FCIA’s Fire & Smoke Protection Features
Barrier and Firestop DIIM Educational Symposium
Doha- May 2014
Fire Protection & Life Safety – Some Facts

- Fire is the most tangible of all visible mysteries
- 75% deaths caused by smoke - Smoke is the killer!
- We can’t rely on any single action: Balanced approach – A rational basis
- Mandatory Special Inspections
Inspection – IBC Chapter 17
Inspection

✓ What
✓ Why
✓ Who
✓ How
✓ When
What is Inspection?

A direct determination of conformance
Why Inspections?

- To comply with:
  - Code requirements – IBC Chapter 17
  - Construction documents – Project specs

- To minimize insurance premium

- To safeguard owner’s interest
Code Requirement?

2012 International Building Code

- Chapter 17
  - Section 1704.2 : Special Inspections
    - 17.04.2.1 : Inspector Qualifications
    - 17.04.2.2 : Access for Special Inspections
    - 17.04.2.3 : Statement of Special Inspections
    - 17.04.2.4 : Reports

2011 UAE Fire Code

- Chapter 1 - Section 21 & Annexure A.1.21 Rev2
Code Requirement?

2012 IBC

Chapter 17 Special Inspections

1705.16.1 Penetration fire-stops systems

- Inspection of ‘Penetration Fire-stop Systems’ shall be conducted by an approved inspection agency in accordance with ASTM E 2174.

- Subject periodic special inspection prior to concealment to determine compliance with the approved construction documents.
Code Requirement?

2012 IBC

Chapter 17

1705.16.2 Fire-resistant joint systems

Inspection of ‘Fire-resistant Joint Systems’ shall be conducted by an approved special inspection agency in accordance with ASTM E 2393.
Code Requirement?

2011 UAE Fire Code
(Annexure A.1.21 Rev 2)

6.12. Inspection

6.12.1. Inspection of through penetration firestop systems shall be in accordance with ASTM E 2174

6.12.2. Inspection of fire resistive joints and perimeter barriers shall be in accordance with ASTM E 2393
Code Requirement?

2011 UAE Fire Code

6.12. Inspection

6.12.3. Cladding systems shall be inspected in each phase of the installation progress.

6.12.4. Work shall not be certified as completed unless approved by the inspecting agency.

6.12.5. Inspector Qualification
Inspection Agency shall be accredited to IAS AC 291 criteria of International Accreditation Service acceptable to Civil Defence Authority.
Code Requirement?

QCDD

FSS – Minimum Requirements

Basic Requirements Chapter

Section 19.1

- All fire and life safety systems shall be properly maintained under a documented preventative maintenance inspection and test plan
- They shall be readily available for presentation to QCD inspectors on request.
Who does Inspections?

IAS AC 291
Special Inspection Agency
2012 International Building Code (IBC)
Inspection Firm & Individual Qualifications
ASTM E 2174 - ASTM E 2393

Inspector Firm & Inspectors
- ‘Independent of, and divested from' Installing firm, Distributor, Manufacturer, Competitor, Supplier...
- ‘Not a Competitor' of the Installer, contractor, manufacturer, or supplier
- Submit notarized statements of ...

Inspector Personnel meet at least one criteria.....
- 2 years experience (Construction, Field), education, and credentials acceptable to AHJ
- Accredited by AHJ
- Meet ASTM E699
Inspector Personnel / Firm Qualification
IAS AC 291

- Inspector Firm shall have at least one staff..
  - PASS UL or FM Firestop Exam
  - 1 year Quality Assurance
    Or...
  - PASS UL/FM Firestop Exam, and PE, FPE, Registered Architect, or
  - PASS UL/FM Firestop Exam, and Education by Certified Agency
How to do Inspections?

ASTM E-2174
Standard Practice for On-Site Inspection of Penetration Firestopping

ASTM E-2393
Standard Practice for On-Site Inspection of Fire Resistive Joints and Perimeter Fire Barriers

Spec Section 07 84 00
Firestopping
How to do Inspections?

- Process
- Methods
- Forms
- Final Report
Inspection Process Highlights…

- Pre-construction Meeting
- Submittal Review
- Review of project documents
- General Review
- Mock-up Review
- Observation Review i.e. In-progress Inspection
- Post installation Inspection i.e. Destructive Testing
- Final Inspection & Certification – Compliance to project specs
**Inspection Process contd…**

ASTM E 2174 - ASTM E 2393

- **Pre Construction Meeting**
  - Review Documents – Identify Conflicts
  - Review Materials – SYSTEMS
    - ASTM E 814 or UL 1479 - ASTM E 1966, UL 2079, ASTM E 2307 Systems
  - Inspection Documents
    - Manufacturer Product Data Sheets
    - Tested and Listed Systems & EJ’s
  - Mock Ups
  - Destructive Testing
  - Installation Measurements
  - Discuss Inspection Method

Leading the standards of Life-safety and Property-protect...
Inspection Process contd…
ASTM E 2174 - ASTM E 2393

- During Construction – In-progress
  - Random witness, Each Floor
    - 10%, each type of Penetration Firestop, no less than one per floor
    - 5% of Total Lineal Feet of Fire Resistance Rated Joint System, each type
Inspection Method
ASTM E 2174 - ASTM E 2393

- Post Construction - Destructive Testing
  - Minimum 2%, no less than 1, each type per 10,000 SF of floor area
  - Minimum 1 / 500 LF of Joint Area, mandatory
  - If 10% variance per firestop type
    - Inspection stops
    - Installer inspects, repairs
    - Inspector re-inspects
Inspection Method
ASTM E 2174 - ASTM E 2393

- Both Methods…
  - If 10% variance per firestop type
    - Inspection stops
    - Installer inspects, repairs
    - Inspector reinspects
  - Inspector Shall not Supervise Workers…
  - Inspect @ Firestop Installation Start
Inspection Forms
ASTM E 2174 - ASTM E 2393

- One for each type of firestop
- Submit 1 day after Inspection to Authorizing Agency
- Numbered – Controlled
- Required – During/Post Construction Methods
Final Report
ASTM E 2174 - ASTM E 2393

The final report shall contain –
I. A cover page with;
   ➢ The project name, location & Ref. no.
   ➢ The name and address of Installer, AA,
     AHJ and Inspector

II. A summary page with;
   ➢ Types and quantity
   ➢ Verification method
   ➢ Percentage deviations/deficiencies
Final Report
ASTM E 2174 - ASTM E 2393

The Final Report shall also contain copies of all

- Correspondences submitted to AA
- Inspection forms arranged chronologically
Closing Remarks

Having presented the inspection element of DIIM with human lives in mind, I encourage Industry Practitioners and the Authorities to work together towards the safety of our society and the mankind.

A great illustration well reflected in Holy Quran – Verse 32, Chapter 5.

'And whoever saved one life; it is as though he saved entire mankind'
Thank you!

Questions?

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