FCIA’s Fire Resistance Rated & Smoke Resistant Systems FOR Safety and Property Protection
DIIM&M – Maintenance (& Management)
Firestop & Fire / Smoke Resistance

Fire Code

• What’s required?

• Maintenance
  – National Fire Code of Canada
    • Integrity Maintained
  – NFPA 101
    • Chapter
  – 4ICC’s IFC
    • 703.1 Requires
    • 703.1 Compliance??
    • FCAC Proposals
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...

NFC yes...but First, NBC...

Includes Fire Dampers, Fire Doors...and Continuity
Compartmentation Codes – NBC

• Division A:1.4.1.2, NBCC 2010

• *Fire separation* means a construction assembly that acts as a barrier against the spread of fire. See Appendix A.

• A *fire separation* may or may not have a fire-resistance rating.
Compartmentation Codes – NBC

• Division A, 1.4.1.2
• Fire resistance rating means the time in minutes or hours that a material or assemblies of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions of test and performance criteria, or as determined by extension or interpretation of information derived therefrom as prescribed in this Code.

• CAN/UL-S101 - Standard Methods of Fire Endurance Tests of Building Construction Materials
Division A, 1.4.1.2

Fire-protection rating means the time in minutes or hours that a closure will withstand the passage of flame when exposed to fire under specified conditions of test and performance criteria, or as otherwise prescribed in this Code.

Flame-spread rating means an index or classification indicating the extent of spread-of-flame on the surface of a material or an assembly of materials as determined in a standard fire test as prescribed in this Code.
3.1.7.5. Rating of Supporting Construction

1) Except as permitted by Sentence (2) and by Articles 3.2.2.20. to 3.2.2.88. for mixed types of construction, all loadbearing walls, columns and arches in the storey immediately below a floor or roof assembly required to have a fire-resistance rating shall have a fire-resistance rating not less than that required for the supported floor or roof assembly.
A-2.2.6.2.(1) **Information Required on Drawings and Specifications.** Examples of information that should be shown on architectural drawings and drawings for heating, ventilating and air-conditioning systems are..

(n) the location and fire-resistance rating of required fire separations.

**NOTE:** This is the root of the National Fire Code Change...
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...

*Includes Fire Dampers, Fire Doors...and Continuity*
National Fire Code of Canada

• Division B – Part 2, Building and Occupant Fire Safety
• Fire Separation Integrity Maintained - How Often?
  – Yearly?
  – Weekly?
  – Monthly?
  – Maintain Integrity

• Fire Separation Repaired with what?
  – Original Construction Code?
  – Current Technology?
  – Mud and Tape? Non Firestop Foam?
  – Systems...or to as originally permitted.
National Fire Code of Canada

• Division B – Part 2, Building and Occupant Fire Safety

• Fire Separation & Features of Protection
• Gypsum Wallboard, Concrete Block, Concrete, Other Assemblies
• Fire Dampers
• Fire Rated Swinging & Rolling Doors
• Fire Rated Glazing
• Firestopping
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. [NFPA 101-2012:4.6.12.1]
• **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. [NFPA 101-2012:4.6.12.5]
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.
Firestop & Fire / Smoke Resistance
Maintenance – How?

• **Records of Inspections**
  – Life Safety Drawings?
  – “Replaced when Damaged…”
    • Tested and Listed systems and manufacturers installation instructions?
    • Generic Materials?
Firestop & Fire / Smoke Resistance Maintenance – How?

• **Records of Repairs**
  – Tested and Listed systems
  – Manufacturers installation instructions.
  – Contractor
  – Checklist
    • Electronic APPS
    • Paper
    • Spreadsheets
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.
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.
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.
Fire Code Action Committee – Task Group

Howard Hopper, UL
Rich Walke, UL
Tony Crimi, International Firestop Council
Vickie Lovell
Fire Code Officials
Others.

FCIA Discovered Proposal
FCIA Requested Modifications
FCIA told to Provide it’s own proposal.
SECTION 701 - FIRE-RESISTANCE-RATED CONSTRUCTION

701.1 Scope. The provisions of this chapter shall govern the inspection and maintenance of the materials, systems and assemblies used for structural fire resistance and fire-resistance-rated fire resistance, fire-resistance-rated construction separation of adjacent spaces and construction designed to resist the passage of smoke to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings. New buildings shall comply with the International Building Code.
701.2 Fire-resistance-rated construction. The fire-resistance rating of the following fire-resistance-rated construction shall be maintained:

1. Structural members.
2. Exterior walls.
3. Fire walls, fire barriers, fire partitions.
4. Horizontal assemblies.
5. Shaft enclosures.
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.
701.3 Smoke barriers. The fire-resistance rating and smoke resistant characteristics of smoke barriers shall be maintained.
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.
701.4 Smoke partitions. The smoke resistant characteristics of smoke partitions shall be maintained.

701.5 Maintaining protection. Materials, systems and devices used to repair or protect breaches and openings in fire-resistance-rated construction and smoke resistant construction shall be maintained in accordance with Sections 703 through 707.
703.1 701.6 Maintenance Owner's responsibility. The required fire-resistance rating of fire-resistance-rated and construction designed to limit the transfer of smoke, including, but not limited to, walls, firestops, shaft enclosures, partitions, smokebarriers, floors, fire-resistive coatings and sprayed fire-resistant materials applied to structural members and fire-resistant joint systems, shall be maintained. Such elements of the construction included in Sections 703 through 707 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. 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.
701.2 701.7 Unsafe conditions. Where any components in this chapter are not maintained and do not function as intended or do not have the fire resistance or the resistance to the passage of smoke required by the code under which the building was constructed, remodeled or altered, such component(s) or portion thereof shall be deemed an unsafe condition, in accordance with Section 110.1.1. Components or portions thereof determined to be unsafe shall be repaired or replaced to conform to that code under which the building was constructed, remodeled, altered or this chapter, as deemed appropriate by the fire code official.

Where the extent of the conditions of components is such that any building, structure or portion thereof presents an imminent danger to the occupants of the building, structure or portion thereof, the fire code official shall act in accordance with Section 110.2.
PC 2 - 701.6.1 Records Information. Records shall include an inventory indicating the location of fire resistance rated construction and smoke resistant construction elements and an inspection report indicating a thorough review of all elements required to be inspected in accordance with 701.6.

PC 1 - 706.1.2 Repair Records Information. Where repairs are made with listed systems, the system listing and manufacturers installation instructions shall be provided to and maintained by the owner.

Listing and Instructions - Consistent with successful FCIA IBC Proposal.

706.1.3 Repairs. Openings and breaches for penetrations, made therein for the passage of pipes, electrical conduit, wires, ducts air transfer openings, joints and holes made for any reason shall be protected with approved methods capable of resisting the passage of fire and smoke.
703.2 Unprotected penetrations. All unprotected penetrations in fire-resistance-rated construction and smoke resistant construction shall be protected as required in the International Building Code.
SECTION 704 JOINTS AND VOIDS

704.1 Maintaining protection. Where required when the building was originally constructed, materials and systems used to protect joints and voids installed in the following locations shall be maintained. The materials and systems shall be securely attached to or bonded to the adjacent construction, without openings visible through the construction and, where required, to the listing criteria and manufacturers installation instructions.
Fire Code Action Committee
F 113 Mod, F5 – FCIA Proposal

April 2016 Objections – to ‘Life Safety Drawings in Buildings’

“Building Owners don’t do this now, why should they start”
(REALLY)

“This means we’d have to document repairs. How do we document a gypsum repair?”

“For existing buildings without Life Safety Drawings, an architect will be required to draw”
Fire Code Action Committee
F 113 Mod, F5 – FCIA Proposal

**Objections**
“Scope is too far, Life of the Installation? Thorough review? Where are the cited problems?” D. Frable, GSA
Objections

“Document every system?”

“Smoke Resistant Construction” is not defined.” M. Hirschler

“Recordkeeping is already required.” J. Shapiro

“Records for the Life of the Installation? Alarms are only for 10 years”. D. Nichols

“This is heart surgery when a band aid is required” G. Keith
WRWG – Western Region Working Group --

Inventory of Fire Resistance Rated Assemblies and construction designed to resist the passage of smoke.

WRWG Fire Service Group
“This is good – They seem to agree with FCIA’s perspective that the inventory of assemblies and the systems documentation is needed to inspect”
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.
Barrier Management Begins when new construction ends...
M–Barrier Management Systems

• NEW Buildings – 07-84-00 Specs (CAN/US)
  – SYSTEMS Expectations
  – As Built SYSTEMS
  – SYSTEMS from Testing Labs, MANUFACTURERS
  – Installation to SYSTEMS
  – Inspection to SYSTEMS

• AS BUILT DOCUMENTATION REQUIRED
M–Barrier Management Systems

• Now it’s your building....
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
  - Low Voltage!!!!
  - and More....
M–Barrier Management Systems

• Barrier Management SYSTEMS
  – TJC # 1 & 2 Violations - Healthcare
    • Hospitals
    • Nursing Homes?
    • High Rise Construction?
    • Dorms & Educational Buildings?
    • Apartments and Condos?
    • Assembly?
  – Control ‘Holemakers’?
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
  – Facility Director
  – Risk Management

• Safer Buildings
  – Purchaser/Renter of Space
M–Barrier Management Systems

• **Barrier Management Policy - Controls**
  – **In House Construction**
    • I-T Crews
    • Electricians
    • Plumbing & HVAC
    • Others
  – **Outside Contractors**
    • I-T Crews, Electricians, Plumbing & HVAC
    • Firestop Contractors
M–Barrier Management Systems

• **Barrier Management Policy - Process**
  – In House Crews and Outside Contractors
    • Above Ceiling Permit Application
    • Fire Wall and Fire Separation Permit Application
      – Barriers to be Breached
      – Statement of Barrier Conditions
      – Systems, Manufacturers Installation Instructions
    • Permit Granted – Visible Markings in Work Area
      – Workers
      – Ladders, Armbands, etc.
  • **Completion Procedure**
    – Inventory
    – Documentation
  • Permit Expiry Date
Barrier Management
Policy = Tool

• Facility Management 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

- Facility Management Communicates...
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  - Staff Education & Incentives
Barrier Management
Policy Tool

– Rules of Engagement in Contracts

• Internal Contracts -
  – In House Departments similar to Outside Contractors

• External Contracts
  – GC Contracts
  – Marked Fire - Smoke Barrier - Actions
  – Barrier Permits
  – Documentation
  – Report
M–Barrier Management Systems

• Common Elements
  – Life Safety Drawings, Fire Separation Inventory
  – 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
Repair Small Holes

USG Photo
Repair Large Holes

Partial Elevation - 1

Existing gypsum panel

Line of patch removal

Existing gypsum panel

Stud
Firestop & Fire / Smoke Resistance Maintenance – How?

• Tracking – Barrier Management Initiatives
  – Paper – Files, pictures, manually track.
  – Software – Spreadsheets, Software Systems
  – APPS – Accessed by mobile
  – Labeling – Key to Barrier Management Systems
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

Gleeson Powers Graphic
<table>
<thead>
<tr>
<th>LSR Details</th>
<th>Status</th>
<th>Latest Photo</th>
<th>Detail Description</th>
<th>Life Safety Type</th>
<th>Life Safety Sub Type</th>
<th>Letters</th>
<th>Numbers</th>
<th>LSR Count</th>
<th>Notes</th>
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<tbody>
<tr>
<td>001</td>
<td>Non-compliant</td>
<td><img src="image1" 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>
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<tr>
<td>002</td>
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<td>Firestopping Through Wall Penetration - Firestop</td>
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<td>Through Wall Penetration</td>
<td>WL</td>
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<tr>
<td>003</td>
<td>Compliant</td>
<td><img src="image3" alt="Firestopping Through Wall Penetration - Firestop" /></td>
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<td>Firestopping</td>
<td>Through Wall Penetration</td>
<td>WL</td>
<td>5000-5999</td>
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<td>EZ Path</td>
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<tr>
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<td>Compliant</td>
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<td>Through Wall Penetration</td>
<td>WL</td>
<td>3000-3999</td>
<td>1</td>
<td>EZ Path</td>
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**Corrective Action Report**

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

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

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

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

**Deficiency Description:** No firestopping
**Suggested CA Notes:** Install UL Listed Firestopping System at penetration/joint

**Survey Notes:**

**Survey Photos**

- Survey Photo
  - Side: 37296
  - Photo ID: 37296

- Survey Photo
  - Side: 2:3L1
  - Photo ID: 37297

**Corrective Action Photos**

- Corrective Action Photo
  - Side: 1:3C1
  - Photo ID: 37298
  - Photo Notes:

- Corrective Action Photo
  - Side: 2:3L1
  - Photo ID: 37299
  - Photo Notes:
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 to Comply w/NFC

• “Integrity Maintained…..”
  – Building Owner and Manager Responsibility
  – Continuous Maintenance
  – Manage Holes in Fire Separations
  – Barriers - Fire Separation Permits?
Barrier Management
Policy = Tool
Barrier Management Policy Tool

• Control Access to Fire Separation Work
  – In House –
    • Carpenters, Electricians, Plumbing/HVAC

  – Outside Contractors
    • Carpenters, Electricians, Plumbing/HVAC
    • Firestop Contractors
Barrier Management Policy Tool

• Process
  – Apply to perform work at barriers.
  – Permits by Project, Area, Building
  – Permit reviewed:
    • Service compliance
    • Fire Resistance compliance
  – Permit Granted
    • Sleeve Band on people
    • Ladder Stickers
    • Paper
    • Electronic Files
  – Notify Area of Work to commence/finish
  – Permit Expiration Dates
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

- 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”

• 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
Effective Compartmentation is a SYSTEM

New UL test standards for Life Safety Dampers will take effect in July 2002
“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
FCIA DIIM & Firestopping

Proper ‘DCIIM’ Means Reliable Systems...

• **Properly Designed** - A/E - Consultant
  – Tested and Listed Systems, FCIA Member Mfr’s., Compartments to IBC, NFPA, NBC, Local Codes, SUBMITTALS.... **Specified (CCS, CDT, RSW)**

• **Properly Coordinated & Installed**
  – FCIA Member, FM 4991, or UL Qualified Contractors

• **Properly Inspected**
  – ASTM E 2174 & ASTM E 2393,
  – **Inspectors, who Passed the FM or UL Firestop Exam, IFC**
  – IAS AC 291 Accredited Inspection Firms

• **Properly Maintained & Managed** –
  – FCIA Member, FM 4991, or UL-ULC Qualified Firms
  – Surveys by FCIA Member, FM, UL Qualified, IAS Accredited
Effective Compartmentation is a SYSTEM
FCIA’s Fire Resistance Rated & Smoke Resistant Systems FOR Safety and Property Protection