

DOCUMENT: RIBA Stage 2 Fire Strategy  
CLIENT: Packaged Living  
DATE: 21/10/2025  
REVISION: 00

# Waterfront Square

## Reading

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**MARS**  
FIRE ENGINEERING

## Key contact

**Carlo Marenghi**

*Director*

-  +44 (0) 7304 297 675
-  carlomarenghi@marsfireengineering.com
- 

**Mars Fire Engineering**  
20 Eastcastle Street  
London  
W1W 8DB

## Auditsheet

PROJECT NUMBER: 00015

DOCUMENT REFERENCE: 00015-MFE-REP-RIBA 2 FSS-Rev00

| Rev | Date       | Description                                     | Written | Reviewed | Approved |
|-----|------------|-------------------------------------------------|---------|----------|----------|
| 00  | 21/10/2025 | RIBA Stage 2 Fire Safety Strategy – For comment | CM      | ES       | JA       |
| 01  | 28/10/2025 | Update to typographical error in Section 1.1    | CM      | ES       | JA       |
|     |            |                                                 |         |          |          |
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# 1. Introduction

Mars Fire Engineering has been appointed to provide fire engineering advice for the Waterfront Square scheme in Reading.

The purpose of this report is to provide an outline fire strategy report for the proposed development, to a RIBA Stage 2 level of detail. Principally, this report should assist the design team to identify and understand the fire strategic principles that are to be employed on the scheme. This report will cover:

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

This fire strategy will utilise the guidance of BS 9991:2024 (including corrigenda) [1], for all residential and residential ancillary areas. The single commercial unit will be designed following the guidance of Approved Document B (ADB): Vol 2 [2]. Broadly speaking, where the guidance of BS 9991 and ADB Vol 2 is followed, this will provide an acceptable route to demonstrate compliance with the functional requirements of the Building Regulations. Where necessary, fire engineered solutions may be employed where compliance with BS 9991 is not achievable. Where not explicitly described within this report it is assumed that in all other aspects the building will be designed to comply with the aforementioned guidance documents.

This report is not suitable to support a Building Regulations application via Gateway 2.

## 1.1. Building description

The scheme consists of a single, new, residential building comprising 11 storeys (Ground + 1<sup>st</sup> -10<sup>th</sup> floors). Whilst the scheme is a single building, as per the definition in the Building Regulations, it is comprised of multiple ‘blocks’ where the building steps back as the building height increases. These blocks are illustrated in Figure 1, where each block is the following number of storeys:

- Block A1: Ground floor + 7 floors
- Block A2: Ground floor + 8 floors
- Block B1: Ground floor + 10 floors
- Block B2: Ground floor + 7 floors + external roof terrace

Each of the blocks are connected at Ground floor of the building, with various connections between the blocks and ancillary areas. The Ground floor comprises of residential apartments, car park, refuse stores, bike storage, commercial space and residential amenity areas. The upper storeys of the building house residential apartments, with external residential amenity terraces areas provided at roof level on Block B1, A1 and at a central podium between the blocks at 1<sup>st</sup> floor.

The building is approximately 31.5m in height from the lowest adjacent Ground floor level to the topmost occupied floor level. As such, the building is defined as a Higher Risk Building (HRB) in accordance with the Building Safety Act and therefore will be subject to the Gateway process.



Figure 1: Blocks in the Waterfront Square development.

## 1.2. Competency statement

The implementation of the Building Safety Act has resulted in a number of amendments to the Building Regulations. The changes to the Building Regulations place legal requirements on individuals and organisations to ensure they are competent to carry out the design work in which they are involved. Moreover, it is a legal requirement that clients take all reasonable steps to appoint designers who are competent to work on the project.

The Building Regulations require that any person carrying out design work must be competent to perform the role in which they are undertaking. In addition, where persons or an organisation propose to utilise others to perform design work, they must satisfy themselves of the competency of these individuals.

All personnel at Mars Fire Engineering possess substantial expertise and experience on a wide range of building types, which demonstrates a high level of individual capability whilst facilitating a strong organisational capability. This experience has instilled the ability, and approach to working, in all employees such that they consistently engage collaboratively on large scale projects, working effectively between disciplines to deliver coordinated project designs. All Mars Fire Engineering’s projects are headed by competent engineers with active involvement in all projects by chartered engineers.

The following personnel have been involved in the development of this report:

**Approver – Johan Askman, MSc, CEng, MIFireE**

Johan is responsible for providing approval for the project. In addition to an academic degree in Fire Engineering, Johan also has a degree in Risk Management and has previous work experience from both Sweden and Australia where he has had the privilege to work on a wide variety of projects from residential and office high-rise buildings to shopping centres and sport stadiums. Johan is a Chartered Engineer through the Institution for Fire Engineers (IFE).

**Reviewer – Eric Swainson, MEng, CEng, MIFireE**

Eric is responsible for reviewing the fire strategy. Eric has nearly ten years' experience working in the Fire Engineering industry in both the UK and Australia. Prior to that he spent three years working as a Process Safety Engineer in the high hazard Oil & Gas industry. Eric has a Master's degree in Chemical Engineering and has extensive experience working with residential buildings. Eric is a Chartered Engineer through the Institution for Fire Engineers (IFE).

**Author – Carlo Marengi, MEng, CEng, MIFireE**

Carlo is responsible for writing the fire strategy report. Carlo has over seven years' experience working in the Fire Engineering industry in the UK. Carlo holds a Master's degree in Chemical Engineering from the University of Leeds and has since developed a wide experience working on residential buildings. Carlo is working towards obtaining Chartership with the Engineering Council via the Institution for Fire Engineers (IFE)

## 2. Fire strategy

This section of the report will detail the fire strategy principles that should be employed in development of the building design.

### 2.1. B1: Means of warning and escape

- The residential flats will be operate under a stay put evacuation strategy. That is, in the event of a fire within a residential apartment, the apartment of fire origin will evacuate only. Other apartments will remain in place, protected by a high degree of compartmentation within the building, unless they decide to evacuate or are instructed to do so by the Fire and Rescue Service.
- The residential ancillary areas will operate under a simultaneous evacuation strategy, on a floor by floor basis. That is, in the event of a fire of a residential ancillary area on a given floor, all occupants of all residential ancillary areas on that level will evacuate simultaneously.
- The commercial space at Ground floor will operate under an independent simultaneous evacuation strategy, separated from the rest of the building via compartmentation.
- The building should be provided with an evacuation alert system throughout for use by the fire service, designed and installed in accordance with BS 8629 [3].
- All apartments should be provided with a Category LD1 fire and alarm system, designed and installed in accordance with BS 5839-6 [4]. All ancillary areas and the commercial area should be provided with a Category L1 detection system throughout, designed and installed in accordance with BS 5839-1 [5]. External amenity spaces should be provided with flashing beacons and sounders to alert occupants in the event of a fire. The cause and effect of detection in common areas will be detailed further at the next design stage.
- As the building steps back as the height increases, and due to different core arrangements, different travel distances are proposed within the common corridors of the residential levels of the building. BS 9991 allows for travel distances up to 7.5m in a single direction, which can be increased to 15m in certain instances. Travel distances when alternate direction of escape is available can be up to 30m, increased to 45m in certain instances.

The travel distances within the common corridors will comply with Figure 7 of BS 9991 throughout the building. A high level illustration of the arrangements adopted are illustrated in the plan included within Appendix A.

Smoke ventilated corridors/lobbies will each be smoke ventilated by single mechanical extract shaft. The mechanical extract shaft should be in line with the guidance of Appendix F of BS 9991. All common corridors should be provided with a Category L5 system without sounders in accordance with BS 5839-1 to activate the smoke control system.

Materials and products used for smoke control ducts and shafts should be tested in accordance with the test standards referred to in BS EN 12101-7 [6] for multi-compartment smoke control ducts which is BS EN 1366-8 [7].

- Common corridors which offer access to multiple means of escape stairs should be separated by sub-dividing doors, at approximately the mid-point between the two stairs.
- Apartments located on Ground floor level will be either:
  - Accessed directly from the outside and will not communicate internally with the building; or

- The apartment will have two means of escape routes. One directly to the outside and one into a smoke ventilated common corridor which provides access to protected escape stairs. These common corridors will be designed in accordance with Figure 7 of BS 9991. The increased risk from Electric Vehicle (EV) cars is noted and the proposed internal connection to the car park is considered to be reasonable as all apartments on Ground floor are provided with an alternate route directly to the outside.
- The maximum travel distance limits for various ancillary areas are outlined in Table 1. Where the internal layout is not know the direct travel distance should be used which is 2/3<sup>rd</sup> of the value (shown in brackets)

Table 1: Travel distances residential ancillary areas.

| Travel distances (ancillary areas)                             |                      |                         |
|----------------------------------------------------------------|----------------------|-------------------------|
|                                                                | Single direction [m] | Alternate direction [m] |
| Bike store                                                     | 9 (6)                | 18 (12)                 |
| Refuse store                                                   | 9 (6)                | 18 (12)                 |
| Car park                                                       | 18 (12)              | 45 (30)                 |
| Plant rooms (engineering services, boiler rooms, switch rooms) | 9 (6)                | 18 (12)                 |
| External terrace                                               | 18 (12)              | 45 (30)                 |
| Common amenity areas                                           | 18 (12)              | 45 (30)                 |
| External plant/roof plant                                      | 60 (40)              | 200 (133)               |

- There is a single extended travel distance identified on Ground floor of Block B1 in the switch plant room. This will require further assessment at the next design. It is considered however that once the plant room is provided with internal layouts, the distances will be within the limits of BS 9991.
- The external terrace space located at 1<sup>st</sup> floor, is provided with three escapes routes from the terrace into Blocks A1, A2 and B2. The podium should be arranged such that the travel distances are within the limits of BS 9991. The maximum allowable capacity of the terrace will be determined at the next design stage, based on the escape routes available.
- An external terrace space is located on 8<sup>th</sup> floor of Block B2. This will be provided with access to two means of escape stairs; however the evacuation lift associated with Stair B2 will not continue to the serve the terrace level due to height constraints and will stop at 7<sup>th</sup> storey. As such, the terrace will be designed with a ‘runway’ type arrangement such that occupants are provided with diverse, separated routes to reach the ventilated common corridor which offers access to Stair B1, such that travel distances are within the limits of BS 9991. This is considered to present an arrangement where a mobility impaired occupant will be able to reach the Stair B1 in the event of a terrace fire and utilise the evacuation lift in that

core to evacuate the building. The runway aspect of the arrangement on the terrace is illustrated in blue in Figure 2

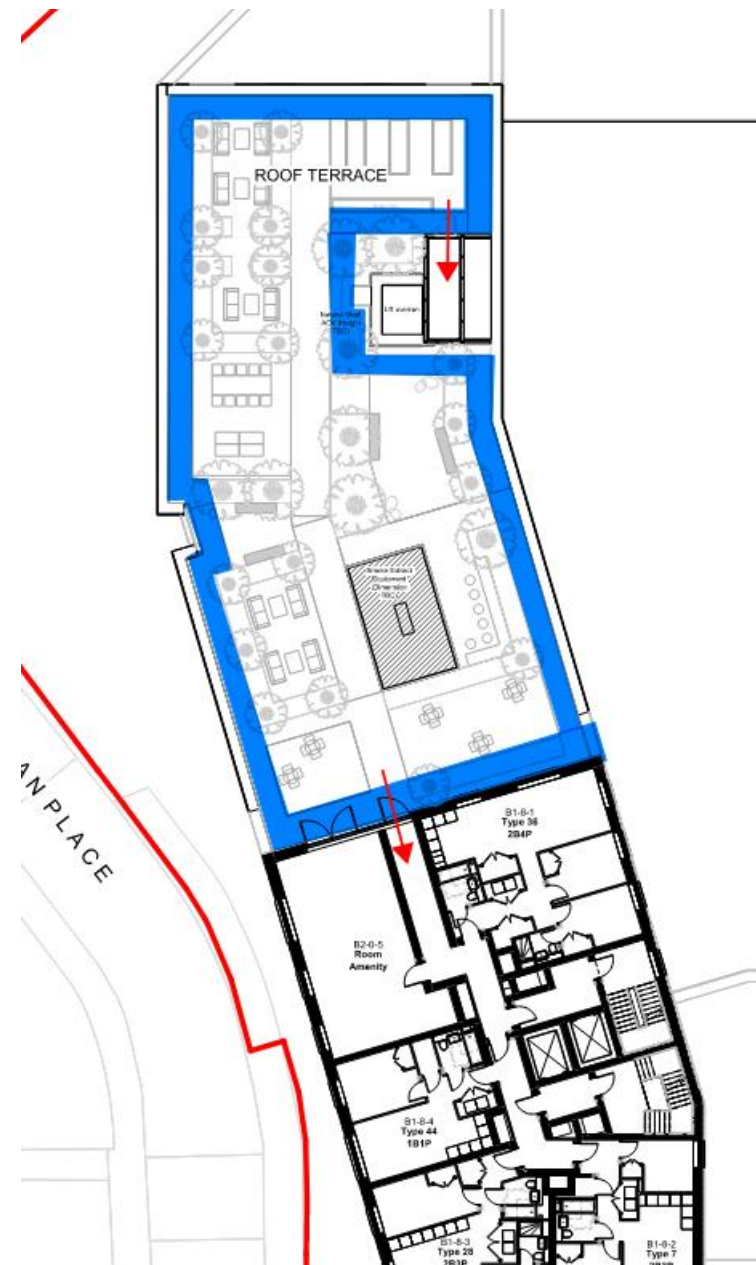


Figure 2: Block B2 8th floor terrace runway arrangement.

- Travel distances within the commercial unit should not exceed 18m and 45m in a single and alternate direction respectively.
- All but one apartments types are proposed to be designed as open-plan apartments. In accordance with BS 9991, the following provisions should be satisfied for the open-plan apartments:
  - The size of the open-plan flat should not exceed 16m x 12m
  - Be single situated on a single level only
  - Category LD1 alarm and detection system throughout the apartment

- Sprinkler system provided throughout the apartment
- Achieve a minimum ceiling height of 2.25m throughout the apartment
- Open-plan kitchens should meet the recommendations of Section 5.6 of BS 9991 which is illustrated in Figure 3.

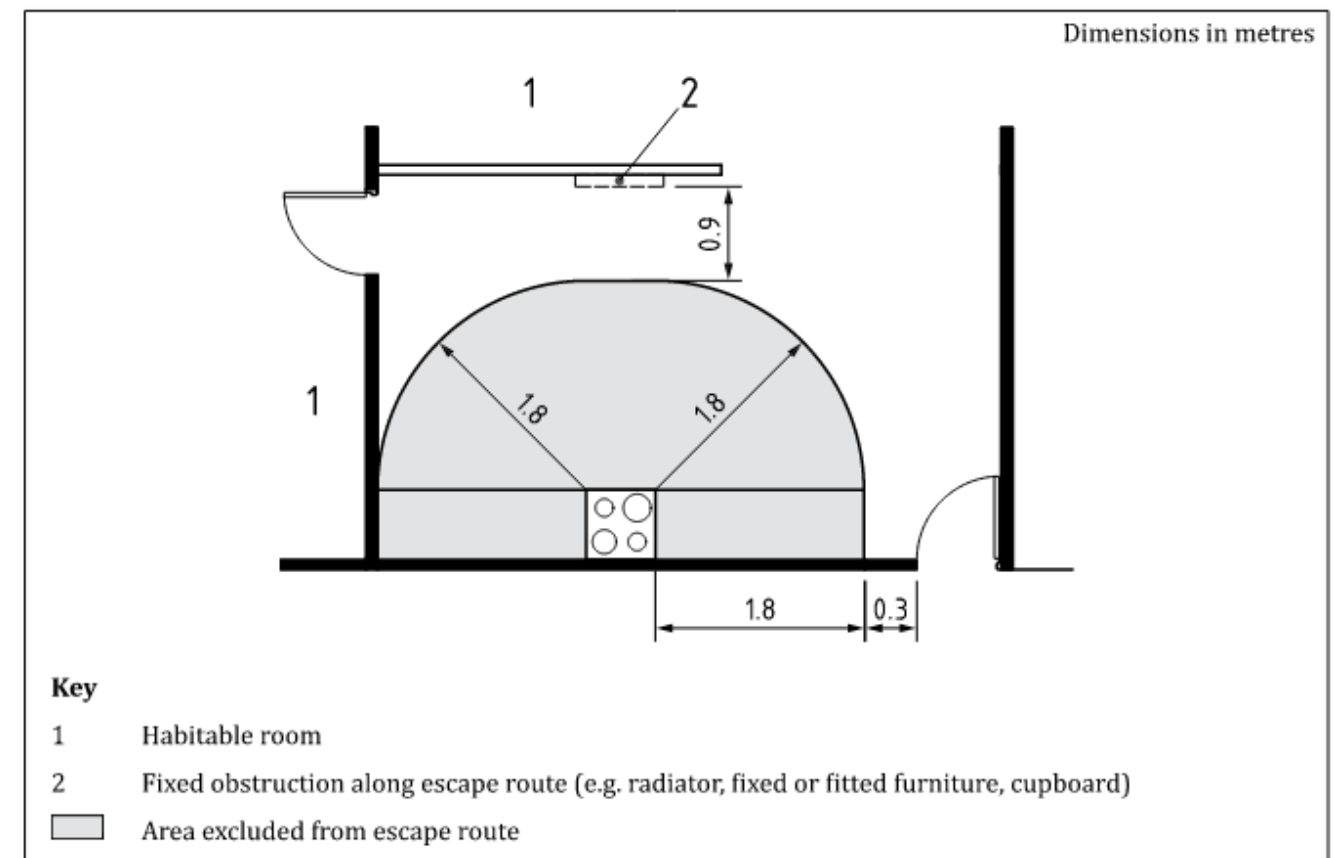


Figure 3: Open-plan kitchen minimum separation distances.

All open-plan apartments meet the conditions detailed within this section.

- A single apartment type will be designed with an entrance hall, following the guidance of Section 8.4.2a of BS 9991. It will be designed such that all points are within 20m from the apartment entrance and all bedrooms will be accessed from the entrance hall. The recommendations of Figure 3, shown above, will also be satisfied within the kitchen room.
- The building is provided with a total of 7 means of escape stairs. Each block has access to a minimum of two protected means of escape stairs on all levels. Each stair should have a minimum clear width of 1200mm in each case. The stairs should discharge either:
  - Directly to the outside via a final exit; or
  - By way of a protected passageway to the outside. The passageway should maintain the width of the stair (1200mm) and achieve the same fire resistance as the stair enclosure. Section 2.3 provides details on lobby and ventilation protection at Ground floor.
- All stairs should be provided with a 1m<sup>2</sup> AOV (free area) at the head of each stair, located as high as is practicable in the stair.

- In accordance with BS 9991, each stair will be provided with an associated evacuation lift. The evacuation lift should be provided in accordance with Section 7.4 of BS 9991. The lifts should be installed in accordance with BS EN 81-76 [8].
- The evacuation lift should be accessed via a evacuation lift lobby, that is served by a 1m<sup>2</sup> natural smoke shaft, providing inlet air to the lobby. The lift lobby should be designed in accordance with Figure 14 of BS 9991 and be provided with a Emergency Voice Communication (EVC) system in accordance with BS 5839-9 [9].

Each evacuation lift lobby will be served by a 1m<sup>2</sup> natural smoke shaft on all levels. There are two exceptions to this:

- Core B1 – The eastern evacuation lift lobby on Ground floor level only will not be served by a 1m<sup>2</sup> natural inlet shaft.
- Core A2 – The northern evacuation lift lobby on Ground floor level only will not be served by a 1m<sup>2</sup> natural inlet shaft.

This arrangement is considered to be reasonable, as the evacuation lift lobbies will not function as waiting spaces on this level. This is owing to the principle that level evacuation will be available at Ground floor and any occupant that utilises the evacuation lift will evacuate directly to the outside via the protected passageway.

In addition, it is considered highly unlikely that the smoke ventilation provisions at this level would ever be used as there are no connections to ancillary areas in Core B1 and in Core A2, there is a single connection into a ground floor corridor which offers onward access to various amenity spaces, which will each be separated via a smoke ventilated protected lobby (as described in Table 3). Therefore there is little to no risk of smoke/heat compromising the evacuation lift lobby due to the high degree of separation and ventilation between ancillary areas.

Finally, in the locations described (i.e. on the Ground floor), the evacuation lifts lobbies are not associated with common corridors as they are on the upper levels. Therefore the 1m<sup>2</sup> shafts do not serve as inlet routes for mechanical extracts on this level, owing to the absence of common corridors, and therefore it is not the intent of the shafts to serve as inlet air paths on these locations.

- BS 9991:2024 notes that 'at least one evacuation lift should be provided for each escape stairway, or more if required by capacity assessment'.
- As all areas of the building are provided with a minimum of two escape stairways, it is proposed to provide at least two evacuation lifts serving all floors. Each stairway will be associated with one of the evacuation lifts in line with BS 9991.
- It is considered that providing two evacuation lifts serving each floor is adequate for this building and does not require a capacity assessment for the following reasons:
  - The building operates a 'stay-put' evacuation strategy, meaning that only the apartment of fire origin will evacuate in the first instance. The occupants of that apartment will have access to at least two evacuation lifts. This is considered to be more than sufficient for the expected number of occupants that would require to use an evacuation lift for a single apartment during an evacuation, to ensure a prompt and timely evacuation.
  - The building is provided with an evacuation alert system, allowing the Fire Service in the latter stages of a fire to raise the alarm in the building on a floor-by-floor basis. It may therefore be that more than one dwelling evacuates at once in the latter stages or an event.

Nonetheless, when discussing stair and final exit capacity, BS 9991 notes that final exits should have a clear effective clear opening width '*suitable for general circulation and meeting inclusive design access requirements where a stay put strategy is in place and the number of occupants will be the occupants of a single dwelling*'. This is understood to mean that the capacity of stairs and final exits are not required to be assessed in the stages where the evacuation alert system may be activated and that is regardless of the number of apartments and expected total occupancy of the building . This is considered to be due to the layers of compartmentation in place protecting the occupants escaping and therefore offering a greater time for evacuation at this stage.

It is therefore considered that this is also applicable for evacuation lifts, and therefore the capacity assessment undertaken for evacuation lifts is not required to consider the event of the evacuation alert system being activated.

In conclusion, it is considered that the provision of at least two evacuation lifts for each area for the building is sufficient and adequate.

- In addition to all evacuation lift lobbies, all other means of escape routes that are not provided with level egress should be provided with a temporary waiting space, with a clear area 900mm x 1400mm and provided with an EVC system in accordance with BS 5839-9. This is inclusive of the B2 stair that continues to serve the 8<sup>th</sup> floor external terrace.
- The first floor is provided with a podium which is accessed from multiples cores. The arrangement will be designed such that the travel distances on the external space are in line with BS 9991, then an occupant is able to travel towards a protected stair core and descend to Ground floor to exit the building.
- The maximum capacity of ancillary areas will be determined as part of a detailed assessment at the next design stage.

## 2.2. B2: Internal fire spread (structure)

- All wall and ceiling linings throughout the proposed development should meet the performance requirements detailed in Table 2.

Table 2: Wall and ceiling linings specifications.

| Location                                                                                                                                                             | European Class |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Small rooms of area not more than: <ul style="list-style-type: none"> <li>– 4m<sup>2</sup> for residential</li> <li>– 30m<sup>2</sup> for non-residential</li> </ul> | D-s3, d2       |
| Other rooms and circulation spaces within dwellings                                                                                                                  | C-s3, d2       |
| Other circulation spaces including common areas of blocks of flats                                                                                                   | B-s3, d2       |

### 2.3. B3: Internal fire spread (structure)

- The building is more than 30m in height from the lowest adjacent ground level to the topmost occupied floor level. Therefore, elements of structure should be designed to achieve 120 minutes fire resistance throughout the building.
- All floors within the building should be constructed as compartment floors achieving 120 minutes fire resistance.
- All residential units should be separated from the rest of the building, and from other apartments via compartment walls that achieve 60 minutes fire resistance. All common corridors should be enclosed by compartment walls that achieve 60 minutes fire resistance.
- All shafts that connect different compartments in the building should be designed as protected shafts achieving 120 minutes fire resistance.
- The commercial unit at the northern end of the building on Ground floor, should be separated from the rest of the building via compartment walls/floors achieving 120 minutes fire resistance.
- The building should be provided with sprinkler protection throughout. This should be provided based on:
  - Residential apartments should be provided with a Category 4 residential sprinkler system designed installed in accordance with BS 9251 [10].
  - Residential ancillary areas less than 100m<sup>2</sup> can be covered by a residential sprinkler system. Detailed design subject to confirmation with the sprinkler design consultant.
  - Commercial areas and residential areas above 100m<sup>2</sup> should be covered by a commercial sprinklers system designed and installed BS EN 12845 [11]. The hazard Category for the commercial sprinkler system is to be confirmed by the sprinkler design consultant: see note below.

*Note: The above should be confirmed by the specialist sprinkler designer who may have additional requirements. In addition it should be confirmed with the building insurers if LPC compliance is required for the sprinkler system as this would drive the requirement for a larger sprinkler tank size above the minimum for a life safety system owing to the coverage of the car park. This should be clarified to ensure early action early in the stage 3 design.*

- The car park in the scheme is not open sided. In accordance with BS 9991 covered car parks should be provided with a heat and smoke ventilation system designed in accordance with BS 7346-7. This British Standard allows for covered car parks to be vented by mechanical or natural means, based on the following:
  - Natural ventilation: Permanent openings equal to at least 2.5% of the floor area of the car park area, with half of the area split across two opposing walls or ceilings.
  - Mechanical ventilation: System should provide 10 air changes per hour (ACH).

It is recommended that the provision of an enhanced 14 ACH mechanical extract system is explored for the building. Such a system would serve as an enhancement to the minimum recommendations of guidance and provide a element of future proofing to the building as new guidance on car park design is anticipated in the future..

- The guidance provided on car park design has not been updated in many years and as such does not specifically address the risks imposed by Electric Vehicles (EVs) and charging facilities. The client has confirmed that the car park will be provided with EV charging facilities. Therefore, the following suite of

measures are recommended to be incorporated into the car park design as enhancements to the minimum recommendations of guidance.

- Additional linear heat protection provided between parking spaces
- CCTV coverage for early indication of fire by management
- Slow charging facilities only which provide a maximum charge up to 80%, with automatic shut off connected to detection system
- Water resistant charging points
- Independent EV charging isolation, connected to the detection and alarm system
- Suitable drainage and surfaces (To be reviewed and discussed with PH/Civil engineer)
- 1200mm separation between charging parking spaces
- There are various internal connections to ancillary areas within the building. Where these connections provide access to an evacuation lift lobby, protected stair, or common corridor, they should be separated via a protected lobby provided with smoke ventilation as detailed in Table 3.

Table 3: Ventilation requirements to lobbies providing access to evac lift lobbies, stairs or common corridor.

| Area                                                                                               | Smoke ventilation provision                         |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Car park, switchgear room (above low voltage)                                                      | 1m <sup>2</sup> permanent ventilation to external   |
| Refuse stores, bicycle stores, communal amenity, transformer/switchgear (low or extra low voltage) | 0.4m <sup>2</sup> permanent ventilation to external |

- Any refuse stores accessed internally should be approached via a protected lobby provided with 0.2m<sup>2</sup> permanent smoke ventilation to external. It should be noted that this should be provided in addition to any lobby which is provided for the purposes described in Table 3.
- Ancillary areas should be enclosed in fire resisting construction in accordance with Table 5 of BS 9991. The car park should be separated from the rest of the building via 120 minute fire resisting construction. There should also be a means to separate the DC current produced by the panels from the building AC supply to limit any electrocution risk when fighting a fire.
- Secondary power supplies should be provided to life safety equipment in accordance with BS 9991 and BS 5819 [12].

### 2.4. B4: External fire spread

- The external envelopes of the building should not provide a means for external fire spread to neighbouring properties.

In accordance with Regulation 7(2), given the building is over 18m in height, the external wall construction and all specified attachments including balconies, solar shading or solar panels, should achieve European Classification A2-s1, d0 or Class A1 in accordance with BS EN 13501-1 [13], other than components detailed in Regulation 7(3).

Although the fire strategy is developed following BS 9991, attention is drawn to additional considerations detailed within Paragraphs 10.20 and 10.21 of ADB: Vol 1 which provides additional commentary on

recommendations which support the requirement of Regulation 7(2) above. It is recommended that this should be considered by the design team in the following design stages.

- Further, a space separation assessment has been carried out following the guidance of BR 187 [14]. The assessment has been undertaken based on the worst case compartment scenario for the each of the relevant elevations. It is considered that on the basis that the worst case scenario on a given elevation allows for 100% UPA façade, then the other compartments will also be acceptable. In the scenario protection is required, other compartments will be assessed as detailed.

The results of the assessment are detailed in Appendix B. The majority of compartments are permitted to be 100% unprotected. The only compartment that requires protection is the eastern end of the Ground floor amenity area. The use of this space is not yet known and therefore a conservative high heat release rate has been assumed, when the use of the space is confirmed there may be scope to rationalise this assessment.

Where protected areas of the external wall are required these should achieve:

- Beyond 1000mm: 120 RE & 15 minutes insulation from inside the building
- Less than 1000mm: 120 REI from both inside and outside the building
- In accordance with BS 9991, where an external wall of a dwelling projects beyond or is recessed from the external wall to another dwelling and forms an angle of less than 135°, then the distance between any openings should not be less than 1m. In this scenario, the wall which separates openings should achieve 60 minutes fire resistance. This is illustrated in Figure 33 of BS 9991.
- Roof coverings should be designed in accordance with Table 11 of BS 9991.
- Where green roofs are proposed, these should be designed in accordance with Section 24.6 of BS 9991 and GRO Guidance [15]. This aspect of the design will require further development with the landscape engineer at Stage 3 to ensure the relevant design recommendations are incorporated into the design. A high level summary of the provisions are outlined below:
  - A 300mm fire break should be provided around all perimeters and penetrations
  - Increased to 500mm for openings into the building
  - The fire break should comprise of 20-50mm round pebbles with a minimum depth of 50mm placed on drainage board or concrete slabs with a minimum width of 40mm.
- Escape routes which are located within 1.8m of an external wall, the external wall should be designed to achieve 30 minutes fire resistance (integrity and insulation performance).
- It is proposed to provide photovoltaic (PV) panels on the roof areas of the building. These PV Panels should be provided with an isolation switch for the fire service and arc fault protection to limit the risk of fire starting. Further, at the next design stage the layout should be developed with the landscape designer and architect to ensure suitable fire breaks are provided where required.

## 2.5. B5: Access and facilities for the fire service

- BS 9991 guidance states that the building should be provided with firefighting shaft(s) owing to the building being over 18m in height. Each storey that is situated above 18m, and exceeds 900m<sup>2</sup> should be provided two firefighting shafts. To satisfy this principle, the building will be provided with five firefighting shafts in the locations illustrated in Figure 4. For clarity, this presents an arrangement which offers an

additional firefighting shaft above the minimum recommendations of guidance; the ‘extra’ firefighting core is illustrated in yellow in Figure 4.

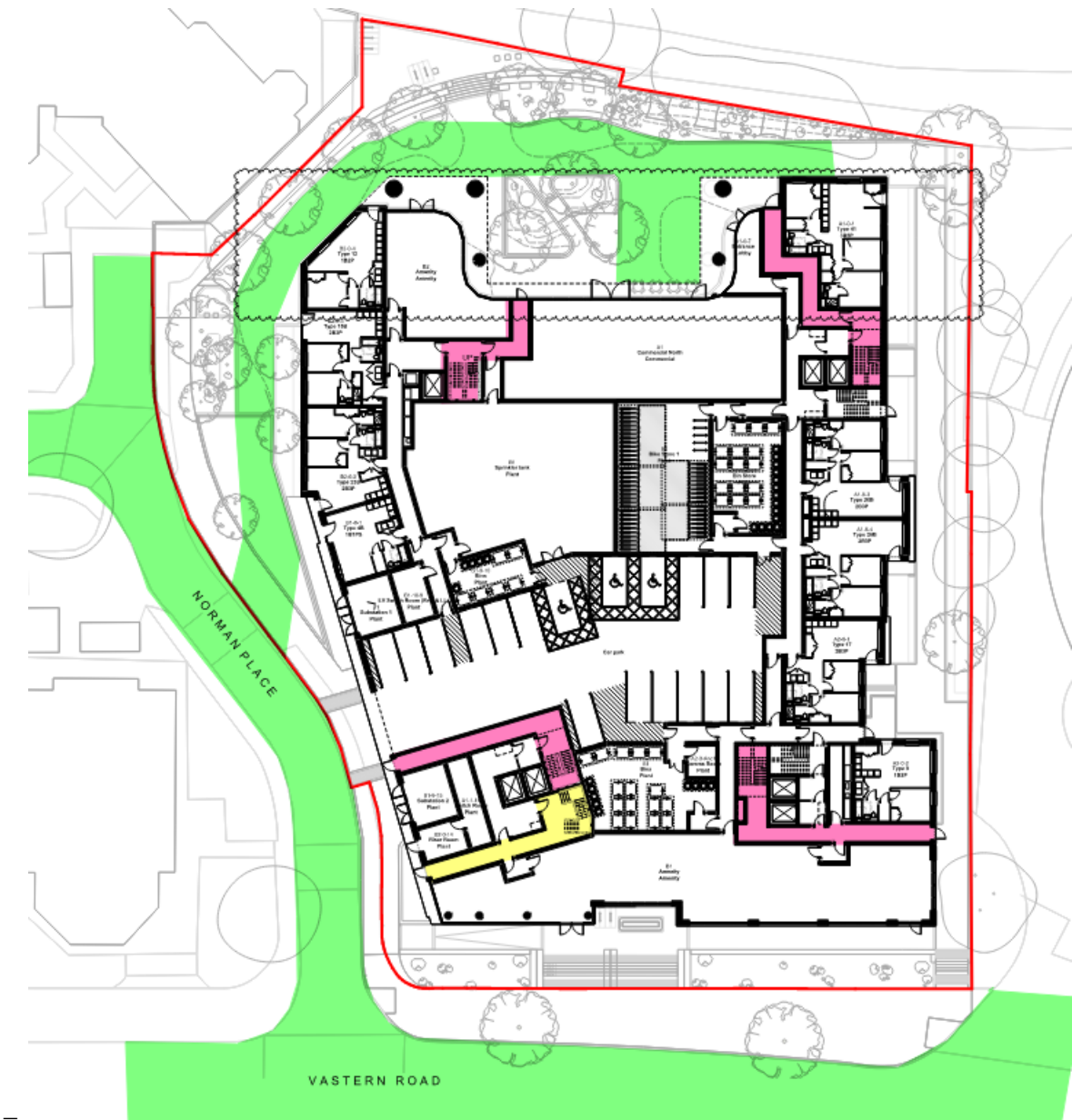


Figure 4: Firefighting shafts within the building.

- All firefighting shafts should be comprised of the following:
  - A firefighting stair (at least 1200mm clear width);
  - A firefighting lift serving all floors
  - A dry fire main
  - Smoke ventilation – This is provided to the evacuation lift lobby and common corridor as described in Section 2.1. For the purposes of clarity, the evacuation lift lobby and common corridor are not considered to constitute firefighting lobbies in line with BS 9991 guidance.

Any protected passageways associated with firefighting stairs do not exceed 18m in length internally, from the final exit door to the stair.

- For increased redundancy in the design, it is proposed that all lifts are designed as triple function, passenger/evacuation/firefighting lifts.
- All areas of the Ground floor level should be within 45m of fire appliance access or 60m of a dry fire main within a firefighting shaft. All points on the upper levels, inclusive of external terraces, should be located within 60m of a fire main outlet.
- Wayfinding signage should be provided to assist the fire service in the event of a fire. Floor identification signs and flat indicator signs should be provided throughout as the building is greater than 11m in height. This signage should be in line with 48.2 of BS 9991.
- The building should be provided with a secure information box. Details of contents of a secure information box is outlined in Section 48.1 of BS 9991.
- Vehicle access should be provided around the site. An internal access route will be provided from Vastern Road and Norman Place. The road will comply with the specifications detailed in Table 4.

Table 4: Fire vehicle access specifications.

| Appliance type                                                                                                                                                                                                                          | Min width of road between kerbs [m] | Min width of gateways [m] | Min turning circle between kerbs [m] | Min turning circle between walls [m] | Min clearance height [m] | Min carrying capacity [tonnes] |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------|--------------------------------------|--------------------------------------|--------------------------|--------------------------------|
| Pump                                                                                                                                                                                                                                    | 3.7                                 | 3.1                       | 16.8                                 | 19.2                                 | 3.7                      | 14                             |
| Note: The weight limit has been increased to 14 tonnes from 12.5 tonnes as a minimum in BS 9991. It is understood that Berkshire Fire and Rescue Service have vehicles that exceed 12.5 tonnes and as such this is a sensible increase. |                                     |                           |                                      |                                      |                          |                                |

- Any dead-end access for a fire vehicle should not exceed 20m. Where this is proposed turning facilities should be provided in accordance with BS 9991.
- The access route is illustrated in Figure 4.
- Fire main inlets should be located within 18m from fire vehicle access. The inlet should be easily visible from the fire appliance.
- Existing hydrants should be located within 100m of the inlets to the four fire mains provided within the building. If not currently achieved, new hydrants should be provided within 90m of the fire main inlet and not more than 90m apart. From the relevant Thames Water survey, it is understood that there are existing hydrants located on Vastern Road and Norman place within 100m of the fire main inlet locations. The functionality of the hydrants in the existing condition is to be confirmed at the next design stage.

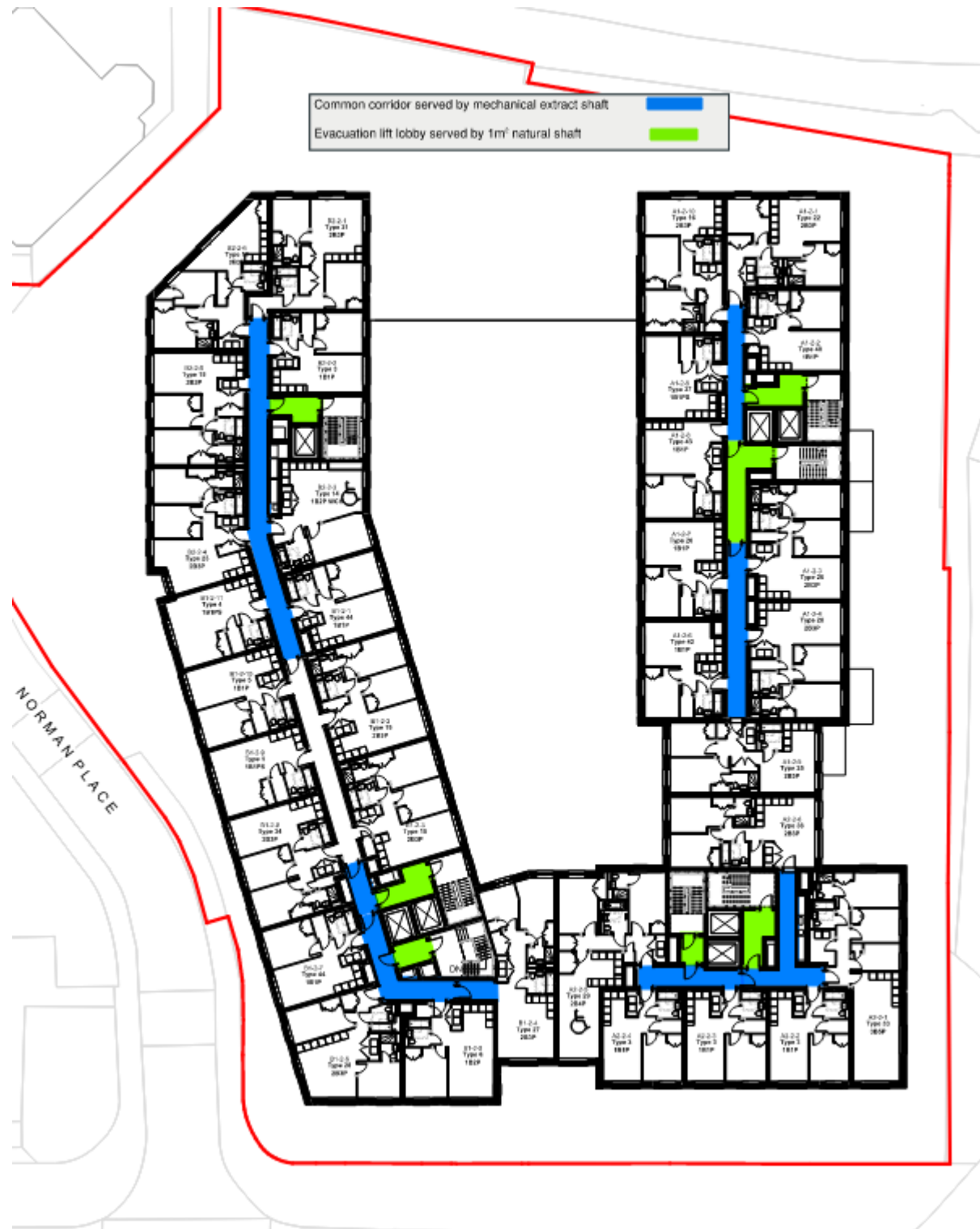
### 3. Conclusion

The outline RIBA Stage 2 fire strategy is described in this report. The fire strategy follows the guidance of BS 9991. This report is considered suitable for outline planning purposes and to develop the design of the scheme at RIBA Stage 2, with further development and coordination required at during subsequent design stages.

## 4. References

- [1] British Standards Institution (BSI), *BS 9991 : Fire safety in the design, management and use of residential buildings - Code of practice*. BSI Global, 2024.
- [2] Ministry of Housing, Communities and Local Government, *Approved Document B Fire safety Volume 2: Dwellings, 2019 edition incorporating 2020, 2022 and 2025 amendments collated with 2026 and 2029 amendments*, 2019 with 2020 and 2022 amendments. 2025.
- [3] British Standards Institution (BSI), *BS 8629:2019+A1:2023 Design, installation, commissioning and maintenance of evacuation alert systems for use by fire and rescue services in buildings containing flats*. British Standards Institution (BSI), 2023.
- [4] British Standards Institution (BSI), *BS 5839 - 6 : Code of practice for the design, installation, commissioning and maintenance of fire detection and fire alarm systems in domestic premises*. BSI Global, 2019.
- [5] British Standards Institution (BSI), *BS 5839 - 1 : Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises*. BSI Global, 2025.
- [6] British Standards Institution (BSI), *BS EN 12101-7:2011 Smoke and heat control systems - Smoke duct sections*. 2011.
- [7] British Standards Institution (BSI), *BS EN 1366-8:2024 - TC Fire resistance tests for service installations - Smoke extraction ducts*. 2024.
- [8] British Standards Institution (BSI), *BS EN 81-76 : Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts. Part 76: Evacuation of persons with disabilities using lifts*. 2025.
- [9] British Standards Institution (BSI), *BS 5839 - 9 : Code of practice for the design, installation, commissioning and maintenance of emergency voice communication systems*. BSI Global, 2021.
- [10] British Standards Institution (BSI), *BS 9251 : Sprinkler systems for residential and domestic occupancies. Code of practice*. BSI Global, 2021.
- [11] British Standards Institution (BSI), *BS EN 12845 : Fixed firefighting systems - Automatic sprinkler systems - Design, installation and maintenance*. BSI Standards Limited, 2020.
- [12] British Standards Institution (BSI), *BS 8519:2020 - TC Selection and installation of fire-resistant power and control cable systems for life safety, fire-fighting and other critical applications. Code of practice*. 2020.
- [13] British Standards Institution (BSI), *BS EN 13501-1:2018 - TC Fire classification of construction products and building elements - Classification using data from reaction to fire tests*. 2018.
- [14] R. Chitty, *BR 187 : External fire spread: building separation and boundary distances*, 2nd ed. Bracknell: IHS BRE, 2014.
- [15] Green Roof Organisation, *The GRO Green Roof Code: Green Roof Code of Best Practice incorporating Blue Roofs and BioSolar Applications*. Green Roof Organisation Ltd.

## Appendix A: High level common corridor arrangement



## Appendix B: Space separation assessment results

| Façade elevation ref                | Compartment dimensions w x h (m) | BRE enclosing rectangle w x h (m) | Available distance to the relevant boundary (m) | Area of compartment requiring protection (m²) | Area of compartment that can be unprotected (m²) | Percentage Unprotected Area of compartment (%) | Sprinklers? | Reduced Fuel Load? |
|-------------------------------------|----------------------------------|-----------------------------------|-------------------------------------------------|-----------------------------------------------|--------------------------------------------------|------------------------------------------------|-------------|--------------------|
| Ground floor                        |                                  |                                   |                                                 |                                               |                                                  |                                                |             |                    |
| Amenity South                       | 46.5 x 4.1                       | 50 x 6                            | 15.60                                           | 0.00                                          | 190.65                                           | 100%                                           | Yes         | No                 |
| Car Park West                       | 11.7 x 4.1                       | 12 x 6                            | 7.10                                            | 0.00                                          | 47.97                                            | 100%                                           | Yes         | No                 |
| Apartment West – B2-0-2             | 10 x 4.1                         | 12 x 6                            | 13.40                                           | 0.00                                          | 41.00                                            | 100%                                           | Yes         | Yes                |
| Apartment West - B2-0-3             | 9 x 4.1                          | 9 x 6                             | 16.50                                           | 0.00                                          | 36.90                                            | 100%                                           | Yes         | Yes                |
| B2 Amenity North                    | 11.6 x 4.1                       | 12 x 6                            | 25.90                                           | 0.00                                          | 47.56                                            | 100%                                           | Yes         | Yes                |
| Commercial North                    | 17.8 x 4.1                       | 18 x 6                            | 17.80                                           | 0.00                                          | 72.98                                            | 100%                                           | Yes         | No                 |
| Apartment East - A1-0-1             | 12.2 x 4.1                       | 15 x 6                            | 7.50                                            | 0.00                                          | 50.02                                            | 100%                                           | Yes         | Yes                |
| Apartment East - A2-0-2             | 7.8 x 4.1                        | 9 x 6                             | 3.00                                            | 0.00                                          | 31.98                                            | 100%                                           | Yes         | Yes                |
| Apartment East – A1-0-3             | 9 x 4.1                          | 9 x 6                             | 4.90                                            | 0.00                                          | 36.90                                            | 100%                                           | Yes         | Yes                |
| Amenity East                        | 7.7 x 4.1                        | 9 x 6                             | 3.00                                            | 4.57                                          | 27.00                                            | 86%                                            | Yes         | No                 |
| Substation West                     | 5.3 x 4.1                        | 6 x 6                             | 7.10                                            | 0.00                                          | 21.73                                            | 100%                                           | No          | No                 |
| Upper floors                        |                                  |                                   |                                                 |                                               |                                                  |                                                |             |                    |
| Apartment West - B1-1-8             | 9.3 x 3                          | 12 x 3                            | 6.70                                            | 0.00                                          | 27.90                                            | 100%                                           | Yes         | Yes                |
| Apartment West - Internal - B1-1-3  | 9.2 x 3                          | 12 x 3                            | 8.90                                            | 0.00                                          | 27.60                                            | 100%                                           | Yes         | Yes                |
| Apartment East - Internal - A1-1-6  | 8.5 x 3                          | 9 x 3                             | 6.00                                            | 0.00                                          | 25.50                                            | 100%                                           | Yes         | Yes                |
| Apartment East - Internal - A1-1-10 | 11.4 x 3                         | 12 x 3                            | 10.50                                           | 0.00                                          | 34.20                                            | 100%                                           | Yes         | Yes                |
| Apartment South - B1-1-6            | 7.7 x 3                          | 9 x 3                             | 12.60                                           | 0.00                                          | 23.10                                            | 100%                                           | Yes         | Yes                |
| Apartment West – B1-1-6             | 6.4 x 3                          | 9 x 9                             | 11.60                                           | 0.00                                          | 19.20                                            | 100%                                           | Yes         | Yes                |
| Apartment East - A2-1-1             | 17.55 x 3                        | 18 x 3                            | 3.00                                            | 0.00                                          | 52.65                                            | 100%                                           | Yes         | Yes                |



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