BexleyCo HOMES
COUNTRY LIVING IN LONDON

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Sidcup Library Residential

London Plan Policy D12 Fire Safety

Compliance Statement

Issue 1

Client: BexleyCo Homes
Architect: Stitch
Date: October 2021
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Fire Ingenuity

Capability Creativity Credibility

Contents

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Nigel is Managing Partner of Fire Ingenuity. Nigel has a fundamental engineering and safety & reliability background complemented by over 25years as a fire engineer in leading building design consultancies. Nigel has also developed British and European Fire Safety Engineering standards for buildings and advice for UK Government on how to apply and assess building fire safety. Nigel has class-leading experience in the practice and practising of fire engineering as a consultant.

Nigel is acknowledged for his ability to develop sophisticated solutions from a technically-excellent skill-base:

- Fundamental (mechanical) engineering skills, with specialist expertise in fluid dynamics, mathematics, & thermodynamics.
- Formal Safety, Risk & Reliability expertise, having operated in mature risk-based sectors including defence, nuclear, transport, oil & gas.
- Sophisticated modelling expertise, having developed commercial and in-house CFD software and commercial evacuation modelling software.

Nigel has had involvement, and continues to be involved, in development of national and European standards, guidance, and national strategy via committee representation. This includes:

- FSH24, continuing development of BS 7974, the fire engineering standard for the design of buildings. This has recently been re-written and issued (March 2019). As well as a general overview role, Nigel has specific roles in the following Published Documents (BS7974 comprises the Standard and supporting Published Documents):
    - Panel Chair 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 in Buildings (CEN TC127 WG8)
- General role in rationale for development of FIRECODE for DoH
- BS9999 Means of Escape for BSI.
- 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.

Nigel is currently acting as an expert witness on a c500apartment multi-block mixed-use development, having been specifically requested by the fire engineering consultancy (part of a major national multi-disciplinary building engineering consultancy practice) to represent them due to his expert knowledge and experience of residential design and approvals processes.

In accordance with the London Plan Policy D12, Nigel is a suitably qualified assessor: a qualified engineer and Member of the Institution of Fire Engineers and a competent professional with the demonstrable experience to address the complexity of the design being proposed. Nigel has compiled this D12 statement from information provided by the design team and client to address the aspects required by London Policy D12.

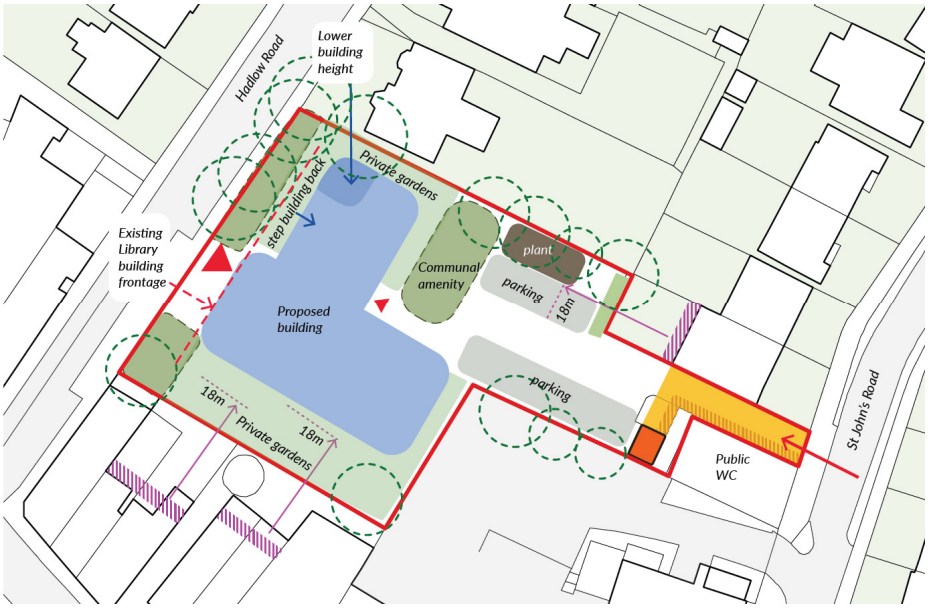
1 INTRODUCTION

Sidcup Library is located just off the High Street in Sidcup Town Centre.

The site is a 20 minute walk away from Sidcup Railway Station and is in close proximately to a number of bus stops and is in easy reach of local shops and services. It has a PTAL rating of 3.

To the south of the High Street is the open space of the Green which is part of a Conservation Area. North-west of the site is the Christchurch Conservation Area which contains the earliest developments of the town dating from the 1890s with an clear Victorian character. These will not directly impact development on the site but can bring influence and a sense of identity to further new housing in the town centre.

The plan diagram below sets out the main principles of proposed development on the site, taking into account the site constraints to bring the most efficient yet sensitive use of space.



The proposal is for a 4 storey building (Ground + 3 above-ground storeys) to deliver 32 homes with a mix of 1, 2, and 3 bedroom apartments:

	1 bed 2 person	1 bed 2 person WCH	2 bed 3 person	2 bed 3 person WCH	2 bed 4 person	3 bed 4 person	3 bed 5 person	Total
Ground								
Private								0
Shared Ownership	1	1		2		1	1	6
1st								
Private	2		1		3	1		7
Shared Ownership	2							2
2nd								
Private	4		1		3	1		9
3rd								
Private	3		1		2	1	1	8
Total	12	1	3	2	8	4	2	32
	40.6%			*40.6%*		*18.8%*		*100.0%*

This 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.

The basis of the fire strategy design is BS9991 (2015) “Fire safety in the design, management and use of residential buildings – Code of practice”. The housing is all Mainstream as defined in BS9991 (there is no specialised or residential care housing).

This fire strategy statement demonstrates how compliance with “Policy D12 Fire Safety” of the London Plan is 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 4 storeys and no apartment storey greater than 11m above ground level.

BS9991(2015) has been selected as the design guidance for the project since, in common with its sister publication BS9999, BS9991 is intended for "designing buildings to be managed".

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 are 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 (D1 LD2).
- The insulation and facade in the external walls system will be either non-combustible (European Classification A1) or of limited combustibility (European Classification A2-s1, d0), even though the legislation (SI 1230) and associated guidance would only require this in residential buildings over 18m.
- An evacuation lift is provided; this would not be necessary for Building Regulations compliance.
- The lift power supply is significantly enhanced compared with the standard required by BS9999 (2017), as it has a diverse supply in the building **as well as** a UPS. The UPS is inline and provides power in the unlikely event that both routes to the lift are compromised.
- The building construction is 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.
- The apartments all have protected entrance halls, which further improves the protection afforded to the common corridors.
- PV Arrays on the roof: An isolator switch is to 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 is to 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.*
- BexleyCo Homes will 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).
- BexleyCo Homes will appoint a management company to manage the development. The management company will 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 will be provided to assist the management company to effectively discharge its fire safety responsibilities.
  - Fire information signs are to 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.
- BexleyCo Homes have specified the enhancements to achieve the required high standards for fire safety without the need for sprinklers. It is noted that the development is below the height at which sprinklers would be required by the Building Regulations guidance.

3 BUILDING DESCRIPTION

There are a variety of dwellings provided over four storeys, as per the introduction. The approximate storey height of the 3rd Floor FFL is 10.2m.

4 BUILDING CONSTRUCTION

The building construction is 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.

5 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 will evacuate initially. The alarm system is stand-alone; alarm is only given in the dwelling affected by fire.

- All dwellings are 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.
- All dwellings have a protected entrance hall, which inherently provides a higher standard of protection to the common corridors.

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

There is step-free escape from the ground storey 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.

6 ESCAPE LIFT

The escape lift is specified for self-evacuation.

The power supply is significantly enhanced compared with the standard required by BS9999 (2017), as it has 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 will be provided inline, in the unlikely event that both electrical routes to the lift are compromised. The provision will 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.

7 PV FIRE SAFETY

Sidcup Library has 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

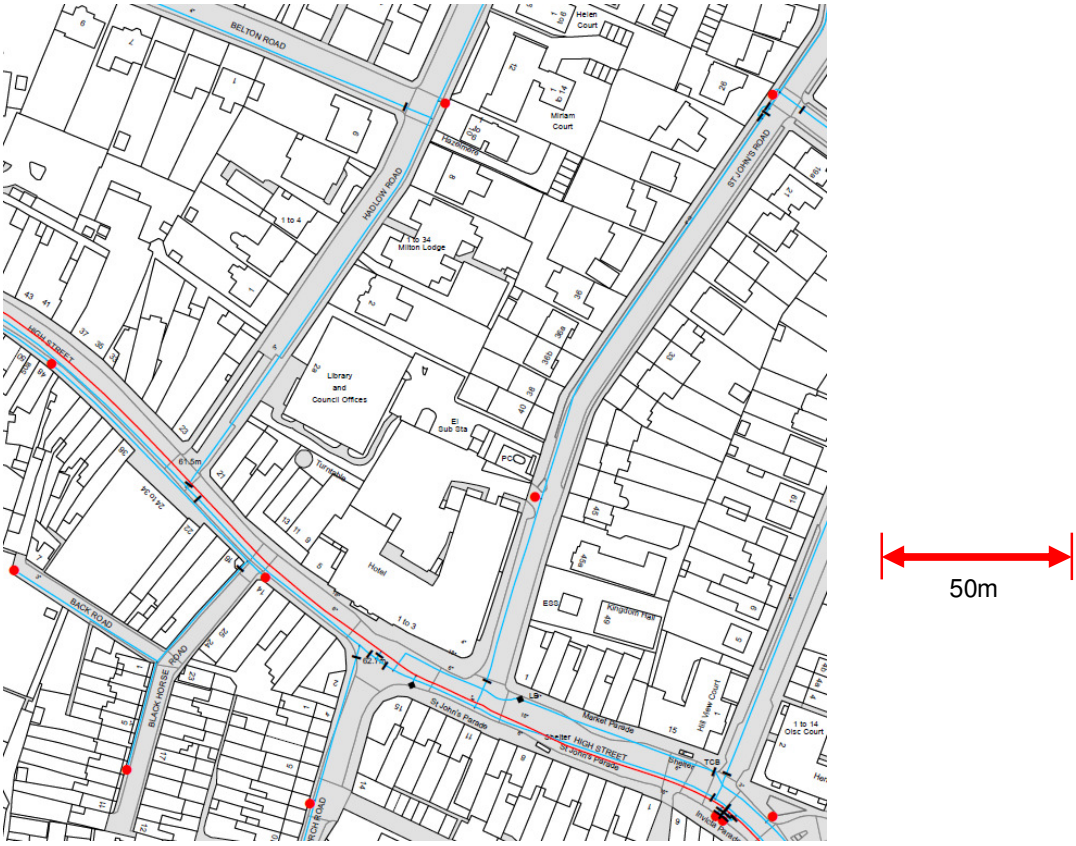
An isolator switch is to be provided at fire service access level **AND** at roof access level. This isolator switch is to isolate the voltage as close as practicable to the PV cells.

An outlet from the fire main is 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.

8 ACCESS AND FACILITIES FOR THE FIRE SERVICE

The development does not have a storey above 18m, so firefighting shafts are not required.

A fire main is provided, with an outlet on each apartment storey, to facilitate effective firefighting. The fire main is specified to BS9990 (2015). The dry riser inlet will be on the Hadlow Road elevation. The plan below demonstrates the extent and proximity of the external hydrants provision (red circles): two are within approx. 60m of the dry riser inlet, which significantly betters the guidance that a single hydrant should be within 100m.



A premises information box is to 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

Sidcup Library is only approximately 500m drive from Sidcup Fire Station, and there are two nearby fire stations (Eltham and Bexley) within approx. 5km drive.