Andrews and Boyd

Rose of York - Richmond

Stage 3 Fire Strategy

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Rose of York - Richmond

Stage 3 Fire Strategy

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TABLE OF CONTENTS

1 INTRODUCTION 6
1.1 General Description of the Development 6
1.2 Purpose and Scope of the Report 6
1.3 Legislative Requirements 7
1.4 Principal Guidance Documents 7
1.5 Reference Drawings 8
2 MEANS OF ESCAPE 9
2.1 Evacuation Strategy 9
2.2 Means of Warning and Detection 9
2.3 Horizontal Escape 10
2.4 Stair 1 Clear Width 21
2.5 Vertical Escape Capacity 23
2.6 External Stair Serving First Floor (Stair 2) 24
2.7 Discharge from Stairs 25
2.8 Stairs Serving Ancillary Accommodation 26
2.9 Door Fastenings 26
2.10 General Door Provisions 27
2.11 Disabled Evacuation 28
2.12 Emergency Lighting 28
2.13 Signage 29
3 INTERNAL FIRE SPREAD 30
3.1 Linings 30
3.2 Structural Fire Protection 30
3.3 Compartmentation and Fire Resisting Construction 32
3.4 Fire Doors 33
3.5 Concealed Spaces 35
3.6 Fire Stopping 39
3.7 Openings for Pipes 39
3.8 Mechanical Ventilation and Ductwork 41
4 EXTERNAL FIRE SPREAD 43
4.1 External Wall Construction 43
4.2 Roof Coverings 43
4.3 Space Separation and Unprotected Areas 43
5 FIRE SERVICE ACCESS AND FIRE FIGHTING FACILITIES 45
5.1 Fire Service Access 45
5.2 Hydrant Provision 46
6 PORTABLE FIRE FIGHTING EQUIPMENT 47
7 FIRE SAFETY MANAGEMENT 48
8 CONCLUSION 49
9 LIMITATIONS 50
BIBLIOGRAPHY 51
APPENDIX A –FLOOR PLANS 53

EXECUTIVE SUMMARY

Lawrence Webster Forrest (LWF) has been commissioned by Andrews and Boyd to produce a Stage 3 Fire Strategy for the refurbishment and extension works of the Rose of York - Richmond.

An assessment has been carried out of the information provided by Andrews and Boyd; items of non-compliance have been identified and solutions provided based on the minimum requirements for a satisfactory level of fire safety in accordance with the statutory guidance.

The assessment has not considered any additional requirements associated with property protection and any discussions associated with variations to the prescriptive approach are based on life safety.

This report sets out the performance requirements for various design aspects only. Detailed design to achieve compliance with the standards specified, including the review and selection of products and materials, will be undertaken by others.

It is considered that the outline recommendations in this report will provide sufficient guidance to obtain approval from the relevant authorities and achieve a satisfactory level of safety, commensurate with the risks for the occupied premises.

Table 1 provides an overview of the fire strategy and highlights any areas where the current design deviates away from the prescriptive requirements outlined within the relevant guidance documents. Where the fire strategy report deviates from standard guidance, suitable justification or alternative solutions have been proposed. Further detailed information regarding the areas of non-compliance and any associated justification or alternative solutions can be found in the related sections of this report, as summarised in the table below.

It should be noted that any variations from guidance present a project risk until they have been agreed with the relevant stakeholders; this includes, but is not limited to:

- The client
- The Building Control Body
- The Local Fire Authority

Section	Compliant with Prescriptive guidance?	Further Information
Means Of Escape	No	Report Section 2.3.6: Extended Travel Distance from Plant Room.
		Report Section 2.7: Reduced Clear Width of Stair 1 to 900mm.
Internal Fire Spread - Linings	Yes	-
Internal Fire Spread – Structural Fire Protection	Yes	-
External Fire Spread	Yes	-
Fire Service Access And Fire Fighting Facilities	Yes	-

Table 1 Compliance Overview

1 INTRODUCTION

1.1 General Description of the Development

The Rose of York is an existing building in Richmond which is constructed over a sloping site and contains multiple purpose groups. It is to undergo refurbishment and extension works. The existing building is located over three storeys which includes storage at basement level, Public House facilities at Ground Floor and an underground car park, with letting rooms at Ground and First Floor alongside staff accommodation at First Floor.

The refurbishment and extension works include the following:

- Alterations to the Reception at Ground Floor.
- Creation of additional staff sleeping accommodation at Ground Floor.
- Construction of three additional letting rooms at Ground.
- Demolition of existing staff accommodation at First Floor and creation of a large managers flat and smaller two bedroom staff apartment.
- Construction of 14 letting rooms at First Floor. This includes a new build extension into the existing underground car park beneath the existing lawn.

As a result of the proposed changes, there are to be a total of 27 letting rooms in the development, and three staff apartment units. Public House facilities will remain at Ground Floor only.

1.2 Purpose and Scope of the Report

The purpose of this report is to examine the proposed layouts for the development in relation to fire safety precautions. On examination of the layouts, any deficiencies highlighted have been raised and solutions proposed. If a compliant design cannot be achieved, a fire engineering approach can be adopted to meet the functional requirements of the Building Regulations.

The purpose of this document is to present the findings to the approval authorities, with a view to achieve outline Building Control approval incorporating approvals following consultation with the Fire Authority.

Based on the recommendations provided within this report, it is believed that the premises will be provided with an adequate level of fire safety to satisfy the Building Regulations. As previously stated, the report makes recommendations for life safety only; property protection is not an objective

of the Building Regulations and has not been specifically identified as one of the project design objectives by the client.

1.3 Legislative Requirements

Under the Building Regulations 2010, "Building Work" will be carried out on the development, which after completion will result in an extended building. Therefore, the building will be required to comply with the requirements of Parts B1-B5 of the Building Regulations 2010. Where the existing design did not previously comply with the requirements of the Building Regulations, the design will be made no more unsatisfactory as a result of the proposals.

1.4 Principal Guidance Documents

The principal guidance document used for the evaluation of fire safety precautions for the proposed development will be Volume 2 of Approved Document B: Fire Safety – 2019 edition (ADB) including the May 2020 amendments. Reference will also be made to relevant British and European standards where appropriate.

As outlined in Table 0.1 of ADB, the premises falls under the following Purpose Groups:

Purpose Group	Description	Locations
2(b)[1)]	Residential (Other)	Letting Rooms, Managers Flat, Staff Accommodation
5	Assembly and Recreation	Public House

NOTES:

1. The letting rooms will be classed as "Hotel" accommodation. While the managers flat and staff accommodation may be more akin to a 1(b) Purpose Group i.e. a Flat, the fire strategy for all sleeping accommodation will follow the principles of a Hotel. Staff accommodation will however be separated from the remainder of the building by 60 minute fire resisting construction.

Table 2 Purpose Group Summary

The Building Regulations are fully functional. This means that the guidance given in ADB is not mandatory. Nevertheless, it is intended that due notice will be taken of the guidance and, where appropriate, deviations from the guidance will be discussed and justified based on compensatory measures and fire engineering design.

1.5 Reference Drawings

This report relates to the following plans provided by Andrews and Boyd.

Description	Drawing Number	Rev
Existing Basement Plan	E001	-
Existing Ground Floor Plan	E002	-
Existing First Floor Plan	E003	-
Existing Roof Plan	E004	-
Existing Site Plan	E005	-
Proposed Basement Plan	P005	B
Proposed Ground Floor Plan	P001	D
Proposed First Floor Plan	P002	D
Proposed Roof Plan	P003	D
Proposed Site Plan	P004	F

Table 3 Reference Drawings

2 MEANS OF ESCAPE

2.1 Evacuation Strategy

The building will operate a simultaneous evacuation strategy throughout. This means that the activation of an evacuation signal will give an instantaneous warning from all fire alarm sounders for an immediate evacuation of the whole premises i.e. sleeping accommodation and Public House areas. Although there are multiple purpose groups in the building, a single interconnected fire alarm system is to be provided throughout.

2.2 Means of Warning and Detection

An automatic fire detection and alarm system will be provided throughout the premises. The system will be designed and installed in accordance with BS 5839-1:2017 and will provide coverage to an L1 standard. The objective of a Category L1 system is to offer the earliest possible warning of fire, so as to achieve the longest available time for escape.

Manual break- glass call points should be provided adjacent to all storey exits and final exits from the building.

The fire alarm must be audible throughout the premises with the provision of supplementary visual beacons in locations where the background noise level necessitates the use of ear defenders (e.g. plant rooms). Consideration should also be given to alerting people with hearing and/or visual impairments. Personal Emergency Evacuation Plans (PEEPs) should be put in place for members of staff and regular visitors with disabilities including those with sensory impairments.

It is recommended that the main fire alarm control panel be situated within the reception to the building, where it will be easily accessible to the attending Fire Service.

It is currently not known whether the fire detection and alarm system will be monitored during out of hours, however, this is strongly recommended.

2.3 Horizontal Escape

2.3.1 Occupancy Loads

The minimum required width of escape routes is dependent on the maximum number of people likely to use the escape route in the event of a fire. It is recognised that in this type of environment there is no single occupancy factor which covers all areas at any one time. The occupancy figures will fluctuate at different times.

Area/Room No.	Floor Space (m^2)	Floor Space Factor[1)]	Occupancy (persons)
Basement			
Storage Area (total)	60	30	2
Ground Floor Level			
Public House (within 2m of serving point)	11.5	0.3	38
Public House (Remaining Area)	151	1	151
Bar (Staff Area)	10.5	Number of Staff	4
Kitchen	30	7	4
Reception	30	5	6
Underground Plant Room	69	30	2
Staff Accommodation	-	2 people per bedroom	4
Disabled Bedroom 1	-	2 people per bedroom	2
Bedroom 2	-	2 people per bedroom	2
Bedroom 3	-	2 people per bedroom	2
Bedroom 4	-	2 people per bedroom	2

Area/Room No.	Floor Space (m^2)	Floor Space Factor[1)]	Occupancy (persons)
		Ground Floor Total	**217**
First Floor Level			
Managers Flat	-	2 people per bedroom	4
Staff Accommodation	-	2 people per bedroom	4
Bedroom 5 - Bedroom 27	-	2 people per bedroom	46
		First Floor Occupancy	**54**

NOTES:

1) Where occupant numbers are known, these have been used. Otherwise, a floor space factor has been applied.

Table 4 Occupancy Figures

2.3.2 Number of Exits

In accordance with ADB, the number of escape routes and exits from any room or storey in the building should be provided as shown in Table 5 below.

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

Table 5 Number of escape routes and exits

Current drawings show that the number of exits per room, area and storey are sufficient for the proposed numbers.

2.3.3 Direction of door openings

It should be noted that ADB requires all doors, which may be used by more than 60 people, to open in the direction of escape; if this cannot be achieved, regardless of the width, the maximum number of occupants able to use this door should be limited to 60. The drawings show that all doors which

may be used by more than 60 people in the event of an evacuation, open in the direction of escape; for some of the cross-corridor doors, this means the doors are double swing, provided with vision panels and are able to open in either direction.

2.3.4 Exit Widths

In addition to the number of exits, the width of each exit should be sufficient for the proposed capacity. In order to calculate the required widths of any exits from an area that has more than a single exit, the largest exit is discounted. This ensures that in the event of a fire preventing occupants from using one of the exits, all occupants can still safely escape with the remaining available exits.

Maximum number of persons	Minimum width (mm)
60	750
110	850
220	1050
More than 220	5 per person

Table 6 Exit Widths

The number of exits, their associated clear exit width and occupant capacities are summarised in Table 7.

Location	Exit Provisions (mm)	Exit Capacity	Number of occupants Served
Basement			
Cold Store	1 x 800	60	1
General Storage	1 x 800 (inward opening)	60	1
Ground Floor			
Bar	1 x 900 1 x 900 1 x 1400	220 (note all doors should swing in the direction of escape)	189
Kitchen	1 x 800 1 x 800 (inward opening)	60	7
Reception	1 x 1850 (inward opening)	60	6

Location	Exit Provisions (mm)	Exit Capacity	Number of occupants Served
	1 x 1000		
Plant Room	1 x 850	60	2
Staff Accommodation[1)]	1 x 750	60	4
Letting Rooms[2), 3)]	1 x 750	60	2
First Floor			
Managers Flat	1 x 750	60	4
Letting Rooms[4)]	1 x 750	60	2
North Wing	1 x 800 1 x 2000 opening to landscape	60	16
East Wing	1 x 850	60	12
South Wing	1 x 1000 1 x 800	60	18

NOTES:

1. The Two-bedroom Staff Accommodation at Ground floor is provided with a 750mm wide exit which leads directly to the outside.
2. All letting rooms at Ground Floor except for the Disabled Bedroom are provided with a 750mm wide exit which leads directly to the outside.
3. The Disabled Bedroom is provided with an inward opening 900mm wide exit. Escape is available for occupants of this bedroom through reception where it is then possible to discharge to the outside.
4. All Letting rooms at First Floor are provided with a single means of escape into a protected corridor or to the outside.

Table 7 Number of Escape routes and exits

2.3.5 General Means of Escape Provisions

Stairs Serving the Site

The building and wider site will be provided with stairs as indicated in Table 8.

Stair Number	Width (mm)	Description	Areas Served
Stair 1	900	Protected internal means of escape stair.	North, East, West and South Wings
Stair 2	1000	External Stair	South Wing
Stair 3	3200	External landscape stairs provided with central handrail.	Provides a route to Petersham Road for occupants escaping from North, South and East Wings alongside some occupants escaping from the Public House
Stair 4	830	External landscape stairs.	Provides a route through the landscape for occupants escaping from the North wing to approach Stair 3.
Stair 5	1450	External landscape stairs.	Provides a route to Petersham Road for occupants escaping from the West Wing, and some occupants from the Public House and Reception
Stair 6	830	Internal Protected Stair	Serves basement and discharges into kitchen at Ground Floor

Table 8 Stair Summary

Note a stair capacity calculation has been provided in Table 10.

Ground Floor

The general means of escape provisions for Ground floor are indicated by the green arrows in Figure 1.

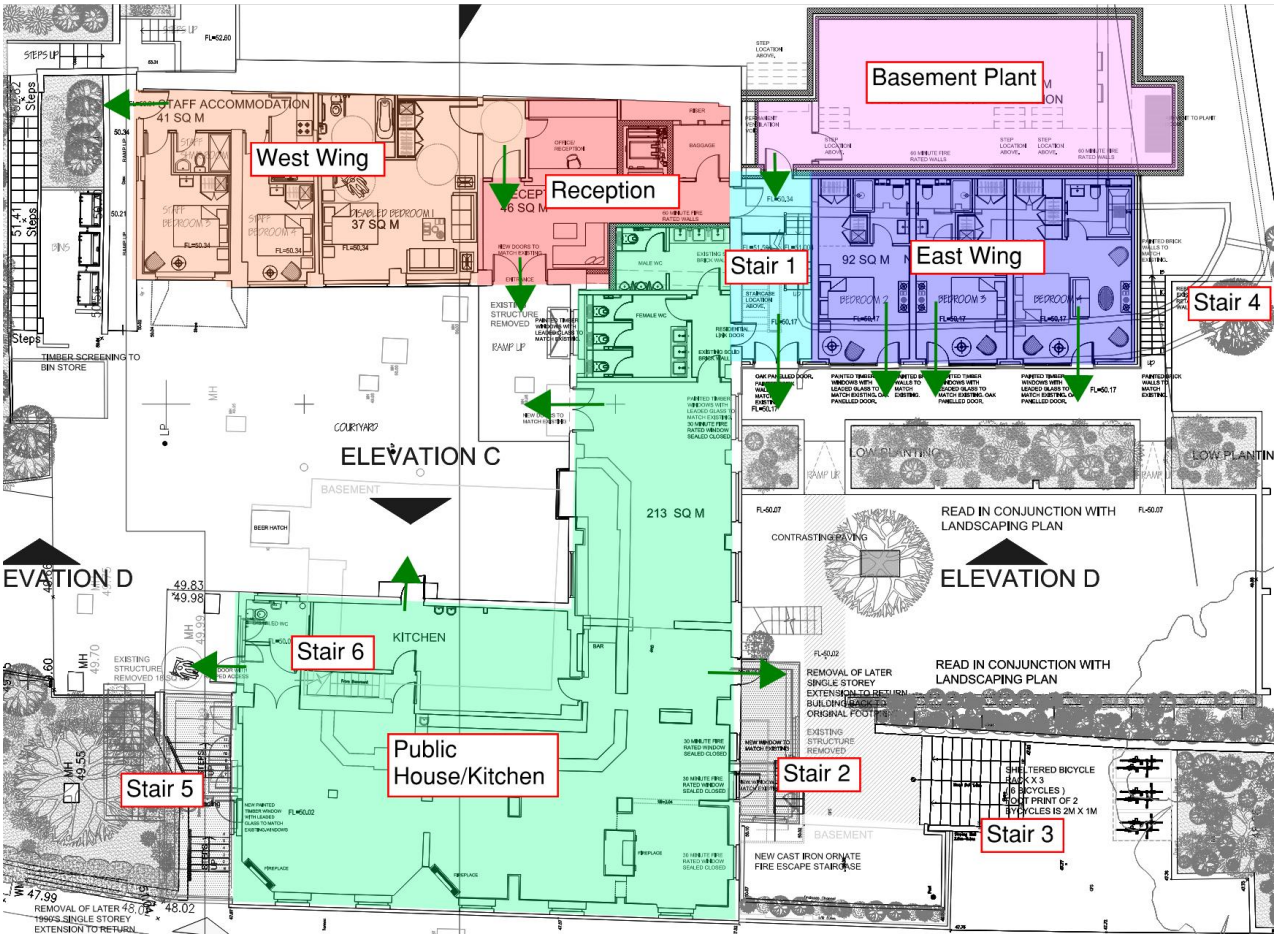


Figure 1: Ground Floor

At Ground Floor, the Public House area of the building is provided with three means of escape doors, which lead directly to outside.

Note: there is a fourth door which leads to the residential access stair, however for security purposes it is proposed not to consider this exit for means of escape.

Occupants of the basement storage area below the kitchen will be the same staff members working in the bar/kitchen at Ground floor. A protected stair (Stair 6) will provide access between kitchen and basement. While the stair does not discharge directly to the outside, this is an existing condition that is being made no more unsatisfactory by the proposals.

Staff accommodation and the Letting Rooms in the new extension (East Wing), will be provided with means of escape leading directly into the landscape. The disabled bedroom at Ground floor will be provided with a means of escape through the reception directly to outside. It is understood that the reception will be manned at all times and will be an area of relatively low fire load. Therefore, it is considered that disabled occupants in close proximity to the reception will be able to escape quickly and safely. Note the following is recommended:

- Management need to ensure that staff are trained in evacuation assistance for disabled occupants.
- Disabled occupants are provided with an additional means of warning alongside the general fire alarm system. This may be in the form of a pager, vibrating pillow or other means deemed suitable by the management. Note this would form part of the emergency evacuation plans developed for the building.

Occupants in the Staff accommodation at Ground will be able to escape directly to the landscape.

Basement occupants of the plant space will have access to Stair 1 for means of escape which discharges directly to the outside.

First Floor

The first floor is separated into four "Wings", North, South, East and West, as shown in Figure 2.

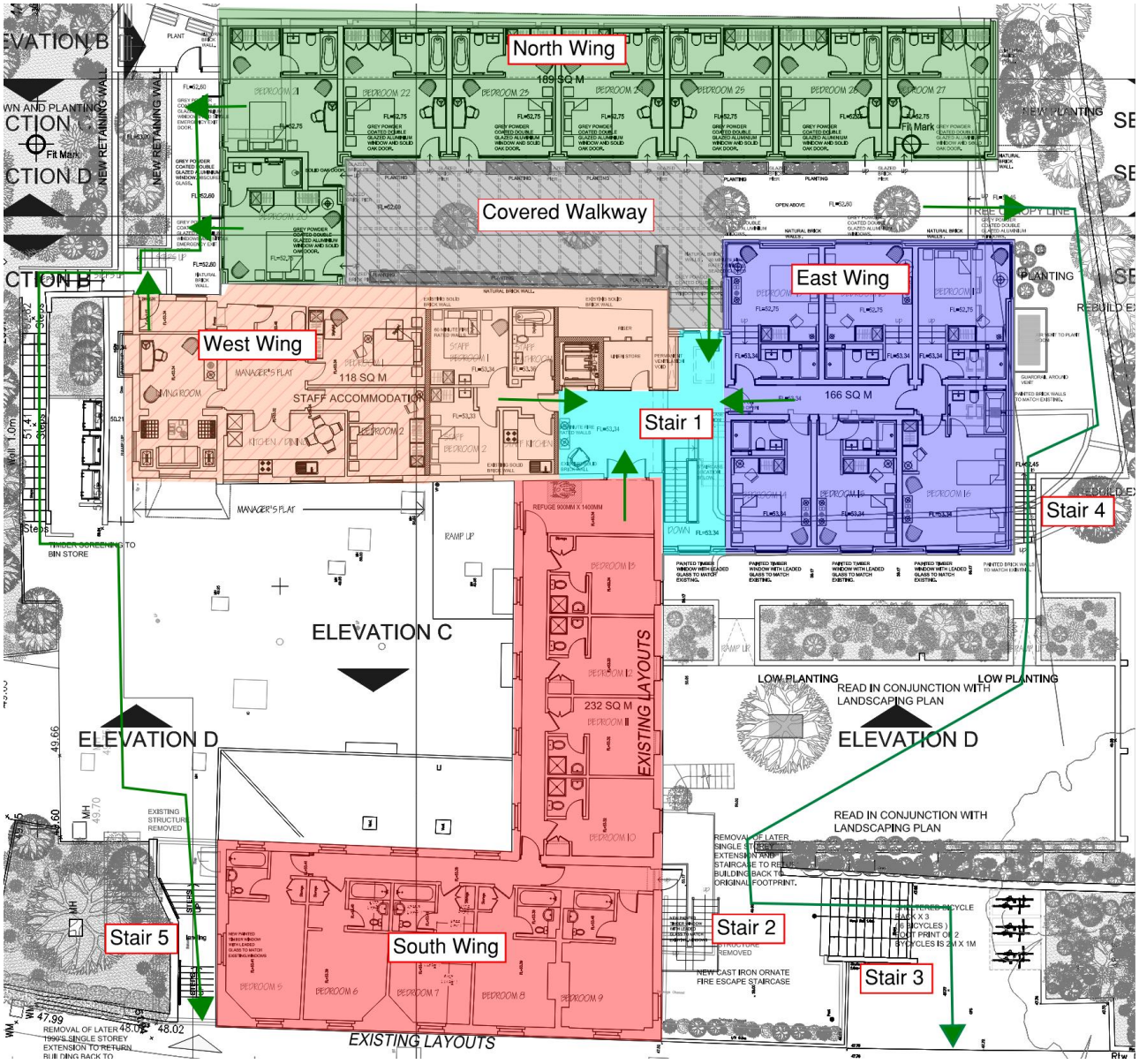


Figure 2: First Floor

North Wing

Occupants in the North Wing will be provided with escape either into Escape Stair 1, or via an open connection to the landscape from which escape is available to Petersham Road (via Stairs 3 and 4).

The primary escape route will lead into Stair 1 as this is likely to be the means by which occupants of the North Wing will access the First Floor. However, the alternative escape is available to the landscape should the access to Stair 1 be unavailable. At First Floor, the escape route leading to Stair 1 from Bedrooms 20-25 is through a covered walkway that is open to the atmosphere at one side which is shown in Figure 2. This opening to the outside provides alternative means of escape if

necessary. Although it should be noted that Bedrooms 20 and 21 will have alternative escape routes leading to the landscape.

East Wing

All occupants of the East Wing will escape directly into Stair 1 through a protected corridor

South Wing

Occupants of the South Wing will escape either directly into Stair 1 or to an external escape stair (Stair 2) which leads to the outside.

West Wing

Occupants of the Staff accommodation/flat will escape directly into Stair 1 at this level, whereas occupants of the Managers Flat will be able to escape directly to the outside.

2.3.6 Travel Distances

Travel distances are limited to the following when using Table 2.1 of ADB:

Description	One direction only (m)	More than one direction (m)
Public House Areas, Reception	18	45
Residential (Other) a. In bedrooms	9	18
b. In bedroom corridors	9	18
c. elsewhere	18	35
Plant room a. Distance within room	9	35
b. Escape route not in open air	18	45

Table 9 Travel Distances

In general, travel distances across the scheme are in accordance with the limitations stated in Table 9 with the exception of the basement plant area. Please refer to the general commentary on travel distances provided below.

Ground Floor

Occupants of the new letting rooms and Staff accommodation will be provided with escape directly to the outside. Travel distances within the room are within the 9m travel distance limit. Once outside, it is considered that occupants are in a place of safety.

At Ground floor, the travel distances from the Public House and Kitchen areas are in accordance with Table 9.

Basement Plant

The maximum single direction of travel from the basement plant area is approximately 12m, this is 3m in excess of the 9m single direction limit recommended above. This relatively small increase in travel distance is considered reasonable based on the commentary below (note this is subject to discussion and agreement with the Statutory Authorities):

- The basement will be provided with an L1 fire detection and alarm system which will provide the earliest possible warning of a fire in the space.
- It is recommended that flashing beacons are provided to ensure a visible warning signal is provided alongside an audible signal.
- Occupants of the basement plant will be able bodied trained personnel who will likely access the space on a permit to work basis, thus being infrequently accessed. Therefore, given the characteristics of the occupants of the space, a 3m increase in travel distance is considered to add a negligible extension to the required travel time.

First Floor

North Wing

The maximum single direction travel distance of 9m is not exceeded in any of the hotel rooms. The longest single direction travel distance at first floor under the covered walkway is measured from Bedroom 25. Occupants can travel 9m in a single direction before they have a choice of escape routes either into Stair 1 or to the landscape.

East and West Wing

Single direction travel distances in rooms and bedroom corridors are all within the 9m travel distance limit for all letting rooms, staff accommodation and the Managers Flat.

South Wing

The single direction travel distances in rooms are within the 9m limit described above. In bedroom corridors, the travel distances are within 9m in a single direction and 35m where an alternative is available.

2.3.7 Inner rooms

There are a number of inner rooms throughout the premises. An inner room is at risk if a fire starts in the access room. For this type of premises, such an arrangement should only be accepted if all of the following conditions are satisfied.

- The occupant number of the inner room does not exceed 60 people.
- The inner room is entered directly from the access room (but not via a corridor).
- The escape route from the inner room does not pass through more than one access room.
- The travel distance from any point in the inner room to the exits from the access room does not exceed the distances outlined in Section 2.3.6
- The access room meets both of the following conditions;
    - It is not a place of special fire hazard.
    - It is in the control of the same occupier.

From the drawings provided, all inner rooms meet the above requirements.

ADB states that an inner room condition is acceptable when one of the following arrangements is in place:

- the enclosures (walls or partitions) of the inner room should be stopped at least 500mm below the ceiling; or
- a suitably sited vision panel not less than 0.1m^2 should be located in the door or walls of the inner room, to enable occupants of the inner room to see if a fire has started in the outer room; or

- the access room should be fitted with a suitable automatic fire detection and alarm system to warn the occupants of the inner room of the outbreak of a fire in the access room.

As a fire detection and alarm system providing coverage to an L1 standard will be fitted throughout the premises, any access rooms will be provided with suitable automatic detection, which will alert occupants within the inner rooms of a fire.

2.4 Stair 1 Clear Width

The proposed clear width of Stair 1 is 900mm which is less than the minimum recommendation of AD-B, for simultaneous evacuation the minimum width of the stair as per AD-B should be at least 1000mm. It is noted that Table 3.1 of AD-B states that where a stair does not serve more than 50 people that a minimum width of 800mm is applicable, and while the upper floor occupancy is assumed to be less than 50, to add a level of robustness to the proposals, a fire engineered assessment has been carried out to demonstrate that the proposals are adequate.

A quantitative comparative analysis has been carried out below which assesses the proposed scenario where a 900mm wide stair serves a floor serving only 46 people, with a code complaint 1000mm wide stair which could effectively serve a floor and provide access for 150 people. The number of people using the stair in the code compliant case will however be reduced to 110 given that the maximum horizontal exit capacity of a 1000mm wide door serving this stair is 110. From the assessment below, a 900mm width stair is considered reasonable in the context of this building.

Note this assessment relates solely to means of escape in a fire scenario, there may be additional requirements under Approved Document M that need to be considered for stairs on the premises.

Number of Occupants

The total number of occupants expected to be on the first floor at any time is 46 people, based on the number of rooms at this level and assuming 2 people per room. Of these occupants at first floor, many will not require the use of Stair 1 for means of escape e.g. those rooms that can escape directly to the outside. However, for conservatism it is assumed that all 46 occupants will use Stair 1.

Flow down a 900mm Stair

As stated above, the expected number of occupants using the stair for means of escape is 46. The width of the final exit at the base of the stair is 1500mm, therefore, it is not considered that this will be a limiting factor in the assessment. A comparison is made below on the time taken for 46 people to pass through a 900mm wide stair when compared to the time taken for 110 people to pass through a 1000mm wide stair, which based on Table 3.2 of AD-B is the capacity of a 1000mm wide stair serving a single storey.

Time taken for 46 people to pass through a 900mm Stair.

The time taken for people to pass through a stair can be taken from the following equations

Stair Width (m) x Flow Rate = Number of Persons per metre per second (1)

Stair Capacity/Number of Persons per metre per second = Time to Exit (2)

Therefore, when equations 1 and 2 are used, the following results are obtained

(0.9-(0.15 x 2)) x 0.94 (From Table G.2 of BS 7974-6) = 0.564 persons/s

46/0.564 = 82 seconds

Note: A boundary layer of 150mm has been subtracted from the clear width of the stair on both sides to produce an effective width.

Time taken for 110 people to pass through a 1000mm Stair.

The time taken for people to pass through a stair has also been calculated using Equations 1 and 2 above. Therefore, when equations 1 and 2 are used, the following results are obtained

(1.0-(0.15 x 2)) x 0.94 (From Table G.2 of BS 7974-6) = 0.658 persons/s

110/0.658 = 167 seconds

Conclusion

The calculated time taken for a reduced upper floor occupancy of 46 people to escape down a 900mm wide stair is significantly less (approx. 85 seconds) than a code compliant scenario in a similar building whereby 110 people could potentially make use of the stair in an evacuation.

2.5 Vertical Escape Capacity

The vertical escape analysis is contained within Table 10 of this report. Should the client provide occupant numbers at the next design stage, this analysis can be updated.

The development is situated on a sloping site, and it is possible for occupants of the North, East and West wings to escape directly to the outside at First Floor if necessary. However, a stair capacity calculation has been considered based on a worst-case scenario of all first-floor occupants evacuating using a stair.

There are a number of stairs in the development as noted on the plans in Appendix A and in Section 2.3.5 of this report.

Stair No	Stair Width (mm)	No. of floors served	Maximum Stair Capacity	Commentary
1	900	1	See Section 2.4.	Could provide escape for all 46 occupants at First Floor if required
2	1000	1	110(1)	Only likely to be used by 18 occupants in South Wing
3	3200	1	640(2)	Can accommodate all occupants of the site if necessary.
4	830	1	50(3)	Could provide escape for all 46 occupants at First Floor if required
5	1400	1	280	Could provide escape for all occupants of the Public House, West Wing and Reception.
6	830	1	50(3)	Sufficient to provide escape for relatively low number of basement occupants.

NOTES

1. While the stair had capacity for 150 people, it can only accommodate 110 people at first floor given that the exit to the stair cannot be wider than the stair. This is well in excess of the expected number of occupants of the South Wing and is therefore provides sufficient exit capacity.
2. Based on Equation (a) of Section 3.18 of AD-B.
3. In accordance with Table 3.1 of AD-B, as the stair is at least 800mm wide, it can accommodate 50 people.

Table 10 Escape Stair Dimensions

It is considered that neither Stair 1 or 2 needs to be discounted from the means of escape calculation from the internal areas of the building based on the following:

- Stair 1 is approached through a protected corridor from the East and West Wings and is approached through a protected lobby from the South Wing. The North wing approach to this stair is partially accessed via a covered walkway which is open at one end. Therefore, given the high degree of protection and multiple approaches, the stair is unlikely to ever be completely blocked by a fire at First Floor.
- Stair 2 is an external stair which is separated from the internal parts of the building by fire resisting construction (see section Appendix A). Therefore, it is unlikely that this stair will be smoke logged.

The overall capacity of Stairs 1 and 2 is sufficient to accommodate the expected first floor occupancy of 46 people. The remaining stairs throughout the site can accommodate the number of people expected to use them.

2.6 External Stair Serving First Floor (Stair 2)

External escape stairs are to be designed in accordance with Section 3.32 of AD-B as follows (note this applies to Stair 2 only):

- Doors to the stair should be fire resisting (minimum FD30) and fitted with a self closing device except for a single exit door from the building to the downward leading external stair provided it is the only door onto the landing.
- Fire resisting construction (minimum 30 minutes) is required for the building envelope within the following zones, measured from the flights and landings of the external stair.
    - 1800mm above and horizontally.
    - 9m vertically below.
    - 1100mm above the top landing of the stair.
- Fire resisting construction (minimum 30 minutes) should be provided for any part of the building (including doors) within 1800mm of the escape route from the foot of the stair to a place of safety. This does not apply if there are alternative escape routes from the foot of the external escape stair.
- Stairs more than 6m in height should be protected from adverse weather. Protection should prevent the build up of snow or ice but does not require a full enclosure.

- Glazing in areas of fire resisting construction should be fixed shut and fire resisting, in terms of integrity but not insulation (minimum 30 minutes).

2.7 Discharge from Stairs

The base of Stair 1 is provided with two potential discharge paths, one of which leads directly to the outside and the other which requires occupants to traverse a route through the Ground Floor reception before escaping to the outside.

The primary escape route from Stair 1 will be via the exit which leads directly to the outside. In accordance with Section 3.30 of AD-B, where a protected stairway is recessed from the adjoining external wall of the building, the minimum distance between an unprotected area of the building enclosure and an unprotected area of the stair enclosure should be 1800mm.

Figure 3 indicates the protection afforded to the wall adjacent the external portion of the escape route from the stair. The construction in this area will achieve at least 30 minute fire resistance and any windows will be fixed shut up to a distance of at least 1800mm from the stair and 1800mm above Ground.

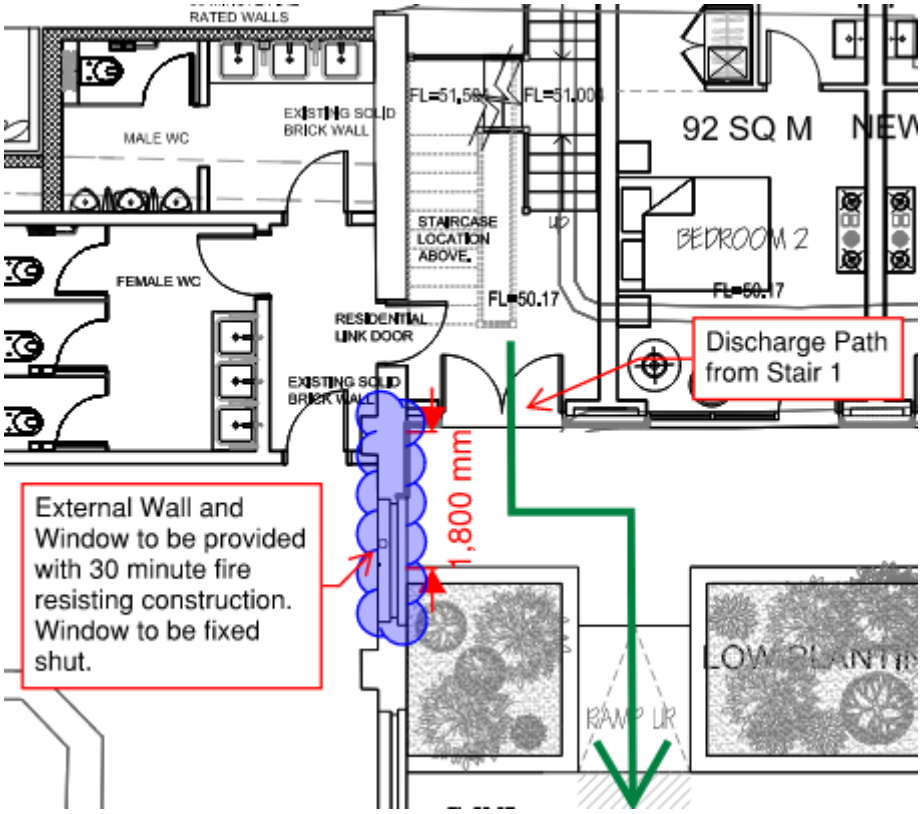


Figure 3 Discharge Path from Stair 1

Occupants discharging down the stair could also escape through the reception if required. The reception will be a managed space, the management strategy for this space should ensure that it is free from a build-up of fire load. The reception is also separated from the Public House by 60 minute fire resisting construction. The inward opening door in the reception leading to the outside can accommodate 60 people, which is in excess of the maximum expected upper floor occupancy.

2.8 Stairs Serving Ancillary Accommodation

The lobby which separates Stair 1 from the basement plant room is to form at least a 30-minute fire resisting enclosure and needs to be ventilated by at least 0.4m^2 permanent natural ventilation.

2.9 Door Fastenings

In general, doors on escape routes should be either of the following.

a. Not fitted with a lock, latch or bolt fastenings.
b. Fitted only with simple fastenings that are all of the following.
    i. Easy to operate; it should be apparent how to undo the fastening.

ii. Operable from the side approached by people escaping.
iii. Operable without a key.
iv. Operable without requiring people to manipulate more than one mechanism.

If a secure door is operated by code or combination keypad, swipe or proximity card, biometric data etc., a security mechanism override should be possible from the side approached by people escaping.

Electrically powered locks should return to the unlocked position in all of the following situations:

a. If the fire detection and alarm system operates.
b. If there is loss of power or system error.
c. If the security mechanism override is activated.

Security mechanism overrides for electrically powered locks should be a Type A call point as described in BS 7273-4: 2015. The call point should be positioned on the side approached by people escaping. If the door provides escape in either direction, a call point should be installed on both sides of the door.

Additionally, as the premises falls under Purpose Group 5, any doors on escape routes from rooms with more than 60 people should be either of the following:

a. Not fitted with locks, latches or bolts.
b. Fitted with panic fastenings in accordance with BS EN 1125:2008.

2.10 General Door Provisions

Doors forming part of the means of escape from, and within, the building should:

- be hung clear of any change of floor level;
- be hung so that they do not reduce the effective width of any escape route across a landing;
- if opening into a corridor, be recessed to the full width of the door;
- where hung to swing both ways (double swing), or subdividing corridors, be provided with a minimum of a vision panel;
- open to an angle not less than 90°.

2.11 Disabled Evacuation

A disabled refuge point will need to be provided in a protected lobby to Stair 1 at First Floor. The refuge will need to be located in the Southern Wing of the building. The refuge point will need to have a minimum dimension of 1400mm x 900mm and will not reduce the width of the escape route or obstruct the flow of occupants evacuating the building.

An emergency voice communication (EVC) system, complying with BS 5839-9: 2011 should be provided, allowing communication between the refuge point and the main receiver station. The location of the main receiver station is yet to be confirmed.

It is the responsibility of the person(s) having responsibility for the premises to provide an emergency evacuation plan for all people with reduced mobilities likely to be in the premises, including disabled people, and how that plan will be implemented. Such an evacuation plan should not rely upon the intervention of the Fire and Rescue Service to make it work.

As the project is currently at the design stage, the evacuation strategy for disabled persons has not yet been produced, however, the strategy should consider the evacuation of disabled persons to a place of ultimate safety.

Consideration should also be given to occupants with hearing and/or visual impairments. Personal Emergency Evacuation Plans (PEEPs) should be put in place for members of staff and regular visitors with disabilities including those with sensory impairments.

General Emergency Evacuation Plans (GEEPs) should also be put in place. A GEEP covers the same points as a PEEP, but instead of being focused on an individual person, it will accommodate any disabled or mobility impaired people who could have access to the building.

2.12 Emergency Lighting

Emergency lighting will be installed in accordance with BS 5266:2016 and BS EN 1838:2013 throughout the premises. Emergency luminaries should be sited on escape routes to final exits, and external emergency lighting should be installed on those discharge points unless the area is satisfactorily lit by independent external lighting.

The emergency lighting system will need to be provided with testing facilities such as key operated test-switch for each circuit, to enable the un-switched supply to each luminaire/circuit to be isolated for test.

2.13 Signage

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

3 INTERNAL FIRE SPREAD

3.1 Linings

In accordance with ADB, the internal linings for the building are recommended to be as detailed below in Table 11.

Location	Classification
Small rooms with a floor area less than 30m^2 in non-residential accommodation	D-s3, d2
Other rooms	C-s3,d2
Other circulation spaces	B-s3, d2$^{(1)}$
NOTES: (1) Wallcoverings which conform to BS EN 15102, achieving at least class C-s3, d2 and bonded to a class A2-s3, d2 substrate, will also be acceptable.	

Table 11 Classification of linings

It should be noted that parts of walls in rooms may be of lower performance than that stated in Table 11, but no worse than class D-s3, d2. In any one room, the total area of lower performance wall lining should be less than an area equivalent to half of the room's floor area, up to a maximum of 60m^2 in non-residential accommodation.

3.2 Structural Fire Protection

In accordance with the guidance given in ADB, all elements of structure will be provided with fire protection to achieve a minimum of 60 minutes fire resistance as outlined in BS 476 and Appendix B, Table B3 of ADB. This requirement also applies to any element of structure that supports or provides stability to another.

An element of structure can be any one of the following (list not exhaustive):

a) A member that forms part of the structural frame of a building, or any other beam or column;
b) A loadbearing wall or loadbearing part of a wall;
c) A floor;
d) A gallery (but not a loading gallery, fly gallery, stage grid, lighting bridge, or any gallery provided for similar purposes or for maintenance and repair);

e) An external wall;

f) A compartment wall (including a wall that is common to two or more buildings).

The following are excluded from the definition of 'element of structure'.

a) A structure that supports only a roof, unless either of the following applies.
   i) The roof performs the function of a floor, such as for parking vehicles, or as a means of escape.
   ii) The structure is essential for the stability of an external wall that needs to be fire resisting (e.g. to achieve compartmentation or for the purposes of preventing fire spread between buildings).
b) The lowest floor of the building.
c) A platform floor.
d) A loading gallery, fly gallery, stage grid, lighting bridge, or any gallery provided for similar purposes or for maintenance and repair.
e) External walls, such as curtain walls or other forms of cladding, which transmit only self-weight and wind loads and do not transmit floor load.

In accordance with Table B3 and B4 of ADB, the fire rating of elements of structure should be as follows:

Element of structure	**Minimum provisions when tested to the relevant parts of BS 476 (minutes)**			**Method of Exposure**
	Load-bearing capacity [1]	**Integrity**	**Insulation**	
Structural frame, beam or column	60	N/A	N/A	Exposed faces
Load-bearing wall element	60	N/A	N/A	Each side separately
Compartment Floor	60	60	60	From underside
External wall less than 1m away from the relevant boundary	60	60	60	Each side separately
External wall 1m or more away from the relevant boundary [2]	60	60	15	From inside the building

Element of structure	Minimum provisions when tested to the relevant parts of BS 476 (minutes)			Method of Exposure
	Load-bearing capacity [1]	Integrity	Insulation	
Compartment walls	60	60	60	Each side separately

NOTES:

1. Applies to load-bearing elements only
2. Such walls may contain areas that do not need to be fire resisting (unprotected areas).

Table 12 Recommended Fire Resistance Period for Elements of Structure

3.3 Compartmentation and Fire Resisting Construction

The main objective of compartmentation is to prevent rapid fire spread, which may prevent occupants of the building from escaping safely. Compartmentation reduces the chance of a fire becoming large, thereby protecting the means of escape and also reducing the likelihood of fire spread to neighbouring buildings.

Due to the building being multi-occupied, compartment walls and floors should be provided to separate the different occupancies.

The compartmentation and fire resisting construction requirements are outlined in the table below and should be read in conjunction with the indicative fire strategy drawings contained in Appendix A.

Part of building	Minimum provisions when tested to the relevant parts of BS 476 (minutes)			Method of Exposure
	Load-bearing capacity [1]	Integrity	Insulation	
Compartment Floors	60	60	60	From underside
Compartment Walls	60	60	60	Each side separately
Protected Stair	60	60	60	Each side separately
Service Risers	60	60	60	Each side separately

Part of building	Minimum provisions when tested to the relevant parts of BS 476 (minutes)			Method of Exposure
	Load-bearing capacity [1]	Integrity	Insulation	
Protected lobby/corridor enclosure	30	30	30	Each side separately
Subdivision of a corridor	30	30	30	Each side separately
Places of special fire hazard	30	30	30	Each side separately
Cupboards, store rooms, comms and server rooms and service risers which don't breach compartment floors	30	30	30	Each side separately
Protection to external escape stair	30	30	-	From inside the building
Plant Rooms	60	60	60	Each side separately
Cavity Barriers	N/A	30	15	Each side separately
NOTES: 1. Applies to load-bearing elements only.				

Table 13 Recommended Periods of Fire Resistance for Compartmentation Elements

3.4 Fire Doors

Fire doors are to be provided in accordance with Table 14 and as per the indicative fire strategy plans in Appendix A.

Location of door	Minimum period of fire resistance	Comments
Enclosing a protected shaft forming a stairway	FD30S	Must be self-closing.
Enclosing a protected shaft forming a lift well or service shaft	FD30	Self-closing devices are not required to cupboards and service ducts which are normally kept locked shut. They are also not required on lift landing doors.

Location of door	Minimum period of fire resistance	Comments
Forming part of the enclosure of a protected lobby/corridor	FD30S	Must be self-closing.
Doors within any other thirty minute fire resisting enclosure	FD30S	Must be self-closing.
Doors within the compartment walls separating purpose groups[1)]	FD60S	Must be self-closing.
Doors within compartment walls used to sub-divide larger compartments	FD60S	Must be self-closing.
Doors to plant rooms	FD60S	Must be self-closing or kept locked shut.

NOTES:

1) Two fire doors may be fitted in the same opening if each door is capable of closing the opening, so the total fire resistance is the sum of their individual resistances. If the opening is provided as a means of escape, both fire doors should be self-closing.

Table 14 Fire Door Provision

All fire doors should be fitted with a self-closing device, except for fire doors to cupboards and service ducts which are normally kept locked shut.

In accordance with ADB, all fire doors should be marked with the appropriate fire safety sign conforming to BS ISO 3864-1 according to whether the door is:

- to be kept closed when not in use (Fire door keep shut);
- to be kept locked when not in use (Fire door keep locked shut); or
- held open by an automatic release mechanism (Automatic fire door keep clear).

Fire doors to cupboards and to service ducts should be marked on the outside. All other fire doors should be marked on both sides. It should be noted that lift entrance doors do not need to be marked.

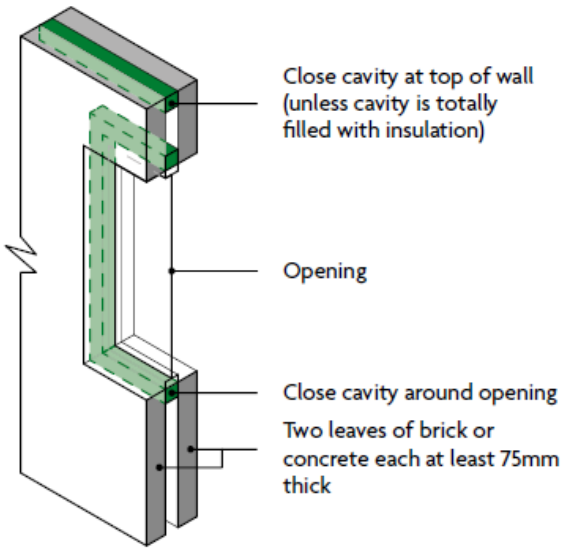
3.5 Concealed Spaces

Concealed spaces and cavities in the building can allow the rapid unseen spread of fire and smoke to areas remote from the seat of an incident. To reduce the potential for fire spread, cavity barriers should be provided to divide cavities and to close the edge of cavities.

In accordance with ADB, cavity barriers should be provided in accordance with Figure 5 and includes, but is not limited to the following:

- all junctions between an external cavity wall and every compartment floor and compartment wall;
- at the edges of cavities, including around openings (such as windows, doors and exit/entry points for services);
- all junctions between an internal cavity wall and every compartment floor, compartment wall, or other wall or door assembly which forms a fire-resisting barrier;
- for a protected escape route, i.e. protected corridor, a cavity that exists above or below any fire resisting construction should either be fitted with cavity barriers on the line of the enclosure to the protected escape route or for the cavities above the fire resisting construction, enclosed on the lower side by a fire resisting ceiling which extends throughout the building, compartment or separated part.

The above does not apply where a wall meets the conditions outlined in Figure 4 below.



NOTES:

1. Materials used to close the cavity in this arrangement do not need to achieve a specific performance in relation to fire resistance.
2. Domestic meter cupboards may be installed provided that the following conditions are met:
   a. There are no more than two cupboards per dwelling
   b. The openings in the outer wall leaf are not bigger than 800×500mm for each cupboard
   c. The inner leaf is not penetrated except by a sleeve not more than 80×80mm, which is fire-stopped.
3. Materials achieving class B-s3, d2 or worse may be placed within the cavity.

Figure 4 Cavity walls excluded from provisions for cavity barriers

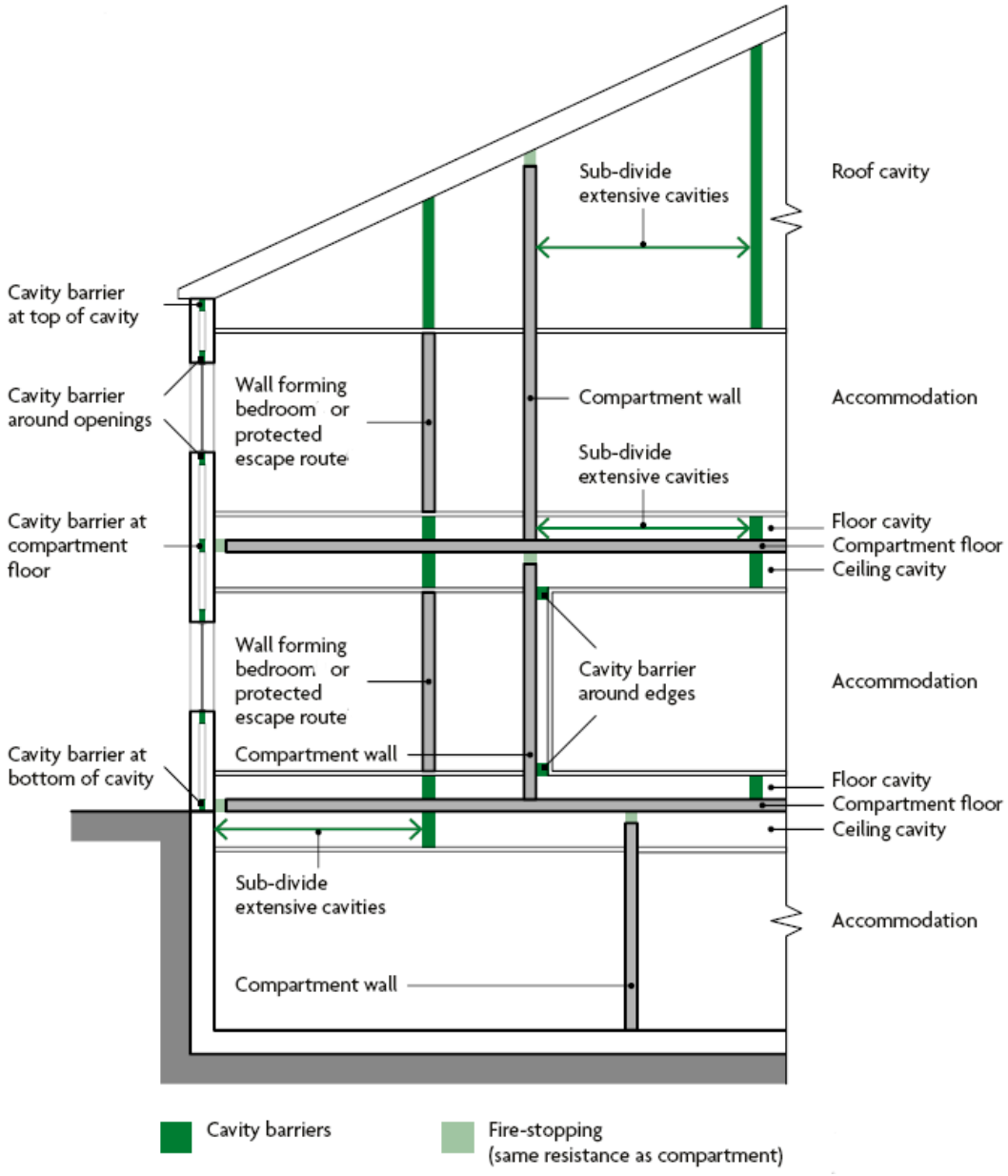


Figure 5 Provisions for Cavity Barriers

If concealed spaces or cavities are created, cavity barriers will be required. The cavity barriers must provide a minimum of 30/15 minutes' fire resistance period in term of integrity and insulation respectively. Cavity barriers must be securely supported to guarantee integrity and insulation properties irrespective of the failure of un-rated components.

Cavity barriers should be tightly fitted to a rigid construction and mechanically fixed in position. If this is not possible (e.g. where a cavity barrier joins to slates, tiles, corrugated sheeting or similar materials) the junction should be fire-stopped.

Cavity barriers should be fixed so their performance is unlikely to be made ineffective by any of the following.

a. Movement of the building due to subsidence, shrinkage or temperature change, and movement of the external envelope due to wind.
b. During a fire, collapse of services penetrating the cavity barriers, either by the failure of the supporting system or through degradation of the service itself (e.g. by melting or burning).
c. During a fire, failure of the cavity barrier fixings. (In roof spaces, where cavity barriers are fixed to roof members, there is no expectation of fire resistance from roof members provided for the purpose of support.)
d. During a fire, failure of any material or construction to which cavity barriers abut. (For example, a suspended ceiling that continues over a fire resisting wall or partition collapses, and the cavity barrier fails prematurely because the ceiling was not designed to provide a minimum fire resistance of EI 30.)

Cavity barriers in a stud wall or partition, or provided around openings, may be formed of any of the following:

a. Steel, a minimum of 0.5mm thick.
b. Timber, a minimum of 38mm thick.
c. Polythene-sleeved mineral wool, or mineral wool slab, under compression when installed in the cavity.
d. Calcium silicate, cement-based or gypsum-based boards, a minimum of 12mm thick.

It should be noted that these do not necessarily achieve the integrity and insulation performance specifications required (i.e. 30 minutes integrity, 15 minutes insulation).

Cavity barriers provided around openings may be formed by the window or door frame, if the frame is constructed of steel or timber of the minimum thickness in (a) or (b), as appropriate.

3.5.1 Extensive Cavities

Cavity barriers should be used to divide any cavity (including roof spaces). Table 15 sets out maximum dimensions for undivided cavities.

Location of cavity	Class of surface/product exposed in cavity (excluding the surface of any pipe, cable or conduit, or any insulation to any pipe)	Maximum dimension in any direction (m)
Between roof and a ceiling	Any	20
Any other cavity	Class C-s3, d2 or better	20
	Worse than Class C-s3, d2	10

Table 15 Maximum dimensions of cavities in buildings other than dwellings

Table 15 does not apply to any of the following cavities:

a) A cavity in a wall that is fire resisting only because it is loadbearing.
b) A cavity in a wall that meets the conditions of Figure 4.
c) A floor or roof cavity above a fire resisting ceiling that extends throughout the building or compartment to a maximum of 30m.
d) In a building not put to residential or institutional use, a cavity that does not contain materials achieving class B-s3, d2 or worse and is formed either:
    i. behind the external skin of an external cladding system with a masonry or concrete inner leaf a minimum of 75mm thick;
    ii. by overcladding an existing masonry (or concrete) external wall or an existing concrete roof.
e) A cavity below a floor next to the ground or next to oversite concrete, if either:
    i. the cavity is less than 1000mm in height;
    ii. the cavity is not normally accessible by people, unless there are openings in the floor such that it is possible for materials to accumulate in the cavity (in which case cavity barriers should be provided and access should be provided to the cavity for cleaning).

If a single room with a ceiling cavity or underfloor cavity exceeds the dimensions outlined in the table above, cavity barriers need only be provided on the line of the enclosing walls/partitions of that room, if both of the following apply:

a) The cavity barriers are a maximum of 40m apart.
b) The surface of the material/product exposed in the cavity is class C-s3, d2 or better.

3.6 Fire Stopping

All penetrations through fire separating elements should be adequately fire stopped or sealed to ensure that the integrity and performance of the element is not impaired. Areas that will require fire stopping will be around pipe and cable services, ventilation ducts and flues and junctions between fire separating elements.

All elements and services that penetrate a compartment wall, floor or other element of fire resisting construction are to be fire stopped using a method appropriate to the element penetrated and the surrounding construction.

Typical fire stopping materials include:

- cement mortar
- gypsum-based plaster
- cement-based or gypsum-based vermiculite/perlite mixes
- glass fibre, crushed rock, blast furnace slag or ceramic-based products (with or without resin binders) and
- intumescent mastics.

Systems used must be designed, installed, tested and maintained in full accordance with the relevant standards (BS 476 and BS 1366-3) and the ASFP Approved Code of Practice.

3.7 Openings for Pipes

Pipes passing through a fire-separating element, unless in a protected shaft, should comply with one of the following options:

Option 1

Provide a proprietary, tested sealing system that will maintain the fire resistance of the wall, floor or cavity barrier.

Option 2

Fire-stop around the pipe, keeping the opening for the pipe as small as possible. The nominal internal diameter of the pipe should not exceed the dimensions outlined in the table below.

Situation	Pipe material and maximum nominal internal diameter (mm)		
	High melting point metal (1)	**Lead, aluminium alloy, uPVC(2), fibre-cement**	**Any other material**
Structure (but not a wall separating buildings) enclosing a protected shaft that is not a stairway or a lift shaft.	160	110	40
Any other situation	160	40	40

NOTES:

1. Any metal (such as cast iron, copper or steel) which, if exposed to a temperature of 800°C, will not soften or fracture to the extent that flame or hot gas will pass through the wall of the pipe.
2. uPVC pipes that comply with either BS 4514 or BS 5255.

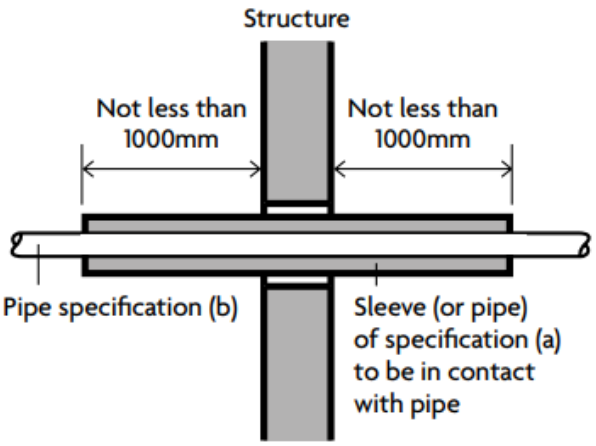
Table 16 Maximum nominal internal diameter of pipes passing through a compartment wall/floor

Option 3

A pipe with a maximum nominal internal diameter of 160mm may be used with a sleeve made out of a high melting point metal, as shown below, if the pipe is made of one of the following:

- Lead
- Aluminium
- Aluminium Alloy
- Fibre-cement
- uPVC (pipes should also comply with either BS 4514 or BS 5255)

A high melting point metal means any metal (such as cast iron, copper or steel) which, if exposed to a temperature of 800°C, will not soften or fracture to the extent that flame or hot gas will pass through the wall of the pipe.



NOTES:

1. Make the opening in the structure as small as possible and provide fire-stopping between pipe and structure.
2. See Table 16 for materials specification.
3. The sleeve should be class A1 rated.

Figure 6 Pipes penetrating structure

3.8 Mechanical Ventilation and Ductwork

Ductwork should not help to transfer fire and smoke through the building. Terminals of exhaust points should be sited away from final exits, cladding or roofing materials achieving Class B-s3, d2 or worse and openings into the building.

It should be noted that ventilation ducts supplying or extracting air directly to or from a protected stairway should not also serve other areas. A separate ventilation system should be provided for each protected stairway.

A fire and smoke damper should be provided where ductwork enters or leaves each section of the protected escape route it serves. It should be operated by a smoke detector or suitable fire detection system. Fire and smoke dampers should close when smoke is detected.

In a system that recirculates air, smoke detectors should be fitted in the extract ductwork before both of the following:

a) The point where recirculated air is separated from air to be discharged to the outside.
b) Any filters or other air cleaning equipment.

When smoke is detected, detectors should do one of the following.

i. Cause the system to immediately shut down.
ii. Switch the ventilation system from recirculating mode to extraction to divert smoke to outside the building.

Non-domestic kitchens and plant rooms should have separate and independent extraction systems; extracted air should not be recirculated.

Any ventilation ductwork will need to be fire protected where it penetrates a fire separating element. As ventilation ducts provide a potential route for fire spread through the duct, consideration of how this will be fire stopped must also be made. Four basic methods should be considered:

- Method 1 - protection using thermally activated fire dampers;
- Method 2 - protection using fire resisting enclosures;
- Method 3 - protection using fire resisting ductwork;
- Method 4 - protection using automatically activated fire and smoke dampers triggered by smoke detectors.

Methods 1 and 4 should not be used for extract ductwork serving kitchens; the likely build-up of grease within the duct can adversely affect dampers. From the plans provided, it would appear that only tea points are provided, however, should cooking facilities be provided, the above should be adhered to.

Thermally activated fire dampers should not be used for extract ductwork which passes through the enclosure of a protected escape route; this is due to the fact that large volumes of smoke could still pass the thermal device without triggering them.

Fire dampers should conform to BS EN 15650 and should have an E classification of at least 60 minutes when tested to BS EN 1366-2 and classified in according with BS EN 13501-3.

Fire and smoke dampers should conform to BS EN 15650. They should have an ES classification equal to, or greater than, 60 minutes when tested to BS EN 1366-2 and classified in according with BS EN 13501-3.

Adequate means of access should be provided to allow inspection, testing and maintenance of the fire damper and its actuating mechanism.

The fire-stopping around fire dampers, fire resisting ducts, fire and smoke dampers and smoke control ducts should be in accordance with the manufacturer or supplier's installation instructions.

4 EXTERNAL FIRE SPREAD

4.1 External Wall Construction

The height to the top of the building is approximately 10m when measured from the lowest Ground level. (considering the sloping site). Therefore, the minimum classification of external wall materials in line with Table 12.1 of AD-B should achieve at least Class C-s3,d2.

4.2 Roof Coverings

Roof coverings are to comply with the recommendations of Table 14.1 of AD-B which has been extracted in Table 17.

Designation of covering of rood or part of roof	**Minimum distance from any point on relevant boundary**			
European Class	**Less than 6m**	**At least 6m**	**At least 12m**	**At least 20m**
B_{ROOF}(t4)	Acceptable	Acceptable	Acceptable	Acceptable
C_{ROOF}(t4)	Not Acceptable	Acceptable	Acceptable	Acceptable
D_{ROOF}(t4)	Not Acceptable	Acceptable (1)(2)	Acceptable (1)	Acceptable
E_{ROOF}(t4)	Not Acceptable	Acceptable (1)(2)	Acceptable (1)	Acceptable(1)
F_{ROOF}(t4)	Not Acceptable	Not Acceptable	Not Acceptable	Acceptable (1)(2)

NOTES:

1. Not acceptable on any of the following buildings
   - Industrial, storage, or other non-residential purpose group buildings of any size
   - Any other buildings with a cubic capacity of more than 1500m^3.
2. Acceptable on buildings not listed in Note 1, if part of the roof is no more than 3m2 in area and is at least 1500mm from any similar part, with the roof between the parts covered with a material rated class A2-s3,d2 or better.

Table 17 Limitations on Roof Coverings

4.3 Space Separation and Unprotected Areas

A space separation analysis has been carried out using the enclosing rectangle method outlined in BR 187. Note that the following assumptions have been made:

Assumptions:

- The new North Wing of the development is built as an extension beneath the existing lawn. As such, there is no external elevation for the North wing and therefore no need to assess under the tables method.
- The existing external elevation of the South Wing facing Petersham road is not being altered as a result of the works and therefore has not been assessed in the space separation analysis.
- The southern elevation of the East wing has been assessed as part of the analysis on the basis that it is new construction.

Building Characteristics	East Elevation	South Elevation	West Elevation
Boundary Distance (m)	3.8	20	9.6
Description of Boundary	Site Boundary	Site Boundary	Site Boundary
Type of Occupancy	Residential (Other)	Residential (Other)	Residential (Other)
Enclosing Rectangle Height (m)	9	3.0	3
Enclosing Rectangle Width (m)	12.9	11.5	11
Enclosing Rectangle Area (m^2)	38.7	34.5	33
BRE Height (m)	3.0	3.0	3
BRE Width (m)	15	12	12
BRE Area (m^2)	45	36	36
Allowed BRE Unprotected Area (%)	96	100	100
Comment	Allowed BRE Unprotected Area > Enclosing Rectangle. Therefore, no additional fire resistance is required to external elevation	NA	NA

Table 18 Space Separation Analysis

5 FIRE SERVICE ACCESS AND FIRE FIGHTING FACILITIES

5.1 Fire Service Access

Based on the floor area of the building, fire service access should be provided to 15% of the perimeter for a pump appliance. Based on the site layout, this appears to be achievable. The external perimeter of the site is approximately 182m. Assuming the fire vehicle can access the site from Petersham road as indicated in Figure 7, they will be able to access at least 43m of the perimeter which is approximately 24% of the overall perimeter.

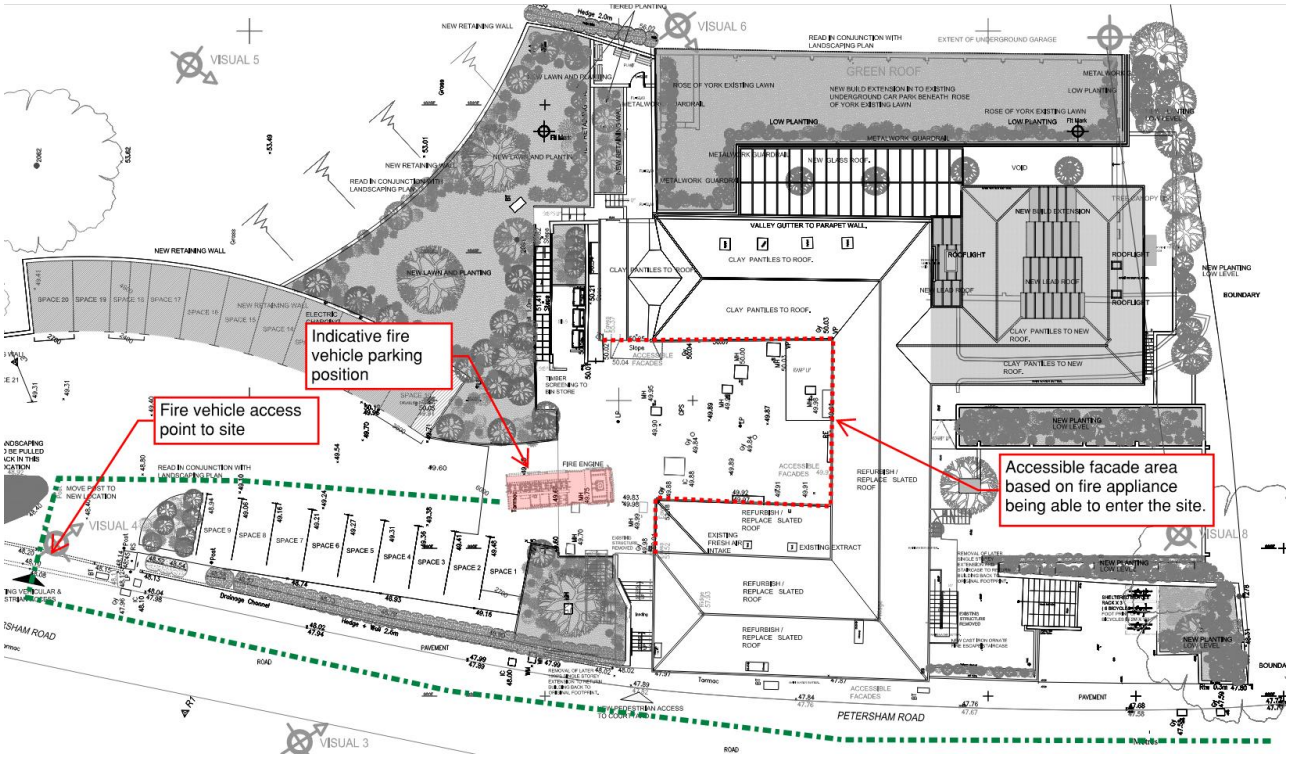


Figure 7: Fire Vehicle Access

Any roads or surfaces providing fire appliance access should comply with the widths and hard standing requirements outlined in AD-B as shown in Table 19. As Petersham road is a public highway it is assumed to comply with the requirements outlined below.

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:

1. Fire appliances are not standardised. The Building Control body may, in consultation with the local fire and rescue service, use other dimensions.

Table 19 Vehicle Access Route Specification

5.2 Hydrant Provision

Existing hydrant provision to the site is currently unknown. However, if the building is located more than 100m away from an existing hydrant, then additional hydrants will be required. Should additional hydrants be required, these should be located no more than 90m away from an entrance to the building and no more than 90m apart. Hydrant provisions to be confirmed in the site wide services information.

6 PORTABLE FIRE FIGHTING EQUIPMENT

A detailed analysis of the risks within the building should be undertaken with portable fire-fighting equipment (PFFE) provided accordingly.

Portable fire extinguishers should be selected and installed in accordance with BS 5306-8:2012 and BS 5306-3:2017.

Normally, extinguishers should be located in conspicuous positions where they will be readily seen by persons following an escape route, i.e. room exits, corridors, stairways, lobbies and landing. Extinguishers should be sited in such a way that it is not necessary to travel more than 30m from the site of the fire to reach an extinguisher.

7 FIRE SAFETY MANAGEMENT

On occupation of the building, a fire safety risk assessment will need to be carried out to comply with the Regulatory Reform Order (Fire Safety) 2005. The fire risk assessment will need to consider the level of management on site, which should ensure that there is always a sufficient number of staff on duty to manage the requirements of the fire strategy for the building.

The management fire safety procedures should recognise that to compliment the passive and active fire safety measures, there must be a safe and effective procedure in the form of a fire evacuation plan. The management plan should ensure that the reception area is a well-managed space and will undergo regular inspections to ensure it is kept free of fire load at all times.

When this plan is in place, it will be rehearsed in the form of staff training and fire/evacuation drills.

The emergency plan together with the notices and procedures detailed in this report will need to form the basis of the management commitment to ensure that effective fire safety procedures are maintained.

Records of all staff training should be maintained in a Fire Safety Logbook.

8 CONCLUSION

The proposals outlined in this document demonstrate a level of fire safety equal to or greater than the general standard implied by compliance with the recommendations in Approved Document B. The information contained within this report will be subject to discussion and agreement with the Statutory Authorities, with specific attention being drawn to the areas which deviate from the prescriptive requirements outlined in Table 1.

9 LIMITATIONS

The information limitations and assumptions used in the preparation of this report are described below.

Building Regulations

This report considers Building Regulations which deal with life safety only. Property protection, business continuity and insurance issues are not addressed in this report.

Other Limitations

Complying with the recommendations of this report will not guarantee that a fire will not occur. This report has been prepared for sole benefit, use and information of Andrews and Boyd and other members of the design team and the liability of LWF, its directors and employees, in respect of the information contained in this report, will not extend to any third party.