Altair

Mole

31 Daleham Gardens
Residential Development

London Plan Policy D12
Fire Safety

Compliance Statement

Issue 1

Client: Altair
Architect: Mole
Date: April 2023
Author: Nigel Hiorns

Fire Ingenuity

Capability Creativity Credibility

Contents

CV OF AUTHOR

I am Nigel Hiorns, a Fire Engineer and Managing Partner of Fire Ingenuity LLP

- BSc 1st Class (Hons) Mech Eng. (UMIST), MoD Sponsored Student Engineer (1983)
- Post-grad Research Mechanical Engineering (UMIST): "Development of a Second-Moment Closure CFD Turbulence Model Applicable to Buoyancy-Affected Free Shear Flows". CASE Award British Gas.
- AIMechE (1983)
- MIFireE (by exam) (1992)
- MSFPE (2006)
- FIHEEM (2010)

I have a fundamental engineering and safety & reliability background, complemented by over 25 years as a fire engineer in leading consultancies:

Fire Ingenuity: January 2010 – Present
Managing Partner: Responsibility for all Technical, Commercial, and Financial aspects in creating, maintaining, and operating a successful fire engineering consultancy

SAFE Consulting / Ramboll: December 2003 – December 2009
Board Director: Specialisation in development of, and negotiating approvals on, leading-edge innovative solutions.

Buro Happold FEDRA: 1995 - 2003
Technical Manager, responsible for delivering quality and innovation. One of the three original fire engineers establishing FEDRA in 1995. Established Buro Happold's numerical modelling group & access consultancy.

AEA Technology: 1992 - 1995
Senior Fire Safety Engineer in Applied Risk Analysis department. Application of formal risk assessment techniques and consequence analyses in mature "risk-based" industries including nuclear, oil + gas, transport, and chemical sectors. Developed pedestrian/evacuation modelling software AEA EGRESS.

Computational Dynamics Limited: 1991 - 1992
Senior Engineer, responsible for development and application of STAR-CD, a general purpose commercial CFD package.

Fluid Gravity Engineering: 1987 - 1991
Senior Engineer in Defence and Commercial Consultancy responsible for unique defence and aerospace design solutions by developing and application of in-house CFD software, Mathematical modelling and Project Management.

I have also developed (and continue to develop) British and European Fire Safety Engineering standards and advice for UK Government on how to apply and assess fire safety, including:

- FSH/24 (the BSI committee responsible for the development of standards for fire safety engineering in buildings): Continuing development of BS 7974, the fire engineering standard. This has recently been re-written and issued (March 2019). As well as a general overview role, I had specific roles in the following Published Documents (BS7974 comprises 8 Published Documents):
    - Panel leader PD-7: Probability Risk Assessment
    - Panel Member PD-2: Fire modelling
    - Panel Member PD-5: Fire & Rescue Service Intervention
    - Panel Member PD-6: Evacuation Modelling
- Designated UK Principal Expert on Fire Safety Engineering for development of CEN European Fire Safety Engineering Standards (CEN TC127 WG8)
- Developing Key Performance Indicators for Fire Engineering and also developing fire safety guidance - both for the Office of the Deputy Prime Minister (ODPM), to enable Building Control to assess engineered solutions more effectively.
- General role in rationale for development of FIRECODE for Department of Health
- BS9999 Means of Escape for BSI.
- Team leader in developing an international fire safety guide for air transportation applications for IATA.

I have class-leading experience in the practice and practising of fire engineering as a consultant, and a key understanding of the commensurate expectations of a fire consultant.

I am also serving as Expert Witness on a wide range of residential and residential/mixed-use developments, having been specifically selected and appointed due to expert knowledge and experience of fire engineering, residential design, and the approvals processes.

I am a third-party independent, suitably qualified assessor in accordance with the London Plan para. 3.12.9: A qualified engineer with relevant experience in Fire Safety.

3.12.9 **Fire statements** should be submitted with all major development proposals. These should be produced by a third-party independent, suitably-qualified assessor. This should be a qualified engineer with relevant experience in fire safety, such as a chartered engineer registered with the Engineering Council by the Institution of Fire Engineers, or suitably qualified and competent professional with the demonstrable experience to address the complexity of the design being proposed. This should be evidenced in the fire statement. Planning departments could work with and be assisted by suitably qualified and experienced officers within borough building control departments and/or the London Fire Brigade, in the evaluation of these statements.

1 INTRODUCTION

The Daleham Gardens project is a six-storey new build apartment building at 31 Daleham Gardens for Altair by Mole Architects, to replace an existing building that was demolished following a fire.

The new building will contain 14 apartments ranging from one to three bedrooms, each with a private balcony or roof terrace. 50% of the homes will be affordable, with two available for social rent and five sold at a discounted rate that will be retained in perpetuity. A garden at the rear of the site will be shared by the residents.

The basis of the fire strategy design shall be Approved Document B Fire Safety Vol 1: Dwellings (current edition - 2019 edition, incorporating 2020 & 2022 amendments). The housing is all Mainstream (there is no specialised or residential care housing).

Significant enhancements to the standard required for Building Regulations compliance shall be made, as detailed in this statement.

Daleham Gardens is a “major development” in terms of planning, since it comprises more than 10 households, and therefore requires a D12 fire statement under the London Plan prepared by a third-party suitably qualified assessor.

This fire strategy statement demonstrates how compliance with “Policy D12 Fire Safety” of the London Plan (excerpt overleaf) shall be achieved.

A In the interests of fire safety and to ensure the safety of all building users, all development proposals must achieve the highest standards of fire safety and ensure that they:

1) identify suitably positioned unobstructed outside space:

   a) for fire appliances to be positioned on

   b) appropriate for use as an evacuation assembly point

2) are designed to incorporate appropriate features which reduce the risk to life and the risk of serious injury in the event of a fire; including appropriate fire alarm systems and passive and active fire safety measures

3) are constructed in an appropriate way to minimise the risk of fire spread

4) provide suitable and convenient means of escape, and associated evacuation strategy for all building users

5) develop a robust strategy for evacuation which can be periodically updated and published, and which all building users can have confidence in

6) provide suitable access and equipment for firefighting which is appropriate for the size and use of the development.

B All major development proposals should be submitted with a Fire Statement, which is an independent fire strategy, produced by a third party, suitably qualified assessor.

The statement should detail how the development proposal will function in terms of:

1) the building's construction: methods, products and materials used, including manufacturers' details

2) the means of escape for all building users: suitably designed stair cores, escape for building users who are disabled or require level access, and associated evacuation strategy approach

3) features which reduce the risk to life: fire alarm systems, passive and active fire safety measures and associated management and maintenance plans

4) access for fire service personnel and equipment: how this will be achieved in an evacuation situation, water supplies, provision and positioning of equipment, firefighting lifts, stairs and lobbies, any fire suppression and smoke ventilation systems proposed, and the ongoing maintenance and monitoring of these

5) how provision will be made within the curtilage of the site to enable fire appliances to gain access to the building

6) ensuring that any potential future modifications to the building will take into account and not compromise the base build fire safety/protection measures.

2 OVERVIEW AND ENHANCEMENTS

The development is for residential, and is a building with 6 storeys. The building is only approx. 16m high and a typical floor only has a NIA of approx. 300m^2.

The ambition is to improve on the already high standard required for Building Regulations compliance. Learning has also been taken from the Hackitt Review and the Moore-Bick Inquiry following the Grenfell tragedy in June 2017. The enhancements above the standard required for Building Regulations compliance include:

- All dwellings shall be provided with a mains-based Grade D1 LD1 fire alarm system, even though the buildings could have been designed to achieve Building Regulations compliance with a lower standard system.
- The building construction is concrete frame with light-gauge steel infill. This has inherent fire resistant and is less likely to be compromised during construction and in-use.
- The standard of fire resistance for elements of structure and for separation between the apartments and to the corridor walls is 60mins.
- The External Wall System shall be either non-combustible (European Classification A1) or of limited combustibility (European Classification A2-s1, d0) where practicable, even though the legislation (SI 1230) and associated guidance would only require this in residential buildings over 18m.
- *It is noted that details of the building construction shall be provided at a later stage, in accordance with the RIBA workplan.*
- An evacuation lift is provided; this would not be necessary for Building Regulations compliance.
- Escape from the stair is available at Lower Ground and Ground storeys, which provides additional resilience.
- The means of escape from the apartments is proposed as protected entrance hall/protected internal stair or open-plan, which shall be designed in accordance with the latest guidance and standards.
- Whilst Building Regulations compliance could be achieved with widow escape, window escape shall not be used on this project as it is considered a low standard of escape and not suitable or unduly risky for elderly persons, young persons, or persons with a mobility impairment. Flat 2 (M4(3)) is open-plan to achieve the design ambitions for operational use, and has been provided with door escape from the bedrooms to afford level escape from the apartment.
- PV Arrays on the roof: An isolator switch shall be provided at fire service access level **and** at roof access level. This isolator switch is to isolate the voltage as close as practicable to the PV cells. This provides a significant benefit to firefighting.
- A premises information box shall be provided, with information and at a location agreed with the LFB. *It is noted that this is also a recommendation from the Moore-Bick Grenfell Inquiry.*
- Altair shall appoint its contractor in line with the "Golden Thread" construction control plan (Hackitt's intent of this is to ensure that the fire strategy is not compromised by changes during construction).
- Altair shall appoint a management company to manage the development. The management company shall be required to prepare a Home User Guide and manage the facilities to ensure that an acceptable standard of fire safety is achieved.
    - Regulation 38 information shall be provided to assist the management company to effectively discharge its fire safety responsibilities.
    - Fire information signs shall be provided in a means that all residents can understand.
    - The Home User Guide and the fire safety management and maintenance regimes will further assist ensuring that the fire strategy is not compromised during operation, as will maintenance of systems in accordance with the manufacturers' recommendations.

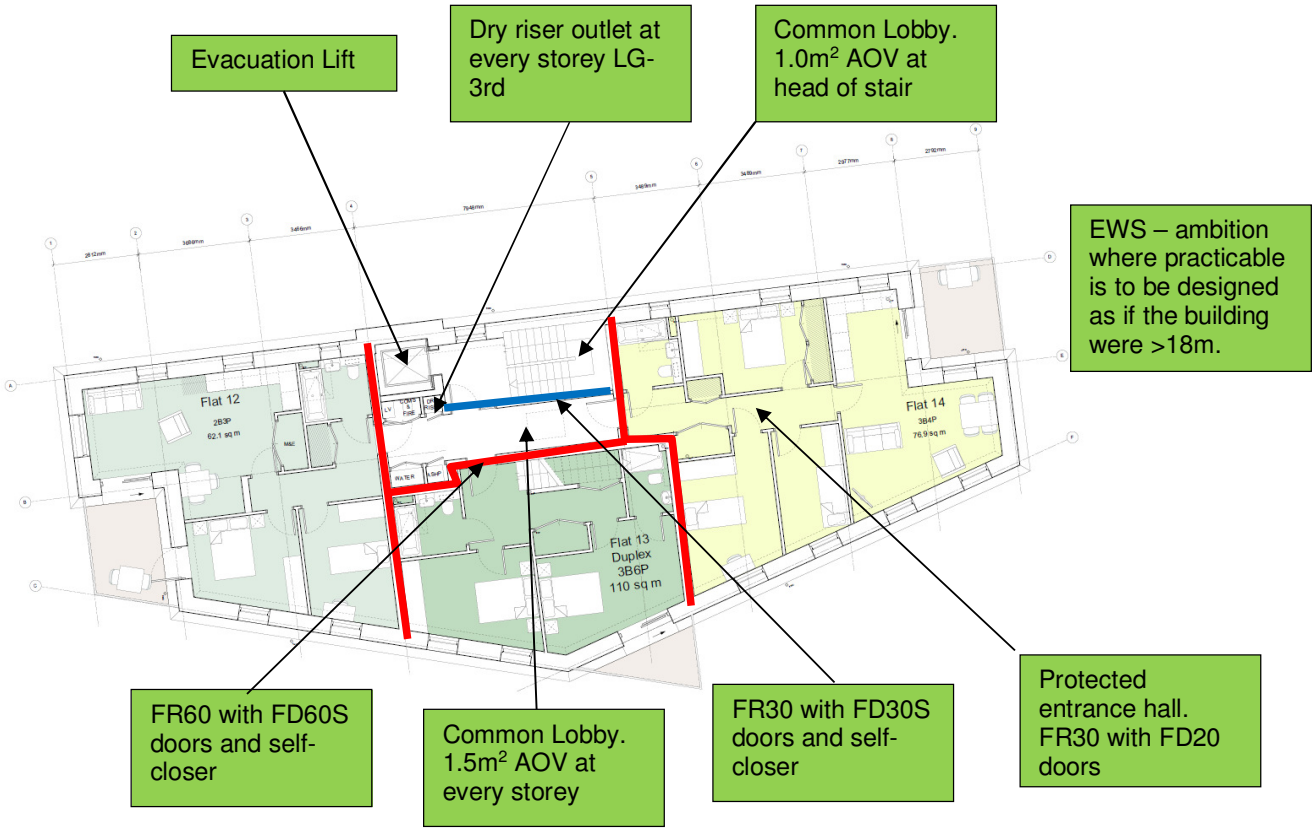
3 BUILDING DESCRIPTION

There are a variety of dwellings provided over the six storeys, as per the introduction. The schematics below are provided to give an understanding of the building geometry, layout, dimensions, and heights. The building is only approx. 16m high and a typical floor only has a NIA of approx. 300m^2.

Short Section (view from the East)

South Elevation

Proposed 3rd Floor Plan



Key Fire Safety Provisions

3.1 KEY BUILDING HEIGHTS

The building is on a sloping site. In terms of applying the guidance, the guidance defines key building heights and "trigger levels". In respect of this, the Architect has confirmed:

- Height of top floor FFL above the lowest ground level adjacent to the building) is approximately 15.5m. In terms of trigger levels, it is between 11m and 18m.

- The 4th floor FFL is approximately 14.3m above fire vehicle access level (Daleham Gardens public road immediately in front of the site). This does not exceed the trigger level of 18m for the guidance requirement for firefighting shaft(s).

4 LEGISLATIVE COMPLIANCE

The project is subject to The Building Regulations 2010 (as amended). A Building Control Body shall be appointed at an appropriate stage to assess compliance. The BCB also is required to consult with the Fire Authority, in this case London Fire Brigade (LFB).

Regulation 38 of the Building Regulations requires the designers to pass on sufficient information on the fire strategy so that the facility can be effectively maintained and managed. For a project of this size it is considered that sufficient information will be provided by:

- The Stage 4 Detailed fire strategy, together with
- Architects and Engineers associated fire strategy drawings and specifications.
- Tenants' Handbook
- The O&M manual

During occupation the premises will be subject to the Regulatory Reform (Fire Safety) Order (RRO). The RRO requires the responsible person to ensure **and be able to demonstrate** that the arrangements for fire safety in the "landlord areas" (all areas apart from the individual dwellings) are acceptably safe. The RRO is regulated by the Local Fire Authority. If the Fire Authority do not consider that a premises is operating safely they can stop it operating ("Prohibition Notice") and/or enforce structural (e.g. additional stairs, sprinklers) or management alterations ("Improvement Notice").

5 TENANT'S HANDBOOK

A tenant has responsibilities for their own safety and the safety of others. *The overall standard of fire safety achieved on the premises is a consequence of the combined and complementary actions of the Landlord and Tenants.*

A "tenant's handbook" contains fire safety advice on:

- Ongoing operation and maintenance associated with the individual dwellings to ensure an acceptable standard of fire safety e.g.
    - Reducing fire risks within the dwelling
    - Planning of escape from the apartment and necessity of awareness of arrangements for escape in the communal areas
    - Routine testing of the fire alarm system
    - Not to paint-over sprinkler heads
    - Permitted works (and not-permitted works) to party walls and floors / ceilings so as not to compromise the standard of fire safety.
    - Closing fire doors (where provided)
    - Appropriate use of balconies and common areas so as not to create a fire hazard.
- Landlord contact details if there are any concerns or questions on fire safety of the Landlord Areas or Building Design

6 BUILDING CONSTRUCTION

he building construction is concrete frame with light-gauge steel infill. This has inherent fire resistant and is less likely to be compromised during construction and in-use. loadbearing masonry walls, with pre-cast concrete slabs. This has inherent fire resistant and is less likely to be compromised during construction and in-use.

The standard of fire resistance for elements of structure and for separation between the apartments and to the corridor walls is 60mins.

7 EXTERNAL WALL SYSTEM & UNPROTECTED AREAS

The External Wall System and specified attachments shall where practicable be designed as if the building were over 18m. This is a significantly higher standard than would be required for Building Regs compliance. Regulation 7 defines the external wall and specified attachments, and provides an exemption for certain components.

Regulation 7(2) and requirement B4

Materials

10.13 Regulation 7(1)(a) requires that materials used in building work are appropriate for the circumstances in which they are used. Regulation 7(2) sets requirements in respect of external walls and specified attachments in relevant buildings.

NOTE: Further guidance on regulation 7(1) can be found in HM Government's *Manual to the Building Regulations*.

10.14 Regulation 7(2) applies to any building with a storey at least 18m above ground level (as measured in accordance with Diagram D6 in Appendix D) and which contains one or more dwellings; an institution; or a room for residential purposes. It requires that all materials which become part of an external wall or specified attachment achieve class A2-s1, d0 or class A1 in accordance with **BS EN 13501-1**, other than those exempted by regulation 7(3).

NOTE: The above includes student accommodation, care homes, sheltered housing, hospitals, dormitories in boarding schools, hotels, hostels and boarding houses. See regulation 7(4) for the definition of relevant buildings.

NOTE: Transposition to a national class (Table B1) does not apply to the classification in this paragraph.

10.15 External walls and specified attachments are defined in regulation 2(6) and these definitions include any parts of the external wall as well as balconies, solar panels and solar shading.

10.16 Regulation 7(3) provides an exemption for certain components found in external walls and specified attachments.

The design of the external wall shall also achieve the requirements for external fire spread to adjacent buildings. This shall be by applying the enclosing rectangle method in BR 187, or another acceptable approach agreed with all interested parties. It is considered that the higher standard than required for Building Regs compliance for external fire spread should be straightforward to achieve if the opaque portions of the wall are specified to have a performance EI 60/15 from the inside, especially given the provision of sprinklers and the understanding that there is no relevant boundary within 1m of the EWS.

8 SPRINKLERS

Sprinklers shall be provided to achieve Building Regulations compliance. The guidance in ADB shall be followed for the design of the system, or an alternative approach agreed acceptable to all interested parties.

9 MEANS OF ESCAPE

The residential escape comprises:

- Escape from the dwelling.
- Escape in common areas.
- Escape for disabled persons.

The means of escape strategy is “stay-put”, in accordance with best practice; only the apartment of fire origin shall be required to evacuate initially (any other occupant may evacuate if they become aware of the fire and choose to evacuate). The alarm system shall be stand-alone; alarm is only given in the dwelling affected by fire.

All dwellings shall be provided with a mains-based Grade D1 LD1 fire alarm system, even though the buildings could have been designed to achieve Building Regulations compliance with a lower standard system.

The means of escape from the apartments is proposed as protected entrance hall/protected internal stair or open-plan, which shall be designed in accordance with the latest standards. BS9991(2015) is the relevant standard for the design of open-plan apartments.

Once out of the apartment, the escape is via the common lobby and the escape stair. An evacuation lift is also provided (Section 9.1), which is above the standard necessary for Building Regulations compliance.

There is escape to a final exit from the stair both from the Ground storey and from the Lower Ground storey (step-free) to a place of ultimate safety away from the building.

The persons who evacuated from the fire apartment can readily be accommodated on and local to site clear of firefighting vehicles and firefighting operations. The situation is the same (persons evacuated can be accommodated on site clear of firefighting vehicles and operations) should other dwellings choose to evacuate or if the fire service (following a dynamic risk assessment on arrival) choose to evacuate additional dwellings.

9.1 EVACUATION LIFT

The evacuation lift shall be specified for self-evacuation.

The power supply is significantly enhanced compared with the standard required by BS9999 (2017), as it shall have a diverse supply in the building (blue box below) **AS WELL AS** a UPS:

> To ensure that operation of the evacuation lift is maintained for as long as required for the evacuation of disabled people, an alternative power supply should be provided. This allows continued operation of the evacuation lift in the event of failure of the primary supply; whether by fire in the building or for some other reason. The alternative supply should be one of the following.
>
> a) A secondary power supply, such as a generator or supply from a separate utility, meeting the recommendations in BS 8519. Where a secondary supply is specified for other life safety systems then it should be of adequate capacity and used to supply the evacuation lift.
>
> b) A separately fused circuit fed directly from the main incoming electrical supply to the building, located in a fire-protected enclosure. Thereafter, the recommendations in BS 8519 should be followed for the configuration of the circuits within the building and fire protection measures. The adoption of such an alternative supply route should be subject to a risk assessment, taking factors into account such as the travel of the lift, the implications of a failure of the primary supply, the alternative evacuation planning, etc. Evacuation lifts using such an alternative supply route through the building should have an automatic rescue device which, in the event of a power
>
> The cables transmitting the secondary supply or alternative circuit should be separated from those of the primary supply and routed through areas of low fire risk, or should be physically protected so that a breakdown, or any cause of a breakdown, on one supply cannot lead to simultaneous failure of the other supply. Any power switches or isolators should be clearly identified. Labels should be provided at the main switchboard and at the incoming power supplies indicating the presence, purpose and location of the two circuits. The arrangements for cable specification, routeing and installation, automatic changeover devices between primary and secondary circuits and the fire protection of any enclosures should be in accordance with BS 8519.

The UPS shall be provided inline, in the unlikely event that both electrical routes to the lift are compromised. The provision shall take account of the guidance in BS9999 below.

> Battery inverters should not be used as secondary power supplies for fire safety purposes, unless it can be demonstrated that:
>
> 1) this power supply is capable of operating the lift at normal speed; and
>
> 2) it has sufficient capacity and endurance to enable the lift to perform sufficient cycles to serve and evacuate every refuge associated with the shaft, at one refuge per cycle (one cycle being movement from final exit level to a refuge and back to the final exit level). Movement to the level from which the authorized person will take control of the lift should also be included. The capacity should be calculated with allowance for the batteries' supply capacity at the end of their design life.
>
> Where it is reasonably foreseeable that the refuges will be used by more than one user, and the size of the evacuation lift is such that more than one cycle would be required to evacuate each refuge, the battery capacity should be increased accordingly.
>
> Any electrical substation, distribution board, generator, hydraulic pump or other apparatus should be protected from the action of fire in the building for a period not less than that specified for the enclosing structure of the evacuation lift installation and in accordance with the general principles of structural fire protection for a lift machine room or machinery space.

10 PV FIRE SAFETY

31 Daleham Gardens is proposed to have roof-mounted PV systems.

The roof is only accessed for maintenance of the roof or PV panels.

A single direction of escape is sufficient on the following guidance basis: *'Plant room or rooftop plant: escape route in open air (overall travel distance 60m if one direction only, 100m if more than one direction).'*

The fire safety implications of PV systems are only recently beginning to be considered in the UK. The principal life safety concern associated with PV panels is firefighting. There are two aspects:

- PV cells will continue to create voltage and current if there is received insolation.
- The DC voltage causes muscles to contract; therefore there is a tendency for muscles to "grip" rather than be thrown–off. This is therefore more inherently dangerous.

An isolator switch shall be provided at fire service access level **AND** at roof access level. This isolator switch is to isolate the voltage as close as practicable to the PV cells. This is a significantly higher standard than required for Building Regulations compliance.

An outlet from the fire main shall be provided at roof level to assist effective firefighting if there were a PV fire. The LFB will have it procedures for firefighting; typically this would involve providing a "blanket" or screen over the PV's to minimise the risk of voltage production and also assist firefighting.

11 ACCESS AND FACILITIES FOR THE FIRE SERVICE

The development does not have a storey more than 18m above fire vehicle access level, so firefighting shafts are not required by the guidance.

However, a fire main shall be provided, with an outlet on each apartment storey - to facilitate effective firefighting. This shall ensure that all parts of every storey shall be within the guidance 45m hoselaying distance. The fire main shall be specified to BS9990 (2015).

There is no fire vehicle (or any vehicle) access within the curtilage of site. Fire vehicle access is by the public road and shall be to the front of the site. The guidance is that the dry riser inlet should be within 18m and within sight of the fire vehicle.

The plan below demonstrates the proximity of the nearest existing external hydrant (from Google Streetview). This is approximately 50m from the site, which significantly betters the guidance that an existing hydrant should be within 100m of the building.

31 Daleham Gardens is only approximately 1-2km drive from West Hampstead Fire Station, and approx. 3km drive from Kentish Road Fire Station.

A premises information box shall be provided, with information and at a location agreed with the LFB. *It is noted that this is also a recommendation from the Moore-Bick Grenfell Inquiry.*

BS9999 (DPC) gives the following guidance for information typically in a PIB

a) simple floor plan layouts, indicating any relevant fire resistance provisions, internal access provisions, firefighting facilities, building services and any specific hazards;

b) relevant information (including operating instructions) relating to equipment/fixed installations/active systems (e.g. smoke control systems) provided for means of escape or firefighting;

c) information regarding the implications of any fire engineering strategy on the performance of the building during a fire, e.g. reduced fire resistance of elements of structure or areas of the building with additional fire protection measures;

d) information relevant to preventing environmental damage;

e) relevant information (including operating instructions) relating to lifts provided for means of escape or firefighting. Where evacuation lifts or firefighters lifts are installed, these should be clearly signed at the fire service access level, and relevant information should be available detailing the locations of the main switch, rescue controls and machinery spaces; and