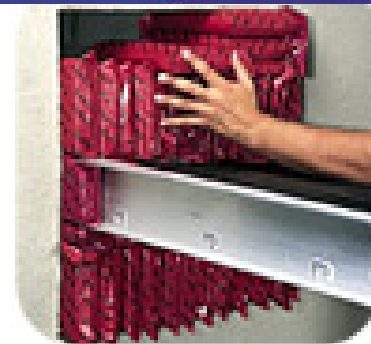
- Floor or Wall Assembly**—Min. 4-1/2 in. thick lightweight or normal weight (100 to 150 pcf) concrete. Will may also be constructed of any UL Classified Concrete Block*. Diam. of circular through opening in floor or wall assembly to be 1/8 in. to 1-1/2 in. larger than diam. of flexible metal conduit (Item 2) installed in through opening. Max. diam. of opening is 6 in.
 See Concrete Block (CAC) 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 silk) fiber Matul or mineral wool batt insulation. Insulation to be secured into 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. 3 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 2500-
 *Bearing the UL Classified Listing Mark
 (Bearing the UL Listing Mark)



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**



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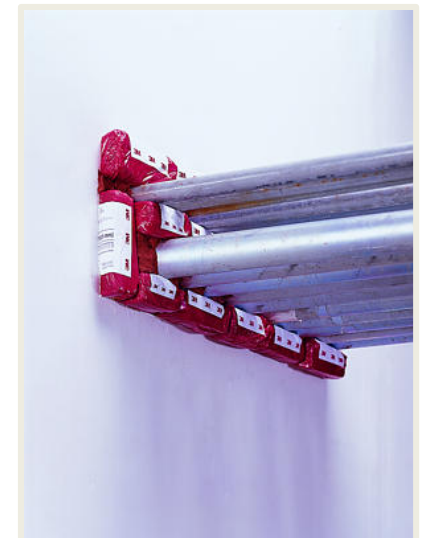
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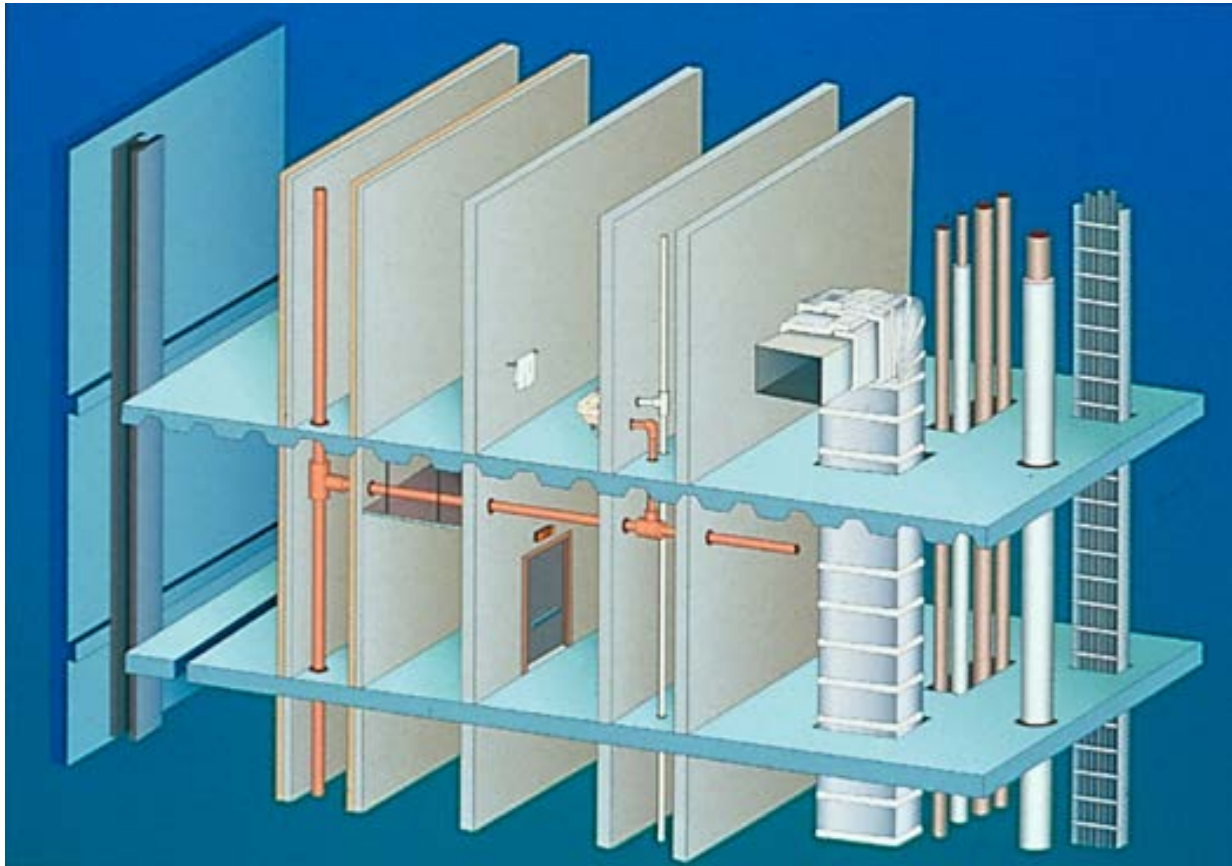


Continuity

Effective Compartmentation Features



M – Maintenance (& Management)



Fire Code Requires Fire & Smoke Resistance Maintenance

- **International Fire Code**
- **NFPA 101**
- **National Building Code of Canada**
- **UAE Fire and Life Safety Code of Practice**

- **Minimum Requirements Stated**

- **Frequency**

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]

National Fire Protection Association - 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. [101:4.6.12.5]

International Fire Code Maintenance



SECTION 703 FIRE-RESISTANCE-RATED CONSTRUCTION

703.1 Maintenance. The required fire resistance rating of fire-resistance rated construction (including walls, fire stops, shaft enclosures, partitions, smoke barriers, floors, fire resistive coatings and sprayed fire resistant materials applied to structural members and fire resistive joint systems) shall be maintained. Such elements shall be visually inspected by the owner annually and properly repaired, restored or replaced when damaged, altered, breached or penetrated.

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.

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..



2015 International Fire Code 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 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.



2009 International Fire Code Maintenance



SECTION 703 FIRE-RESISTANCE-RATED CONSTRUCTION

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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.

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.

National Fire Code of Canada

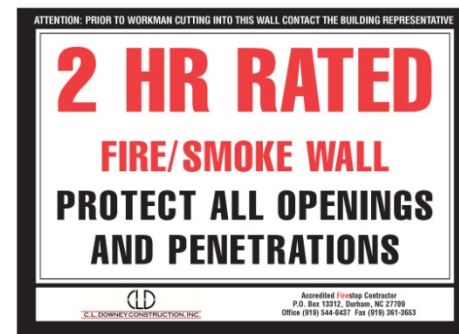
National Fire Code of Canada

- **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



Firestop Maintenance

- **Maintenance**
 - Code Required
 - How??
- **How to keep Track – Barrier Management Initiative**
 - Paper
 - Software
 - Labeling



M–Barrier Management Systems Starts with 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 – 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 – ASTM E 3038**

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**

M–Barrier Management Systems Starts with CONSTRUCTION

- **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**

M–Barrier Management Systems Starts with CONSTRUCTION

- **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 Starts with CONSTRUCTION

- **Why Specifications Division 01-78-00?**
 - **Fire Resistance Inventory REQUIRED** -
 - F-113-16 – 2018 International Fire Code
 - Section 703.1 becomes 701.1
 - Fire Rated Walls & Floors
 - **Firestop Systems**
 - Fire & Smoke Dampers
 - Fire Rated Rolling & Swinging Doors
 - Fire Rated Glazing

M–Barrier Management Systems

F113-16 – 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.*

M–Barrier Management Systems

F113-16 – Fire Resistance

- **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.*

M–Barrier Management Systems

F113-16 – Fire Resistance

- **703.1 Maintaining protection. Materials and firestop systems used to protect membrane- and through-penetrations in fireresistance- rated construction and construction installed to resist the passage of smoke shall be maintained.**

M-Barrier Management Systems

F113-16 – Fire Resistance

- **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.

M–Barrier Management Systems

- **Why Manage Barriers?**
- **International Fire Code**
- **International Property Maintenance Code**

M–Barrier Management Systems

ICC's IPMC

IPMC SECTION 703

[F] 703.1 Fire-resistance-rated assemblies. The required fire-resistance rating of fire-resistance-rated walls, fire stops, shaft enclosures, partitions and floors shall be maintained.

[F] 703.2 Opening protectives. Required opening protectives shall be maintained in an operative condition. Fire and smokestop doors shall be maintained in operable condition. Fire doors and smoke barrier doors shall not be blocked or obstructed or otherwise made inoperable.

International Existing Building Code

M–Barrier Management Systems Policies

- **Barrier Management Policy**
 - **Inventory**
 - **Monitor**
 - **Permits**
 - **Management**
 - **Request Budget to Meet Code Requirements**
 - **Implement Maintenance**
 - **In House (Rules)**
 - **Outside Contractor (Rules)**

M–Barrier Management Systems Policies

- **Barrier Management Policy**
 - **Items to Survey**
 - **Fire Rated Walls and Floors**
 - Breach?
 - Wall not completed at new construction?
 - Wall removed above ceiling?

M–Barrier Management Systems Policies

- “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 2015, 703.1]*

M–Barrier Management Systems Operations

- **Items to Survey**
- **Fire Doors – Annually – NFPA 80**
 - Close and Latch
 - Holes
 - Attach at Frame
 - Undercut & Astragals
 - Labels Legible
 - Labels recertified, requirements of 3rd party certification agency

M-Barrier Management Systems Operations

- **Firestop Systems – Not Concealed Only**
- **Through & Membrane Penetrations**
 - **Joints**
 - **Wall to Wall**
 - **Floor to Floor**
 - **Head – Bottom of Wall**
 - **Continuity Head of Wall**
 - **Perimeter Fire Containment**

M–Barrier Management Systems Operations

- **Firestop Systems – SYSTEMS**
 - Visibly Comply with System
 - Visibly ‘sealed’
 - Without openings
 - Firestop Materials & Systems
 - Securely Attached

M–Barrier Management Systems

Items to Survey

Fire Dampers

- **NFPA 80 –**
- **Initial Installation**
- **At 1 year, each 4 years,**
- **6 years healthcare**
 - **Fire Dampers**
 - **Smoke Dampers**
 - **Combination Fire/Smoke Dampers**
 - **Ceiling Dampers**

M–Barrier Management Systems

Items to Survey

- **Fire Rated Glazing**
 - **Verify it's still fire rated**
 - **Glazing / Frame Attachment**
 - **Frame attached to wall**
 - **Glazing Marking as Built**

M–Barrier Management Systems

Items to Survey

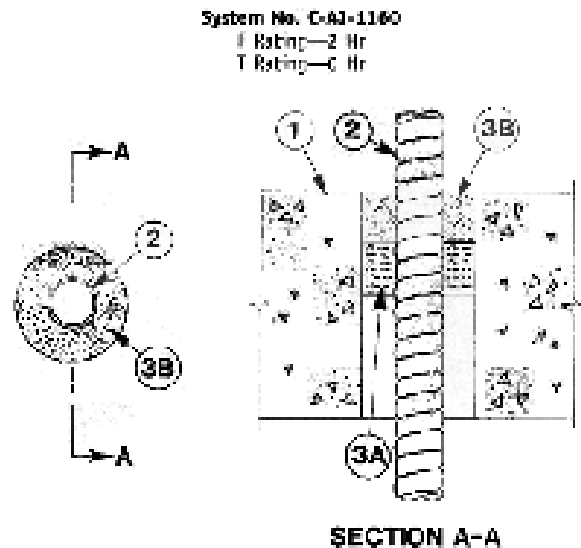
- **Fire Resistance Inventory Systems**
 - Paper & Files
 - Spreadsheets
 - Software

M–Barrier Management Systems Building Operational

- **Barrier Management Policy**
 - **Repairs**
 - **As originally permitted and *approved***
 - ***As required by Fire Code, Existing Building Code***
 - **If SYSTEMS required, SYSTEMS REPAIRS**
 - **If no Systems, original materials.**
 - **Fire Official**
 - **Insurance Company**

Firestopping for Continuity

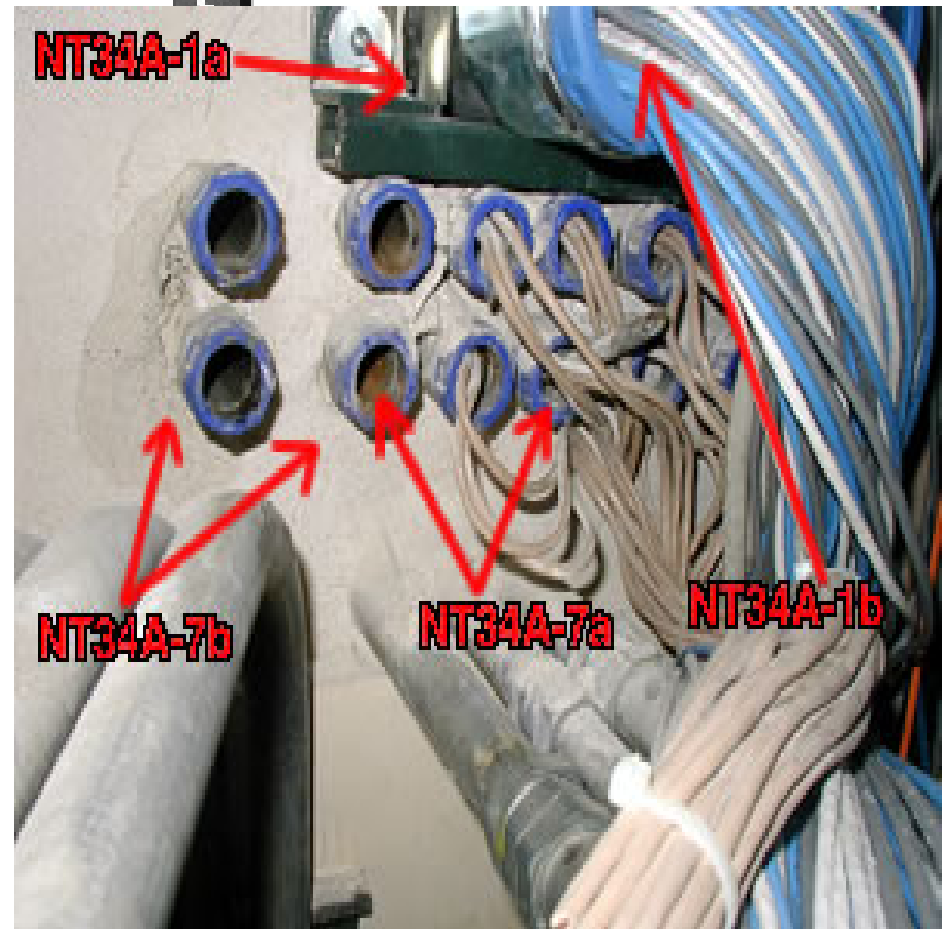
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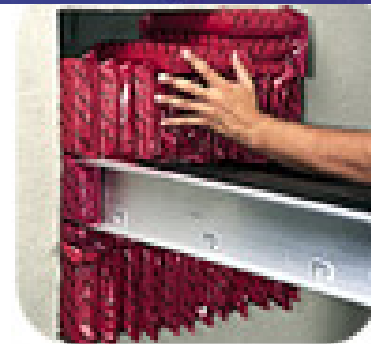
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Firestop Materials, Systems & Physical Properties

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



Properly Tooled/Smoothed Firestop Sealants



Sleeved Pipes



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



Firestop Applications

Floor to Wall



Top of Wall



Fire Stop
Technologies,
Inc.

Graphics – Firestop Solutions

Penetrations in Head of Wall



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.”



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



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**

Firestop Contractor Qualifications

1. Bought at Hardware Store, etc.

- Contractor or Individual?

2. Manufacturer Trained Individuals

- 1 hour program
- ½ day program
- 2 day education

3. ULC Qualified, FM 4991 Approved Companies

- 3rd Party Verified **Company** Management System
- **Individuals** Pass 3rd Party Exam
- **Individual** Knowledge – FCIA MOP
- All Manufacturers Products Covered
- **Company gets Approved or Qualified, not Individual**

Firestop Contractor Qualifications?

- **Manufacturer Educated**
 - **Short Class – 25 - 60 minutes**
 - Some Training
 - Worker educated
 - Short test
 - Administered by salesperson
 - **Worker Education at Shop**
 - **Manufacturer HQ Education**
 - 1-2 Days Education
 - Test – Teach to the Test?
 - Not 3rd Party

Firestop Contractor Qualifications

- **Association Member**
- Insurance – Classification?
 - Specialty Firestop Contractor?
 - Plumber, other trade??
- Workforce – Educated as Firestop/Containment Workers
- Bonding Capability
- Project References & Experience
- **Management System reviewed by....**
 - **FM 4991, UL or ULC ?**

Firestop Contractor Qualifications

FM & UL/ULC – 4 Components

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

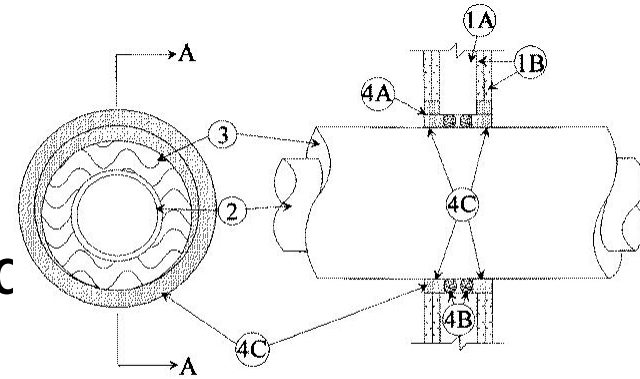


1. Office Audit of Company Management System Manual

- Controlled Management Processes
- Project Successful Proven Contractor
- Education, Training, Accountability

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 Procecc
- Non-Conformances
- Documentation
- Project closeout



CONFIGURATION A

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

- 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 – 6 FM, 10 UL, ea. 3 yrs.
- Retested every 3 years (FM Only)
- One DRI per Approved Contractor Location



4. Annual Audit

FM 4991 UL / ULC

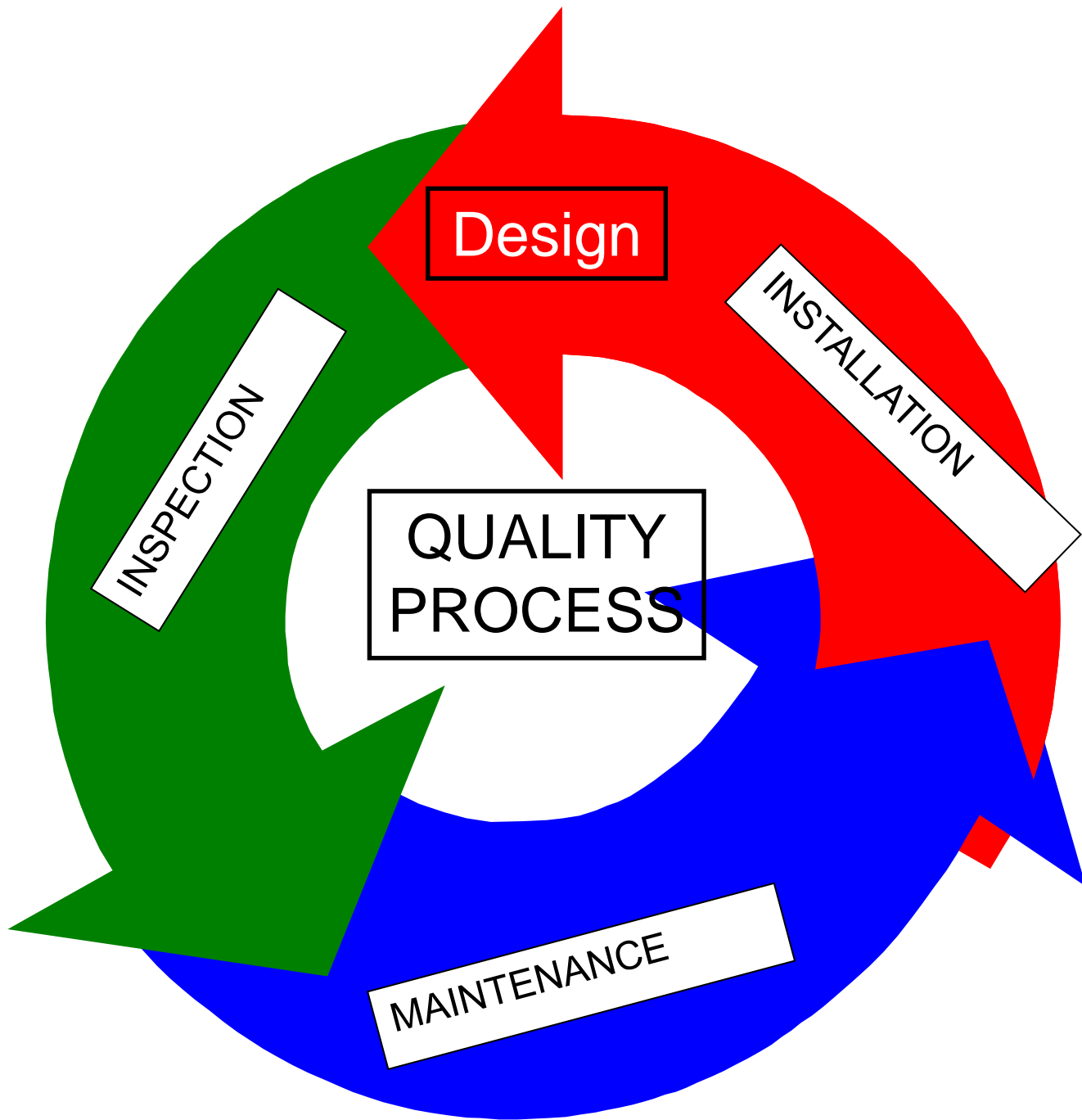
Contractor Company Personnel

- Continued satisfactory performance
 - Quality Manual Implementation
- Documented - Archived record keeping
- Employee Training Documentation
- Jobsite Visit
- DRI CEU Verification
- **Find @www.fcia.org**

UL-ULC/FM 4991 Contractor Company Benefits

Quantified Differentiation ...

- **Focus on the Company & Individual**
- Investment in Company Procedures
- Investment in People Education
- Investment in FCIA Manual of Practice
 - Project Successful Proven Contractor
 - Education, Training, Accountability
 - = Reduced Risk – Life, Property, Business



Design

INSTALLATION

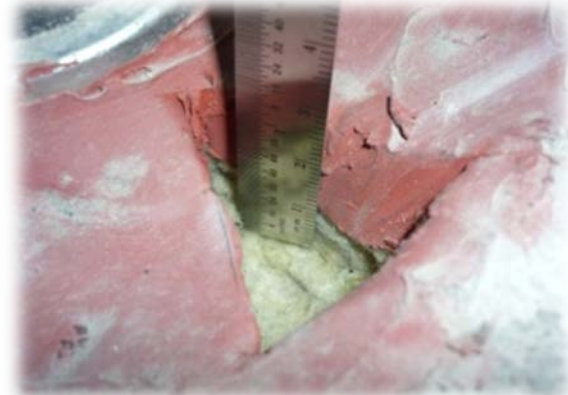
QUALITY
PROCESS

MAINTENANCE

INSPECTION

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 – Code Requirements

[A] 110.4 Inspection agencies. The *building official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability. [IBC 110.4]

[A] 110.6 Approval required. Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the *building official*....More.
[IBC 110.6]

I – Inspection – Code Requirements

Definitions

[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 – 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 – Code Requirements

1704.2.1 Special inspector qualifications. The special inspector shall provide written documentation to the building official **demonstrating his or her competence** and relevant experience or training. **Experience or training shall be considered relevant** when the documented experience or training **is related in complexity to the same type of special inspection activities for projects of similar complexity and material qualities.** These qualifications are in addition to qualifications specified in other sections of this code. The **registered design professional in responsible charge** and engineers of record involved in the design of the project **are permitted to act as the approved agency and their personnel are permitted to act as the special inspector for the work designed by them, provided they qualify as special inspectors.**

I – Inspection – 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.

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
 - Report to Building Owner, Fire Marshals & Code Officials

Inspection Firm & 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
 - **Submit notarized statements** of ...

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

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**
- Inspection Documents
 - Manufacturer Product Data Sheets
 - Tested and Listed Systems & EJ's
 - Safety Data Sheets

Inspection Process

ASTM E 2174 - ASTM E 2393

- Pre-Construction Meeting
 - Mock Ups
 - Destructive Testing
 - Installation Measurements
 - Discuss Inspection Method
- Meeting Required
 - During/Post Inspection Methods

Inspection Methods

ASTM E 2174 - ASTM E 2393

- During Construction
 - Random witness, Each Floor
 - **10%, each type** of Penetration Firestop,
 - **5% of Total Lineal Feet** of Fire Resistance Rated Joint System, each type

Adler Photo



Inspection Methods

ASTM E 2174 - ASTM E 2393

- Post Construction - Destructive Testing
 - **Minimum 2% , no less** than 1, each type per 10,000 SF of floor area
 - **Minimum 1 / 500 LF** of Joint Area, mandatory
 - If 10% variance per firestop type
 - Inspection stops
 - Installer inspects, repairs
 - Inspector reinspects



Adler Photo

Inspection Methods

ASTM E 2174 - ASTM E 2393

- Variances....
 - ASTM E 2174 & ASTM E 2393
 - One Day Notice after discovery to Contractor
 - International Building Code 1704.2.4
 - ‘Brought to IMMEDIATE attention of contractor’
 - ‘If not corrected, Building Official AND RDP... prior to completion of that phase’



Adler Photo

Inspection Methods

ASTM E 2174 - ASTM E 2393

- Both Methods...
 - If 10% variance per firestop type
 - Inspection stops
 - Installer inspects, repairs
 - Inspector reinspects
 - Inspector Shall not Supervise Workers...
 - Inspect @ Firestop Installation Start

Inspection Forms

ASTM E 2174 - ASTM E 2393

- One for each type of firestop
- Submit 1 day after Inspection to
Authorizing Agency
- Numbered – Controlled
- Required – During/Post Construction Methods

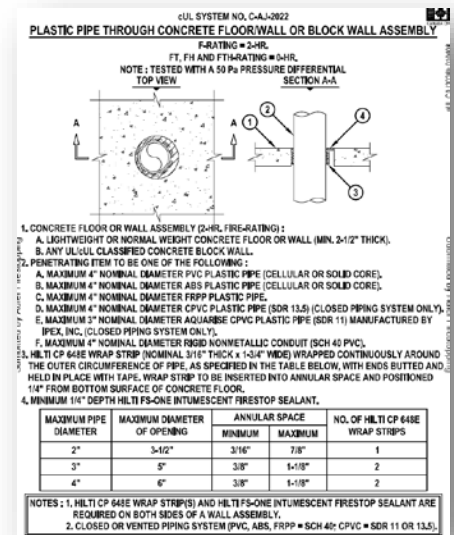
Inspection Reports - IBC

1704.2.4 Report requirement. Special inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the building official, and to the registered design professional in responsible charge. Reports shall indicate that work inspected was or was not completed in conformance to approved construction documents. **Discrepancies shall be brought to the immediate attention of the contractor for correction.** If they are **not corrected**, the discrepancies shall be brought to the attention of the building official and to the registered design professional in responsible charge **prior to the completion of that phase of the work.** A final report documenting required special inspections and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon prior to the start of work by the applicant and the building official.

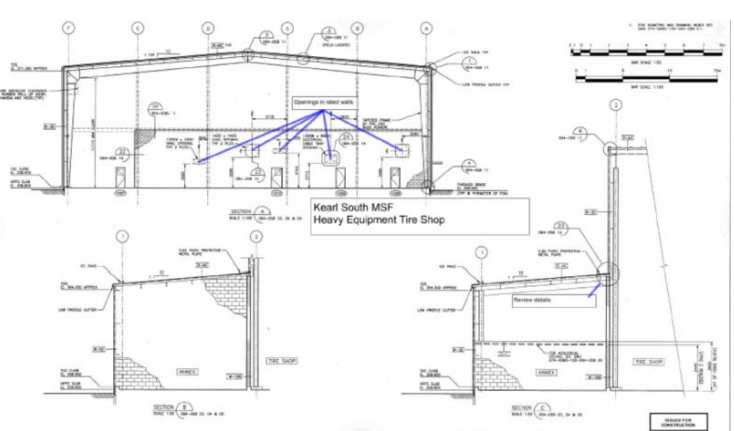
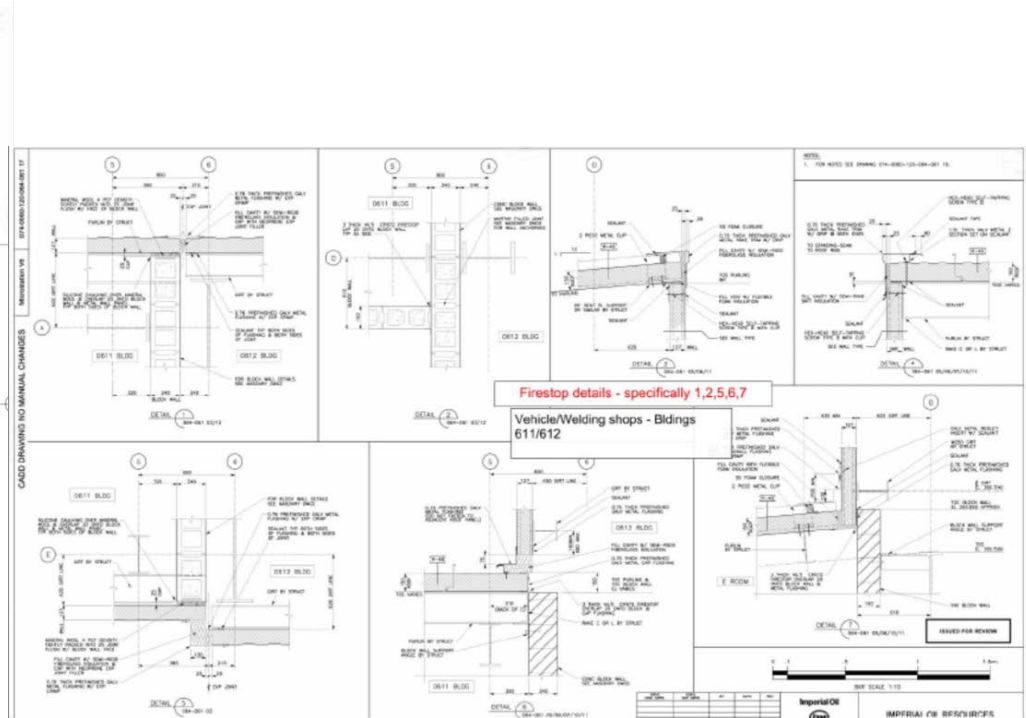
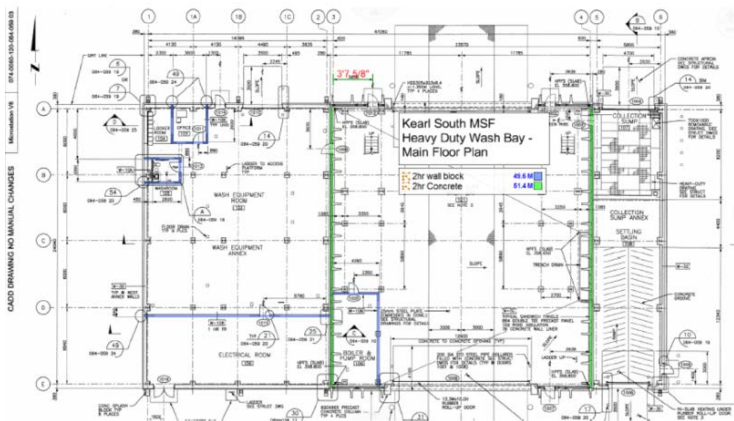
Inspection Final Report

ASTM E 2174 - ASTM E 2393

- Name, address, location – project, installer, inspector
- Type and quantity of firestops inspected
- Verification method
- Percentage Deviation
- Copies of all documents sent to Authorizing Agency



Firestopping & Compartmentation for Safety



07-84-00 Specifications (FREE @ FCIA.org)

MasterFormat - 07 84 00 - Firestopping

- **Part I** – FCIA Member, FM 4991 Approved or UL Qualified Firestop Installer/Contractor - Valid DRI, Test Standards
- **Part II – Products** – Testing, Properties
 - Pipes, cables, ducts, cable trays, MEP&C Systems -
 - Fire Resistance Rated Joints –
 - Head of Wall, Wall to Wall, Wall to Floor
 - Perimeter Fire Containment Joints
 - Floor Slab edge/Exterior Wall
- **Part III, Execution, Quality Assurance (DIV 1 Reference)**
 - **ASTM E 2174 & ASTM E 2393 Inspection**
 - **IAS AC 291** Special Inspection Agency –
 - Individual on staff passed FM or UL Firestop Exam

FCIA Webinar Series
Bill McHugh
FCIA Executive Director
Bill@FCIA.org

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