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 – Chapter 17
Inspection

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

A direct determination of conformance
Why Inspections?

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

- To minimize insurance premium

- To safeguard owner’s interest
Code Requirement?

2013 AD-IBC

- Chapter 17
  - Section 1704 – Special Inspections
  - Section 1705 – Statement of Special Inspections

2011 UAE Fire Code

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

2013 AD-IBC

1704.17 Penetration fire-stops systems, concealed draftstop, fireblock systems

- Subject periodic special inspection prior to concealment to determine compliance with the approved construction documents

- Listed systems shall be inspected for compliance with their listing

- Inspection of ‘Through-penetration’ and ‘Membrane penetrations’ by an approved inspection agency in accordance with ASTM E 2174.
Code Requirement?

2013 AD-IBC

Fire-resistant joint systems

Inspection of ‘Fire-resistant joint systems’ and ‘Exterior curtain wall/floor intersection’ 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 (Annexure A.1.21 Rev2)

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.
Who does Inspections?

IAS AC 291
Special Inspection Agency
2013 Abu Dhabi International Building Code (ADIBC)
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

- 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

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
Inspection Process
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
Leading the standards of Life-safety and Property-protection...

Butler Engineering (ME)
The Inspection Experts

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 reinspects
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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