

RIBA Stage 2 – Outline Fire Strategy

PROJECT NAME: Summerland Street, Exeter

DATE: 31/08/2023

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Quality Assurance

Rev	Date	Prepared/Updated By	Reviewed By	Comments
-	29/08/2023	Euan Ibison Gardner	Ellis White/ Ben Cooper	Initial issue for design team comments
А	31/08/2023 Euan Ibison Gardner Oskar Dzielak		Oskar Dzielak	Amendment from a reference of 'PBSA' to 'Co-Living'





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Introduction 1

1.1 Report Brief

- 1.1.1 Orion Fire Engineering have been appointed by McLaren Properties to produce a RIBA Stage 2 Outline Fire Strategy report for the Summerland Street residential development in Exeter. This report outlines the key fire safety aspects within the design as a basis to support the design team for the proposed site to satisfy the functional requirements of Part B to the Building Regulations.
- 1.1.2 This outline fire strategy has been developed to provide sufficient information to meet the core objectives and criteria of the RIBA Plan of Work for RIBA Stage 2. This RIBA 2 fire strategy addresses the architectural concept of the building and provides commensurate advice to the current stage of work. Cognisance has been paid to key fire safety items that could affect the architectural concept, M&E/structural engineering strategy or the land use and planning considerations of the development. Further detail will need to be provided in RIBA Stage 3 to support the formal Building Regulations application subject to appointment for this aspect of the works.
- 1.1.3 It is understood that there are no further fire safety requirements applicable to the scheme above and beyond the relevant Part B Building Regulations requirements e.g., employer's requirements, insurer/funder requirements, warranty provider requirements, with the exception of Class A1 insulation materials in the external wall build-up. If this changes, Orion should be advised at the earliest opportunity to assess/consider the impact of any additional requirements.

The report also provides a list of recommendations, within blue highlighted zones, which are clearly distinguished from those concerned with life safety and Building Regulations compliance, by using a blue background to highlight them. These are recommendations for the client and wider design team to consider to further improve the level of safety and/or add additional property protection measures.

1.2 Legislation and Proposed Approach to Fire Safety

- 1.2.1 The Building Regulations 2010 contains functional requirements that are broad statements that describe how the building should perform to meet the requirements of the Building Regulations. Prescriptive codes, such as Approved Document B, BS 9991 and BS 9999 provide specific recommendations for the majority of typical buildings. The adoption of one of these prescriptive codes is one way to achieve compliance with the Building Regulations.
- 1.2.2 The principal guidance document that has been applied to the building to produce this RIBA 2 fire strategy is BS 9991:2015 (Incorporating Corrigendum No.1): "Fire safety in the design, management and use of residential buildings - Code of Practice". In addition to the principal guidance document, multiple supporting British Standards, European Norms and industry guidance documents will be applied. The specific application of these documents will be referenced in the relevant sections of this report.

1.3 Project Information

1.3.1 The drawing information listed in Table 1 has been reviewed whilst producing this report. Any information not listed in Table 1 has not been reviewed by Orion Fire Engineering. All recommendations made within this report are based on the drawings listed below. Any revisions to those drawings may invalidate this report.

Table 1: Drawing Information Reviewed

		icwcu		
roduced	Drawing Number	Drawing Title	Rev	Date
у				Reviewed
tride	154670-STL-ZZ-ZZ-	Site Location Plan	S2_P18	29/08/2023
reglown	DR-A-ZZ-00001			
	154670-STL-ZZ-ZZ-	Proposed Site Plan	S2_P18	29/08/2023
	DR-A-ZZ-00002			
	154670-STL-ZZ-00-	Proposed Ground Floor Plan	S2_P21	29/08/2023
	DR-A-ZZ-10000			
	154670-STL-ZZ-ZZ-	Proposed First Floor Plan	S2_P21	29/08/2023
	DR-A-ZZ-10001			
	154670-STL-ZZ-ZZ-	Proposed Second Floor Plan	S2_P21	29/08/2023
	DR-A-ZZ-10002			
	154670-STL-ZZ-ZZ-	Proposed Third Floor Plan	S2_P21	29/08/2023
	DR-A-ZZ-10003			
	154670-STL-ZZ-ZZ-	Proposed Fourth Floor Plan	S2_P21	29/08/2023
	DR-A-ZZ-10004			
	154670-STL-ZZ-05-	Proposed Fifth Floor Plan	S2_P21	29/08/2023
	DR-A-ZZ-10005			
	154670-STL-ZZ-07-	Proposed Roof Plan	S2_P21	29/08/2023
	DR-A-ZZ-10007			
	154670-STL-ZZ-XX-	Proposed Verney Street and Red Lion	S2_P32	29/08/2023
	DR-A-ZZ-200001	Lane Elevations		
	154670-STL-ZZ-XX-	Proposed Summerland Street and	S2_P21	29/08/2023
	DR-A-ZZ-200002	Rear Elevations		
	154670-STL-ZZ-XX-	Proposed Courtyard Elevations	S2_P21	29/08/2023
	DR-A-ZZ-200003		60 D40	20/00/2020
	1546/0-STL-ZZ-XX-	Proposed Section A & B	S2_P18	29/08/2023
	DK-A-22-30000		62 824	20/00/2022
	1546/U-SIL-ZZ-XX-	Proposed Sections C & D	S2_P21	29/08/2023
	DK-A-22-30001			

1.4 Site and Building Description

- The development is a six storey (Ground Floor Level 5) Co-Living building with a footprint of 1,150m² 1.4.1 and a maximum occupied storey height of 17.6m above the lowest adjacent ground level. For the purposes of fire safety guidance it is being designed as a block of flats. The ground floor contains studio flats in addition to residential ancillary accommodation in the form of:
 - Amenity rooms (Co-Working, Residents Lounge, Gym, Communal Lounge, Cinema etc.)
 - Laundry
 - Refuse Storage
 - Plant Rooms (e.g. Data, Mechanical Plant, Sprinkler tank, LV Equipment etc.) •
 - Meeting Rooms and Offices •
 - Cycle Storage
- 1.4.2 The upper levels consist primarily of studio flats served by two protected stairways, one which extends to Level 4 and one which extends to Level 5 under the current design. At Level 5 a kitchen dining area is present serving the residents in addition to a rooftop amenity terrace.



- 1.4.3 The primary structural material shall be concrete for the building frame, with masonry and brickwork external walls.
- 1.4.4 Vehicular access to the site is provided by Verney Street to the southeast, Summerland Street to the southwest, and Red Lion Lane to the northwest as per the site plan provided in Figure 1. Primary access route into the ancillary areas of the development is via the southwest elevation into the Reception Lobby, while the stairs discharge via independent final exit doors at the northwest and southeast elevations which provides access to upper storeys. The northeast elevation is within 1m of the site boundary and is directly adjacent to Aceland House, a neighbouring development.





Figure 2: Ground Floor Layout Plan

Figure 1: Site Plan





Figure 3: Maximum Storey Height - Southwest Section

1.5 Variations from Prescriptive Guidance

1.5.1 The layout of the development is generally in accordance with the prescriptive recommendations given within BS 9991. All alternative approaches from the recommendations of BS 9991 have been summarised in Table 2 for ease of reference. Unless listed below, no other aspect of the design should deviate from the relevant recommendations of BS 9991.

Table 2: Variations to the Prescriptive Guidance

Variation

The location of the natural smoke shafts serving the Levels 1-4 are in close proximity to the stair ere recommends they be located remote from the stair, that all travel distances within these corridors shaft with BS 9991:2015, and CFD modelling conducted compliant arrangements have demonstrated that ventilation system is not detrimentally affected by residential corridors and lobbies. Additionally, the robust sprinkler system which shall significantly re from any fire development. There is no similar re external wall AOV, which forms an alternative mean of a natural smoke shaft over a mechanical shaft w air flow rates down the corridor as the ventilation sy buoyancy. This shall be subject to further discussion a later stage.

The eastern protected stair which forms a single m Level 5 is connected to ancillary accommodation justified in further detail at RIBA Stage 3, but is co that the stair is separated from ancillary areas by a natural ventilation equivalent to that provided at apartments, in addition to further fire resisting protected ancillary corridor. The ancillary spaces throughout with Category L2 automatic alarm a detection and alarm relative to a minimum Categ delay in summoning the fire service to commence enhanced residential sprinkler system designed in 5.6 of BS 9251:2021 shall also be provided through ground floor to inhibit uncontrolled fire growth be Firefighting operations of ancillary accommoda additionally be achievable without the use of resi <45m hoselaying distances from fire appliance parki building, on-site management will be present who fire load and ignition risk within the ancillary areas, protection over a standard block of flats with arrangement shall be subject to review and approv and the BCB.

	Report Section
e dead end residential corridor on nclosure, whereas BS 9991:2015 . This shall be justified on the basis Il be less than 15m in accordance ed historically by Orion for code at the performance of a smoke y the location for code compliant e development is provided with a educe the smoke production rates equirement for the location of an ns of ventilating a corridor. The use <i>v</i> ill also not lead to any increase in ystem operates on the principle of n with the Building Control Body at	2.6.4
heans of escape from dwellings at at the ground level. This may be onsidered acceptable on the basis protected lift lobby equipped with t upper levels serving residential separation provided by another at the ground floor are equipped and detection to provide earlier gory M system, reducing the time e fire suppression operations. An accordance with Section 5.5 and ughout the ancillary areas at the eyond the compartment of origin. ation at the ground floor will idential dry riser mains based on ing locations. Finally, as a managed will have the duty to manage the which forms an enhanced level of n no on-site management. This ral with the fire and rescue service	4.2.10



Variation	Report
	Section
From the residential corridors at the Ground Floor and Level 5 which form a single means of escape from dwellings, ancillary accommodation is connected, which forms a variation from BS 9991. This shall be further justified at RIBA Stage 3 on the basis that each ancillary space shall be equipped with an automatic alarm and detection system to provide earlier detection and alarm relative to a code compliant Category M system, in addition to an enhanced residential sprinkler system provided throughout to inhibit uncontrolled fire growth. The material contents of ancillary areas such as the KLD room and cleaner's cupboards on Level 5 are also considered not to exceed the fire risk to the corridor or stair relative to a code compliant additional studio flat which would otherwise be acceptable, and the compartmentation (60-mins) between the ancillary areas and the residential corridor is equivalent to that provided to a dwelling. Additionally, to provide increased protection to the corridors, the ancillary rooms at the Ground Floor and Level 5shall be separated from the residential corridor forming a single direction of escape by a ventilated (0.4m ²) protected lobby, with the exception of cleaner's cupboards which have minimal floor area and are considered lower risk. Finally, BS 50615 Category B cut off devices shall be installed to the cooking facilities in the KLD rooms to inhibit fire development upon detection of excessive temperature rises, thereby reducing the risk posed by these appliances. This arrangement be subject to review and approval with the fire and rescue service and the BCB.	4.2.9
On Level 5, the single direction travel distance from the door to the open terrace to the storey exit into the Level 5 stair exceeds 15m in a single direction, but is maintained below 30m. To compensate for this, a mechanical smoke ventilation system shall be provided which shall be installed which is designed in accordance with industry guidance (i.e., SCA 3 rd Edition) and Annex A of BS 9991:2015 to achieve an equivalent level of performance with regards to maintenance of tenability conditions within the corridor as a code compliant arrangement. This shall be achieved through the locating of two mechanical smoke ventilation systems, or one mechanical shaft and one AOV subject to confirmation on travel distances, at roof level at the most remote locations on either end of the extended corridor. This arrangement is shown in Appendix A and shall be designed by a specialist incorporating CFD modelling at a subsequent design stage to achieve pre-determined performance criteria. This shall be subject to BCB approval at a later design stage.	2.6.3

1.6 Further Works

1.6.1 This fire strategy has been produced to provide a performance specification suitable for RIBA Stage 2. There are multiple areas of the current design that will require further development as they currently provide a design risk, and the Architect's GA Plans will need to be developed alongside this preplanning fire strategy. These areas have been summarised in Table 3 below.

Table 3: Further Works to be developed at RIBA Stage 3

Further works	Report Section
Any additional client, insurer or warranty requirements beyond minimum compliance with the functional requirements of the Building Regulations shall be communicated. This may include additional fire safety provisions regarding green roofs and/or PV panel installations present on Level 1,5 or 6.	N/a

Further works

Discuss the variations to prescriptive guidance with authorities.

This Stage 2 report contains numerous best practirequired under Building Regulations. The clie recommendations and determine whether they sho of the building. These items have been highlighted distinguishable from the remainder of the report whether M&E design team to conduct a utility survey identified of existing fire hydrants within 100m of the building. The material build-up of the external wall shall be of and a schedule should be maintained as the design whether the recommendations of Regulation 7 sha materials.

The level of on-site management (limited hours, 24/ If 24/7 on site management shall be provided, it sho L1 automatic alarm and detection system for the de monitoring and an investigation period is desirable It shall be confirmed how the client intends to rest of the Kitchen Diner and amenity terrace on Level 5 The architects' plans should be updated to acco mechanical shaft and ceiling AOV at Level 5 as per t The internal layout of the flats and location of cool be compliant upon further development of the plan be required

Additional refuges should be provided to the grou are relied upon for horizontal escape from ancillary The means of mechanically ventilating the residentia Ground Floor should be further developed as h comments. It should be ensured that smoke outlets and fire service access routes.

The type and location of the secondary power sup ventilation system shall be identified.

The location of dry riser inlets on the external stairways at the ground floor shall be confirmed y outlet locations within the residential stair shall be The ground floor studio apartments should be provegress in addition to escape through the western s shown.

It should be confirmed if the bicycle storage room sh Where this is the case it shall not form a valid emer rooms and the egress arrangements shall be review Where non-compliant inner room arrangement highlighted in Appendix A. The design shall be review these non-compliances.

Where direct distance requirements have not been shall be ensured that the maximum travel distances These are highlighted in Appendix A.

	Report Section
thin this report with the approval	1.5
ice recommendations that are not ent team should review these ould be implemented in the design ed in blue so that they are easily hich contains mandatory guidance.	All
fying the operability and flow rates g.	6.4
confirmed at the next design stage progresses. It should be confirmed all be adopted for all external wall	3.3
(7) shall be confirmed by the client. ould be communicated if a Category evelopment to provide addressable as an alternative	4.4.1
rict the peak combined occupancy 5 to 60 occupants.	4.2.6
ommodate the relocation of the the drawing comments below	4.2.3
king facilities shall be confirmed to ns, or an engineered solution shall	Figure 4
nd floor stair/lobbies where steps accommodation	Appendix A
al corridor/s serving the stair at the highlighted in the below drawing are remote from means of escape	Appendix A
ply for the and mechanical smoke	2.8
elevation and outlets within the with updated floor plans, and the provided.	2.7
vided with an alternative means of tair as per the corridor connection	Appendix A
all contain electric charging points. gency escape route from the plant ved.	Appendix A
s are present, they have been quired to be amended to address	Appendix A / 4.2.20
n met under the current design, it shall not be exceeded upon fit out.	Table 6



Further works	Report Section
CFD Modelling shall be required at a later design stage to demonstrate that a mechanical smoke ventilation system provided to Level 5 shall maintain tenable conditions within the corridor in accordance with Annex A of BS 9991:2015 and the SCA Guide.	2.6.3
To avoid extended inner inner room arrangements, it is recommended that an additional doorset be provided to the Gym or Wellness Studio directly to the external air, or the western stair be continued through to Level 5.	Appendix A
It is noted that if the western protected stair was extended up to Level 5 amenity such that two directions of escape were available from every dwelling, this would form a significant benefit to the fire safety compliance of the design. The current variations from BS 9991 as referenced in Section 2.6.3, 4.2.10 and 4.2.9 would be compliant arrangements without additional mitigatory measures, and provision of a protected lobby equipped with 0.4m ² permanent ventilation between the eastern stair and the bicycle room at ground level would be sufficient for BS 9991:2015 compliance in place of 60-min solid construction. The extension of the western stair to Level 5 is strongly recommended by Orion to improve fire safety and accommodate numerous aspects of the current design.	N/a

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Fire Safety Systems 2

Fire Detection and Alarm System 2.1

- 2.1.1 All Co-Living apartments will be provided with a Grade D1, Category LD1 fire detection and alarm system designed in accordance with BS 5839-6.
- 2.1.2 Residential corridors, lift shafts, residential lobbies and residential stairs will be provided with a Category L5 detection system comprising smoke detectors only (no sounders, manual call points or other typical BS 5839-1 alarm devices to be provided in these areas).
- 2.1.3 The landlord's fire detection and alarm system shall cover the ancillary accommodation (see Section 1.4 for the list of ancillary accommodation). Although this will be part of the Category L5 system, the coverage in the ancillary accommodation and along the escape route should be equivalent to a BS 5839-1 Category L2 system. This should cover the following locations:
 - Escape routes; and
 - Rooms accessed from escape routes; and •
 - Amenity & Office Rooms ٠
 - Storage Rooms •
 - Plant Rooms •
 - Bicycle and Refuse Storage rooms (including those accessed externally, with the exception of plant • rooms that cannot be accessed for maintenance such as substations); and
 - Audible warning devices in inner-rooms and inner-inner rooms
- The rooftop terrace and roof maintenance areas are to be provided with sounders and visual display 2.1.4 units (VDU's) interfaced with the Category L5 automatic detection along the common circulation areas which provides escape from that area and ancillary accommodation within the building. Upon automatic detection within either an ancillary area or the residential circulation routes, alarms shall activate at roof level.

Unless it is confirmed on-site building management is present 24 hours a day, it is recommended allowance is made for the fire alarm to be linked to an off-site remote monitoring/alarm receiving centre to monitor the state of the fire alarm system and summon the fire and rescue service if required. If permanent (24/7) on-site management is provided, it is recommended that a Category L1 automatic alarm and detection system is provided throughout the development which may be used to inform staff of any automatic detection by sending a signal to the fire alarm panel which shall be located at the building management position.

2.2 Hob Cut-off Devices

2.2.1 Cooking devices within studio flats shall be located remotely from the internal means of escape route and the flat front door as per the dimensions outlined in Figure 4.



Figure 4: Hob Separation Distance

2.2.2 The KLD room at Level 5 opening directly to the common corridor shall be equipped with BS 50615 Category B cut off devices to the cooking hobs regardless of hob separation distance to mitigate the connection to a residential corridor providing a single means of egress for dwellings, unless the western stair is continued to Level 5.

2.3 **Emergency Lighting**

- Emergency lighting should be provided in all common escape routes and ancillary accommodation in 2.3.1 accordance with the recommendations of BS 5266 and EN 1838.
- 2.3.2 Emergency lighting should be provided to open plan areas more than 60m² in size, WC/bathrooms more than 8m² in floor area, and plant rooms.

Emergency Signage 2.4

- 2.4.1 Fire escape signs are to be provided to guide occupants from any point in a building, via a place of relative safety (the escape route) to the place of ultimate safety (outside the building). Exit and directional signage should be provided in accordance with the requirements of BS ISO 3864-1.
- 2.4.2 Emergency escape signage should be provided above every doorway or other exit that provides access to a means of escape, unless that exit is in ordinary use (e.g., the main entrances and primary circulation space).

2.5 Automatic Suppression Systems

- 2.5.1 The residential areas of the building should be provided with a Category 3 residential sprinkler system, designed in accordance with BS 9251:2021.
- 2.5.2 Where a compartment containing ancillary accommodation is less than 100m² in floor area and meets the definition of one of the occupancies in Table 3 or 4 of BS 9251 following a hazard evaluation, it may be equipped with an enhanced residential sprinkler system in place of a commercial sprinkler system in accordance with Section 5.5 and 5.6 of BS 9251. Where ancillary areas are to be subdivided to below 100m² in maximum floor area, the minimum fire resistance of the compartment walls shall



be 60 minutes (REI 60) at a minimum with E60Sa doorsets as per Table 4. This includes any glazing forming a partition between adjacent compartments which would be required to be fire resisting (EI 60).

2.5.3 Where any ancillary compartment exceeds 100m² in floor area, a commercial EN 12845 sprinkler system shall be required.

2.6 Residential Corridor/Lobby Smoke Ventilation Systems

- 2.6.1 Each stair should be provided with a $1.0m^2$ AOV either at roof level or on the external wall. If an external wall AOV is provided to the stair, the top of the AOV should be higher than the top of the door. The AOV shall activate upon smoke detection within the stair enclosure or within a common residential corridor or ground floor corridor/lobby opening into the shaft.
- 2.6.2 All corridors or lobbies that provide direct access to a residential stair should be provided with a smoke control system. The primary objective of a smoke control system in a residential building is to prevent smoke ingress into the stairs to allow the vertical circulation routes to remain available at all times.
- 2.6.3 The proposed smoke ventilation strategy for the building will comprise:
 - The ground floor protected lobbies and corridors separating the protected stair enclosures from the ancillary accommodation shall be equipped with a natural smoke shaft of minimum free area 1.5m² with an AOV of minimum free area 1.0m² designed to EN 12101-2 which opens into the shaft and is triggered upon detection within the storey, or alternatively with a mechanical smoke extraction system achieving an equivalent level of performance.
 - For Levels 1-4, the dead-end sections of the residential corridor which directly serve a protected stair enclosure and provide a single direction of escape from studio flats shall be served by AOV's opening to the natural smoke shafts which ascend from the ground floor and discharge at roof level. Where multiple directions of escape are available the corridors shall not be required to be ventilated as the multiple direction travel distance requirements are achieved under the current design. The residential corridor at Levels 1-4 shall be continuously connected such that it serves both stairs and provides multiple storey exits to dwellings, with appropriately located dead-end and cross corridor doorsets.
 - Level 5 maintains a single direction of escape with a travel distance in excess of 15m but below 30m. To mitigate this extended travel distance, a mechanical smoke ventilation system is required to be provided with a shaft located at the extreme end of the residential corridor. A proposed location has been identified within the drawing comments in the Appendix. The minimum shaft sizing shall be 0.8m², subject to input and CFD modelling by a specialist at a later design stage. The mechanical smoke control system shall be equipped with a secondary power supply and standby/duty fans located at roof level. Upon automatic detection, the mechanical smoke ventilation system in closest proximity to the site of detection shall activate, with replacement inlet air provided via the stair door and head of stair AOV. This shall be subject to CFD Modelling by a smoke control specialist to demonstrate an equivalent performance standard as a code compliant design shall be achieved, and is subject to agreement with approvals bodies. Where the other extreme end of the corridor achieves code compliant travel distances, it shall be ventilated with a roof AOV of free area 1.5m². Alternatively, the western protected stair may be continued up to serve the Level 5 open amenity space and provide a secondary means of egress form this level. This would remove the need for a mechanical smoke control system to serve the residential corridor, and the existing natural smoke shaft would serve Level 5 instead.

- 2.6.4 The location of the natural smoke shafts serving the residential corridors in Levels 1-4 shall be in close proximity to the stair enclosure, which forms a variation from BS 9991. However, this is justifiable on the basis of historical CFD modelling conducted by Orion which has demonstrated the performance of a smoke ventilation system is negligibly affected by the location for code compliant residential corridors and lobbies, and that an equivalent performance at a minimum is achieved for natural smoke shafts in close proximity to the opening to the stair as for those which are remote. Additionally, the development shall be provided throughout with a robust automatic sprinkler system, which shall act to inhibit fire development and reduce the smoke production rate. The alternative means of naturally ventilating a residential corridor is via an external wall AOV of equivalent free area, however there is no such requirement under BS 9991:2015 for the AOV to be remove from the stair door. As a natural smoke shaft is provided which ventilates the hot smoke and gas through the effect of buoyancy, locating the shaft close to the stair will not lead to an increase in the velocity of air flows as for a mechanical smoke system. Finally, the Smoke Control Association Guide for Smoke Control in Residential Apartment Buildings 3rd Edition also states that locating the shaft remotely from the stair door is only a recommendation, and the primary purpose of the smoke ventilation system is to prevent smoke ingress into the stair. This arrangement shall form a design risk subject to agreement with the Building Control Body at RIBA Stage 3.
- 2.6.5 Where mechanical smoke shafts are used at Level 5, they shall discharge at roof level more than 5m from the AOV inlet to the stair and they shall point in the opposite direction.
- 2.6.6 Where an AOV to a natural or mechanical smoke control system opens upon automatic detection, the AOV at the head of the stair should open simultaneously and no AOV's to the shaft on other floors except for the AOV on the storey of detection shall open subsequently, regardless of smoke detection elsewhere. For the lobby serving the protected stairs at the ground level, the AOV shall form the bottom of the shaft and be located horizontally within the ceiling such that it opens directly into the natural smoke shaft above without occupying ground floor space.
- 2.6.7 Where a refuse storage is accessed internally, it shall be separated by a protected lobby equipped with 0.2m² permanent natural ventilation, subject to any increases required by other aspects of the fire strategy.
- 2.6.8 Where a place of special fire hazard (e.g. boiler, fuel storage, switchgear, transformer) is accessed internally via a common means of escape route, it shall be accessed through a protected lobby equipped with permanent ventilation of minimum free area 0.4m² or a suitable mechanical alternative.

2.7 **Dry Mains System**

- 2.7.1 The protected stairs shall both be provided with a dry rising main designed to BS 9990 with landing valve outlets located on the full landing of every floor including the ground floor. Landing valves shall be on the main landing and located such that they do not pose an obstruction to door swing, the means of escape route or to fire service access.
- 2.7.2 All locations within every upper storey shall be within 45m from an outlet within the protected stair enclosure along a clear and unobstructed hoselaying route.
- 2.7.3 All points within ground floor ancillary accommodation shall be within 45m from an outlet within a protected stair, or alternatively 45m from a fire appliance parking position along a hoselaying route.



2.7.4 The dry riser breeching inlets shall be located either on the external face of the building or in a freestanding cabinet within 18m of a fire appliance parking position in a clear and accessible location. The maximum horizontal pipework distance between the inlet location and the vertical main within the stair enclosure shall be maintained at below 18m for both systems. It is recommended that the dry riser main inlet be located adjacent to the entrance to the protected stairs on the southeast and northwest elevations in clear view of a fire parking location.

2.8 Secondary Power Supplies

- 2.8.1 All power control and cabling including secondary power supplies shall be provided in accordance with BS 8519.
- 2.8.2 The majority of the fire safety systems within the building will be provided with secondary power supplies via integral back-up batteries. However, the following life safety systems will require a dedicated independent secondary power supply:
 - Mechanical Smoke Control Systems (Ground Floor & Level 5)
- 2.8.3 Provisions should be made within the design for either a life safety generator or Uninterruptible Power Supply (UPS) to be provided on site to form the secondary power supply for the high-power systems.

The use of diverse feeds from a single substation is not recommended for compliance with the current issue of BS 8519.

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Building Fabric and Components 3

Structural Fire Protection 3.1

- Based on the height of the building being between 11m and 18m in storey height, all elements of 3.1.1 structure should achieve 60 fire resistance at a minimum (R 60).
- 3.1.2 Where a loadbearing elements of structure also provides compartmentation between two spaces in accordance with Table 4, the loadbearing capacity (R) of the element shall be upgraded to the more onerous value.
- 3.1.3 The fire resistance performance of the element shall be demonstrated through testing and classification in accordance with EN 13501-2. It is understood at this design stage that the primary constituent materials of the structural frame shall be concrete, in which case fire resistance shall be achieved through the inherent properties of the material, subject to confirmation by the structural engineer.

3.2 Compartmentation

3.2.1 The compartmentation requirements for the building have been tabulated below in Table 4. Note that where one wall falls into more than one of the below categories, the higher rating should be applied.

To mitigate the impact of anticipated changes in Approved Document B, Orion Fire recommend that test data achieving a European classification for fire-resistance (EN 13501) is used instead of that issued under National classifications (BS 476) for all parts of the building supporting compartmentation or providing structural fire resistance.

3.2.2 As the development is designed as a Block of Flats, each floor shall be designed as a compartment floor achieving 60 minutes fire resistance from the underside (REI 60). This includes any compartment floors which form floors to external open air terraces (i.e. underside of Level 5).

Table 4: Compartment Wall and Floor Requirements

Location	European Classification ^[1]
Protected Stair	EI 60
Protected Lift Shaft	EI 60
Compartment Floors (including roofs forming terraces) from the underside	EI 60
Residential Corridors	EI 60
Protected Ancillary Lobbies/Corridors	EI 30
Flats	EI 60
Plant Room (Non-Life Safety)	EI 60
KLD Room/Cleaners Cupboards on Levels 1-5	EI 60
Amenity Rooms	EI 60
Refuse Storage	EI 60
Storage (Refuse, Bicycle)	EI 60
Smoke Shafts	EI 60
Service Risers	EI 60
Rooms containing life safety plant (e.g. sprinkler systems, UPS/Generator)	EI 120
Substation	EI 240
Compartment Walls Between Ancillary Areas to Achieve <100m ² Floor Area	EI 60

Location

Protected Area of the External Wall (<1m to Releva Protected Area of the External Wall (>1m to Releva External Wall Adjacent to Single Direction External <1100mm above ground level) – inside to out only [1] Add R to the fire-resisting rating for any loadbearing walls

3.2.3 Fire doors are generally half the rating of the wall they are fitted in, rounded to the nearest 30 minutes, with the exception of compartment walls and multi-compartment fire and smoke dampers opening to smoke shafts which require an equivalent level of performance as the fire resisting element in which they are situated. All fire resisting doors shall be equipped with self-closing devices designed to EN 1154 with the exception of cupboards and riser shafts which shall be lockable for building management. Smoke seals shall be provided to all doors along the means of escape routes.

External Walls 3.3

- 3.3.1 The external envelope of the building should not contribute to excessive smoke and fire spread from one part of the building to another.
- 3.3.2 External walls are defined as the full external wall build up from the external surface of the wall to the internal surface (excluding any internal decorative finish).
- 3.3.3 As a minimum requirement to meet prescriptive fire safety guidance, the external surfaces of the building shall achieve Class A2-s1,d0 at a minimum. All insulation and filler materials shall achieve Class A1 as a client requirement. Where balconies are provided, they shall be constructed from materials achieving Class A2-s1,d0 with limited exceptions as per Section 10.12 of ADB Vol 1.

However, although the building is less than 18m in storey height and therefore is not defined as a 'Relevant Building', it is Orion's recommendation that to improve life safety and mitigate against any potential future amendment to ADB, all materials forming the external wall shall be achieve Class A2s1,d0 or A1, with exceptions as listed in Regulation 7(3).

3.3.4 It shall be confirmed at the next design stage what the external wall build-up of materials shall be and that they comply with the fire strategy requirements outlined above.

3.4 Roofs

- 3.4.1 As the building contains residential accommodation with a high density of compartment walls at the top storey and the roof is within 1m of the site boundary on the northeast elevation, it is recommended that all roof coverings across the development achieve a B_{ROOF}t(4) classification.
- 3.4.2 Where a compartment wall is continued up to the underside of the roof, covering, for a minimum distance of 1.5m either side of the compartment wall junction the $B_{ROOF}t(4)$ roof covering shall be applied over an EN 13501-1 Class A2-s3,d2 substrate deck.

If it is recommended that if a combustible roof insulation is proposed, that the roof deck should be a concrete slab. If a metal deck or timber deck is proposed, it is recommended that a non-combustible roof insulation be provided.

	European
	Classification ^[1]
nt Boundary) – both sides	REI 60
nt Boundary) – inside to out	RE 60 REI 15
rnal Escape Routes (height	RE 30



Photovoltaic Panels

3.4.3 A PV panel installation is intended for the development and shall be provided at roof level.

Where PV panels are to be provided, it is advised that as an enhancement above the minimum requirements of prescriptive fire safety guidance that additional recommendations are adopted from RISC Authority "RC62 Recommendations For Fire Safety with photovoltaic panel installations" where feasible.. This guidance includes but is not limited to providing a concrete roof deck, or alternatively with non-combustible insulation where PV panels and equipment are not maintained more than 2.5m from the junction between the compartment walls and the roof.

Fire Performance of Green Roofs

3.4.4 A green roof shall be provided to Level 1 which is accessible from the inside.

Where Green Roofs are provided, additional fire safety guidance may be adopted from the Green Roof Organisation – GRO fire risk guidance document and the Ministry of Housing, Communities and Local Government (MHCLG) guidance document "Fire Performance of Green Roof and Walls.

3.5 Material Specifications

- 3.5.1 The flights and landings of the protected stairs should be constructed of A2-s3,d2 rated materials, such as concrete or steel.
- 3.5.2 Class A1 rated materials should be used in the construction of sleeves used for firestopping applications, smoke shafts and flues.
- 3.5.3 A client requirement above the minimum requirements of Part B of the Building Regulations is for all external wall insulation materials to achieve Class A1 at a minimum.
- 3.5.4 The following rooms should be enclosed in robust, solid, non-combustible construction, such as blockwork:
 - Refuse stores
 - Boiler rooms
 - Fuel storage spaces
 - Transformer and switchgear rooms, except for rooms that contain only low voltage equipment.

Distribution of Services 3.6

- 3.6.1 No services should be run through or within the common escape stairs unless they are required to serve the stair (e.g. lighting, automatic detection). As per the 18th Edition of BS 7671, "Protected Escape Routes" are considered to be the vertical escape routes only (i.e. protected stairs).
- 3.6.2 Where electrical services are run through residential corridors forming a means of escape, the ceiling void shall be constructed and lined with Class A2-s1,do or A1 materials, with any insulation or other materials present achieving Class A2-s3,d2 at a minimum. Alternatively, the ceiling shall achieve 60 minutes fire resistance (EI60) from both sides.
- 3.6.3 All cables within common escape routes shall be kept in place with non-combustible trays and fixings.

HVAC Systems 3.7

- 3.7.1 Where HVAC ductwork serve both common escape routes (corridors, lobbies) and either other occupancies or other fire separated parts of the escape route, they shall be equipped with fire and smoke dampers (ES) at the penetration through fire resisting elements which achieve a fire resistance performance equivalent to the element itself, down to a minimum of 60 minutes. These shall be thermally activated or close upon automatic smoke detection.
- 3.7.2 Independent ventilation systems which do not recirculate air and do not serve any other occupancy are required to be provided for the:
 - Protected Stair Enclosure
 - Plant rooms
- 3.7.3 The temperature control systems provided within common residential corridors should not rely on any inlet air from the stair.

Ventilation ducts are recommended not to pass-through party walls between apartments or through the protected stair enclosures. Common ventilation systems are not recommended in private residential accommodation.

3.8 **Re-entrant Corners**

3.8.1 Where there is an internal angle between two facades, additional fire protection measures are required at that internal junction. The level of protection varies depending on the type of accommodation on each side of the internal angle. Figure 5 illustrates the general parameters for reentrant corners. The various conditions that should be read alongside Figure 5 have been tabulated below.

Table 5: Re-entrant Corner Conditions

Compartment A	Compartment B	Angle (x)	Minimum	Minimum	Fire
			Separation	Separation	Resistance of
			Distance (y)	Distance (z)	boundary
Dwelling	Any other	<135°	1.0 m	N/A	EI 60
	accommodation				
Accommodation	Accommodation	<90°	See Section	N/A	See Section 5
			5		





Figure 5: Re-entrant Corner Illustration

3.8.2 Re-entrant corners present within the building have been highlighted in Appendix A.

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Means of Escape 4

4.1 Evacuation Strategy

- 4.1.1 A stay-put evacuation strategy will be adopted in the residential areas.
- 4.1.2 Each ancillary accommodation enclosure will operate on an independent simultaneous evacuation strategy that does not include the flats or residential circulation areas.
- 4.1.3 The rooftop terrace at Level 5 shall evacuate immediately upon activation of any automatic detection within the common escape routes.

4.2 Horizontal Means of Escape

Studio Apartments

- 4.2.1 As BS 5839-6 Grade D1 Category LD1 alarm and detection systems are provided to apartments in addition to code compliant BS 9251 residential sprinkler systems, the maximum single direction travel distance within a studio flat is 20m.
- 4.2.2 Cooking hobs shall be located remotely from the flat front door and internal means of escape route in accordance with Figure 4.

Residential Circulation Areas

- The prescriptive travel distance requirements for residential corridors in sprinklered buildings are per 4.2.3 the recommendations of BS 9991 are:
 - 7.5m in a single direction in an unventilated corridor (into a sterile lobby)
 - 30m where more than one direction of escape is available and part of the corridor is not ventilated
 - 15 in a single direction in a ventilated corridor
 - 60m where more than one direction of escape is available and the corridor is ventilated • throughout the escape route.
 - 15m to 30m (maximum) in a single direction in a ventilated corridor provided with an enhanced mechanical smoke ventilation system, subject to CFD Modelling validating the design.
- 4.2.4 From Levels 1-4, two stairs shall be made available as storey exits to all dwellings. To ensure no extended single direction travel distances in excess of 30m are present, the additional cleaner's cupboard shall be removed from the Level 1-4 residential corridor such that multiple means of escape are available at this storey. Where design amendments are required to achieve this, it has been highlighted in Appendix A.
- 4.2.5 On Level 5, a single direction of escape is available from the terrace door which exceeds 15m in travel distance. To mitigate this, mechanical smoke ventilation shall be provided to Level 5 as per Section 2.6.3, subject to validation of the design following CFD modelling and agreement with the BCB and fire service.
- 4.2.6 As a single means of egress is provided to Level 5, the peak occupancy of the combined amenity areas on the storey (KLD and open terrace) shall be restricted to less than 60 persons. This shall either be achieved through development of the internal layout or through a building management approach to be confirmed at the next design stage.

- 4.2.7 As per Annex D of BS 9991, communal open roof terraces shall be required egress directly into protected ventilated residential corridors, lobbies or stairways.
- 4.2.8 Where a residential corridor connects two storey exits and the travel distance to a storey exit exceeds 15m, a cross corridor partition and doorset achieving 30-min fire resistance (E30Sa) shall be provided at the mid-point.
- 4.2.9 Where a residential corridor provides a single means of escape from dwellings as part of a single stair arrangement, under BS 9991 ancillary accommodation is prescriptively prohibited from connecting to the corridor at that storey. However, on the Ground Floor and at Level 5, ancillary accommodation in is accessed via a ventilated residential corridor which form a single means of egress from dwellings. This forms a variation from BS 9991, however is justified on the basis of the below. It is noted the maintenance of this connection between ancillary accommodation with a single means of egress from dwellings forms a design risk and shall be subject to agreement within the Building Control Body (BCB) at RIBA Stage 3, and the design risk may be removed through the continuation of the western stair to roof level such that multiple means of escape are available from all dwellings.
 - The ancillary areas will also be equipped with a BS 5839-1 Category L2 automatic alarm and Category M (manual) system.
 - beyond the compartment of fire origin.
 - shall be provided to the separating lobby.
 - For the Kitchen Diner, Category B cut off devices designed to BS 50615 shall be provided to the likelihood of fire development within these ancillary spaces occurring.
 - As a co-living residential building, the level of management with regards to restriction on potential anticipated for a code compliant block of flats.
- 4.2.10 Ancillary accommodation in the form of amenity, plant and storage spaces are connected horizontally to the eastern protected stair enclosure at the ground floor, which forms a sole vertical means of escape from dwellings at Level 5. This forms a variation from the prescriptive guidance of BS 9991, however shall be justified on the basis of the below. It is noted that the extension of the western stair to Level 5 would make the current arrangement at Level 5 compliant with BS 9991, although the ground floor residential corridor would still form a variation to be agreed with approvals bodies.
 - All ground floor ancillary accommodation shall be separated from the exit passageway by a gas that enters.
 - The lift lobby opens directly to a fire sterile protected ancillary (30-min) circulation corridor, which ancillary spaces.

detection to provide earlier warning and summoning of the fire service than a code compliant

Each ancillary space will be equipped with an enhanced BS 9251 residential sprinkler system which upon activation shall reduce the smoke production and fire growth rate, and inhibit fire spread

Ancillary rooms shall be separated from the residential corridor by additional protected (EI30) ancillary lobbies or corridors to provide increased protection to the corridor. For the Ground Floor ancillary lobby and Level 5 Kitchen Diner, permanent ventilation achieving a free area of 0.4m²

cooking hobs regardless of location to the means of escape route, which shall reduce the

ignition sources and the build-up of flammable items in communal areas shall be superior to that

protected 60-min lift lobby equipped with ventilation as per Section 2.6 to extract any smoke or

shall provide an additional layer of fire resisting protection from any fire development in the



- The eastern protected stair serving Level 5 shall not be used as a means of escape route from the ground floor ancillary accommodation, which shall instead have sufficient escape arrangements via other appropriately signed routes. Additionally, all points within the ground floor ancillary accommodation are either accessible within 45m of a fire appliance parking position or are 45m from a dry riser outlet within the western protected stair enclosure. Therefore, there is no anticipated breach in compartmentation to the eastern stair during either the means of escape or firefighting phases.
- All ancillary accommodation shall be equipped with a robust sprinkler system which extends throughout the ground floor compartments, which are subdivided to areas less than 100m² by 60minute compartment walls and FD60S doors. This suppression system shall act to control any fire growth that occurs within the ancillary space.
- BS 5839-1 Category L2 automatic alarm and detection throughout shall provide more rapid warning to occupants and quicker summoning of the fire service than a code compliant manual (Category M) system.
- As a co-living residential building, the level of management with regards to restriction on potential ignition sources and the build-up of flammable items in communal areas shall be superior to that anticipated for a code compliant block of flats.
- 4.2.11 This ground floor connection via the lift lobby shall form a design risk and shall be subject to discussion and agreement with the Building Control Body (BCB) at RIBA Stage 3/4.

Ancillary Accommodation

- 4.2.12 Travel distances throughout the building to the nearest storey exit from residential circulation areas and ancillary accommodation should be in line with Table 6 below. Where these travel distances have not been achieved, they have been referenced below and highlighted in Appendix A. Where internal layouts are not available, direct distances equivalent to 2/3 the travel distance listed in Table 6 have been used.
- 4.2.13 Where an external horizontal single direction of escape passes within 1800mm of the external wall, the external wall shall achieve 30 minutes fire resistance (RE 30) from the inside up to 1100mm above the external ground level.
- 4.2.14 Where a single means of egress is available, the peak occupancy shall be limited to 60 persons at a maximum evacuating simultaneously. Where the occupancy exceeds 60 people, a minimum of two exits shall be provided and both doors shall swing shall be in the direction of escape. Emergency escape windows are not permitted to serve as escape routes to ancillary spaces on the ground floor.

Table 6: Travel Distance Limitations

Area	Single Direction (m)	More than one Direction (m)
Amenity/Office Rooms	18	45
Refuse Store (within room)	9	18
Plant Rooms (within room)	9	18
Plant Room (to storey exit)	18	45
Roof Terrace	45	N/A

4.2.15 Where alternative exits are provided, they shall not be through places of special fire hazard, nondomestic kitchens, protected stairs forming a single egress route from dwellings or areas under the control of a separate occupier.

- 4.2.16 Where a dead-end section of an ancillary corridor is longer than 4.5m, a fire resisting doorset (FD 30S) shall be provided to separate the dead end from the point where multiple directions of escape are available.
- 4.2.17 Where a non-residential corridor serving ancillary spaces connects two storey exits which are separated by more than 12m, an additional cross corridor doorset (FD30S) shall be provided at the mid-point.
- 4.2.18 Where the occupancy of the ancillary accommodation escaping is in excess of 60 persons, the direction of door swing shall be in the direction of escape and a minimum of two exits shall be provided which are either separated by fire resisting construction or remote from one another as per Figure 6 such that the travel distances highlighted in Table 6 are achieved.



Figure 6: Alternative Exit Routes – Ancillary Accommodation

4.2.19 Doors serving ancillary accommodation should be sized depending on the maximum occupancy of the space. The minimum door widths for a specified number of occupants have been included below in Table 7. This should assume the largest horizontal exit available is discounted due to obstruction by fire and/or smoke unless the peak occupancy is less than 60 persons, with the remaining exits maintaining sufficient exit capacity for the peak population.

Table 7: Minimum Door Widths

Number of people	Door width (mm)
60	750
110	850
220	1050
More than 220	5mm per person

Inner Rooms

- 4.2.20 Inner rooms within ancillary areas are only permitted when the below requirements have been achieved:
 - Travel distances as per Table 6 are compliant from all points in the inner room
 - Peak occupancy is 60 persons within the inner room
 - Both access and inner rooms are under the control of the same occupier.
 - The access room is not a kitchen, place of special fire hazard or an existing inner room.
 - No additional room, circulation corridor or lobby is provided between the access room and inner • room
- 4.2.21 As the ancillary accommodation throughout the development shall be equipped with a Category L2 automatic alarm and detection system designed to BS 5839-1, where inner room arrangements are present and the above requirements are met they may be deemed compliant with prescriptive guidance.

Alternative escape routes are available from C because angle ACB is 45 degrees or more and therefore distance CA or CB (whichever is the less) should be no more than the maximum travel distance given for alternative escape routes.

Alternative escape routes are not available from D because angle ADB is less than 45 degrees (therefore see Diagram 2.1).

There is also no alternative escape route from E.



- 4.2.22 Where non-compliant inner room arrangements are present, they have been highlighted in Appendix A. The design shall be required to be amended to address these non-compliances.
- 4.2.23 The above does not apply to sanitary accommodation or WC/Bathrooms.

Vertical Means of Escape 4.3

- 4.3.1 The building is served by two stairs:
 - Protected Stair Eastern (Ground Floor Level 5)
 - ii. Protected Stair - Western (Ground Floor – Level 4)
- 4.3.2 Escape stairs should discharge either:
 - Directly to a final exit; or
 - Into a protected corridor leading to a final exit which is itself lobbied from any accommodation to an equivalent standard as the stair itself.
- 4.3.3 This is achieved under the latest design whereby both stairways discharge directly to a final exit on the external wall. They shall be separated from accommodation at the ground floor by protected, ventilated lobbies equipped with code compliant natural or mechanical ventilation as per Section 2.6. Doors opening directly to the protected stair enclosure from ancillary areas as per the current design shall be replaced by solid construction of an appropriate fire resistance performance as per Table 4 or by a ventilated lobby as highlighted in Appendix A.
- 4.3.4 Where the residential stairs discharge to an external escape route, the external path shall be clearly defined, equipped with suitable marking and guarding where necessary and be lit with emergency illumination. Where a single direction external escape route from the development is within 1800mm of the external façade, the façade adjacent to the escape route requires 30 min fire resistance up to a height of 1100mm above the adjacent ground storey level. Any external escape route shall be remote (>1800mm) from any smoke outlet.
- 4.3.5 Both the protected stairs are 1300mm in width. This in excess of the minimum width of a protected residential stair which is 1000mm. As the peak combined occupancy of the ancillary accommodation on Level 5 shall be maintained less than 60 based on the single means of egress available, this exit width shall be sufficient for simultaneous evacuation of the upper storey ancillary accommodation.
- 4.3.6 Final exit doors from stairs serving residential accommodation should be suitably sized for general circulation. This is achieved based on the latest design. As final exit doors from the western and eastern stairs also serve as escape routes from ground floor and Level 5 ancillary accommodation respectively, they shall be required to swing in the direction of escape and be sized to ensure no narrowing occurs along the means of escape route.

Evacuation of Non-Ambulant Occupants 4.4

4.4.1 There is no approved guidance that provides advice on the evacuation of non-ambulant occupants from residential buildings. This is primarily due to the lack of onsite management in residential buildings. As there may be no on-site staff to assist non-ambulant residents in evacuating the building in the event of a fire within their dwelling, residential buildings are designed to facilitate selfevacuation with no reliance on onsite management as far is reasonably practicable. It shall be confirmed whether any on-site management shall be present 24/7.

- 4.4.2 The safety features required within residential buildings accommodate this approach via a high degree of compartmentation and the provision of smoke ventilation which should work in tandem to prevent fire spreading from the room of origin, with the smoke ventilation systems clearing any smoke that leaks from the fire room. This is to allow the building to remain in normal operation provided that the fire safety systems within the building operate as designed.
- 4.4.3 Where simultaneous evacuation will be conducted from the ancillary accommodation and roof terraces present at Ground Floor and Level 5 which necessitate the use of steps and these areas are accessible members of the public, refuges will be required within the protected stairway or residential corridor enclosure to provide a temporary place of relative safety for non-ambulant occupants. Where refuges are required they shall achieve minimum dimensions of 900mm x 1400mm and be removed from the escape route such that they do not form an obstruction. They shall be equipped with appropriate signage and Type B emergency voice communication systems (EVC's) designed to BS 5839-9 that will enable communication with building management or a control point at the fire service access level in close proximity to the fire alarm panel.
- The base design standard for Part B of the Building Regulations would allow for the lift to remain in 4.4.4 use in the event of a fire within the building. This is due to the design approach for residential buildings being based on maintaining normal conditions within the building. To allow wheelchair users and other non-ambulant residents to make a dignified escape from the building, any lift should remain in normal operation and only be taken out of service and descend to lowest unaffected level in the event of a smoke detector activating within the lift shaft.



Space Separation 5

- 5.1.1 The relevant external fire spread boundary for the building has been included in Figure 8 below. This has generally been taken as the site ownership boundary. Where the site borders land that is unlikely to be developed upon (e.g. public road), the relevant external fire spread boundary has been extended halfway across that space.
- 5.1.2 Where protection is required for sections of the external walls for external fire spread purposes, they shall achieve minimum fire resistance performance requirements as per Table 4.
- 5.1.3 For protected areas of the external wall, the maximum dimensions of any unprotected areas within these spaces shall be as per the guidance in Figure 7. These are permitted to be provided on the basis that they pose an acceptably low risk to fire spread between buildings.



Key

- Unrestricted 1
- 2 External wall of shaft that is enclosed by a minimum of 60 min fire resistance from the accommodation side
- 3 Compartment boundaries

Figure 7: Unprotected Areas in Protected External Walls

Protected stairs which form fire sterile spaces with no combustible materials present are not required 5.1.4 to be provided with protected areas on the external façade unless they are within 1m of the relevant boundary.



Figure 8: Relevant Boundary

compartments have been assessed, however the only compartments that require protection are those that are within 1m of the relevant boundary along the northeast elevation. These are highlighted in Figure 9 and Figure 10. Where a compartment external wall is not shown, protection may still be required where referenced elsewhere within this report. It has been assumed for the purposes of the assessment that a code compliant sprinkler system shall be provided throughout the development, which permits a halving in minimum boundary distance or doubling in unprotected area (%) for each compartment external wall. This external fire spread assessment shall be reviewed upon any amendment to the internal compartmentation at a later design stage.

5.1.5 A space separation assessment was conducted in accordance with the guidance in BR 187. All





Figure 9: External Wall Protected Area: Ground Floor



Figure 10: External Wall Protected Area: Level 1-5

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Fire Service Access 6

Site Access 6.1

- 6.1.1 The access and provisions to the site for the fire service has been illustrated below in Figure 11. These diagram/s should be developed into fire service access plans at RIBA Stage 3 for the fire service consultation.
- 6.1.2 Where any road to the development is to be newly constructed or amended as part of the works, it should be designed and constructed to meet the requirements stated in Table 8 for a Pump appliance. Fire service access to the site is provided by the three adjacent public roads which meet the dimensional requirements of Table 8. Consultation with the Local Fire Authority and Building Control are required to ensure these dimensions are true to the equipment available for fire crews.
- 6.1.3 As the development shall be equipped with a dry riser mains system designed to BS 9990 serving both protected stairs, the fire appliance is required to be capable of parking within 18m of both of the breeching inlets along an unobstructed hoselaying route. Access to the protected stairs should be provided directly from the external air or via a protected passageway.
- 6.1.4 All locations in the ground floor ancillary areas shall be within 45m of a fire appliance parking position or protected stair dry riser outlet along a hardstanding hoselaying route.
- 6.1.5 As the development operates a stay put evacuation policy this development is designed to facilitate self-evacuation with no reliance on the fire service as far as reasonably practicable.

Table 8: Fire Appliance Access Route Specification Appliance Minimum Minimum Minimum Minimum Minimum Minimum Width Carrying Type of Width of Turning Turning Clearance Road Gateways Circle Circle Height (m) capacity Between Between (m) Between (tonnes) Kerbs (m) Kerbs (m) Walls (m) 3.7 3.1 16.8 19.2 3.7 12.5 Pump

6.2 Wayfinding Signage

6.2.1 To assist the fire service to identify each floor in a block of flats with a top storey more than 11m above ground level, floor identification signs and flat indicator signs should be provided at all upper levels.

Premises Information Box 6.3

6.3.1 In order to assist the attending fire crews in obtaining the correct information efficiently upon arrival on site, it is advisable that the end-user/future responsible person provides a Fire Service Information Box within the building. This should be located adjacent or in close proximity to the entrance of the building most likely used by the attending fire crews. The location should be discussed and agreed with local Fire Service.

6.4 Hydrants

- 6.4.1 A utilities survey has not been received for review at this time. The location of an existing hydrant has been identified on Red Lion Lane to the north of the development and two have been identified to the southwest on Summerland Street as shown in the fire service access plan in Figure 11. These are within 90m of the dry riser inlets serving the building as required by BS 9991:2015.
- 6.4.2 Hydrants present within 90m of the development should have the operability and minimum flow rate established through engagement with the local Water Authority. Each hydrant serving the development is recommended to achieve a minimum of 20-35L/s flow rate for a residential building under "National Guide for Firefighting Activities, 3rd Edition", however the local fire and rescue service and the Water Supply Authority should be contacted at an early stage to ensure the existing water supplies and confirm whether it is suitable for the development.
- 6.4.3 Where the existing hydrants serving the development fail to meet the above operability and flow rate requirements, additional hydrants shall be provided which are designed to BS 9990 and located within 90m of the dry riser mains breeching inlet along a hoselaying route and a minimum of 6m from the building façade.
- 6.4.4 All hydrants shall be equipped with signage designed to BS 3251.







Appendix A – Drawing Comments