

Darwin Court, Gloucester Avenue, London, NW1 7BQ London Plan Policy D12 Report



This report details the results of a fire engineering assessment of the Darwin Court development located on Gloucester Road in Northwest London. The assessment considers the proposed scheme against the requirements of Policy D12 of the London Plan, as detailed in Chapter 3 of The London Plan 2021 as published by the Greater London Authority

FE20097_Darwin Court London Plan D12 _01 12th March 2024

01772808581

info@deltafireengineering.co.uk



Record of Issue

Issue	Date	Written by	Reviewed by	Verified by	Amendments
01	30/01/2024	JK	JH	JH	Initial Issue
02	12/03/2024	JK	JH	JH	Updated -Elevations

Written by

Reviewed by

Verified by

father -

Joel Koyithara BEng (Hons) Senior Fire Engineer Delta Fire Engineering Ltd Joe Hart BSc (Hons) MSc MIET MIFireE MSFPE AMEI Group Director, Head of Fire Engineering Delta Fire Engineering Ltd Joe Hart BSc (Hons) MSc MIET MIFireE MSFPE AMEI Group Director, Head of Fire Engineering Delta Fire Engineering Ltd





1. Introduction and Scope

1.1 Introduction

Darwin Court is a group of existing residential apartment blocks situated on Gloucester Avenue, Camden, London. The development consists of 3 buildings with a total of 105 dwellings. It is proposed that these buildings are extended up one more storey, such that apartments are provided on the existing roof level. The 3 buildings comprise a total of 5 Blocks. Blocks A and B are adjacent to each other and consist of a shared car park on the basement level, though are treated as individual blocks with independent access. Block A contains 25 apartments (Apartments 1-25) and Block B consists of 20 apartments (Apartments 26-45).

Blocks C and D are adjacent to each other and consist of a shared car park. Block C contains 20 apartments (Apartment 46-65) and Block D has a total of 24 apartments (Apartment 66-89). Block E contains 16 apartments (90-105).

Blocks A and D consist of 7 storeys (Basement, Ground + 5) while Blocks B and C consist of 6 storeys (Basement, Ground + 4). It is understood that Blocks A-D were constructed at the same time; Block E was constructed approximately 2 years later. Block E is the smallest block within the development and consists of 5 storeys (Basement, Ground + 3).

Each block of apartments is directly accessed from Gloucester Avenue, with a car park running under all the blocks. The access to the car park is between Blocks B and C and the car park situated on the lower ground level is ventilated naturally.

The blocks are designed as single stair buildings. The protected stair serves ground and all the upper levels within the block but does not directly connect to the basement on the lower ground. In all blocks, the stair to the lower ground car park is accessed externally, adjacent to the final exit from the main stair.

As part of a proposed extension project an additional storey will be constructed at existing roof level across each of the blocks. For Blocks A and E, a single 3-bedroom open-plan apartment is proposed. For Blocks B, C and D two 2-bedroom apartments are proposed.

The existing protected stairs will be extended up to serve the new storey at existing roof level, with the building line stepping back slightly.



Figure 1 Site Plan



Figure 2 Proposed Extension Floor

1.2 <u>Scope</u>

Delta Fire Engineering Ltd have been engaged to provide fire engineering support with respect to the proposed upward extension of Darwin Court located on Gloucester Avenue, London, NW1 7BQ. Delta Fire Engineering attended site on 12/09/2023 to carry out a non-intrusive survey of the existing floor levels.

The scope of this report is to assess the proposed works against the London Plan requirements for fire safety, specifically London Plan Policies D5(B) and D12(B), and does not constitute a full fire strategy review against the Functional Requirements of the Building Regulations.

It is expected that a formal fire safety strategy for the scheme will be developed as the design progresses, building on the principles outlined within this fire statement, to allow a formal Building Regulations 2010 submission for the scheme.

The Government's system of fire safety gateways requires fire safety information for 'relevant buildings' to be submitted to the regulator. 'Relevant buildings' are defined as buildings that:

- contain two or more dwellings or educational accommodation, and
- are 18m or more in height, or 7 or more storeys, whichever is reached first.

The addition of proposed levels on the topmost level will mean that the building will become more than 18m in height. Therefore, a Planning Gateway One Fire Statement will be required. This will be need to be submitted to the Regulator as a separate report

1.3 <u>Consultation</u>

No consultation relating to the fire safety of the development is understood to have taken place to date. Consultation with the Building Control authority / Approved Inspector and local Fire and Rescue Service (London Fire Brigade) will begin in the next stages of design and continue throughout the design and construction stages of this development.

1.4 Design Codes/Standards

The fire safety design of the development will be primarily based on guidance within BS 9991: 2015 Fire safety in the design, management and use of residential buildings – Code of practice for residential areas. Where the design deviates from the guidance contained within the British Standards, this will be assessed using fire engineering principles following the general methodology of BS 7974:2019.



Delta Fire Engineering have been provided with the following information in the collation of this report:

Title	Drawing Number	Status	Received
Site Plan-As Proposed	306_PL_010	Planning	November 2023
Basement Plan-As Proposed	306_PL_201	Planning	November 2023
Ground Floor Plan-As Proposed	306_PL_200	Planning	November 2023
Fourth Floor Plan-As Proposed	306_PL_202	Planning	November 2023
Fifth Floor Plan-As Proposed	306_PL_203	Planning	November 2023
Sixth Floor Plan-As Proposed	306_PL_204	Planning	November 2023
Roof Plan-As Proposed	306_PL_205	Planning	November 2023
Typical Mid-Floor Plan- As Existing	306_PL_102	Planning	November 2023
Ground Floor Plan-As Existing	306_PL_100	Planning	November 2023
Site Plan-As Existing	306_PL_002	Planning	November <mark>2023</mark>
Flats 1-45 Elevations Proposed Elevations	306_PL_320	-	November 2023
Flats 46-89 Elevations Proposed Elevations	306_PL_321	-	November 2023
Flats 90-105 Elevations Proposed Elevations	306_PL_330	-	November 2023
Flats 90-105 Elevations Proposed Elevations	306_PL_329	-	November 2023

Table 1 Drawing Number

2. Site Address

Table 2 Site Address

Site Address	
Site address line	Darwin Court, 22 Gloucester Avenue
Town	London
Site postcode (optional)	NW17BG

3. Description of Proposed Development

The description of the development as stated on the application for permission form is:

Construction of a single-storey roof extension to the properties comprising Darwin Court to provide residential units and improvements to the existing entrances to the building'.

4. Qualifications & Experience of the Author

 Table 3 Qualifications (1)

Qualifications Name

01772808581

Joel Koyithara BEng (Hons)

info@deltafireengineering.co.uk

www.deltafireengineering.co.uk



Joel has over 5 years experience in Fire Engineering and is currently a Senior Fire Engineer. Joel is currently doing a MEng degree in Fire Engineering at the University of Central Lancashire. During his career, he has worked on a wide range of projects including residential (student, private and PRS), commercial, industrial, office, educational and more in the UK.

Table 4: Qualifications (2)

Joe Hart
BSc (Hons) MSc
Member of the Institution of Fire Engineers
Member of the Society of Fire Protection Engineering
Member of the International Association for Fire Safety
Science
Associate Member of the Energy Institute
Affiliate Member of the Royal Institute of British Architects
Reviewer

Joe is the Group Director and founder of the Delta Innovation Group and Head of Fire Engineering at Delta Fire Engineering Ltd. Joe has extensive knowledge in Fire Engineering with over 10 years commercial experience and is also Head of R&D at Delta Research and Development. Alongside his role at Delta, Joe is Lecturer in Fire Engineering at the University of Central Lancashire where he teaches fire engineering at both undergraduate and postgraduate levels.

5. London Plan Policy D12(B) and D5(B5)

In accordance with Section 2 of The Town and Country Planning (Development Management Procedure) (England) O9652+6rder 2015, a '**major development'** is defined as:

1	2	3	4
a	The winning and working of minerals or the use of land for mineral-working deposits	Yes	No
b	Waste development	Yes	No
c (i)	The provision of dwellinghouses where the number of dwellinghouses to be provided in 10 or more	Yes	No
c (ii)	The provision of dwellinghouses the development is to be carried out on a site having an area of 0.5 hectares or more and it is not know whether the development falls within sub- paragraph (c)(i)	Yes	No
d	The provision of a building or buildings where the floor space to be created by the development of 1,000 square metres or more	Yes	No
e	Development carried out on a site having an area of 1 hectare or more	Yes	No
	Does the scheme meet the definition of a 'major development'?	Yes	No

Table 5 Major Development Assessment

The London Plan 2021 includes two design policies to be taken into account when considering a Fire Safety Strategy for a building - Policy D5 "Inclusive Design" and Policy D12 "Fire Safety".



The London Plan Guidance Fire Safety Document released in February 2022 highlights that Policy D12 is broken into two policies D12(A) and D12(B). Although only 8 dwellings will be provided as part of the works (a single 3-bedroom open-plan apartment for Block A and Block E , and two 2-bedroom apartments for Blocks B, C and D), each of the blocks will contain more than 10 dwellings.

As per Table 3.1 of The London Plan Guidance, only Policy D12(B) applies to major developments. Table 3.1 of The London Plan Guidance is replicated in the table below (Table) and will be used as the basis for this report.

Development	Major	Non-major	Householder and
type	Development	Development	some Non-major development
Approach	Fire	Planning Fire	Reasonable
	Statement	Safety Strategy	Exception Statement
Relevant Section	Policy D12		
of London Plan	part B	Policy D12 part A	Policy D12 part <mark>A</mark>
Policy D12			
Form	Form 1	Form 2	For <mark>m 4</mark>
	Appendix 3 of the London Plan Guidance- Fire Safety Document, February 2022		

Table 6 Table 3.1 of London Plan Guidance-Fire Safety

The report specifies fire safety provisions to satisfy the D12(B) requirements (1) to (6) as per section 5.3 of the "London Plan Guidance Fire Safety" which was issued on February 2022.

Table 7 Demonstrating compliancy to London Plan Policy D12(B)

Form 1 – Fire Statement template (London Plan Policy D12B) for major			
Site Address	Table 2		
Description of development	Section 3		
Name, qualifications, professional memberships and experience of author	Section 4		
Has a Gateway One Statement been submitted?	No - Gateway One Statement will be submitted as separate document along		
Policy considerations (D12B) Potential	Policy considerations (D12B)		
 (1) The building's construction: methods, products and materials used 	Section 6.1		
(2) Means of escape for all building users and the evacuation strategy	Section 6.2		
(3) Passive and active fire safety measures	Section 6.3		
(4) Access and facilities for the fire and rescue service	Section 6.4		
(5) Site access for the fire and rescue service	Section 6.5		
(6) Modifications to the development and the 'golden thread' of information	Section 6.6		



6. Compliance with Policy D12(B) (Fire Safety)

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

Elements of Structure

The elements of structures should achieve 90-minutes fire resistance in Blocks A and D, whereas the elements of structures should achieve 60-minutes fire resistance in Blocks B, C and E. The elements of structures should achieve the fire resistance proposed in Section 6.3 and Table 10 in terms of load-bearing capacity.

It is understood that the existing building is concrete framed. However, this will need to be confirmed via a compartmentation survey. Concrete is a non-combustible material with a relatively low thermal conductivity, which has been shown to perform well in a fire, the fire resistance of the existing areas will need to be confirmed.

Airspace group have confirmed that the proposed levels will be constructed using lightweight substructure, i.e. light gauge steel frame (metsec) and a brick slip façade.

External wall construction

The addition of the proposed level on the topmost level would mean that the Blocks A and D will have an overall height greater than 18 m. Therefore, these blocks will need to meet the criteria for a 'relevant building' as defined by Regulation 7(4) of the Building Regulations, which requires all materials used in the external wall to achieve class A1 or A2-s1, d0 standard. For Block B, C and E, although these buildings are not treated as relevant buildings, the overall building height is greater than 11m, as such the construction for external walls and specified attachments should achieve a rating of Class A2-s1, d0.

It is recommended that any new sections of external wall are designed to achieve a minimum class A2-s1-d0 and this will become a legal requirement for any Relevant Buildings in the development. It should be noted that remediation may be required to relevant buildings where combustible elements are provided in the existing external walls. As per Approved Document B Volume 1:2022 amendments, this includes any insulation product, filler material (such as the core materials of metal composite panels, sandwich panels and window spandrel panels but not including gaskets, sealants and similar). This restriction does not apply to masonry cavity wall construction which complies with Diagram 8.2 of ADB:2019 including 2020 and 2022 amendments. The construction is two leaves of brick or concrete each at least 75 mm thickness.

The existing external walls are predominantly constructed from traditional brick and masonry. However, it is noted that there are vertical sections of panels, as seen below. It is unclear what these panels are constructed from and the fire performance of these panels,





and some remediation may be required where combustible components are identified within Relevant Buildings (i.e. those over 18m).



Figure 3 Continuous vertical panels

Under current guidance, the external surface of all residential buildings with a building height of greater than 11 m will need to achieve Class A2-s1, d0 or better. It is unclear what performance the spandrel panels would achieve, however a review of the external wall materials will be required as the design progresses.

Linings to limit internal fire spread

The surface linings of the circulation spaces and other rooms within the proposed level of each block will be in line with BS 9991:2015 to limit the surface spread of flame and minimising heat release rates.

6.2 (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

Evacuation Strategy

As with typical residential apartment buildings, the evacuation approach proposed revolves around the "stay put" evacuation strategy where only the occupants from the apartment of fire origin will evacuate. Occupants may also evacuate if they wish to do so, or if being instructed by the management of the building or the fire service.

No works will be carried out to the existing ancillary spaces and the existing basement car park. It is understood that the car park is ventilated via natural ventilation. Although no works are to be carried out to the existing car park, during the site visit it was noted that there were inner rooms with no automatic fire detection and alarm system. Therefore, it is recommended that a Category L3 AFDA system in accordance with BS 5839-1 should be provided. The Car Park and ancillary areas will evacuate based on a simultaneous evacuation policy.

Horizontal Means of Escape

<u>General</u>



The travel distance will be in accordance with the table shown below.

Area	One way escape	More than one direction
Open-Plan Apartments	20m	N/A
Unventilated Common Corridor	7.5m	N/A

Table 8 Travel Distance-Proposed Areas

<u>Residential</u>

The residential element of the building adopts a stay put evacuation strategy, as such the storey exit doors on a typical level are not expected to be used by a large number of occupants. Therefore, the width of doors along the escape route does not need to be larger than the minimum requirement for wheelchair users which is 850mm. Therefore, it is proposed that the doors into stair/stair lobbies and protected corridors are at least 850mm.

As per BS 9991, for common escape routes in single stair buildings with a floor level more than 11m above ground, every flat should be separated from the common stair by a protected lobby or common protected corridor. As per Figure 6 of BS 9991, ventilation should be provided to the common corridor/ventilated lift lobby.

Two 2-bedroom apartments are proposed for Blocks B, C and D, with the apartments accessed via a ventilated common corridor as seen in figure below. The common corridor will be ventilated via mechanical smoke extract system, with CFD analysis to be conducted later in the design stage. Note, this design is similar to Figure 6b of BS 9991:2015.



Figure 4 Two Bedroom Apartments- Blocks B and C







Figure 5 Two Bedroom Apartments- Block D

There is currently no specific guidance published for the design and implementation of evacuation lifts, however some information is provided within Annex G of BS 9999:2017. The London Plan guidance does also recommend a Type 2 lift car and Part M recommends at least an 8 person lift car.

The evacuation lift should be contained within a protected lift shaft and be provided with protected waiting areas (lobbies) in front of lift entrances which is served by smoke control measures.

As per the draft BS 9991, an evacuation lift lobby should not be directly accessible from any flat, maisonette, storage room or electrical equipment room. The common corridors or lobbies serving the flats or maisonettes should also be separated from the evacuation lift lobby by an FD 30S fire door as a minimum. Note, this is draft BS 9991, as such is subject to change. Two lobbies should be provided between the apartment and the evacuation lift. Therefore, the proposed cores will likely need re-arranging to facilitate the evacuation lift arrangement.

However, an engineered solution with only one lobby is be proposed on the proposed level of Block B, C and D. This is based on the following:

- As this is the topmost levels, it is also proposed that occupants can take refuge within the stair without impacting the occupant flow rate within the stair. Note, the stair will be provided with 1.5 m² AOV to roof rather than the 1.0m² AOV at the head of the stair, this will provide a higher level of ventilation and protection to the stair.
- Only two apartments will be accessed from the corridor, therefore, the expected occupancy within this level will be low.
- Although the apartments are treated as open-plan apartments with the provision of Category LD1 Grade D1 alarm coverage in accordance with BS 5839-6 and sprinkler system in accordance with BS 9251, a 30-minute protected entrance





hallway will be provided to act as a secondary lobby/provide some fire resistance between the area of fire origin (high risk area e.g. kitchen) and the lift.

• Fire size will be controlled due to the provision of sprinklers, and as such the likelhood of flashover is significantly reduced.

For Blocks A and E, a single 3-bedroom open-plan apartment is proposed. The lifts and stair wll be accessed via ventilated lobby. The area shaded in blue in the figures below indicate the ventilated common corridor. Although this design is un-common, as the lift is not accessed from the stair-core on this level, this is considered acceptable for means of escape purposes due the the following reason:

- The design is similar to Figure 6b of BS9991:2015, whereby the same level of protection is provided to Figure 6b of BS9991. I.e. the lift will sperated form the apartment via a common ventilated lift lobby. The stair will be separated from the apartment via a ventilated common corridor.
- The stair will be provided with 1.5m² AOV to roof rather than the 1.0m² AOV at the head of the stair, this will provide better ventilation and protection to the stair.
- There is only one apartment on this level. Therefore, any disabled occupants can evacuate using either lift or take refuge within the stair without impacting the occupant flow rate within the stair.



Figure 6 -Block A Ventilated Lobbies





During the site visit, it was noted that there are no smoke control measures provided within the common corridors, with the unventilated common corridor opening directly into the stair within each of the blocks. Although the building is existing, as part of the works to significantly improve B1 - Means of Warning and Escape, it is proposed that additional doors will be provided on the existing levels, which will in turn create a designated lift lobby similar to that of Figure 6a of BS9991. Note, the lift lobby will also be provided with mechanical ventilation. The area indicated in blue in the figure below indicates the ventilated area. The area shaded in red indicates the indicative location of the mechanical ventilation system.







Figure 8 - Typical Level- Common Corridors- Existing



Figure 9 - Typical Level- Existing Common Corridors-Proposed

Note, the mechanical ventilation system will be extended down to the ground floor level, to ventilate the lift lobby.





Figure 10 -Typical Level- Existing Ground Floor-Proposed

Therefore, the addition of smoke ventilation to the existing corridors with the provisions of provide sprinklers throughout all new floor levels will significantly the improve the means of escape, thus B1 of the Building Regulations.

It is understood no sprinkler provision is in place on existing floors. It is not proposed to extend coverage to existing floor levels, however this non-compliance will require early engagement with the approval authorities.

Non-Residential/Car Park

It is understood that there are inner rooms (ancillary areas and plant rooms) in the lower ground car park. It is noted that none of the following provisions (which constitute guidance for inner room conditions) are present:

- The enclosures (walls or partitions) of the inner room should stop a minimum of 500mm below the ceiling.
- The door or walls of the inner room should contain a vision panel (minimum 0.1m²), so people can see if a fire starts in the access room (car park).
- The access room (car park) should be fitted with an automatic fire detection and alarm system to warn occupants of the inner room if a fire starts in the access room.

It is therefore recommended that the car park is provided with an automatic fire detection and alarm system (AFDA). It is recommended that a Category L3 AFDA system in accordance with BS 5839-1 should be provided.

Vertical Means of Escape

All of the stairs within the Darwin Court blocks are protected stairs as the height from the access level (ground floor) to the topmost storey is less than 18m. Clause 28 states that the unobstructed width (measured between the walls and/or balustrades) of each common stair should be not less than 750mm.





As per clause 34 of BS991, every protected stairway should lead to a final exit, either directly or via a protected exit passageway. Any protected exit corridor or stair should have the same standard of fire resistance and lobby protection as the stair it serves.

In the existing layouts, the stair-core discharges back into the unventilated common corridor on ground floor level. Although egress from the common corridor to the external is provided, apartments open directly into the final exit route, thus, no protected exit route is provided from within the building for all blocks.

During the site visit, it was noted that although a final exit directly to the outside is provided from the residential and car park stairs, it was observed that these exits were provided with metal railings, making it unusable. It was clarified on site that the final exits from the stairs were initially directly to the external. Therefore, it is proposed that the railings to block the final escape route from each of the stairs should be removed, such that occupants can evacuate directly to the external from the stairs.

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

Fire detection and alarm system

The systems proposed are summarised in Table 9.

Location	Detection and Alarm system	Design Standard	Sounder in the area	Manual call points in the area
In each proposed	Category LD1	BS 5839-6	Yes	No
apartment	Grade DI			
Enclosed Common Corridors/Stair (where applicable)	Category L5	BS 5839-1	No	No
Car Park and Ancillary areas	Category L3	BS 5839-1	Yes	Yes

Table 9 Fire detection and alarm system

Evacuation alert system

For Blocks A and D, although the height is less than 18 m to the topmost level from the access level, an evacuation alert system is recommended to these blocks. This is because even though the height of the building is less than 18m to the topmost level from the access level, the height to the top storey is greater than 18m when measured to the lowest side of the building, as such it is recommended in order to further aid firefighting provisions that an evacuation alert system is provided to these blocks. This will allow the Fire and Rescue Service to alert individual or multiple floors to evacuate simultaneously should the need arise during firefighting operations, instead of knocking at each apartment door one by one. The system will be designed and installed in line with BS 8629:2019 – Code of Practice for the Design, Installation, Commissioning and Maintenance of Evacuation Alert Systems for use by the Fire and Rescue Service in Buildings Containing Flats.





After the addition of the proposed level for Blocks B, C and E, the height to the topmost level from the access/ground level is less than 18m, as such evacuation alert system is not proposed.

Passive fire protection – Elements of structure

For blocks A and D, the height measured from the ground to the top occupied floor is greater than 18m but less than 30m, as such the elements of structure of these blocks shall achieve 90-minutes fire resistance in terms of load bearing capacity when classified in accordance with BS EN 13501-2 for load-bearing elements of structure.

For blocks B, C and E, the height measured from the ground to the top occupied floor is greater than less than 18m, as such the elements of structure of these blocks shall achieve 60 minutes fire resistance in terms of load bearing capacity when classified in accordance with BS EN 13501-2 for load-bearing elements of structure.

Where one element of structure supports, carries or give stability to another, the fire resistance of the supporting element should be no less than the minimum period of fire resistance for the other element (whether that element is loadbearing or not).

Passive fire protection – Compartmentation and Fire Doors

The compartmentation should be in accordance with the table below for the proposed levels.

Block	Element	Fire resistance European Standard (minutes)
Blocks A & D	Protected Stair Core	REI 120
Blocks A & D	Evacuation Lifts Core	REI 120
Blocks A & D	Service risers	REI 120
Blocks A & D	All floors	REI 90
Blocks B, C & E	Stair Core	REI 60
Blocks B, C & E	Evacuation Lifts	REI 60
Blocks B, C & E	Service risers	REI 60
Blocks B, C & E	All floors	REI 60
All Blocks	Residential common corridor	REI 60
	Enclosure of each apartment	REI 60

Table 10 Compartmentation

Fire-resisting doors should be specified as complete fire door sets and should achieve the minimum level of fire resistance when tested in accordance with either BS 476-22 or the appropriate European Standard and classified in accordance with BS EN 13501-2.

Note, where the suffix S/Sa is used, the fire door is required to provide smoke seals.

Table 11 Fire Door



Door Location	Fire Rating (minutes)	European Standard (minutes)	Self-closing device required?
Evacuation Lift Doors-Block A and D	FD60	E60	N/A
Evacuation Lift Doors- Blocks B,C and D	FD30	E30	N/A
Apartment entrance doors	FD30S*	E30Sa	Yes
Stair Doors- Block A & D	FD60S	E60Sa	Yes
Stair Doors- Block B, C and E	FD30S	E30Sa	Yes
Lobby Doors	FD30S	E30Sa	Yes

*It is proposed that the apartment doors on the proposed level of Block is provided with FD60s.

Fire-stopping

The requirements for the openings for pipes, fire-stopping, fire rated ductwork and fire dampers will be detailed in the next design stage. The fire stopping should nonetheless typically reinstate the fire rating of the breached compartment line to the same standard, as specified in the tables above. Fire stopping should comply with BS 9999: 2017 and BS 9991: 2015. Note, a compartmentation will will need to be carried out in the existing areas to see if sufficient have been provided within the key areas, such as means of escape, any riser etc.

Passive fire protection – Cavity barriers

Requirements for cavity barriers in external walls and extended cavities will be detailed in the next design stage. They should nonetheless comply with BS 9991: 2015.

<u>Signage</u>

Exit and directional signage should be provided in accordance with the requirements of BS ISO 3864-1, BS 5499-4 and BS EN ISO 7010.

Emergency lighting

Emergency lighting should be provided in accordance with BS EN 1838 and BS 5266.

Sprinkler system

None of the existing buildings are understood to be provided with sprinklers. Blocks A to D are greater than 11m, as such would require sprinkler provisions to comply strictly in accordance with the latest recommendations (Approved Document B: Volume 1 2019-incorporating 2022 amendments). However, these buildings were built in c.1970s.

For Blocks A and D as the height of top storey, when measured from upper floor surface of top floor to ground level on lowest side, these buildings will be greater than 18m, a Category 4 sprinkler system should be installed in accordance with BS 9251:2021.

For Blocks B, C and E, as the height of top storey measured from upper floor surface of top floor to ground level on lowest side these buildings will be greater than 11m but less than 18m, so a Category 2 sprinkler system should be installed in accordance with BS 9251:2021.



It is noted that under contemporary guidance sprinklers should be provided throughout the building. It is proposed to provide sprinklers throughout all new floor levels, however it is understood no sprinkler provision is in place on existing floors. It is not proposed to extend coverage to existing floor levels, however this non-compliance will require early engagement with the approval authorities.

Smoke ventilation system

It was noted that there are no smoke control measures provided within the common corridors in any of the blocks. The unventilated common corridor opens directly into the stair within each of the blocks. Although the building is existing, as part of the works to significantly improve B1 - Means of Warning and Escape and to provide more protection to the stairs, it is proposed that additional doors will need to be provided on the existing levels. This will in turn create a designated lift lobby- similar to that of Figure 6a of BS9991. Note, the lift lobby will also be provided with mechanical ventilation.

Note, this is a significant improvement to the existing condition, and satisfies the reccommendations outlined in BS 9991.

On the topmost levels/proposed levels of all the blocks, the common corridors and the lift lobbies will be ventilated via a new 1.5m² AOV to the roof.

It is proposed that the AOV at the head is to be 1.5m² rather than the minimum recommendation of 1.0m². This is 50% over the recommendation stated within the latest guidance and will provide significant enhacement to the stair.

The building management team will be required to develop management plans for the building that will ensure that the passive and the active fire safety systems are adequately maintained in accordance with the appropriate design guidance. This will be monitored and reviewed as a part of their obligations under the Regulatory Reform (Fire Safety) Order 2005.

6.4 (4) Access and facilities for the fire and rescue service

Vehicle Access and Dry Riser Main

There are no fire mains within any of the blocks even though the hose laying distance is greater than 45m to the furthest point from the fire appliance setting down point. Therefore, it is proposed that all blocks will be provided with a new dry riser main. Dry fire main inlets should be provided on the facade, close to the entrance to the building and visible from the road with outlets provided at all levels (across new and existing floors). Access should be provided for a pumping appliance to within 18m of each fire main inlet connection point, with inlets located on the face of the building.

The blocks are existing, and the access to each of the blocks is via Gloucester Avenue. The indicative location of the inlets are within 18m of the pumping appliance. The approximate distance is measured to be 9m.





Figure 11 - Dry Riser Inlet and Outlet.

The height from the top storey to the access level (ground floor) is less than 18m for all of the blocks, as such no firefighting shafts will be provided/required within the development. However, due to the height of the building of Blocks A and D (height from top-storey to the lowest side being greater than 18m), it is proposed that as an enhancement to the stair and lift shaft within Blocks A and D should achieve 120 minutes fire resistance. This is a significant enhancement from the existing. Evacuation

6.5 (5) Site access for the fire and rescue service

The LFB – GN 29 Access for Fire Appliances, recommendations are as follow:

Appliance		Distance
Minimum width of road between kerbs (m)	3.7	
Minimum width of gateways (m)	3.1	
Minimum turning circle between kerbs (m)	26.0	
Minimum turning circle between walls (m)	29.0	
Minimum clearance height (m)	4.0	
Minimum carrying capacity (tonnes)	23.0	
Maximum reversing distance (m)	20	

As this is an existing site, it is understood that the Gloucester Avenue can support the weight of the appliance. No works will be carried out to the street.

Water supplies for firefighting purposes will be provided by local fire hydrants, provided such that they will be within 90m to the fire main inlet.

Each fire hydrant should be clearly indicated by a plate, fixed nearby in a conspicuous position, in accordance with BS 3251. As this is an existing site it is expected that there will be public hydrants within 90m. Note, this will be confirmed at the next stage. The working condition of the hydrant will be confirmed by the design team.

6.6 (6) Modifications to the development and the 'golden thread' of information

Golden Thread





Delta Fire Engineering Ltd are not expected to act as the Dutyholder or Accountable Person with regards to the Golden Thread process.

However, we shall exercise reasonable skill and care, with regards to the extent of the appointed scope, and support the Dutyholder/Accountable Person in developing and maintaining the Golden Thread of information on the scheme.

Modification to the development

Darwin Court blocks are existing residential blocks, with proposals to provide an additional level on the current roof level by way of an upward extension to each block. The current proposal significantly improves the fire safety provisions within the building. It is currently understood that the blocks of flats are not provided with any Fire Strategies. The proposal would allow for significant enhancements to the fire safety measures within the blocks as well as providing the development with fire safety strategy reports and Operations & Maintenance manuals for the fire safety systems in the buildings. If any future works are to be carried out following the airspace alteration, the fire strategy needs to be considered holistically and alterations to any aspect of the design will need careful validation by a suitably qualified fire engineer.

7. Compliance with Policy D5(B5)

7.1 Introduction

The London Plan Policy D5(B5) requires development proposals to be: "[...] designed to incorporate safe and dignified emergency evacuation for all building users. In all developments where lifts are installed, as a minimum at least one lift per core (or more subject to capacity assessments) should be a suitably sized fire evacuation lift suitable to be used to evacuate people who require level access from the building."

7.2 Evacuation Lifts.

There is limited guidance available on the design and implementation of evacuation lifts within residential developments. The limited guidance within BS 9991, BS 9999:2017 and draft guidance1,2,3 has been considered in conjunction with fire engineering experience and expertise to guide the development of this fire strategy.

BS 9991 recommends that evacuation lifts are clearly signed at the final exit storey with information provided detailing the locations of the main switch, rescue controls and machinery spaces. Evacuation lifts should be suitably maintained and tested periodically to ensure their operation in the event of an evacuation.

The London Plan (draft) guidance outlines the key features of an evacuation lift as follows which are to implemented in this project:

- Contained within a protected lift shaft;
- Provided with protected waiting areas (lobbies) in front of lift entrances;
- Served by smoke control measures (including within lobbies);

¹ DRAFT Mayor of London, 'Lond<mark>on Plan Guidance: Fire Safe</mark>ty', February 2021.

² DRAFT Greater London Authority, 'London Plan Guidance Sheet: Policy D5(B5), n.d.

³ DRAFT BS EN 81-76, 'BS EN 81-76, 'Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lift. Part 76: Evacuation of persons with disabilities using lifts', 2019.





- Provided with a separate power supply to enable continuous use throughout an evacuation;
- Provided with water protection measures for electrical components in the shaft and lift car;
- Indicated with clear signage, lighting and pictograms of the evacuation route to the lift;
- Detailed in a management plan setting out operational procedures;
- Provided with a lift control system supported by the fire detection and alarm system;
- Provided with an emergency intercom/communication system and lift operation;
- Provided with emergency trap doors within the lift car;
- Provided with visual and audible indications within the lift car;
- Operated by a trained person.

The guidance does, however, state that lifts may be used in 'automatic mode' with direction from building management, trained evacuation assistants or rescue services. It is, however, acknowledged that in some buildings an operative will not be available and so residents using the lift should be trained on operating it and allowed to self-drive the lift.

The guidance also states that contingency arrangements should be made for both building occupants and firefighters should a lift break down or be out of service. Contingency arrangements should be developed by the Responsible Person.

Residential levels will operate a 'stay-put' evacuation policy in which only those in the flat of fire origin are expected to evacuate in the first instance. Any requirement for additional persons to evacuate will be progressive. The largest expected occupancy of any individual flat (based on bedroom provision) is 6 persons. A car size of at least type 2 (in accordance with BS EN 81-70) should accommodate this occupancy.

In accordance with the (draft) guidance within BS EN 81-76: 2019 draft publication, fire and smoke detection should be provided to the evacuation lift well, safe areas and machinery spaced. A means for diverting water away from the lift well should be provided to protect from water ingress in the event of sprinkler activation.

BS 9999 details evacuation lift guidance for non-residential buildings. In the absence of published guidance for residential buildings, design guidance from this standard as been considered. BS 9999 recommends that refuges for evacuation lifts are sized at a minimum of 900mm x 1400mm and that doors are at least 850mm wide.

Direct access from the stair to the lift waiting area should be provided as per the reccommendation of Annex G of BS999.

The evacuation lifts should be provided with a primary electrical supply from a sub-main circuit dedicated to the evacuation lift and a secondary power supply should be provided. Further detail on the electrical supply provision can be found in Annex G of BS 9999 and designed in cognisance of BS 85194. Level access should be provided to the final exit which is to be provided in the existing location.

It is proposed that evacuation lifts are provided in all of the Blocks.

⁴ BS 8519, 'Selection and installation of fire-resistant power and control cable systems for life safety and fire-fighting applications.' 2020





8.0 Conclusion

This technical note has been prepared by Joel Koyithara, Senior Fire Engineer and checked by Joe Hart, Director. All findings and assumptions detailed within this note are based on the information drawings provided in Table 1.

The existing building lacks significant fire safety measures such as ventilation and adequate provisions of fire service access. Therefore, it is Delta's opinion that the building in its current form does not meet the Functional Requirements B1 to B5 of Part B of the Building Regulations and the existing building do not comply with the London Plan Policies D5(B5) and D12.

The proposal of the additional level provides an opportunity to significantly enhance the fire safety measures within each of the blocks in the Darwin Court development. Delta Fire Engineering have provided engineered solutions (outlined within this document) to significantly make the blocks safer for the existing occupants within building.

13.0 Verification

In accordance with our internal Quality Assurance procedures, this document has been reviewed and approved for issue by a Company Director.

Prepared by	Reviewed by
Joel Koyithara Senior Fire Engineer Delta Fire Engineering Ltd	Joe Hart BSc (Hons) MSc MIFireE MSFPE AMEI
	Director Dolta Fire Engineering