Cundy Street Quarter

Fire Strategy Report

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GROSVENOR

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1.0 INTRODUCTION

1.1 Description of Building

Cundy Street Quarter is a redevelopment of an existing site into a new residential and amenity development in the City of Westminster, London.

The development comprises of three main buildings:

- Building A: Senior Living Accommodation- The senior Living Building comprising ground plus nine floors with a top floor height of 32.6m above ground. The building is served by three stair cores linked by common corridors on the apartment levels. The building will be used as an assisted living space at first to fourth floor (C2 use) and fifth to ninth floor will be independent living apartments (C3 use);
- Building B: Private and Intermediate Accommodation- Building B1 is a private residential Building comprising two separate stair cores serving ground plus ten floors. Building B2 and B3 are single stair intermediate apartment buildings with Building B2 comprising ground plus eight floors and Building B3 comprising ground plus four floors. The top floor height of the highest Building (Building B1) is 37.1m above ground;
- Building C: Social Rent Accommodation- Two single stair affordable apartment Building comprising ground plus six and ground plus seven floors including the roof terrace of the taller Building. The top floor height of the taller Building is 24.8m above ground.

Ground floor in all Buildings will include independent commercial units for a mix of A1/A3/A4/B1 use such as retail, and restaurant units as well as a cinema over ground plus basement and a community space. All of the Buildings will also connect to a large basement space. The basement will include a spa area and car park beneath both the Senior Living building and Building B as well as large ancillary areas such as plant rooms, stores and back of house spaces to both the residential and retail areas.

The Coleshill buildings are two existing Grade II listed terraced residential buildings comprising ground plus five upper floors plus a lower ground floor to the South of the scheme. The lower ground floor is accessed via the lightwells at the rear. Part of the development will also include the conversion of the apartments at lower ground level to commercial use (Class A1/B1). New external stairs will be provided into the reconfigured garden area. These are as shown in the Figure below.

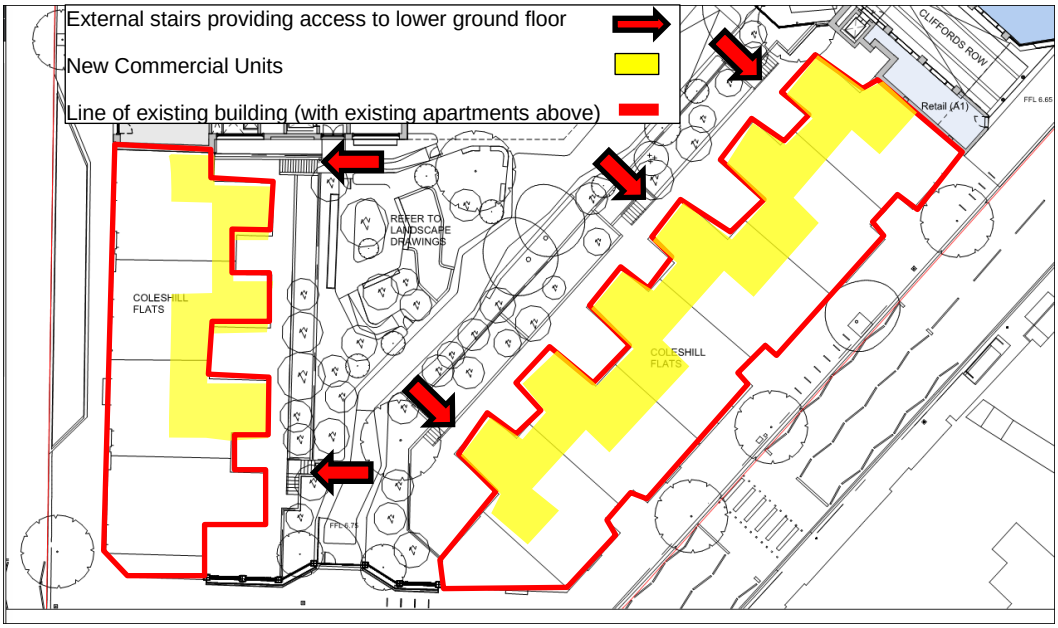

Figure 1: Coleshill Basement Units

The layout of the full scheme is as shown in the Figures below.

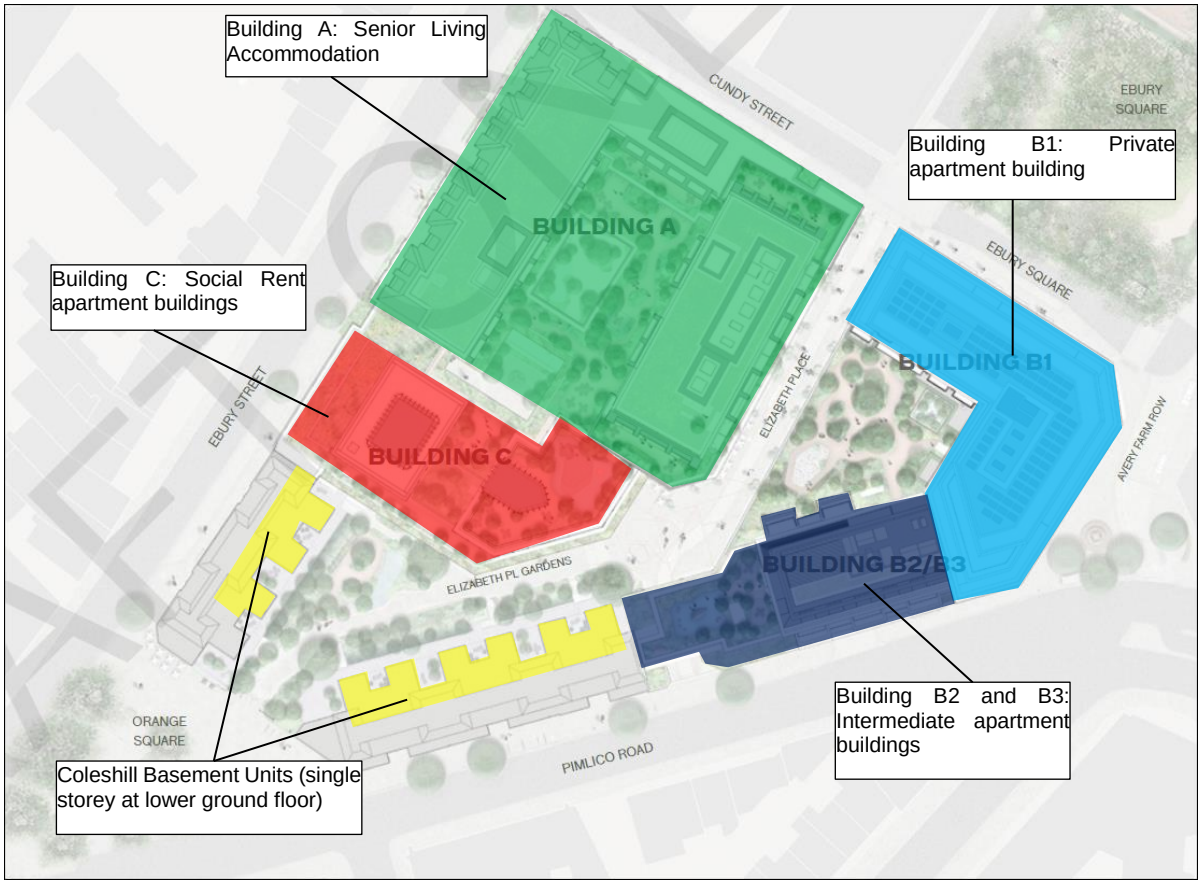

Figure 2: Overview of Development

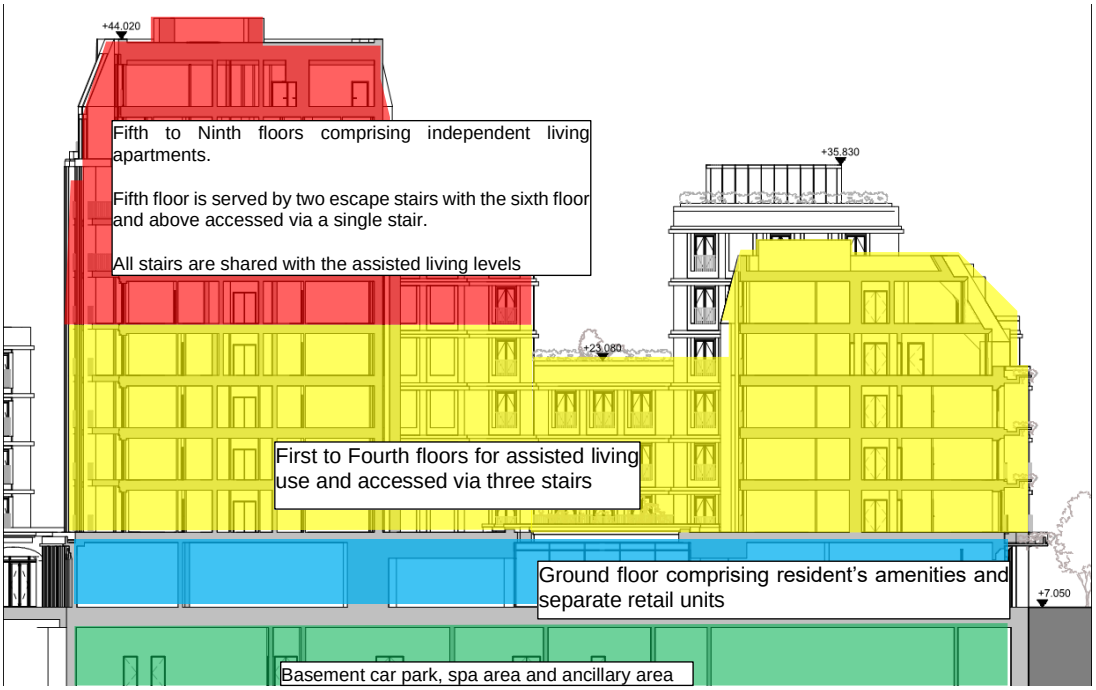

Figure 3: Section through Building A

1.2 Building Regulations Guidance

This report has been prepared using guidance in BS 9991: 2015 *Fire safety in the design, management and use of residential buildings – Code of practice* for Buildings B and C and guidance given in BS 9999: 2017 - *Fire safety in the design, management and use of buildings – Code of practice* for the ground and basement amenity areas of Building A and B, the basement and commercial areas and the Coleshill Basement units.

The strategy for means of escape from the assisted living levels of Building A draws from guidance in Approved Document B which provides guidance on the design of residential care homes. However, the design is not fully compliant with it and fire engineering solutions have been proposed.

The fire strategy for all buildings has also been prepared using guidance in Approved Document B to reflect recent changes to Building Regulations guidance in relation to external walls.

Where the design of the development deviates from current guidance, fire engineering solutions have been proposed. Areas requiring technical justification for departures from code guidance have been described in this report. These will be developed in more detail at a later stage.

1.3 Aim of Report

This report describes the fire strategy principles for the development and only addresses life safety, not property protection.

The report has been prepared to a Stage 2 level of detail and it is intended to be submitted as part of the planning application.

The report will then be updated as necessary and issued to Building Control for approval of the fire strategy principles.

2.0 ACTIVE FIRE SAFETY SYSTEMS

2.1 Sprinklers

The top floor height of Buildings A and B is greater than 30m. Therefore, sprinklers will be provided in these Buildings.

The top floor height of Building C is less than 30m above ground so could be designed without sprinklers. However, due to the connections between the buildings at basement level, and for best practice all areas of Buildings A, B and C including the basement spaces and retail units will be sprinklered. The provision of sprinklers significantly increases the standard of safety and will help to support fire engineering solutions.

The sprinkler system will be designed to a life safety standard in line with BS EN 12845 – 2015: *Fixed firefighting systems — Automatic sprinkler systems — Design, installation and maintenance* to account for the retail and car park uses covered by the system. The pipes and coverage on the residential and assisted living floors will be designed to BS 9251 – 2014: *Fire sprinkler systems for domestic and residential occupancies – Code of practice.*

Sprinklers are not needed within the new single storey commercial units in the Coleshill building as the top floor of the existing buildings is less than 30m above ground, so are not proposed.

2.2 Fire Detection and Alarm

2.2.1 Assisted Living Levels of Building A

The assisted living levels of Building A will be provided with an L1 standard of fire detection and alarm which will include voice alarm throughout the building to support progressive horizontal evacuation on the assisted living levels.

The alarm system of the assisted living levels and the independent living levels at fifth to ninth floor will be linked. Controls will also be provided to allow for the fire service or building management to facilitate a partial or full evacuation of the building including the independent living floors for a fire in any area.

2.2.2 Residential Areas- Buildings B and C and Independent Living Levels of Building A

Apartments will be provided with a minimum of LD3 standard of fire detection and alarm in the conventional apartment layouts.

All open plan apartments will be provided with an LD1 standard of fire detection and alarm.

The common areas will be provided with an L5 standard of fire detection and alarm. This will be to activate the smoke extract systems in the corridors and lobbies and to open the automatically opening vents at the heads of the stairs.

Alarm sounders or beacons will be provided on the external amenity terraces to provide a means of alarm on smoke detection in the common areas.

The apartments will generally operate on a ‘stay put’ basis where the apartment affected will evacuate in the first instance. However, the alarm system in all residential areas will be designed for either the fire service (or management staff of Building A) to trigger a full or partial evacuation of the residential floors.

The topic of providing a common alarm in residential buildings follows new guidance given in BS 8629: 2019 *Code of practice for the design, installation, commissioning and maintenance of evacuation alert systems for use by fire and rescue services in buildings containing flats* which states that any proposal to install an evacuation alert system needs to be discussed with the Fire Brigade before proceeding with the design of the system. The need for or benefit of such a system is something that may become a requirement in future and therefore provides flexibility for potential changes in guidance or legislation.

Controls will be provided which will allow management or the fire brigade to facilitate the evacuation of the residential buildings. This will be developed in detail in conjunction with the fire alarm system designer.

2.2.3 Ground and Basement Amenity Areas

Fire detection and alarm within the ground and basement areas in Buildings A-C will be provided to an L1 standard.

2.2.4 Shop and Commercial Areas

All shop and commercial areas will be provided with a minimum of an L3 standard of fire detection and alarm. These will be independent systems but will include a link to the fire alarm panels in the relevant Building to alert management.

2.2.5 Coleshill Basement Units

Fire detection and alarm will be provided in the Coleshill basement units to an L3 standard. This will be an independent system and will have no link to the existing residential uses above.

3.0 MEANS OF ESCAPE - BUILDING A (SENIOR LIVING BUILDING)

3.1 General

Building A is a Senior Living building comprising of ground plus nine floors. It includes amenity spaces at ground, a roof terrace at first floor and a large spa and car park at basement level. First to fourth floors will be for C2 use and will be designed for occupants who require assisted living. Fifth to Ninth floor will be for C3 use designed as conventional apartments for independent living.

A progressive horizontal evacuation strategy will be developed on the assisted living levels of Building A. The basement and ground amenities will evacuate simultaneously for a fire on one of these levels as occupants will be awake and there will be greater numbers of staff on these levels to assist. The independent living areas on fifth to ninth floors will be designed as per a residential building with a 'stay put' evacuation strategy with the flexibility in the alarm system to trigger a full or partial evacuation.

Three stairs will serve first to fourth floor with two stairs serving the fifth floor and only a single stair continuing to serve the remaining independent living levels. The principle for a single stair on sixth to ninth floors is in line with code guidance for residential buildings. Staff will also be able to help with the evacuation of occupants on these floors after dealing with the assisted living floors. However, the use of a single stair to support assisted living as per the lower levels is not acceptable. Therefore, there is no flexibility within the planning application for floors six to nine to become assisted living use in the future and if they were a second means of escape would be required. It will be the responsibility of the building operator to maintain the upper floors for independent living use only or provide a second means of escape if care requirements change.

3.2 First to Fourth Floor – Assisted Living Areas

3.2.1 General

Guidance recommends care homes are designed with a progressive horizontal evacuation strategy. This is on the basis that occupants within the bedrooms will require some assistance to escape horizontally into the adjacent compartment. Once in the adjacent compartment, they will be in a place of relative safety where staff can assist with their evacuation down the building. On detection anywhere in the building, only the compartment affected will evacuate in the first instance. The remaining compartments will evacuate in later stages. This is to allow staff to focus on the most at risk areas first.

This will require further coordination with the operator as the design develops.

3.2.2 Progressive Horizontal Evacuation

For Progressive Horizontal Evacuation, ADB guidance recommends the building is divided into a minimum of three fire compartments and residents should be able to escape into at least two horizontal adjacent compartments from all areas. Travel distances should also be within the recommended limits of 9m in a single direction, 18m to the nearest place of safety i.e the nearest compartment or protected stair, and the total travel distance to a protected stair should be no more than 64m.

Due to the "U shaped" configuration of the corridors, escape into two adjacent compartments is not possible from all areas and instead the corridors will be divided into five compartments. The dining/ lounge area will be one compartment with each wing containing bedrooms divided into two separate compartments.

This allows for escape horizontally into only a single compartment from the two south compartments on first to fourth floor.

A fire engineering solution to support this arrangement will be developed based on occupants being able to also escape into a protected stair in an adjacent compartment. This will be supported based on the following:

- All areas are sprinklered. The provision of sprinklers will limit fire growth and fire spread and will provide protection to occupants in all bedrooms and in the lounge/ dining areas;

- A mechanical smoke extract shaft will be provided in each corridor section of the bedroom corridors i.e 4 mechanical smoke shafts in total. This will help protect the stairs from smoke ingress from a fire in any area including the lounge/ dining compartment. Mechanical smoke extract shafts will be ~ 0.6-

0.8m^2 in area and will achieve an extract rate of 3-5m^3/s to be confirmed by a CFD study to support the fire engineered solution;

- The three stairs will be designed as firefighting shafts. This will provide occupants in every compartment with access into a stair in an adjacent compartment which includes a firefighting lift. The firefighting lifts on all floors could also form part of the management strategy for the evacuation of mobility impaired occupants. Two firefighting lifts will be provided to each of these cores. This will allow at least one of the lifts to be used for evacuation while the fire service take control of the other on arrival;

- Three of the compartments will be provided with one dedicated protected stair. The stairs serving the two South wings will also open into a separate smoke vented lobby. The lobbies will be smoke vented via a 1.5m^2 automatically opening vent to the external elevation.

- Travel distances into an adjacent compartment will be limited to less than 64m from all bedrooms at a maximum of 35m. Travel distance to a nearest stair is a maximum of 57m. The maximum travel distance to the nearest place of safety (to either an adjacent compartment line or stair lobby) is 25m from the bedroom in the North-West corner to the door into the Lounge/ dining compartment.

- Disabled refuges will be provided in the stair or stair lobby;

- The assisted living bedrooms will be fire separated from adjacent bedrooms and the common corridors by 1-hour compartment walls. This exceeds the minimum recommendations of guidance of 30 minutes fire resistance. The lounge/ dining compartment will be separated from the bedroom areas by 1-hour compartment walls.

This is summarised in Figure 4 below.

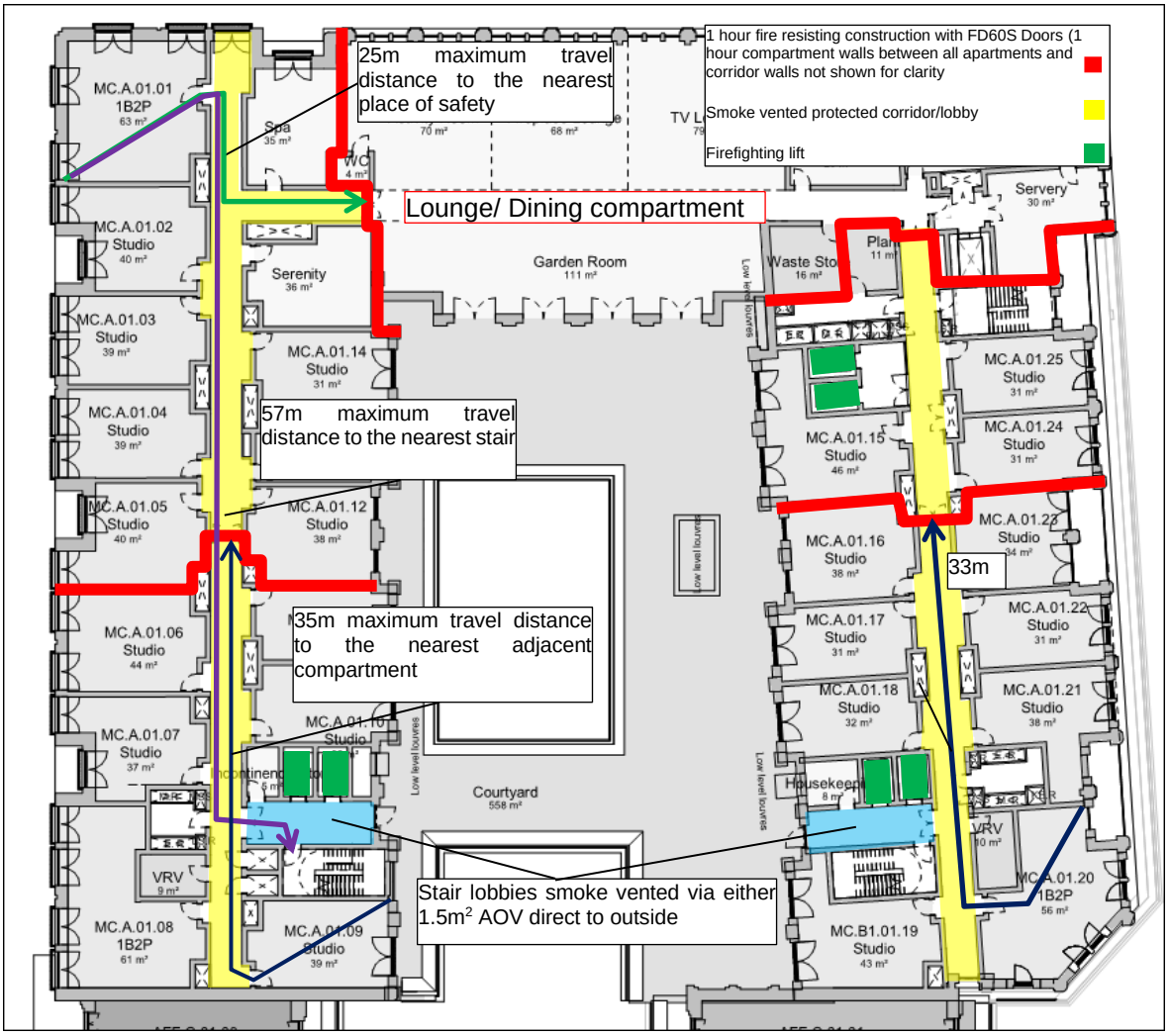

Figure 4: Building A – Fire Compartments First to Fourth Floors

The Lounge/ Dining compartment will contain senior living amenity spaces only. This is proposed on the following basis:

- The amenity spaces will be sprinklered to a commercial standard. The sprinkler-controlled fire size within the amenity spaces will be similar to that in a typical bedroom;
- No bedrooms will open into the same compartment as the amenity spaces;
- There are two escape routes from the bedrooms in the adjoining compartments so there is no reliance on the amenity compartment for escape from any of the bedrooms;
- The escape route through the amenity compartment will not be constructed as a protected corridor. However, a clear route will be maintained through the amenity compartment to allow occupants to escape between the wings.

3.2.3 Escape from Assisted Living Bedrooms

Guidance recommends travel distances are limited to 9m in a single direction. This will generally be achieved in most bedrooms as they will be planned as studios so that the distance from the furthest point to the entrance door will be no more than 9m.

However, travel distances within some of the rooms exceed the recommended maximum and are up to 12m to the entrance door. The maximum single direction travel distance from any of the bedrooms to the point where alternatives are available in the corridor also exceeds the recommended limit in a bedroom in the South-East wing as shown in the Figure below.

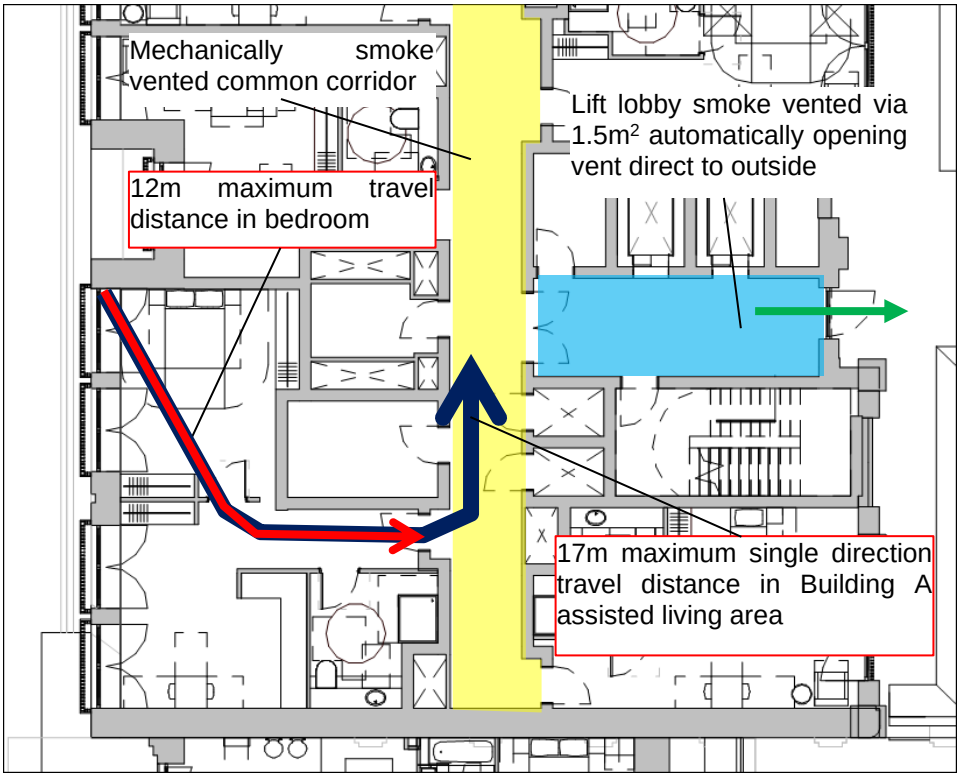

Figure 5: Maximum Travel Distance in Assisted Living Bedrooms

This is proposed based on the following:

- All bedrooms are sprinklered and provided with an L1 standard of fire detection of alarm. This will provide the earliest warning of fire in any of the bedrooms and is considered sufficient to justify a 3m extension in travel distance within the bedroom;
- The provision of sprinklers means occupants within the bedrooms are protected and tenable conditions will be maintained for longer during means of escape and firefighting;
- Travel distances within the common corridors are a maximum of 9m in a single direction from the furthest bedroom door to where multiple directions of escape are possible;
- Once occupants have exited their bedrooms, they will be within a place of relative safety where they can make their way either to a nearest stair or an adjacent compartment;
- The corridors will be provided with mechanical smoke extract shafts. This exceeds the minimum recommendations for common corridors in a code compliant care home. Mechanical smoke extract in the corridors will help to remove smoke from the corridor while occupants are being assisted towards a stair;
- The two South stair lobbies are also provided with automatically opening vents direct to outside.

3.3 Fifth to Ninth Floor – Independent Living Areas

Fifth to Ninth floor will be designed as a conventional apartment building in terms of the fire strategy, utilising a 'stay put' evacuation strategy where only the apartment affected evacuates in the first instance. However, the alarm system will be linked to the senior living levels to notify staff at the lower levels for a fire at the upper levels and to facilitate a full alarm of the floors if necessary.

On fifth floor, the apartments will have access to two of the escape stairs serving the assisted living accommodation on the floors below. All apartments will have access to the North-East and South-West escape stairs via a protected corridor. Only the North-East stair will serve the apartments on sixth to ninth floor with the apartments accessed via a single dead-end corridor,

For residential buildings, guidance recommends single stairs acting as the only escape route should not connect to other occupancies. However, the connection of the residential stairs to the assisted living levels is proposed as the stairs are protected from the bedrooms by a mechanically smoke vented corridor.

The fire load at the assisted living levels will be similar to that in a typical residential building and all of Building A will be sprinklered. Occupants within the assisted living compartment affected by smoke and which contain the stair will not use the stair for a fire within the compartment and will instead evacuate initially into an adjacent compartment on the same floor.

The apartment and corridor strategy for escape at these levels will follow the principles as outlined in Sections 4.2 and 4.3.

3.4 Occupancy and Stair Widths

The total occupancy on the assisted living levels is 119 based on the number of bedrooms in each compartment.

Each of the escape stairs are 1.2m wide. During an evacuation it has been assumed that the stair within the fire compartment would not be used. This is on the basis that occupants in the fire compartment will move into an adjacent compartment before escaping via the stair.

The senior living levels are served by three stairs. Each of the stairs serving up to fifth floor provide capacity for 420 occupants therefore, the stairs provide sufficient capacity for the full occupancy after discounting one of the stairs.

3.5 Stair Final Exits

Guidance recommends stairs should discharge direct to outside or to outside by protected corridor.

The access routes to the South firefighting stairs at ground will be protected to the same level as would be required to the stairs at the upper levels i.e via smoke vented lobbies. Smoke vented lobbies will be provided between the escape route from the stair and the main lounge, the retail cycle storage area and the senior living back of house area. Risers will open into single protected lobbies where they are accessed from the escape route from the stairs.

All doors on the escape route from the stairs to outside will open in the direction of escape and will be at least as wide as the stairs i.e. 1.2m.

A typical example of this is as shown in the Figure below.

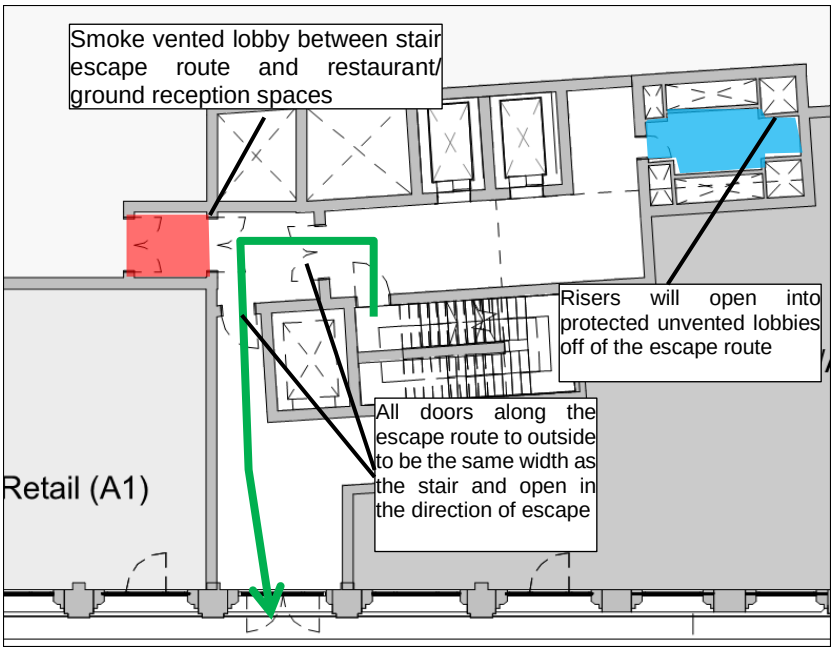

Figure 6: Protection to Building A Stairs

At ground floor, the escape route from the stair to the North-East serving as the single escape stair from the independent living apartments on sixth to ninth floors connects to the loading bay via two separate routes as well as the kitchen servery and Building A ground floor amenity spaces. This is proposed on the basis of two protected lobbies between the stair escape route and loading bay. The connection to the loading bay via the South lift lobby will be via a two lobby separation with the outer lobby being smoke vented as shown in the Figure below.

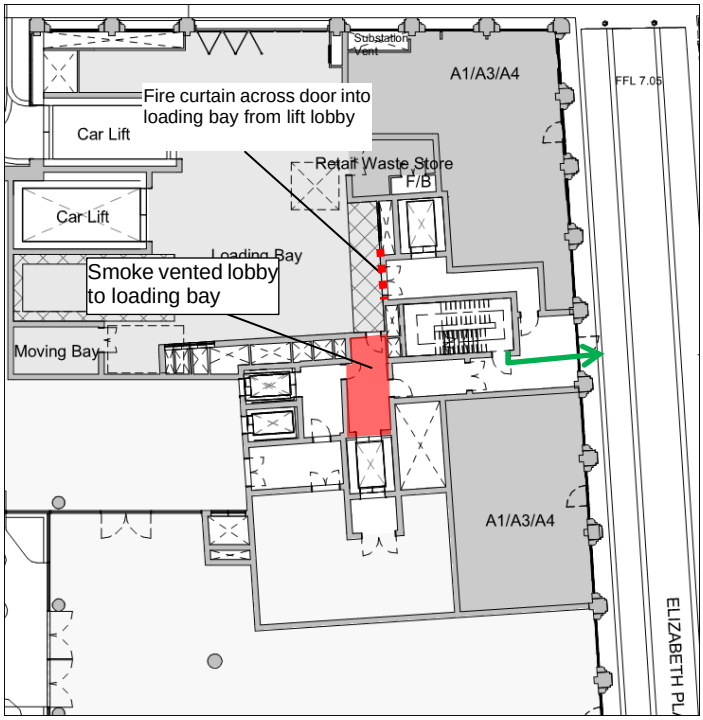

Figure 7: Protection to Building A North-East Stair

The connection to the escape route via the North lift lobby will include a fire curtain across the door into the loading bay as shown in Figure 7 to prevent smoke for a fire in the loading bay from reaching the escape route via either route.

3.6 Escape from the Ground Floor

3.6.1 Risk Profiles

Means of escape from the ground floor amenity areas has been assessed using an A1 risk profile. This is on the basis that occupants on this level are awake and familiar with their escape routes, the space is sprinklered and the presence of management staff to assist occupant's escape.

3.6.2 Ground Floor Spaces

Ground floor of Building A includes a large entrance lobby containing areas of seating, a restaurant, private dining, a library, a small craft workshop and a staff office.

Exits are provided direct to outside from most of the spaces, as well as via the main entrances to the North and West and via the corridors to outside via the other stair escape routes. A minimum of two exits will be provided where the anticipated occupancy in each area exceeds 60. All exits will be at least 850mm wide and will generally open in the direction of escape which necessary to provide capacity for the anticipated occupancy.

Travel distances will be limited to 26m in a single direction and 65m where alternatives are available after fit out. The distribution of the exits provides flexibility before fit out.

3.6.3 Roof Terraces

A Roof terrace is proposed with a large external courtyard at first floor.

The courtyard is provided with a total of three escape routes: one via the doors opening into the amenity compartment to the North and an exit into the East and West corridors. All exits are at least 850mm clear width but open against the direction of escape, therefore the capacity on the courtyard is limited to 120 after discounting the escape route into the amenity compartment to the North.

All exits into the building from the roof terraces and courtyards will be available for all occupants without reliance on electronic locks or keys to use the exits. Therefore, any secure access doors will be provided with a break glass or similar to allow occupants to escape into the stairs from the terraces.

3.7 Connection to Basement Areas

All stairs serving the upper levels will also serve the basement. This is proposed on the basis that all of the stairs serving basement will open into mechanically smoke vented lobbies with an additional non-vented protected lobby separation to the adjoining accommodation. The basement smoke venting strategy is described in more detail in Sections 8.6 and 8.8.

4.0 MEANS OF ESCAPE - BUILDING B, C AND BUILDING A: 5-9TH FLOORS (RESIDENTIAL BUILDINGS)

4.1 Evacuation Strategy

The apartments will generally work on a “stay put” evacuation strategy. However, controls will be provided to allow the fire service to initiate a full or partial evacuation of the building depending on the circumstances.

4.2 Apartments

4.2.1 Conventional Apartment Layouts

Two types of apartment layouts are possible: conventional apartments and open plan apartments.

The conventional apartment layouts will be designed as follows:

- In apartments designed with entrance hallways, the total travel distance within the entrance hallway will be limited to 9m from the entrance door to the door to the furthest room;
- In apartments designed as studios, the total travel distance from all parts of the apartment to the entrance door will be limited to 9m and the kitchen will be sited away from the entrance door;
- No rooms should be inner rooms;
- A minimum of an LD3 standard of fire detection and alarm will be provided.

If the apartments are provided with an LD1 standard of fire detection and alarm, this would permit open plan arrangements as described below.

4.2.2 Open Plan Apartments

The provision of sprinklers and LD1 fire detection and alarm system supports an open plan apartment arrangement.

BS 9991 guidance recommends open plan apartments should be limited to 8m x 4m if the kitchen is open to the living space with the kitchen being remote from the entrance door. Guidance also recommends kitchens should be enclosed in apartments up to 16m x 12m in size.

The recommendation in BS9991 comes from research carried out by the Building Research Establishment on behalf of the NHBC Foundation. The research involved a number of studies of apartments of varying size, using computational fire modelling to compare code compliant layouts in unsprinklered apartments with open-plan layouts in sprinklered apartments. The code compliant apartments were designed following the guidance of the Approved Document B (ADB) and had rooms accessed from a protected hallway.

The studies only covered apartments up to 16m x 12m, and kitchens were open to the living area in smaller apartments up to 8m x 4m, but enclosed in larger apartments. The conclusion of the studies was that sprinklers provided better conditions for apartment occupants than an ADB-compliant layout, but that further work was required to study the effect of larger apartment dimensions and the design of kitchens.

The research did not conclude that larger apartments or open kitchens in larger apartments would present an additional danger to occupants, because that was not covered by the research carried out. These limits certainly should not be considered as a threshold above which open plan apartments are not safe.

A fire engineering solution to allow for apartments to exceed 8m x 4m with open kitchens is proposed. This will be assessed on a case by case basis and will be dependent on the internal layout of the apartment. From modelling on open plan apartments on other projects, a minimum safe distance between cooking hobs and opposing walls of 1.8m has been used to justify the open kitchen arrangement. This will be developed in more detail in the next stage.

JGA have carried out a wide range of studies of similar ‘open plan’ apartment layouts with open kitchens and those analyses have shown that the same conclusions can be drawn.

Ceiling heights will be at least 2.25m to permit the open plan apartment design

4.3 Common Corridors

4.3.1 Common Corridor Escape distances

Building Regulations guidance recommends travel distances in common corridors are limited to 15m in a single direction or up to 60m to a nearest stair where multiple directions of escape are possible.

Where travel distances are a maximum of 15m in a single direction, the corridors will be provided with a single mechanical smoke extract shaft. This is as shown in the Figure below.

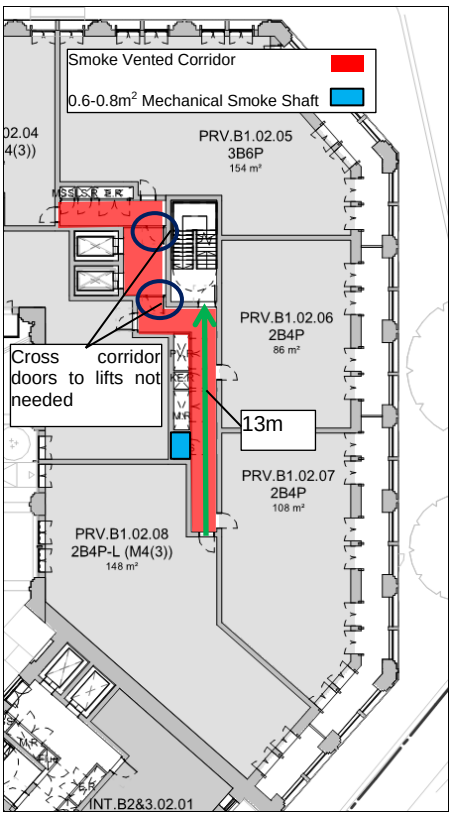

Figure 8: Smoke Venting in Corridors with Travel Distances Less than 15m in a Single Direction

A fire engineering solution will be developed to support travel distances up to a maximum of 30m in a single direction in corridors provided with an enhanced mechanical smoke extract system. A "push-pull" smoke extract system comprises of two mechanical smoke shafts each located at the far end of the corridor which work together to flush smoke away from the stairs. Therefore, two mechanical smoke shafts will be provided in corridors where travel distances exceed 15m in a single direction. This arrangement will be provided in the corridors served by the intermediate core of Building B and on sixth to ninth floors in Building A.

Mechanical smoke shafts will be 0.6-0.8m^2 in area and will achieve an extract rate of 3-5m^3/s. The smoke shafts will each be located no more than 5m from the end of the corridor. This will be confirmed as the design develops.

This arrangement is as shown in the Figures below.

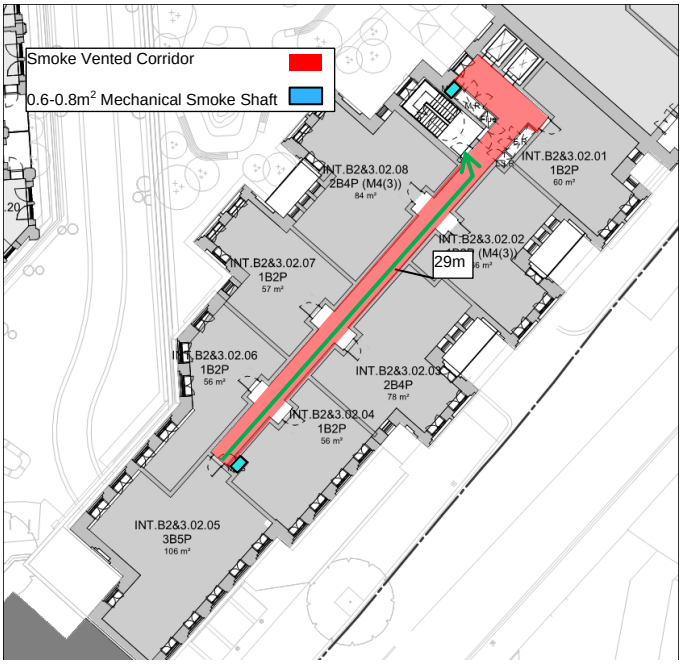

Figure 9: Smoke Venting in Corridors with Travel Distances Greater than 15m in a Single Direction (Building B Intermediate Core)

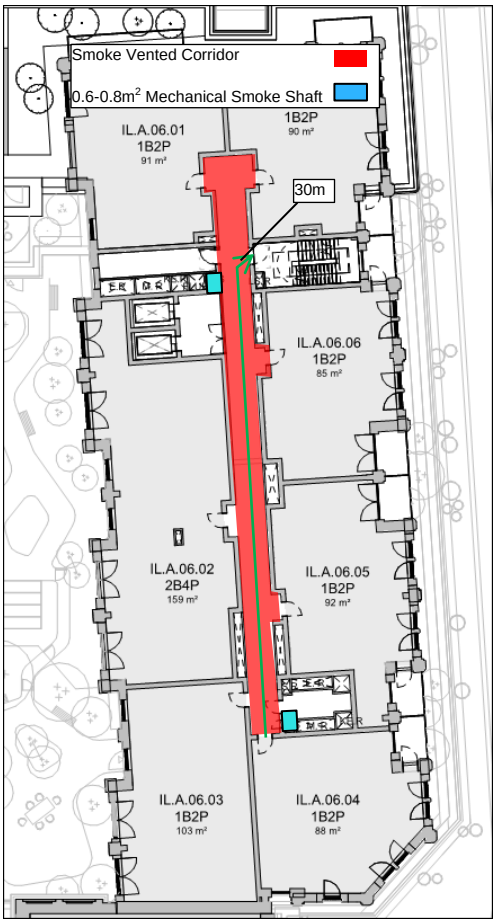

Figure 10: Smoke Venting in Corridors with Travel Distances Greater than 15m in a Single Direction (Building A Sixth to Ninth floor)

On fifth floor of Building A, the independent apartments are provided with access to the two of the stairs. Travel distances in the East wing are up to 30m in a single direction. This section of corridor will be provided with an enhanced mechanical smoke extract system as provided at Sixth to Ninth floor.

Travel distances from all other apartments will be within 60m of the nearest stair and are a maximum of 42m to the nearest stair from the North-West apartment. The lobby to the South-West stair will be smoke vented via a single mechanical smoke shaft.

The smoke venting arrangement for the fifth floor of Building A is as shown in Figure 11.

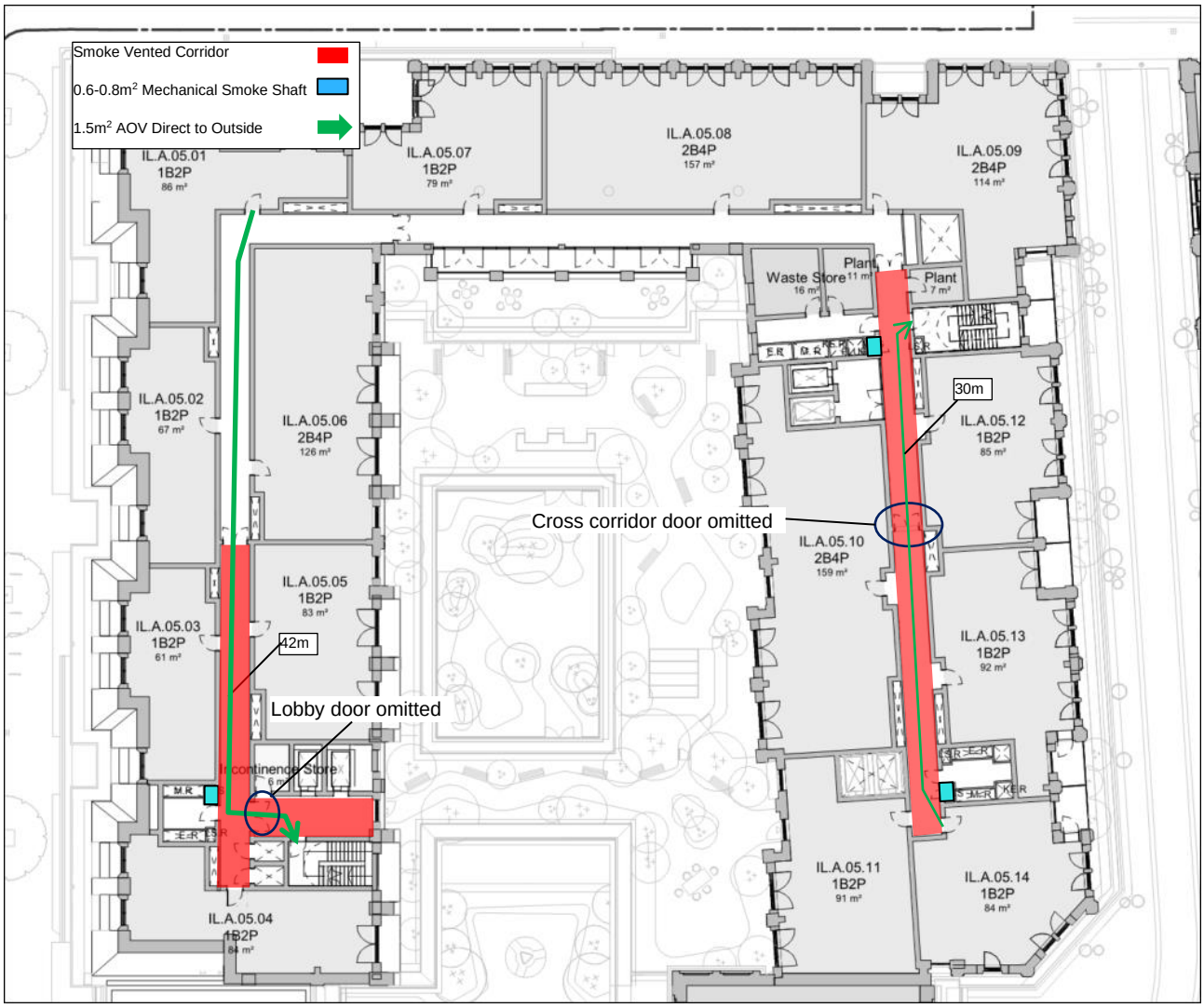

Figure 11: Smoke Venting in Common Corridors (Building A Fifth Floor)

4.4 Stairs

All stairs will be at least 1.2m wide and will be provided with a 1m² automatically opening vent at the head of the stair.

4.5 Means of Escape for Mobility Impaired Occupants

The firefighting lifts will be designed so that they can be used for escape by residents with mobility impairments.

All residential stair cores will be provided with two firefighting lifts. This will allow residents to be able to use at least one of the lifts for escape after the fire service arrive and take control of the other firefighting lift.

4.6 Final Exits from Stairs

Guidance recommends stairs should discharge direct to outside or to outside by way of protected corridor. All protected corridors to outside will be protected to the same level as the stair i.e smoke vented lobbies provided between the stair escape route and any accommodation. Where connections to other ancillary accommodation from the stair escape route occur, the accommodation will be accessible from the stair via smoke vented lobbies.

Alternatively, stairs will discharge into a fire sterile lobby to outside at ground. There will be no connections to any other accommodation into the stair lobby other than the lift shafts and the lobbies will be free of fire loads. There will be no access to risers from the fire sterile lobby with the exception of low risk services which will be accessed via screw-shut, fire rated panels from the lobby. Other higher risk risers will open into a separated protected lobby off of the stair escape route.

The protection to the escape routes from the residential stairs are as shown in the figures below. The protection to the ground floor escape route of the stair serving as the only escape route from sixth to ninth floors in Building A is as described in Section 3.5.

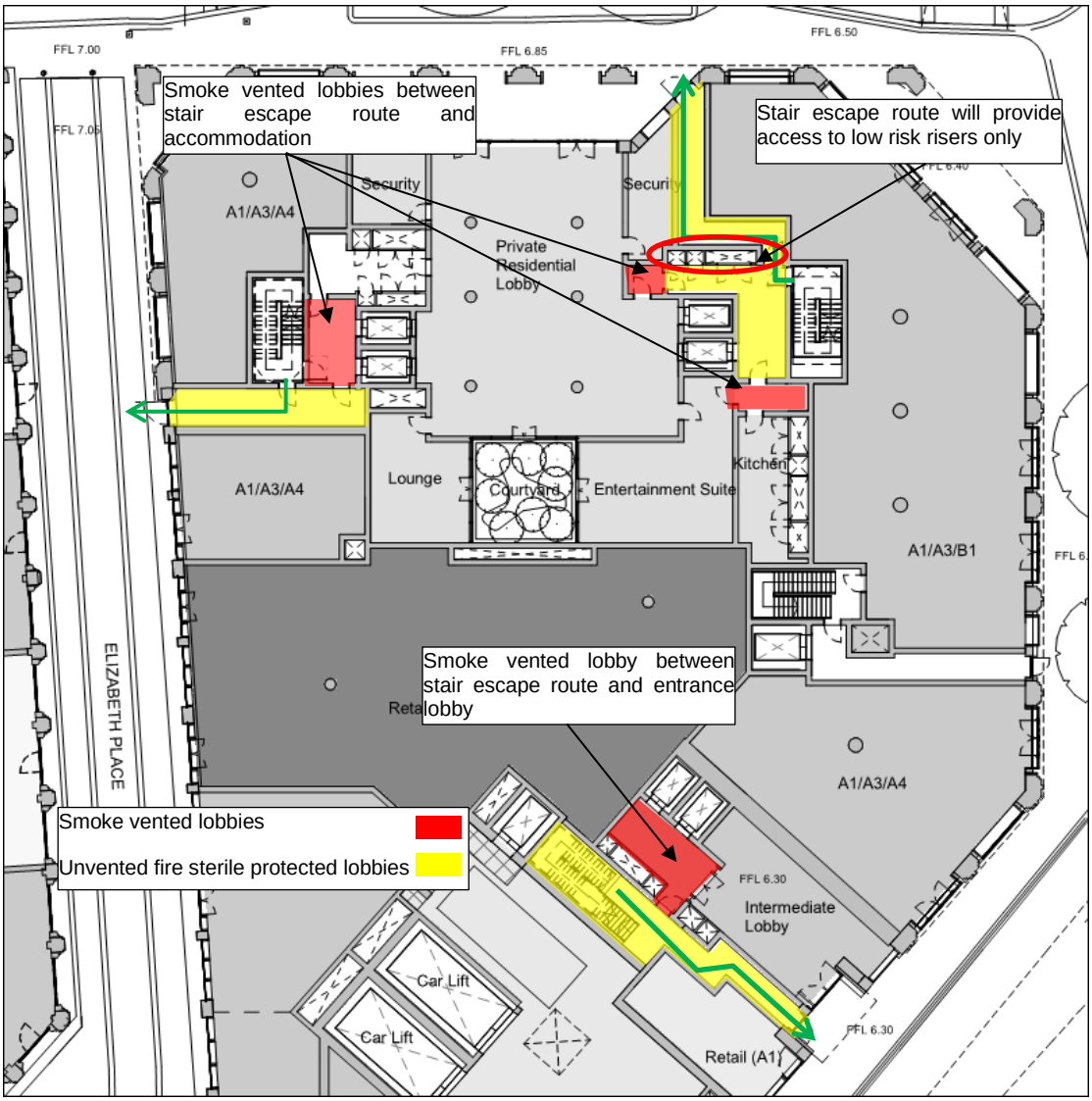

Figure 12: Protection to Building B Stairs at Ground Floor

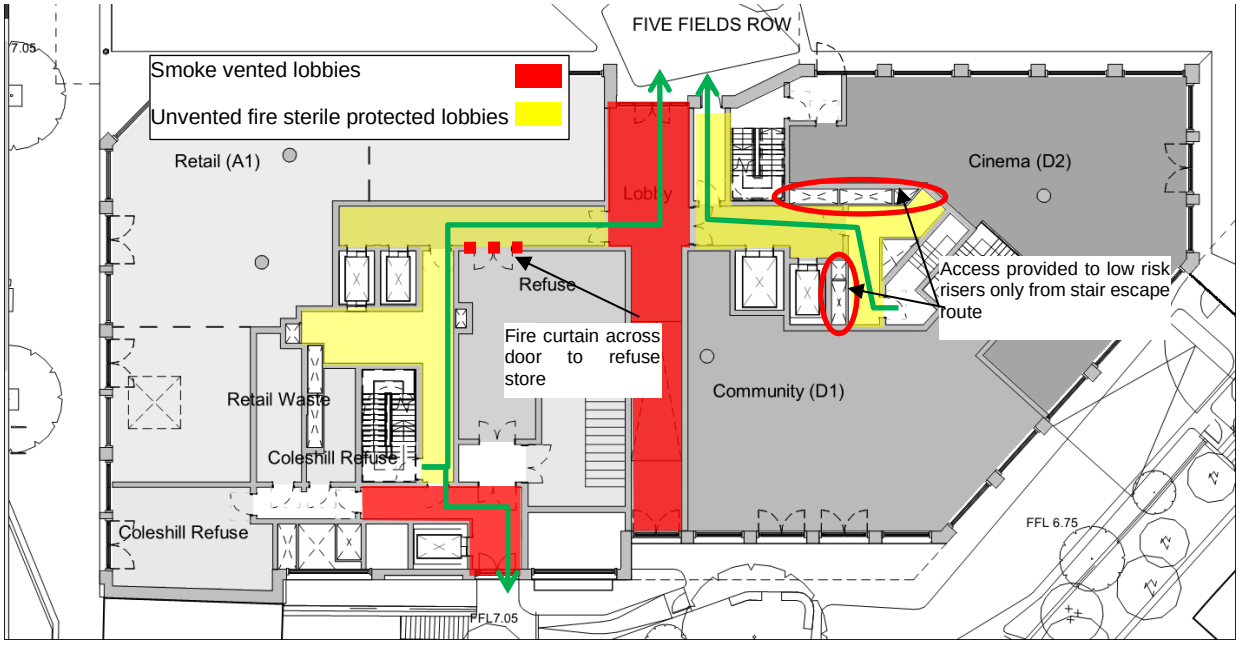

Figure 13: Protection to Building C stairs at Ground Floor

Lifts which open into the fire sterile lobby at ground floor and open outside of a smoke vented lobby at basement level will open into a protected corridor and will be provided with fire curtains across the lift opening at basement level. These will descend on local detection and will achieve 2 hours fire resistance.

The instances where this occurs are:

- Both firefighting lifts in Building C which open outside of a smoke vented lobby at basement and into the sterile lobbies on exit from both stairs at ground;
- The firefighting lift of the North-East stair in Building B which has dual entry at basement and opens into the escape route from the North-East stair at ground floor.

Doors along the escape routes from the stairs will be at least 850mm clear width and will open in the direction of escape to allow for a full evacuation of the upper levels during a fire if necessary.

Refuse stores connecting to the stair escape route such as from the West stair of Building C will be provided with at least 0.2m^2 of permanent ventilation or a suitable mechanical alternative to prevent the build-up of flammable gases.

4.7 Connection to Basement

Guidance states single stairs serving as the only escape route from the upper floors of the building should not also connect to basements.

It is proposed for the residential stairs to connect to the basement. A fire engineering solution will be developed to support the connection to basement based on the provision of sprinklers and a two-lobby separation between the stairs and any accommodation. One of the two lobbies will be mechanically smoke vented. This will be achieved via extending the mechanical smoke shafts from the upper floors to serve the lobbies at basement.

A typical arrangement is shown in the figure below.

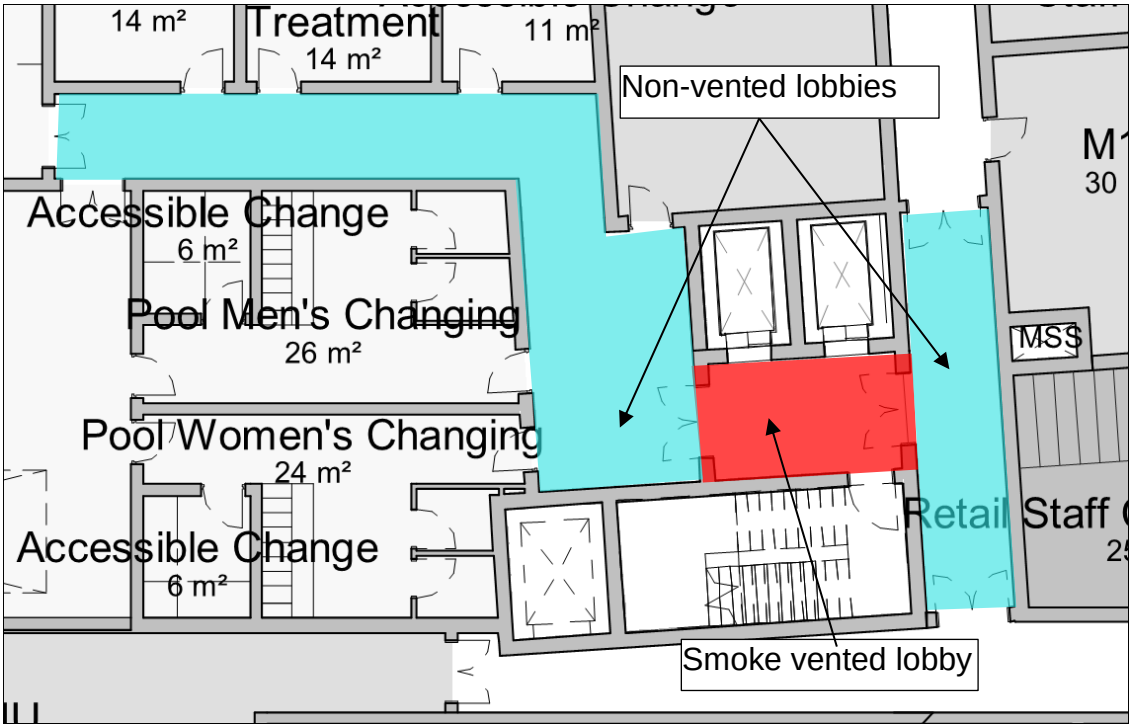

Figure 14: Protection to Residential Stairs at Basement

4.8 Roof Terraces

Roof terraces are proposed in both Buildings B and C.

Building B contains a large courtyard space at first floor and a small roof terrace at fifth floor. The roof terrace at fifth floor has a single exit opening into the building. This limits the exit capacity on the terrace to 60.

Three exits will be provided from the first-floor courtyard as it could hold more than 60 occupants. Exits from the courtyard at first floor will be at least 850mm clear width and will open in the direction of escape i.e into the building.

The East core of Building C contains an outdoor amenity space at first floor as well as a roof terrace at seventh and fourth floor. These three are each provided with a single exit into the East stair core which provides capacity for up to 60 occupants on each of the terraces.

Sounders or beacons will be provided on the roof spaces. These will be to alert occupants on the roof on smoke detection in the common areas.

All exits into the building from the roof terraces and courtyards will be available for all occupants without reliance on electronic locks or keys to use the exits. Therefore, any secure access doors will be provided with a break glass or similar to allow occupants to escape into the stairs from the terraces.

5.0 BASEMENT AREAS

5.1 Risk Profile

Basement areas comprise of separate car parks, amenity and spa areas for Buildings A and B with the rest of the basement predominantly used as back of house/ storage space and plant areas for all occupancies. The Building C basement consists exclusively of plant and storage areas.

The spa and car park areas have been assessed using an A1 risk profile for travel distances and exit widths from these areas. This is considered appropriate given the provision of sprinklers and the presence of occupants who are awake and familiar with their escape routes. However, an A2 risk profile has been used to assess storey exit capacity and travel distances to the nearest stair for maximum flexibility and considering the higher risk rooms present in the basement.

Escape from the plant/ storage areas has been assessed using either an A2 or A1 risk profile based on the use and type of equipment in each area.

5.2 Basement Amenity and Spa Areas

5.2.1 Building A Amenity and Spa Areas

The Building A basement amenity and spa area consists of a home theatre, fitness centre and swimming pool as well as several staff offices.

The amenity spaces are provided with escape via the corridor to the South-West stair and to the South-East stair. All exits into the stair will be at least 850mm clear width. These exits will provide capacity for 139 occupants in the spa after discounting one of the exits into the stairs.

Travel distances will be limited to 26m in a single direction and a maximum of 55m to a nearest stair.

5.2.2 Building B Amenity and Spa Areas

The spa area to Building B consists of a swimming pool, changing areas, treatment rooms and a gym.

The Spa is served by an exit from the swimming pool, two inwards opening escape routes from the spa reception and an exit from the gym. These provide capacity for up to 120 occupants in the spa.

Travel distances will be limited to 26m in a single direction and 55m to a nearest stair.

Additional exits will be provided where necessary.

5.3 Car Parks

5.3.1 Building A Car Park

The car park to Building A at basement comprises of 18 car spaces and also provides access to ancillary spaces such as the car park vent room and maintenance workshop. This gives an indicative occupancy of 36 based on 2 persons per parking space.

The Building A car park is provided with two exits: one into the corridor to the North-East and a second exit into the South-East corridor. These are at least 850mm wide and open against the direction of escape which provides capacity for 60 in the Building A car park. This exceeds the number of occupants present in the car park based on the number of parking spaces.

Guidance recommends travel distances are limited to 26m in a single direction and 55m to a nearest stair. The car park exits are sufficiently placed to limit travel distances to well within the recommended limits as shown in Figure 15.

5.3.2 Building B Car Park

The Building B car park has 20 parking spaces giving an indicative occupancy of 40 based on 2 persons per parking space.

The Building B car park is provided with three exits as shown in the figure below.

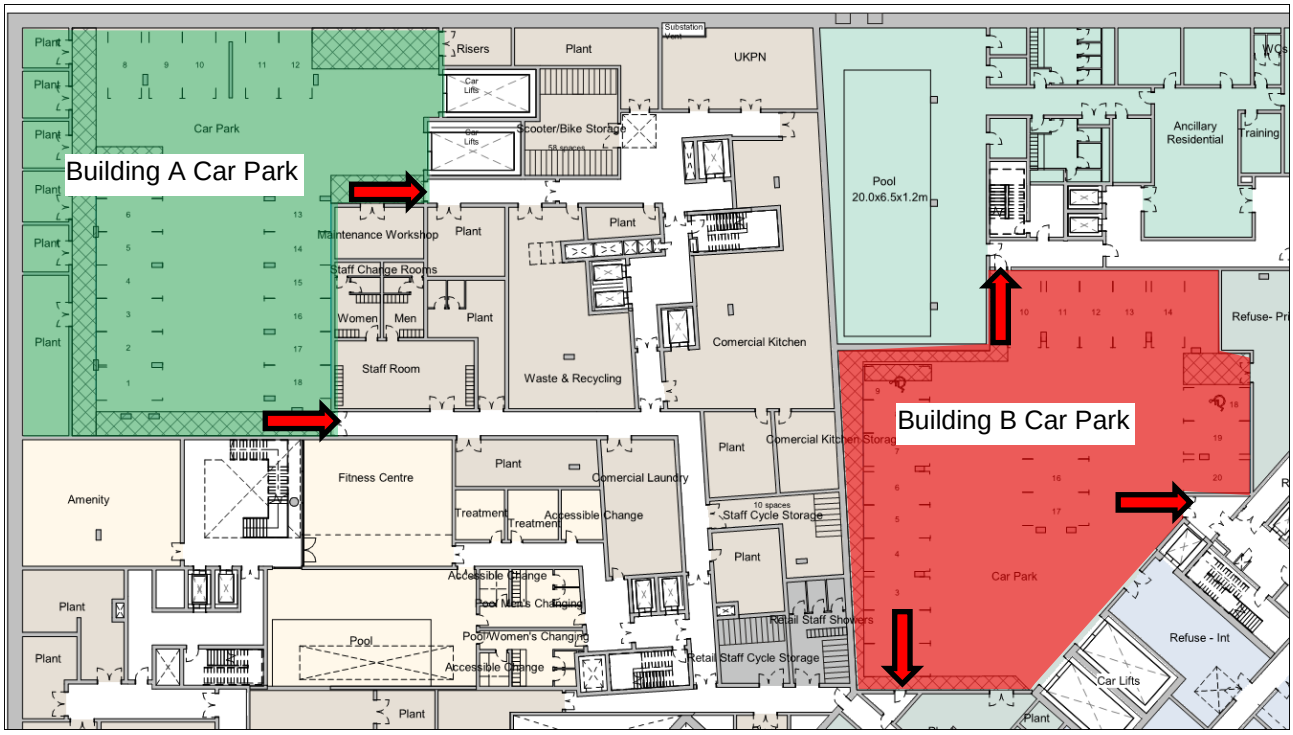

Figure 15: Escape from the Car Park in Building A

The exits from the Building B car park are all at least 850mm clear width, sufficient for the indicative occupancy. The exits in both car parks can open against the direction of escape if necessary. This would be sufficient for up to 120 occupants in the Building B car park and up to 60 in the Building A car park, greater than the indicative occupancy in either.

Travel distances are within the recommended limits of 26m in a single direction and no more than 55m to a nearest stair in both car parks.

5.4 Plant and Storage Areas

5.4.1 Store Rooms

Storage areas at basement comprise of residential and senior living storage areas such as cycle and mobility scooter stores.

Travel distances will be limited to 22m in a single direction and 55m where alternatives are available using an A2 risk profile.

Additional exits will be provided where the single direction travel distance is exceeded such as to the storage spaces in the basement areas of Building C as shown in the Figure below.

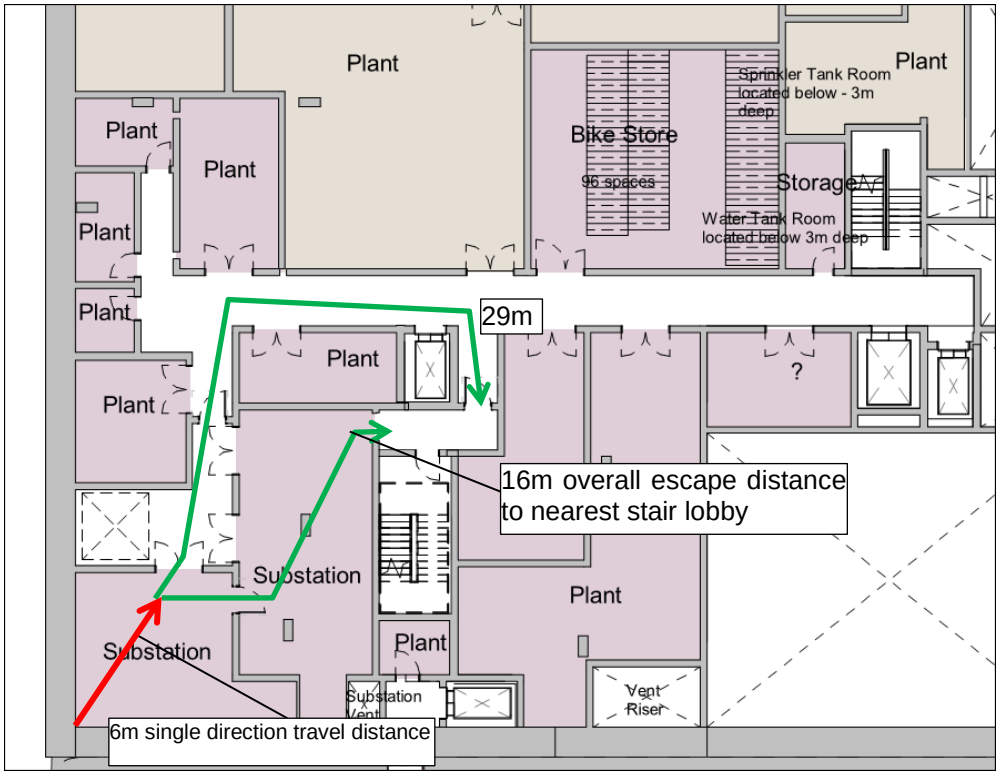

Figure 16: Additional Exits from Building C Storage Areas

5.4.2 Plant Areas

Means of escape from the plant rooms will be dependent on the contents and type of equipment in each room.

Single direction travel distances from plant rooms containing low risk equipment will be limited to 26m using an A1 risk profile. Travel distances to a nearest stair from these rooms will be limited to a maximum of 55m following an A2 risk profile to allow for maximum flexibility before fitout.

Travel distances from plant areas containing higher risk equipment such as fuel storage will be limited to 22m in a single direction and 55m where alternatives are available using an A2 risk profile.

At sub-basement level, there will also be a large plant area for the sunken residential water tanks adjacent to the Cinema area. These will be accessed from the Building A and C plant areas on the floor above and will only be accessible during maintenance periods. Exits to the above floor will be located to limit travel distances to no more than 26m in a single direction and 55m to a nearest exit after fitout. Additional exits such as an exit into the cinema escape stair will be provided if necessary.

5.5 Basement Occupancy and Escape Capacity

5.5.1 Building A

The spa area in Building A is 445m^2 in area corresponding to an occupancy of 109 based on a floor space factor of 5m^2 per person typical of gym/ spa areas and accounting for the number of seats in the home theatre. The car park has 18 spaces and has an occupancy of 36 based on 2 persons per parking space. The remaining space is used for storage and ancillary space which will have a low occupancy.

Building A is served by three escape stairs at basement: the North escape stair and the two South escape stairs. Each of the stairs are 1.2m wide and are accessed via 850mm wide exits opening into the stairs.

These provide capacity for a total of 276 occupants at basement level after discounting an exit into a stair. This is sufficient for the proposed occupancy and provides flexibility to account for an additional 167 occupants including occupants within the staff offices and plant and storage areas.

5.5.2 Building B

The spa area Building B is 640m^2 in area. This is equivalent to an occupancy of 128 in the spa based on a floor space factor of 5m^2 per person typical of gym/ spa areas. The car park has 20 parking spaces which gives an occupancy of 40 based on two persons per parking space. The remaining space is used for storage, plant and ancillary spaces and will have a low occupancy.

The basement areas of Building B are served by three escape stairs: the two residential escape stairs to the North and the south residential stair. The stair from a ground floor retail unit also serves this level but is accessed within the back of house area of the retail unit and has not been included in the assessment.

All three stairs are 1.2m wide but are limited by the exits into the stairs which are 850mm wide. These provide capacity for 276 occupants after discounting an exit into a stair. This is sufficient for the proposed occupancy and provides flexibility for an additional 148 occupants including staff and occupants in the ancillary areas.

5.5.3 Building C

The basement areas to the West core of Building C comprise of plant and storage areas. These are served by the West core of Building C only and are limited to a maximum of 60 occupants at this level. This is sufficient given the low occupancy in these areas.

The East stair of Building C serving the cinema does not connect with the residential occupancy and is discussed in more detail in Section 6.3.

5.5.4 Minimum Exit Widths at Basement

Doors on escape routes that could be used by mobility impaired occupants will be at least 850mm clear width.

All other doors used by a small number of occupants will be at least 800mm clear width.

5.5.5 Access to Exits at Basement

All doors into the stairs at basement level will be available for escape without reliance on locks or keys to enter the stairs. Therefore, any secure access doors will be provided with a break glass or similar to allow occupants to escape into the stairs.

Doors with electronic locks will fail unlocked on fire detection or loss of power in the basement.

5.6 Disabled Refuges

Refuges will be provided in all of the stairs or stair lobbies serving the basement areas of Building A, B and C.

6.0 COMMERCIAL UNITS

6.1 Retail/ Restaurant Units

The commercial areas have been assessed based on a B2 risk profile with the provision of sprinklers and because occupants will be awake and unfamiliar with their surroundings.

All commercial areas will have exits direct to outside. Units provided with single exits will be limited to 60 occupants i.e 120m^2 for a typical retail occupant density of 2m^2 per person. Larger units will require a second escape route. At least two well separated exits will be provided for units with an occupancy greater than 60. Exits from the larger units will open in the direction of escape and will be at least 850mm clear width.

Travel distances will be limited to 20m in a single direction and 50m where alternatives are available after fitout or 16m in a single direction and 40m where alternatives are available before fitout.

6.2 Basement Retail Area

There is a back of house area for the retail units to the South-East side of Building B at basement level. These comprise of a back of house space and a refuse and kitchen store.

The basement retail area is provided with access to a dedicated protected stair and into the corridor providing access into the residential stairs to Building B. These provides capacity for up to 60 occupants at basement level.

6.3 Cinema

A cinema is proposed at ground and sub-basement in Building C. This will comprise a large entrance foyer at ground with three screens at basement level. Sub-Basement is provided with access to one 1.2m wide protected stair and a 1.3m wide open stair.

The occupancy at sub-basement is 155 based on the seating numbers in the screens and in the foyer. The ground floor occupancy is 60 based on the seating numbers.

The exits to both stairs are in close proximity within the foyer at basement level. Therefore, there is the potential for a fire in the space immediately adjacent the protected stair to discount both exits. The foyer and lobby outside of Screens 1 and 2 will therefore be treated as a circulation space. No fire loads will be permitted within the area between the two exits as shown in red in the Figure below.

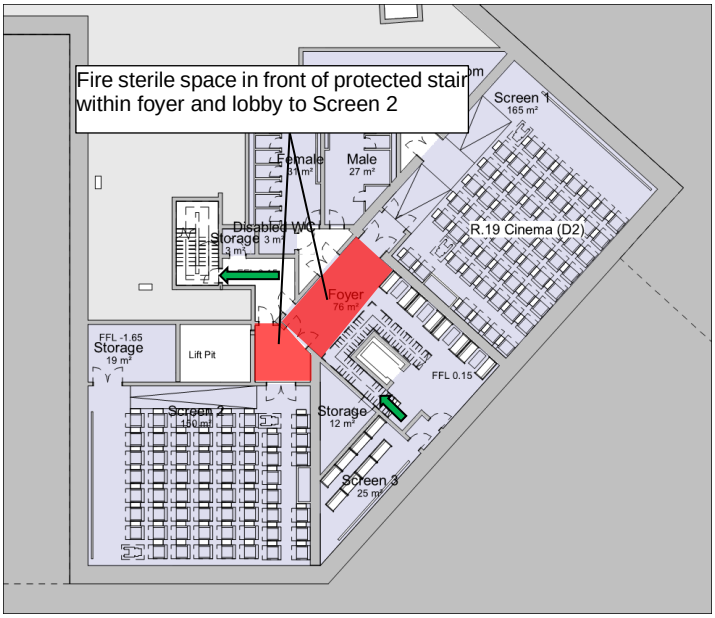

Figure 17: Protected Area at Sub-Basement Level

All screens other than screen 2 are considered inner rooms as they are reliant on escape into the foyer space. Therefore, smoke detectors within the screens will be linked to the main alarm system to evacuate on detection in any of the circulation spaces.

Screens 1 and 2 have 62 occupants each based on the number of seats in each screen. Both screens have access to a single exit and should strictly be limited to a maximum of 60 occupants. The slight increase in occupancy in both Screens 1 and 2 is proposed based on the provision of sprinklers. Screen 3 is provided with a single exit which is sufficient for the proposed seating numbers.

A refuge will be provided to the protected stair to assist with the evacuation of mobility impaired occupants.

Travel distances should be limited to 24m in a single direction and 60m where alternatives are available based on a B1 risk profile. Travel distances are within the recommended limits in all areas and are a maximum of 22m in a single direction in Screen 1. Travel distances from the furthest wheelchair space in Screen 1 are a maximum of 20m to the lobby of the protected stair. Alternative exits are possible on exit from each of the cinema screens.

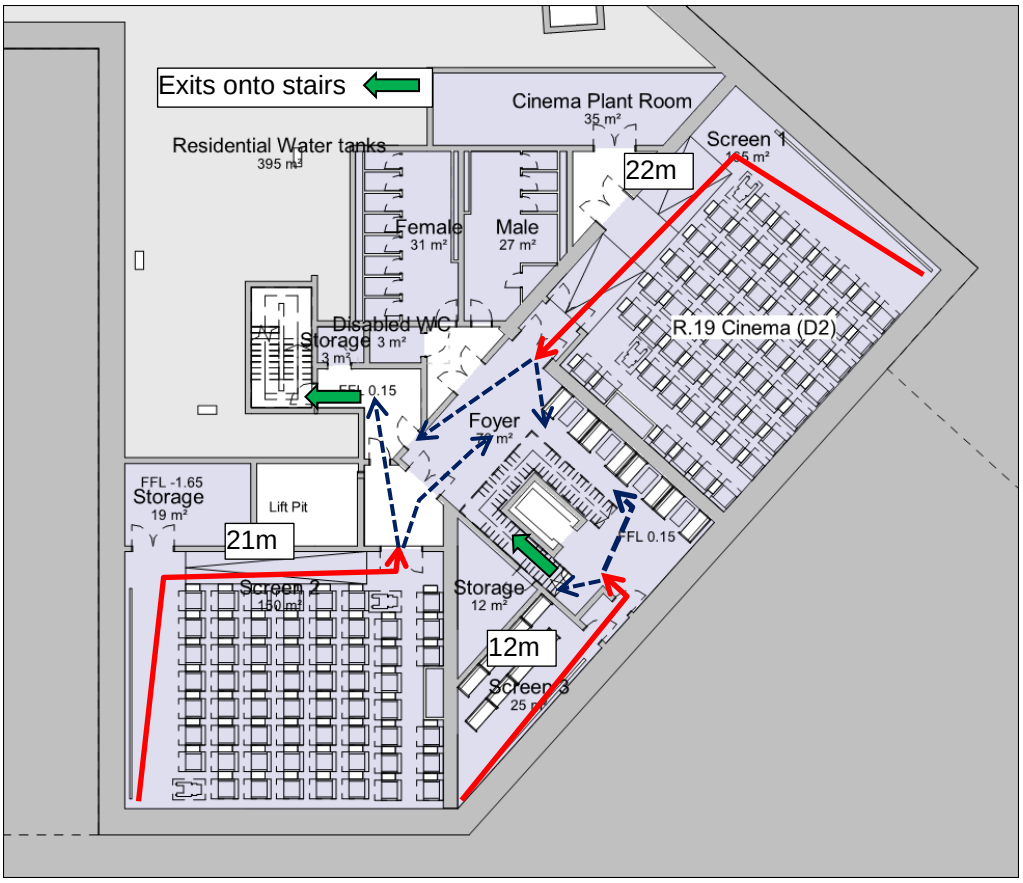

Figure 18: Travel Distances from Screens 1 and 2 at Sub-Basement

The exit into the protected stair will be at least 1050mm wide and will open in the direction of escape.

Both the protected stair and the open stair are 1.2m clear width. These provide capacity for up to 280 occupants after discounting escape via the open stair. This is sufficient for the sub-basement occupancy based on the number of seats and allows for up to an additional 125 at sub-basement to account for staff or occupants in the adjacent storage areas.

7.0 COLESHILL BASEMENT UNITS

Single storey commercial units are proposed within the existing Coleshill buildings. These will be for either A1 or B1 use. These will comprise of individual units in the basement of both buildings and will be accessible via external escape stairs within the lightwells leading into Elizabeth Place Gardens at ground.

The occupancy and means of escape have been assessed based on retail (Class A1) use for maximum flexibility and to give a maximum expected occupancy. All units are approximately 45m^2, this equates to 23 occupants per unit based on a floor space factor of 2m^2 per person typical of retail use and a total of 138 and 69 in each building respectively.

Travel distances to the stairs will be limited to 18m in a single direction and no more than 45m where alternatives are available. The provision of alternative exits from the lightwells allows for two directions of escape on exit from all of the offices and the maximum travel distance to Elizabeth Place Gardens is 26m.

Single direction travel distances within the units are a maximum of 12m which provides flexibility before fitout.

Access to external escape stairs is possible at each end of the lightwells to allow for two directions of escape from all offices. This is as shown in the Figure below.

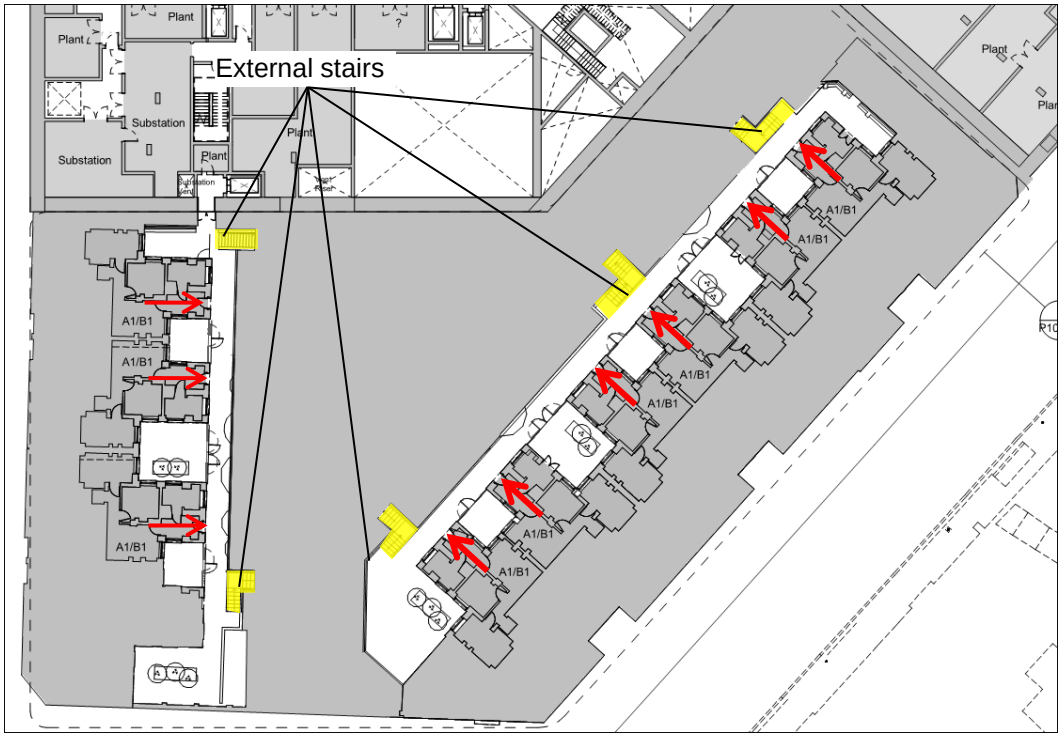

Figure 19: Protection to Units at the Dead ends in the Coleshill Buildings

The external stairs are at least 1.1m clear width, sufficient for either office, light industrial or retail use.

8.0 FIREFIGHTING

8.1 Firefighting Shafts

The top floor height of all Buildings is greater than 18m, therefore all Buildings should be provided with at least one firefighting shaft.

Residential Buildings B and C are served by single stairs, therefore all stairs in Building B and C will be constructed as firefighting stairs including firefighting lifts.

In Building A, all stairs will be constructed as firefighting stairs to support the progressive horizontal evacuation strategy at first to fifth floors and including the stair serving the independent living apartments on sixth to ninth floors.

Firefighting shafts will include the following:

- 1.1m wide firefighting stair;
- A firefighting lift within 7.5m of the stair door on all floors;
- 2 hour fire resisting enclosure to the firefighting stair, firefighting lift and access route to the firefighting shaft at ground floor;
- Dry riser located within the stair with an outlet located on the landing on all floors including ground;
- 1m^2 automatically opening vent at the head of each stair

The mechanical smoke venting arrangements provided for means of escape in the corridors will be sufficient for firefighting.

8.2 Firefighting Lifts

The provisions provided in an apartment building are designed to minimise the risk of fire spread beyond the flat on fire and allows the residents of non-fire flats to stay in their own homes (stay put strategy). This strategy applies to all occupants both able bodied and mobility impaired.

For that reason, Building Regulations guidance does not make any specific recommendation for the need for any additional features to assist mobility impaired occupants who use the building.

The proposed London Plan, however, states that buildings should be designed to facilitate a dignified escape for occupants of restricted mobility. It proposes that at least one lift per core should be usable for mobility impaired escape.

Each of the firefighting stairs serving Buildings A and B will be provided with two firefighting lifts to enhance the standard of safety.

Two firefighting lifts should allow for one to be dedicated to the Fire Brigade with the other potentially being used for the evacuation of occupants, particularly those with mobility impairments, should a full evacuation be considered necessary. This satisfies the intent of the London Plan in providing measures to facilitate a dignified escape for occupants of restricted mobility. It also overcomes any potential conflicts between the needs of escaping occupants and those of fire fighters trying to access the fire floor.

Some of the lifts will need to be dual entry at ground floor. Where this occurs, the lift openings will be provided with fire curtains where they open outside of a firefighting lobby. This is discussed in more detail in Section 8.7.

8.3 Hose Cover

Hose cover will be possible within most of the non-commercial areas of Building A-C to within 60m of the dry riser outlets.

Hose coverage within the basement of Building A is as shown in Figure 20 below.

Hose coverage is a maximum of 64m to the EC1 LV Switchroom in the Building A car park. However, a 4m extension is considered reasonable based on the following:

- The electrical switchroom will be separated from the car park by full height fire resisting construction forming a compartment wall;
- The room is a switchroom likely to contain electrical equipment and the fire service would not be expected to use water hoses to tackle a fire in the room.
- The car park will be sprinklered, this will provide protection to fire fighters along the access route to the switchroom via the car park;
- The switch room will not be provided with sprinklers, but will be provided with an equivalent gas/ wet powder type suppression system to limit fire growth and fire spread.

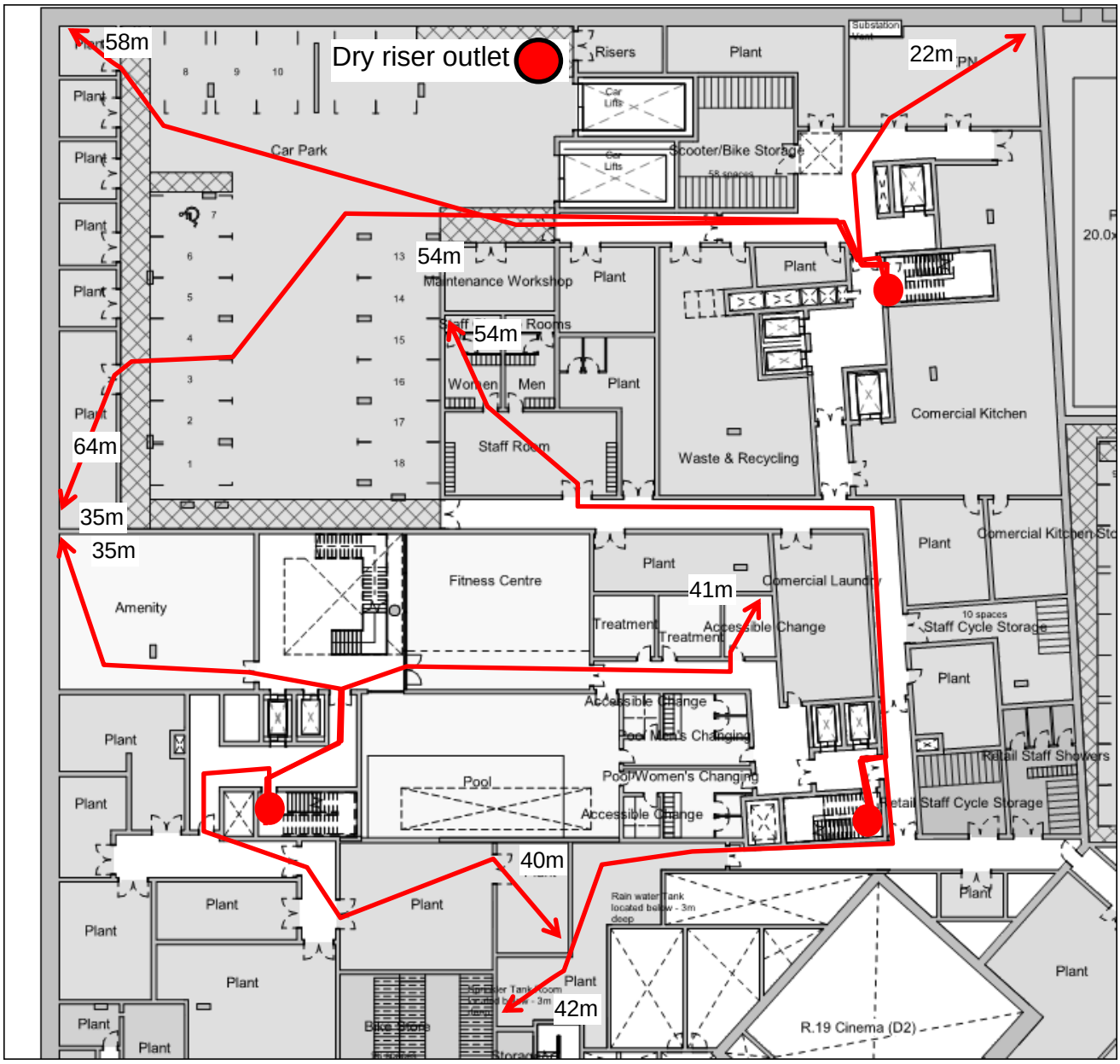

Figure 20: Building A Basement Hose Coverage

Hose coverage to the upper levels of Building A is provided via the dry riser outlets in all stairs. These provide sufficient hose coverage in the basement and hose coverage is a maximum of 60m before fitout.

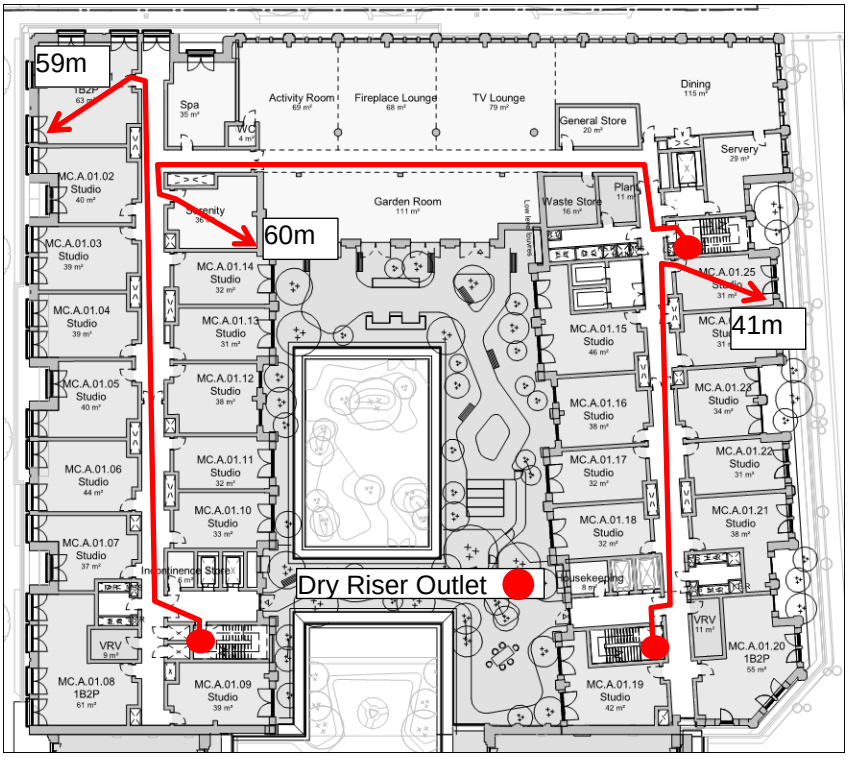

Figure 21: Maximum Hose Coverage to Building A First to Fifth Floor

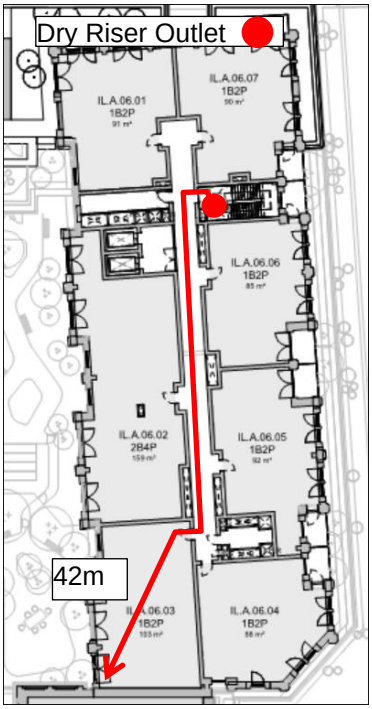

Figure 22: Hose Coverage to Building A Sixth to Ninth Floor

Hose coverage on all residential floors in Buildings B and C is within 60m of the dry riser inlet and is a maximum of 47m from the South stair core in Building B.

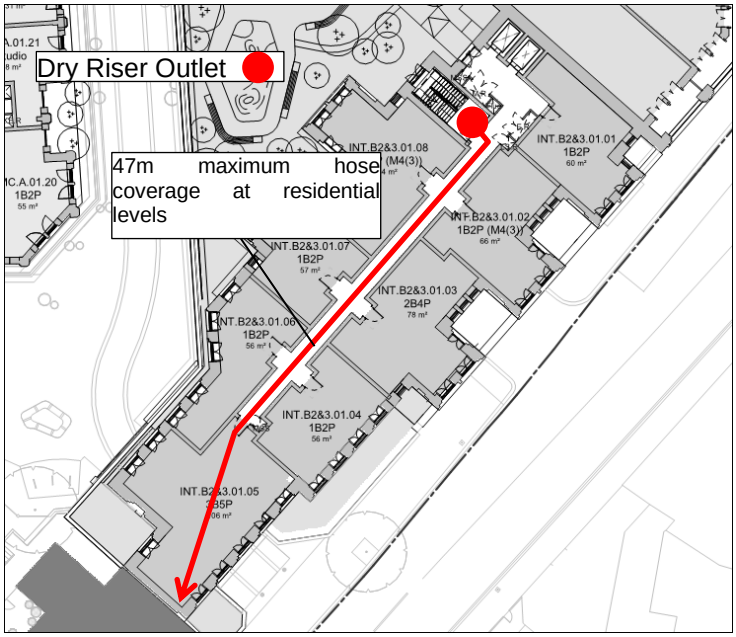

Figure 23: Maximum Hose Coverage at Residential Levels

8.4 Fire Vehicle Access

8.4.1 Fire Vehicle Access Route Design

All fire vehicle access routes will be designed in line with the recommendations of Table 15.2 of Approved Document B for load bearing capacity and clearance height and widths for pump appliance access.

These are as highlighted in the Figure below.

Table 15.2 Typical fire and rescue service vehicle access route specification

Appliance type	Minimum width of road between kerbs (m)	Minimum width of gateways (m)	Minimum turning circle between kerbs (m)	Minimum turning circle between walls (m)	Minimum clearance height (m)	Minimum carrying capacity (tonnes)
Pump	3.7	3.1	16.8	19.2	3.7	12.5
High reach	3.7	3.1	26.0	29.0	4.0	17.0

NOTES:

1. Fire appliances are not standardised. The building control body may, in consultation with the local fire and rescue service, use other dimensions.
2. The roadbase can be designed to 12.5 tonne capacity. Structures such as bridges should have the full 17-tonne capacity. The weight of high reach appliances is distributed over a number of axles, so infrequent use of a route designed to accommodate 12.5 tonnes should not cause damage.

Figure 24: Design of Fire Vehicle Access Routes

All dead ends will be limited to a maximum of 20m. Therefore, it is not necessary for turning facilities/ spaces to be provided within the site.

8.5 Site Wide Fire Vehicle Access

The site wide fire vehicle access routes is as shown in Figure 25.

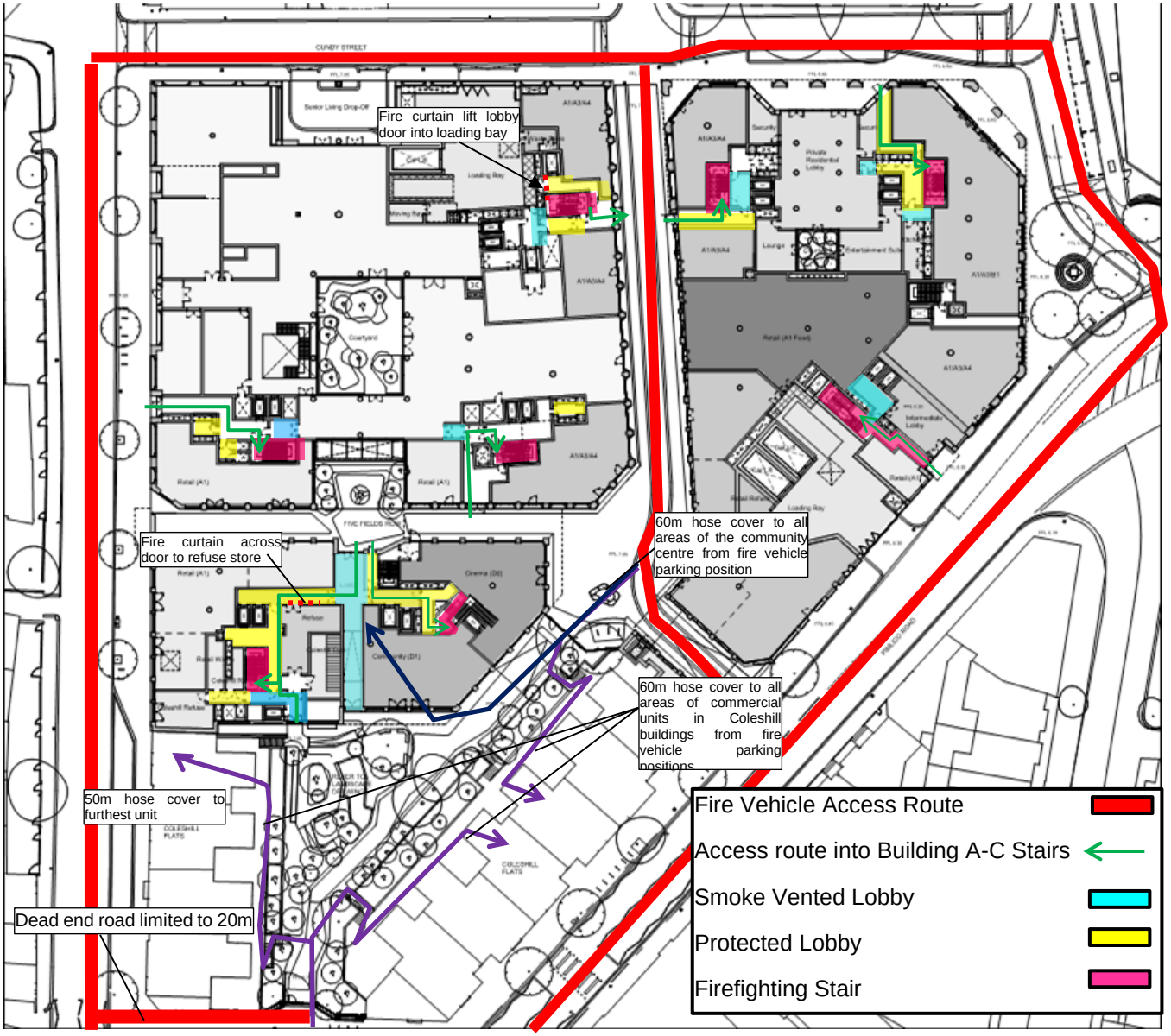

Figure 25: Site Wide Fire Vehicle Access

8.5.1 Residential and Senior Living Areas

All residential stair cores and all stairs in the Senior Living building will be designed as firefighting shafts which include dry risers.

Therefore, vehicle access will be possible to within 18m and in sight of all dry riser inlets to Buildings A-C from the surrounding access roads.

Guidance recommends distances within the corridor providing access to the internal firefighting shaft from outside should be no more than 18m. This is achieved in all Buildings.

8.5.2 Retail, Restaurants and Offices

All of the commercial spaces are less than 11m in top floor height and less than 2000m^2 in area.

Therefore, the surrounding access roads will either be designed to be either:

- Within 15% of the perimeter of each unit with access to within 18m of an entrance point into the building, or;
- To allow for hose coverage to within 60m of all areas from a fire vehicle parking position[1] [2].

Note 1: The provision of sprinklers in all commercial units other than the Coleshill basement units will be used to support hose coverage up to 60m to these areas from a fire vehicle parking position.

Note 2: The Coleshill basement units are all accessed externally with the majority of the access route to the offices being via Elizabeth Place Gardens. Given the relatively small area of each unit and that the access route to the units will be external it is considered reasonable to allow for hose coverage up to 60m from a parking appliance without sprinklers in the offices.

8.6 Firefighting Lifts Opening Outside of Firefighting Lobbies at Basement Level

The firefighting shafts of all cores serve the basement level. In some instances, the firefighting lifts will open outside of the smoke vented firefighting lobby at basement. This occurs in the two North stairs to Building B and the two firefighting lifts to the cores of Building C.

This is on the basis that the firefighting lift and the any adjacent lifts serving the upper floors will open into an unvented protected lobby and will be provided with a fire curtain across the lift door at basement level. The basement is also only one storey deep, so the firefighting lifts do not need to serve the basement for Fire Brigade access to the basement. Instead the Fire Brigade will set up at ground and travel down one storey via the stairs to reach the basement accommodation. The curtain will descend on local detection to prevent smoke spread via the lift shaft for a fire at basement level. Fire curtains will achieve 2 hours fire resistance.

This is as shown in the figure below.

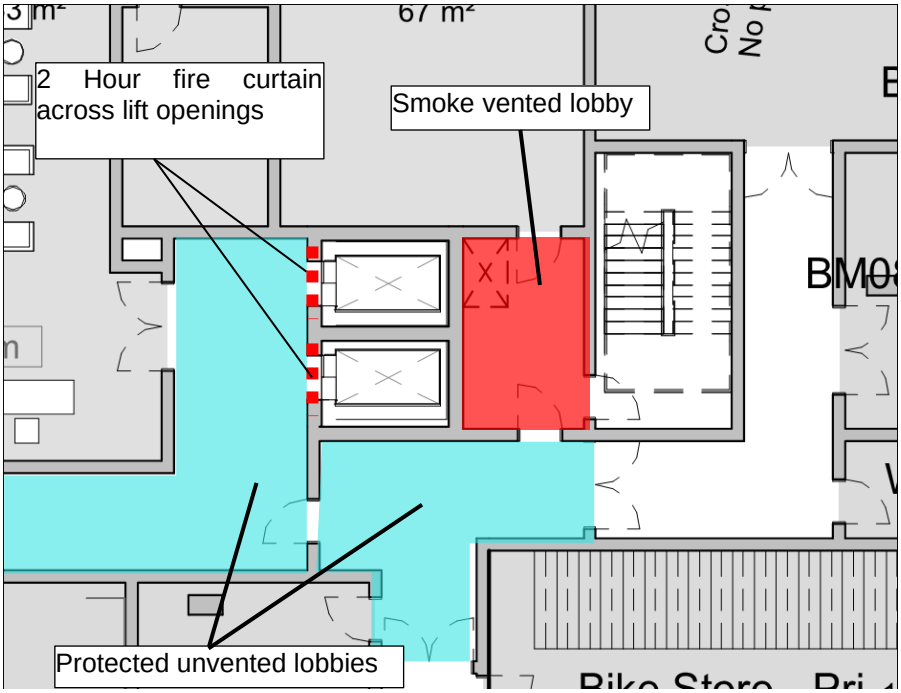

Figure 26: Protected to North-East Firefighting Shaft Building B

For all other stairs serving the apartments/ senior living areas, the firefighting lifts and firefighting stairs will both open into a smoke vented lobbies at basement. This is as shown in the Figure below.

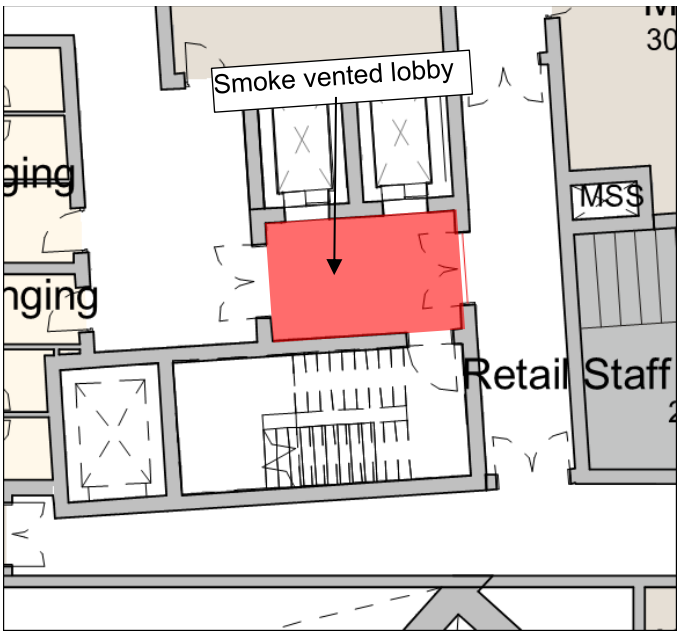

Figure 27: Protection to South Firefighting Shaft Building A

8.7 Dual Entry Firefighting Lifts

Some of the firefighting lifts have dual entry access at ground and basement level. Some of the passenger lifts also open into the residential entrance lobby space as well as into the firefighting lobby. Fire curtains will be provided across the openings of the lifts that open outside of the firefighting shaft. The fire curtains will achieve 2 hours fire resistance and will descend on local detection in the entrance lobby.

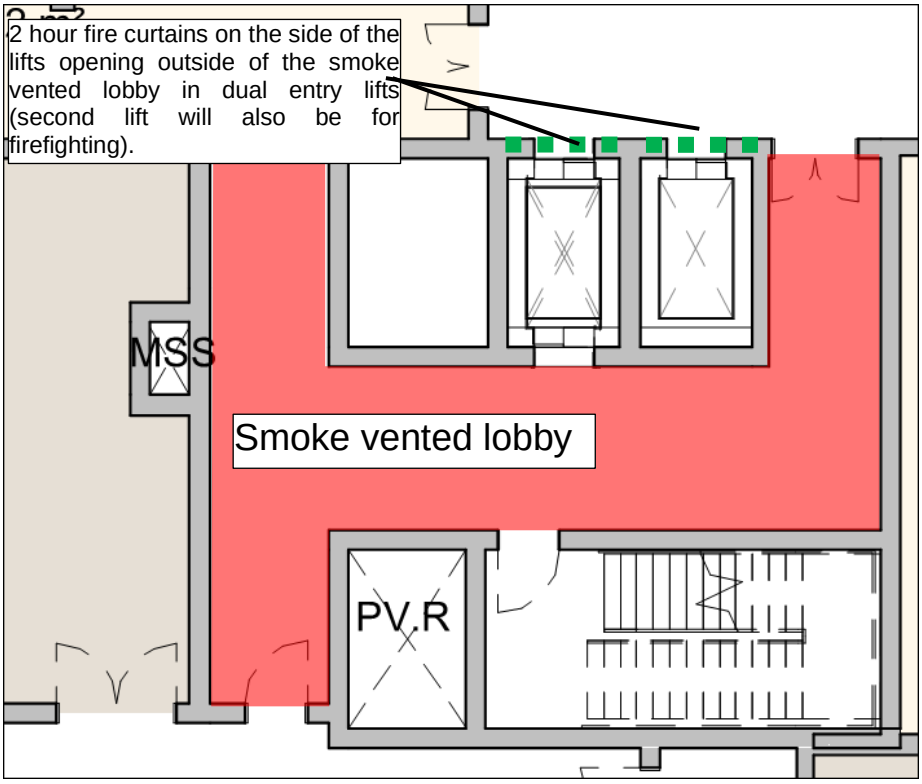

Figure 28: Protection to Dual Entry Lifts

8.8 Basement Smoke Venting

Smoke venting will be provided in all basement areas. Given the provision of sprinklers and that the majority of the basement compartments do not have access to an external elevation, mechanical smoke venting will be provided.

This will comprise of a system which will achieve 10 air changes an hour for each compartment and will be capable of running at 300°C for at least an hour. The system will be designed to extract either from each fire separated compartment or via extracting through the access corridors where the system is designed to extract at 10 air changes per hour for the combined volume of the corridor and the largest compartment.

8.9 Hydrants

Access to within 100m of an existing hydrant will be possible from all fire main inlets for the buildings fitted with fire mains and within 100m of an entrance point to each building not provided with fire mains.

If this cannot be achieved, then new hydrants will be provided within 90m of all fire main inlets and entrance points to buildings not fitted with fire mains and located no more than 90m apart.

Locations of existing hydrants will need to be confirmed as part of the site survey.

9.0 STRUCTURE AND COMPARTMENTATION

9.1 Structure

The top floor height of Buildings A and B are greater than 30m above ground. Therefore, structure in these Buildings will achieve 2 hours fire resistance.

The structure of Building C and any new structure providing support to the residential floors above in the Coleshill buildings will achieve 90 minutes fire resistance.

Structure within the basement will achieve 2 hours fire resistance.

9.2 Compartmentation

All floors in Buildings A, B and C will be constructed as compartment floors with the same fire resistance period as the structure in each of these buildings. This includes the compartment floors between ground and basement.

Floors between the Coleshill basement units and the ground floor will achieve 90 minutes fire resistance.

The following will be constructed as compartment walls achieving 2 hours fire resistance:

- Walls enclosing all firefighting stairs, firefighting lifts and the access routes to firefighting shafts at ground floor;
- Walls enclosing all service risers, lifts shafts and any other floor penetrations in Buildings A and B;
- Walls enclosing plant rooms containing life safety equipment;
- Walls enclosing the non-firefighting stair enclosure in Building A;
- Party walls between all Buildings and walls between retail and non-retail areas.

The following will be constructed as compartment walls achieving 90 minutes fire resistance:

- Walls between the existing residential areas of the Coleshill buildings and the new commercial units including compartment floors between the two uses;
- Walls enclosing non-firefighting lifts and service risers in Building C.

The following will be constructed as compartment walls achieving 1 hour fire resistance:

- Walls between retail units;
- Walls between and enclosing all apartments in Buildings A, B and C;
- Walls dividing compartments in the senior living building;
- Walls enclosing plant rooms containing high risk equipment;
- Walls enclosing common corridors at the upper levels in all buildings;
- Walls enclosing the car parks;

The following will be constructed as compartment walls achieving 30 minutes fire resistance:

- Walls enclosing ancillary accommodation including cycle and refuse stores;
- Walls enclosing plant rooms containing low risk equipment;
- Walls enclosing protected entrance hallways in conventional apartment layouts;
- Walls enclosing kitchens in the retail, restaurant and senior living areas;
- Walls enclosing protected stair lobbies;

9.3 Building A – Double Height Space

There will be a double height space between the Building A entrance lobby at ground and the amenity spaces at basement. This will include an accommodation stair for circulation into the senior living amenity areas.

The accommodation stair will be fully fire separated from the rest of the basement accommodation by 2 hours fire resisting construction to maintain floor to floor compartmentation. The accommodation stair and the fitness centre and pool area will be designed as a single compartment connected to the ground floor space as shown in the Figure below.

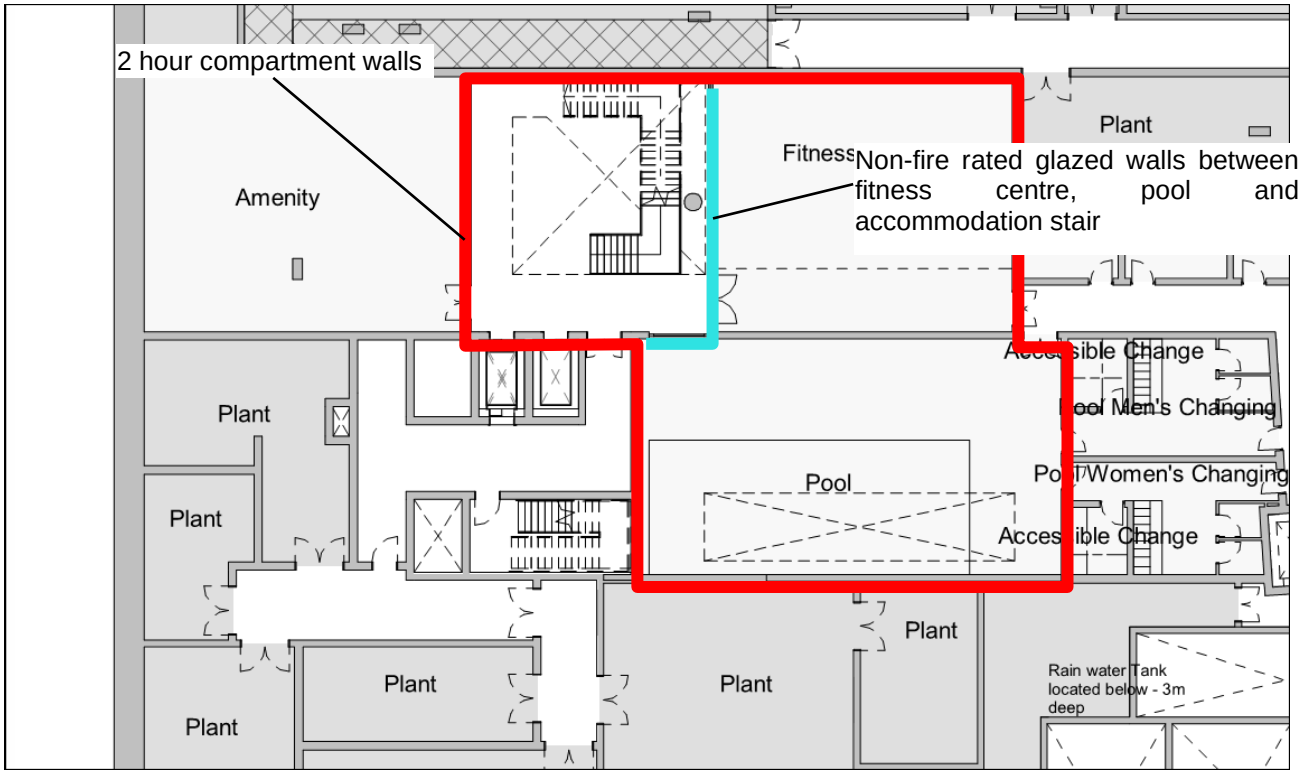

Figure 29: Building A – Basement Amenity Space Compartment

The pool and fitness centre are proposed to be separated from the accommodation stair by non-fire rated glazing. This is proposed based on the provision of sprinklers and relatively low fire loads associated within these areas.

Therefore, fire spread from the basement rooms to the ground floor amenity space is considered unlikely.

10.0 ELEVATIONS

10.1 Restrictions to Unprotected Areas

10.1.1 General

Elevations will be assessed using the enclosing rectangle method as stated in BR 187: External fire spread, Building separation and boundary distances. A detailed assessment on the unprotected areas has not been carried out yet. Detailed calculations will be carried out in the next phase based on the frozen compartment sizes.

The assessments into the amount of permitted unprotected areas will be carried out on the basis that all areas other than the Coleshill basement units are sprinklered.

Where elevations face public roads, the boundary distances have been taken to the middle of the road due to the likelihood of future development being low. Elevations between adjacent facing buildings will be taken to the midpoint between the buildings.

10.1.2 Ground Floor Commercial units

The ground floor commercial units will be a mixture of units for A1/A3/A3/B1 use. These represent a greater risk of a severe fire due to the increased fire load and larger compartment sizes compared to residential apartments.

The two elevations where there are likely to be restrictions are on the North and South retail units facing into Five Fields Row between Buildings A and C and the elevations to the West and East retail units facing into Elizabeth Place between Buildings A and B. In these two areas, the boundary distances between the adjacent buildings will be taken as the midpoint of Five Fields Row and the midpoint of Elizabeth Place as shown in the Figure below.

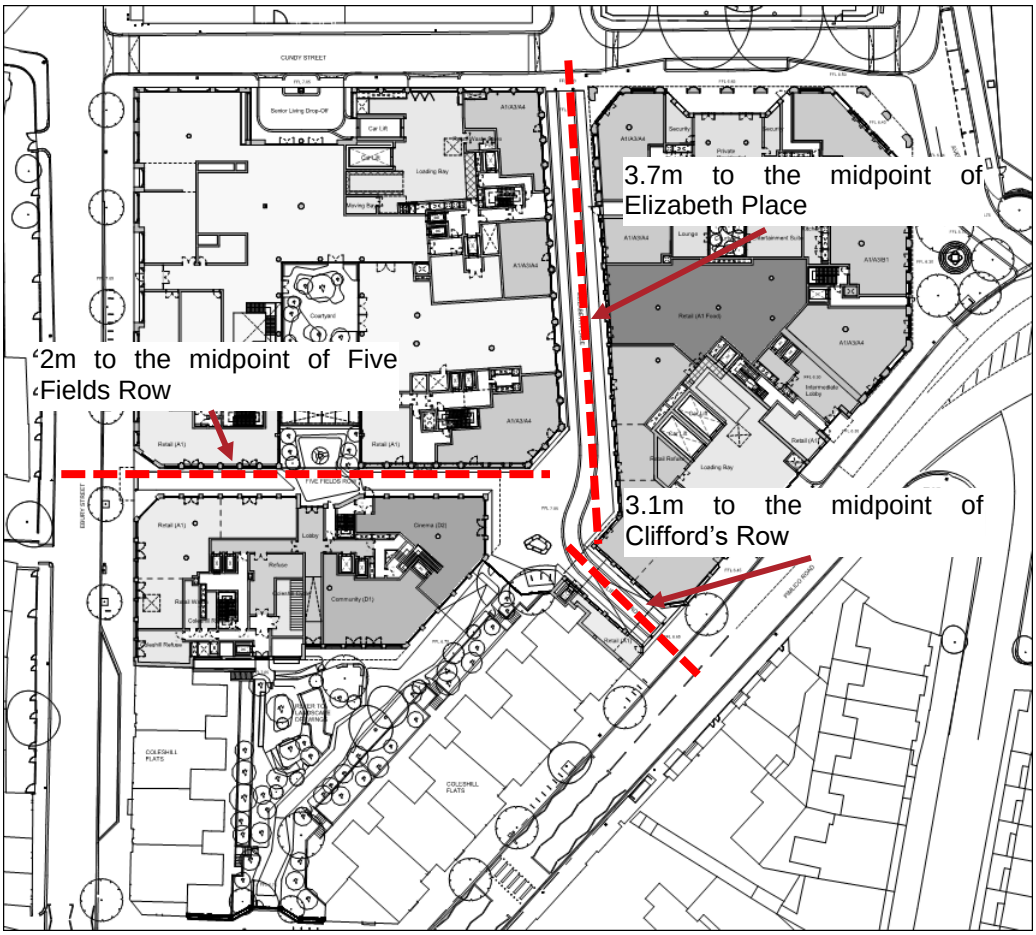

Figure 30: Notional Boundaries between Commercial Units

The protected areas of the elevations which are more than 1m from the site boundary or the notional boundary will achieve 90 minutes fire resistance for integrity and 15 minutes for insulation from the inside face only.

It is not anticipated for there to be any restrictions to the amount of unprotected areas on any of the other elevations to the restaurant and retail units which face onto public roads given the provision of sprinklers.

10.1.3 Residential

Given the provision of sprinklers and high level of compartmentation, it is not expected for there to be any restrictions to the amount of non-fire resisting construction to any of the residential or elevations on the senior living buildings.

10.2 External Wall Construction

All Buildings exceed 18m in top floor height, therefore products which form part of the external wall construction will achieve European Class A2-s1, d0 or Class A1, with the list of exemptions listed in Regulation 7(3) as shown in the Figure below.

Regulation *continued*

(3) Paragraph (2) does not apply to—

(a) cavity trays when used between two leaves of masonry;

(b) 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;

(c) door frames and doors;

(d) electrical installations;

(e) insulation and water proofing materials used below ground level;

(f) intumescent and fire stopping materials where the inclusion of the materials is necessary to meet the requirements of Part B of Schedule 1;

(g) membranes;

(h) seals, gaskets, fixings, sealants and backer rods;

(i) thermal break materials where the inclusion of the materials is necessary to meet the thermal bridging requirements of Part L of Schedule 1; or

(j) window frames and glass.

(4) In this regulation—

(a) a "relevant building" means a building with a storey (not including roof-top plant areas or any storey consisting exclusively of plant rooms) at least 18 metres above ground level and which—

(i) contains one or more dwellings;

(ii) contains an institution; or

(iii) contains a room for residential purposes (excluding any room in a hostel, hotel or boarding house); and

(b) "above ground level" in relation to a storey means above ground level when measured from the lowest ground level adjoining the outside of a building to the top of the floor surface of the storey.

Figure 31: List of Exemptions to Regulation 7(3) in Approved Document B

Membranes within the external wall will achieve a minimum of Class B-s3, d0.

The requirements also apply to “specified attachments” including: balconies, solar panels and solar shading devices attached to the external wall including laminated glass on balustrades.

External surfaces will also meet the recommendations given in Approved Document B, Table 12.1, for surface spread of flame.

Due to many of the commercial spaces sharing and connecting to the same facades as the senior living and residential areas, these restrictions apply to all areas regardless of occupancy.

11.0 FIRE SAFETY MANAGEMENT

11.1 General

Once the building is occupied, it is the responsibility of the management to ensure that all fire safety systems are tested and maintained to ensure their continuous effectiveness. The management should: -

- Be aware of all the fire safety features provided and their purpose
- Ensure a competent person is present in all non-residential buildings during all occupied times
- Liaise with and seek the advice of the fire authority

11.2 Staff

Staff should be trained by competent persons. The training should be at regular intervals and should ensure that all staff know what to do if a fire is discovered; the correct response on hearing a fire alarm, and the correct escape procedures from every part of the building.

A management structure should be provided to ensure that in the case of fire staff are aware of their responsibilities, which should be clearly defined. A chain of command should be provided with clear lines of responsibility, authority and accountability.

11.3 Fire Safety Manual

Before a building is occupied, a fire safety manual should be completed. The purpose of the manual is to clearly define the nature of the fire safety systems provided for the building. It should include: -

- An explanation of the overall fire safety strategy
- Evacuation procedures
- Design documentation to describe the use of each fire safety system
- Staff roles in the event of a fire: their responsibility, authority and accountability
- A detailed maintenance routine

The Fire Safety Manual should be reviewed periodically and when any alterations are made to the building. Details of the suggested contents of the fire safety manual are provided in Appendix G of the Approved Document B and Annex H of BS 9999 Code of practice for fire safety in the design management and use of buildings.

11.4 Maintenance and Housekeeping

It is the role of management to ensure that maintenance is carried out in accordance with the relevant British Standards, so that all fire safety systems are operational in the event of a fire. It is also important that good housekeeping practices are followed. The building management should be aware of any hazardous substances or practices within the building, which increase the risk of fire.

11.5 The Regulatory Reform (Fire Safety) Order 2005

This Order places a duty on the 'responsible person' to ensure, 'as far as is reasonably practical' the safety of his employees and to take such general fire precautions as may be reasonably required to ensure that the premises are safe [i.e. for non-employees].

Under the Order, there is a requirement to carry out and continually update an assessment of the risk of fire to people in and around the premises/building, and to assess and maintain the measures to reduce those risks to an acceptable level. Where there are five or more employees, the risk assessment must be recorded.

A Fire Risk Assessment should be carried out:-

1. On completion of the building fit out, and strictly before first occupation of the building.
2. Regularly, particularly where any changes occur such as changes in the use of the building, the number or nature of occupants, or building works.
3. We would recommend that a fire risk assessment is carried out at least annually.

Other legal duties include: -

1. Keeping a record of the Fire Safety Arrangements. These are the preventative and protective measures for the building.
2. A person must be nominated for any special role identified in an emergency plan.
3. Employees must be consulted about nominations to perform special roles, and about any proposals for improving the fire precautions.
4. Other employers in the building must be informed about any significant risks, which might affect the safety of their employees, and there must be co-operation with them in measures to reduce the risk.
5. Those having control over the workplace have a responsibility to ensure compliance with the regulations in those parts of the building over which they have control.
6. A suitable and readily available method of calling the emergency services must be established.
7. Employees are required to co-operate in ensuring that the workplace is safe from fire.

The order also adopts 'Principles of Prevention'. These include:-

- Avoiding risks;
- Evaluating the risks which cannot be avoided;
- Combating the risks at source;
- Adapting to technical progress;
- Replacing the dangerous by the non-dangerous or less dangerous [particularly with respect to hazardous substances];
- Developing a coherent overall prevention policy which covers technology, organisation of work and the influence of factors relating to the working environment, and;
- Giving appropriate instructions to employees.

12.0 INFORMATION, LIMITATIONS AND ASSUMPTIONS

The information limitations and assumptions used in the preparation of this report are noted below: -

Drawings

This report is based on drawings issued to us. Dimensions have been taken from these drawings. The following drawings were used: -

GA Drawings Issued: 13/03/2020

288-20-001	-	Proposed Site Plan
288-20-098	-	Proposed Sub-Basement Plan
288-20-099	-	Proposed Basement Plan
288-20-100	-	Proposed Ground Floor Plan
288-20-101	-	Proposed First Floor Plan
288-20-102	-	Proposed Second Floor Plan
288-20-103	-	Proposed Third Floor Plan
288-20-104	-	Proposed Fourth Floor Plan
288-20-105	-	Proposed Fifth Floor Plan
288-20-106	-	Proposed Sixth Floor Plan
288-20-107	-	Proposed Seventh Floor Plan
288-20-108	-	Proposed Eighth Floor Plan
288-20-109	-	Proposed Ninth Floor Plan
288-20-110	-	Proposed Tenth Floor Plan
288-20-111	-	Proposed Roof Plan

Section Drawings:

288-40.001	-	Proposed Site Section AA
288-40.002	-	Proposed Site Section BB
288-40.003	-	Proposed Site Section CC
288-40.016	-	Building B Proposed Building Section
288-40.020	-	Building C Proposed Building Section

Proposed Coleshill Building Drawings:

288_P10.045	-	Ebury Street Coleshill's Proposed Elevations 19,20
288_P10.046	-	Ebury Street Coleshill's Proposed Elevations 21-27

288_P10.047	-	PimlicoRoad Coleshill's Proposed Elevation 3
288_P10.048	-	Pimlico Road Coleshill's Proposed Elevation 4
288_P10.049	-	Pimlico Road Coleshill's Proposed Elevations 5,6
288_P10.050	-	Pimlico Road Coleshill's Proposed Elevations 7-17
288_P10.051	-	Coleshill's Proposed Basement Plan
288_P10.052	-	Coleshill's Typical Unit Proposed Layout

Information

The following information was used for the preparation of this report:

Existing Coleshill Building Information Issued: 24/09/2019

9579C-04	-	Topographic Survey 1 of 2
9579C-05	-	Topographic Survey 2 of 2
9579E-01	-	Coleshill Flats Elevation Key Plan
9579E-02	-	Elevation 1 and Elevation 18
9579E-03	-	Elevation 2, 3, 5 and 6
9579E-04	-	Elevation 4, 7, 8, 9, 10 and 11
9579E-05	-	Elevation 12 to 17
9579E-06	-	Elevation 19 to 27

Building Regulations

This report considers building regulations, which deal with life safety. Property protection and insurance issues are not addressed in this report. Guidance on property protection and insurance requirements can be found in the document *Approved Document B: Fire Safety (Volume 2) – Buildings other than dwellinghouses Incorporating Insurer's Requirements for Property Protection,* RIBA Publishing 2008.

Other Limitations

Complying with the recommendations of this report will not guarantee that a fire will not occur.

Unless otherwise described in this report, the fire strategy assumes that the building design, the mechanical and electrical systems, construction methods and materials specifications will comply with current Building Regulations guidance, and relevant British Standards and Codes of Practice. The design of mechanical and electrical systems such as fire alarm and sprinklers is a specialist area. Fire Strategy recommendations are given in this report, however, the design and specifications need to be developed at the appropriate stage in consultation with the specialist designers of these systems.

This report has been prepared for the sole benefit, use and information of Grosvenor Estate Belgravia and the liability of Jeremy Gardner Associates Limited, its directors and employees in respect of the information contained in the report will not extend to any third party.

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