Barrier Management Systems

ASHE Region 9
Queen Mary
September 17 & 18, 2014
“DIIM”

• Barriers are for Safety – DIIM
  • Properly *Designed* and Specified
    – *Tested and Listed Systems* – Directories, Tables
  • Professional *Installation* - Companies
  • Properly *Inspected* – Commissioned, Companies
  • *Maintained* –
    – NFPA 101 - 2000 (TJC, CMS)
    – International Fire Code - IFC 2012 - Annually (Local)
“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

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

• Products Become Systems Through Testing
  – Fire Barriers ASTM E 119, NFPA 251 & UL 263
  – Firestopping - ASTM E 814 / UL 1479, ULC-S-115, UL 2079, E-2307 as the test method…”
  – Dampers - UL 555, UL 555S
  – Doors - UL 10B, 10C
  – Fire Rated Glazing UL 9

• 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…
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...

- UNDERSTANDS ALL ABOUT SYSTEMS & DOCUMENTATION
Why Contractor Qualifications?

• Accountability
• Built right the first time…
• Documentation
• SYSTEMS Selection, Analysis
  – F, T, H, L, W
  – Tolerances - Annular Space Sizes
  – Gap Sizes - Undercuts - Framing
  – Anchors - Spacing – Hardware
  – Closers - Activation Sensors, more…
Installation & Inspection

Duct w/Pink FBGL

ST23-8a, ST23-8e
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
M – Maintenance (& Management)
Firestop Maintenance

• **Maintenance**
  – Code Required
  – How??

• **How to keep Track – Barrier Management Initiatives**
  Paper
  Software
  Labeling
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]
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]
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.
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

• **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

*Includes Fire Dampers, Fire Doors…and Continuity*
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.’

![Sailing boat image](image-url)
Barrier Management Begins when new construction ends...
M–Barrier Management Systems

• NEW Buildings – Specifications Set Stage
  – SYSTEMS Expectations
  – As Built SYSTEMS
  – Testing
  – Installation
  – Inspection

• AS BUILT DOCUMENTATION IN SPECIFICATIONS
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
  – 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 Project

**Gleeson Powers Graphic**

<table>
<thead>
<tr>
<th>Area: 3C1/3L1</th>
<th>Side: 3C1</th>
<th>Side: 3L1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance Status:</td>
<td>Non-compliant</td>
<td>LSR Group:</td>
</tr>
</tbody>
</table>

### LSR Details

<table>
<thead>
<tr>
<th>LSR ID</th>
<th>Status</th>
<th>Latest Photo</th>
<th>Detail Description</th>
<th>Life Safety Type</th>
<th>Life Safety Subject</th>
<th>Letters</th>
<th>Numbers</th>
<th>LSR Count</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>LST-B1-03-007</td>
<td>Non-compliant</td>
<td><img src="image1.png" alt="Firestopping Through Wall Penetration - Firestop" /></td>
<td>Firestopping Through Wall Penetration - Firestop</td>
<td>Firestopping</td>
<td>Through Wall Penetration</td>
<td>WL</td>
<td>1000-1999</td>
<td>1</td>
<td></td>
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<tr>
<td>002</td>
<td>Compliant</td>
<td><img src="image2.png" alt="Firestopping Through Wall Penetration - Firestop" /></td>
<td>Firestopping Through Wall Penetration - Firestop</td>
<td>Firestopping</td>
<td>Through Wall Penetration</td>
<td>WL</td>
<td>1000-1999</td>
<td>0</td>
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<tr>
<td>003</td>
<td>Compliant</td>
<td><img src="image3.png" alt="Firestopping Through Wall Penetration - Firestop" /></td>
<td>Firestopping Through Wall Penetration - Firestop</td>
<td>Firestopping</td>
<td>Through Wall Penetration</td>
<td>WL</td>
<td>5000-5999</td>
<td>1</td>
<td>EZ Path</td>
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<tr>
<td>004</td>
<td>Compliant</td>
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<td>Firestopping Through Wall Penetration - Firestop</td>
<td>Firestopping</td>
<td>Through Wall Penetration</td>
<td>WL</td>
<td>3000-3999</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Add New Life Safety Detail Entry**  **Edit Selected Life Safety Detail Entry**

**Edit**  **Save**  **Save & Add Another**  **Save & Close**  **Delete Record**  **Cancel**
### Corrective Action Report

**Life Safety Type:** Firestopping  
**Life Safety Sub Type:** Through Wall Penetration - Firestop Systems

<table>
<thead>
<tr>
<th>Penetration Type</th>
<th>Penetration Size</th>
<th>Annular Space</th>
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<tbody>
<tr>
<td>EMT or Conduit</td>
<td>Max 1&quot;</td>
<td>MIN 0 to .50&quot;, MAX:</td>
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</tbody>
</table>

**Date Completed:** May-02-2011  
**Classification System:**

<table>
<thead>
<tr>
<th>Survey #</th>
<th>Survey Date</th>
<th>Deficiency Description</th>
<th>Suggested CA Notes</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>No firestopping</td>
<td>Install UL Listed Firestopping System at penetration/joint</td>
</tr>
</tbody>
</table>

**Survey Notes:**

<table>
<thead>
<tr>
<th>CA Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Corrective Action Photo</th>
<th>Corrective Action Photo</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Survey Photo" /></td>
<td><img src="image2" alt="Survey Photo" /></td>
</tr>
</tbody>
</table>

- **Side:** 1:3C1  
- **Photo ID:** 37298

- **Side:** 2:3L1  
- **Photo ID:** 37299

**Photo Notes:**

**05/02/2011**

Gleeson Powers Graphic
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

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

• 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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• Detection & Alarm Systems

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“DIIM”

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  - Properly *Designed* and Specified
    - *Tested and Listed Systems* – Directories,
  - Professional *Installation* - Companies
  - Properly *Inspected* – Commissioned
Effective Compartmentation is a SYSTEM.
Contacts

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Bill McHugh – bill @ fcia.org
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