FCIA’s Fire Resistance Rated & Smoke Resistant Systems FOR Safety and Property Protection
Firestop & Fire / Smoke Resistance

Fire Code

• What’s required?
• Maintenance
  – NFPA 101
  – IFC
  – 703.1 Requires
  – 703.1 Compliance??
  – FCAC Proposals
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.

4.5.8.3* Existing life safety features obvious to the public, if not required by the Code, shall be either maintained or removed.

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.

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.
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.
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

F113 Proposal

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 its 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 smoke resistant construction 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 smoke-resistant 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 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.
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.
701.6.1 Records Information. Records shall include a copy of the drawings 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.

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.

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.
703.1 Maintaining protection. Materials and firestop systems used to protect membrane- and through-penetrations in fire-resistance-rated construction and smoke resistant construction shall be maintained. 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.
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.

-
1. Joints in or between fire-resistance-rated walls, floors or floor/ceiling assemblies and roof or roof/ceiling assemblies.
2. Joints in smoke barriers.
3. Voids at the intersection of a horizontal floor assembly and an exterior curtain wall.
4. Voids at the intersection of a horizontal smoke barrier and an exterior curtain wall.
5. Voids at the intersection of a nonfire-resistance-rated floor assembly and an exterior curtain wall.
6. Voids at the intersection of a vertical fire barrier and an exterior curtain wall.
7. Voids at the intersection of a vertical fire barrier and a nonfire-resistance-rated roof assembly.

Exception: Unprotected joints and voids, do not need to be protected where such joints and voids were not required to be protected when the building was originally constructed.
705 Opening Protectives...
Doors
Windows
706.1 Duct and Air Transfer Openings
701.3 Repair of Penetrations, Joint and Voids. Where materials used to protect membrane and through-penetrations, joints and voids have been damaged, they shall be replaced or repaired with materials and systems that comply with code requirements applicable at the time when the assembly was constructed, remodeled or altered.
701.3 Repair of Penetrations, Joint and Voids.

Means repair with ‘systems’ rather than ‘stuff’ ONLY when the original construction code required it...
703.1 Maintenance Maintaining Protection. The smoke resistant construction and the required fire-resistance rating of fire-resistance-rated construction, including, but not limited to, walls, firestops through penetration and membrane penetration firestop systems, shaft enclosures, partitions, smoke barriers, smoke partitions, 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. 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. shall be maintained in accordance with NFPA 80.
703.1.1 Fireblocking and draftstopping Inspection. Required fire-blocking
Fire resistance-rated construction and draftstopping in combustible concealed spaces smoke resistant construction elements shall be maintained to provide visually inspected by the owner annually. The inspection shall verify that the continuity and integrity of such elements is maintained by approved methods. Where damaged, altered, breached, or penetrated by other than approved methods, the construction element shall be properly repaired, restored or replaced. 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.
703.1.2 Smoke barriers and smoke partitions Records maintenance. Required smoke barriers Records of inspections and smoke partitions repairs shall be maintained to prevent by the passage of smoke owner and shall be available to the code official upon request. Openings protected with approved smoke barrier doors or smoke dampers Such records shall be maintained in accordance with NFPA 105 for the life of the installation.

Add new text as follows:

703.1.2.1 Records information. Records shall include a copy of drawings 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 703.1.

703.1.2.2 Repair records information. Where repairs are made with listed systems, the system listing and manufacturer's installation instructions shall be provided to and maintained by the owner.
703.1.3 Fire walls, fire barriers and fire partitions—Repairs. Required fire walls, fire barriers. Openings and fire partitions shall be maintained to prevent breaches for penetrations, joints 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 protected with approved doors or fire dampers through fire resistance-rated assemblies shall be maintained in accordance with NFPA 80—protected by self or automatic-closing doors of approved construction meeting the fire protection requirements or the assembly.
703.1.4 Unprotected Penetrations. Unprotected penetrations in fire-resistance-rated construction and smoke resistant construction shall be protected with approved methods capable of resisting the passage of smoke and fire.

703.1.5 Fireblocking and draftstopping. Required fireblocking and draftstopping in combustible concealed spaces shall be maintained to provide continuity and integrity of the construction.

703.1.6 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.

703.1.7 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.
Objections

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

NBCC Process Just STARTING...FCIA Invited.

Includes Fire Dampers, Fire Doors...and Continuity
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, 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
- and More:
  - Low Voltage!!!!
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 - Tool
  – In House Construction & I-T Crews
  – Outside Contractors
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

– 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

• 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
Repair Small Holes

USG Photo
Repair Large Holes

Partial Elevation - 1
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
### Life Safety Details

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<th>Detail Description</th>
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**Corrective Action Report**

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

**Life Safety Type:** Firestop

**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:**

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**Deficiency Description:** No firestopping

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

**Survey Notes:**

**CA Notes:**

---

**Fire Barrier Permit**

**Finish**

**Fire Barrier**

**Permit is Issued**

**Is Contractor Qualified?**

**Qualified**

**Contractor**

**Installs Firestop Systems**

**Qualified Contractor is Subcontracted**

**Completed Work is reviewed for Compliance**

**Firestop Installations Complaint?**

**YES**

**NO**

**Project Documentation is submitted as part of Closeout**

**YES**

**NO**

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**Corrective Action Photo**

**Survey Photo**

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**Survey Photo**

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**Corrective Action Photo**

**Survey Photo**

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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
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

• 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
QUALITY PROCESS

- Inspection
- Installation
- Maintenance
- Design
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
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