FCIA Barrier Management Management Series Barrier Management Barrier Management Policies



Barrier Management Symposium









Free Symposium Sept 5-6 Steamboat Springs, CO Hosted By CAHED



Inspection & Maintenance of Rated Barrier Systems in

Healtheare Environments

Healthcare Environments

The safety and welfare of patients depends on many things, including a healthcare environment that is fire safe.

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 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-1966, E-2307 E-2837, ... test method..."
 - 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 <u>system</u> application

Products become Systems Hose Stream = Shock Test



Barrier Continuity Products become SYSTEMS

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

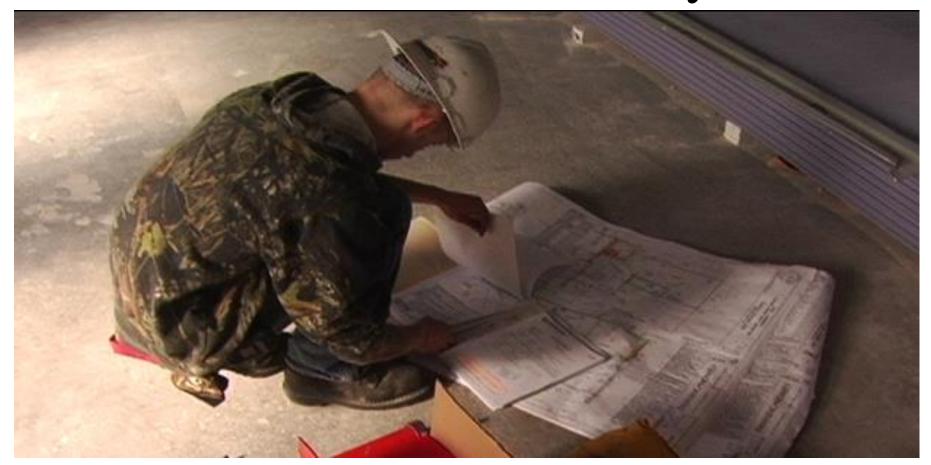
Systems Selection & Analysis...Not as easy as it looks...





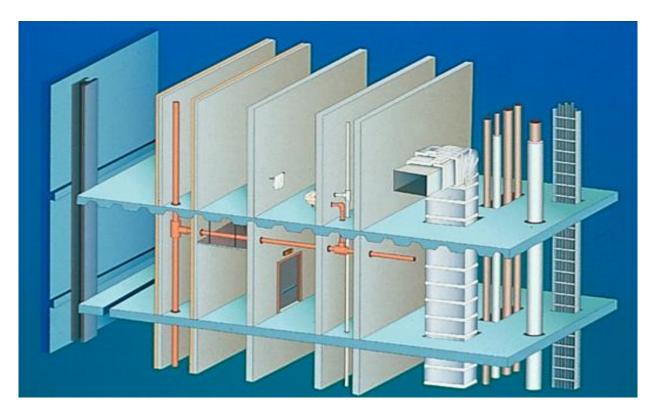
Intertek		Product Directori	es	
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Enter Search	Terms:			
Company Nothing Selected				
Listing Section	FIRESTOP SYSTEMS			
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Company		Title	Standard	
SM (Minnesote Mining and Manufesturine)		255 Fire Server Dutt Weep 615	ASTM ESIA ISO 8944	-
3M (Minnesota Mining and Menufectoring)		SM Fire Servier Outs Wrep 615+	ASTM CSIS, ASTM ESIS, ASTM ESIS, ASTM ESIS, ASTM ESIA, ICC-ES ACIDS: ISO 6944	1.003
SM (Minnesota Mining and Menufacturing)		SM Fire Berrier" 1000 NS Sillione Joint Sealant	ASTM E1399; ASTM E2307; ASTM E2336; ASTM E814; ICC-E5 AC101; ISO 6944; UL 2079	
Manufacturing)		SM Fire Barrier" 1002 St Siricone Joint Sealant	ASTM E2107, ASTM E2106, ASTM E214, ICC-ES AC101, ISO 6944; UL 2079	
SM (Minnesota Missing and Manufesturing)		SM Fire Barrier* 2000 and 2003 Sillicone Joint Sealant	ASTM ELLR, ASTM ERLS	
5M (Minnesota Mining and		SM Fire Barrier" 2000+ Silicone	ASTM 82596, ASTM 8814, ICC-85	*

Barrier Continuity I – Installation – Listed Systems



I- Installation

Who's Responsible, How to Choose???



What Contractor Qualifications?

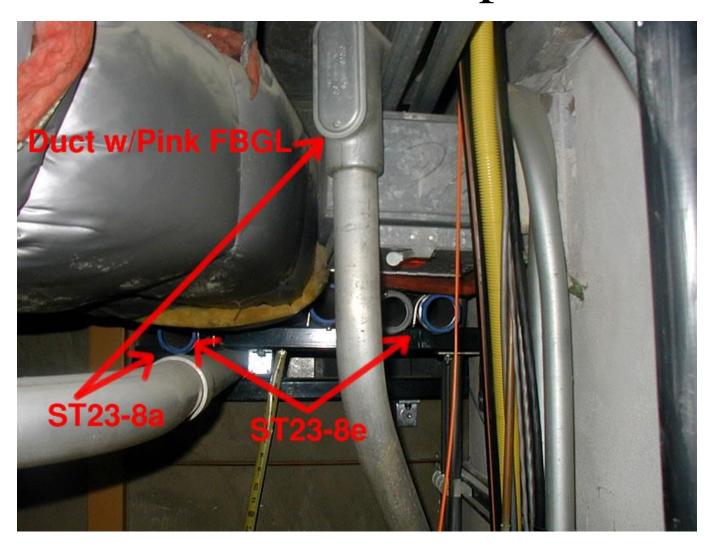
- FM 4991 Standard for the Approval of Firestop Contractors
- UL Qualified Firestop Contractors
- Other Industries...
 - FM 4991/UL CONTRACTORS UNDERSTAND SYSTEMS & DOCUMENTATION

Why Contractor Qualifications?

- 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...



Installation & Inspection



I – Inspection – Options

Contractor Self Inspection

Verify Management System validity

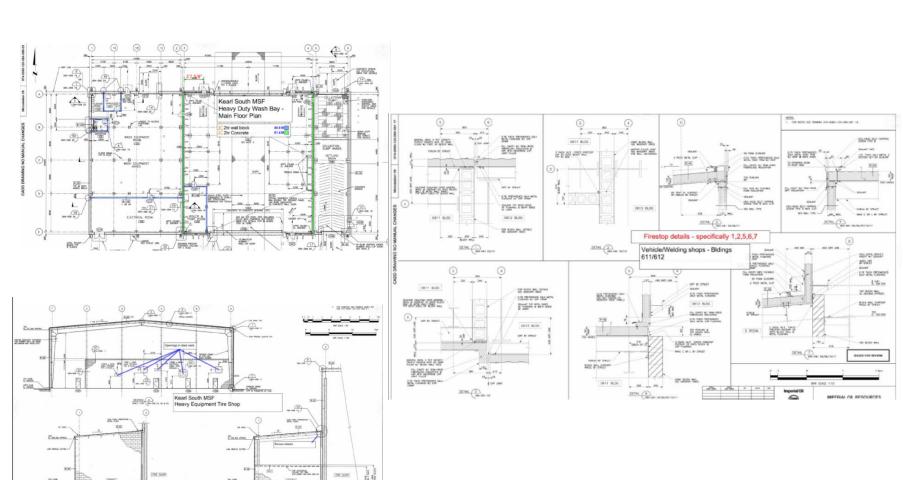
Manufacturer Inspection?

Does not exist ... Survey, maybe

Special Inspection/Commissioning

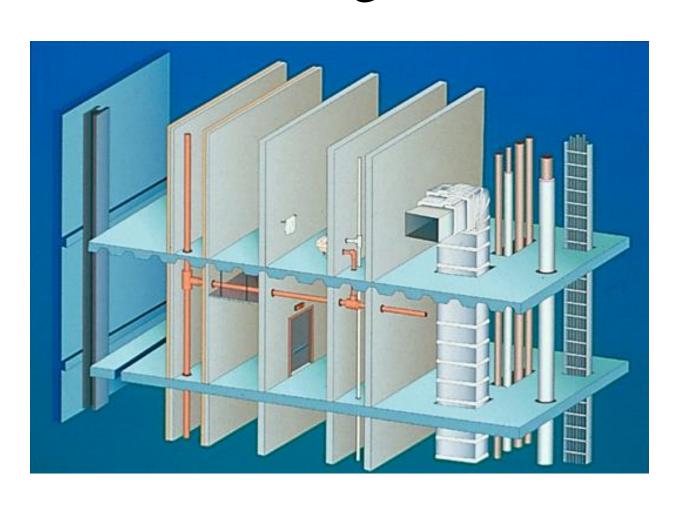
- Independent 3rd Party
- Destructive, Non Destructive
- Specified Frequency
- Inspection Agency Accreditation IAS AC 291

Compartmentation for Safety



500700 (C) Seat 100 (Se-00 C) to 8 D

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 <u>shall be removed or</u> <u>reduced</u> 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, <u>shall be either maintained or removed</u>.
 [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 <u>shall be performed under the supervision of a responsible person who shall ensure</u> that testing, inspection, and maintenance <u>are made at specified intervals</u> in accordance with applicable NFPA standards or as directed by the AHJ. [101:4.6.12.5]

International Fire Code Maintenance

SECTION 703FIRE-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

<u>21.15.2</u> The required fire resistance rating of installed firestop systems shall be <u>visually inspected</u> by the owner or owner's inspection agency <u>annually</u>. 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

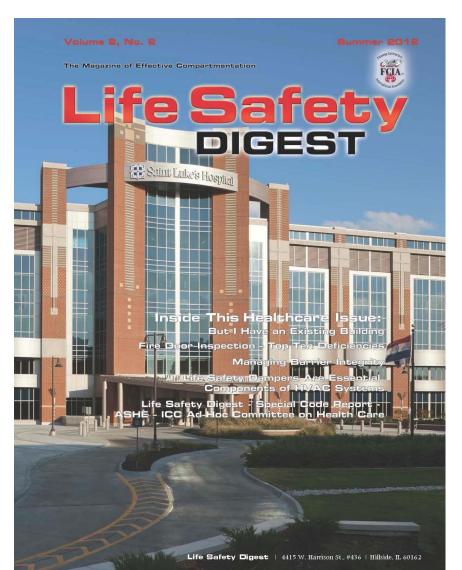


M-Barrier Management Systems

'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...



- NEW Buildings 07-84-00 Specs
 - www. FCIA .org
- Part I Focus on
 - SYSTEMS
 - Manufacturers
 - Not Products
- "Single Manufacturer to the greatest extent possible" EJ's

- 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

- 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 Certification ASTM E 3038

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

- 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

- 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

- 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

• 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.

- 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 Starts with CONSTRUCTION

• 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 Starts with CONSTRUCTION

• 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.

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

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

International Existing Building Code

- Alteration Levels
 - Level 1
 - Level 2
 - Level 3

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

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

• "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 720
 - Firestop Systems
 - Fire & Smoke Dampers
 - Fire Rated Rolling & Swinging Doors
 - Fire Rated Glazing

- 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 Starts with CONSTRUCTION

- 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

- Firestop Systems SYSTEMS
 - Visibly Comply with System
 - Visibly 'sealed'
 - Without openings
 - Firestop Materials & Systems
 - Label with System Number
 - 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

- 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

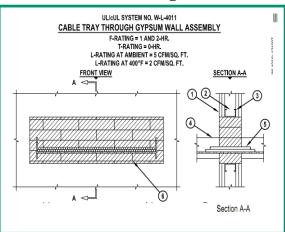
Now it's your building....

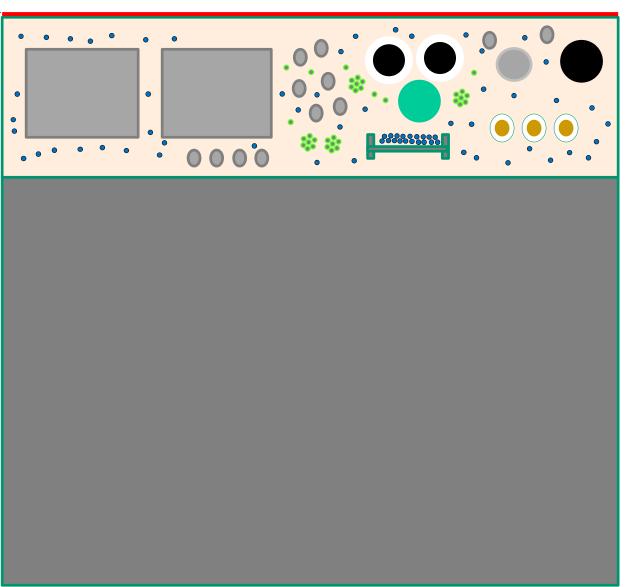


Gleeson Powers Graphic

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!!!!





M-Barrier Management Systems

- Barrier Management
 - TJC # 1 & 2 Violations
 - 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, Patients
 - The Joint Commission
 - CMS Inspectors
 - Building Official, Fire Marshal
 - Insurance Company

Barrier Management Policy Contents

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





- 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

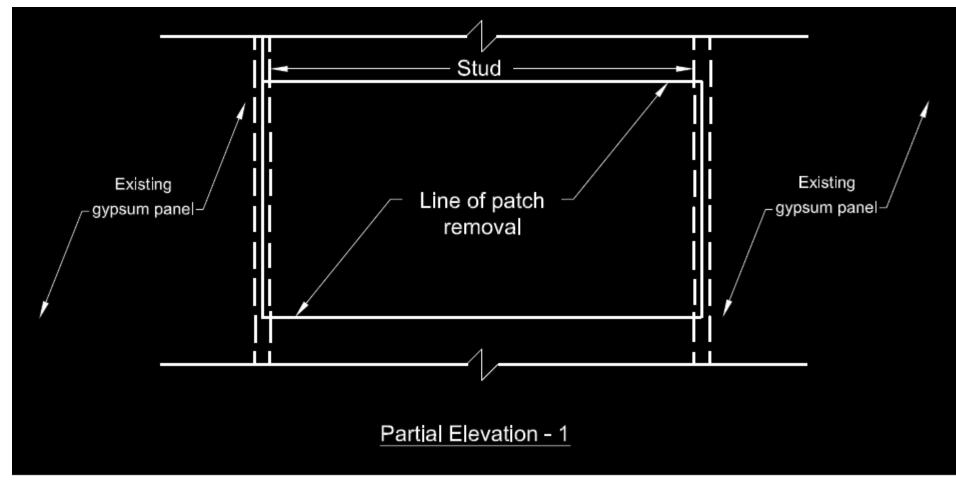
M-Barrier Management Systems

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

M-Barrier Management Systems

• Barrier Repair Examples

Gypsum Wallboard Repair Large Holes

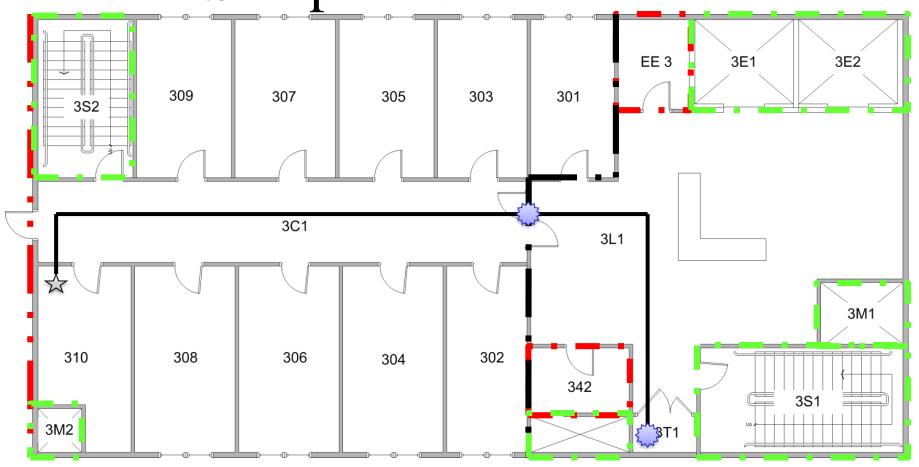


M-Barrier Management Systems

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



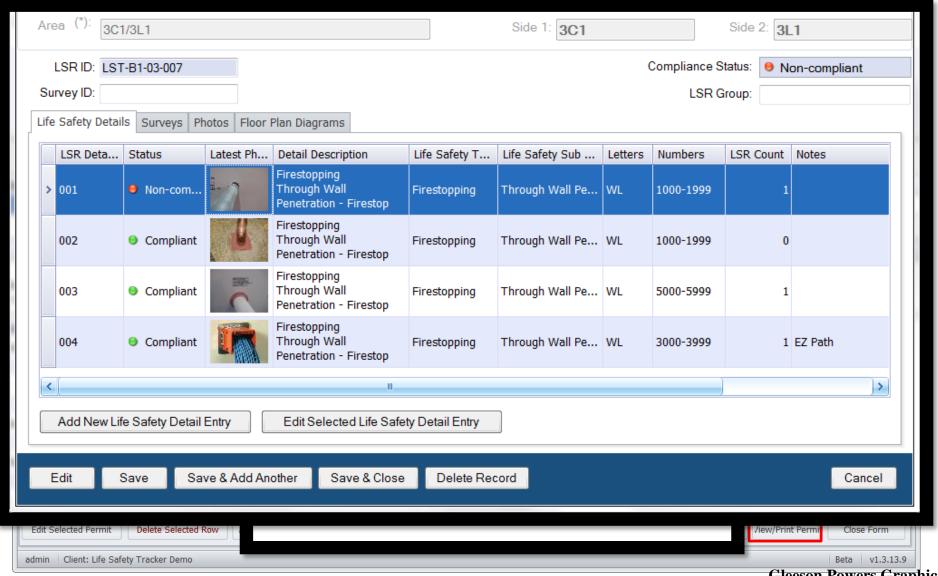
Sample Permit – Area

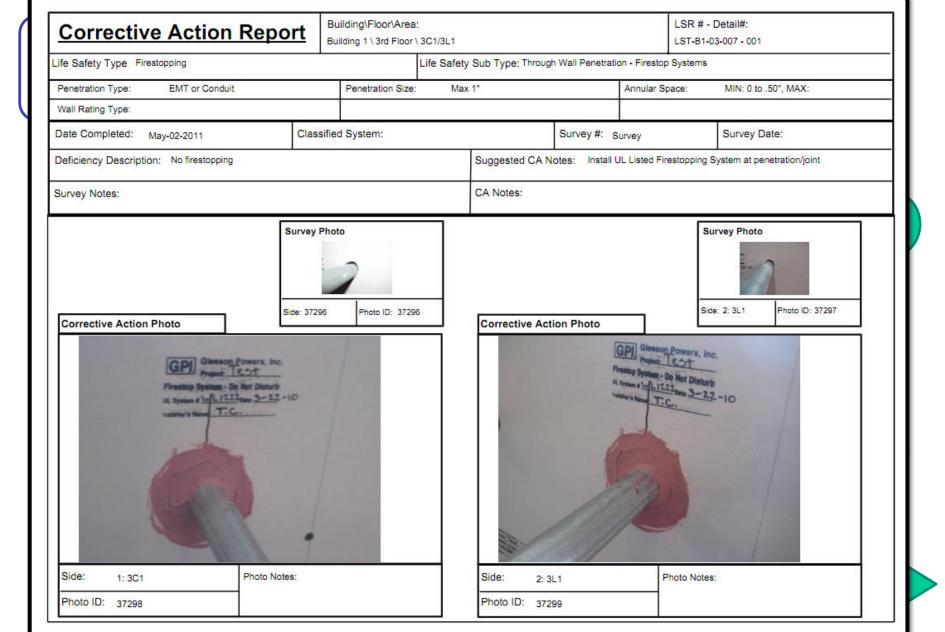






Permit No.: 2011-005





- 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 Warnings on ASSEMBLIES
- International Building Code 2009++





- 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.





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

- Find Violators....
 - Staff Awards

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

- 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













Contacts

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Barrier Management

FCIA Barrier Management Series



Barrier Management Systems

Best Practices



