



# PLANNING FIRE STRATEGY REPORT REV 4.0

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23 Crescent East, Barnet EN4 0EY

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8<sup>th</sup> November 2023

## Author Credentials





Nadim has a first-class honors MEng in Aerospace Engineering, an international Diploma in Risk Management including having studied at Oxford University (Exploring the Universe) and Imperial College Business School (Business Economics.).

Nadim is ex Technical Director of Arcadis and ex Associate Director of Arup (both global engineering design firms) where he headed up the Safety Risk and Human Factors teams. Nadim is dual Chartered through the Institute of Mechanical Engineers (IMechE) and Chartered Institute of Building Service Engineers (CIBSE).

Nadim became a Chartered Engineer in an unprecedented three years and then followed this up by becoming one of IMechE's youngest Fellows. Nadim is a full member of the Institute of Fire Engineers (IFE) and has specialist experience in Safety, Reliability, Fire and Risk having worked in this field for over 15 years. His experience covers a range of industries including rail, nuclear, defence and the built environment. Nadim has established himself as a technical risk leader and has won numerous industry awards (4-won, 8 finalist positions) testifying to this including being nominated for the prestigious, Royal Academy of Engineering (RAE) Silver Medal Prize.

Nadim has served time as a Non-Executive Director on 2 separate Risk and Audit boards, written numerous technical publications and has frequently spoken at international conferences including being invited on to expert panels. Nadim currently sits on the Institute of Fire Engineers working group for fires in electric vehicles.

## Revisions

Revision	Date	Prepared By	Comments	Signature
1.0	28.08.2023	Nadim Choudhary	Issued for Comment and Acceptance	
2.0	13.10.2023	Nadim Choudhary	Updated drawings	
3.0	26.10.2023	Nadim Choudhary	Updated with client comments	
4.0	08.11.2023	Nadim Choudhary	Updated with client comments	

This report has been prepared for the sole benefit, use and information of the client named in this report only and the liability of Rockland Safety Services Ltd, its directors, and Employees in respect of the information contained in the report will not extend to any third party.

This report is formulated based on information and experience available at the time of preparation. It is applicable to the above-mentioned project only in accordance with the client's instructions. It is only valid provided no other modifications are made other than those for which a formal opinion has been sought and given by Rockland Safety Services Ltd.

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# 1. Purpose of Document

Fire Safety Services trading under Rockland Safety Services Ltd have been instructed in the development of a Planning Fire Strategy (this document) for the development at 23 Crescent East, Barnet EN4 0EY. This report should be updated and coordinated further with the design team at the detailed design stage at which point a full Fire Safety Strategy document should be developed.

## 1.1. Fire Safety Objectives

The primary objective of this report is to help provide a design that minimises the fire risks to people within the building. To achieve this, the design aims to:

- Prevent fires in the first place by minimising sources of ignition.
- Minimise fire escalation by all means possible including the facilities fabric and materials.
- Minimise hazards from a fire - smoke, toxic fumes, damage to structures that could lead to unsafe structural conditions (e.g., avoiding structural collapses).
- Provide a means by which the conditions that might lead to a fire are detected early enough for preventive action (e.g., thermal detection on machines).
- Provide a means to initiate the evacuation (includes alarms).
- Prevent people entering or re-entering the building during the fire.
- Provide the means by which people can escape from the fire hazards (including whilst evacuating) and reach a place of relative safety without undue exposure to fire hazards (escape routes from all areas that are ideally familiar).
- Provide a design that minimises the time to extinguish the fire safely and remove fire hazards.
- Ensure Fire-fighters can operate in reasonable safety.

## 1.2. Legislation

The main fire legislation applicable to this building includes The Building Regulations, The Regulatory Reform (Fire Safety) Order 2005 and the Fire Safety Order 2021.

This document forms a concept approach for fire matters, the design team must ensure the contents of this report are incorporated in the building. This concept will not prevent a fire occurring and good housekeeping will be encouraged to reduce the risk. This strategy is mainly concerned with getting occupants out of the building safely and providing measures, where necessary, to assist the fire fighters in their operations.

The concept is only valid where the systems are designed correctly and maintained in an operating condition. If there is a failure in the management approach and a fire occurs, this concept will not reduce the impact on contents and building damage.

Following occupation, the developer / management of the premises are required under current legislation to carry out a fire risk assessment.

### 1.2.1. Building Regulations 2010 (as amended to date)

The construction or modification of any building in England & Wales needs to comply with the statutory requirements of the Building Regulations. These regulations deal with the minimum standards of design and building work for the construction of residential, commercial, and industrial buildings. The Building Regulations contain a list of requirements, referred to as Schedules, which are designed to ensure the health and safety of people in and around buildings. There are 14 Parts, which cover subjects such as structure, fire safety, ventilation, drainage, etc.

In the case of fire, the regulations are dealt with under the functional requirements B1 to B5 of Schedule 1 of the Building Regulations.

- B1 - Means of Warning and Escape.
- B2 - Internal Fire Spread (Linings).
- B3 - Internal Fire Spread (Structure).
- B4 - External Fire Spread.
- B5 - Access and Facilities for the Fire Service.

There are several prescriptive documents, which can be adopted to show compliance with the Schedules. These include Approved Document B Volume 1 (ADB) and BS 9991 which are considered as adequate to provide general guidance for residential buildings.

### 1.2.2. Regulatory Reform (Fire Safety) Order 2005 and Fire Safety Order 2021

In this development, the Regulatory Reform (Fire Safety) Order 2005 and the Fire Safety Order 2021 will apply once the building works are completed, and the building is occupied. The responsible person must ensure a fire risk assessment is carried out which focuses on the safety of all relevant persons in the event of a fire. It is vital that this includes the consideration of external wall systems, fire doors as well as occupants with different needs (such as people with disabilities) to ensure that the fire safety measures adopted are easily and readily accessible for all.

The fire risk assessment must include consideration of any dangerous substances likely to be on the premises and identify risks that can be removed or reduced. This informs the nature and extent of the general fire precautions that need to be taken to protect all relevant persons against the fire risks that remain.

The building management team will be responsible for the appropriate management of the fire safety provisions, and that they are to be maintained and tested over the whole life of the building.



### 1.2.3. Regulation 7

Regulation 7 has been recently amended in 2018 and 2022 to identify buildings with a floor in excess of 18 as being a 'relevant building'. 'Relevant buildings' are allowed to include only specific low risk materials as part of the external wall system.

Albeit this building is assumed to not include a floor in excess of 18m, therefore not classed as a 'relevant building', it is proposed to comply with the requirements of Regulation 7 for 'relevant buildings' as a robust way to indicate compliance with the functional requirement B4 (external fire spread), to reduce the approval's risk overall and to reduce the risk with respect to the properties likely needing an ESW1 form. Therefore, all external wall materials and specified attachments, except those in Regulation 7(3), should achieve Class A1 or A2-s1, d0 in accordance with BS EN 13501-1.

This is also in accordance with the amendment to ADB dated June 2022, reducing the top floor height threshold from 18m to 11m for external wall materials to achieve Class A2-s1, d0 or better.

Additionally, Regulation 7(1A) has been introduced to prohibit the use of relevant metal composite materials forming part of the external wall systems or specified attachments of all buildings. Relevant metal composite materials are defined as any panel or sheet, having a thickness of no more than 10mm which is composed of a number of layers two or more of which are made of metal, alloy or metal compound and one or more of which is a substantial layer made of a material having a gross calorific value of more than 35MJ/kg when tested in accordance with BS EN ISO 1716. A substantial layer is defined as a layer which is at least 1mm thick or has a mass per unit area of at least 1kg/m<sup>2</sup>.

### 1.2.4. Regulation 38

Regulation 38 of the Building Regulations states that, where building work involves the erection or extension of a relevant building, or a relevant change of use of a building which affects fire safety, it is necessary that the fire safety information for the building shall be given to the responsible person at the completion of the project or when the building or extension is first occupied.

The information will facilitate the production of fire risk assessment which is a requirement of the Regulatory Reform (Fire Safety) Order. The fire safety information in this strategy may be used to supplement the information required to be given to the responsible person. As a minimum it will be necessary for the occupiers of the building to be given the detailed fire strategy document and all as built fire safety plans.

## **1.3. Property Protection**

The guidance and recommendations herein are primarily concerned with the protection of life and preventing conflagration. However, the life safety objectives of this fire safety strategy will

also aid in protecting the property by minimizing damage to the building and contents caused by heat, smoke, and firefighting.

The provision of fire safety systems for life safety does not necessarily give adequate protection to property or to the continuity of the business carried out in the building. It is therefore recommended that if the potential for property and business loss is considered important, an additional assessment should be undertaken, so that the risks are understood and addressed.

## 2. Type of Property

### 2.1. Description

The project represents the development of a new block of flats. The site is flanked by Crescent East towards the South, and other properties towards the North, East and West.

The new block of flats consists of four storeys (B + G +2), with a top occupied storey (second floor) of less than 11m above the lowest adjoining ground, with a single duplex flat on lower ground and ground. The building is served by a single stair core and lift. The building is proposed to include a covered car park and plantroom at the lower ground and single storey flats on the ground, first and second floors. It is noted that the car park and plantroom are accessed only directly from the outside.

This report covers the entire building in the finished building condition. Phased or temporary arrangements fall beyond the scope of this report. All occupants are assumed to be able to evacuate independently at all material times.

It is the understanding of Rockland Safety Services Ltd that the building does not include a floor in excess of 18m above the lowest adjoining ground, when measured in accordance with Diagram D6 of ADB.

The design team should immediately inform Rockland Safety Services Ltd if the understanding of the project, or any assumptions within this report are not accurate.

### 2.2. Design Approach

Approved Document B Volume 1 (ADB) has been employed as the guidance document to develop this planning fire strategy. This report is not exhaustive in nature. Therefore, where not specifically stated, all fire safety provisions should be in accordance with ADB, and the documents referenced therein.

### 2.3. Purpose Group

The building will be used as a block of flats therefore the purpose group selected will be Flats [1(a)], as described in Table 0.1 of ADB (see extract below).

#### Volume 1 purpose groups

Title	Group	Purpose for which the building or compartment of a building is intended to be used
Residential (dwellings)	1(a) <sup>(1)</sup>	Flat.
	1(b) <sup>(2)</sup>	Dwellinghouse that contains a habitable storey with a floor level a minimum of 4.5m above ground level up to a maximum of 18m. <sup>(3)</sup>
	1(c) <sup>(2)(4)</sup>	Dwellinghouse that does not contain a habitable storey with a floor level a minimum of 4.5m above ground level.



## 3. Requirement B1: Means of Warning and Escape

“The building shall be designed and constructed so that there are appropriate provisions for the early warning of fire, and appropriate means of escape in case of fire from the building to a place of safety outside the building capable of being safely and effectively used at all material times.” - Part B of Schedule 1 of the Building Regulations 2010.”

### 3.1. Evacuation Strategy

All residential units should employ a ‘defend-in-place strategy’, whereby only the residential unit of fire origin should evacuate immediately upon activation of the fire alarm therein. Occupants from other residential units should be able to evacuate if they wish to do so or if prompted by the Fire Service, however the other residential units will not receive an automated evacuation signal.

All ancillary areas (car park, plantroom) should employ a simultaneous evacuation strategy, whereby the each ancillary area should evacuate immediately upon activation of the fire alarm therein.

### 3.2. Fire Detection

Each residential unit should include a Grade D1 Category LD1 fire detection and alarm system designed, installed and maintained in accordance with BS 5839-6. These should include smoke detection in all rooms and all areas and heat detection in the kitchen.

The lower ground and the common residential parts of the building should be covered by a Category L5 fire detection and alarm system designed, installed and maintained in accordance with BS 5839-1. This system should be employed to trigger the smoke ventilation systems (see Section 3.10), and also evacuate the ancillary areas.

The communal system should include smoke detection in the communal staircase, common corridors and all ancillary areas. The fire alarm panel for the block of flats should be located near the main entrance of the staircase on the ground floor.

The fire detection and alarm engineer should ensure the cause-and-effect is fit-for-purpose for all parts of the building. On completion of commissioning, a separate certificate must be issued with the recommendations of the fire detection and fire alarm systems.

### 3.3. Automatic Fire Suppression

As the building does not include a floor in excess of 11m above the ground and, automatic fire suppression is not considered a minimum requirement for the building. Therefore, this fire strategy has been developed without relying on this provision.

### 3.4. Escape Signage

Escape signage should be designed and installed in accordance with BS ISO 3864-1, BS EN ISO 7010, and BS 5499-4. It is expected that escape signage should be provided to the communal staircase, common corridors and ancillary areas.

### 3.5. Emergency Lighting

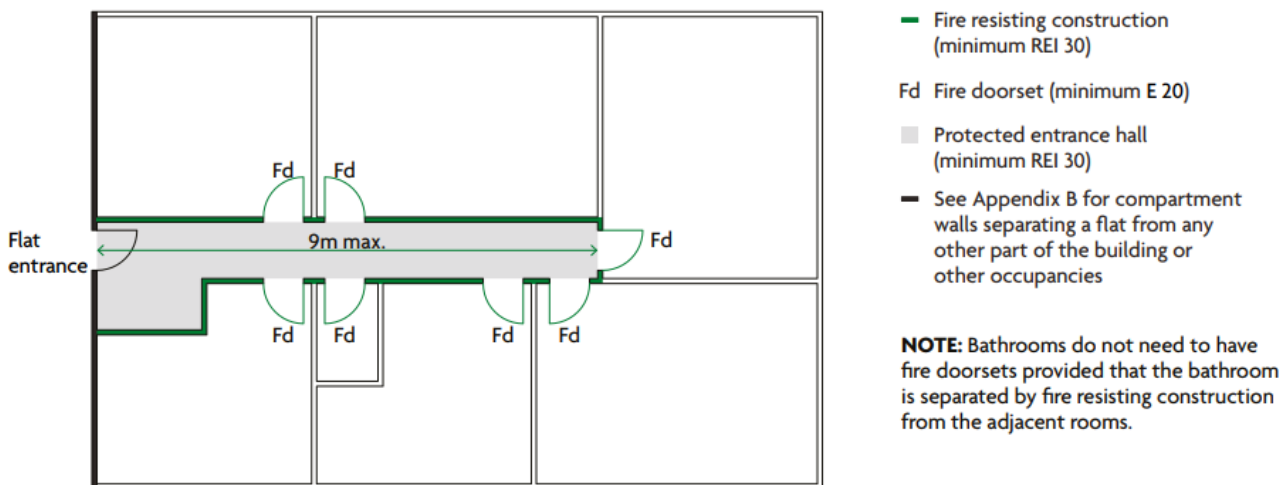
Emergency lighting should be designed and installed in accordance with the recommendations of BS 5266-1 and BS EN 1838. It is expected that emergency lighting should be provided to the communal staircase, common corridors and ancillary areas.

### 3.6. Escape within Flats

All flats should employ protected entrance halls in accordance with Diagram 3.2 and Section 3.18.a) of ADB (as extracted below).

Each protected entrance hall should achieve 30 minutes of fire resistance and serve all habitable rooms via FD30 fire doors. Travel distance within the protected entrance hall should be limited to 9m.

Kitchen hobs or other similar high risk cooking appliances should not be located within 1.8m of the escape route from the living / kitchen areas (or any terrace / balcony served by these area). Special care should be employed when selecting the hob location to comply with this requirement.



### 3.7. Escape within the Ancillary Areas

Ancillary areas are noted to be accessed only directly from the outside. The design team should confirm that there are no ancillary areas opening either directly into the staircase or into a staircase lobby.

Travel distances in the plantroom should be limited to 9m in a single direction of escape. For the car parking areas, travel distances should be limited to 18m in a single direction of escape.

### **3.8. Inner Rooms**

Inner rooms are rooms accessed only via another room, called an access room. Bedrooms and living rooms are not permitted as inner rooms. The only rooms permitted to be inner rooms should be:

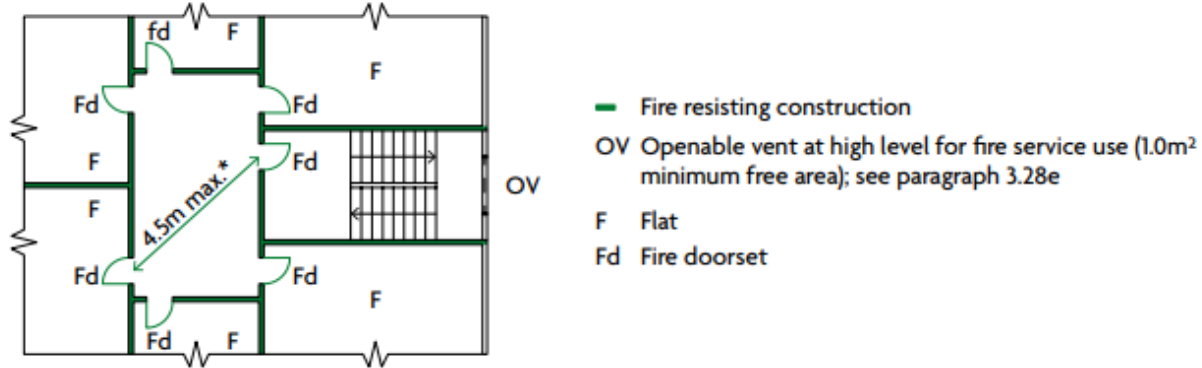
- A kitchen.
- A laundry or utility room.
- A dressing room.
- A bathroom, WC or shower room.

### **3.9. Escape in Common Parts of Block of Flats**

The common residential areas within the block of flats will follow the guidance of Section 3.28 and Diagram 3.9.a) of ADB (as extracted below) for a small single stair building. The building should comply with the following provisions:

- The building should not include a floor in excess of 11m above ground.
- The building should not include more than 3 storeys above ground.
- The staircase should include smoke ventilation in accordance with Section 3.10 (i.e., 1.0m<sup>2</sup> AOV).
- All flats should be separated from the staircase by a protected common corridor. It is noted that the staircase can discharge at ground floor level (via the ground floor common corridor) or at lower ground floor directly to the outside. Therefore the arrangement of the ground floor flats is considered tolerable.
- The staircase should not connect to ancillary areas. The design team should confirm all ancillary areas are accessed only directly from the outside.
- The maximum travel distance within common corridors should be limited in accordance with Section 3.11 (i.e., 4.5m as measured from the flat entrance door to the staircase door).
- The above and below ground portion of the staircase should be separated from each other using 60-minute fire resistance and FD30S fire doors. This is not achieved, however it is considered tolerable as the staircase also discharges at lower ground floor at the back of the building.

### a. Small single stair building



\*If smoke control is provided in the lobby, the travel distance can be increased to 7.5m maximum (see Diagram 3.7, example b).

## 3.10. Smoke Ventilation

As discussed in Section 3.9, smoke ventilation protection is a critical requirement for the communal staircase.

In accordance with ADB, an AOV, achieving a minimum free area of 1.0m<sup>2</sup>, should be provided at high level above the staircase. The AOV should be designed, installed and maintained in accordance with BS EN 12101-2.

## 3.11. Travel Distance

Within protected entrance halls of flats, travel distances should be limited to 9m, as measured from the door serving any habitable room, up to the flat entrance door.

Within communal corridors, travel distances should be limited to 4.5m in a single direction of escape, as measured from the entrance door of any flat to the staircase door.

For the car parking areas, travel distances should be limited to 18m in a single direction of escape.

For the plantroom, the travel distances should be limited to 9m in a single direction of escape.

## 3.12. Provision of Refuges

There is generally no requirement for refuge locations for residential buildings, therefore the building is not proposed to include refuge areas. It is noted that the building does include lift access to all floors.

Attention is drawn to the London Plan Policy D5 which requires dignified escape for disabled occupants. Therefore, the lift should be designed as an evacuation lift.



The ground floor and lower ground floors are assumed to include level escape suitable for disabled occupants up to a designated fire muster point. The design team should confirm this has been achieved as part of the landscaping around the building.

The design team should confirm how the building complies with The Equality Act.

Personal Emergency Evacuation Plans (PEEPs) need to be developed for regular occupants (PEEPs). PEEPs must outline the fire safety requirements and evacuation procedures for persons with disability to ensure that the differing needs of all persons using the building are properly considered.

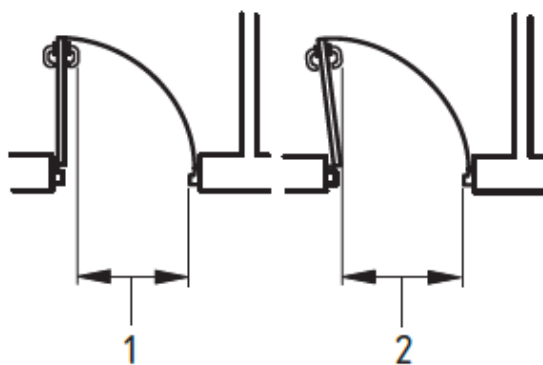
### 3.13. Provision of Muster Points

Suitable muster points must be identified once occupants leave the building. It may be acceptable to have one common muster area depending on available space in the surrounding area. The route to the muster point shall be clear of the building, well defined, and if necessary, suitably guarded from possible traffic. The selection of the muster point should not adversely impact on Fire Service access and facilities.

### 3.14. Escape Doors

Escape doors should not be fitted with a lock, latch or bolt fastening. These should always be easily openable from the inside by occupants making their escape. Any security devices should release the door upon activation of the fire alarm.

The minimum clear exit width will be 750mm for all doors. The clear width is measured as extracted from ADB below.



#### Key

- 1 Effective clear width (door stop to projecting building hardware)
- 2 Effective clear width (door stop to door leaf)

### 3.15. Vertical Means of Escape

The communal stair serves a top floor less than 18m; therefore, the stair does not need to be designed as a firefighting core. The staircase will achieve a clear width of 1,000mm throughout.

Only fire resisting letter boxes achieving 30 minutes and constructed of materials achieving Class A2-s3, d2 or better are permitted. Furniture or combustibles are not permitted in the staircase.

The staircase will be designed as a 60-minute protected stair core, with FD30S doors.

The staircase should discharge directly to a final exit via a suitable protected discharge route. It is noted that the staircase includes two final exits, one at the front on the ground floor and one at the rear of the building on the lower ground floor.

### **3.16. Lift**

The lift does not serve a floor in excess of 18m; therefore, it does not have to be designed as a firefighting lift. However, in support of London Plan Policy D5, the lift should be designed as an evacuation lift in accordance with BS 81-73. The lift should be enclosed in 60 minutes fire resisting construction (and FD30 fire doors).

At lower ground level, the lift should open into the common corridor.

### **3.17. Service Risers**

Service risers should be enclosed in 60 minutes fire resisting construction (and FD60S fire doors), including adequate 60 minutes fire stopping in line with each floor. Service risers should only open into a common corridor.

Service risers should not be used for storage; therefore, the service risers should be only used for services and / or meters. These should be designed in accordance with BS 8313.

### **3.18. Escape Beyond Final Exits**

Travel beyond final exits should not be adversely impacted upon by unprotected areas within the building façade. Therefore, one of the three options below should be employed:

- Escape is directly away from the building.
- Escape is possible in both directions along the building façade along the perimeter, with at least one escape route available in a fire scenario.
- The building façade is protected to 60 minutes fire resistance within 1,800mm of the escape route.

## 4. Requirement B2: Internal Fire Spread (Linings)

“To inhibit the spread of fire within the building, the internal linings shall adequately resist the spread of flame over their surfaces; and have, if ignited, either a rate of heat release or rate of fire growth, with is reasonable in the circumstances.” - Part B of Schedule 1 of the Building Regulations 2010.”

In this context, “internal linings” means the materials or products used in lining any partition, wall, ceiling, or other internal structure. The interior wall and ceiling surfaces in a building may have a significant influence on how quickly a fire may develop. It is particularly important that in circulation spaces, where the rapid spread of fire is most likely to prevent occupants from escaping, the surface linings are restricted by making provision for them to have low rates of heat release and surface spread of flame.

The materials used in construction, walls and internal linings of the walls and ceilings should be classed in accordance with the requirements of Table 4.1 in ADB as a minimum and tested in accordance with the European Classifications in accordance with BS EN 13501-1, as outlined in the extract below.

Location	Classification
Small rooms of maximum internal floor area of 4m <sup>2</sup>	D-s3, d2
Garages (as part of a dwellinghouse) of maximum internal floor area of 40m <sup>2</sup>	
Other rooms (including garages)	C-s3, d2
Circulation spaces within a dwelling	
Other circulation spaces (including the common areas of blocks of flats)	B-s3, d2 <sup>(1)</sup>

**NOTE:**

1. Wallcoverings which conform to **BS EN 15102**, achieving at least class C-s3, d2 and bonded to a class A2-s3, d2 substrate, will also be acceptable.

## 5. Requirement B3: Internal Fire Spread (Structure)

“The building shall be designed and constructed so that, in the event of a fire, its stability will be maintained for a reasonable period. A wall common to two or more buildings shall be designed and constructed so that it adequately resists the spread of fire between those buildings. To inhibit the spread of fire within the building, it shall be sub-divided with fire-resisting construction to an extent appropriate to the size and intended use of the building. The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.” - Part B of Schedule 1 of the Building Regulations 2010”

### 5.1. General

The fire resistance of building components and constructions are classified in different fire resistance classes or combinations of those, which specify different performance criteria. These classes include:

- The ability to maintain load-bearing capacity during a fire (classification “R”).
- The ability to prevent the spread of fire and smoke directly by maintaining the integrity of the element (classification “E”).
- The ability to insulate against radiation across the element (classification “I”).

Normally the fire resistance classification is followed by a time limit in minutes (15, 30, 45, 60, 90, 120 etc.) which shows the time the performance criteria is fulfilled during a standardized fire test.

### 5.2. Structural Fire Resistance

The early failure of the load-bearing structural elements of buildings during a fire represents a risk to:

- Occupants, some of whom may need to remain within the building during evacuation.
- Firefighters, who may be engaged on operations within the building during the fire; and,
- People in the vicinity of the building could be hurt by falling debris or building collapse.

This can be prevented by providing such load-bearing structural elements with a minimum standard of fire-resistance, in terms of resistance to collapse or failure of load bearing capacity when exposed to fire (classification “R”).

In accordance with ADB, the building should include 60-minute structural fire resistance considering the top occupied floor is assumed to be more than 5m and less than 11m.

Any structural element that provides support to other fire rated elements should achieve at least the same fire rating as those elements they support. There is no requirement to provide structural fire protection to any structure solely supporting a roof, although any structure

supporting a roof top plant or escape route from a plantroom (unless solely used for maintenance access) should be provided with the appropriate period of fire resistance.

### 5.3. Minimum Fire Resistance Standards

Fire resistance periods are taken as per Table B3 and B4 of ADB. The period of fire resistance is based on the height and purpose group of the building. The fire resistance periods and classifications should be tested in accordance with the relevant parts of BS 476.

The overall compartmentation strategy is presented in Table 1. For fire doors, “30” refers to the period of fire resistance with respect to Integrity (E) only, and “S” refers to the ability to resist the passage of smoke by means of intumescent strips and smoke seals as necessary.

**Table 1 - Compartmentation Strategy**

Building Element	Minimum Fire Resistance (minutes)	Fire Doors
Elements of structure	60R	N/A
Fire resisting external walls (see Section 6.4)	60REI	N/A
Compartment floors (all floors)	60REI	N/A
Protected shaft (staircase)	60REI	FD30S
Protected shaft (lift)	60REI	FD30
Protected shafts (service risers)	60REI	FD30S
Compartment walls (flats)	60REI	FD30S
Compartment walls (communal corridors)	60REI	FD30S
Compartment walls (ancillary areas)	60REI	FD30S
Protected entrance halls	30REI	FD30
Cavity Barriers	30E, 15I	N/A

### 5.4. Fire Compartmentation

All floors in the block of flats should be constructed as compartment floors achieving 60 minutes of fire resistance. Any shaft penetrating compartment floors should be constructed as a protected shaft achieving 60 minutes fire resistance (i.e., service risers, etc.).

The staircase and lift should be constructed as protected shafts achieving 60 minutes with FD30S fire doors (FD30 for the lift).

Each flat and common corridor / lobby should be a standalone, independent fire compartment achieving 60 minutes fire resistance and FD30S fire doors.

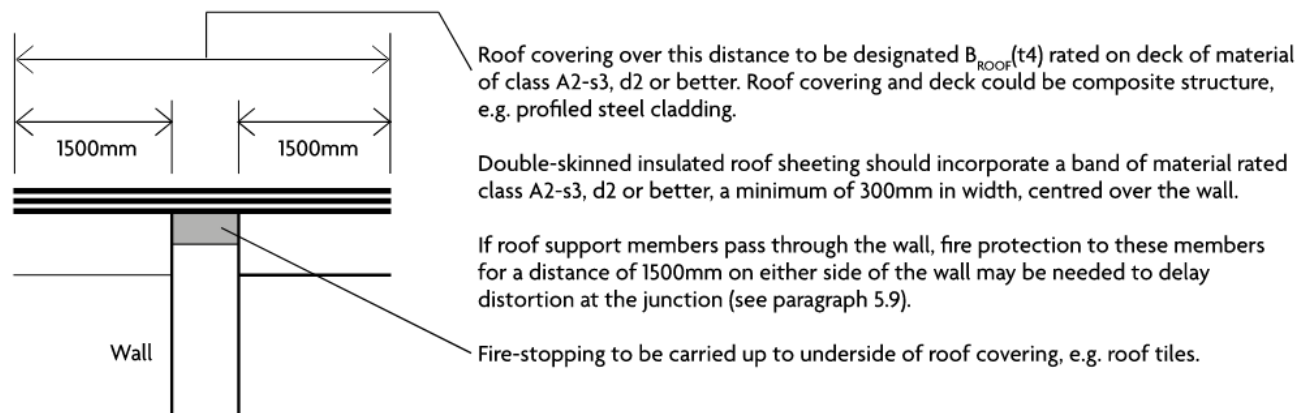
Each ancillary area should be a standalone, independent fire compartment achieving 60 minutes fire resistance and FD30S fire doors.

Each protected entrance hall should include 30 minutes fire resistance as separation from any other area within the same flat.

Fire resisting construction should be continued up to the underside of the structural floor above (or roof) and below the floor served (i.e., through ceiling or floor voids).

The junction of a compartment wall with a roof should be in accordance with Diagram 5.2 of ADB (as extracted below).

a. ANY BUILDING OR COMPARTMENT



## 5.5. Fire Doors

Doors in fire-separating elements are some of the most important features of a fire protection strategy. They protect escape routes from the effects of fire so that occupants can reach a final exit; and they protect occupants, fire-fighters, and the contents and/or structure of a building by limiting the spread of fire.

The fire door ratings should be as per Table C1 of ADB, when tested in accordance with BS 476-22 in accordance Table 1 with above. Fire doors should be self-closing unless they give access to cupboards or service risers, in which case they should be kept locked.

Fire doors should also be marked with the appropriate fire safety signage complying to BS 5499-5. Fire doors to cupboards and service ducts should be marked on the outside, all other fire doors marked on both sides (except within flats).

## 5.6. Fire Stopping

In order to ensure that fire compartmentation is efficient, all junctions with fire resisting construction and fire resisting elements as well as penetrations for services should include fire

stopping which should be fit-for-purpose. The rating of fire stopping should achieve as a minimum the rating of the fire resisting enclosure in which the penetration is proposed.

### **5.7. Fire Resisting Dampers / Ductwork**

Where a penetration in fire resisting construction is proposed for ventilation systems, this should be provided with a fire / smoke damper or fire resisting ductwork that is fit-for-purpose (and connected to the fire alarm system). The rating of the fire / smoke damper or ductwork should achieve as a minimum the rating of the fire resisting enclosure in which the penetration is proposed. Fire / smoke dampers are not permitted in the common escape staircase, and fire resisting ductwork should be employed instead.

### **5.8. Concealed Spaces**

In order to ensure that fire does not spread within the building via cavities, cavity barriers should be provided in the following locations and in accordance with Diagram 8.1 of ADB:

- At the junction of an external cavity wall with a compartment floor, compartment wall, or other fire resisting construction.
- At the junction of an internal cavity wall with a protected entrance hall or other fire resisting construction.
- Around all openings (i.e., windows and doors) within an external cavity wall.
- Around the edges of cavities.
- To limit the size of extended cavities to 20m where materials in the cavity achieve Class C-s3, d2 linings.
- To limit the size of extended cavities to 10m where materials in the cavity do not achieve Class C-s3, d2 linings.

## 6. Requirement B4: External Fire Spread

“The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building; The roof of the building shall adequately resist the spread of fire over the roof and from one building to another, having regard to the use and position of the building.” - Part B of Schedule 1 of the Building Regulations 2010.”

### 6.1. External Wall Materials

This building is assumed to not be a ‘relevant building’ in accordance with Regulation 7(4) as it is assumed to not include a floor in excess of 18m above ground. However, in order to employ a robust way to indicate compliance with the functional requirement B4 (external fire spread), to reduce the approval’s risk overall and to reduce the risk with respect to the properties likely needing an ESW1 form, it is proposed that external walls comply with Regulation 7(2) for this building.

This is also in accordance with the amendment to ADB dated June 2022, reducing the top floor height threshold from 18m to 11m for external wall materials to achieve Class A2-s1, d0 or better.

Therefore, materials forming part of the external walls (including specified attachments and balconies) should achieve Class A2-s1, d0 or A1 in accordance with BS EN 13501-1. Attention is drawn to the exceptions to this requirement, as listed in Regulation 7(3). For clarity, even if exempt, membranes should still achieve Class B-s3, d0 or better.

Additionally, Regulation 7(1A) has been introduced to prohibit the use of relevant metal composite materials forming part of the external wall systems or specified attachments of all buildings. Relevant metal composite materials are defined as any panel or sheet, having a thickness of no more than 10mm which is composed of a number of layers two or more of which are made of metal, alloy or metal compound and one or more of which is a substantial layer made of a material having a gross calorific value of more than 35MJ/kg when tested in accordance with BS EN ISO 1716. A substantial layer is defined as a layer which is at least 1mm thick or has a mass per unit area of at least 1kg/m<sup>2</sup>.

### 6.2. Cavity Barriers in External Walls

Cavity barrier requirements are presented in Section 6.2. Cavity barriers should be provided in the following locations of external walls:

- At the junction of an external cavity wall with a compartment floor, compartment wall or other fire resisting construction.
- Around all openings (i.e., windows and doors) within an external cavity wall.
- Around the edges of cavities.
- To limit the size of extended cavities to 20m.



### 6.3. Roof Coverings

A roof is any external wall with a slope of more than 70° from the horizontal.

Roof coverings are proposed to achieve a performance of B<sub>ROOF</sub>(t4).

Green roofs (if applicable) should be designed in accordance with 'Fire Performance of Green Roofs and Walls', published by the Department for Communities and Local Government.

### 6.4. Separation Distances

Any external wall which falls within 1000mm of a relevant boundary should be constructed as a party wall achieving 60 minutes fire resistance from both sides. This, however, is not applicable to this building, as all external walls are noted to be more than 1000mm from relevant boundaries.

Separation distance calculations have been undertaken in accordance with the tabulated solutions of BR187. The relevant boundaries have been selected as presented below, noting the elevations in the figure below:

- Towards the South, the middle of the adjoining road (Crescent East).
- Towards North, East, and West, the actual site boundaries.

BR 187 indicates that for areas with reduced fire load densities (<25kg/m<sup>2</sup>), a radiation intensity of 84 kW/m<sup>2</sup> should be used (i.e., residential). For areas with increased fire load densities (>25kg/m<sup>2</sup>), a radiation intensity of 168 kW/m<sup>2</sup> should be employed (i.e., car park and plantroom). However, the ancillary areas for the building are only placed at the lower ground.

The overall calculations are presented in Table 2, with elevations presented in the figure below. The design team should confirm the dimensions employed are accurate and that the maximum unprotected areas are achieved.

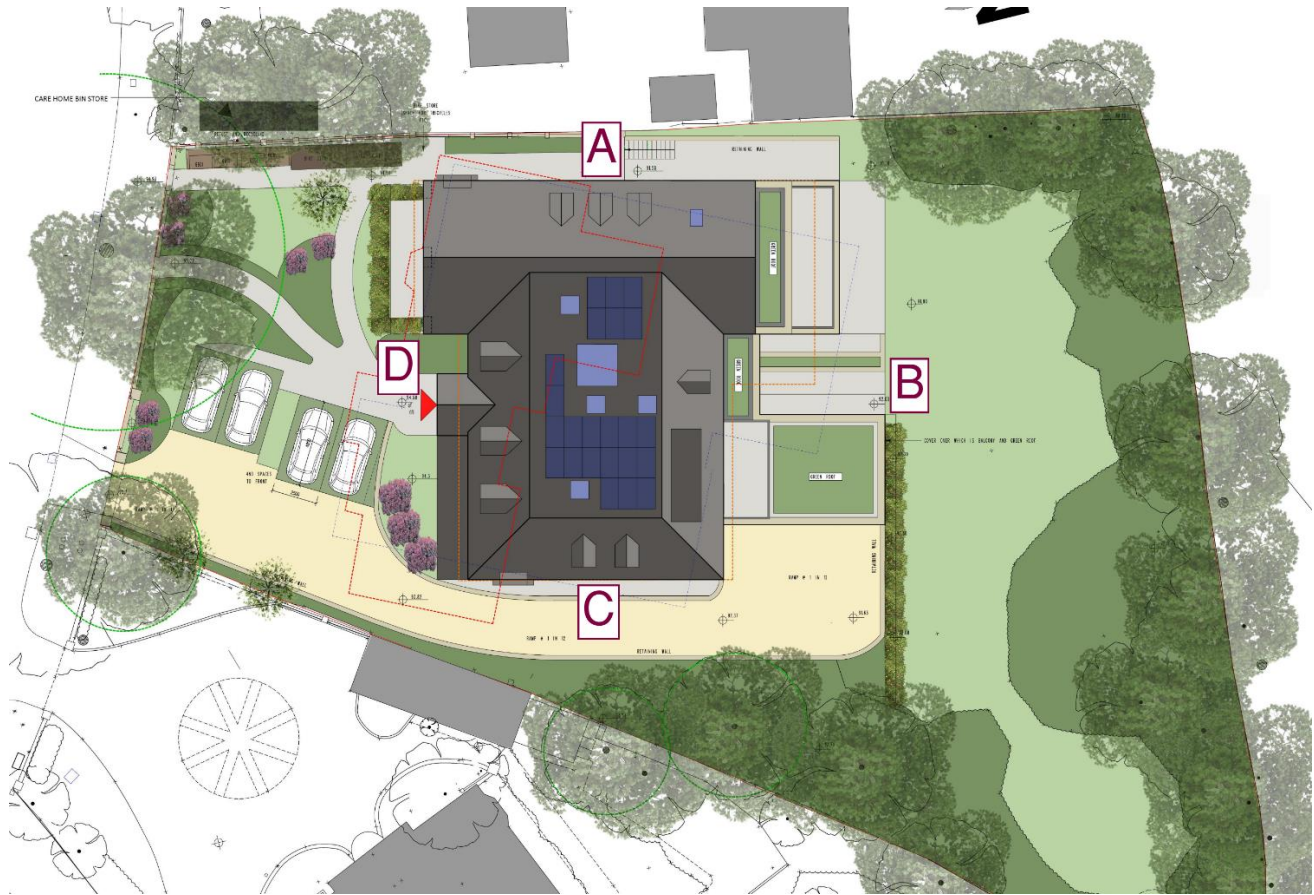


Table 2 - Separation Distance Calculations for the Block

Elevation	Radiator Height (m)	Radiator Width (m)	Radiation Intensity (kW/m <sup>2</sup> )	Assumed Boundary Distance (m)	Maximum Unprotected % Elevation Allowed
<b>Residential areas</b>					
A	3.0	18.0	84	>2.0	40%
B	3.0	18.0	84	>4.0	100%
C	3.0	18.0	84	>4.0	100%
D	3.0	18.0	84	>4.0	100%
<b>Ancillary areas</b>					
A	3.0	6.0	168	>2.0	30%
B	3.0	6.0	168	>4.0	100%
C	3.0	9.0	168	>4.0	100%

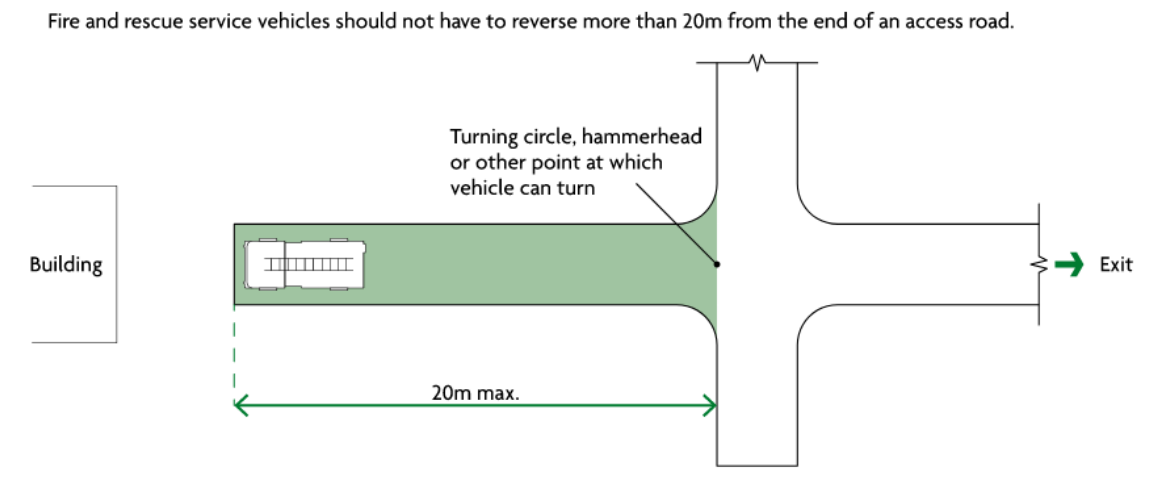
## 7. Requirement B5: Access and Facilities for Fire and Rescue Service

“The building shall be designed and constructed so as to provide reasonable facilities to assist fire fighters in the protection of life; Reasonable provision shall be made within the site of the building to enable fire appliances to gain access to the building.” - Part B of Schedule 1 of the Building Regulations 2010.”

### 7.1. Vehicle Access

Vehicle access to the exterior of the building is needed to enable a pumping appliance to supply water and equipment for firefighting and rescue activities.

Pump appliance vehicle access to the block should be via Crescent East. A pump appliance should not have to reverse more than 20m, without a suitable turning point, in accordance with Diagram 13.1 of ADB as extracted below.



The pump appliance parking location should be on Crescent East, immediately in front of the building, within 18m and line of sight of the entrance to the staircase as well as the dry rising main inlet valve. This is a public road which without dead ends in excess of 20m.

The size and mass of fire appliances is not standardized. The dimensions of access routes and hard standings vary according to the fire appliances that are used in a particular fire authority area. The local Fire Service should therefore be consulted to ascertain their recommendations relating to access roads. It is recommended that the hard-standing requirements of this appliance be considered during consultation.

The typical access route specifications for a pump are presented in GN29 as issued by the London Fire Brigade as extracted below. The design team should confirm these are achieved on site.

Appliance Type	Min. width of road between kerbs(m)	Min. width of gateways (m)	Min. turning circle between kerbs (m)	Min. turning circle between walls (m)	Min. clearance height (m)	Min. carrying capacity (tonnes)
Pump	3.7	3.1	16.8	19.2	3.7	14.0

## 7.2. Access into the Building

Any perimeter doors providing access into the building should achieve a minimum width of 750mm (unless otherwise specified in this report) in support of firefighting operations. Doors should not be located more than 60m apart from each other.

Any security provisions providing access to the building should enable the responding fire service to conduct their operations effectively.

The dry rising main should be designed in accordance with BS 9990. It should include an inlet valve on the building façade, near the main entrance, adjoining the ground floor entrance to the staircase served.

Dry rising main outlet valves should be provided on the full landing of the staircase (including on the ground floor and the lower ground). The horizontal portion of the main should not extend more than 18m.

All areas in all flats should be within 45m along a route suitable for laying hose as measured from a dry rising main outlet valve.

All areas in all ancillary areas at lower ground level should be within 45m along a route suitable for laying hose from the dry rising outlet valve.

## 7.3. Water Supplies

The building should include a suitable operational hydrant within 90m of the entrance of the building. If this is not achieved, a new private hydrant would be required within 90m of the entrance to the block of flats, as well as the dry rising inlet valve. Private hydrants should be in accordance with BS 9990.

## 7.4. Car Park Smoke Ventilation

The car park should be designed as an open-sided car park, in accordance with Section 11 of ADB Volume 2. The following provisions should be included in the covered car park design:

- Natural smoke outlets connecting directly to the open air should be provided for the car park.

- The combined clear cross-sectional area of all smoke outlets should be a minimum of 1/40 of the area of the car park.
- At least half of the ventilation area should be provided on two opposing walls, equally distributed along the perimeter.
- Smoke outlets should not be placed where they prevent the use of escape routes from the building.
- The car park should also include only materials achieving Class A1 (non-combustible).
- The car park is noted to be accessed only directly from the outside the building and does not connect to any staircase or common corridor.

### **7.5. Wayfinding Signage**

In support of firefighting operations, the block of flats should be provided with a secure information box in accordance with Sections 15.18 to 15.21 of ADB, even if the block does not include a floor in excess of 11m in height.

### **7.6. Secure Information Box**

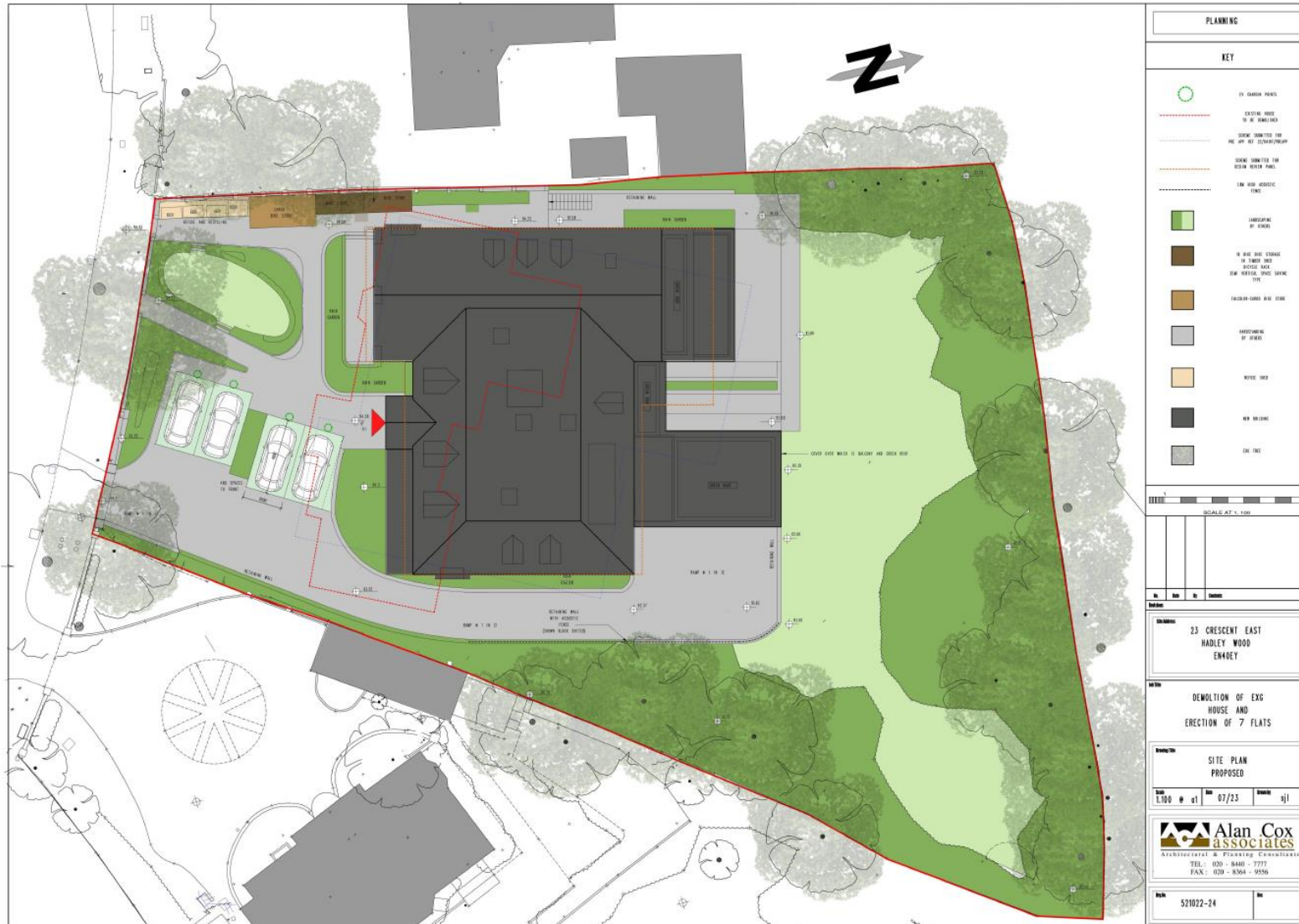
In support of firefighting operations, the block of flats should be provided with a secure information box in accordance with Sections 15.18 to 15.21 of ADB, even if the block does not include a floor in excess of 11m in height.

### **7.7. PV Panels (if included)**

PV panels (if included) could represent a risk for firefighters. Therefore, a suitable sign should be included at ground floor level in the staircase, adjacent to the fire alarm panel to inform firefighters of this risk. Additionally, an isolation switch for the DC side of the PV panels should be provided adjacent to the main fire alarm panels, in support of firefighting operations.

## 8. Appendix A – Drawing Plans

### Site location plan



Proposed Lower Ground, Ground, First and Second Floor Plan

