

Barrier Management Symposium

Arkansas Association for Healthcare Engineering January 29, 2016

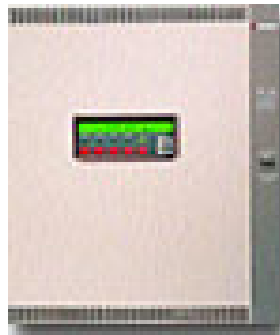


Objective – Share Knowledge

- 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 - 2000 (TJC, CMS)
 - International Fire Code - IFC 2012 - Annually (Local)
- *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-2307 as the test method...”
 - **F/S 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

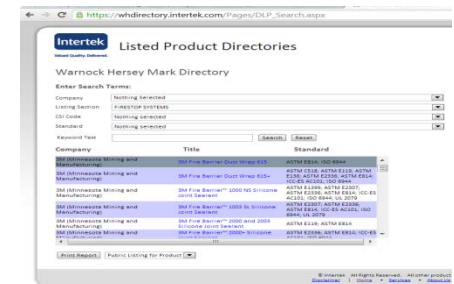


Barrier Continuity

Products become SYSTEMS

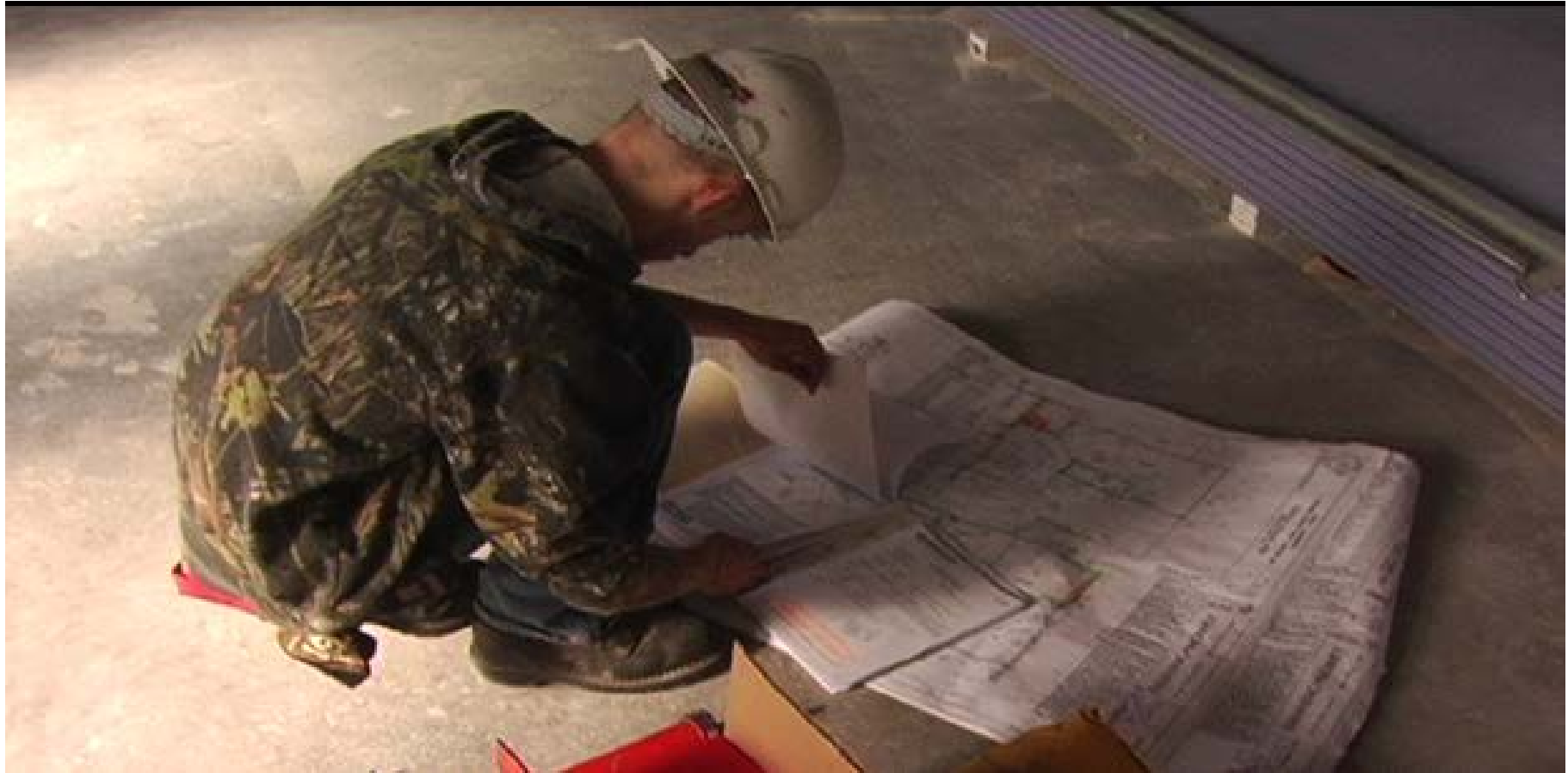
- **Fire Rated Systems Directories –**
 - **UL Fire Resistance Directory**
 - **Intertek**
 - **FM Approvals**

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



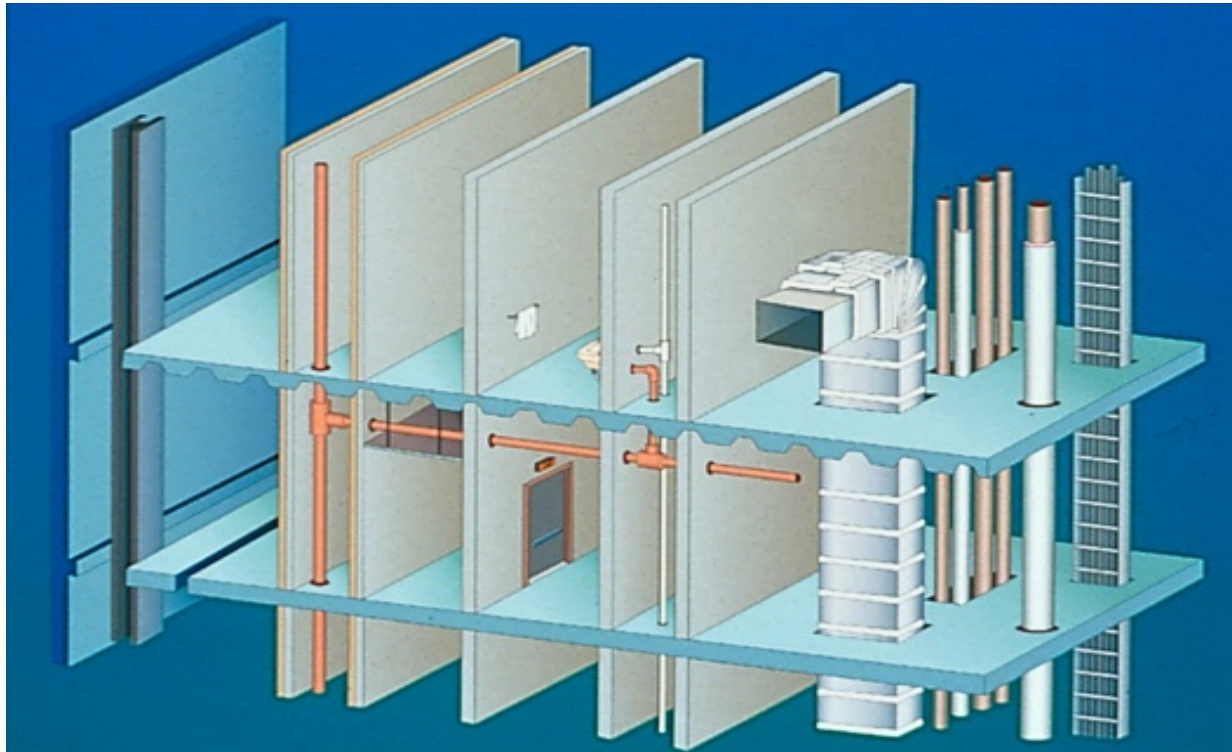
Barrier Continuity

I – Installation – Listed Systems



I- Installation

Who's Responsible, How to Choose???



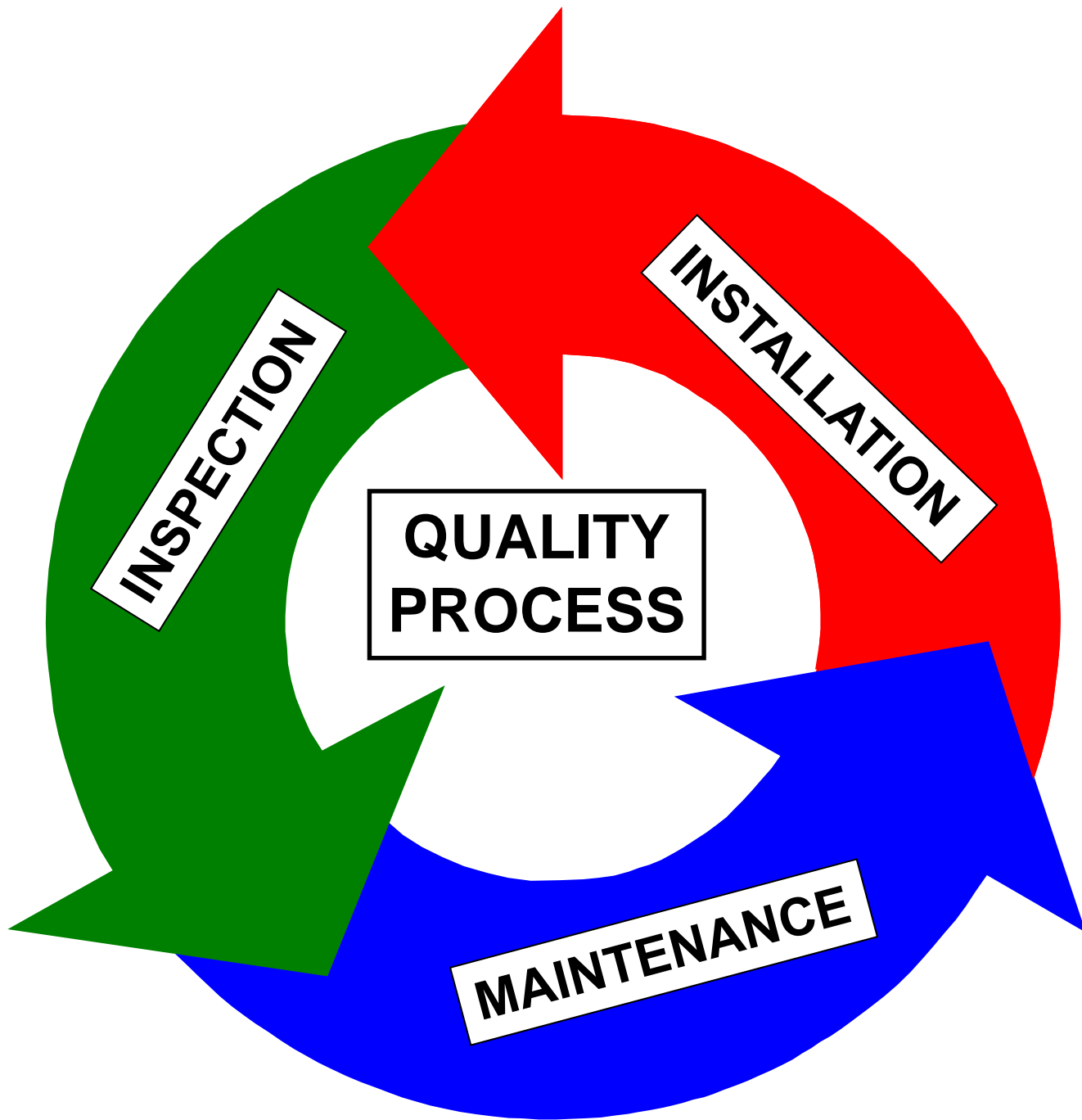
Graphics – STI

What Contractor Qualifications?

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

Why Contractor Qualifications?

- **Accountability**
- **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...**



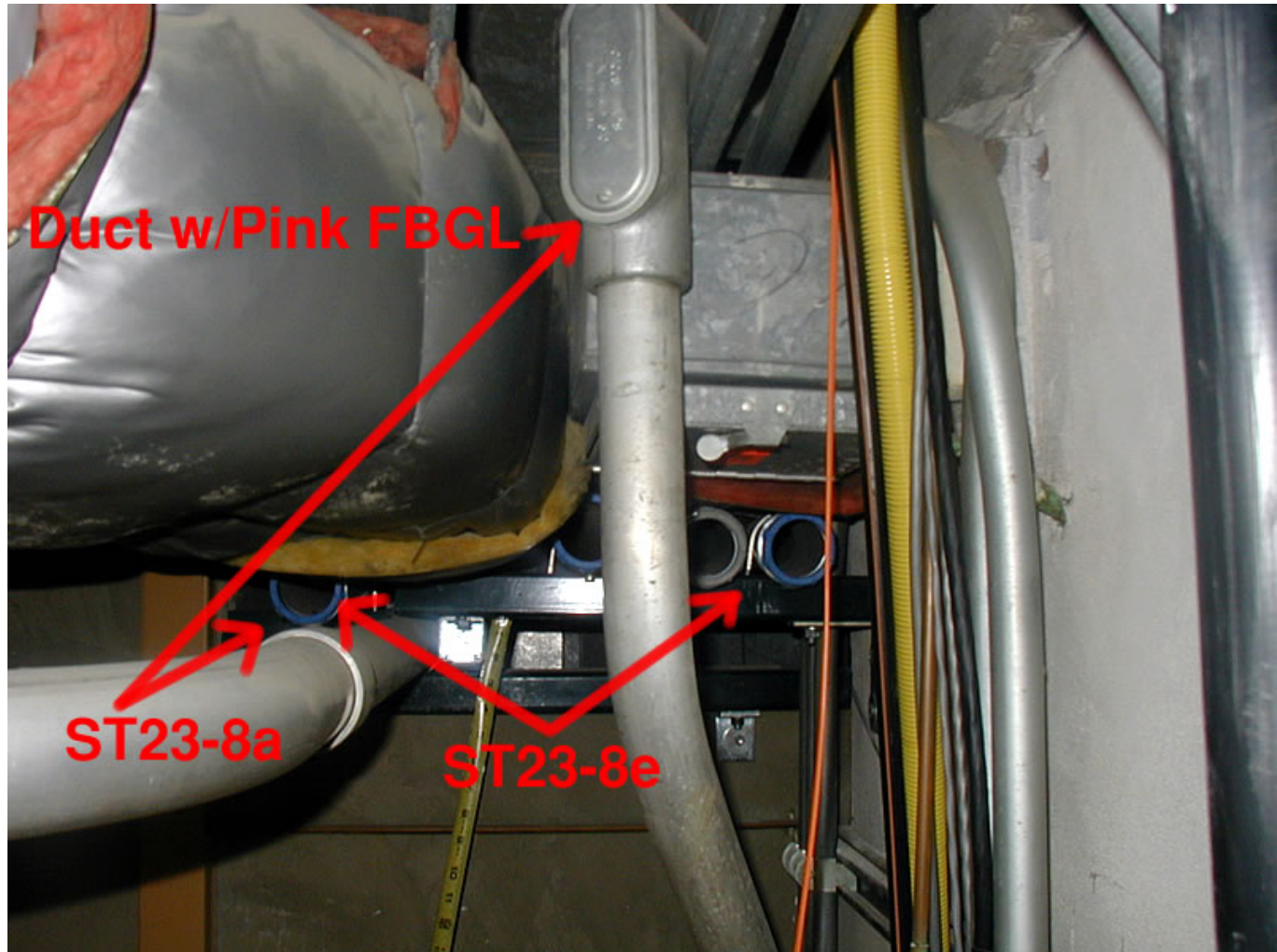
INSPECTION

INSTALLATION

MAINTENANCE

**QUALITY
PROCESS**

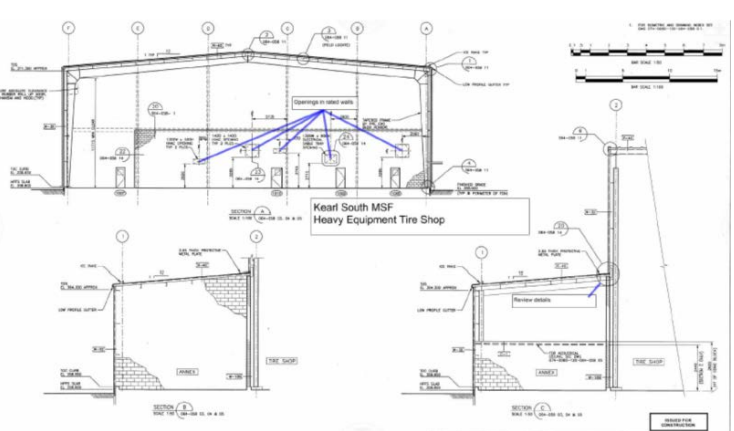
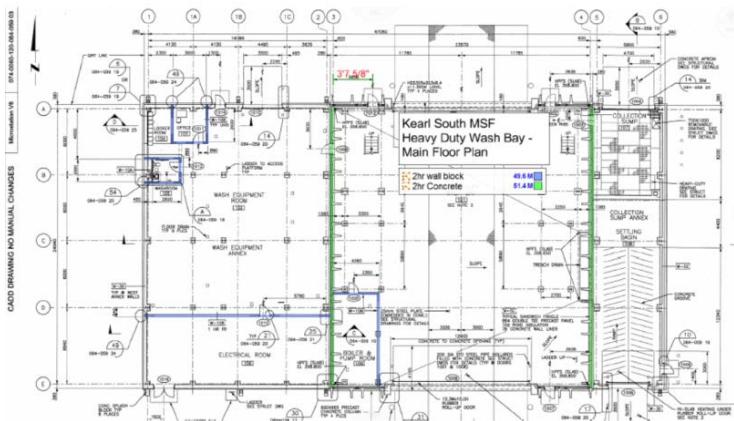
Installation & Inspection



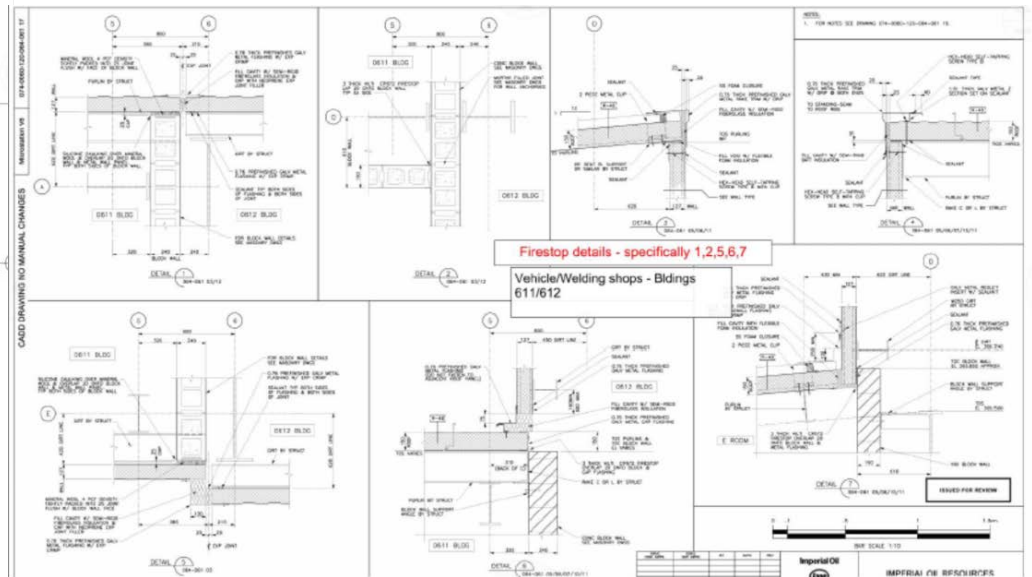
I – Inspection – Options

- **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

Compartmentation for Safety

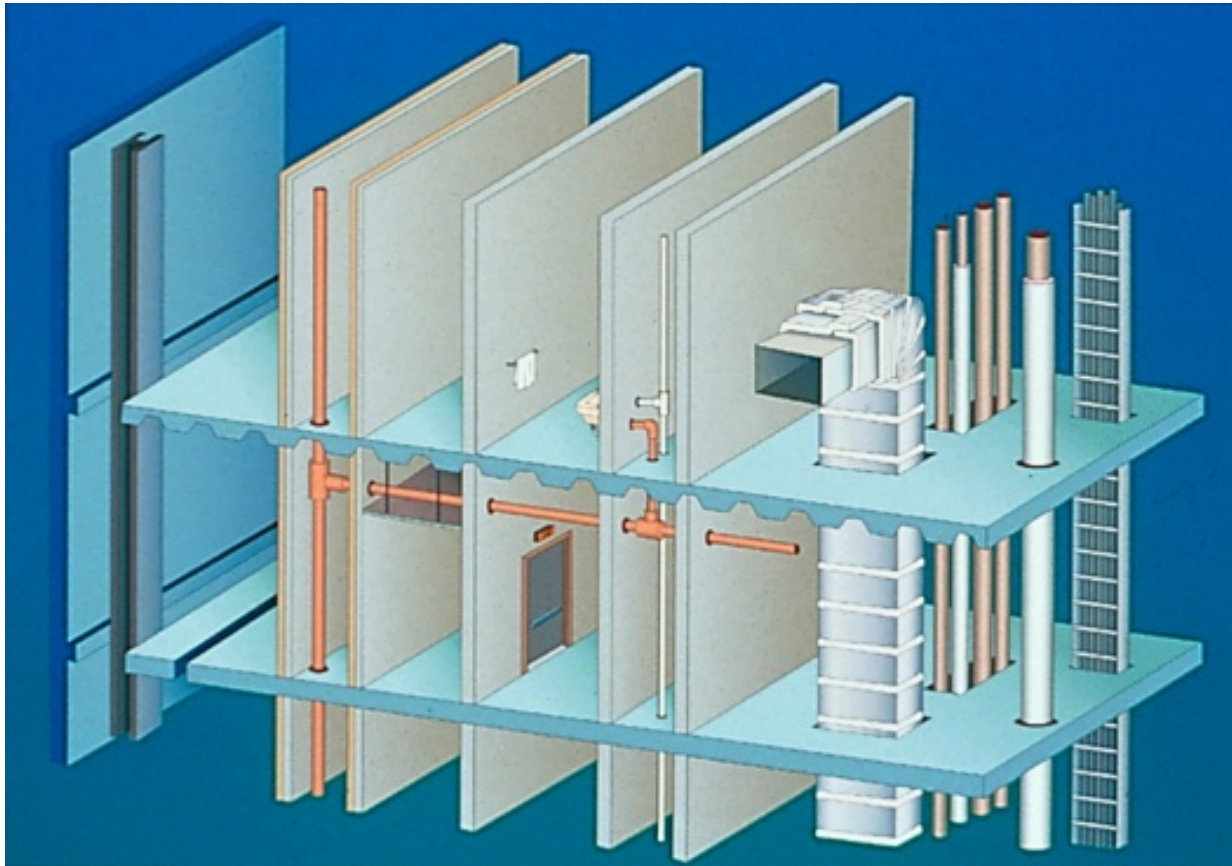


CAD/DRAWING NO MANUAL CHANGES



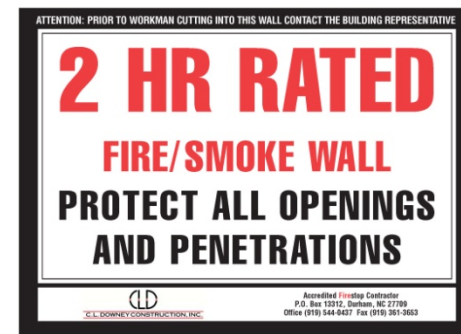
CAD/DRAWING NO MANUAL CHANGES

M – Maintenance (& Management)



Firestop Maintenance

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



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.

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

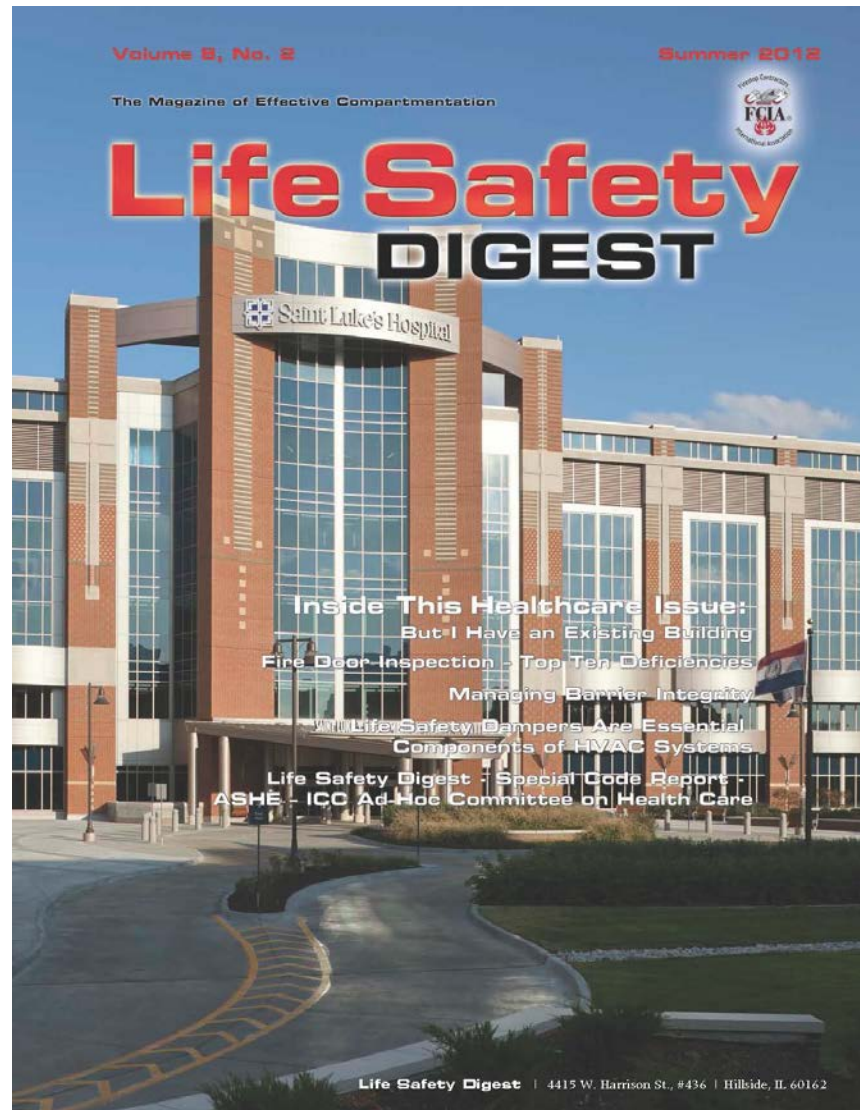


M-Barrier Management Systems

‘When you’re up to you’re a__ in alligators, it’s hard to remember you’re there to drain the swamp.’



Barrier Management Begins when new construction ends...

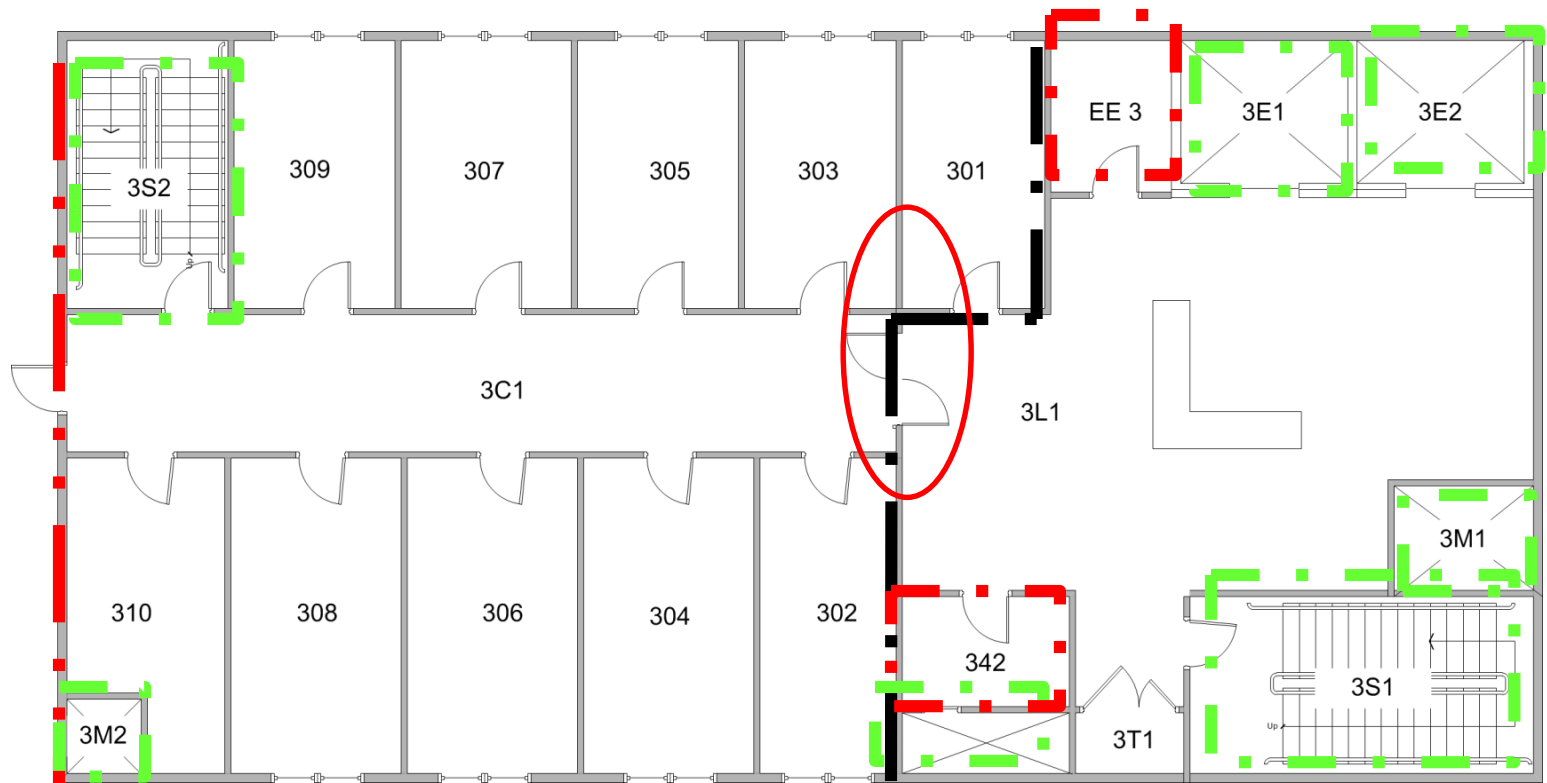


M–Barrier Management Systems

- **NEW Buildings – 07-84-00 Specs**
 - **SYSTEMS Expectations**
 - **As Built SYSTEMS**
 - **SYSTEMS from Testing Labs**
 - **Installation to SYSTEMS**
 - **Inspection to SYSTEMS**
- **AS BUILT DOCUMENTATION REQ'D**

M-Barrier Management Systems

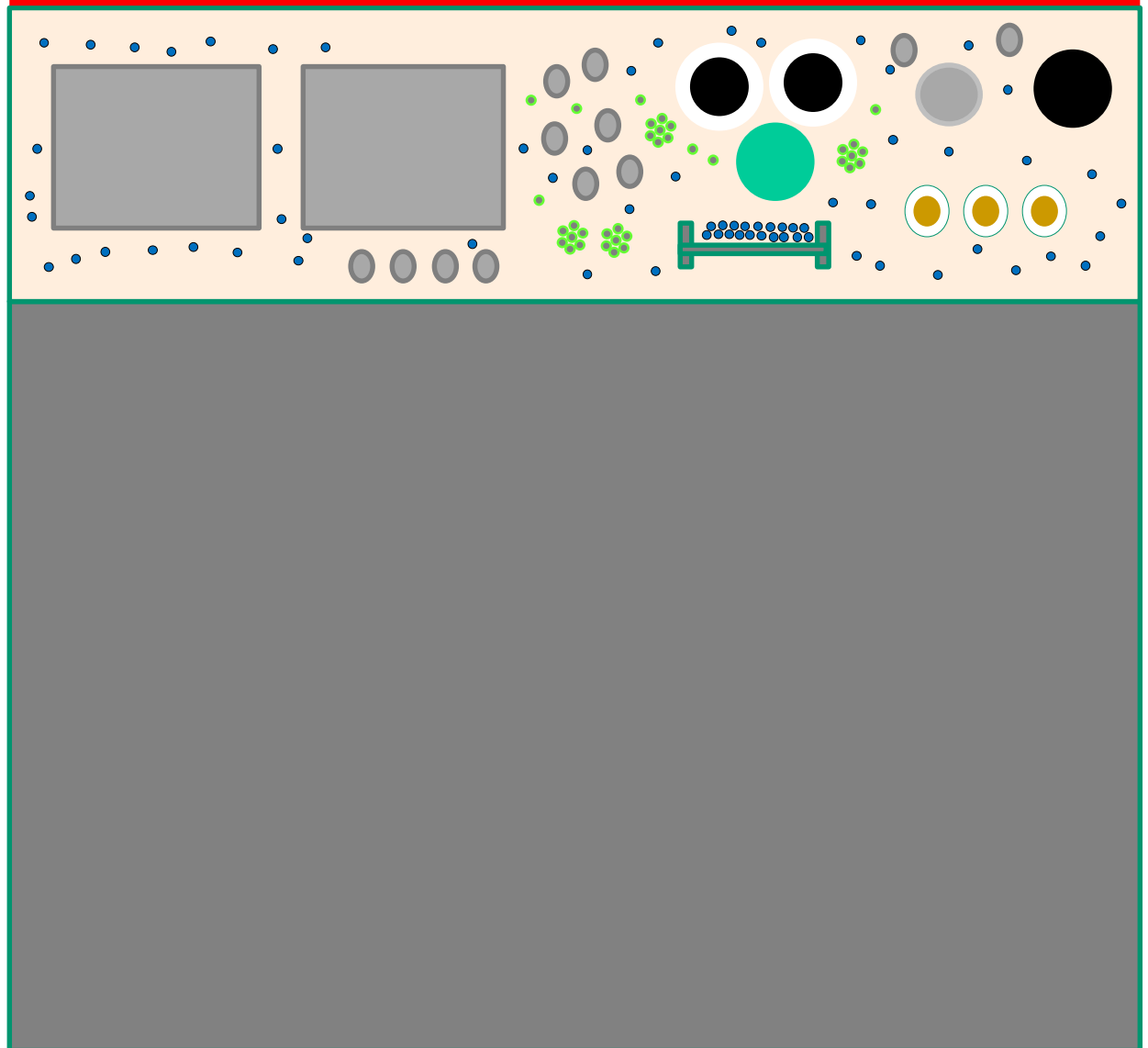
- **Now it's your building....**



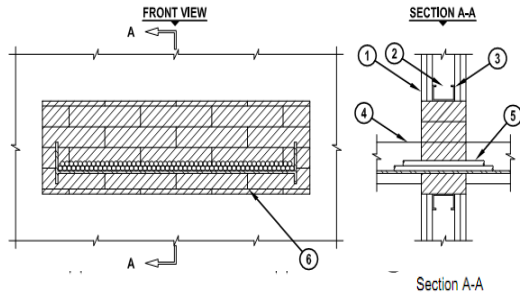
- **Gleeson Powers Graphic**

WHAT NEEDS TO BE MAINTAINED?

- Fire Resistive Wall Construction
- Fire Doors
- Fire Dampers
- Firestop Systems:
 - Joint Systems
 - Hot and Cold Water Piping
 - Laboratory Waste
 - Medigas Piping
 - Pneumatic Tubing
 - Sprinkler Piping
 - Rigid Electrical Conduits
 - Cable Trays
 - BX Cables
 - Low Voltage Cables
 - and More....
 - **Low Voltage!!!!**



UL/cUL SYSTEM NO. W-L-4011
CABLE TRAY THROUGH GYPSUM WALL ASSEMBLY
F-RATING = 1 AND 2-HR.
T-RATING = 0-HR.
L-RATING AT AMBIENT = 5 CFM/SQ. FT.
L-RATING AT 400°F = 2 CFM/SQ. FT.



M–Barrier Management Systems

- **Barrier Management**
 - **TJC # 1 & 2 Violations**
 - **Constant issues**
 - **Control?**
 - **Staff?**
 - **Attitude?**



Barrier Management HUB

- **A HUB must control all Action**
 - **C-Suite Execs**
 - **Construction – In House & Outside**
 - **I-T Department – In House & Outside**
- **The HUB is YOU!**

Why Barrier Hub is YOU?

- **YOU answer to...**
 - **The Joint Commission**
 - **CMS Inspectors**
 - **Building Official, Fire Marshal**
 - **Other AHJ's**
 - **C-Suite**
 - **Staff**
 - **Patients**

M–Barrier Management Systems

- **Barrier Management Policy - Tool**
- **ASHE Member Healthcare Engineer & Director Communicates...**
 - **In House Construction & I-T Crews**
 - **Outside Contractors**

Barrier Management

Policy = Tool

- **ASHE Member Healthcare Engineer & Director Communicates...**
 - **Rules of Engagement in Contracts**
 - **Internal Contracts**
 - **External Contracts**
 - **Pre Construction Meetings**
 - **Barrier Warnings - Markings**
 - **Violation Consequences**
 - **Ongoing Management**
 - **Staff Education & Incentives**



Barrier Management Policy Tool

– Rules of Engagement in Contracts

- **Internal Contracts -**

- **In House Departments similar to Outside Contractors**

- **External Contracts**

- **AIA Contract**

- **Marked Fire - Smoke Barrier Actions**

- **Barrier Permits**

- **Documentation**

- **Report**

M–Barrier Management Systems

- **Methods to Control**
 - **Paper, Pictures & Files**
 - **Electronic Pictures & Files**
 - **‘Custom’**
 - **‘Packages’**

M–Barrier Management Systems

- **Common Elements**
 - **Life Safety Drawings**
 - **Existing Conditions Documented**
 - **Ongoing Survey Records**
 - **Deficiency Reports**
 - **Systems Documentation Control, Retrieval**

M–Barrier Management Systems

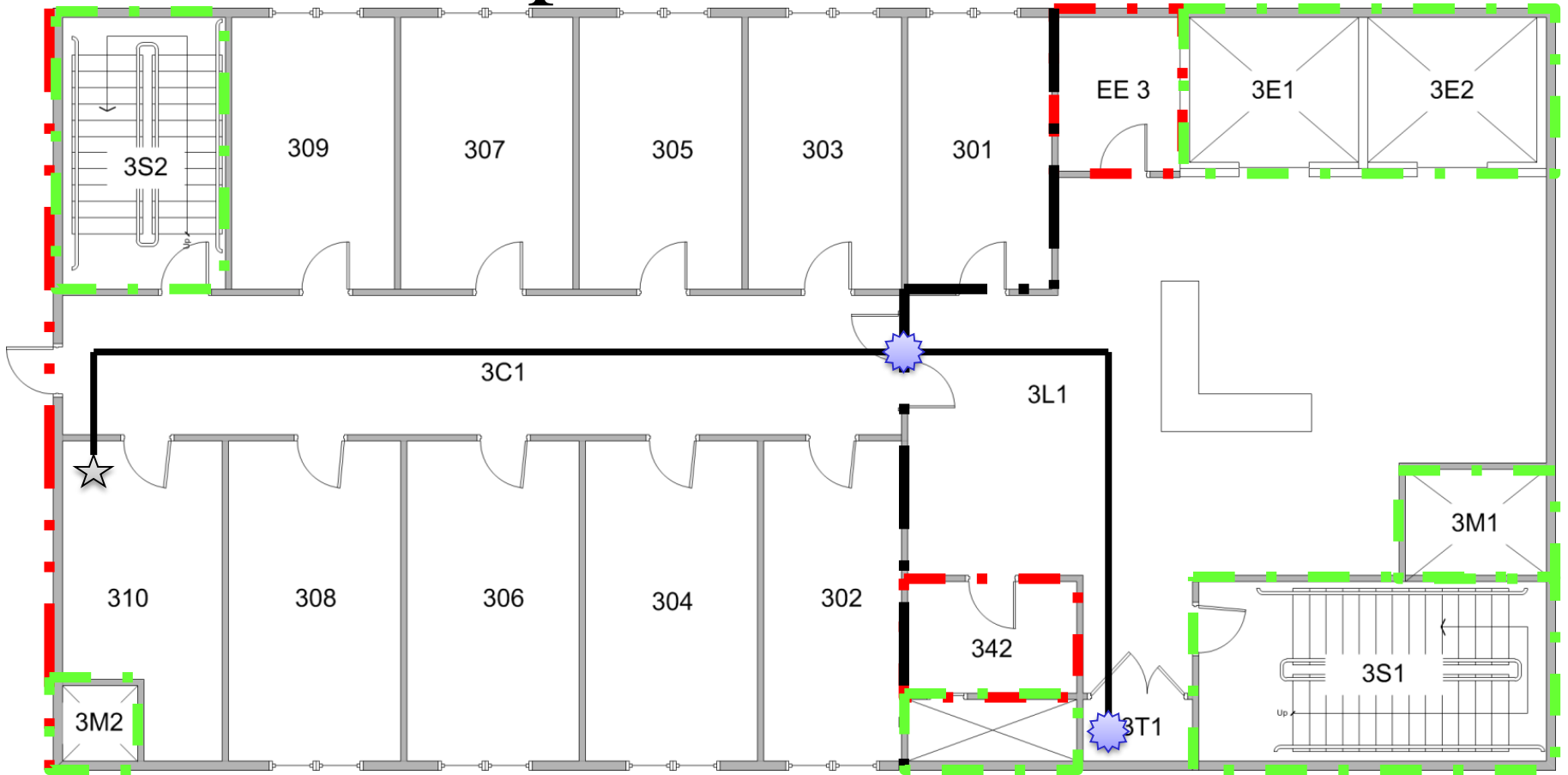
- **Document & Control**
- **Fire Resistance Rated & Smoke Resistant**
 - **Barrier Walls, Floors**
 - **Firestop Systems - Penetrations & Joints**
 - **Fire Doors – Rolling & Swinging**
 - **Fire Rated Glazing**
 - **Fire/Smoke, Combination Dampers**

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

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

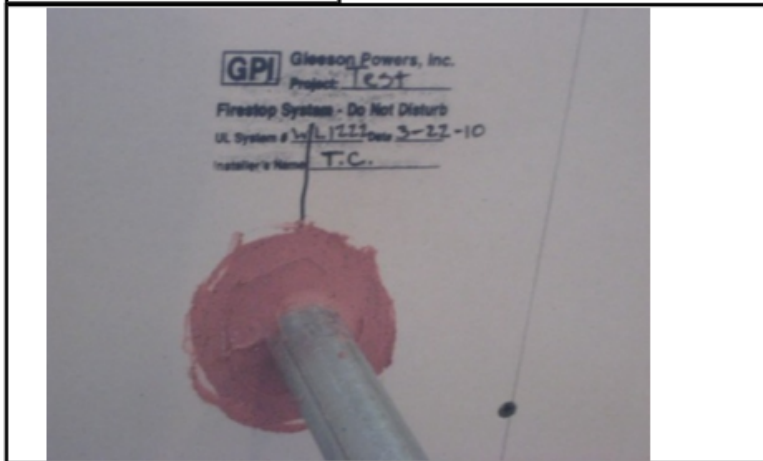
Survey Photo



Side: 2: 3L1

Photo ID: 37297

Corrective Action Photo

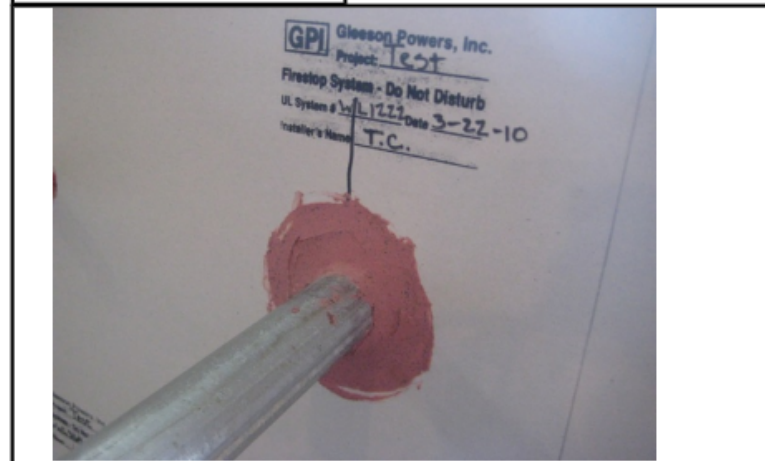


Side: 1: 3C1

Photo Notes:

Photo ID: 37298

Corrective Action Photo



Side: 2: 3L1

Photo Notes:

Photo ID: 37299

Barrier Management Policy Tool

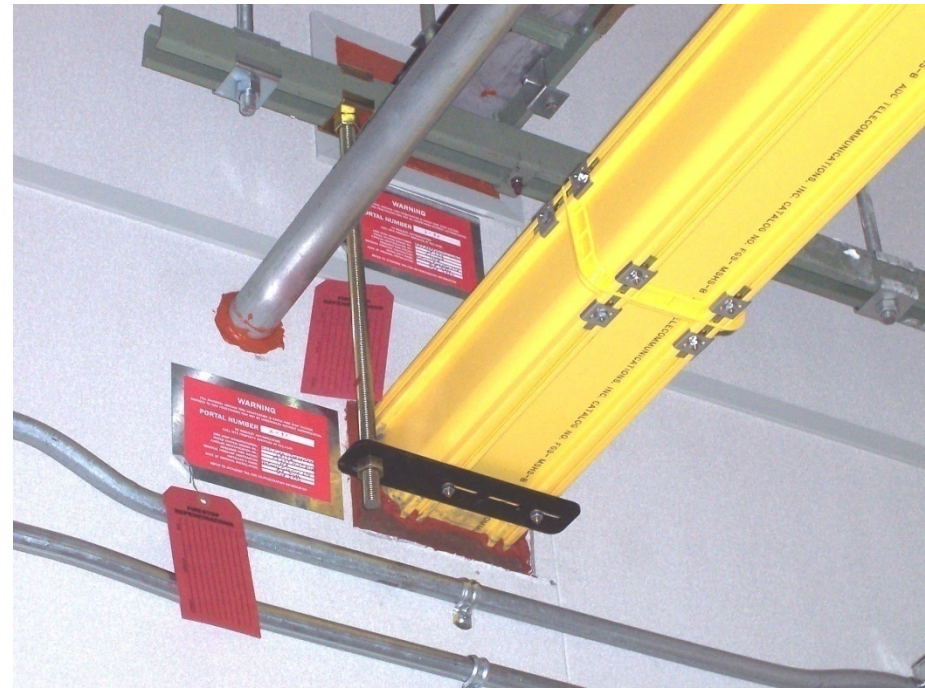
- **Pre Construction Meetings - Education**
 - **Barrier Markings Mean...**
 - **Actions when at Barriers Required...**
 - **Permit required – Above Ceiling, Barrier Hole...**
 - **Infection Control Rules**
 - **Healthcare facility Rules**

Barrier Management Policy Tool

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

ATTENTION: PRIOR TO WORKMAN CUTTING INTO THIS WALL CONTACT THE BUILDING REPRESENTATIVE

**2 HR RATED
FIRE WALL**
**PROTECT ALL OPENINGS
AND PENETRATIONS**



Barrier Management

Policy = Tool

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



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

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

Barrier Management Policy Tool

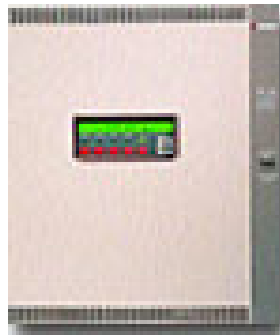
- **Ongoing Management**
 - **Engineering Staff Reviews**
 - **User Staff Reviews**
 - **Inside Construction**
 - **Outside Contractor**

Barrier Management Policy Tool

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

“TOTAL FIRE PROTECTION”

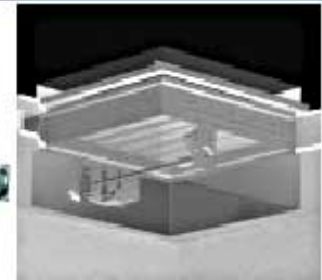
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“DIIM”

- Barriers are for Safety – DIIM
 - Properly *Designed* and Specified
 - *Tested and Listed Systems* – Directories,
 - Professional *Installation* - Companies
 - Properly *Inspected* – Commissioned
 - *Maintained* - Annually – IFC 2012, NFPA 101, International Fire Code

Effective Compartmentation is a SYSTEM



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





Contacts

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Bill McHugh – bill @ fcia.org

Presentations – **www.FCIA.org**

Barrier Management Symposims

Left side....

Barrier Management Symposium

Arkansas Association for Healthcare Engineering January 29, 2016

