Passive Fire Protection Guidance for the Fire Risk Assessor

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ASFP has just completed a guide on what to look for when undertaking a Fire Risk Assessment of the PFP.
“I’m sure it’s a great read. Doesn't it just say - check that there aren't any holes in the walls? Then check that anything filling the holes made by pipes and wires is the proper stuff.”

Brian Martin – Responsible for Building Regulations in England & Wales
Contents - 1

- Passive Fire Protection
  - What is it for?
  - How does it work?
  - Statutory guidance for building construction
- Concept of Primary Means of Escape
  - Structured, reasoned approach
  - Not always same as Building Regulations
  - Recognises limitations of and on Fire Risk Assessors
Contents - 2

• What you need to do
  • Modern buildings – use documented information wherever possible
  • Older buildings – plan it yourself taking using a structured reasoned approach
• Passive Fire Protection – for each type:
  • How to inspect it? (important points)
  • How much to inspect?
  • Where to find more information
  • Good and bad examples
  • Checklist
• Summary
Passive Fire Protection

‘Built-in’ measures

• Loadbearing only (beams and columns)
• Loadbearing and separating (Walls, floors)
• Non-loadbearing separating (walls, doors, partitions, glazed screens, cavity barriers, suspended ceilings)
• Services (penetration seals, linear gap seals (fire stopping) fire resisting ducts, fire resisting dampers, service ducts and shafts)
Structural Fire Protection

To maintain the stability of the structure during the period of the fire and ensure that it does not collapse.
Structural steel loses about half its strength at about 500°C.
Compartmentation

- Prevent spread of fire and smoke
- Subdivide buildings into manageable areas of risk
- Provide adequate Means of Escape
- Provisions in statutory guidance documents
Statutory guidance documents

- Statutory guidance documents
  - England & Wales – Approved Document B 2006
  - Scotland – Technical Handbook B 2010
  - Northern Ireland – Technical Booklet E 2005

- Other codes of practice
  - BS 9999: Fire safety in the design management and use of buildings
  - BS 7974: Application of fire safety engineering principles to the design of buildings
PFP for Primary Means of Escape

• Structured reasoned approach
  • Not necessarily full compliance with Statutory Guidance Documents
  • Too onerous and not needed for primary means of escape
  • Not possible to evaluate all within a normal Fire Risk Assessment
    • Not enough time
    • Invasive inspections are unrealistic (won’t be tolerated)
    • Fire Risk Assessors don’t have the expertise (GP analogy)
    • Significant problems should lead to further investigation by specialists
  • Will need to be appropriate to building type and occupancy
What you need to do - 1

- Determine building layout - Modern Buildings
  - 1994 to 1997 all information should be held under the Construction (Design & Management) Regulations – Ask the RP
  - 2007 onwards – Regulation 38 of Building Regulations applies (Approved Document B Appendix G) – Ask for it
  - Fire Services Act 1981 & 2003 fire safety design & fire safety certificate – Ask for it
  - If you can check the building against the appropriate info and all is well – that is enough

- Statutory guidance documents provide info for all Passive Fire Protection measures. Note BS 9999 or other codes could have been used.
What you need to do - 2

- Determine Building layout - Older Buildings
  - Information required probably not be readily available
  - You will need to survey the premises (compartmentation audit)
  - You will have to decide what level of PFP is appropriate
    - HMO – Sleeping risk, nobody on duty, conversion? Poor compartmentation? Occupants know building layout
    - Hotel – Sleeping risk, well specified PFP, staff on duty, some active measures, but occupants unfamiliar with layout
    - Offices – no sleeping risk, well specified PFP, active measures
    - Block of flats – Sleeping risk, well specified PFP? Stay Put policy, concentrate on smoke sealing/ventilation

- Create a document that lists the compartmentation as a basis for checking PFP as part of the Fire Risk Assessment
What you need to do - 3

Fire Compartmentation
The Who, Why & How of Compliance

Fire-resisting floor construction to protect route above
Cavity fire barrier
Efficient smoke seal
False ceiling
Fire-resisting partition constructed up to underside of floor overhead
Protected route
Fire-resisting floor construction

First floor
Basement

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What you need to do – 3

1. Lining materials for walls and ceilings on ALL escape routes
2. ALL Fire doors on escape routes
3. Construction of walls and ceilings on ALL escape routes (esp above corridor ends)
4. Penetrating services in walls, ceilings and floors on ALL escape routes (esp above corridor ends)
5. Sandwich panel constructions (in critical areas and where repaired)
6. Other items of PFP, but only while examining items above
   • No detailed inspection of e.g. structural fire protection
   • BUT any significant deficiencies to be reported and a call for inspection by a third party should be recommended
1. Wall and ceiling linings

1. Extensive overpainting
   • Paint is very flammable when thick and poorly adhered
   • Redecorate with paint proven to work on overpainted surfaces
   • Management issue to keep escape routes clear from items e.g. furniture

2. Addition of materials on surfaces
   • Carpets, posters, notices etc
   • Significant amounts should be removed – management issue again
   • Fabrics can be flame retarded – evidence
2. Fire Doors - 1

- Look at ALL fire doors on escape routes
- Is it a fire door?
  - Voids
  - Labels/plugs
- Correct door gaps around edges?
  - ~3mm
- Frame fixed/sealed to opening?
- Suitable Ironmongery?
  - 3 hinges
  - Operation of lock/latch/striker
  - Presence of self-closing device
  - Secure knobs, handles etc
2. Fire Doors - 2
2. Fire Doors - 3

- Presence/condition of intumescent strips?
  - Around periphery of leaf
  - To ironmongery and glazed panels
- Presence/condition of smoke seals?
- Hold open device - automatic release on activation of fire alarm/detection?
2. Fire Doors – 4

- Panic exit devices (not PFP but important in escape – maybe fitted to non fire doors)
- Air transfer grilles
  - Cannot be thermally activated
  - Linked to fire detection/alarm in escape routes
- Third party certificated products/installers?
  - Higher quality
  - Labelled/numbered to help traceability
- RECORDS?
3. Walls/floors/ceilings – 1

- Assume existing construction is OK
- New construction/alterations
  - Is it fire resisting construction?
  - Doors/walls/glazing/ceiling?
  - Changes to means of escape layout?
  - Role of suspended ceilings?
  - Compartmentation maintained in hidden spaces?
  - Holes in hidden spaces?
- Third party certificated products/installers?
- RECORDS?
3. Walls/floors/ceilings - 2

When it all goes wrong...
How do I inspect it? – 1

• Already established that it’s impossible/impractical/unnecessary to do it all
• Are you qualified to do it?
• But an audit should be carried out on compartment walls/floors/ceilings and penetrations through them – identifiable by:
  – Information supplied under Regulation 38, CDM Regs or Fire Safety Design and Fire Safety Certificate
  – Your survey
• Ends of corridors and adjacent to escape corridor walls
How do I inspect it? – 2

- Remove e.g. 1 or 2 suspended ceiling tiles adjacent to compartment walls and along each side of the escape corridors and inspect any penetrations seals
- Use of remote camera/video equipment facilitates this
- Check other PFP measures while you’re at it
- If all is well – record it.
- If not – you need to get the Responsible person to get a proper survey carried out and repairs made.
- You need to know enough to know something is wrong
How Fast Does Smoke Travel?

Consider this:

• A square room 6m x 6m x 3m has a pencil hole between compartments.

• How long will it take for the smoke to fill the room to a thickness such that you cannot see your hands half a metre in front of you?
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Pencil Hole

< 4 minutes

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4. Penetrating services (cables/pipes) - 1

- Suitably fire stopped?
- Suitably supported?
- Good condition/complete?
- Any holes?
- Third party certificated products/installers?
- Labelled?
- RECORDS?
4. Penetrating services (cables/pipes) - 2
Fire Compartmentation
The Who, Why & How of Compliance

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4. Penetrating services
(ducts/dampers) - 1

- Suitably fire stopped?
- Suitably supported?
- Good condition/complete?
- Method of air handling understood?
  - Method 1 – Fire damper operation linked to detection system? – Check it
  - Method 2 – Fire resisting construction
  - Method 3 – Fire resisting ducts
- Third party certificated products/installers?
- Labelled?
- RECORDS?
4. Penetrating services (ducts/dampers) - 2

- Suitably fire stopped?
- Suitably supported?
- Good condition/complete?
- Method of air handling understood?
  - Dampers not in plane of the wall
  - Duct is not protected
  - No fire stopping around 2 ducts
  - Duct performance will not have been evaluated in a cellular beam
- Not Labelled
- No RECORDS
5. Sandwich panels

- Fire resisting construction? (where visible)
- What is the core material?
- All repairs or modifications undertaken competently?
- Operational considerations
  - No heating appliances or ovens adjacent to walls/ceilings?
  - No storage of highly combustibles adjacent to walls/ceilings?
  - Are panels loadbearing?
- Any hot work/processes to be extensively supervised
- RECORDS?
6. Other Passive

Fire Protection - 1

- Fire protection to structural frame (where visible)
  - Good condition?
  - Complete?
- Cavity barriers (where visible)
- IF THERE ARE PROBLEMS CALL IN A THIRD PARTY INSPECTOR
- Third party certificated products/installers?
- RECORDS?
6. Other Passive
Fire Protection - 2

Getting it wrong

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Where can I find more information?

- ASFP website  
  www.asfp.org.uk
- Colour Books
- Technical Guidance Documents
Fire Compartmentation
The Who, Why & How of Compliance

- **RED BOOK**
  - Fire stopping & penetration seals for the construction industry
  - *3rd Edition*
  - The Association for Specialist fire protection

- **YELLOW BOOK**
  - Fire protection for structural steel in buildings
  - *4th Edition*
  - The Association for Specialist fire protection

- **PURPLE BOOK**
  - Fire resisting non load-bearing partitions

- **GREY BOOK**
  - Fire & smoke resisting dampers

- **BLUE BOOK**
  - Fire resisting ductwork
  - *2nd Edition*
  - The Association for Specialist fire protection

- **ORANGE BOOK**
  - Fire retardant coatings for the construction industry
  - The Association for Specialist fire protection
ASFP Technical Guidance Documents

- TGD 1  Sprayed mineral wool (concrete floors)
- TGD 2  Sprayed mineral wool (structural steel)
- TGD 8  Junctions between diff types of protection
- TGD 9  Beams with web openings (cellular beams)
- TGD 11 On site sprayed intumescent coatings
- TGD 14 Board systems
- TGD 15 Non - reactive sprayed coatings
- TGD 16 Off site sprayed intumescent coatings
ASFP has just completed a 1st draft of a short guide on what to look for when undertaking a Fire Risk Assessment of the PFP.
Contents - 1

• Introduces role of FRA
• Need to evaluate PFP associated with ‘Primary means of escape’
• NOT a full survey of compliance with statutory guidance docs
Contents - 2

• ½ to 3 pages on each type of PFP according to role in means of escape

• Pictures of what to look for (good and bad)

• Annexes with more info & further reading
Fire Compartmentation
The Who, Why & How of Compliance

Contents - 3

• The all important Check List for each type of construction

• Related to primary means of escape

• References to clauses in doc with further information

• OUT SOON!

### Annex A – Checklist

The fire risk assessor will need to draw up a check list related to the ASFP so as to check in the particular building being assessed. The list below identifies what needs to be checked for each type of construction. Guidance on how to check & fill in the clause number in the left hand column.

<table>
<thead>
<tr>
<th>Item &amp; Ref</th>
<th>Description</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall &amp; Ceiling linings 1</td>
<td>Reasonable limitation of sizes that might promote fire spread</td>
<td>Condition of exposed lined walls, presence of heavy weight/significantly reduced wall opening, presence of flammable linings e.g. carpers</td>
</tr>
<tr>
<td>Fire doors 2</td>
<td>Is the fire door BS certified?</td>
<td>Close door gaps &lt;=2mm, suitable lining, sash, appropriate label, self-closing device, opening/closing device, automatic release of self-closing device, fire/smoke doors?</td>
</tr>
<tr>
<td>Walls, floors &amp; ceilings on escape routes 3</td>
<td>Fire resisting construction?</td>
<td>Changes to window/door areas, fire resistance of suspended ceilings, hold down clips present?</td>
</tr>
<tr>
<td>Penetrating services (walls &amp; floors) 4</td>
<td>All penetrations closed pipe services</td>
<td>Suitable Fire stopped?</td>
</tr>
</tbody>
</table>
Summary

- Passive Fire Protection - what it is and how it works
- Need to determine building layout and where to get information
  - Modern Building from documents where possible
  - Older Buildings where info is not available - from your own compartmentation audit of what is needed for primary means of escape
- How to assess each type of PFP within the context of a Fire Risk Assessment for primary means of escape (more where it’s important and less where it’s not)
- Examples of good and bad
- Need to get professional surveyors in if problems found
- Get information from new ASFP publication and website
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