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“BS 9991:2011 Fire safety in the design, management and use of residential buildings”

Rory McShane
Director - Maurice Johnson & Partners, Fire Engineering Consultants
Lecturer - Fire Safety Engineering @ LyIT School of Engineering
Scope of presentation is to highlight the major changes in approach within the new BS 9991 Code with respect to:

- Means of escape from dwellings
- Internal planning of flats / maisonettes
- Common escape routes
- Fire service access considerations
- Fire safety systems
- Passive fire safety elements
- Access and Facilities for the Fire Service
Definitions (Clause 3)

- Important definitions

3.17  **dwelling**
unit of residential accommodation, occupied (whether or not as a sole or main residence):

a) by a single person or by people living together as a family; or
b) by not more than six residents living together as a single household, including a household where care is provided for residents

3.21  **extra care housing**
accommodation in a housing scheme for which specialized accommodation and support services are available to residents 24 hours a day

**NOTE** Residents receive a more intensive level of support in extra care housing than is usually provided in sheltered housing.
General Requirements (Clause 5)

- **Escape Windows / Doors (Clause 5.1(c))**
  - Min opening size as per BS 5588-1 and TGD-B 2006
  - Cill of dormer or rooflight ≤1.5m (1.7m in TGD-B 2006)
  - Reduced 600mm for protective barriers at roof lights omitted – refers to Table 1 of BS 6180:2011

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Minimum barrier heights</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Use</strong></td>
<td><strong>Position</strong></td>
</tr>
<tr>
<td>Single-family dwelling</td>
<td>a) barriers in front of a window</td>
</tr>
<tr>
<td></td>
<td>b) stairs, landings, ramps, edges of internal floors</td>
</tr>
<tr>
<td></td>
<td>c) external balconies including Juliette balconies, edges of roofs</td>
</tr>
</tbody>
</table>

- Permits the use of keys on escape windows and doors (advice to occupants) – not as per TGD-B 2006
Dwelling Houses (Clause 6)

- **Single / Two Storey Houses H<4.5m (Clause 5.1)**
  - “**unless** a protected escape route is provided” bedrooms to have escape window
  - Potential application to HSE / Care Providers where escape windows present a security risk

- **Three Storey Houses: 1 floor at H>4.5m (Clause 6.3(c))**
  - Facilitates “open plan living” at ground floor subject to
    - Sprinklers (**BS 9251**) **throughout**, and
    - Fire rated partition & doorset provided to maintain access to an escape window at 1st floor level

**Difficult to understand logic of protection throughout**
Dwelling Houses (Clause 6)

- Four Storey Houses: H>7.5m (Clause 6.4(b))
  - Where a sprinkler system (BS 9251) is fitted throughout a house having four or more storeys in conjunction with a protected stairway, a second stairway is not required.

- Loft Conversions (Clause 6.5)
  - Facilitates trade offs using sprinkler protection.
  - Some inconsistencies with recommendations elsewhere in respect of 6.3 (three storey house) and 9.3 (maisonette < 4.5m).
Dwelling Houses (Clause 6)

- **Loft Conversions (Clause 6.5)**

  A loft conversion to a two-storey house should have fire-resisting construction in the form of fire-resisting doors and fire-resisting partitions to protect the stairway.

  This protected stairway should:
  
  a) be protected at all levels; and
  b) extend to the final exit; or
  c) allow access to at least two escape routes at ground level that are separated from each other by fire-resisting construction and fire doors.

  Where an open-plan arrangement exists at ground level, one of the following should be provided:

  1) a fire-resisting partition to enclose the escape route conforming to 6.5b) or 6.5c); or
  2) sprinkler protection to the open-plan area, in conjunction with a fire-resisting partition and door, in order to separate the ground floor from the upper storeys. This door should be arranged such that the occupants of the new loft room are able to access an escape window conforming to 5.1 at first floor level in the event of a fire in the open-plan area.

  Houses having a floor level of a loft conversion higher than 4.5 m above ground level should conform to 6.3 or 6.4, as applicable.

More onerous than TGD-B
More logical than 6.3
Is this correct ????
Common Escape (Clause 7)

- Private Balconies (Clause 7.1 & Annex C2 & C3)
  - Private balconies $H<4.5m$
    - Enclosed balconies to be treated as an inner room
    - Where balconies are enclosed and are contiguous with enclosed balconies to other flats, the fire resistance of the balcony structure and compartmentation to be maintained
  - Private balconies $H>4.5m$
    - Escape through not more than one access room
    - Access room to be clearly visible from balcony
    - Travel distance limits for single direction escape???
Common Escape (Clause 7)

- Private balconies H<4.5m (Contd)
  - Cooking risk in the access room should be enclosed with fire-resisting construction unless:
    1) cooking risk is remote from the balcony and does not prejudice escape route through access room; and
    2) automatic smoke detection (BS 5839-6) provided in access room with an alarm system on the balcony.

- Where travel distance on balcony exceeds 7.5 m, alternative escape route without going via the same access room or the access room should be provided with automatic smoke detection.
Common Escape (Clause 7)

- Communal Roof Gardens, Balconies & Terraces (Annex C4)
  - Single direction escape of 45m
  - No limit on travel with alternative escape

  (distinction between communal roof garden in Annex C4 and Annex C6 not clear, however the latter has an unlimited travel distance)

  - Protection of escape routes to conform with the requirements for either small buildings or single stair buildings >11m

  - Need to consider evacuation of disabled where lift access is provided
Balcony Deck Approach (Clause 7.3 & Fig 5)

- No limitations on travel distance on deck approach but “all parts of the building need to be within 45 m of a fire main, measured along a line on which hose can be laid”
Common Escape (Clause 7)

- **Balcony Deck Approach (Clause 7.3 & Fig 5)**
  - Minimum fire resistance of 30 min
  - Walking surface to be imperforate
  - Down-stands depths can be defined by calculation (or adopt 0.3m-0.6m criteria).
  - Need to prove that balcony will not be smoke logged if less than 1.8m from the building facade and single direction of escape.
    - **Manual calculations acceptable but CFD analysis may be most appropriate tool**
  - Single direction of escape further safeguarded by
    - external balustrade to be imperforate.
    - Wall, balcony soffit and balustrade should be of a Class 0 rating.
Common Escape (Clause 7)

- Common Corridor Approach (Clause 7.4)
  - Single stair buildings > 11m and multi stair building

New Fig in BS 9991
Common Escape (Clause 7)

- **Common Corridor Approach (Clause 7.4)**
  - Natural ventilation (Clause 26)
    - or
  - Mechanical smoke control system option in lieu of cross-corridor fire doors and natural vents in code compliant layouts.
    - or
  - Mechanical smoke control system option may be considered to facilitate extended corridor solutions (quantitative comparative design required)
    - or
  - If sprinklered throughout the block of flats (excl EC facilities), travel distances can be doubled on common escape (Clause 23.2)
    - 7.5m → 15.0m
    - 30.0m → 60.0m
Smoke Control in Common Corridors (Clause 7.4)

- Refers to Clause 26 for details of smoke control requirements. Vent to stairs must be an AOV (1.0m2) (Clause 26.1.3)

- Clause 26.1.3 (options a, b or c) all refer to requirements for common lobby / corridor “immediately adjacent to the stair”

→ no venting in dead end corridors not connected directly to a stair ??

NOTE 3
The shaded area indicates the area requiring a smoke control system.
0.2.3 Smoke control in common parts
“.....these ventilation systems have two main purposes: the first of which is to provide some protection to the stair core and the second of which is to aid fire-fighters when tackling a fire. Ventilation systems can also be used to compensate for extended travel distances within the common corridor leading to the stairs and thereby help occupants to escape safely...”

26.1.1 Smoke control for means of escape
“.... Whilst the primary aim of smoke control in residential buildings is to protect the staircase enclosure it can also provide some protection to the adjacent protected corridor or lobby. In extended corridors, the primary objective of the smoke control system is to protect both the common corridor and the staircase enclosure for means of escape.....”. 
Common Escape (Clause 7)

- Common corridor in multi stair

- Maximum travel distance 30m

(a) Corridor access dwellings (no dead ends)

- Maximum travel distance 7.5m

- Maximum travel distance 30m

BS 5588-1
Common Escape ( Clause 7 )

- Common corridor in multi stair condition

Clause 26.1.4 refers to 26.1.3 for venting requirements.

26.1.3 specified corridor AOV of 1.5m² / stair AOV 1.0m².

“however ...... vents to the exterior of the building may also be manually operated.” (Clause 26.1.4) and 26.1.3 only refers to automatic venting over stairs - - - - IMPLICATIONS???

→ venting in non-dead end common corridor / stairs to be automatic with 1.5m² vent in common corridor ???
Common Escape (Clause 7)

- Common Corridor Approach: Small Single Stair < 11m (Clause 7.5 & Fig 8)
  Criteria largely as per BS 5588-1 except for a few notable changes
Common Escape (Clause 7)

- Common Corridor Approach: Small Single Stair < 11m (Clause 7.5)
  - Omits the requirement that ancillary areas and flats should not be on same floor level (Clause 12(b)(e))

- Fig 8(b) design (two apartments per floor)
  - stair ventilation must be by means of an AOV and not OVs (Clause 26.1.2)
  - Not applicable to Open Plan living layouts (unless the lobby to the stair is maintained)

- Not explicitly stated in Clause 7.5 that the option of extended corridor design is applicable to small single stair blocks ??
Extra Care / Special Housing (Clause 8)

- Scope of BS 9991 code expanded to cover “extra care” and other special housing
  - Max **9m travel** within EC unit or provide alternative escape. Max **7.5m travel** from flat door to storey exit or cross corridor door retained
  - Need to consider “adequate refuge space” requirements in corridors / stairs
  - Evac lifts to BS9999: 2008 “**where deemed necessary**”
  - Free swing / hold open devices to be used in common circulation routes where self closers present an obstacle to movement
  - Extra care facilities to be sprinkler protected (**Clause 23.1**).
Internal Planning (Clause 9)

- Open Plan Layout (Clause 9.3 & 9.7)
  - Flat fitted with a sprinkler system throughout designed to BS EN 12845 or BS 9251
  - Domesic AFD of Grade D Type LD1 to BS 5839-6
  - Limitations:
    - Max flat size should not exceed 16m x 12m;
    - Be single level only (exclude flats with galleries);
    - Min ceiling height of 2.25m within the flat;
    - Kitchen to be enclosed if open plan area > 10m x 8m;
    - Cooking not adjacent to the entrance if < 10m x 8m;
    - An open-plan flat design is not compatible with small, single staircase unless internal protected entrance halls maintained
Open Plan Flat Layouts: Assessing Life Safety In the Event of Fire

Typical Layouts (3 bed)

- 12m x 16m
- Case 3a: AD-B compliant
- Case 3b: Open plan with inner bedrooms + increased detection
- Case 3c: Open plan with inner bedrooms + increase detection + sprinkler protection
NHBC Foundation / BRE
Open Plan Flat Layouts:
Assessing Life Safety In the Event of Fire

Results –
FED Analysis
Internal Planning (Clause 9)

- **Maisonettes with floor(s) at H>4.5m (Clause 9.5.2)**
  - Requirement for alternative escape(s) from non access level omitted if either;
    - A protected stairway enclosure and an LD1 AFD system to BS 5839-6 subject to no floor >7.5 m above or below entrance level of maisonette); or
    - A protected stairway enclosure and domestic sprinkler coverage in accordance with BS 9251 or BS EN 12845 within the unit.

- **Flats with Galleries (Clause 9.6(e))**
  - Additional limitation that gallery >50% of the area of the floor below should be treated as an **inner room** – cannot be overcome by sprinkler protection in floor containing the gallery
Vertical Escape (Clause 10-17)

- **Stair Width (Clause 11)**
  - Minimum 750mm (previously 1000mm) – other functional requirements likely to dictate otherwise in any event, e.g. Part M 2010 but will provide relaxation for existing buildings.

- **Stair Enclosure (Clause 12)**
  - Note 2 Fig 16 – requires **insulation** rating at re-entrant angle protection.
Vertical Escape (Clause 10-17)

- Basement Stairs (Clause 13.2)

  - Single stair connecting to basements permitted in the following scenarios
    - Building < 11m (implies small block of flats)
    - Building not more than 3 storeys (implies mixed use block)
    - Basement is sprinklered (implies H>11m)

  - Requirements in the above scenarios
    - FD30S door / wall to separate flights at ground floor level
    - Dry falling main
    - Vented lobby to stair and/or lift – significant venting requirements in Table 1
## Vertical Escape (Clause 10-17)

### Table 1  Lobby ventilation

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Ventilation to lobby</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flats</td>
<td>In accordance with Clause 26</td>
</tr>
<tr>
<td>2</td>
<td>Communal lounges and common amenity areas</td>
<td>1 m² permanent ventilation; or 0.4 m² permanent ventilation with provision of automatic sprinkler protection in accordance with BS EN 12845 throughout the basement.</td>
</tr>
<tr>
<td>3</td>
<td>Transformer, switchgear and battery rooms for low voltage or extra low voltage equipment</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Engineering service installation rooms, excluding those covered by item 2 and items 6–8 inclusive</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Refuse chutes and refuse storage areas/bicycle stores</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Installation rooms for engineering services housing fixed internal combustion engines</td>
<td>1 m² automatic opening vent</td>
</tr>
<tr>
<td>7</td>
<td>Boiler rooms and fuel storage spaces</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Transformer and switchgear for equipment above low voltage</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Car park areas</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Increased vent requirements from 0.4m²
Mixed Use Buildings (Clause 14)

- Common stair serving both residential and non-residential uses in buildings of not more than **three** stories above **ground level**

- At odds with the recommendations of ADB 2010 – Section 2.50 refers to **three** stories above **ground storey**

- BS 5588 Part 1 referred to **four** storeys above **ground level**

Don’t believe this to be an error as 13.2 also makes reference to three storey buildings.
Vehicular Access – no internal fire main (Clause 19.1.2)

- Access to **all parts** of dwellings within 45m
  (TGD-B: Developments < 1000m² only requires access to entrance doorsets)

- Can be increased on foot of **sprinkler protection** and where arrival time of fire service is not more than **10mins**
  - to 90m for houses (H<4.5m)
  - to 75m for houses / flats (not more than one floor above 4.5m)

**Arrival time subject to consultation with Fire Service**
Access for Fire Service (Clause 18-21)

- **Residential Fire Fighting Shaft (Clause 19.2)**
  - Stair door to be FD60S
  - Apartment corridor to serve as fire fighting lobby
  - Can use additional fire mains in escape stair to meet coverage requirements;
    - 60m from outlet in fire shaft
    - 45m from outlet in escape stair

[Diagram showing fire fighting shaft and coverage requirements]
Active Fire Protection (Clause 22-26)

- **Fire Alarm System (Clause 22)**
  - No requirement for common AFD system (Clause 22.1) other than to initiate smoke control systems

  *Clause 26.2.3.4 “Unless a simultaneous evacuation arrangement is deemed appropriate, there should be no sounders attached to the smoke detectors within common parts. NOTE 2 The purpose of smoke detectors is to operate the smoke control system, not to raise an alarm”*

  - Only non residential areas in mixed user buildings need have AFD fitted **Significant difference in approach to TGD-B**
  - Risk assessment approach considered appropriate in determine AFD requirements for communal areas / roof gardens associated with sheltered housing
Active Fire Protection (Clause 22-26)

- Sprinkler & Watermist Systems (Clause 23)
  - Sprinklers recommended for
    - Buildings > 30m *(and possibly H>18m)* – BS EN 12845
    - Extra Care developments
  - Sprinkler protection trade-offs (*discussed already*)
    - 3 storey house with open plan ground floor (Clause 6.3)
    - 4 storey house with no 2\textsuperscript{nd} means of escape (Clause 6.4)
    - Open plan flats (Clause 9.7)
    - Increased distance vis vehicular access (Clause 19.1.2)
    - Increased travel in common corridors (Clause 7.4)
    - Reduced boundary distance by half (Clause 29.4.2)
Sprinkler & Watermist Systems (Clause 23)

- Watermist gets conditional approval in BS9991 subject to agreement of the relevant enforcing authority (Clause 23.1)
- Needs specific scenario testing to prove viability and effectiveness of each system

Important developments in Watermist regulation:
- DD 8458 for Residential/Domestic Systems (Nov ‘10)
- DD 8489 for Industrial/Commercial Systems (Feb ‘11)
- FIRAS Warrington - Third Party Installer Scheme
- NFPA 750 (2010 Ed) – commonly used as guide

Some companies have undertaken extensive testing on their systems to-date with independent test facilities such as BRE Global, e.g. Plumis Ltd’s “Automist” system
Active Fire Protection (Clause 22-26)

- **PFFE (Clause 24)**
  - Not required in common areas (unless risk assessment dictates otherwise)
  - Employed in “higher fire risk areas” in sheltered housing

- **Special Risk Protection (Clause 25)**
  - “Where a common stair forms part of the only escape route from a flat, unless it is designated as a small single-stair building in accordance with 7.5, it should not also serve any covered car park, boiler room, fuel storage space or other ancillary accommodation of similar fire risk.”
  - At odds with 13.2 which permits sprinklered basement car park for single stairs buildings > 11m ??
Active Fire Protection (Clause 22-26)

- Smoke Control (Clause 26)
  In addition to points already raised;

Clause 26.2.3.4 - AOVs

- AOVs to comply with EN 12101-1
- AOVs in buildings (other than small single stair buildings), are to be activated on detection of smoke **within the adjoining lobby directly adjacent to the stair**. Note: Vent in that lobby also to open simultaneously – all other lobby vents at other floors to remain closed.
Active Fire Protection

Clause 26.2.4.2 Natural ventilation smoke shaft - As per ADB
- Being closed at the base
- Minimum CSA of 1.5m² with min dimension of 0.85m
- Extending >0.5m above the highest structure within 2m
- Extending 2.5m above the ceiling of the highest level served by the shaft
- Lobby vent to be 30min FR and have a leakage of 200m³/hr/m²

Clause 26.2.5 Mechanical Smoke Control System
- Comparative analysis using CFD
- Need to consider door opening forces, standby power, duty and standby fans
Fire Resistance (Clause 27)

- **Table 2** – General requirements for elements of structure
- **Table 3** – Fire resistance (independent of ventilation)
  - derived by considering the risk assessment, fire growth rate and occupants of the building - largely follows the ADB guidance
- **Table 4** – Fire resistance (considers ventilation conditions)
  - derived using time equivalent approach in BS EN 1991-1-2, for post-flashover fires
  - Monte Carlo analysis used to generate random variables for inputs (fire load, thermal properties, ventilation factor and compartment geometries)
  - Risk = frequency x probability x consequence of failure analysis
Design for Construction (Clause 27-37)

- Height to top floor – does it include roof terraces???
  NOTE 3  Methods of measurements such as floor heights, heights of buildings and fire and rescue service access can be found in the Building Regulations 2000 – Approved Document B [11].

- ADB – Appendix C6 defined the height to the top storey as excluding “any top storeys consisting exclusively of plant rooms”

3.53 storey
part of a building comprising all the rooms that are on the same level including any gallery having an area of more than half that of the space into which it projects and any roof, unless it is accessible only for maintenance or repair

Roof garden / terrace used for communal amenity purposes are considered a storey

Implications for small buildings and fire rating requirements !!!

27.2.4 Roof structure
The structure of a roof, and structure that supports only a roof, does not generally require fire resistance unless the roof forms part of an escape route or functions as a floor, e.g. as a car park, or is part of a portal frame structure where the roof and the supporting stanchions form a single structural element.
**Fire rating requirements (Clause 27.2)**

### Table 3: Fire resistance periods for elements of structure (independent of ventilation conditions)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Minimum periods of fire resistance, in minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Depth below access level of basement level</td>
</tr>
<tr>
<td></td>
<td>&gt;10 m</td>
</tr>
<tr>
<td>Sprinklered A)</td>
<td>90</td>
</tr>
<tr>
<td>Unsprinklered</td>
<td>90</td>
</tr>
</tbody>
</table>

A) Sprinkler systems should conform to BS 9251

**TGD-B Table A2 identified in Red**

**Max Height =18m Unsprinklered**

### Table 4: Fire resistance periods for elements of structure (based on ventilation conditions A)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Minimum periods of fire resistance, in minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Height of top occupied storey above access level</td>
</tr>
<tr>
<td></td>
<td>≤5 m</td>
</tr>
<tr>
<td>Sprinklered B)</td>
<td>45</td>
</tr>
<tr>
<td>Unsprinklered</td>
<td>60</td>
</tr>
</tbody>
</table>

No benefit in ventilated conditions for H<18m

**Max Height =30m Unsprinklered**
Fire rating requirements (Table 3-4)

The ventilation conditions for an individual residential building are as follows:
- minimum potential area as a percentage of the floor area: 10%;
- height of opening as a percentage of the compartment height (i.e. from floor to ceiling): 30% to 90%;
- where the opening height is the weighted mean height (by ventilation area) of the potential openings. If a compartment has openings each with an area of $A_1$, $A_2$, $A_3$, ... $A_n$ and heights of $h_1$, $h_2$, $h_3$, ... $h_n$, then the total area of the openings $A = A_1 + A_2 + A_3 + ... + A_n$, and the weighted mean height, $h$, is given by:

$$h = \frac{A_1h_1 + A_2h_2 + A_3h_3 + ... + A_nh_n}{A}$$

<table>
<thead>
<tr>
<th>Room</th>
<th>Area</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed 1</td>
<td>$2.0m \times 1.0m$</td>
<td>$2.0m^2$</td>
</tr>
<tr>
<td>Bed 2</td>
<td>$2.0m \times 1.0m$</td>
<td>$2.0m^2$</td>
</tr>
<tr>
<td></td>
<td>$1.5m \times 1.0m$</td>
<td>$1.5m^2$</td>
</tr>
<tr>
<td>Kitchen</td>
<td>$1.2m \times 0.8m$</td>
<td>$0.96m^2$</td>
</tr>
<tr>
<td>Living</td>
<td>$1.8m \times 2.0m$</td>
<td>$3.6m^2$</td>
</tr>
<tr>
<td>Total A</td>
<td></td>
<td>$10.06m^2$</td>
</tr>
<tr>
<td>% Area</td>
<td></td>
<td>$10.06/86 = 11.7%$</td>
</tr>
<tr>
<td>Area weighted H</td>
<td></td>
<td>$13.468 / 10.06m = 1.34m$</td>
</tr>
<tr>
<td>% Height</td>
<td></td>
<td>$1.34/2.4 = 56%$</td>
</tr>
</tbody>
</table>
Fire rating requirements (Table 3-4)

NOTE  In the calculation of the weighted mean height it is also acceptable to selectively consider only the height(s) of the openings that achieve the minimum ventilation area.

If \( h \) is the weighted mean height of all the openings and \( H \) is the height of the compartment then \( h/H \) should be between the values given in the end column.

If these ventilation conditions cannot be met then Table 3 should be used instead.

B) Sprinkler systems should conform to BS EN 12845.
C) Where a product or system is not available to meet the recommendation, it is acceptable to use a product or system having the next highest available classification. The classification periods 75, 105 and 135 do not exist in European classification system BS EN 13501-2.

Only need to consider vents which make up the min 10% vent area required

Reductions in SFR based only on sprinklers to BS EN 12845. Various trade offs given elsewhere vis MOE provides option of domestic sprinklers to BS 9251
Compartmentation (Clause 28)

- Compartment walls to accommodate predicted deflection of the floor on the basis of either:
  - A head detail capable of deforming while maintaining its integrity during fire exposure, or:
  - Compartment wall designed to resist vertical load when forced to sag under fire conditions.

- Limited scope of conditions where “non-combustible” construction is required by reference to Clause 31.3, i.e. Does not include buildings > 10m in height

→ Timber frame construction (comparable with ADB)
Concealed Spaces (Clause 30)

Key
1 Section through cavity wall
2 Opening
3 Close cavity at top of wall (unless cavity is totally filled with insulation)
4 Close cavity around opening
5 Two leaves of brick or concrete each at least 75 mm thick

Cavity Closers
(Clause 30.2.1 and Fig 27)
NOTE 1 Cavities may be closed with a material that might not conform to the various recommendations in Table 2 for cavity barriers. The purpose of closing the cavity is to restrict airflow within the cavity.

- Is PVC acceptable???
Design for Construction (Clause 27-37)

Services Shafts (Clause 32)
- Access to service shafts are not to be located within escape stairs (Clause 32.1)

Fire Rated Glazing (Clause 33)
- Reduction to integrity rated glazing only in sprinklered areas permissible subject to appropriate risk assessment (Clause 33.4)

Fire Curtains / Barriers (Clause 34)
- Guidance on use and deployment available
Openings/Fire Doorsets (Clause 35)

- For non insulated fire doors in compartment walls, door openings **should not exceed 25%** of the length of the wall (Clause 35.1)
- Self closing devices **are not** required on internal doors within dwellings, flats and maisonettes (Clause 35.1.6)
- Threshold gap should, where practicable, be sealed by a flexible edge seal (3 m³/h/m at 25 Pa) or just contacting the floor. Where impracticable, the threshold gap should **not exceed 3mm** at any point (Clause 35.1.7)
- **All fire doors** other than lift entrance doors should be marked with the appropriate fire safety sign conforming to BS ISO 3864-1 (Clause 35.1.9)
HVAC (Clause 38-39)

- Advice based on provisions in the former BS and BS9999.

ANCILLARY ACCOMMODATION (Clause 40-50)

- Advice on a range of ancillary accommodation, engineering service installations, lighting, car parks etc.

MANAGEMENT (Clause 51-57)

- Advice on a range of issues of fire safety management and evacuation of disabled

BUILDING WORKS (Clause 58-63)

- Brief commentary on buildings undergoing refurbishment, change of use, and alterations including works in buildings partly occupied
ANNEXES

- Annex A – Business and Property Protection Advice
- Annex B – Atria
- Annex C – Private Balconies
- Annex D – Advice to occupants
- Annex E – Methods of smoke control.
THANK YOU FOR YOUR ATTENTION

ANY QUESTIONS?

Rory McShane
rmcshane@mjp.ie
rory.mcshane@lyit.ie