Great Northern, Leisure Box

10-RIBA Stage 2 Fire Strategy

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Quality Management

Revision	Date	Comment	Author	QA & Technical Review	Approver
R00	31/08/2022	First issue for comments	ST	AR	SFL
R01	25/11/2022	Incorporated design updates and comments from the design team	ST	AR	SFL

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1 INTRODUCTION

1.1 Appointment

OFR Consultants (OFR) have been appointed by Peterson Group Management Limited to develop the RIBA Stage 2 outline fire safety strategy for Great Northern Warehouse scheme located in Deansgate, Manchester. The proposed Great Northern scheme will be delivered in 3 phases. The scope of this fire strategy report focuses on the Leisure Box.

The purpose of this report is to document the fire strategy at the end of RIBA Stage 2.

Preliminary discussions with the approval authorities have commenced for the project, with agreement in principle reached, but final proposals are subject to approval by the Building Control Body (BCB) (Ball & Berry) including their statutory consultation with the Greater Manchester Fire and Rescue Service (GMFRS).

1.2 Applicable Legislation

Fire safety of building works is legislated by the Building Regulations 2010 (as amended in 2018) [1], referred to as "The Regulations". The Regulations have been enacted under the Building Act 1984 and are published by the Controller of HMSO. The Regulations impose requirements on people carrying out building work. The requirements are functional rather than prescriptive in nature which means that the designer is given the freedom to choose the method they use to satisfy the legislation.

This strategy has been developed to address the requirements of Part B of the Regulations that governs fire safety of building design. These functional requirements are segregated into distinct aspects of building design as follows:

- B1 – Means of warning and escape;
- B2 – Internal fire spread (linings);
- B3 – Internal fire spread (structure);
- B4 – External fire spread; and
- B5 – Access and facilities for the fire and rescue service.

All aspects of the fire safety design remain subject to review by the Building Control Body (including their statutory consultation with the local fire and rescue service), and, ultimately, formal approval by the Building Control Body.

The strategy has been developed in cognisance of the Construction (Design and Management) Regulations 2015 (CDM 2015), which sets out what designers are required to consider in order to protect anyone involved in the construction or ongoing use of a project. The strategy does not address site fire safety during the building works. The Health and Safety Executive (HSE) issues guidance on identifying and managing fire precautions during the works and they should be consulted by the appropriate party.

It must also be noted that this strategy does not cover any additional requirements beyond life safety, such as insurance requirements, and as such it is recommended that all relevant stakeholders are consulted on the contents of this report and the building design such that any additional measures can be incorporated.

1.3 Design Basis and Guidance

The guidance of BS 9999:2017 [2] has been used for the non-residential levels, Basement to Level 3. The guidance documents BS 9991:2015 [3] has been used for the residential levels, Level 4 – 34 (including residential ancillary areas) of the building. Where applicable, a fire engineered approach may also be adopted to ensure a practical, robust fire strategy.

BS 9991 and BS 9999 allow for alternative fire engineering methods to be employed to support solutions where strict adherence to the codes would conflict with the wider aspirations for the scheme, or where the prescriptive expectations would be applied beyond their remit/scope.

Where not specifically stated, fire safety provisions should be specified and installed according to the current editions of relevant published guidance.

On 29th November 2018, the Ministry of Housing, Communities and Local Government (MHCLG) issued an update to the English Building Regulations and associated guidance in relation to the control of external fire spread (Regulation B4). The new regulations came into force on 21st December 2018 and apply to this scheme. Further updated legislation is also in progress.

Following the amendments to Building Regulations, a new revision of the statutory guidance supporting the amendments to the regulations was issued in July 2019. Further amendments to the guidance in the Approved Documents were introduced in May of 2020.

Therefore, as best practice, the updated guidance in Approved Document B 2019 Edition: Volume 1, as amended in May 2020 (AD B V1 05-20) [4] and Approved Document B 2019 Edition: Volume 2, as amended in May 2020 (AD B V2 05-20) [5] to supplement the guidance in BS 9991 and BS 9999 where applicable.

On 1 June 2022, the government introduced a package of improvements to further strengthen and clarify building regulations and fire safety guidance as part of wider reforms to building safety. The government has also published an update to Approved Document B to introduce new rules for external walls and balconies for new blocks of flats between 11 metres and 18 metres in height. The amended Approved Documents will come into force on 1 December 2022. The 2019 edition incorporating the 2020 amendments will continue to apply where a building notice or an initial notice has been given to, or full plans deposited with, a local authority before 1 December 2022.

1.4 Reference Information

This document is based upon the information listed in Table 1 provided by SimpsonHaugh Architects.

Table 1: Reference drawings

Document Name	Description	Revision No.	Date Received
10422-SHP-Z4-A-B5D9-G200-PL-B1-001	General Arrangement Leisure Box - Proposed Basement Floor Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-00-001	General Arrangement Leisure Box - Proposed Ground Floor Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-01-001	General Arrangement Leisure Box - Proposed Level 01 Floor Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-02-001	General Arrangement Leisure Box - Proposed Level 02 Floor Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-03-001	General Arrangement Leisure Box - Proposed Level 03 Floor Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-04-001	General Arrangement Leisure Box Proposed Level 04 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-05-001	General Arrangement Leisure Box Proposed Level 05 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-06-001	General Arrangement Leisure Box Proposed Level 06 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-07-001	General Arrangement Leisure Box Proposed Level 07 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-08-001	General Arrangement Leisure Box Proposed Level 08 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-09-001	General Arrangement Leisure Box Proposed Level 09 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-10-001	General Arrangement Leisure Box Proposed Level 10 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-11-001	General Arrangement Leisure Box Proposed Level 11 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-12-001	General Arrangement Leisure Box Proposed Level 12 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-13-001	General Arrangement Leisure Box Proposed Level 13 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-14-001	General Arrangement Leisure Box Proposed Levels 14 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-15-001	General Arrangement Leisure Box Proposed Level 15 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-16-001	General Arrangement Leisure Box Proposed Level 16 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-17-001	General Arrangement Leisure Box Proposed Level 17 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-18-001	General Arrangement Leisure Box Proposed Level 18 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-19-001	General Arrangement Leisure Box Proposed Level 19 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-20-001	General Arrangement Leisure Box Proposed Level 20 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-21-001	General Arrangement Leisure Box Proposed Level 21 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-22-001	General Arrangement Leisure Box Proposed Level 22 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-23-001	General Arrangement Leisure Box Proposed Level 23 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-24-001	General Arrangement Leisure Box Proposed Level 24 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-25-001	General Arrangement Leisure Box Proposed Level 25 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-26-001	General Arrangement Leisure Box Proposed Level 26 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-27-001	General Arrangement Leisure Box Proposed Level 27 Plan	P01	2022-11-08
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10422-SHP-Z4-A-B5D9-G200-PL-29-001	General Arrangement Leisure Box Proposed Level 29 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-30-001	General Arrangement Leisure Box Proposed Level 30 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-31-001	General Arrangement Leisure Box Proposed Level 31 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-32-001	General Arrangement Leisure Box Proposed Level 32 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-33-001	General Arrangement Leisure Box Proposed Level 33 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9-G200-PL-34-001	General Arrangement Leisure Box Proposed Level 34 Plan	P01	2022-11-08
10422-SHP-Z4-A-B5D9- G200-EL-EN-001	General Arrangement Leisure Box Proposed North Elevation	P01	2022-11-08

2 Site Description

2.1 General

The proposed Great Northern scheme will be delivered in 3 phases. The scope of this fire strategy report focuses on Phase 3, the Leisure Box. The location of the Leisure Box is shown in Figure 1.

The proposed design consists of:

- 5-storey car park (B+G+3); and
- 3 residential towers above the car park, comprise of 1, 2 and 3-bedroom flats and resident amenity spaces. The proposed towers are 13-storey, 24-storey and 31-storey above the car park with a height of c. 51.4 m, c. 84.0 m and c. 105.2 m respectively (when measured from the fire service access level to the highest occupied floor, as shown in Figure 3).

An overview of the residential tower arrangement is illustrated in Figure 2.

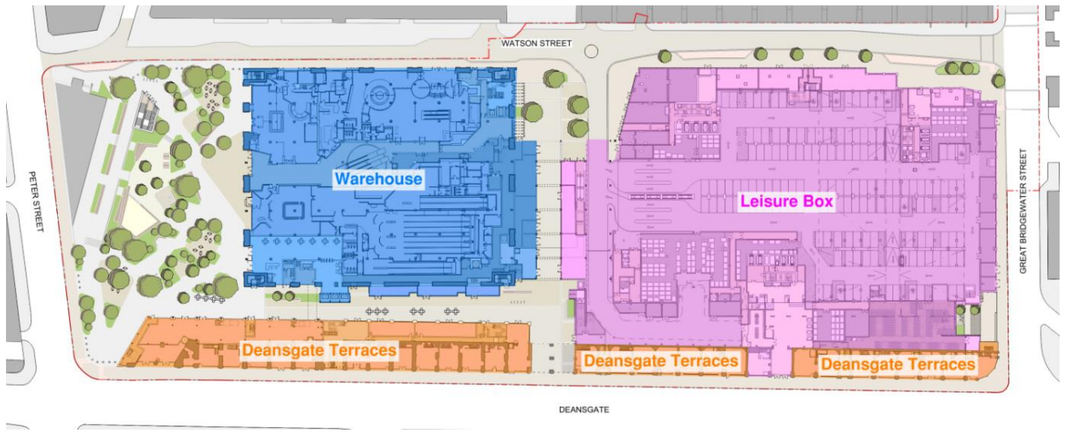


Figure 1: Location of the Leisure Box (RIBA Stage 2)

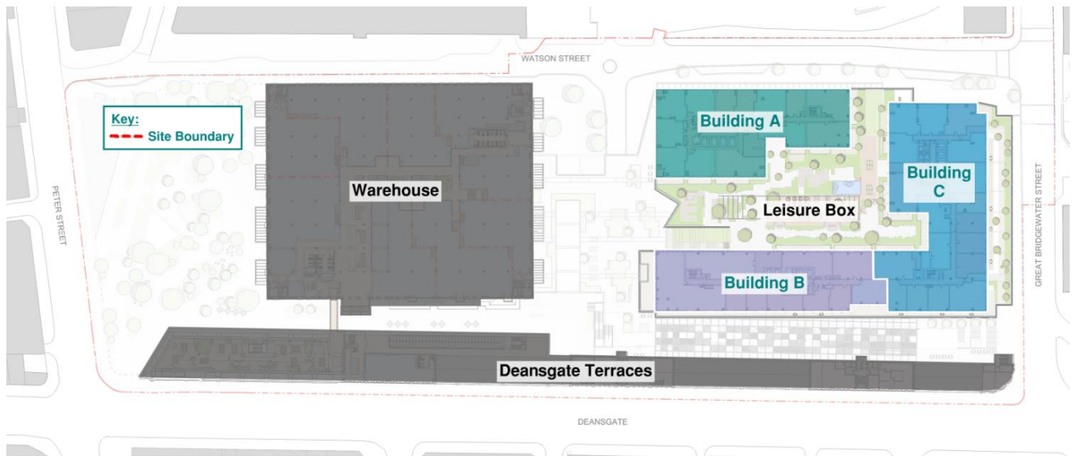


Figure 2: Residential towers arrangement overview (RIBA Stage 2)

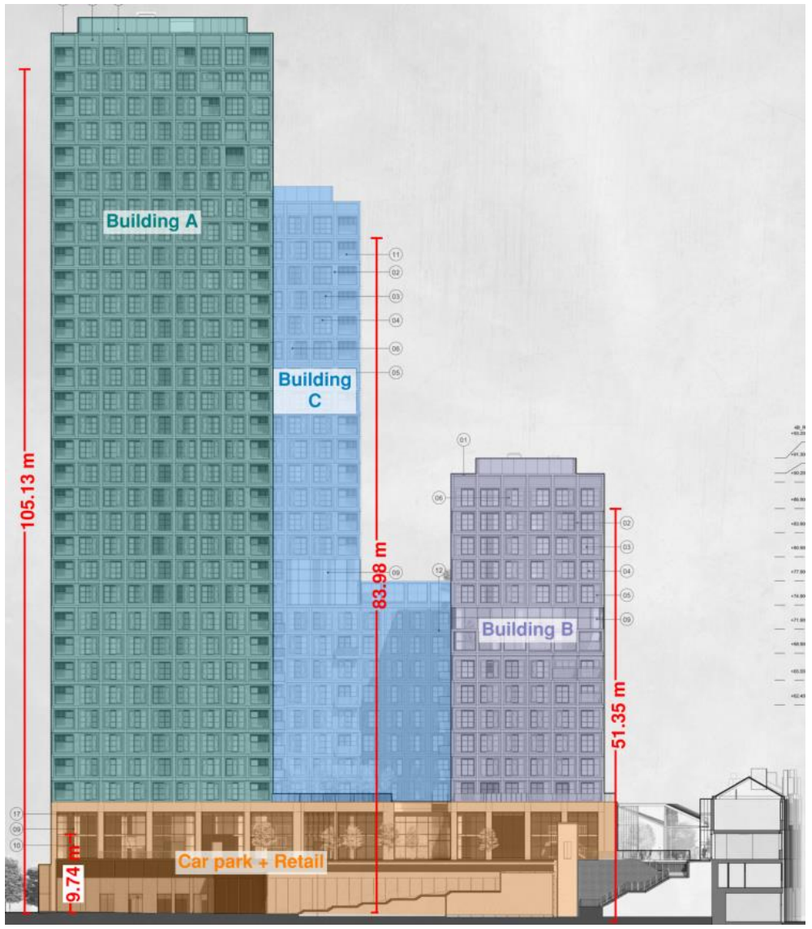


Figure 3: Height from fire service access level to the topmost occupied storey (RIBA Stage 2)

2.2 Overview

The Leisure Box consists of refurbishment work throughout the Basement to Level 3, the existing Cinema will be demolished with 3 residential towers to be added above the car park, comprise of 1, 2 and 3-bedroom flats and resident amenity spaces. This phase of the development is bounded by Great Bridgewater, Deansgate and Watson Steet (Figure 4).

The proposed towers are 13-storey, 24-storey and 31-storey above the car park with a height of c. 51.4 m, c. 84.0 m and c. 105.2 m respectively (when measured the fire service access level to the highest occupied floor).

A brief description of each floor of the Leisure Box is shown below in Table 2 and shown in Figure 4 to Figure 14.

Ancillary accommodation covers all those parts of the building containing flats that are ancillary to the dwellings. It includes engineering services such as the plant rooms and accommodation such as the covered car park, cycle stores, bin store and management stores. As such, these areas will be designed to the recommendations in BS 9991.

Table 2: Description

Key Characteristics		Description
Building height (when measured from Ground Floor Fire Service access level to height of topmost occupied storey)		Carpark – 9.8 m Tower A – 105.2 m Tower B – 51.4 m Tower C – 84.0 m
Number of floors		Carpark – 5-storey Tower A – 31-storey Tower B – 13-storey Tower C – 24-storey
Level	Basement	Carpark, plant rooms, district heating
	Ground Floor	Carpark, residential tower entrances, plant rooms, retails, residential refuse, residential bike store
	Level 1	Carpark, plant rooms, residential bike store
	Level 2	Carpark, plant rooms, retails, gym
	Level 3	Carpark, plant rooms, retails, gym
	Level 4 - 34	Residential flats with residential amenity spaces and open-air roof terraces at some levels. Each residential tower will be provided with 3 stairs. As the towers step back, only the 2 stairs in the central core will be serving the upper levels.

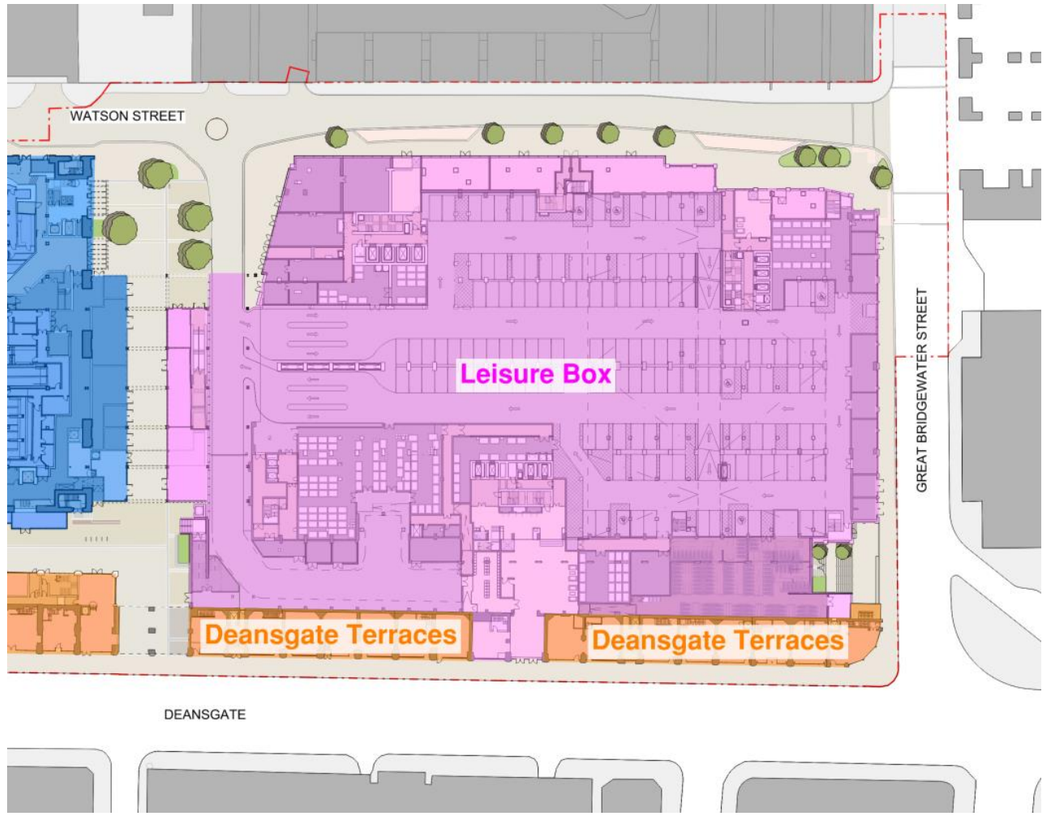


Figure 4: Location of the Leisure Box (RIBA Stage 2)



Figure 5: Proposed Basement (RIBA Stage 2)



Figure 6: Proposed Ground Floor (RIBA Stage 2)

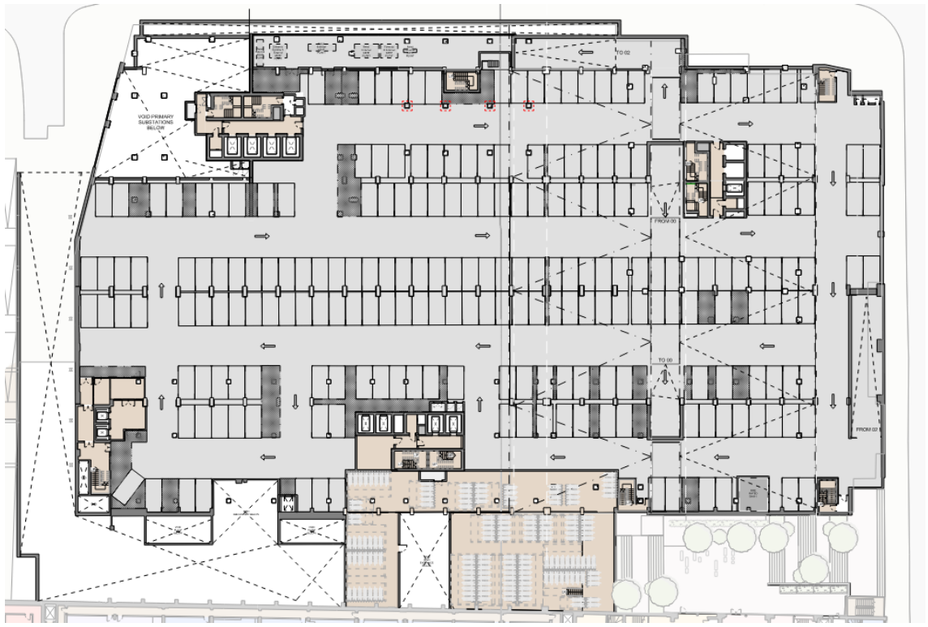


Figure 7: Proposed Level 1 (RIBA Stage 2)



Figure 8: Proposed Level 2 (RIBA Stage 2)



Figure 9: Proposed Level 3 (RIBA Stage 2)

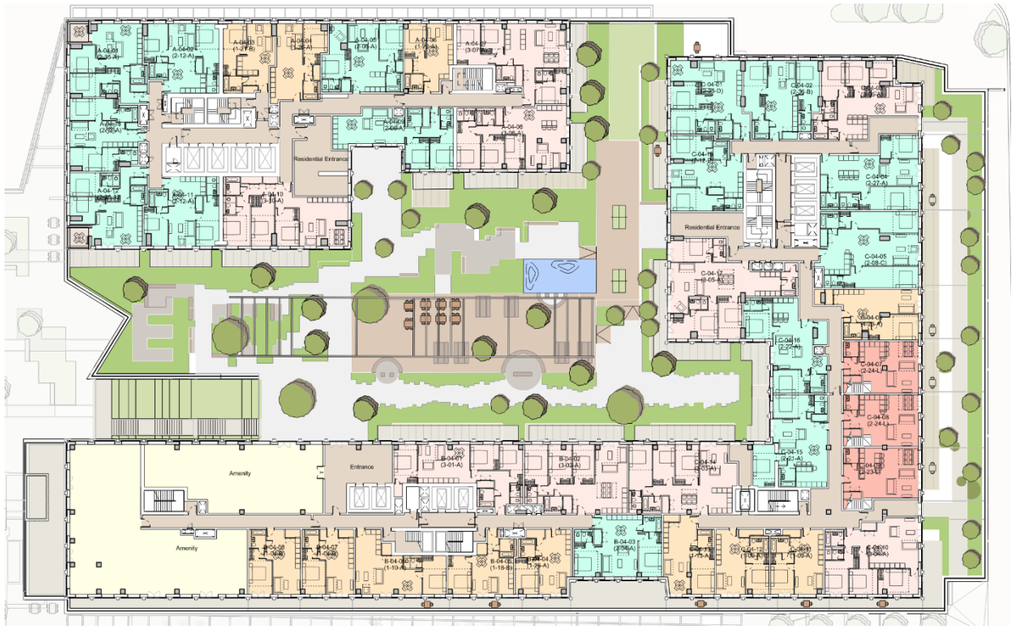


Figure 10: Proposed Typical Residential Layout (Level 4, RIBA Stage 2)



Figure 11: Proposed Typical Residential Layout (Level 10, RIBA Stage 2)



Figure 12: Proposed Typical Residential Layout (Level 12, RIBA Stage 2)

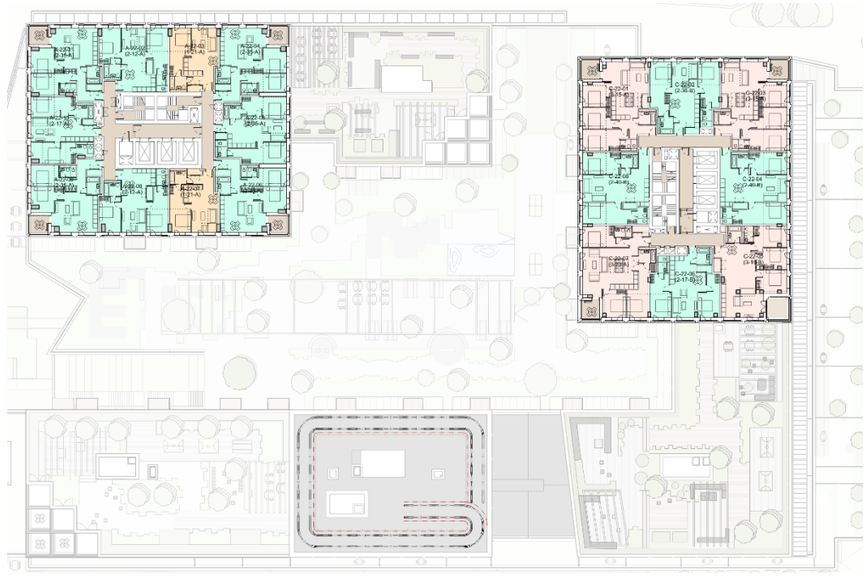


Figure 13: Proposed Typical Residential Layout (Level 22, RIBA Stage 2)

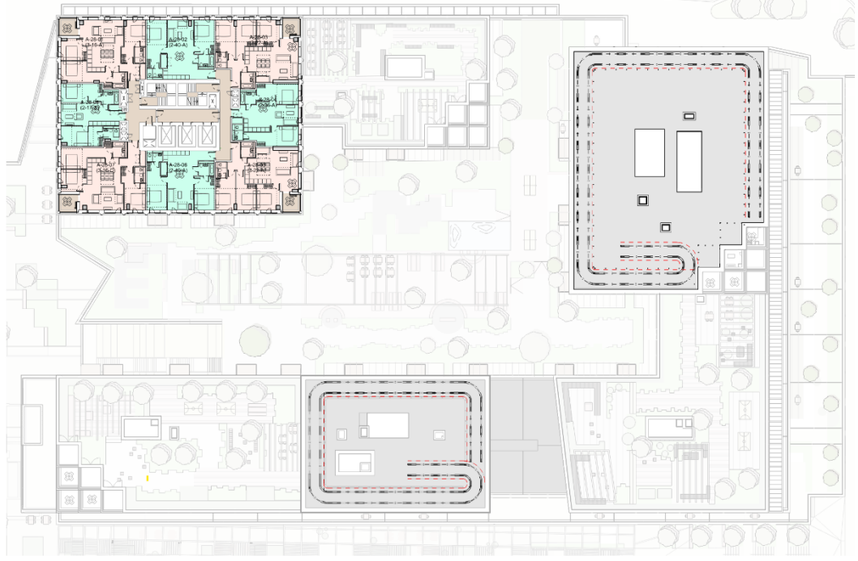


Figure 14: Proposed Typical Residential Layout (Level 28-29, RIBA Stage 2)

2.2.1 Risk Profiles

As per BS 9999 recommendations, non-residential areas (Basement to Level 3) will be assigned a risk profile. The risk profile is a combination of the familiarity of occupants within the premises and the potential fire hazard (growth rate) in said areas.

The risk profiles can be categorised as per the following:

- A: Occupants who are awake and familiar with the building.
- B: Occupants who are awake and unfamiliar with the building.

Fire growth rates are given a numerical risk rating between 1 and 4 to describe the characteristic growth rate, with the relevant growth rates being:

- 1: Slow.
- 2: Medium.
- 3: Fast.

The relevant occupancy characteristics for non-residential areas (Basement to Level 3) are shown in Table 3. Residential ancillary accommodation will be designed to the recommendations in BS 9991.

2.2.2 Variations of Risk Profile

2.2.2.1 General

Section 6.5 and Section 18 in BS 9999:2017 permits variations to be made. Such as reducing the fire growth rate by 1 level, also reduction in travel distances, door widths and stair widths on the basis that the level of risk can be reduced by the provision of additional fire prevention/protection measures. For the Leisure Box (Basement to Level 3), this can be achieved via the means explained in the following sections.

2.2.2.2 Automatic Fire Suppression System

As stated in the existing fire strategy, the Basement to Level 3 of the Leisure Box is currently provided with sprinklers, it is proposed that sprinklers will be retained as the works involve converting this phase into residential use which has a building height in excess of 11 m. As such an automatic fire suppression system is to be provided throughout the building. Compliance of the sprinklers with current version of guidance documents (e.g., BS EN 12845:2015+A1:2019) will need to be confirmed.

2.2.2.3 Automatic Fire Detection System

As stated in the existing fire strategy, the Basement to Level 3 of the Leisure Box is to be provided with a Category L1 automatic fire detection system in accordance with BS 5839-1. It is proposed to retain this level of coverage in the carpark and extend the Category L1 automatic fire detection system to the non-residential areas of this phase of the development.

The provision of an automatic fire detection system throughout Basement to Level 3 of the Leisure Box is an enhancement over the minimum provisions recommended in BS 9999 for an A2 and B1 risk profile areas (Category M minimum).

Table 3: Risk Profiles

Floor	Non-residential Areas (Basement to Level 3)	Risk Profile [1]
Basement	Carpark	B1
	Plant rooms	A2
Ground Floor	Carpark	B1
	Plant rooms, refuse stores, bike stores	A2
	Retails	B1
Level 1	Carpark	B1
	Plant rooms, bike stores	A2
Level 2	Carpark	B1
	Plant rooms	A2
	Retail, gym	B1
Level 3	Carpark	B1
	Plant rooms	A2
	Retail, gym	B1

[1] As stated in Section 2.2.2.2, the Basement to Level 3 of the Leisure Box is provided with sprinklers, as such have been applied with one reduction of fire growth rate.

Table 4: Additional fire protection measures

Description	Minimum Recommendation [1]	Proposed	Variation	Risk profiles applicable to
Fire detection and alarm system	Category M	Category L1	15%	A2 and B1

[1] As recommended in BS 9999:2017 edition for an A2 and B1 risk profile areas.

2.2.3 Anticipated Occupancy

An occupant density of 2 person per carpark space has been used for the carpark (Basement to Level 3) within the Leisure Box Carpark as per the guidance in Table D1 of AD B to calculate the anticipated occupancy in the carpark, summarised in Table 5.

Rooms such as the plant rooms are considered transiently occupied spaces and as such have not been considered. The retail units have not been considered within the horizontal exit and vertical stair capacity calculations (Section 5.1 and Section 5.2), as occupants in this area will have direct exits to street level or the open-air podium (Level 2). However, the occupancy within each retail unit should be limited to 60 persons at any one time due to a single exit will be provided from each unit. The occupancy in the gym should be limited to 60 persons at any one time due to one of the exits open against the direction of escape.

Table 5: Carpark Occupancy - Basement to Level 3

Carpark Level	Parking Spaces	Estimated Occupancy
Basement	218	436
Ground Floor	149	298
Level 1	228	456
Level 2	165	330
Level 3	167	334

3 Fire Safety Systems

3.1 Automatic Fire Detection and Alarm Systems

3.1.1 Non-residential (Basement – Level 3)

The existing fire strategy for the Leisure Box specifies that a Category L1 automatic fire detection and alarm system designed in accordance with BS 5839-1 is provided. It is proposed to retain this level of coverage to the non-residential areas of this phase of the development, in accordance with BS 5839-1:2017 [6].

The non-residential area will adopt a simultaneous evacuation strategy, actuation of either a manual call point or fire detection system should give warning from all fire alarm sounders. There is a potential to consider double-knock or similar to reduce impacts from false alarm, the cause and effect and evacuation sequencing will be further developed with the relevant stakeholders as the design progresses.

3.1.2 Residential (Level 4 – Level 34)

For residential areas, each apartment will be provided with its own fire detection and alarm system designed and installed in accordance with the recommendations of BS 5839-6:2019 [7]. As all apartments are designed as open-plan flats, each apartment should be provided with an LD1 category of fire alarm and fire detection. The smoke alarm systems shall be Grade D1 to meet the recommendations detailed within BS 5839-6. Smoke alarm systems should be mains operated and conform to BS EN 14604:2005 [8].

Heat detection should be provided in the kitchen, this should be mains operated and conform to BS 5446-2:2003 [9].

Common residential corridors and stairs will be provided with a Category L5 fire detection and alarm system in accordance with BS 5839-1. The sole purpose of this system will be to trigger the smoke ventilation systems within the residential areas of the building.

As discussed in Section 1.3, the amended Approved Documents will come into force on 1 December 2022. The amendment includes the recommendation to implement a BS 8629 [10] system (building evacuation alert system). Although it is not a recommendation in the current AD B but will be from December 2022 and therefore consideration should be given to including it to future proof the design.

It is recommended the residential ancillary accommodation to be provided with a Category L3 automatic fire detection and alarm system, to be confirmed at the next design stage.

3.2 Carpark Ventilation

The covered car park is proposed to be provided with mechanical ventilation. The system should be provided that complies with all of the following:

A. The system should be both of the following:
    1. Independent of any other ventilating system (other than any system that provides day to day ventilation to the car park.
    2. Designed to operate at 10 air changes per hour during a fire.

B. The system should run in two parts, each of which is:
    1. Capable of extracting 50% of the rates set out in item A.
    2. Able to operate alone or with the other part.
    3. Provided with an independent power of supply capable of operating if the main supply fails.

C. 50% of the outlets should be at high level and 50% at low level.

D. The system should use E, I and S ductwork in accordance with BS EN 1366-8 [11].

3.3 Residential Common Corridor Ventilation

The current proposal is to provide mechanical ventilation systems within the residential common corridor with the objective to protect the stairs from smoke ingress and clear smoke from the corridor. The systems will be an enhancement to minimum recommended in BS 9991. The systems will be developed as the design progress, and it will subject to validation using CFD or similar. It is recommended that an allowance is made so that each mechanical smoke shaft on the residential levels can achieve a supply and extract rate of 6 m^3/s at this stage. In addition, a natural smoke shaft with a free area of 1.5 m^2 is to be provided to serve the lift lobbies. In addition to ventilation within the corridor, an AOV at the head of each stair with a free area of 1 m^2 should be provided.

3.4 Refuse Chute Ventilation

Refuse chutes should be provided with a lobby at each level that provides 0.2 m^2 of permanent ventilation.

3.5 Automatic Fire Suppression System

Given the works involve converting this phase into residential use which has a building height in excess of 11 m then an automatic fire suppression system is to be provided throughout the building.

Non-residential areas are to be protected by a BS EN 12845 [12] sprinkler system. Given the non-residential use, (car parks and retail units), then BS EN 12845 would suggest a Category OH2 system is provided. If the design were to evolve that would result in the height between the lowest sprinkler head and highest sprinkler head exceeding 45 m then the category of system would need to be upgraded to an OH3 system which would also result in an increase in minimum water volume. The category of sprinkler system should be agreed with all stakeholders including Building Control and the fire service.

For residential areas, a Category 4 sprinkler system in accordance with BS 9251:2021 [13] should be provided to serve the residential areas. Based on the number of sprinkler heads, design discharge density and duration of supply recommended in BS 9251, a water volume of c. 18 m^3 would be in n the region of what would be needed.

Sprinkler water volumes and tank sizes will need to be confirmed by the specialist sprinkler sub-contractor.

3.6 Access Control Systems

Where doors are normally secured against entry, they should only be fitted with a lock or fastening which is readily operated, without the use of a key and without having to manipulate more than one mechanism.

Where electronically powered locks are provided, then they should be designated in accordance with BS 7273-4 [14] and return to the unlocked position under the following conditions:

- On operation of the fire alarm system (via detector or manual call point);
- On loss of power to the system;
- On system error; or
- On activation of a manual door release unit positioned on the side of the door approached by occupants making their escape.

3.7 Emergency Lighting

3.7.1 Non-residential (Basement – Level 3)

As per Section 15.4 in BS 9999, suitable lighting should be provided to all areas of the buildings to enable the safe movement of persons along escape routes to a place of relative or ultimate safety.

Emergency lighting should be installed in accordance with BS 5266-1 [15] and BS EN 1838:2013 [16]. The areas requiring emergency escape lighting as per Table 8 in BS 9999 are listed below for the relevant occupancy characteristic.

Table 6: Provisions for emergency escape lighting

Occupancy Characteristic [a)]	Areas requiring emergency escape lighting
A	• Underground or windowless accommodation • Stairways in a central core or serving storey(s) more than 18m above ground level • Internal corridors more than 30m long • Open-plan areas of more than 60m^2
B	• All escape routes
Any use	• All sanitary accommodation with a floor area of 8m^2 • Windowless sanitary accommodation with a floor area not more than 8m^2 • Electricity and generator rooms • Switch room/battery rooms for emergency lighting systems • Emergency control room
a) Refer to Table 3 for the occupancy characteristics for the Leisure Box.	

3.7.2 Residential (Level 4 – Level 34)

Emergency lighting should be provided in accordance with the recommendations of BS 5266-1. Emergency lighting should illuminate all occupied areas and common evacuation routes (internal and external as necessary) as well as illuminating points of emphasis including fire exits, fire alarm call points, changes in level or direction, external assembly points and firefighting equipment.

3.8 Evacuation Lift

The current design shows an evacuation lift is provided in each residential core to be suitable for use in an evacuation for mobility impaired persons. At the next design stage, a smoke modelling assessment will be undertaken to demonstrate that during the escape phase, the conditions in the lift lobby will remain tenable to support means of escape via the lift.

BS 9991:2015 states where evacuation lifts are installed, these should be clearly signed at the final exit storey and relevant information should be available detailing the locations of the main switch, rescue controls and machinery spaces.

The evacuation lift should be designed and installed in accordance with the relevant provisions in BS EN 81-20 [17] and BS EN 81-70 [18].

An evacuation lift should be provided with a switch clearly marked “Evacuation Lift” and situated adjacent to the lift landing door at the final exit level.

3.9 Exit Signage

Every doorway or other exit providing access to a means of escape, other than exits in ordinary use (e.g. main entrances) should be distinctively and conspicuously marked by an exit sign in accordance with BS ISO 3864-1 [19] and BS 5499-4.

3.10 Fire Door Hold Open Devices

Where hold-open devices are provided to fire doors, these should be designed in accordance with BS 7273-4 [14]. They will be designed to release the door on activation of the fire alarm system, and on loss of power.

Where self-closing doors may provide a hinderance to occupants, then the use of free swing door closers conforming to BS EN 1155 [10] and other similar devices should be considered.

3.11 Heating, Ventilation and Air Conditioning Systems (HVAC)

Where ductwork passes through fire resisting construction, then the fire resistance of that element will be maintained and the potential for smoke spread through the element is minimised. This can be achieved via a combination of thermally activated dampers, fire resisting enclosures or fire resisting ductwork (providing both the integrity and insulation requirements of fire resistance), and/or automatically activated fire/smoke dampers operated by the fire alarm system.

HVAC systems should shut down in event of fire.

3.12 Protected Power Circuits

- Cables for fire alarm circuits should conform to BS 5839-1.
- Cables for voice alarm circuits should conform to BS 5839-8 [11].
- Cables for emergency voice communication circuits should conform to BS 5839-9 [12].
- Cables for all other circuits that require a resistance to fire, either for life safety, or property protection should conform to BS 8519 [13].

3.13 Emergency Power

Emergency power supplies are required for all active fire safety systems including the following and all power and control cabling should comply with the relevant recommendations of BS 8519:2020 [21]:

- Fire detection and alarm systems;
- Automatic water sprinkler suppression systems (AWSSS);
- Emergency lighting and self-illuminated exit signage;
- Emergency voice communication (EVC) system;
- Fire safety devices such as fire dampers, fire and smoke dampers and air transfer grilles;
- Smoke control systems (fans, control equipment and vents);
- Firefighting provisions (lighting, lifts and communication);
    - This should include both general lighting and emergency lighting in the firefighting stairs; and
- Evacuation lift

The means for providing secondary power should be confirmed by the M&E engineers.

4 Means of Escape – General

4.1 Evacuation Strategy

4.1.1 Non-residential

The evacuation strategy for the non-residential areas at Basement – Level 3 and the residential areas ancillary accommodation will be a simultaneous evacuation strategy. Upon activation of either the automatic fire detection system or a manual call point, the fire alarm will sound in the area and all occupants will evacuate immediately upon receiving this evacuation signal.

4.1.2 Residential

The evacuation strategy for apartments at Levels 4 – 34 will be a 'stay-put' policy. The strategy is as follows:

- Only the occupants from the flat of fire origin should need to evacuate initially;
- All other occupants should be safe to remain safely in place in their flats;
- If further occupants decide to leave or need to leave because they become affected by heat or smoke, they can; and
- If the fire and rescue service consider wider evacuation is required, then this can be accommodated.

4.2 Door Opening

The door leaf of any doorway or exit should, where reasonably practicable, be hung to open in the direction of escape, and should always do so if the number of persons that might be expected to use the door at the time of a fire is more than 60.

All doors on escape routes should be hung to open not less than 90°, and with a swing that is clear of any change of floor level.

A door that opens towards a corridor or a stairway should be sufficiently recessed to prevent its swing from encroaching on the effective width of the stairway or corridor.

4.3 Door Vision Panels

Vision panels should be provided where doors on escape routes sub-divide corridors, where any doors are hung to swing both ways, or where it is required as one of the conditions for providing an inner-room arrangement.

4.4 Number of Escape Routes

The number of escape routes and exits from any room, tier or storey should be not less than the minimum recommended in Table 7 below for the intended number of occupants.

Table 7: Minimum number of escape routes and exits from a room, tier or storey

Minimum number of persons	Minimum number of escape routes/exits
60	1
600	2
More than 600	3

4.5 Single Escape Routes and Exits

A single escape route should be provided only where a room, tier or storey has an occupant capacity of 60 or fewer persons and the travel distance limit for travel in one direction meets the recommendations for the relevant risk profile.

4.6 Height of Escape Routes

A clear height of 2 m should be maintained through escape routes. Doorways are exempt from this minimum height.

4.7 Inner Rooms

The current arrangement shows there will be inner rooms in the building. Inner rooms should not be provided unless all of the following conditions are met:

- The occupant capacity of the inner room does not exceed 60 persons (30 where the occupants require assistance escaping);
- The inner room is not a bedroom;
- The inner room is entered directly from the access room;
- The escape route from the inner room does not pass through more than one access room (i.e. an inner-inner room);
- The travel distance from any point in the inner room to the exit (s) from the access room does not exceed the allowable one-way travel distance;
- The access room is not a place of special fire hazard and is in control of the same occupier as the inner room;
- One of the following arrangements is made:
    - The enclosures (walls or partitions) of the inner room stop at least 500mm below the ceiling; or
    - A suitably sited vision panel not less than 0.1m^2 is located in the door or walls of the inner room, to enable occupants of the inner room to see if a fire has started in the outer room; or
    - The access room is protected by an automatic smoke detector that either operates an alarm that is immediately audible in the inner room, to a sound pressure level in accordance with the minimum recommended in BS 5839-1, or gives an immediate visual alarm conforming to BS EN 54-23 [14] in the inner room if the ambient noise levels are so great as to make an alarm inaudible.

It is proposed to provide automatic smoke detector in every access room to the inner room. It is likely to be achieved due to the provisions of the L1 automatic fire detection and alarm system will cover most areas in the Leisure Box, thus in compliance with this recommendation in BS 9991 and BS 9999.

5 MEANS OF ESCAPE

5.1 Horizontal Means of Escape

5.1.1 Non-residential Areas (Basement – Level 3)

5.1.1.1 Travel Distances

The maximum travel distances as recommended in Table 11 of BS 9999 is dependent upon the risk profile of the area as shown below in Table 8.

As described in Section 2.2.2, increases of 15% have been provided to these travel distance limitations due to the provision of a Category L1 fire detection system. This increase has been applied for both A2 and B1 risk profiles.

Where internal layouts are known, actual travel distance are used. Where internal layouts are unknown, direct travel distance have been used. A preliminary assessment on the travel distances has been carried out and travel distances from all areas in the building are within the limits provided in Table 8.

Table 8: Maximum travel distances as per Table 11 of BS 9999

Risk Profile	Maximum Travel Distance (m) [1]			
	Two-way Travel		One-way Travel	
	Direct	Actual	Direct	Actual
A2	42.55	63.25	17.25	25.30
B1	46.00	69.00	18.40	27.60

[1] Travel distance limits have been increased by 15% due to the provision of an automatic fire detection for risk profiles A2 and B1.

5.1.1.2 Exit Widths

The minimum exit width per person as recommended in Table 12 of BS 9999 is dependent upon the risk profile of the area as shown in Table 9.

As described in Section 2.2.2, a decrease of 15% has been provided to these minimum width limitations due to the provision of a Category L1 fire detection system. This decrease has been applied for risk profiles A2 and B1.

Utilising the values in Table 9, the maximum capacity of various areas of the scheme can be calculated. It should be noted that minimum door widths should not be less than 850 mm to accommodate wheelchair users. Furthermore, doors which are expected to be used by more than 60 persons will be hung to open in the direction of escape.

The current design shows the retail units are provided with a single exit and therefore should be limited to 60 persons at any one time. The occupancy in the gym should be limited to 60 persons at any one time due to one of the exits open against the direction of escape.

A preliminary exit capacity calculation of the carpark has been carried out. Discounting the largest storey exit on each level of the carpark, the maximum horizontal exit capacity from each level is shown in

Table 10, which is sufficient to accommodate the anticipated occupancy of each level listed in Table 5.

Table 9: Minimum exit widths per person as per BS 9999 recommendations

Risk Profile	Minimum exit width per person (mm)
A2	3.06
B1	3.06
[1] Minimum exit widths have been decreased by 15% due to the provision of an automatic fire detection for risk profiles A2 and B1. [2] The recommended horizontal exit with for aB1 risk profile has been adopted for the open-air residential roof terrace as it is expected there will be visitors present on the terraces, they are considered to be unfamiliar with the building/ building escape routes.	

5.1.2 Residential Areas (Level 4 – 34)

5.1.2.1 Internal Planning of Flats

The design consists of open-plan flats with escape through a living area containing a kitchen and which is not located with a separate enclosure. BS 9991 states open-plan flats should meet the following specific recommendations:

- The size of the open-plan flat should not exceed 16 m × 12 m;
- Open-plan flats should be situated on a single level only;
- The ceilings within the open-plan flat should have a minimum height of 2.25 m;
- The kitchen should be enclosed in open-plan flats having an area exceeding 8 m × 4 m. Cooking appliances in open-plan flats having an area smaller than 8 m × 4 m should not be adjacent to the entrance of the flat;
- Open-plan flat layouts should not be provided for accommodation where the occupants are not capable of independent evacuation; and
- Travel distances within the flats will be limited to 20 m as an AWFSS and a Grade D1 LD1 fire detection and alarm system in accordance with BS 5839-6 will be installed.

In addition, the DRAFT BS 9991 recommends the following:

- All cooking apparatus, will be located such that the edge of the cooking apparatus is 1.8 m away from a means of escape route to an escape door;
- All egress routes from habitable rooms to the escape door from the apartment will not be less than 0.9 m in width; and
- A gap of 0.3 m will be provided between the leading edge of the door and the 1.8 m zone from the cooking apparatus, to allow people with mobility impairments to access the door hardware.

As shown in Appendix A, the proposed design meets the above recommendations, except the kitchen will not be enclosed in the open-plan flats and the area of the open-plan flats will exceed 8 m x 4 m. Further justification will be provided at the next stage.

5.1.2.2 Private Balconies

The proposed design consists of flats with a private balcony, the following provisions should be applied to flats with a private balcony.

- All balconies should be guarded with a protective barrier conforming to BS 6180;
- At least 50% of the vertical section should be open and the area of opening should be uniformly spread around the surface;
- No store (unless provided within a 30 min enclosure) or other fire risk should be erected externally on a balcony;
- The escape route from the balcony should not pass through more than one access room;
- The interior of the access room should be clearly visible from all parts of the balcony unless provided by a fire detection and alarm system in accordance with BS 5839-6:2013;
- The risk of open cooking in the open kitchen in the access room is remote from the balcony and positioned in such a way that it does not prejudice the escape route through the access room; and
- A fire detection and fire alarm system in accordance with BS 5839-6:2013 is provided to the access room with an alarm system on the balcony.

5.1.2.3 Residential Common Corridor

Travel distances in the residential common corridors meet the recommendations in BS 9991. The current proposal is to provide mechanical ventilation systems within the residential common corridor with the objective to protect the stairs from smoke ingress and clear smoke from the corridor. The systems will be an enhancement to minimum recommended in BS 9991. The systems will be developed as the design progress, and it will subject to validation using CFD or similar. It is recommended that an allowance is made so that each mechanical smoke shaft on the residential levels can achieve a supply and extract rate of 6 m^3/s at this stage. In addition, a natural smoke shaft with a free area of 1.5 m^2 is to be provided to serve the lift lobbies. In addition to ventilation within the corridor, an AOV at the head of each stair with a free area of 1 m^2 should be provided.

BS 9991 states that ancillary accommodation should not connect with any part of the only escape route from one or more dwelling(s) on the same storey as the ancillary accommodation unless provided with a lobby. If a stair provides access to an enclosed car park, there should be a ventilated protected lobby at every car park access level, refer to Appendix A.

5.1.2.4 Residential Roof Terrace

Each residential tower will be provided with a roof terrace, each terrace is provided with two exits, as one of the exits open against the direction of escape, the occupancy in each terrace is limited to 60 persons at any one time. Travel distances in the residential open-air rooftop terraces should be limited to the recommendations given of risk profile B1 in Table 8, this is currently achieved in the design.

Table 10: Carpark Horizontal Exit Capacity

Level	Horizontal Exit Capacity	Stair A	Stair B	Stair C	Stair D	Stair E	Stair F	Stair G	Total car park horizontal capacity (per level)
Basement	Width	850	850	850	850	850			652
	Exit Width Factor	3.06	3.06	3.06	3.06	3.06			
	Capacity	163	163	163	163	163			
Ground Floor	Width	850	850	850	850				489
	Exit Width Factor	3.06	3.06	3.06	3.06				
	Capacity	163	163	163	163				
First Floor	Width	850	850	850	850	850			652
	Exit Width Factor	3.06	3.06	3.06	3.06	3.06			
	Capacity	163	163	163	163	163			
Second Floor	Width				850	850	850	850	489
	Exit Width Factor				3.06	3.06	3.06	3.06	
	Capacity				163	163	163	163	
Third Floor	Width				850	850	850	850	489
	Exit Width Factor				3.06	3.06	3.06	3.06	
	Capacity				163	163	163	163	

Discounted Horizontal Exit / Stair

Not Served By Stairs / Not Served By This Stair

Remaining Capacity After Subtracting the Desired Occupancy

5.2 Vertical Means of Escape

5.2.1 Non-residential Areas (Carpark Basement – Level 3)

5.2.1.1 Number of Stairs

All levels of the carpark are served by at least 2 stairs, the locations of the stairs are shown in Appendix A.

5.2.1.2 Stair Width

As the building will incorporate a simultaneous evacuation, the stairs should be suitably sized to accommodate all persons evacuating from Basement, Level 1 to Level 3. The minimum width of escape stairs for an B1 risk profile area as per BS 9999 is shown in Table 11 below.

Table 11: Minimum width of escape stairs for simultaneous evacuation

Risk Profile [1]	Total number of floors served	Minimum width of stair per person served (mm) [2]
B1	1	3.57
	2	3.06
	3	2.63

[1] Risk profile for the carpark.

[2] Minimum stair widths have been decreased due to the provision of automatic fire detection for risk profile B1.

5.2.1.3 Stair Capacity

The maximum stair capacity of the within the carpark has been calculated in accordance with BS 9999 recommendations, discounting the largest stair for conservatism.

As described in Section 2.2.2, a decrease of 15% to the minimum width of stair per person has been provided to these minimum stair width limitations due to the provision of a Category L1 fire detection system.

A preliminary vertical exit capacity calculation of the carpark has been carried out. The maximum vertical exit capacity is shown in Table 12, which the number of stairs and stair widths is sufficient to accommodate the total anticipated occupancy in the carpark as listed in Table 5 (Basement, Level 1 to Level 3).

No merging flow has been considered for these stairs, as occupants on Ground Floor have independent exits to outside.

5.2.2 Residential Area (Level 4 - 34)

Each residential tower will be provided with 3 stairs. As the floor plate of the towers step reduce on the upper levels, only the 2 stairs in the central core will be serving the upper levels. All stairs are currently designed with a clear width of 1200mm. This meets the minimum clear width of 750 mm as per BS 9991:2015 for common stairs in residential flats.

The discharge routes of the stairs are still in development, but it is proposed that for Building A and C, the stairs either discharges into a protected route leading to a final exit which itself is separated from any accommodation by ventilated protected lobbies, or into the main residential tower entrance. The protected route and main residential tower entrance on Ground Floor are to be interconnected and occupants will have the opportunity to use the unaffected route to reach the final exit. This strategy is to be supported by dynamic exit signage.

For Building B, the discharge routes from the stairs are available on Level 2. Similar to Building A and C, the stairs either discharges into a protected route leading to a final exit which itself is separated from any accommodation by ventilated protected lobbies, or into the main residential tower entrance. The protected route and main residential tower entrance on Level 2 are to be interconnected and occupants will have the opportunity to use the unaffected route to reach the final exit to the open-air podium. This strategy is to be supported by dynamic exit signage.

As discussed in Section 1.3, the amended Approved Documents will come into force on 1 December 2022. The amendment includes the recommendation to implement a BS 8629 system (building evacuation alert system). Although it is not a recommendation in the current AD B but will be from December 2022 and therefore consideration should be given to including it to future proof the design.

Table 12: Carpark Vertical Exit Capacity

Level	Vertical Exit Capacity	Stair A	Stair B	Stair C	Stair D	Stair E	Stair F	Stair G	Total car park vertical capacity (per level)
Basement	Width	900	1200	1060	1140	1140			1187
	No. of floors served	1	1	1	1	1			
	Stair width factor	3.57	3.57	3.57	3.57	3.57			
	Capacity	252	336	297	319	319			
Ground Floor	Width								
	No. of floors served								
	Stair width factor								
	Capacity (level)								
First Floor	Width	1020	1200	1050	1140	1140			868
	No. of floors served	1	1	1	3	3			
	stair width factor	3.57	3.57	3.57	2.63	2.63			
	Capacity (level)	286	336	294	144	144			
Second Floor	Width				1140	1140			484
	No. of floors served				3	3			
	Stair width factor				2.63	2.63			
	Capacity (level)				144	144			
Third Floor	Width				1140	1140	1200	1200	624
	No. of floors served				3	3	1	1	
	Stair width factor				2.63	2.63	3.57	3.57	
	Capacity (level)				144	144	336	336	

Discounted Horizontal Exit / Stair

Not Served By Stairs / Not Served By This Stair

Remaining Capacity After Subtracting the Desired Occupancy

5.2.3 Mobility Impaired Persons (MIPs)

5.2.3.1 Non-residential Areas (Basement – Level 3)

Under the Regulatory Reform (Fire Safety) Order, it is the duty of the responsible person to ensure that there are measures and procedures in place to allow everyone to be assisted to a place of ultimate safety outside the building in the event of an emergency. As such, building management need to develop procedures to assist with the evacuation of MIPs in the event of a fire from the non-residential area of the Leisure Box. Provisions should not rely on the fire and rescue service for assistance. MIPs include those with mobility, sensory and/or cognitive impairments.

5.2.3.1.1 Temporary Refuge Spaces

At ground floor, all exits directly to outside are level access, and so no refuges are proposed at this level. For Basement, Level 1-3, 1 refuge should be provided within each protected stair.

Each refuge will be provided space for a wheelchair not less than 900mm x 1400mm and located such that they would not obstruct the flow of persons escaping from each level.

All refuges will be provided with an emergency voice communication (EVC) system in accordance with BS 5839-9:2021 [12]. The signal location of the EVC system will be provided next to the main fire alarm panel or a location which will be staffed when the building is occupied.

5.2.3.2 Residential Areas (Level 4-Level 34)

An evacuation lift has been proposed in each residential core to serve all residential levels which will be suitable for use in an evacuation for mobility impaired persons. At the next design stage, a smoke modelling assessment will be undertaken to demonstrate that during the escape phase, the conditions in the lift lobby will remain tenable to support means of escape via the lift.

5.2.4 Escape Away from Building

The final exits from all stairs will be directly to outside. Once outside, occupants have the choice in the direction they reach a place of ultimate safety. As such, it is not considered necessary to provide fire-rated external wall construction adjacent to these discharge routes, as persons could turn their back on a fire.

The routes away from the building will be well defined and be suitably guarded against potential traffic hazards. It is the responsibility of the building management to choose a fire assembly location for the Leisure Box which does not put assembling persons at risk (e.g., from traffic).

6 Internal Fire Spread

6.1 Linings

The surface linings of walls and ceilings should meet the classifications in Table 13 for the appropriate location when tested in accordance with BS EN 13501-1 [15].

However, parts of walls in rooms may be of a lower class (but not lower than European Class D-s3,d2) provided that the total area of those parts in any one room does not exceed half of the floor area of the room, subject to a maximum of 60 m^2 .

Table 13: Classification of linings

Location [a)]	European Class
Small rooms of area not more than: • 4m^2 in residential accommodation; or • 30m^2 in non-residential accommodation.	D-s3, d2
Other rooms	C-s3, d2
Circulation spaces within dwellings	C-s3, d2
Other circulation spaces (including common areas of blocks of flats)	B-s3, d2
a) The flights and landings of the firefighting stairs should be constructed of materials achieving Class A2-s3,d2 or better. Materials added to the top horizontal surface of the treads should achieve at the minimum Class B-s3,d2.	

6.2 Structural Fire Resistance

The required structural fire resistance rating for loadbearing elements for the Leisure Box is a minimum of 120 minutes as per the recommendations in BS 9999.

Elements of structure includes:

- A column, beam, or other member forming part of a structural frame;
- A load-bearing wall; and
- A floor (including roof that serves as a floor for plantroom or means of escape).

Any structural element supporting or providing stability to any fire resisting construction should, as a minimum, achieve the same fire resistance rating as the supported element.

6.3 Fire Doors

Any doors penetrating a fire rated partition should be provided in accordance with BS 476-22:1987 [16] and provided with smoke seals (where specified) in accordance with BS 476-31.1:1983 [17].

All fire doors should be fitted with a self-closing device except for fire doors to cupboards and to service ducts, which will be kept locked shut at all times other than for maintenance.

6.4 Compartmentation

6.4.1 General

- Compartment walls should be constructed to achieve at the minimum 120 minutes fire resistance (REI 120), any openings within the wall should be fitted with FD 60S fire door sets, except for flat enclosure, which can be REI 60 and FD 30S;
- Walls separating the Leisure Box and the adjoining Deansgate Terrace should be constructed as a compartment wall (REI 120);
- All floors separating the non-residential and residential, and all floors separating residential occupancies should be designed as compartment floors to achieve at the minimum 120 minutes fire resistance (REI 120) and;
- The preliminary proposed fire rating of building elements during RIBA Stage 2 of the Leisure Box is provided in Table 14.

Table 14: Fire resistance of elements

Element	Minimum Fire Resistance rating (minutes)	Minimum Fire Resistance Fire Doorset
Loadbearing elements	R 120	N/A
Compartment walls	REI 120	FD 120S
Compartment floors	REI 120	N/A
Separating fire-fighting shaft from the rest of the building	REI 120	FD 60S
Separating fire-fighting stair, firefighting lift shaft and fire-fighting lobby	REI 60	FD 30S
Fire-fighting lobby smoke shaft	REI 60	FD 30S
Protected shafts (risers, smoke shafts, refuse chutes)	REI 120	FD 60S
Refuse chutes lobbies	REI 60	FD 60S
Flat enclosures	REI 60	FD 30S
Sub-division of a corridor	REI 30	FD 30S
Separation between the car park and the adjcent accommodations	REI 120	FD 120S
Storage areas greater than 1 m^2 in area but not greater than 450 m^2	REI 30	FD 30S
Cycle Store	REI 60	FD 60S
Transformer, switchgear, and battery rooms for low-voltage or extra-low-voltage equipment	REI 30	FD 30S
Engineering services installation rooms	REI 30	FD 30S

Refuse storage areas	REI 90	FD 90S
Transformer and switchgear rooms for equipment above low voltage	REI 120	FD 120S
Rooms housing fixed internal combustion engine(s)	REI 120	FD 120S
Any electrical substation or enclosure containing any distribution board, generator and any equipment associated with life safety and fire protection systems	REI 120	FD 120S
Cavity Barriers	E 30, I 15	FD 30

6.5 Concealed Spaces (Cavity Protection)

In order to restrict smoke and fire spread through concealed spaces or cavities, cavity barriers should be provided as described in Section 19 and 21 of BS 9991:

- At the edges of cavities, including around openings (such as windows, doors and exit/entry points for services);
- At the junction between an external cavity wall and every compartment floor and compartment wall;
- At the junction between an internal cavity wall and every compartment floor, compartment wall or other wall or door assembly forming a fire resisting barrier; and
- Subdivide extensive cavities to meet the provisions in Figure 15 and Table 15.

Table 15: Cavity Barrier Provisions

Location of cavity	Class of surface /product exposed in cavity	Maximum dimensions in any direction (m)
Between roof and ceiling	Any	20
Any other cavity	Class C-s3,d2 or better	20
	Worse than Class C-s3,d2	10

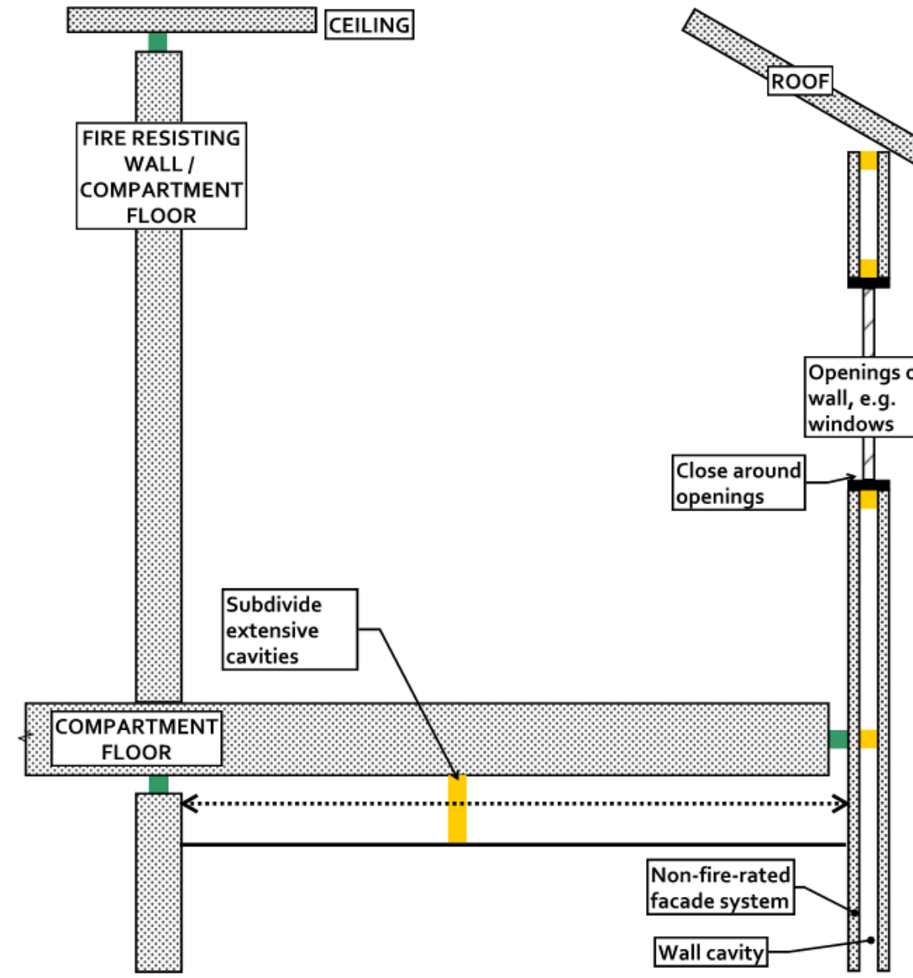


Figure 15: Cavity barriers and fire-stopping

6.6 Fire-stopping

6.6.1 Overview

As described below, any openings in fire resisting walls and floors should be fire-stopped achieving the same fire rating as the wall or floor through which they pass, including all relevant openings for pipes, ducts and conduits for cables. The number of openings should be kept to as few in number as possible and the size as small as is practicable. Fire-stopping is also to be installed where joints between fire resisting elements are provided (Figure 16).

Where fire stopping, dampers or similar are used to maintain protection when services pass through fire resisting elements, the design of the penetration should ensure the configuration of the chosen sealing product is compatible with the relevant substrate and application. Where practicable, penetration details should align with standard details provided by product manufacturers supported by relevant test data.

Where achieving a standard detail is not practicable, the non-standard detail must be supported by assessments or engineering judgements by a suitably qualified party and be based on appropriate primary and secondary test data.

All fire stopping, dampers or similar must be installed by suitably qualified persons and certified by the installer (if a member of a self-certification scheme) or by a suitable third party.

6.6.2 Pipes

Pipes that pass through a fire separating element, as shown in Figure 16, should meet one of the following provisions:

- Proprietary seals - Provide a proprietary fire-stopping sealing system (e.g. a pipe collar) which has been shown by test to maintain the fire resistance of the wall, floor or cavity barrier; or
- Restricted pipe diameter - Where a proprietary sealing system is not used, and the nominal internal diameter of the pipe is not more than the relevant dimension given in Figure 16 providing a suitable fire stopping sealant applied around the pipe is sufficient. The opening should be kept as small as possible; or
- Sleeving - A pipe of lead, aluminium, aluminium alloy, fibre-cement or uPVC (BS 4514:2001 [21] and uPVC pipes complying with BS 5255:1989 [22]), with a maximum nominal internal diameter of 160mm, may be used with a sleeve made out of a high melting point metal. The opening in the structure should be as small as possible and suitable fire stopping sealant should be provided around the sleeve. The sleeve should extend no less than 1000mm on either side of the structure.

In addition to the minimum recommendations from guidance, best practice guidance recommends that appropriate protection be provided to pipes such that the insulation and integrity of the separating element they pass through be maintained.

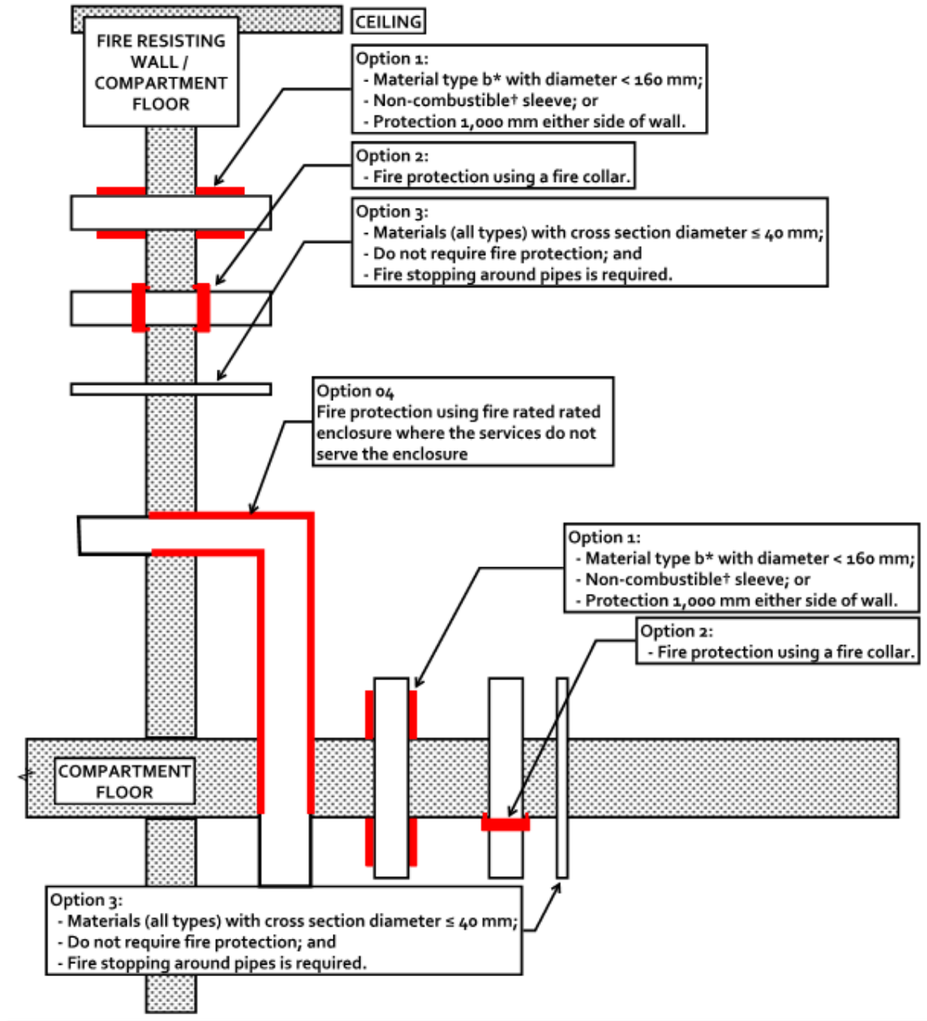


Figure 16: Fire-stopping details: pipes

6.7 Ventilation Ducts, Flues, etc.

One of the following methodologies, as illustrated in Figure 17, is to be implemented where a ventilation duct passes through a fire resisting element to maintain the integrity of this element:

- Protection using fire and smoke dampers, conforming to BS EN 15650 [23]. It should be noted that thermally activated fire dampers only are not adequate to protect escape routes of the building. Penetrations into protected escape routes and fire resisting walls subdividing evacuation zones shall be protected with motorised fire and smoke dampers, which are activated on the detection of smoke or fire within the associated compartments;
- Protection using fire-resisting enclosures; and
- Protection using fire-resisting ductwork.

Any extract ductwork serving kitchens penetrating fire resisting elements should not be provided with fire dampers. They should be protected throughout using a fire resisting enclosure or fire-resisting ductwork.

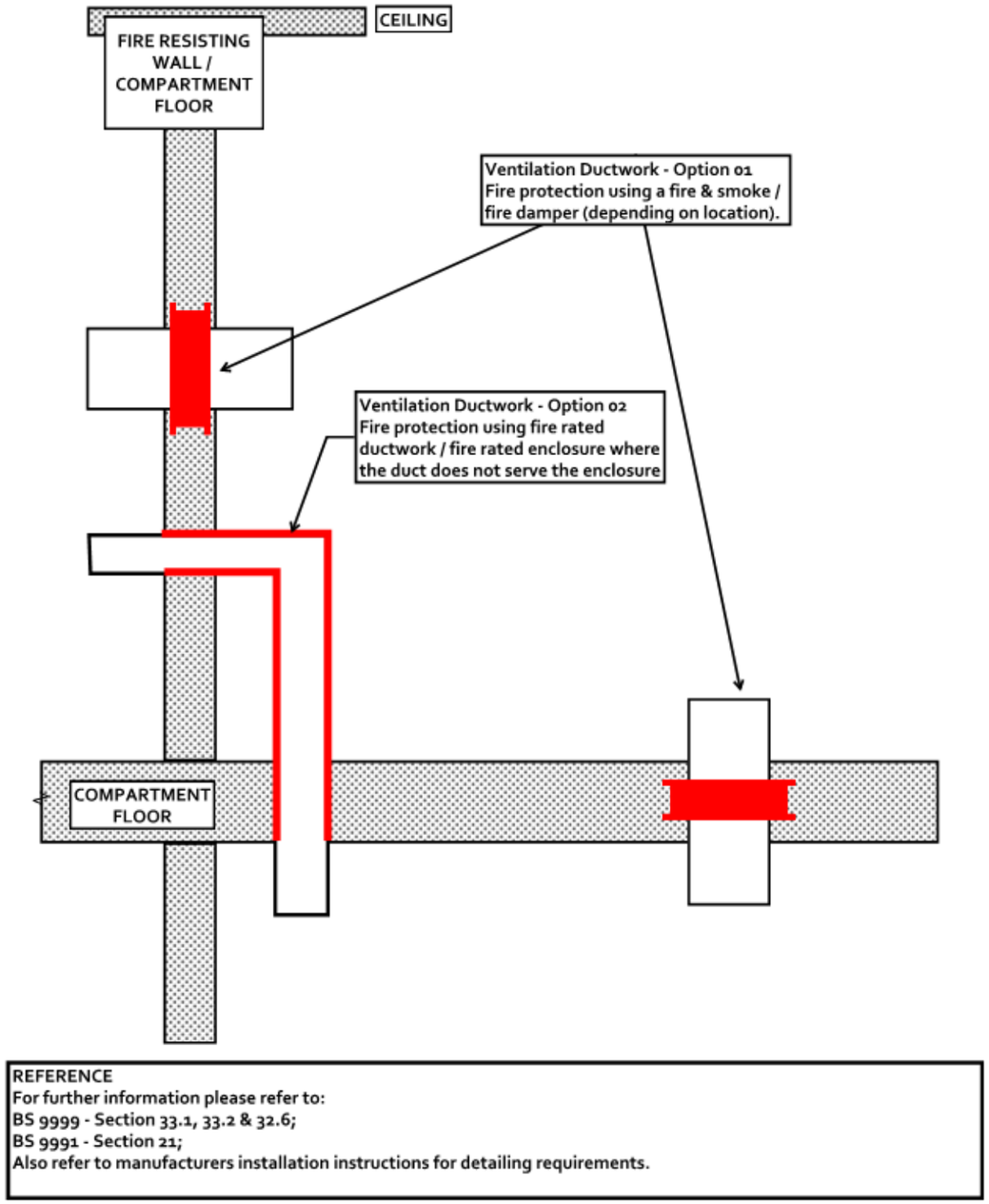


Figure 17: Fire-stopping details: ventilation ducts

7 External Fire Spread

7.1 External Wall Build-up

The building will have a storey at least 18m above ground level and will contain one or more dwellings, such as a room for residential purposes. Therefore, the external wall materials need to meet the requirements in Regulation 7 (specifically Regulation 7(2)) of the Building Regulations which now specifies that materials which become part of an external wall, or specified attachment, of a relevant building must be of European Classification A2-s1,d0 or Class A1, classified in accordance with BS EN 13501-1.

The balconies to the flats will be classified as a specified attachment and as such must also meet Regulation 7 (2).

Regulation 7(3) sets out some exceptions from the requirements in 7(2), which includes the following:

- Cavity trays when used between two leaves of masonry;
- Any part of a roof (other than any part of a roof which falls within paragraph (iv) of regulation 2(6)) if that part is connected to an external wall;
- Door frames and doors;
- Electrical installations;
- Insulation and water proofing materials used below ground level;
- Intumescent and fire stopping materials where the inclusion of the materials is necessary to meet the requirements of Part B of Schedule 1;
- Membranes;
- Seals, gaskets, fixings, sealants and backer rods;
- Thermal break materials where the inclusion of the materials is necessary to meet the thermal bridging requirements of Part L of Schedule 1; and/or
- Window frames and glass.

Whilst regulation 7(3) states that the requirements do not apply to membranes, the revised statutory guidance (AD B) recommends that membranes used as part of the external wall construction should achieve a minimum classification of European Class B-s3, d0.

As best practice, it is recommended that ALL elements of the external wall build-up including those mentioned prior achieve Class A2-s1,d0 or better, and that all practical endeavours should be applied to seek the best performing materials (subject to other performances being satisfactory).

7.2 Roof Coverings

Performance of the resistance of roofs to external fire exposure is measured in terms of penetration through the roof construction and the spread of flame over its surface.

Roof constructions are classified within the European system as $B_{ROOF}(t4)$, $C_{ROOF}(t4)$, $D_{ROOF}(t4)$, $E_{ROOF}(t4)$ or $F_{ROOF}(t4)$. in accordance with BS EN 13501-5:2016 [24]. $B_{ROOF}(t4)$ indicates the highest performance and $F_{ROOF}(t4)$ the lowest.

Table 36 in BS 9999 has been used to recommend the minimum designation of roof covering of roof for the Leisure Box. As part of the roof covering falls between 6 m and 12m to the relevant boundary, the minimum recommended designation for roof covering is $C_{ROOF}(t4)$.

7.3 Space Separation Assessment

A preliminary space separation assessment carried out in accordance with BR 187 [26] has been conducted, in order to determine the requisite quantity of fire rated external wall construction to mitigate the risk of fire spread across relevant boundaries.

The following assumptions have been made for these calculations:

- Each area has been measured as an equivalent rectangle, the largest compartment has been taken on each elevation;
- A heat flux of 168 kW/m^2 has been adopted for carpark and plants. A heat flux of 84 kW/m^2 has been adopted for residential gym;
- The provisions of sprinklers have been considered in the calculation;
- The relevant boundaries have been measured to either the centreline of Watson Street, the centreline of Great Bridgewater Street, or as a notional boundary to the adjacent Deansgate Terraces or the Warehouse as shown in Figure 18.

The results of the assessment are shown in Table 16, it shows that there is no limitation on the maximum allowed unprotected area and therefore no fire-rated construction is necessary. There are openings between carpark levels (e.g., for vehicle ramps) and therefore all carpark levels (except for Basement) should be taken as the compartment size in the assessment. However, the compartment height used in the assessment does not consider all carpark levels, due to the carpark being provided with a sprinkler system throughout therefore the fire growth is assumed to be restricted and developing into a flashover fire is unlikely. The existing concrete floor slabs will also mitigate the risk of fire spread to multiple carpark levels.

Table 16: External fire spread allowable unprotected area

Elevation	Location	Compartment Size	Distance to Boundary	Heat flux (kW/m^2)	Unprotected area allowed
1	Level 1 Carpark	63.3 m x 3.0 m	7.4 m	168	100%
2	Ground Floor Plant / Carpark	57.3 m x 3.1 m	7.7 m	168	100%
3	Level 2 Residential Gym	34.0 m x 3.0 m	6.3 m	84	100%
4	Ground Floor Carpark	61.6 m x 3.1 m	7.3 m	168	100%

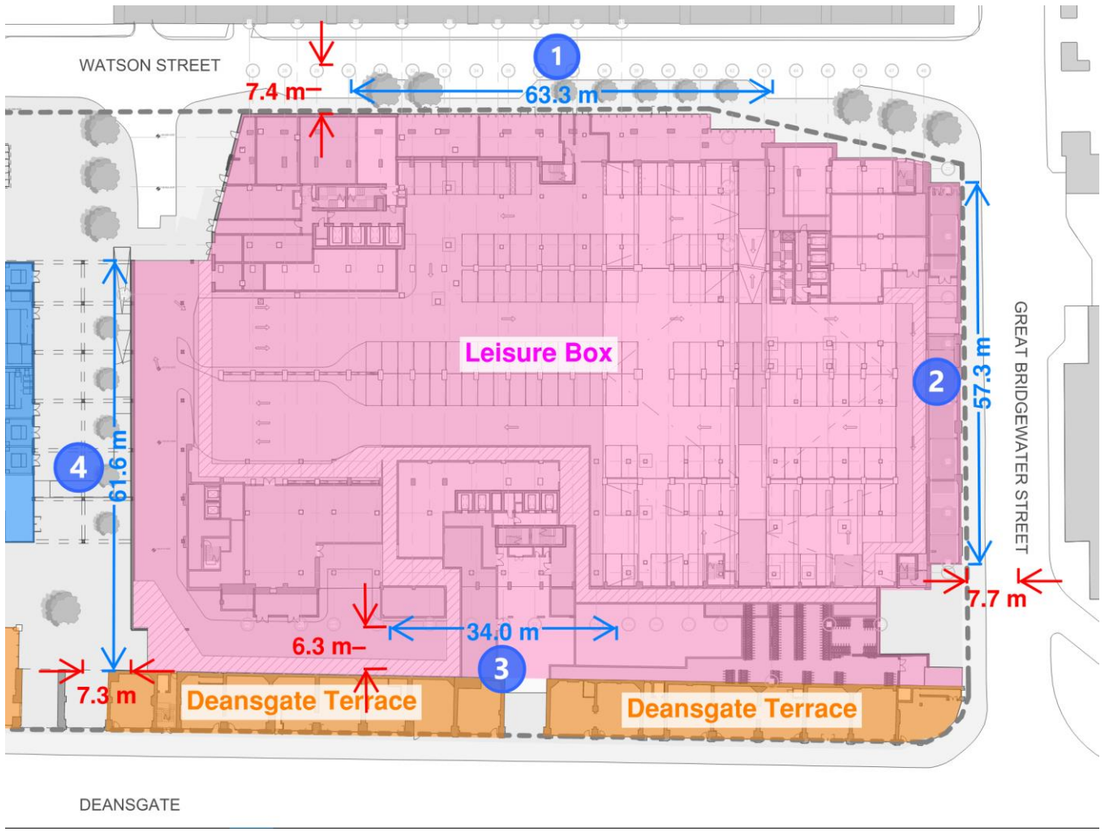


Figure 18: Preliminary External Fire Spread Analysis

8 Access and Facilities for the Fire Service

8.1 Non-residential areas (Basement – Level 3)

The guidance in Section 6 of BS 9999:2017 has been used as the basis to review the fire service access and facilities provisions on the car park levels (Basement – Level 3).

8.1.1 Standard Guidance Recommendations

8.1.1.1 Provisions of fire-fighting facilities

As per Table 17 of BS 9999:2017, for any building in occupancy risk category A or B and with a height of 11 m or more, but less than 18 m, an escape stair and unvented protected lobby with a fire main should be provided.

The number of fire mains needed are to meet the maximum hose distance. For buildings fitted throughout with an automatic sprinkler system in accordance with BS EN 12845, every part of every qualifying storey should be no more than 60 m from a fire main outlet in a fire-fighting shaft, measured on a route suitable for laying hose.

Fire mains should be installed within a protected lobby where provided, or a stair enclosure.

8.1.1.2 Fire Service Access

There should be access for a pumping appliance to within 18 m of each fire main inlet connection point, typically on the face of the building, and the inlet should be visible from the appliance.

Fire mains should be designed and installed in accordance with BS 9990:2015 [20].

8.1.1.3 External Water Supply

Hydrants should be provided within 90 m of dry fire main inlets on a route suitable for laying hose.

All hydrants should have signage in accordance with BS 3251:1976 [21].

8.1.2 Existing Provisions

8.1.2.1 Provisions of fire-fighting facilities

The existing fire strategy states Stairs A, H, N and M are designed as firefighting stairs in accordance with the recommendations in Approved Document B and BS 5588-5. The stairs are constructed as protected shafts with a minimum fire resistance of 120 minutes and each stair is provided with a fire main. The fire mains are of dry risers, which will be charged from an inlet located on Watson Street adjacent to Stairs A and N. Outlets are provided at each level in the firefighting lobbies to each firefighting stair.

The fire-fighting stairs and lobbies are provided with natural ventilation via manual and automatic opening vents in accordance with the BS 5588-5.

Fire-fighting lifts are not provided.

8.1.2.2 Fire Service Access

On arrival at the Great Northern complex, the fire service will first approach the Watson Street Car Park entrance to establish command and control and make initial entry to the complex. Fire main inlets are provided along Watson Street, the inlet points are within 18 m of the fire service parking location.

Fire alarm and sprinkler controls are located adjacent to the carpark entrance.

A radio repeater with associated aerials is installed within the building to enhance the signal to Fire Service mobile radios.

8.1.2.3 External Water Supply

The location of the nearest fire hydrant is not discussed in the existing fire strategy. As shown on Google Maps, there are multiple fire hydrants located along Watson St, directly adjacent to the dry riser inlet points for Stairs A and N of the Leisure Box (as shown in Figure 19). The nearest hydrants are within 90 m of all dry fire main inlets on a route suitable for laying hose, in accordance with the recommendations in BS 9999.

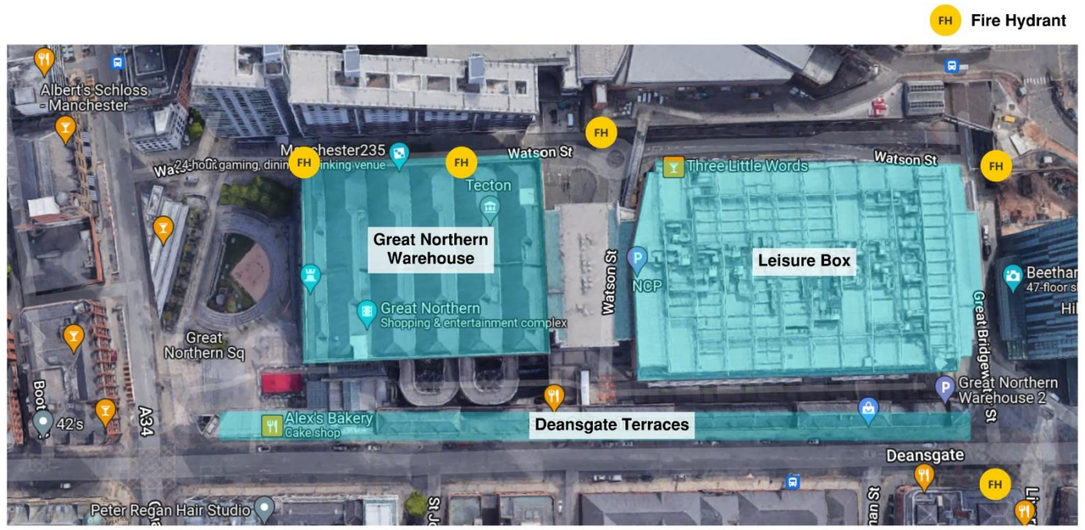


Figure 19: Hydrant location (Image Courtesy of Google Maps)

8.1.3 Ventilation

The Leisure Box car park is provided with a mechanical ventilation system providing 10 air changes per hour. The system is designed to run in two parts, each part capable of extracting 50% of the rate above, and designed so that each part may operate singly or simultaneously.

Each part of the system has an independent power supply which operates in event of failure of the main supply.

The fans are rated to run at 300°C for a minimum of 60 minutes, and the ductwork and fixings are constructed of materials having a melting point not less than 800°C.

8.1.4 Recommended Provisions

8.1.4.1 Provisions of fire-fighting facilities

The existing fire strategy states Stairs A, H, N and M are designed as firefighting with a minimum fire resistance of 120 minutes and each stair is provided with a fire main with outlets on every floor. However, during OFR's site visit, only the dry fire main inlets adjacent to Stairs A and N have been observed, the outlets in the fire-fighting stairs have not been observed.

It is recommended to install dry fire main on the car park levels, the intention is to retain the existing dry risers to not compromise the existing fire strategy. The number of fire mains needed are to meet the maximum hose coverage distance, which is 60 m from a fire-fighting shaft as the car park is sprinklered. A preliminary hose coverage distance assessment has been carried out and it is likely that at least 5 fire mains will need to be provided to satisfy the maximum hose coverage distance (see Figure 20).

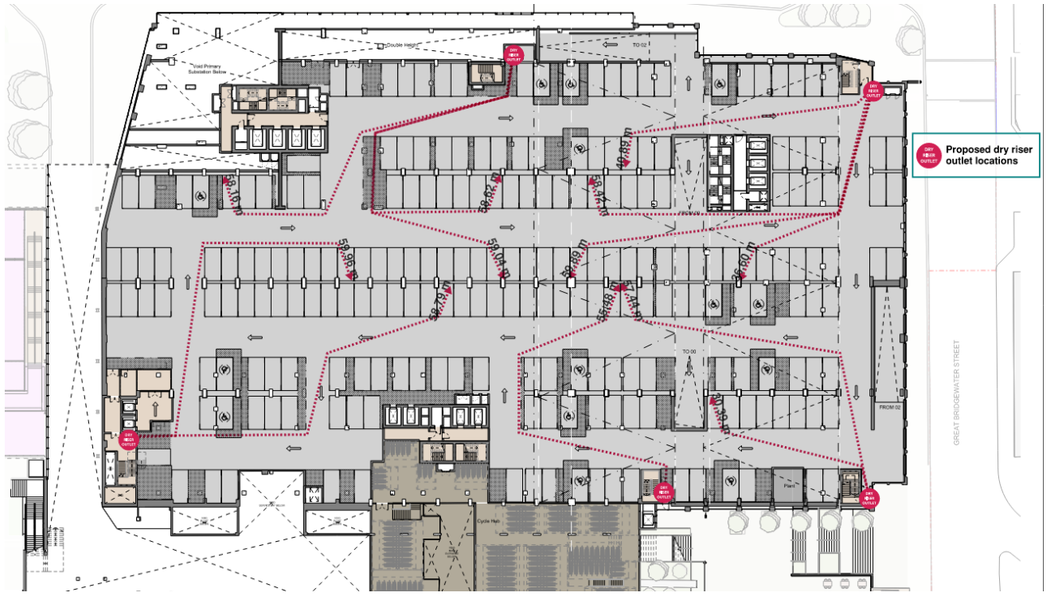


Figure 20: Proposed dry riser outlet locations to meet hose coverage distance

Fire mains should be installed within a protected lobby where provided, or a stair enclosure.

There should be access for a pumping appliance to within 18 m of each fire main inlet connection point, typically on the face of the building, and the inlet should be visible from the appliance.

8.1.4.2 Ventilation

The Leisure Box car park is proposed with a mechanical ventilation system providing 10 air changes per hour, in accordance with the recommendations in BS 9999 and Approved Document B Volume 2: Buildings other than dwellings, 2019 edition incorporating 2020 amendments.

8.2 Residential areas (Level 4 – Level 33)

The guidance in Section 8 of BS 9991:2015 has been used as the basis to review the fire service access and facilities provisions on the residential levels (Level 4 – Level 33).

8.2.1 Standard Guidance Recommendations

8.2.1.1 Number and Location of Fire-fighting Shaft

Buildings with a floor higher than 18 m above fire and rescue service access level, or with a basement more than 10 m below fire and rescue service access level, should be provided with fire-fighting shaft(s) containing fire-fighting lifts.

A sufficient number of fire-fighting shafts should be provided to meet the maximum hose distance, and at least two fire-fighting shafts should be provided in buildings with a storey of 900 m^2 or more in area.

Fire-fighting shafts should serve every storey through which they pass.

Wherever practicable, fire-fighting shafts should be sited against an exterior wall. Where this is not practicable:

- The route from the fire and rescue service entrance to the fire-fighting shaft should be as short as possible; and
- The fire-fighting shaft should be protected by fire-resisting construction to prevent fire from affecting the route or cutting off the means of escape for either the fire and rescue service or other persons within the building.

Where fire-fighting shafts are required, they should be located such that every part of every storey is no more than 60 m from a fire main outlet in a fire-fighting shaft, as measured on a route suitable for laying hose.

Where there are floors higher than 50 m above fire-fighting access level, wet fire mains should be installed because of the pressures required to provide adequate water supplies at the landing valves at upper floors and also to ensure that water is immediately available at all floor levels. The fire main should be located within the stair enclosure.

Fire mains should be designed and installed in accordance with BS 9990.

In order to meet the 60 m hose coverage distance, it might be necessary to provide additional fire mains in escape stairs. This does not imply that these stairs need to be designed as fire-fighting shafts.

8.2.1.2 Fire Service Access

Multi-storey buildings fitted with wet fire mains should have fire appliance access:

- Within 18 m of, and within sight of, a suitable entrance giving access to the wet fire main; and
- Within sight of the inlet for the emergency replenishment of the suction tank for the wet fire main.

8.2.1.3 Construction of fire-fighting shafts

8.2.1.3.1 Fire-fighting stairs

Fire-fighting stairs should be designed in accordance with BS 5395-1, with a width between the walls or balustrades of not less than 1.1 m. This width should be kept clear for a vertical distance of 2.0 m, as measured from the pitch line or landing floor level, with the following exceptions:

- stringers, each intruding into the stair by not more than 30 mm; and
- handrails, each intruding into the stair by not more than 100 mm.

A fire-fighting stair should not contain any cupboards or provide access to service shafts serving the remainder of the building.

To prevent smoke from basement storeys penetrating the stair enclosure above ground level, fire-fighting stairs serving floors both above and below ground level should be separated at ground floor level by a fire door.

The fire-fighting stair should serve every storey that is served by the fire-fighting lift.

Fire-fighting stair enclosures should be provided with facilities for smoke control.

Signage numerically indicating the floor level should be provided within the fire-fighting stair.

In blocks of flats the protected corridor or protected lobby provided for means of escape purposes is assumed to be the fire-fighting lobby, and it is not necessary to provide an additional fire-fighting lobby between the protected corridor or protected lobby and the fire-fighting stair.

8.2.1.3.2 Fire-fighting lift

A fire-fighting lift installation includes the lift car itself, the lift installation within the well and the lift machinery spaces, together with the lift control system and the fire and rescue service communications system. Fire-fighting lift installations should conform to BS EN 81-72.

The fire-fighting lift may open directly into the protected corridor or protected lobby, but the fire-fighting lift landing doors should not be placed more than 7.5 m from the fire-fighting stair and should not be located within the stair enclosure.

The use of dual-entry fire-fighting lifts is not recommended in residential buildings.

The power supply of the lift and lighting should consist of primary and secondary (emergency, stand-by or alternative) supplies. There should also be means to minimize the effect of water penetration into the fire-fighting lift well.

Access points into the fire-fighting lift well should be provided in accordance with BS EN 81-72.

Where a fire-fighting lift is intended to run blind through a number of floors, it should be determined that there is adequate access for fire-fighting personnel to set up a bridgehead on any required floor. Where lifts are proposed to run blind there should be early consultation with the local fire and rescue service.

8.2.1.4 Location and access to external fire supply

Hydrants should be located in positions that are near to building entry points (including entry points to fire-fighting shafts containing fire mains) and should be provided within 90 m of an entry point to the building and not more than 90 m apart.

All hydrants should have signage in accordance with BS 3251.

8.2.2 Recommended Provisions

As the residential towers proposed with a floor higher than 18 m above fire and rescue service access level, fire-fighting shaft(s) containing fire-fighting lifts should be provided. Wet fire main(s) should be provided as the towers will have a floor higher than 50 m above fire and rescue service access level.

As some levels will have a storey of 900 m^2 or more in area, two fire-fighting shaft(s) complying with the recommendation in BS 9991:2015 will be provided. The proposed fire-fighting access arrangement for Building A is illustrated in Figure 22, the remaining two buildings will also follow the same principle. However, the arrangement of the fire-fighting shafts will slightly deviate from the standard guidance recommendations:

- Some of the residential fire-fighting shafts will not every storey through which they pass, as they will not serve the carpark levels;
- The route from the fire and rescue service entrance point to the some of the fire-fighting shaft access points will be greater than 18 m in length;
- For Building A and C, some of the fire-fighting access route will not be via a protected route (e.g. via a residential entrance lobby);
- For Building B, the Fire Service access routes to the fire-fighting stairs will be via the residential entrance lobby, either route will not be a protected route; and
- As the residential levels will be sprinklered, every part of every storey should be no more than 60 m from a fire main outlet in a fire-fighting shaft. The hose coverage distance will exceed 60 m in some of the flats in Building C, as these flats are furthest away from the fire-fighting stairs.

The following has been considered to justify the above deviation:

- If the residential fire-fighting shafts also serve the carpark levels then provisions such as additional lobbies, ventilation will be provided in between the carpark and the fire-fighting shafts. In addition, the car park will be provided with fire-fighting facilities in accordance with the recommendations in BS 9999 (summarised in Section 8.1.1.1);
- The access route for Building A and C on Ground Floor is interconnected and the fire service will have the opportunity to use the unaffected route to enter the upper levels (see Figure 22);
- For Building B, if there is a fire on one of the residential levels, the Fire Service will still be able to access the fire-fighting stairs via the residential entrance lobby as it will remain unaffected from the fire. If there is a fire in the residential entrance lobby, the Fire Service will not need to enter the lobby to reach the fire. There will also be additional measures in place, e.g., separating the fire-fighting stairs from the residential entrance lobby with protected lobbies / fire curtains to ensure that a fire in the residential entrance lobby will not compromise the fire-fighting stairs; and
- The hose coverage in Building C only marginally exceeded the 60 m limit, e.g. 67.9 m (see Figure 21). Another option would be to install an additional wet riser in the escape stair to compensate the extended distance.

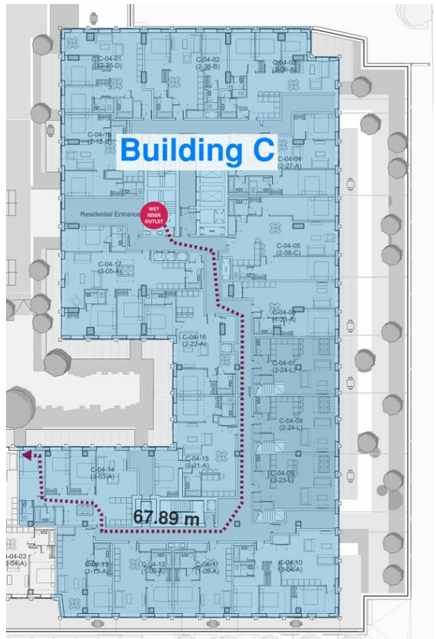


Figure 21: Flat with extended hose coverage distance (RIBA Stage 2)

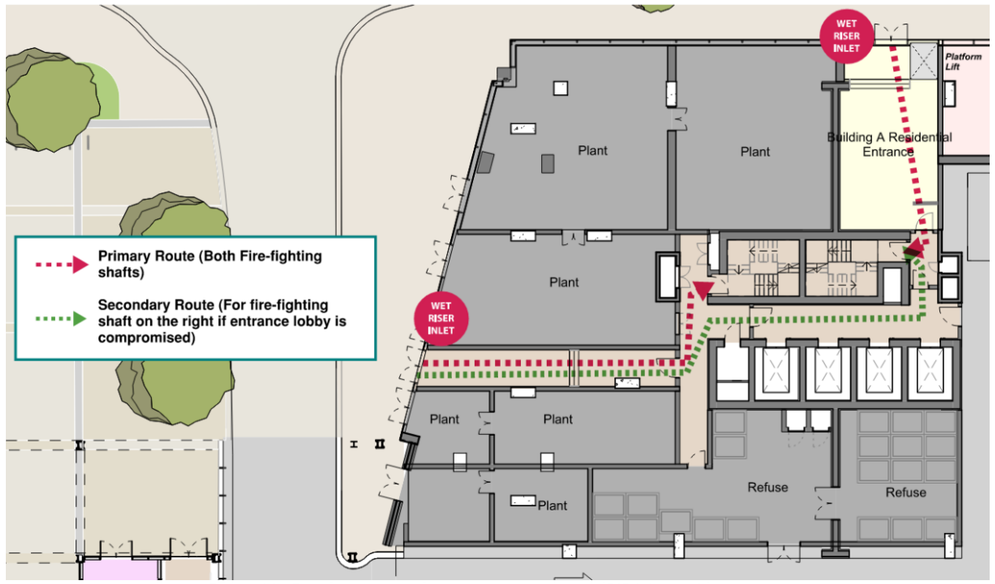


Figure 22: Fire-fighting shaft access arrangement (RIBA Stage 2)

8.2.2.1 Fire Service Access

Provisions for Fire Service Access should be provided in accordance with the recommendations in BS 9991 (summarised in Section 8.2.1.2).

8.2.2.2 Construction of fire-fighting shafts

The construction of fire-fighting shafts, including fire-fighting lifts and stairs should be in accordance with the recommendations in BS 9991 (summarised in Section 8.2.1.3).

8.2.2.3 Location and access to external fire supply

The nearest fire hydrant is located within 90 m of an entry point to the building on a route suitable for laying hose, and hydrants are not more than 90 m apart (see Figure 19). This recommendation by BS 9991 is considered to be satisfied.

9 References

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Appendix A – Initial Fire Safety Comments

KEY:

Residential (Use Class C3)

- Residential Entrance/ Shared Amenity
- Residential circulation/ Private Amenity
- One Bed Apartment
- Two Bed Apartment
- Three bed apartment

Office (Use Class E(c))

- Office
- Office Entrances
- Office Circulation/ Balconies & Terraces

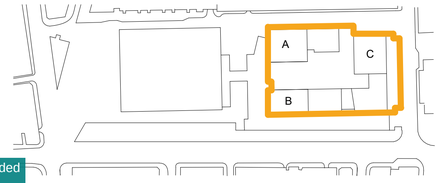
Commercial, Business & Service Community (Use Class Varies)

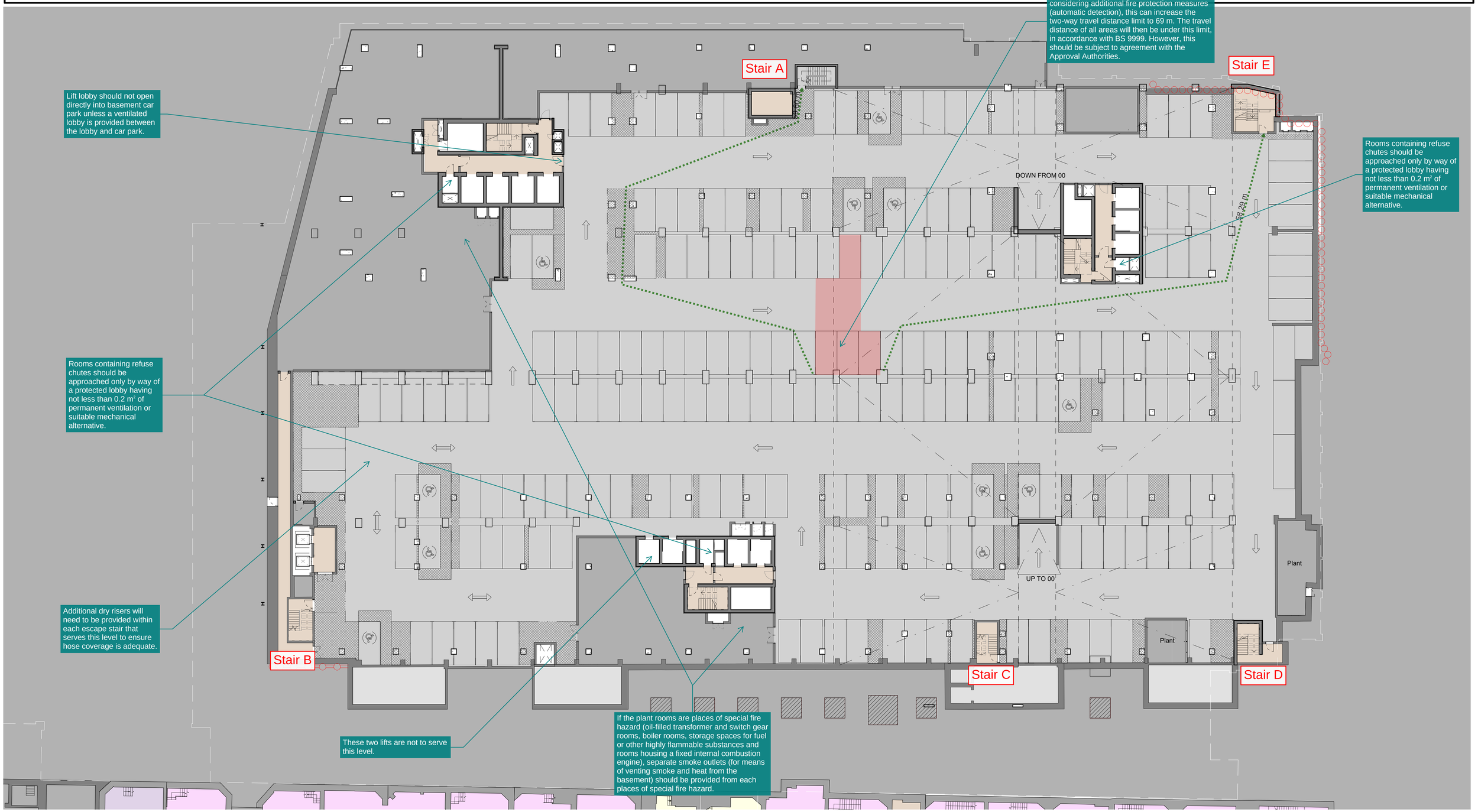
- Use Class E
- Use Class E or Sui Generis (Entertainment Venue)
- Use Class E or Sui Generis (Drinking Establishments or Hot Food Takeaway or Entertainment Venue)
- Use Class E or F2 (b)
- Entrances & Circulation

Other (Use Class Varies)

- Car Park (Sui Generis)
- Ancillary (Plant, Refuse Stores, Back of House, etc)
- Ancillary (Cycle Stores)

KEY Plan:





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NORTH

Rev	Date	Description
P01	18-11-2022	Planning Submission

DRAFT

Project Title: Great Northern

Drawing Title: General Arrangement
Leisure Box - Proposed Basement Floor Plan

Project No: 10422

Scale: 1 : 200 @ A1

Status: PLANNING

10422-SHP-Z4-A-B5D9-G200-PL-B1-001

Revision: P01

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KEY:

Residential (Use Class C3)

- Residential Entrance/ Shared Amenity
- Residential circulation/ Private Amenity
- One Bed Apartment
- Two Bed Apartment
- Three bed apartment

Office (Use Class E(c))

- Office
- Office Entrances
- Office Circulation/ Balconies & Terraces

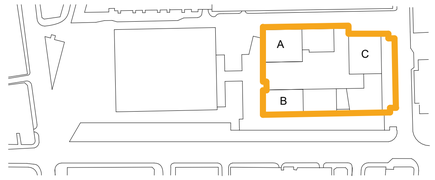
Commercial, Business & Service Community (Use Class Varies)

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- Entrances & Circulation

Other (Use Class Varies)

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- Ancillary (Cycle Stores)

KEY Plan:



Lift lobby should not open directly into basement car park unless a ventilated lobby is provided between the lobby and car park.

Each stair from Tower A has its own route directly to outside. However if the exit discharge route was compromised then there is alternative route available. Dynamic exit signage should be provided at the base of each stair to advise occupants to not use the fire affected route.

Rooms containing refuse chutes should be approached only by way of a protected lobby having not less than 0.2 m2 of permanent ventilation or suitable mechanical alternative.

Rooms containing refuse chutes should be approached only by way of a protected lobby having not less than 0.2 m² of permanent ventilation or suitable mechanical alternative.

Stair A

Stair B

Stair C

Stair D

Plant
Building A Residential Entrance
Platform Lift
Refuse
Store
Service Bay
Building C Residential Entrance
Main Residential Entrance & Reception
Residential Office
Post & Deliveries
UP TO 01
DOWN TO B1
UP FROM B1
DOWN FROM 01
GREAT BRIDGEWATER STREET

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NORTH

Rev	Date	Description
P01	18-11-2022	Planning Submission

DRAFT

Project Title: Great Northern

Drawing Title: General Arrangement
Leisure Box - Proposed Ground Floor Plan

Project No: 10422

Scale: 1 : 200 @ A1

Status: PLANNING

PROJ - ORIG - ZONE - MOLF - CLAS - TYPE - LOC - SEQ: 10422-SHP-Z4-A-B5D9-G200-PL-00-001

Revision: P01

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KEY:

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- Residential circulation/ Private Amenity
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- Two Bed Apartment
- Three bed apartment

Office (Use Class E(c))

- Office
- Office Entrances
- Office Circulation/ Balconies & Terraces

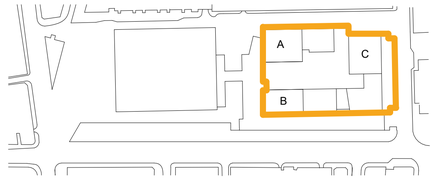
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- Entrances & Circulation

Other (Use Class Varies)

- Car Park (Sui Generis)
- Ancillary (Plant, Refuse Stores, Back of House, etc)
- Ancillary (Cycle Stores)

KEY Plan:





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NORTH

Rev	Date	Description
P01	18-11-2022	Planning Submission

DRAFT

Project Title: Great Northern

Drawing Title: General Arrangement
Leisure Box - Proposed Level 01 Floor Plan

Project No: 10422

Scale: 1 : 200 @ A1

Status: PLANNING

PROJ - ORIG - ZONE - MOLF - CLAS - TYPE - LOC - SEQ
10422-SHP-Z4-A-B5D9-G200-PL-01-001

Revision: P01

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KEY:

Residential (Use Class C3)

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- Residential circulation/ Private Amenity
- One Bed Apartment
- Two Bed Apartment
- Three bed apartment

Office (Use Class E(c))

- Office
- Office Entrances
- Office Circulation/ Balconies & Terraces

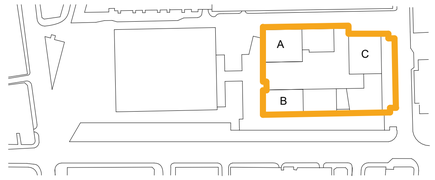
Commercial, Business & Service Community (Use Class Varies)

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- Use Class E or F2 (b)
- Entrances & Circulation

Other (Use Class Varies)

- Car Park (Sui Generis)
- Ancillary (Plant, Refuse Stores, Back of House, etc)
- Ancillary (Cycle Stores)

KEY Plan:





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NORTH

Rev	Date	Description
P01	18-11-2022	Planning Submission

DRAFT

Project Title: Great Northern

Drawing Title: General Arrangement
Leisure Box - Proposed Level 02 Floor Plan

Project No: 10422

Scale: 1 : 200 @ A1

Status: PLANNING

10422-SHP-Z4-A-B5D9-G200-PL-02-001

Revision: P01

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KEY:

Residential (Use Class C3)

- Residential Entrance/ Shared Amenity
- Residential circulation/ Private Amenity
- One Bed Apartment
- Two Bed Apartment
- Three bed apartment

Office (Use Class E(c))

- Office
- Office Entrances
- Office Circulation/ Balconies & Terraces

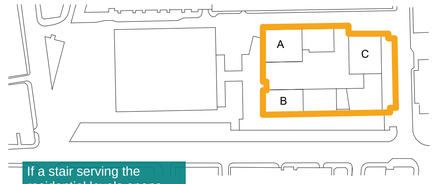
Commercial, Business & Service Community (Use Class Varies)

- Use Class E
- Use Class E or Sui Generis (Entertainment Venue)
- Use Class E or Sui Generis (Drinking Establishments or Hot Food Takeaway or Entertainment Venue)
- Use Class E or F2 (b)
- Entrances & Circulation

Other (Use Class Varies)

- Car Park (Sui Generis)
- Ancillary (Plant, Refuse Stores, Back of House, etc)
- Ancillary (Cycle Stores)

KEY Plan:



If a stair serving the residential levels opens onto this level then it should be fire separated by a ventilated lobby.

If a stair serving the residential levels opens onto this level then it should be fire separated by a ventilated lobby.

Rooms containing refuse chutes should be approached only by way of a protected lobby having not less than 0.2 m² of permanent ventilation or suitable mechanical alternative.

Rooms containing refuse chutes should be approached only by way of a protected lobby having not less than 0.2 m² of permanent ventilation or suitable mechanical alternative.

Access into this stair from this level is necessary.

Stair E

Stair F

Stair G

Stair D

FROM 02

TO 02

Car Park

Plant

Plant

Plant

VOID
Plant below

VOID
Plant below

VOID

VOID

VOID

VOID
Fire Exit corridor below

VOID

VOID
Entrance below

GREAT BRIDGEWATER STREET

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NORTH

Rev	Date	Description
P01	18-11-2022	Planning Submission

DRAFT

Project Title: Great Northern

Drawing Title: General Arrangement
Leisure Box - Proposed Level 03 Floor Plan

Project No: 10422

Scale: 1 : 200 @ A1

Status: PLANNING

10422-SHP-Z4-A-B5D9-G200-PL-03-001

Revision: P01

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KEY:

Residential (Use Class C3)

- Residential Entrance/ Shared Amenity
- Residential circulation/ Private Amenity
- One Bed Apartment
- Three bed apartment
- Two Bed Apartment

Office (Use Class E(c))

- Office
- Office Entrances
- Office Circulation/ Balconies & Terraces

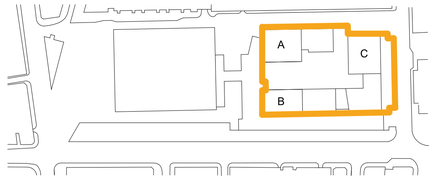
Commercial, Business & Service Community (Use Class Varies)

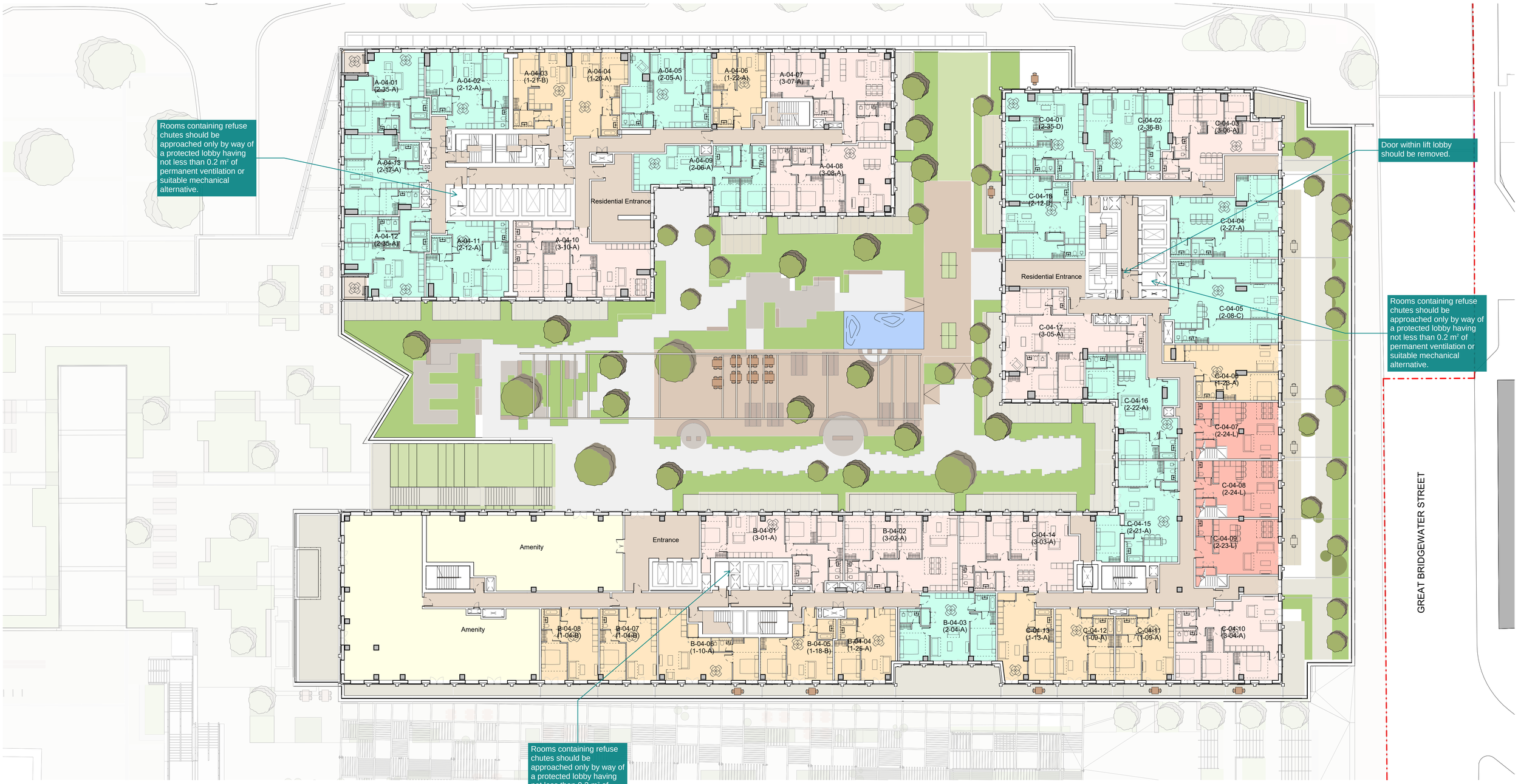
- Use Class E
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- Use Class E or F2 (b)
- Entrances & Circulation

Other (Use Class Varies)

- Car Park (Sui Generis)
- Ancillary (Plant, Refuse Stores, Back of House, etc)
- Ancillary (Cycle Stores)

KEY Plan:





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NORTH

Description
Planning Submission

DRAFT

Project Title: Great Northern

Drawing Title: General Arrangement
Leisure Box
Proposed Level 04 Plan

Project No: 10422

Scale: 1 : 200@ A1

Status: PLANNING

PROJ - ORIG - ZONE - ROLE - CLASS - TYPE - LOC - SEQ
10422-SHP-Z4-A-B5D9-G200-PL-04-001

Revision: P01

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KEY:

Residential (Use Class C3)

- Residential Entrance/ Shared Amenity
- Residential circulation/ Private Amenity
- One Bed Apartment
- Three bed apartment
- Two Bed Apartment

Office (Use Class E(c))

- Office
- Office Entrances
- Office Circulation/ Balconies & Terraces

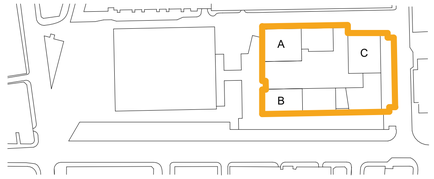
Commercial, Business & Service Community (Use Class Varies)

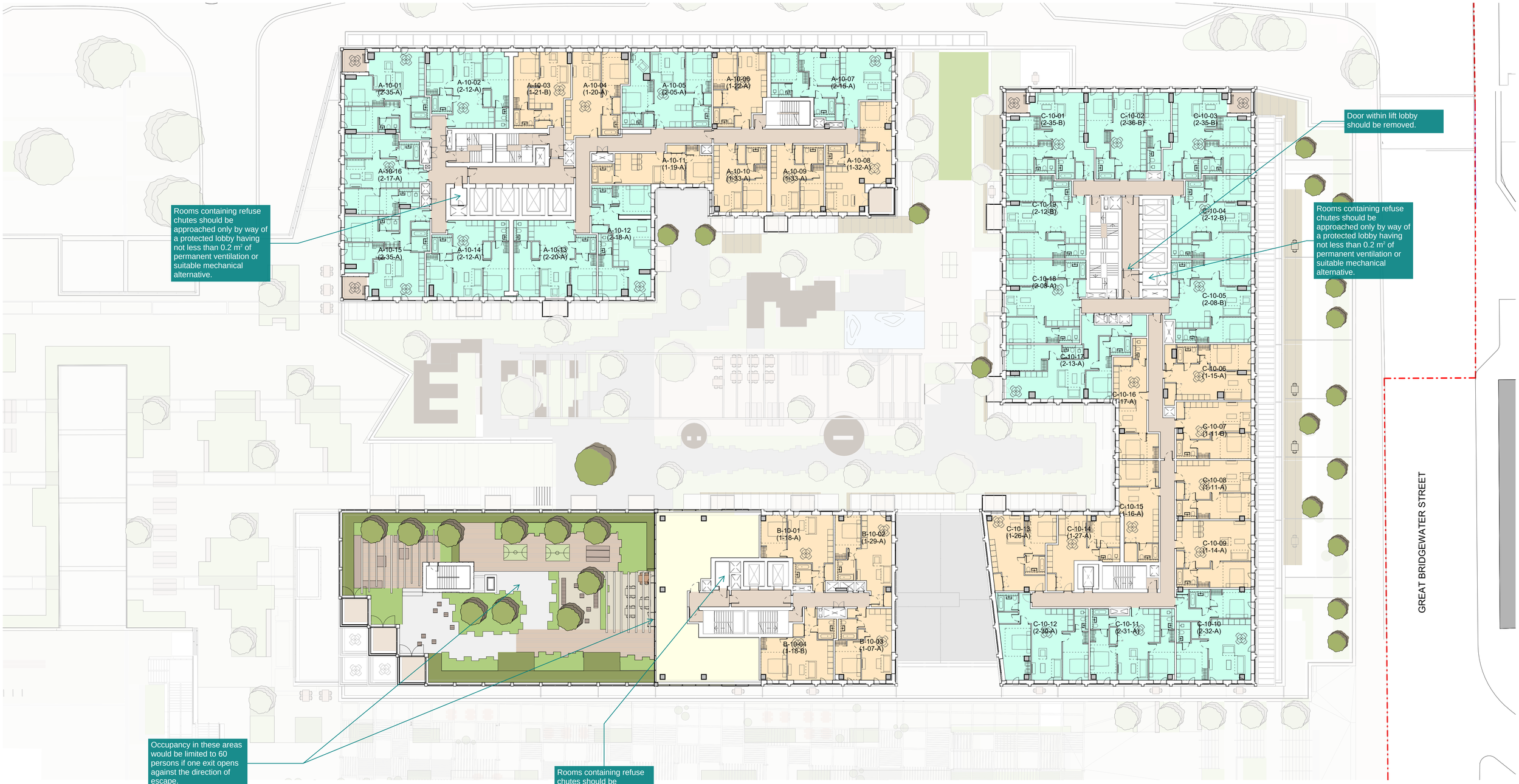
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- Entrances & Circulation

Other (Use Class Varies)

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- Ancillary (Cycle Stores)

KEY Plan:





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NORTH

Description
ission

DRAFT

Project Title
Great Northern

Drawing Title
General Arrangement
Leisure Box
Proposed Level 10 Plan

Project No
10422

Scale
1 : 200@ A1

Status
PLANNING

PROJ - ORIG - ZONE - ROLE - CLAS - TYPE - LOC - SEQ
10422-SHP-Z4-A-B5D9-G200-PL-10-001

Revision
P01

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KEY:

Residential (Use Class C3)

- Residential Entrance/ Shared Amenity
- Residential circulation/ Private Amenity
- One Bed Apartment
- Three bed apartment
- Two Bed Apartment

Office (Use Class E(c))

- Office
- Office Entrances
- Office Circulation/ Balconies & Terraces

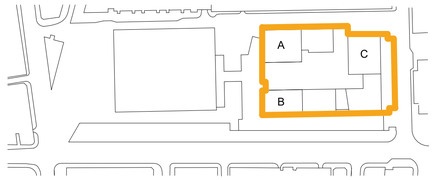
Commercial, Business & Service Community (Use Class Varies)

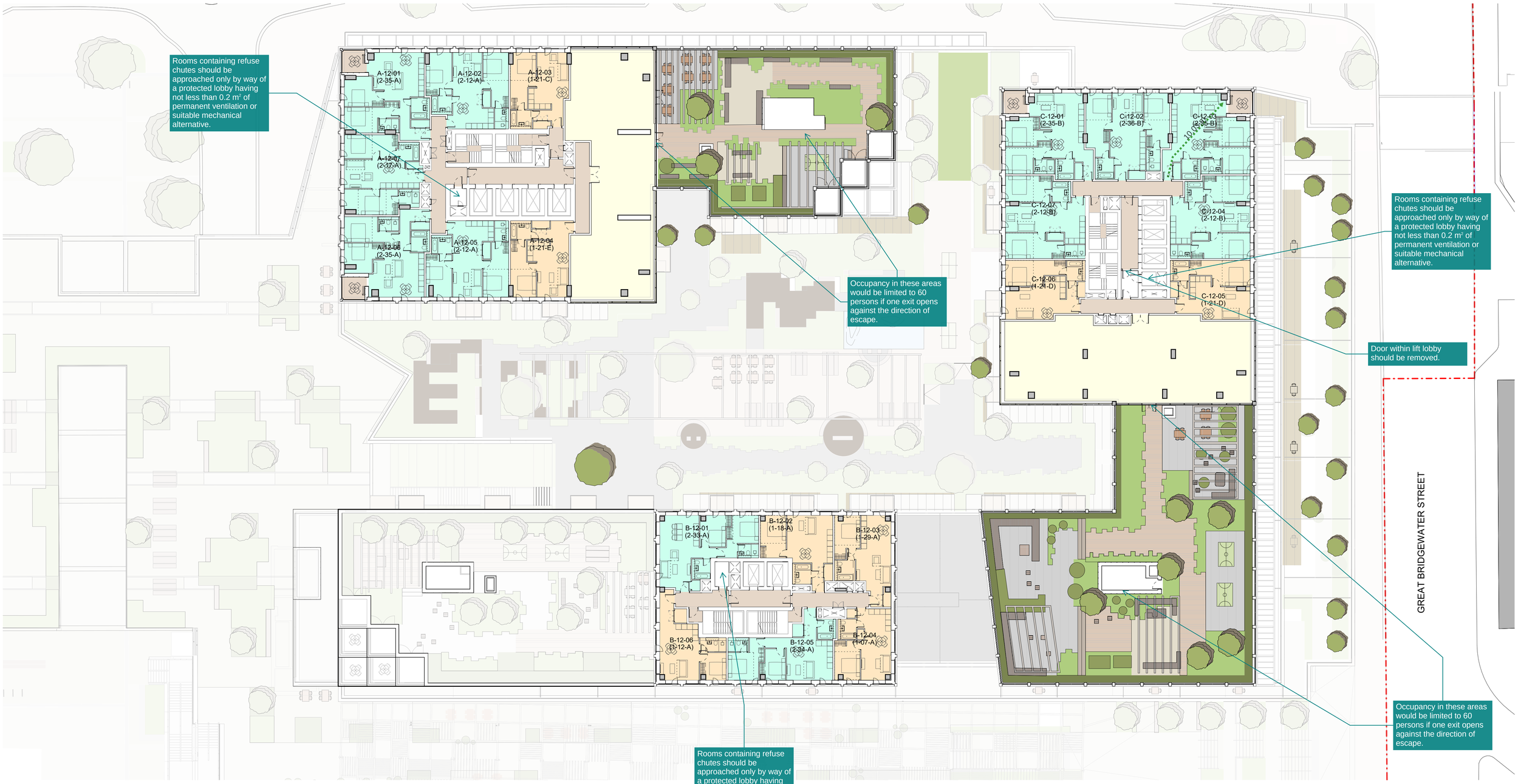
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- Use Class E or F2 (b)
- Entrances & Circulation

Other (Use Class Varies)

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- Ancillary (Plant, Refuse Stores, Back of House, etc)
- Ancillary (Cycle Stores)

KEY Plan:





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NORTH

Rev	Date	Description
P01	18-11-2022	Planning Submission

DRAFT

Project Title: Great Northern

Drawing Title: General Arrangement
Leisure Box
Proposed Level 12 Plan

Project No: 10422

Scale: 1 : 200 @ A1

Status: PLANNING

10422-SHP-Z4-A-B5D9-G200-PL-12-001

Revision: P01

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KEY:

Residential (Use Class C3)

- Residential Entrance/ Shared Amenity
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- Two Bed Apartment

Office (Use Class E(c))

- Office
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- Office Circulation/ Balconies & Terraces

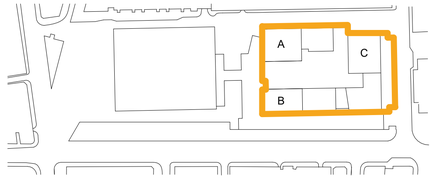
Commercial, Business & Service Community (Use Class Varies)

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KEY Plan:





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NORTH

Rev	Date	Description
P01	18-11-2022	Planning Submission

DRAFT

Project Title: Great Northern

Drawing Title: General Arrangement
Leisure Box
Proposed Level 22 Plan

Project No: 10422

Scale: 1 : 200 @ A1

Status: PLANNING

PROJ - ORIG - ZONE - ROLE - CLAS - TYPE - LOC - SEQ: 10422-SHP-Z4-A-B5D9-G200-PL-22-001

Revision: P01

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KEY:

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- Office
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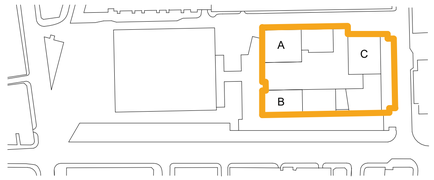
Commercial, Business & Service Community (Use Class Varies)

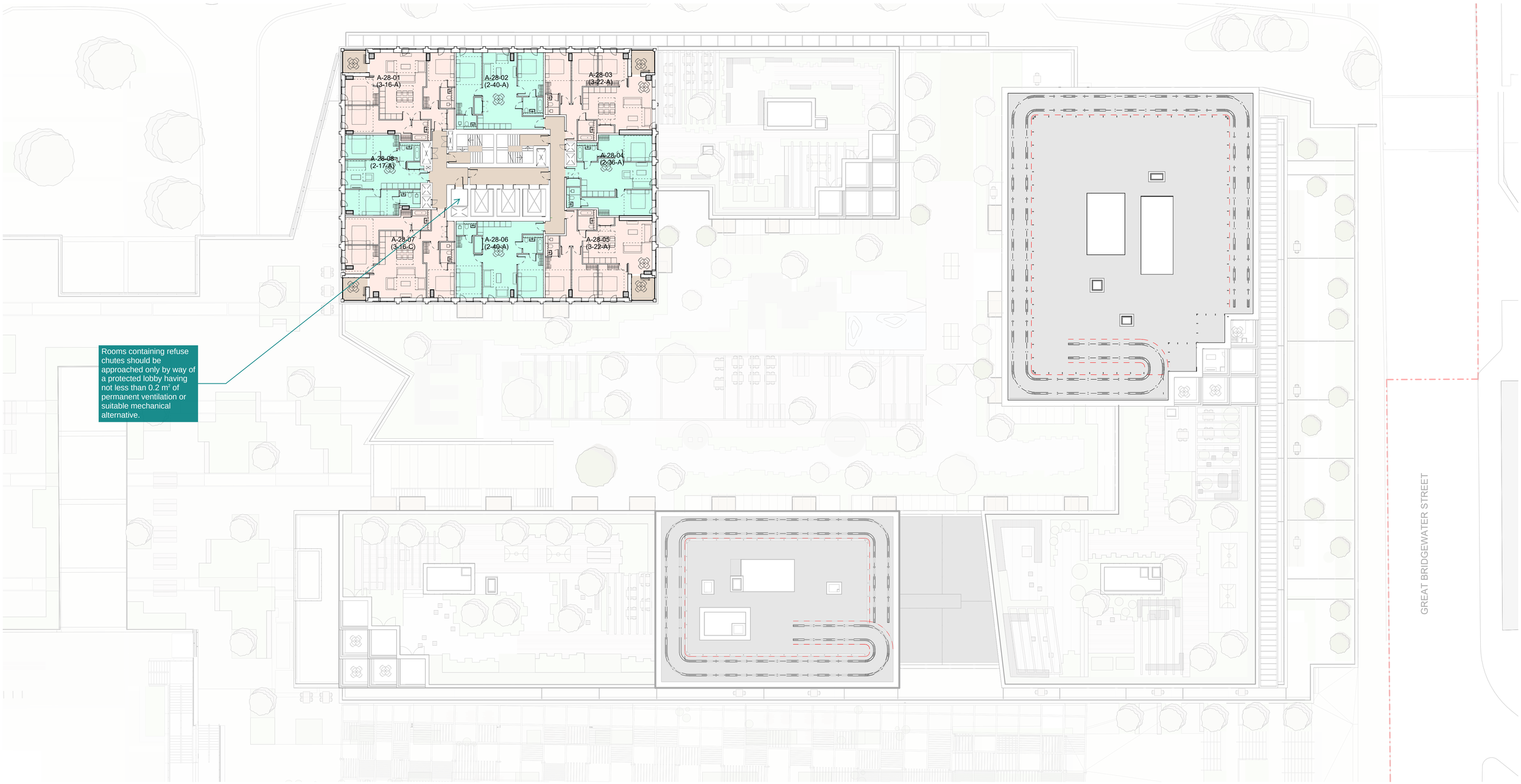
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KEY Plan:





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NORTH

Rev	Date	Description
P01	18-11-2022	Planning Submission

DRAFT

Project Title: Great Northern

Drawing Title: General Arrangement
Leisure Box
Proposed Level 28 Plan

Project No: 10422

Scale: 1 : 200@ A1

Status: PLANNING

PROJ - ORIG - ZONE - FOLD - CLASS - TYPE - LOC - SEQ: 10422-SHP-Z4-A-B5D9-G200-PL-28-001

Revision: P01

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