

Barrier Management Symposium™

Barrier Management Policies

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Objective – Keep Buildings Safe

- Barriers are for Safety – DIIM
 - Properly *Designed* and Specified
 - *Tested and Listed Systems* – Directories, Tables
 - *Specified*
 - Professional *Installation* Companies
 - Properly *Inspected* – Commissioned, by Companies
 - *Maintained* –
 - NFPA 101 - 2012 (TJC, CMS)
 - International Fire Code - IFC 2015 - Annually
- *Effective Compartmentation for Fire & Life Safety*

“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



Building & Fire Code Requirements

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

Continuity

Effective Compartmentation Features



Barrier Continuity SYSTEMS

- **Products Become Systems Through Testing**
 - **Fire & Smoke Barriers** - ASTM E 119, UL 263
 - **Firestopping** - ASTM E 814 / UL 1479, ULC-S-115, UL 2079, E-1966, E-2307, E-2837, ...test methods...”
 - **Fire/Smoke Dampers** - UL 555, UL 555S
 - **Swing/Rolling Fire Doors** - UL 10B, 10C
 - **Fire Rated Glazing** - UL 9
- **SYSTEM Testing = Suitability statement for use of a product in a specific system application**



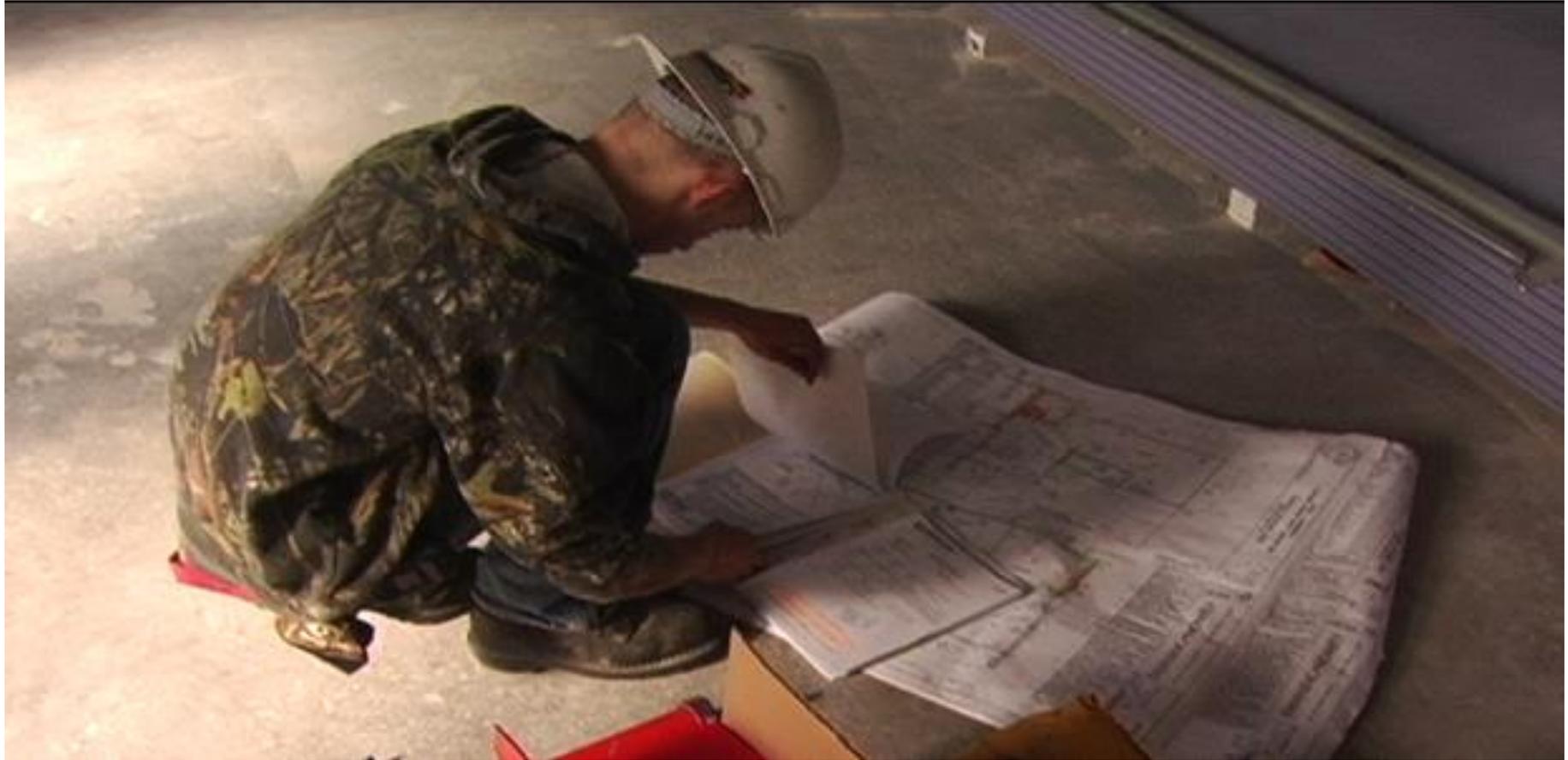
Products Become Systems

Hose Stream = Shock Test



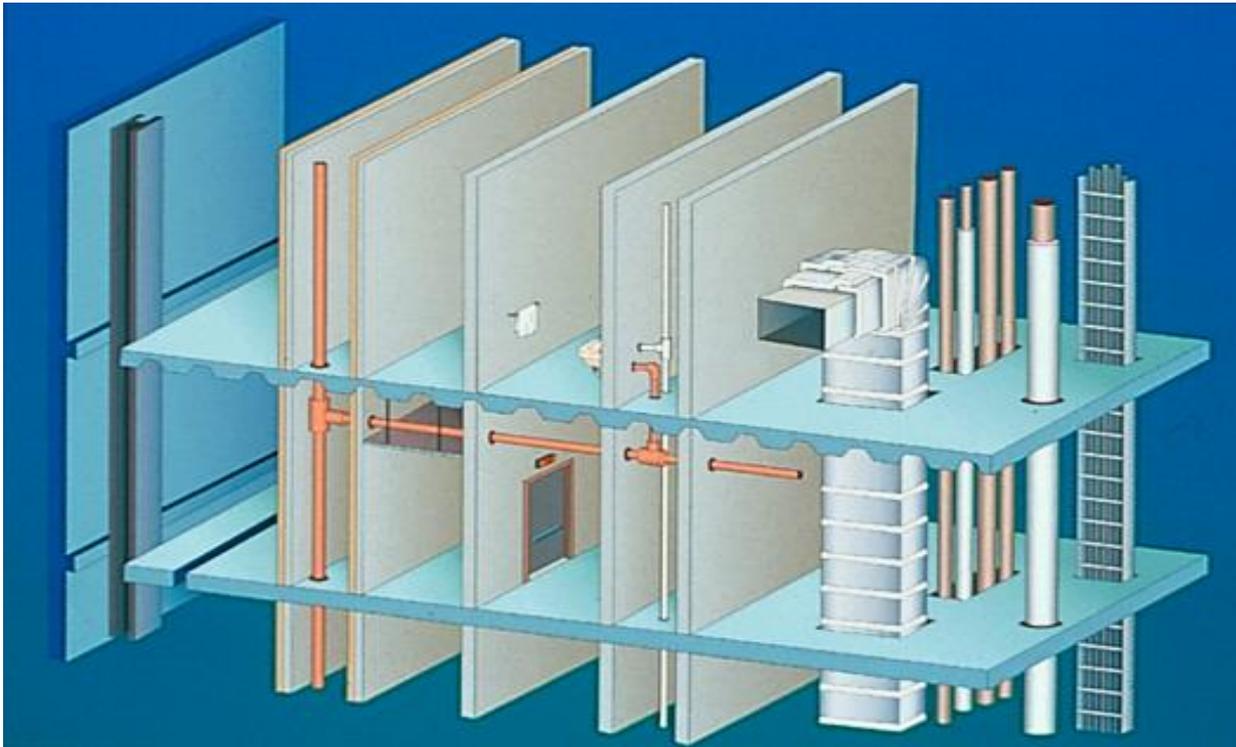
Barrier Continuity

I – Installation – Listed Systems



I- Installation

Who's Responsible, How to Choose???



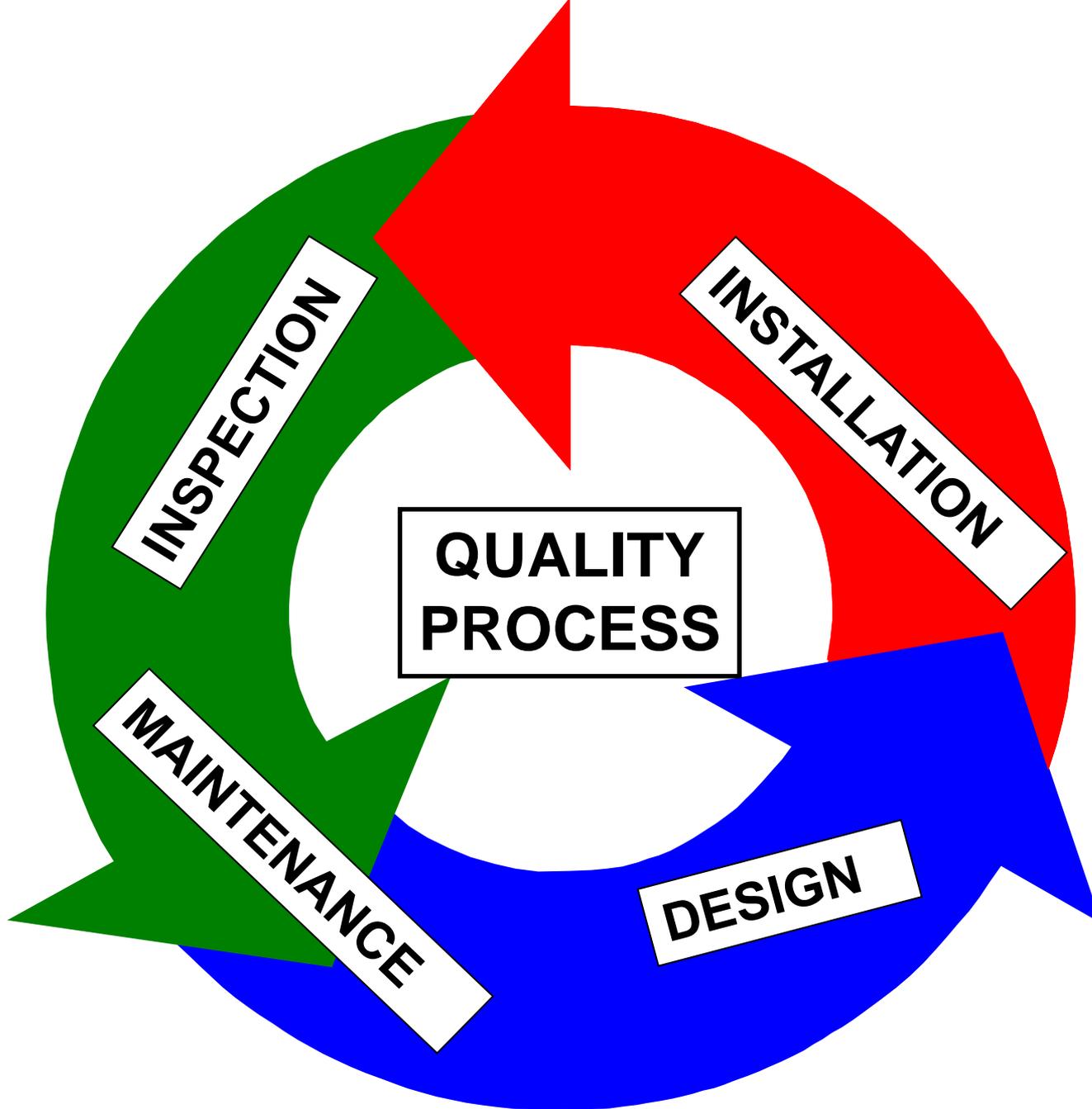
Graphics – STI

Contractor Qualifications?

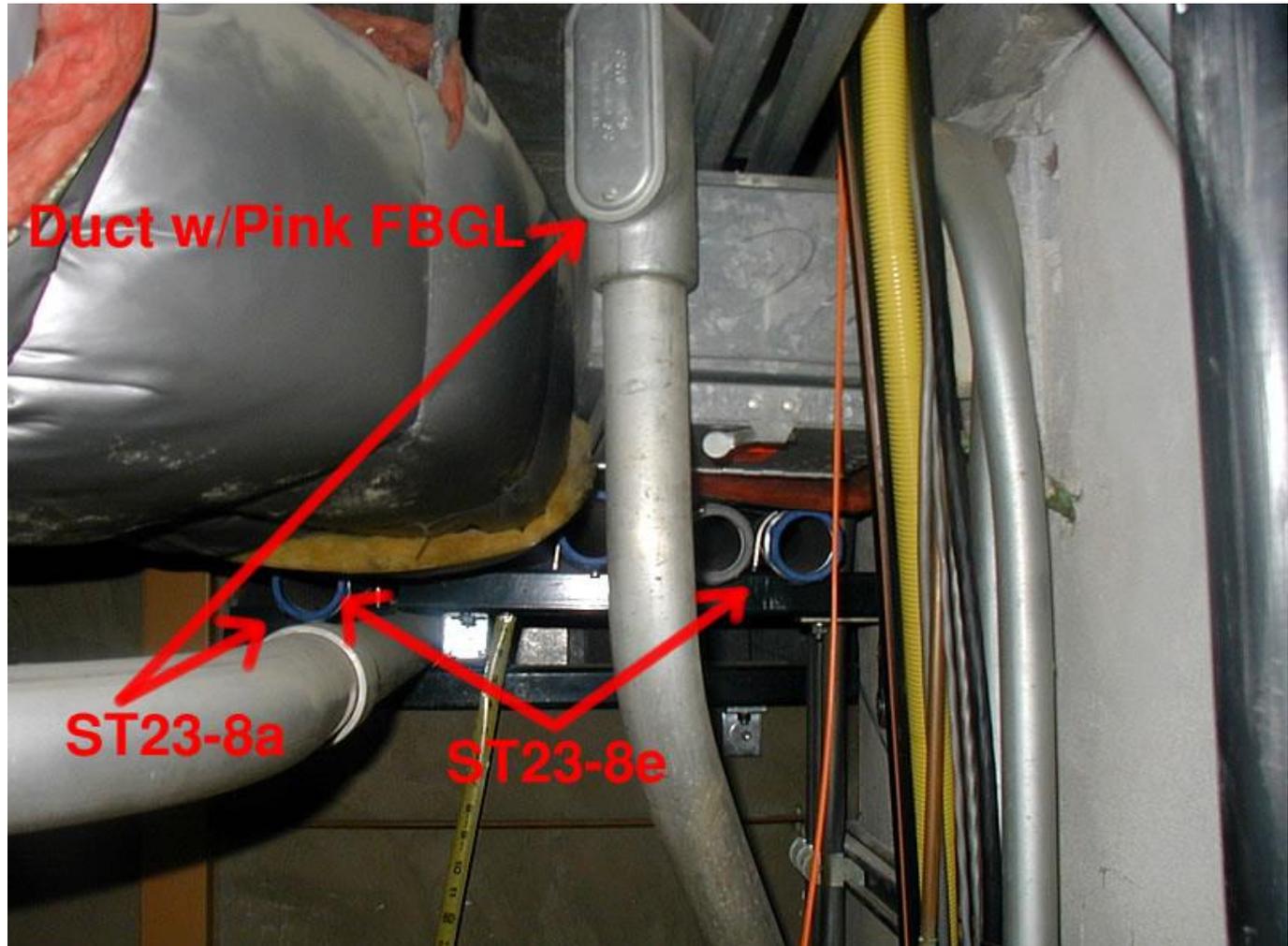
- **FM 4991 – Standard for the Approval of Firestop Contractors**
- **UL Qualified Firestop Contractors**
- **Other Industries...**
 - **Accreditations?**
 - **FM 4991 Approved / UL Qualified Firestop Contractors ENTATION**

Why Contractor Qualifications?

- **Built right – Building Life Cycle**
- **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...**



Installation & Inspection



I – Inspection – Options

- **Contractor Self Inspection**
 - Verify Management System validity
- **Manufacturer Inspection?**
 - Does not exist ... Survey, maybe
- **Special Inspection/Commissioning**
 - Independent 3rd Party
 - Destructive, Non Destructive
 - Specified Frequency
 - Inspection Agency Accreditation – IAS AC 291

Fire Code Requires 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]

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

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.

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

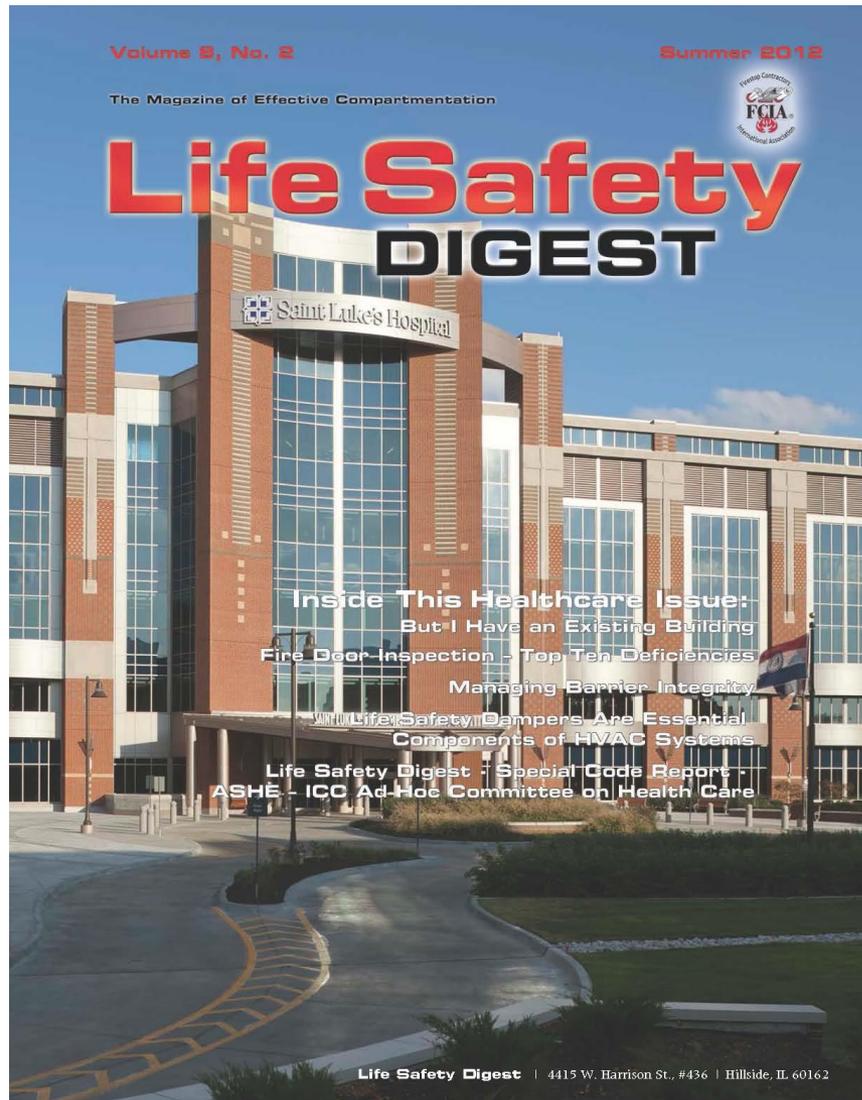


Maintenance

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



Barrier Management Begins when new construction ends...



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

- **Part II – Qualifications**
 - **FCIA Member in Good Standing, AND**
 - **FM 4991, Standard for the Approval of Firestop Contractors, OR**
 - **UL Qualified Firestop Contractor Program**
 - **Other Accreditation Program**
 - **AND**
 - **Manufacturer Accredited, Approved, Trained**

M–Barrier Management Systems Starts with CONSTRUCTION

- **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**
 - **ASTM E 3038**

M–Barrier Management Systems Starts with CONSTRUCTION

- **Part III – Execution**
 - **Special Inspection**
 - **ASTM E 2174 - Penetrations**
 - **ASTM E 2393 - Joints**

M–Barrier Management Systems

Starts with CONSTRUCTION

- **Specifications 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**
 - **Budget to Meet Code Requirements**
 - **Implement Fire Resistance 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 Starts with CONSTRUCTION

- **Fire Rated Walls & Floors**
 - Walls - U, V 400, 900 Designs
 - Floors – P Designs
 - Calculated Fire Resistance
 - Code Defined Fire Resistance – IBC Sec. 720

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

- **Items to Survey - 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

- **Items to Survey - Firestop Systems**
 - **Visibly Comply with System**
 - **Visibly ‘sealed’**
 - **Without openings**
 - **Firestop Materials & Systems**
 - **Securely Attached**

M–Barrier Management Systems

Items to Survey

Items to Survey - 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

- **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

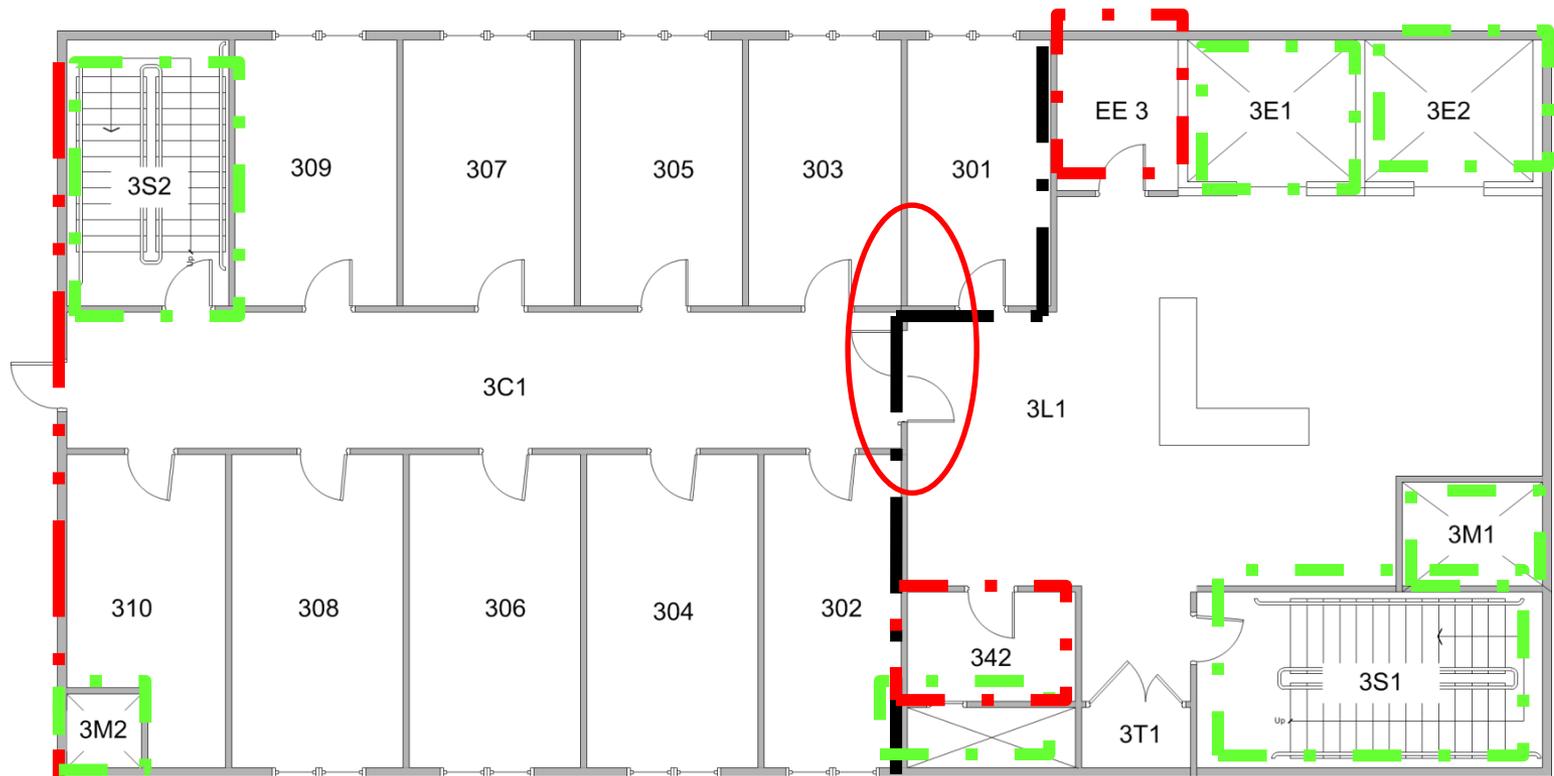
- **Fire Resistance Inventory –**
 - **Systems & Manufacturers Installation, Maintenance Instructions**
 - **Paper & Files**
 - **Spreadsheets**
 - **Software**

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**

M-Barrier Management Systems

- **Now it's your building....**



- **Gleeson Powers Graphic**

M–Barrier Management Systems

- **Barrier Management?**
 - **Issues...Budget???**
 - **Other Occupancies---Big Problem**
 - **Constant issues**
 - **Control?**
 - **Staff?**
 - **Manage?**

Barrier Management HUB

- **The HUB is Facility Director!**
- **HUB Controls Actions**
 - **C-Suite Execs – Budgeted Yearly**
 - **Construction –**
 - **In House Crews**
 - **Outside Contractors**
 - **I-T Department –**
 - **In House Crews & Outside Contractors**

Barrier Hub = Facility Director?

- **YOU answer to...**
 - **Other AHJ's**
 - **C-Suite**
 - **Occupants, Students, Faculty, Patients**
 - **Building Official, Fire Marshal**
 - **Insurance Company**
 - **The Joint Commission**
 - **CMS Inspectors**

Barrier Management Policy

Possible Contents

- *Annual Line Item Budget*
- **Rules of Engagement in Contracts**
 - Internal Contracts
 - External Contracts
- **Pre Construction Meetings**
- **Barrier Warnings - Markings**
- **Violation Consequences**
- **Ongoing Management**
- **Staff - Occupant Education**



Barrier Management Policy Tool

- **Contracts = Rules**
 - **Internal Contracts -**
 - **In House Departments similar to Outside Contractors**
 - **External Contracts**
 - **AIA Contract**
 - **Marked Fire - Smoke Barrier Actions**
 - **Barrier Permits**
 - **Documentation Systems**
 - **Report**

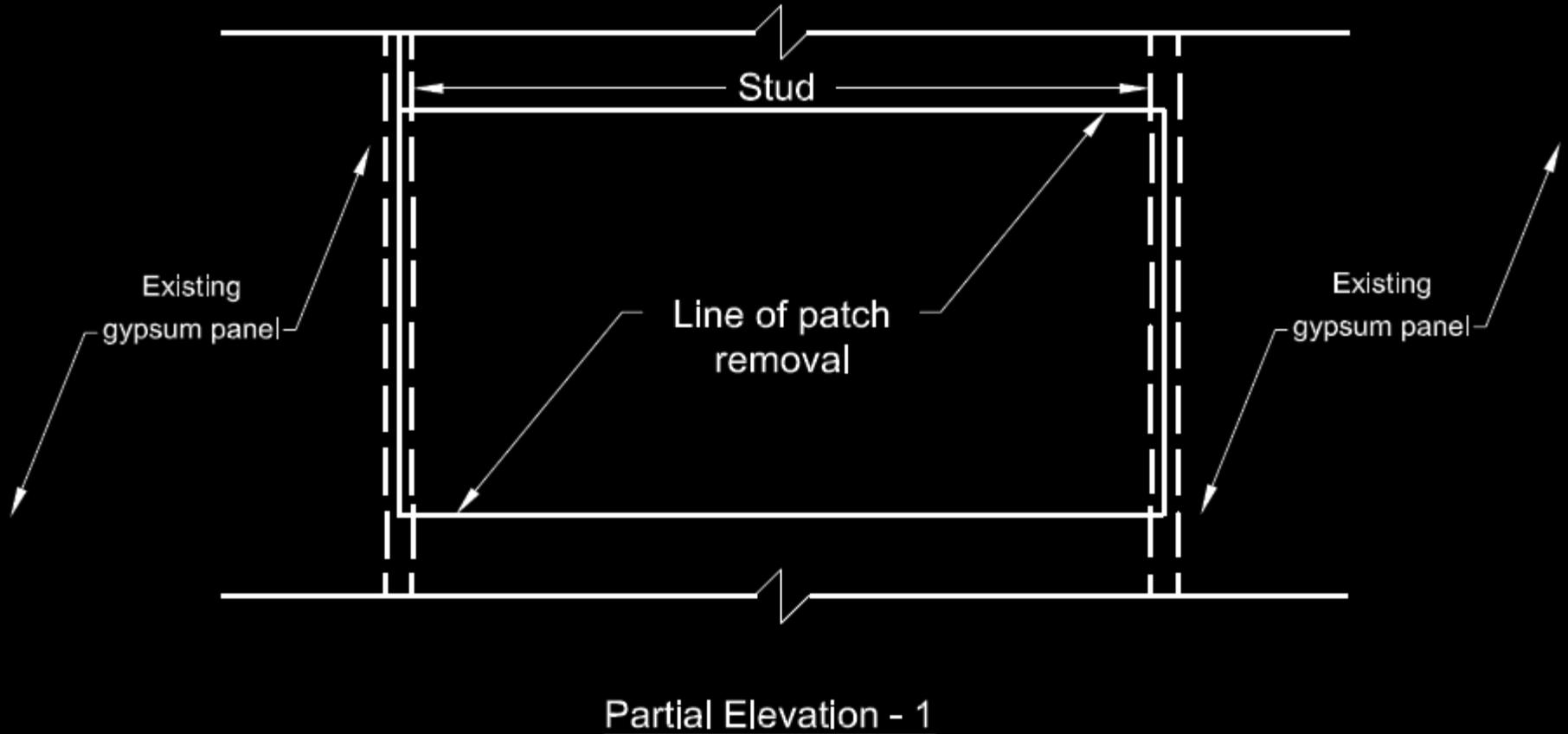
M–Barrier Management Systems

- **Barrier Inventory Elements**
 - **Life Safety Drawings**
 - **Existing Conditions Documented**
 - **Ongoing Survey Records**
 - **Deficiency Reports**
 - **Systems Documentation Control, Retrieval**
- **ALL FIRE PROTECTION FEATURES**

M–Barrier Management Systems

- **Barrier Repair Examples**

Gypsum Wallboard Repair Large Holes



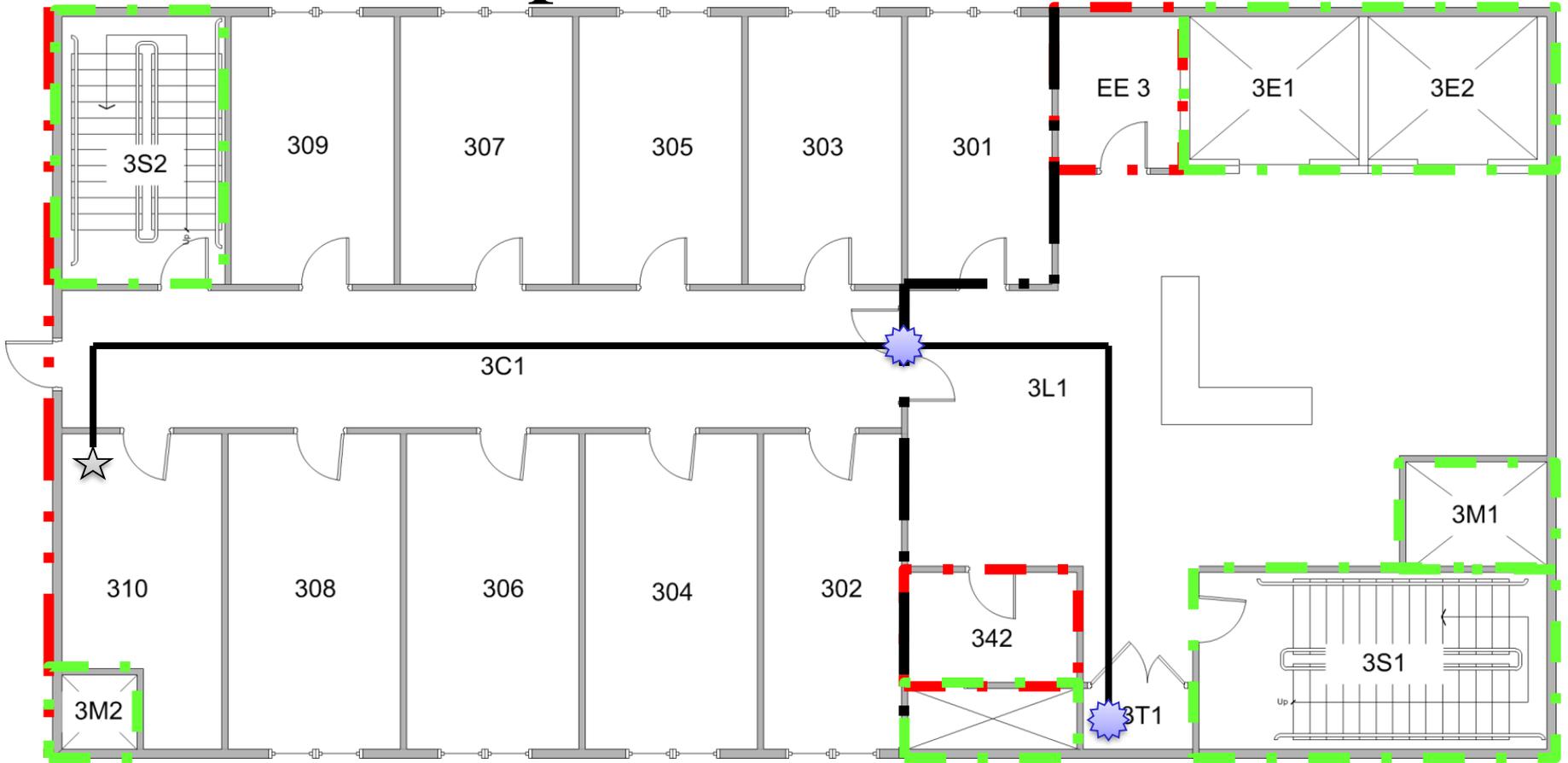
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M–Barrier Management Systems

- **Electronic Best Practice Elements**
 - **Action Oriented**
 - **Projects - Specifications**
 - **Ongoing Surveys – FCIA RPPS 2010-1**
 - **Action Reminders**
 - **In Process Status**
 - **Record Retrieval**



Sample Permit – Area





Demo Hospital

Permit No.: 2011-005

Area (*): 3C1/3L1

Side 1: 3C1

Side 2: 3L1

LSR ID: LST-B1-03-007

Compliance Status: ● Non-compliant

Survey ID:

LSR Group:

Life Safety Details **Surveys** Photos Floor Plan Diagrams

LSR Deta...	Status	Latest Ph...	Detail Description	Life Safety T...	Life Safety Sub ...	Letters	Numbers	LSR Count	Notes
> 001	● Non-com...		Firestopping Through Wall Penetration - Firestop	Firestopping	Through Wall Pe...	WL	1000-1999	1	
002	● Compliant		Firestopping Through Wall Penetration - Firestop	Firestopping	Through Wall Pe...	WL	1000-1999	0	
003	● Compliant		Firestopping Through Wall Penetration - Firestop	Firestopping	Through Wall Pe...	WL	5000-5999	1	
004	● Compliant		Firestopping Through Wall Penetration - Firestop	Firestopping	Through Wall Pe...	WL	3000-3999	1 EZ Path	

Add New Life Safety Detail Entry

Edit Selected Life Safety Detail Entry

Edit

Save

Save & Add Another

Save & Close

Delete Record

Cancel

Edit Selected Permit

Delete Selected Row

View/Print Permi

Close Form

admin Client: Life Safety Tracker Demo

Beta v1.3.13.9

Corrective Action Report

Building/Floor/Area:
Building 1 \ 3rd Floor \ 3C1/3L1

LSR # - Detail#:
LST-B1-03-007 - 001

Life Safety Type: Firestopping

Life Safety Sub Type: Through Wall Penetration - Firestop Systems

Penetration Type: EMT or Conduit

Penetration Size: Max 1"

Annular Space: MIN: 0 to .50", MAX:

Wall Rating Type:

Date Completed: May-02-2011

Classified System:

Survey #: Survey

Survey Date:

Deficiency Description: No firestopping

Suggested CA Notes: Install UL Listed Firestopping System at penetration/joint

Survey Notes:

CA Notes:

Survey Photo



Side: 37296

Photo ID: 37296

Survey Photo



Side: 2: 3L1

Photo ID: 37297

Corrective Action Photo

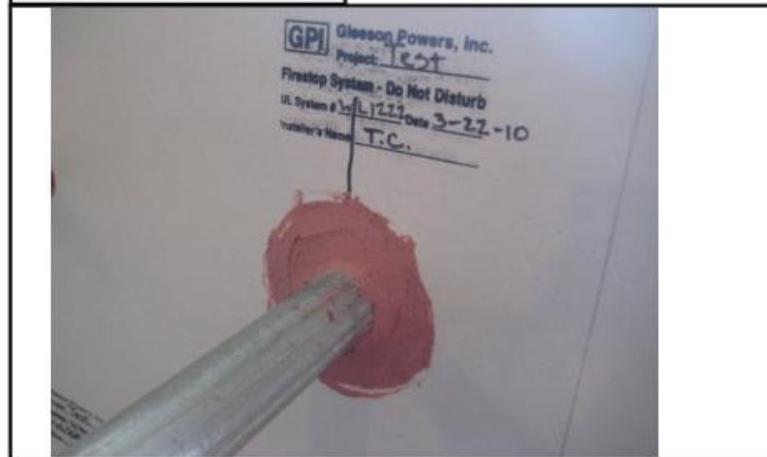


Side: 1: 3C1

Photo Notes:

Photo ID: 37298

Corrective Action Photo



Side: 2: 3L1

Photo Notes:

Photo ID: 37299

Barrier Management Policy - Markings



Barrier Management

Policy – Tools from Codes

703.7 Marking and identification. *Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:*

1. Be located in accessible concealed floor, floor-ceiling or *attic spaces*;
2. Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144 mm) measured horizontally along the wall or partition; and
3. Include lettering **not less than 3 inches (76 mm) in height with a minimum 3/8 inch (9.5 mm) stroke** in a contrasting color incorporating the suggested wording.

“FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS”
or other wording.

Exception: Walls in Group R-2 occupancies that do not have a removable decorative ceiling allowing access to the concealed space.

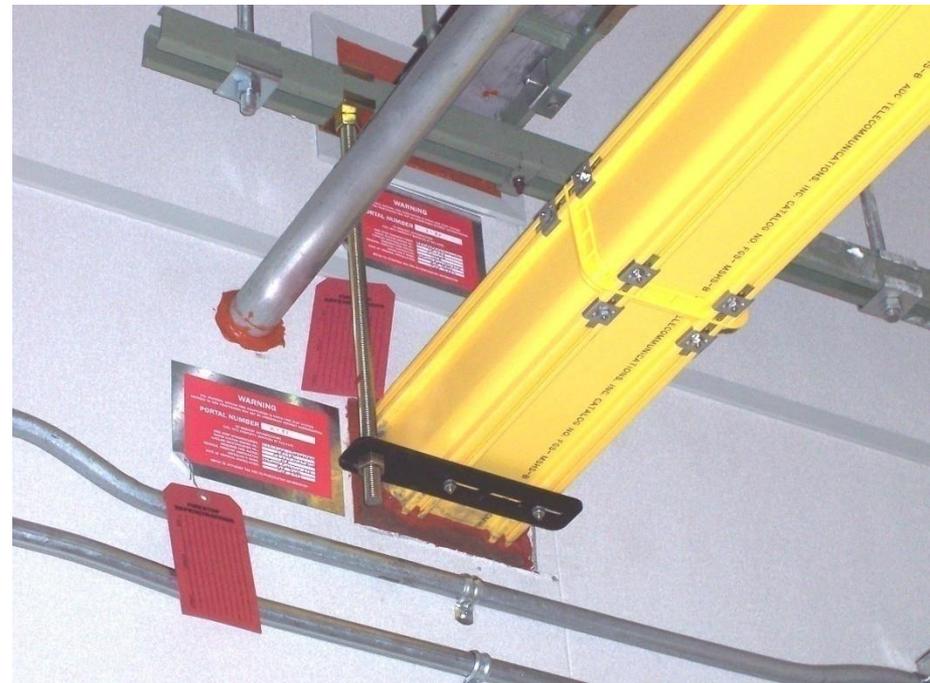


Barrier Management Policy Tool

- **Pre Construction Meetings - Education**
 - **Barrier Markings Mean...**
 - **Actions when at Barriers Required...**
 - **Permit required – Above Ceiling, Barrier Hole...**
 - **Infection Control Rules**
 - **Healthcare Facility Rules**

Barrier Management Policy Tool

- Barrier Warnings on ASSEMBLIES
- International Building Code – 2009++



Barrier Management Policy Tool

- **Violation Consequences**
 - **In House** –
 - **2 strikes & work reassignment to cleaning...**
 - **Others...**
 - **Outside Contractors**
 - **2 strikes & not allowed to work above ceilings**
 - **Others...**

Barrier Management Policy Tool

- **Find Violators....**
 - **Staff Awards, Incentives?**

Barrier Management Policy Tool

- **Ongoing Management**
 - **Engineering Staff Reviews**
 - **User Staff Reviews**
 - **Inside Construction**
 - **Outside Contractor**

Barrier Management Policy Tool

- **Education - Healthcare Staff – Simple??**
 - **Fire Doors & Hardware – Simple things...**
 - **Close & Latch**
 - **Holes in Door**
 - **Ladder on Floor = ?? Permit Sticker?**
 - **Fire Rated Walls - Holes**
 - **Accidental**
 - **Workers**
 - **Solutions???**

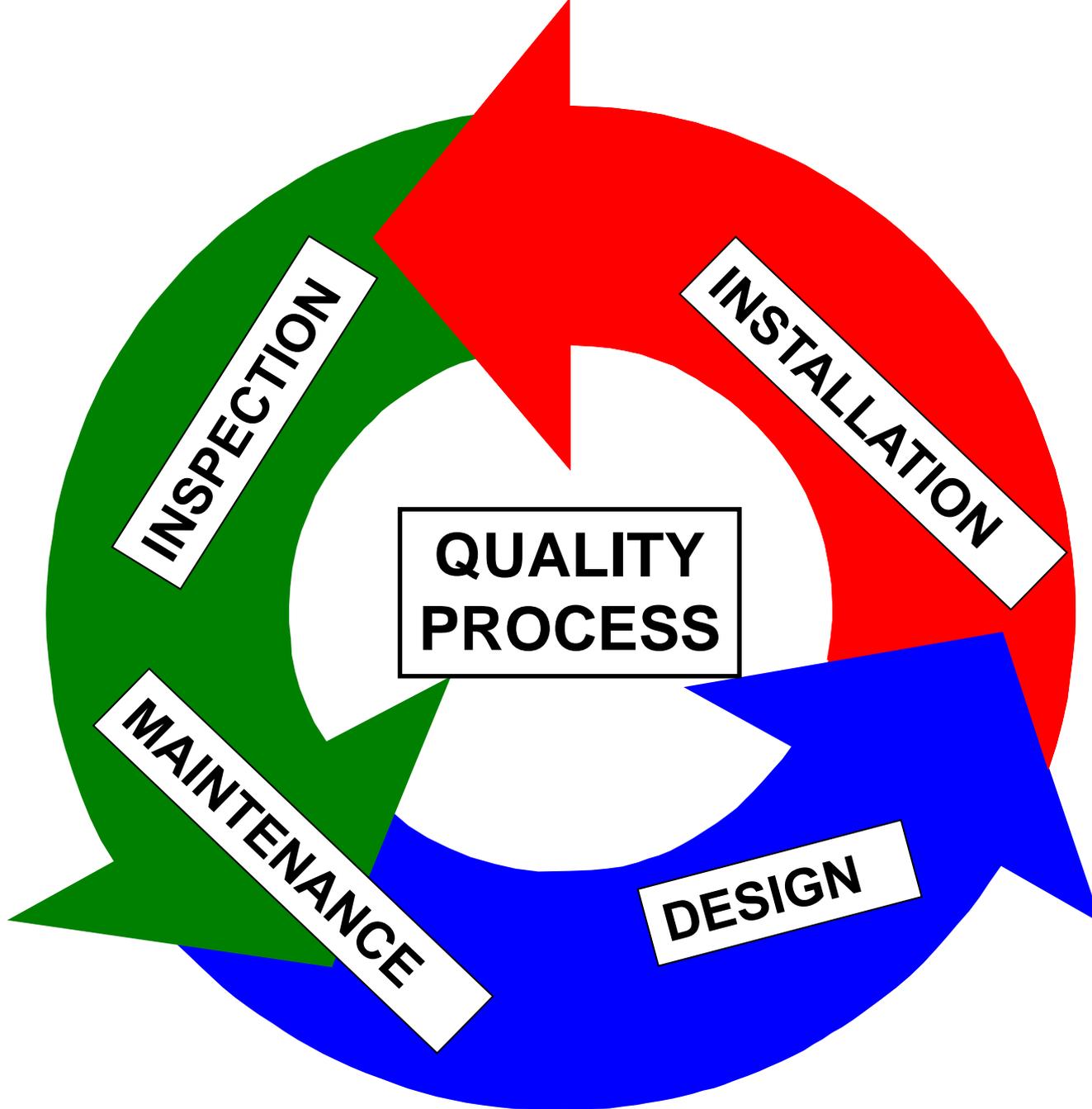
Barrier Management Policy Tool

- **Add a Line Item in Budgets...**
 - **Sprinkler Maintenance**
 - **Alarms Maintenance**
 - **Security**
 - **Fire and Smoke Resistant Assemblies**
 - **Doors**
 - **Dampers**
 - **Firestops**
 - **Glazing**
 - **Walls/Floors**

“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”

- Barriers are for Safety – DIIM
 - Properly *Designed* and Specified
 - *Tested and Listed Systems* – Directories,
 - Professional *Installation* - Companies
 - Properly *Inspected* – Commissioned
 - *Maintained* - Annually –
 - NFPA 101, International Fire Code
- **For Patients, Staff, Visitors
at Facilities, Worldwide**

Effective Compartmentation is a SYSTEM





Contacts

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Barrier Management Policy = Tool



Barrier Management Symposium™

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