

OMEGA FIRE

Reading Metropolitan Outline Fire Strategy

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Quality Assurance

Revision	Date	Prepared by	Authorised by	Reason
-	12/12/2018	Gareth McGaughey	Mike Gilmartin	For Discussion with Design Team
A	19/12/2018	Gareth McGaughey	Mike Gilmartin	Update Following Client Comments/Updated Drawings

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This report relates only to statutory requirements for Building Regulations compliance. Additional fire safety measures may be necessary for insurance and other purposes. The detailed aspects of the design and construction are, unless explicitly stated otherwise in this report, to be in accordance with the recommendations of BS 9991 and the appropriate British Standards.

The validity of this report is dependent upon the recommendations being implemented in full and as described.

This report is based on the Client’s description of their requirements, and is subject to assumptions that Omega Fire can reasonably be expected to make in accordance with sound professional principles and experience. Omega Fire accept no liability for the accuracy of the information provided by the Client or other third parties. Omega Fire shall not be held responsible or liable for the designs produced by any other consultants, sub-consultants or sub-contractors, including any original designs produced by others which you may adapt, modify or develop in the carrying out of the Services. The report is based on the drawings referenced. Any subsequent changes to the design which are not agreed with Omega Fire invalidate the report.

This report relates to a project that is subject to review from Approval Authorities. It should be ensured that the contents of the report are agreed with all the relevant approval bodies prior to implementation.

1 Design Principles Summary

1.1 Introduction

- 1.1.1
- Omega Fire have been commissioned to produce an Outline Fire Strategy for the proposed ‘Reading Met’ office & residential development in Reading.
- 1.1.2
- The paragraphs below outline the major Fire Engineering considerations within the proposed building as a design basis to support the planning application for the site.

1.2 Legislation

- 1.2.1
- Under the Building Regulations a building owner is required to provide an adequate level of life safety to the building by providing suitable means of escape, means of warning occupants of a fire, limiting internal fire spread, protecting adjacent property from fire, and facilitating Fire Service operations. This can be achieved by the adoption of standard guidance as documented within Approved Document B (ADB) 2006 Edition (Incorporating 2007, 2010 and 2013 amendments). However, ADB further recognises that alternative solutions may provide a more appropriate design. The use of an alternative approach is detailed in ADB, Use of Guidance page 5:

“The approved documents are intended to provide guidance for some of the more common building situations. However, there may well be alternative ways of achieving compliance with the requirements. Thus there is no obligation to adopt any particular solution contained in an approved document if you prefer to meet the relevant requirement in some other way.”
- 1.2.2
- As an alternative to ADB, BS 9991 – Fire Safety in the design, management and use of residential buildings 2015 will be considered within the residential aspects of design & BS 9999 2017 will be used for the office and retail areas of the scheme.
- 1.2.3
- Where no reference is made within this report with regards to a certain element it is assumed that it be designed and installed in accordance with BS 9991, BS 9999 and/or the appropriate British Standard.

1.3 Scheme Description

- 1.3.1
- Reading Met, Reading involves the development of a number of blocks which contain a mix or residential and office accommodation. There are also a number of retail units on the Ground Floor of the site and two blocks of two storey townhouses. The heights of the numerous blocks and their uses can be seen in Table 1, these are based on previous development presentations and elevations provided. The location of each block on a site plan can be seen in Figure 1. On Basement level there is a Car Park which is accessible from Block A, B & C, blocks along with Cycle Stores, Energy Centre and Refuse Stores on this level.

1.4 Evacuation Policy

- 1.4.1
- The proposed residential areas will operate on a ‘defend in place’ evacuation strategy whereby only those within the apartment of fire origin will evacuate in the event of a fire. Evacuation of other persons will be in the event:
 - Occupants choose to leave independently;
 - The Fire Service or building management conclude evacuation of other occupants is required.
- 1.4.2
- The office blocks within the scheme will work on a simultaneous evacuation, whereby an alarm detection anywhere in the block will require a full evacuation of the respective block.

- 1.4.3
- All other areas of the scheme (non-residential, ancillary areas and commercial/retail areas) will evacuate with simultaneous evacuation of a single compartment only. For example, in the event of a fire in a Retail Unit or the Basement Car Park, only those in this compartment will be required to evacuate; evacuation of other compartments within the building is not required.

Table 1: Block Use and Heights

Block	Storeys	Height of Topmost Storey (above fire service access level)	Height to Roof AOD	Use
A	25	c.80m	123.18m	Residential/Office/Retail
B	16	c.46.9m	90.18m	Residential
C	11	c.32.5m	74.18m	Retail/Residential
D	12	c.35.3m	77.18m	Residential
E	11	c.32.5m	74.18m	Retail/Residential
F	11	c.32.5m	74.18m	Residential
G	8	c.23.5m	66.18m	D1/Residential
H	8	c.23.5m	66.18m	D1/Residential
J	7	c.24m	66.68m	Office

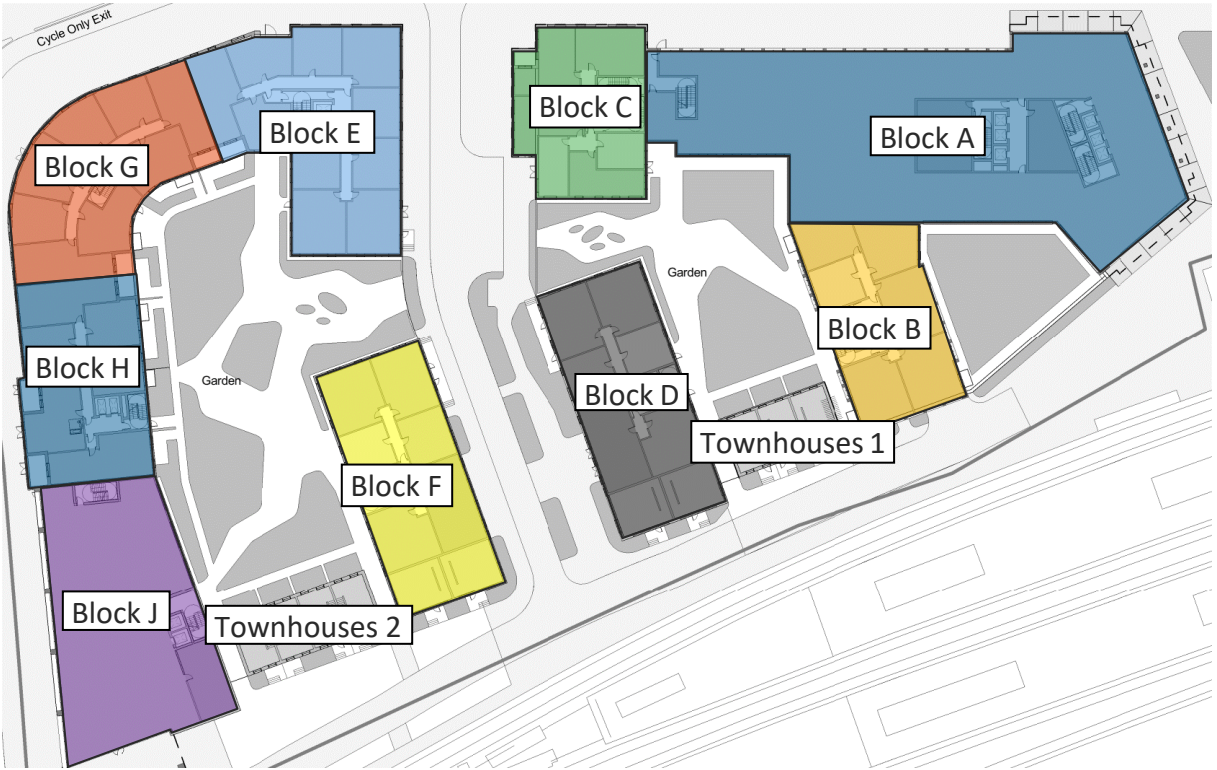


Figure 1: Reading Met Block Location

1.5 Risk Profile

- 1.5.1
- The Office and Retail areas are to be designed to BS 9999, as BS 9991 only covers residential accommodation. The risk profile of the Office areas is a A2, awake and familiar with the building with a medium fire growth rate

whilst the Retail Units will have a B3 risk profile, awake and unfamiliar with the building with a fast fire growth rate. The travel distances, door and stair widths are provided in Table 2.

Table 2: Emergency Egress Limitations

Fire Precaution	Minimum Requirements for Risk Profile A2	Minimum Requirements for Risk Profile B3
Single Direction Horizontal Travel Distance	22m	27m
Alternative Directional Horizontal Travel Distance	55m	40m
Door & Corridor Widths	3.6mm	6.0mm
Stair Width (Per Floor)	4.5mm	N/A
Stair Width (Per Floor)	2.2mm	N/A
Stair Width (7 Floors)	2.0mm	N/A

1.6 Alarm and Detection System

- 1.6.1
- The layout of the apartments have not yet been confirmed to Omega Fire. The minimum alarm and detection system required for new build, residential apartment is a BS 5839-6, Grade D Category LD2 alarm and detection system. If open-plan apartments, where the bedrooms are accessed as inner rooms off the living room/kitchen area, are provided then these must have a BS 5839-6, Grade D Category LD1 alarm and detection system.
- 1.6.2
- Residential common corridors will be provided with a L5 alarm system designed and installed in accordance with BS 5839-1. This is required to operate the smoke control system only and will not include manual call points or sounders in the common areas.
- 1.6.3
- The non-residential and ancillary areas of the residential blocks, including the Basement Car Park, are to be provided with a L2 alarm and detection system designed and installed in accordance with BS 5839-1. In the Basement Car Park this automatic detection will be used to activate the smoke control in the area.
- 1.6.4
- The Office blocks and Retail Units require a minimum of a Manual M system, designed and installed in accordance with BS 5839-1. Manual call points should be provided no more than 45m away from each other along escape routes. The end user of these areas may require an enhanced alarm over the Manual system.

1.7 Means of Escape

- 1.7.1
- Travel distances within the building will be limited as defined in Table 3.

Table 3: Travel Distance Limitations

Location	One Direction	More than one direction
Standard Apartments	9m	n/a
Internal Travel Distances Within Open Plan Apartments	20m	n/a
Common Corridors	7.5m	30m
Common Corridors With Sprinkler Suppression in Apartments	15m	60m
Ancillary & Non-Residential Areas	18m	45m
Car Park	25m	45m
Plant Rooms	9m	18m

Apartments

- 1.7.2
- The majority of the apartment layouts are still unknown to Omega Fire, but the principles of differing apartment types must be as follows:

 - Studio apartments must be limited to 9m single direction travel distance;
 - Where standard apartments have a travel distance exceeding 9m from the apartment door to the furthest accessible point, if this is exceeded the entrance hall to which all rooms are accessed off must be 30 minute protected with FD30 doors;
 - Open plan apartments must be limited to 20m travel distance;
 - Cooking facilities should not be on escape routes, calculations will be provided at detailed designs stage showing that a required distance of 1.75m should be provided between cooking facilities and any opposing wall or furnishings. Where this is not met, a BS EN 50615 Category B device will be provided. This device will acknowledge when a pan is getting too hot and cut off the supply to the cooker, preventing a fire from starting rather than waiting for the fire to start and then cutting off the supply.

Duplex Apartments and Townhouses

- 1.7.3
- Both Duplex Apartments and Townhouses follow the same provisions. Each room in the unit should be accessible from a 30 minute protected stair with FD30 fire doors.

Common Corridors

- 1.7.4
- BS 9991 permits a travel distance of up to 7.5m single direction travel distance or 30m where more than one direction is provided in a vented common corridor. BS 9991 also permits that if all apartments accessed off the common corridor are provided with sprinkler suppression then these distances can double to 15m single direction travel distance or 60m where more than one direction is provided.
- 1.7.5
- In Blocks A-F, the height to the topmost habitable storey, is over 30m and therefore, sprinkler suppression is required throughout the building and BS 9991 permits 15m single direction travel distances within the apartments. The majority of these blocks are within the 15m single direction travel distance from furthest apartment door to the stair door and therefore it is proposed to remove the cross corridor doors and to provide a 0.8m² mechanical extract shaft or 1.5m² natural smoke shaft in the firefighting corridor. Where the travel distance is extended past 15m to the stair door, but not to the stair lobby, a ventilation shaft would be required in both the common corridor and firefighting lobby, along with a cross corridor door between the two areas for compliance. Therefore, it is recommended that travel distances are limited to 15m.
- 1.7.6
- In Block G&H, sprinkler suppression is not required for the height of the block, however, if open plan apartments are provided then sprinkler suppression would be required in the residential areas and a 15m travel distance to

the stair would be permitted. In Block G there are travel distances of up to 12m to the stair door and up to 10m to the stair lobby. Therefore, to justify these distances, an enhanced mechanical ventilation system is required. This will require two 0.8m² mechanical ventilation shafts, at opposing ends of the corridor. Upon detection in the corridor, one will begin extracting air whilst the other will start to provided inlet air. This will require CFD justification. If sprinkler suppression is provided then the cross corridor doors can be removed and the corridor can be served by a single shaft. This is shown in Figure 2.

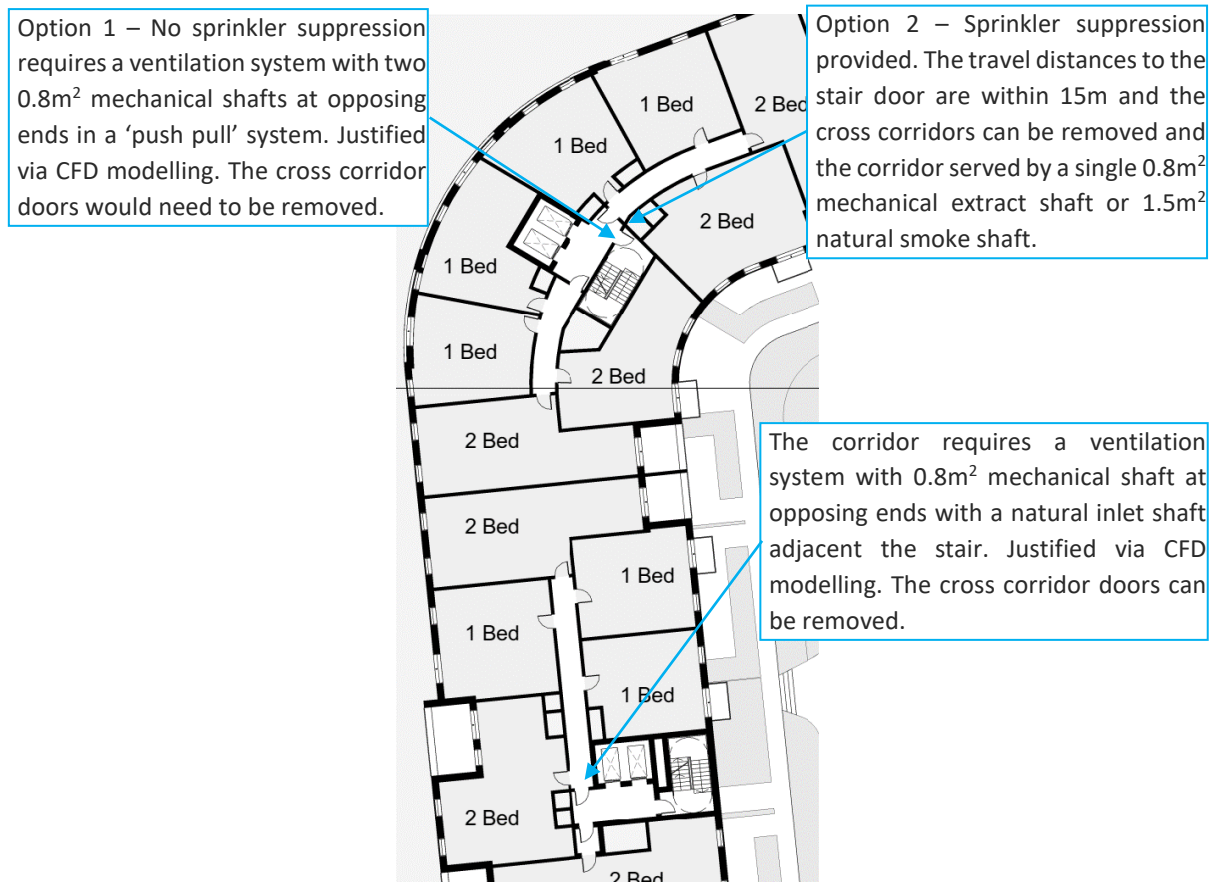


Figure 2: Block G & H Ventilation Requirements

- 1.7.7
- In Block H, there are extended travel distances to the stair, if the apartments are sprinklered or not, therefore an enhanced mechanical ventilation system is required. It is proposed to provide a 0.8m² natural inlet shaft adjacent to the stair with a 0.8m² mechanical extract shaft at the opposing end of the corridor. This will require CFD modelling to justify and can be shown in Figure 2.
- 1.7.8
- Where buildings are provided with two stairs, the ventilation in the common corridors can be provided as a manual system, with no requirement of detection in the corridors. However, due to the size of the blocks, Omega Fire would recommend that all common corridor ventilation is automatic.

Office Areas

- 1.7.9
- Due to there being at least two escape routes from all office areas, the travel distance limitations shown in Table 3 are compliant.
- 1.7.10
- To permit more than 60 occupants on an office floor plate, the doors along the escape route should swing in the direction of escape from the area. The permitted occupancy will depend on clear door width. The clear door widths should be at least 800mm, this would give escape capacity for 138 per floor, if 1050mm doors are provided

then this can be increased to 291. If more occupants, per floor, as desired then each door must provide 3.6mm per person, as shown in Table 2.

- 1.7.11
- As the stairs are lobbied on each floor from the office areas, therefore, neither has to be discounted when determining stair sizes. The current stair widths in the office blocks have a clear width of c.1250mm, please see Table 4 for the permitted occupancies given that width and what other clear stair widths would provide.

Table 4: Office Stair Capacity Based on Stair Clear Widths

Stair Clear Width	Capacity Per Stair (Block A)	Total Upper Floor Occupancy (Block A)	Capacity Per Stair (Block B)	Total Upper Floor Occupancy (Block B)
1250mm	625	1250	568	1136
1300mm	650	1300	590	1180
1400mm	700	1400	636	1272
1500mm	750	1500	681	1362

- 1.7.12
- The total office area (it is all considered ‘upper floor’) in Block A is approximately 11000m², based on a floor space factor of 6m² per person, a total upper floor occupancy is approximately 1850. To allow this, each stair would require a clear width of 1850mm.
- 1.7.13
- The total upper floor office area of Block B is approximately 4515m², based on a floor space factor of 6m² per person, a total upper floor occupancy is approximately 752. Therefore, the current stair sizing is sufficient.
- 1.7.14
- As the office blocks exceed 18m in height, guidance states that each stair should be accessed via a lobby on every floor, including Ground Floor, apart from the topmost storey. This is not currently met within the scheme and should be ensured going forward.

General

- 1.7.15
- It should be ensured that between the three differing areas in the scheme: Office, Residential and Retail, that there is no access between them. They should all have their own independent escape routes and occupants should not depend on other purpose group areas to escape.
- 1.7.16
- All stairs should discharge direct to the external or via a protected escape, the same fire rating as the stair, to the external. There are a number of blocks where at least one of the stairs does not achieve this. Where there are two stairs, e.g. in Block A (Both Residential and Office areas) & B with one stair discharging to the external either directly or via a protected route, the other stair is permitted to egress through an area. However, the fire load in this area must be limited, e.g. if there is an entrance area then this must be no more than 10m² with the rest of the area containing no combustible materials.
- 1.7.17
- The single stairs in both Blocks C & E do not egress to the external via a protected route and therefore active compartmentation must be provided to ensure that occupants have a safe escape to the external. Both blocks will be provided with a 120 minute fire and smoke curtain, linked to local detection, to provide a protected route to the external. The area between the stairs and occupants escaping must remain free of any combustible materials. This is shown in Figure 3 & Figure 4.

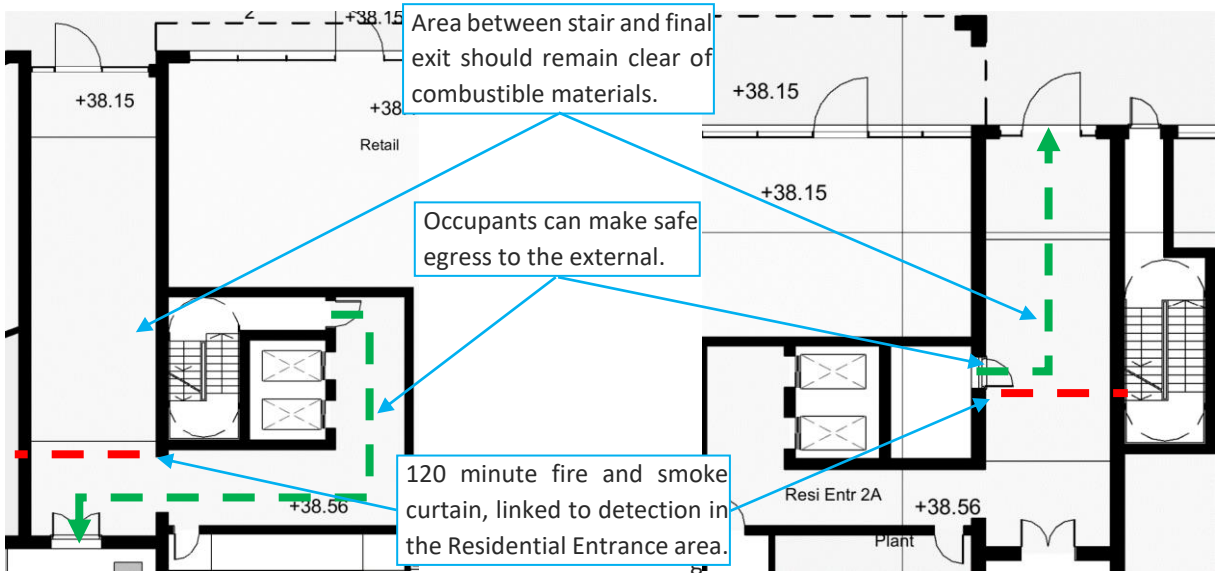


Figure 3: Block E Single Stair Egress

Figure 4: Block C Single Stair Egress

- 1.7.18 Where a single stair within a building also serves a basement level, it must be separated within the staircase at Ground Floor level by 60 minute fire rated construction with a FD30S fire door.
- 1.7.19 There are three escape widths from the large Retail Unit on the Ground Floor of Block A, a 1900mm door, 1450mm door and a 850mm door. When discounting the largest exit doors this leaves a 1450mm exit door which can serve 241 occupants and a 850mm door which can serve 141 occupants. A total occupancy of 382. If the 850 door was increased to 1050mm then this would permit 416.
- 1.7.20 Where units only have one escape route, or the two escape doors are not remote from each other. They must be limited to 60 occupants at all times.
- 1.7.21 All Refuse Stores must be accessed internally via a lobby with 0.2m² permanent ventilation. Where only a lobby/corridor separate a Refuse Store and a stair, as in Ground Floor of Block E, the ventilation should be enhanced to 0.4m² permanent ventilation.

Basement Car Park

- 1.7.22 Based on an occupancy of 2 occupants per car parking space, the maximum occupancy expected in the Car Park at any one time is 128. Therefore, as there are three escape routes from the area (a greater number of doors but some of the exit doors aren't remote from each other), and one is discounted, a clear width of 850mm must be provided to permit this occupancy.
- 1.7.23 The stair widths to accommodate the occupancy from this level are sufficient (all c1250mm).
- 1.7.24 BS 9991 states that where a stair is accessed from a Basement Car Park, it should be done so via a lobby with a 1.0m² AOV. If this can be achieved via extending a mechanical shaft down from the upper levels then a fire engineered solution can be proposed to Building Control.
- 1.7.25 It is to be confirmed if there will be a fire exit door, with a specific pedestrian route leading up to it, at the head of the Car Park ramp to provide another direction of escape from the area. If not, an escape route should be at the bottom of the ramp into the communal stair area.

1.8 Evacuation of Disabled Occupants

- 1.8.1 In the residential blocks there are no requirements for disabled refuges to be provided. This is due to the high degree of compartmentation that is provided to residential buildings. However, if there are any ancillary areas on proposed for the upper floors e.g. external terrace areas, then a disabled refuge would be required in the protected stair. This is also a requirement for disabled refuges where residential stairs serve Basement levels, as disabled occupants may be in the area.
- 1.8.2 The upper floors within the office accommodation also disabled provisions. Within each protected stair or lobby on each level, a disabled refuge should be provided.
- 1.8.3 Disabled refuges will be provided in protected stairs on those levels. The dimensions of the disabled refuge should be at least 1400mm x 900mm and not obstruct the width of the stair for escaping occupants.
- 1.8.4 Voice communication via a Type B outstation in accordance with BS 5839-9 should be provided within each disabled refuge.
- 1.8.5 It is proposed to keep the firefighting lifts, where applicable, operational during a fire situation to allow occupants to self evacuate.

1.9 Emergency Escape Signage & Lighting

- 1.9.1 Fire escape signs are to be provided to guide occupants from any point in a building, via a place of relative safety (the escape route) to the place of ultimate safety (outside the building). Exit and directional signage should be provided in accordance with the requirements of BS ISO 3864-1.
- 1.9.2 Emergency lighting will be provided in accordance with BS EN 1838.

1.10 Limiting Fire Spread

Structural

- 1.10.1 As Blocks A-F exceed 30m in height from ground level to the topmost habitable storey, they therefore require 120 minute fire resistance to all elements of structure when tested in accordance with the appropriate parts of BS 476 for load bearing elements of structure.
- 1.10.2 As Blocks G-J are between 18m and 30m in height from ground level to the topmost habitable storey, they therefore require 90 minute fire resistance to all elements of structure when tested in accordance with the appropriate parts of BS 476 for load bearing elements of structure.

Sprinkler Suppression System

- 1.10.3 As Blocks A-F exceed 30m in height to the topmost habitable storey, sprinkler suppression will be provided throughout the building. On the residential levels this will consist of sprinkler system within the residential apartments only (i.e. sprinklers not required within the corridors or stairs). This will be a minimum of a Category 2 sprinkler suppression system with 30 minutes duration.
- 1.10.4 As the Basement Car Park is serving a building with sprinkler suppression, BS 9991 states that it requires a BS EN 12845 sprinkler suppression system. This system should also serve all non-residential, ancillary and retail areas of these blocks.
- 1.10.5 As Tower A & B exceed 45m in height, further provisions are required in regards to the residential sprinkler suppression system provided. This is to be discussed further with Building Control and the Fire Service but we would propose a 60 minute duration to the system.

- 1.10.6 Currently, there are no sprinkler suppression requirements for Blocks G & H (apart from those mentioned in 1.13.2). However, if open plan apartments, where bedrooms are accessed via the living area, are the desired apartment layout for these blocks then they will require to be provided with sprinkler suppression. To allow for an open kitchen layout in these apartments, a BS 9251 Category 2 system with a 30 minute duration would be proposed.

1.11 Linings

- 1.11.1 All wall and ceiling linings within the development should meet the recommendations of Section 31 of BS 9991. This requires linings within common circulation spaces having a Class 0 rating.

Compartmentation

- 1.11.2 Each apartment is to be a separate compartment and all-party walls (and walls to common areas) are to be compartment walls. As the building provides residential accommodation, all floors are to be constructed as compartment floors.
- 1.11.3 Different purpose groups and different blocks, where joined, should be separated from each other via either the fire rating of the blocks or the fire rating of the more onerous block. In this scheme that will be typically 120 minutes.
- 1.11.4 A full set of fire strategy drawings will be provided at detailed design stage. However, indicative compartmentation mark ups are provided in Appendix A.

Cavity Barriers

- 1.11.5 Cavity barriers are to be provided in accordance with Section 19 of BS 9991. Cavity barriers are required at all floors, compartment walls and openings (e.g. windows and doors). Additional cavity barriers are required where a compartment wall meets an external wall of the building. Cavity barriers are to also to be provided to ensure there is no void in the external wall exceeding 20m in any direction in the non-residential areas.

Fire & Smoke Dampers

- 1.11.6 Fire/fire and smoke dampers to be provided in accordance with the recommendations of ADB. Where ductwork serves more than one part of a compartment or fire-separated protected escape route, smoke detector operated fire dampers should be provided where ductwork enters each fire-separated or smoke-separated section of the escape route.

1.12 External Fire Spread

- 1.12.1 The space separation of the building from its relevant boundaries should be assessed in full. This will identify areas of non-fire rated elements of the façade where the separation is less than the minimum requirement within BRE 187 – External Fire Spread; Building Separation and Boundary Distances.
- 1.12.2 The Unprotected Area (UPA) permitted for each type of compartment within the scheme should be calculated considering the distance from the relevant boundary, the compartment height and width along with the occupancy profile.
- 1.12.3 The internal site relevant boundaries will be the midpoint between each block. The relevant boundary to outside of the site will be to the midpoint of the surrounding roads. Areas which may require a significant amount of protected area is the South Elevation of the Retail Unit in Block A, the North elevation of the unmarked unit in Block G, West elevation of the unmarked unit in Block H and both blocks that contain office accommodation. If

Omega Fire are commissioned to undertake a detailed fire strategy on the project then a full external fire spread assessment will be undertaken then.

Insulation and Façade Products

- 1.12.4 In a building with a storey 18m or more above ground level any insulation product, filler material (not including gaskets, sealants and similar) etc. used in the external wall construction should be of limited combustibility in accordance with BS 9991.

1.13 Fire Fighting Access

- 1.13.1 The fire service access for the scheme can be seen in Figure 5.
- 1.13.2 Where apartments and townhouses are accessed via Ground Floor, all areas must be accessible within 45m from the fire appliance vehicle. Where sprinkler suppression is provided, this can be increased to 90m as the upper level is less than 4.5m in height from ground level. To ensure this is met within the scheme, the apartments accessed from the external in Block G and H must be provided with a BS 9251 sprinkler suppression system.
- 1.13.3 The retail units are less than 2000m² and therefore to comply, 15% of the perimeter must be accessible for the Fire Service. This is met within the scheme.
- 1.13.4 All blocks have a topmost habitable storey greater than 18m, therefore a firefighting shaft is required in each block, there is no requirement for the firefighting shafts to serve the Basement, however, the dry risers within the stairs should extend down. These will include:
- A 120 minute fire rated enclosed stair;
 - At least a 1100mm clear width in the stair;
 - A 1.0m² AOV at the head of the stair (in residential firefighting shafts only);
 - Ventilated lobby/corridor (see means of escape section);
 - A dry rising main (a wet riser is required in the residential core of Block A). In residential buildings this will be in the stair and for office accommodation will be in the firefighting lobby;
 - A firefighting lift to BS EN 81.
- 1.13.5 In the majority of the Blocks which are provided with two stairs, one stair designed as the firefighting stair is sufficient, however as the office accommodation in Block A exceeds 900m², two firefighting shafts will be required and should both follow the requirements stated in Section 1.13.1. The Fire Service should be spoken about about only requiring on firefighting lift within the block though.
- 1.13.6 The Fire Service should have direct access to the firefighting shaft from the external and their access should be within relative proximity to a road. E.g. the firefighting shafts in G&H are accessed from the external but not via anywhere close to where a fire appliance vehicle can park. Therefore, the access to these shafts require further justification.
- 1.13.7 Where a firefighting lift opens up in an Entrance area, the area should remain sterile with no combustible materials. It should also be provided with ventilation, either a 0.8m² mechanical extract shaft or 1.5m² natural smoke shaft.
- 1.13.8 In Block J, the firefighting lift opens up directly into the office accommodation. This is non-compliant and the layout should be rearranged, the firefighting lift should open up into a ventilated lobby and no more than 7.5m away from the firefighting stair door.
- 1.13.9 In Block C, the distance from the firefighting stair to the firefighting lift exceeds 7.5m and therefore the layout of the area should be rearranged so this limit is not exceeded.

- 1.13.10
- Within all sprinklered blocks, all areas should be within 60m of the fire main (dry/wet riser) outlet. In non-sprinklered buildings this should be 45m. This appears to be met throughout the scheme.
- 1.13.11
- The firefighting lifts will be installed in accordance with BS EN 81-71 and to BS EN 81-1 or BS EN 81-2 as appropriate for the particular type of lift.
- 1.13.12
- The specification for the pump appliance route access is provided in Table 5. Where there is a reversing distance of 20m for a fire appliance vehicle, a turning head should be provided if it cannot be shown that a Fire Appliance vehicle can adequately turn.

Table 5: Fire Appliance 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

Notes: This table is subject to agreement with the fire service as some fire services have appliances of greater weight or different sizes.

Wet Riser – Block A

- 1.13.1
- The wet rising main is designed and installed in accordance with BS 9990. The wet riser has an adequate water supply provided via a tank with mains infill. The tank is sized to supply two firefighting jets for at least 45 minutes at 1500L/min, i.e. 67,500L (67.5m³) total capacity. The tank is formed of two interconnected tanks with a combined minimum capacity of 45,000L (45m³), with mains supply to provide additional inlet (500L/min). If the mains inlet cannot be confirmed then the full 67,500L capacity will be needed.
- 1.13.2
- Two automatic pumps are provided to serve the rising main, duty and standby.
- 1.13.3
- The inlet for the emergency replenishment of the suction tank should be in sight of where the fire service access the building and within 18m of the appliance access.

Dry Riser – Block B-J

- 1.13.4
- The dry riser inlet connection points are to be within 18m of a fire appliance access point and visible from the fire appliance. Furthermore, the horizontal distance between the dry riser inlet point up to a point where the pipework becomes vertical should not exceed 18m. The current distance from Fire Service Access point to dry riser inlet point is exceeded and this will require justification at detailed stage.
- 1.13.5
- Note, the dry riser inlet should be either located on the external façade of the building, or alternatively, the inlet can be located in a free-standing cabinet. The exact dimensions, colour and materials used should be in accordance with the recommendations of BS 9990.

Fire Hydrant

- 1.13.6
- For Block A a fire hydrant should be provided within 90m of an entry point to the building. Blocks B-J require a fire hydrant within 90m of each dry riser inlet point.

Car Park Ventilation

- 1.13.7
- As the car park is covered it will require ventilation. Given that it is within a Basement Floor, natural ventilation is not possible.

Mechanical Ventilation

- 1.13.8
- As the Car Park is to be fitted with a sprinkler suppression system, the mechanical ventilation system must:

- Provide ten air changes per hour;
- Be capable of handling gas temperatures of 300°C for a continuous period of not less than 60 minutes;
- Operate automatically either on activation of the sprinkler system or the L2 system within the area.

- 1.13.9
- Each part of the system should have an independent power supply which would operate in the event of power failure of the main supply. Extract points should be arranged so that 50% of the outlets are high level and 50% are at low level.
- 1.13.10
- Mechanical ventilation system should be designed and installed conforming to BS EN 12101-3:2002.
- 1.13.11
- Another alternative solution would be to provide jet fans to aid air flow and direct smoke towards a mechanical extraction point.

1.14 Secondary Power

- 1.14.1
- The life safety systems within the buildings should be provided with dual power supplies which can be either via battery back-up, generator, UPS or, for residential areas only, two diverse routes from a single substation, subject to appropriate risk assessment. The most appropriate means to achieve this will be determined in conjunction with the M+E designer during the detailed design.
- 1.14.2
- Life safety systems in the Reading Met scheme include:
 - AOV at the head of the stairs;
 - Ventilation system serving the residential common corridors;
 - Emergency lighting;
 - Sprinkler suppression systems;
 - Fire detection and alarm systems;
 - Wet riser;
 - Firefighting lifts.

1.15 Conclusion

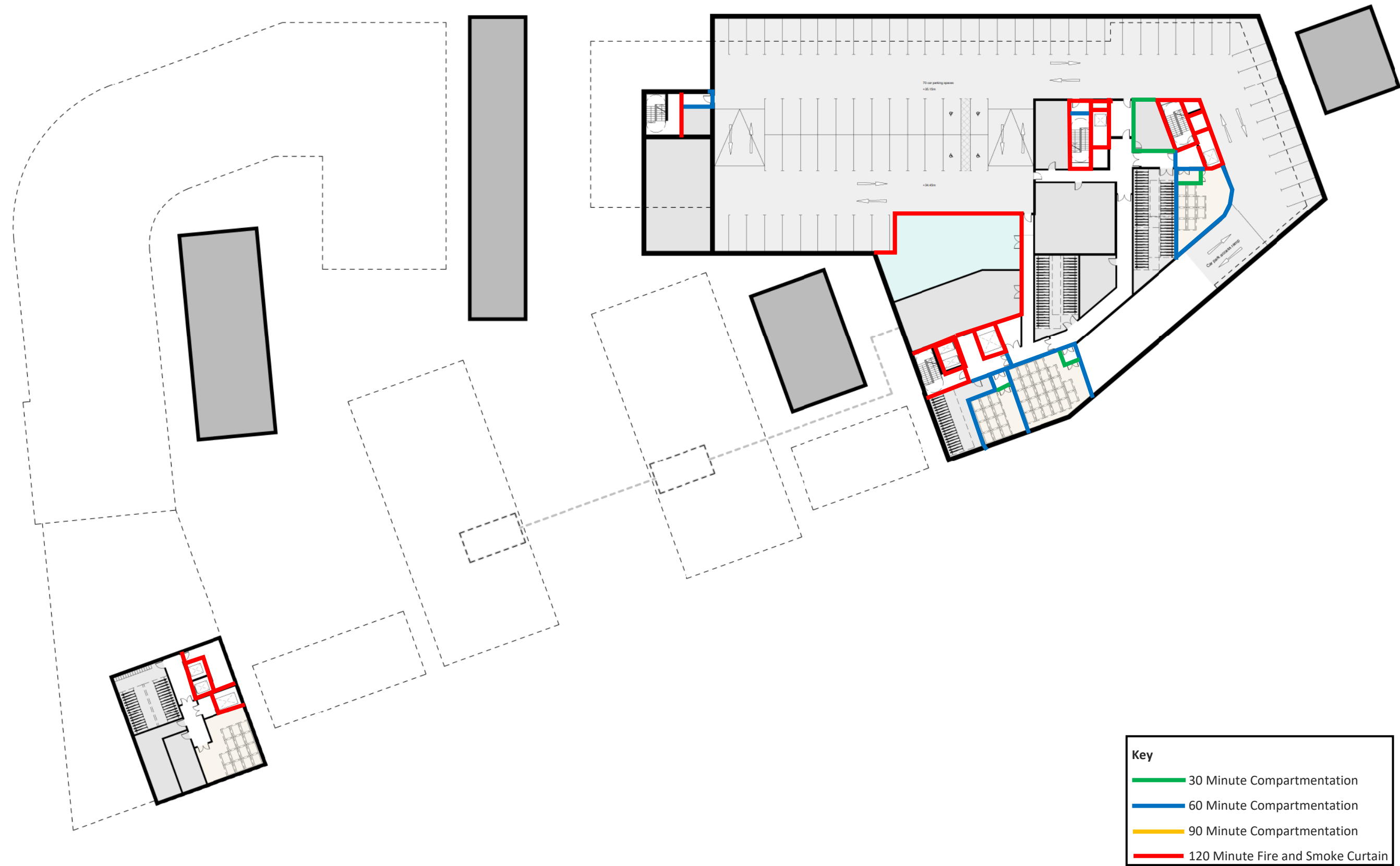
- 1.15.1
- The outline design of the scheme, in general meets with prescriptive requirements of ADB. If the recommendations given in this report are followed, then it is considered that the building will meet the functional requirement of the Building Regulations. As this report provides recommendations for meeting the minimum requirement of the Building Regulations, any deviation may result in a fundamentally non-compliant building. The prescriptive requirements have been stated within this report and will be adhered to. Where codes of practise are restrictive to the design, an alternative (fire engineering solution) has been considered.
- 1.15.2
- It is considered that between a culmination of the prescriptive requirements and fire engineering, a solution will be provided adequate to the prevailing risk.



Figure 5: Fire Service Access

Appendix A – Compartmentation Mark Ups

Basement Floor



Ground Floor



Typical Upper



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