

Detailed Fire Strategy Report

The Mission House
19 Royal Pier Road
Gravesend, DA12 2BD

Version	Status	Date Issued	Comment	Prepared by	Reviewed by	Verified by
01	Draft	20.07.2021	DRAFT for comment by the Design Team	EP	AT	AT
02	Final	25.08.2021	Updated following client meeting and review of FRA	EP	AT	AT
03	Final	22.09.2021	Updated following updated drawings	EP	AT	AT

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LIST OF AMENDMENTS

The table below lists the amendments made between the different versions of this report.

It should be noted that only the main changes are illustrated and therefore, it is recommended that the whole report is studied.

V3		
Section	Page	Amendment reference
§2.2	5	Figure 2 updated.
§3	6-7	Deviations table updated.
§4.5	9	Reference to AOV and Basement updated.

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1 INTRODUCTION

1.1 SCOPE

FCS-Live have been appointed to produce a Detailed Fire Strategy report for the project known as The Mission House, 19 Royal Pier Road, Gravesend DA12 2BD.

The Detailed Fire Strategy is intended for discussion between the design team and to assist the design team in gaining approval in principle from the Building Control Body.

This report is based on the guidance illustrated in Approved Document B – Volume 2: 2019, including 2020 amendments (ADB).

This report follows the main sections of ADB; however, in specific areas fire engineering may have been utilised to justify deviations from the guidance. Such deviations are presented in each section as appropriate. These justifications are subject to approval by the Approving Authorities and until then should be registered as risk items.

The design team should ensure that the contents of this report are fully incorporated in the building design.

This report should form part of the information handed over to the end user, as per Regulation 38 of The Building Regulations 2010 (as amended in 2020).

1.2 PRIMARY LEGISLATION

The primary fire legislation applicable to this development is as follows.

- The Building Regulations 2010 (as amended in 2020): Pre-occupation;
- The Regulatory Reform (Fire Safety) Order 2005: Post-occupation;
- Construction (Design and Management) Regulations: 2015;

The Building Regulations 2010 (as amended in 2020)

ADB is guidance approved and issued by the Secretary of State for the purpose of providing practical guidance with respect of the requirements of Schedule 1 and Regulation 7 of The Building Regulations 2010 (as amended in 2020).

Responsibility for deciding if the requirements of the Regulations have been met, rests with the Building Control body.

Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform (Fire Safety) Order 2005 (FSO) is a primary piece of legislation relating to fire safety in existing, non-domestic premises and the common areas of residential buildings and is enforced by the local Fire Authority.

Responsibility for ensuring that the requirements of the Order are met, rests with the 'Responsible Person', who must undertake (or cause to undertake) a fire risk assessment for the purpose of identifying the fire precautions required.

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Construction, Design and Management Regulations 2015

UK projects are subject to the requirements of the Construction (Design and Management) Regulations: 2015 (CDM).

Where any conclusions or recommendations contained within this report specify materials, products or forms of construction, these will have been assessed in accordance with CDM - Regulations 11 and 18 (duties for designers).

If these involve significant residual risks or health and safety critical assumptions, this information will be made available to the principal designer. Where the architect or other consultants use all or part of this report to specify works, they are assumed to be competent in alerting the client, principal designer, designers, contractors and building occupier of issues arising under the CDM.

Statutory Consultation

During the Building Regulations application process, the Building Control body is required by law to consult with the Fire Authority. The purpose of this consultation is to give the Fire Authority an opportunity to make observations, with respect to The Building Regulations 2010 (as amended in 2020), and to provide an opportunity to make the applicant aware of action that may have to be taken in order to meet the requirements of the FSO.

If the Fire Authority require physical changes to be made to the building, in order to meet the requirements of the FSO, the Building Control body has a legal responsibility to pass on all comments and recommendations to the applicant/responsible person. The applicant should take note of all comments and where necessary, implement these into the buildings design.

It is the responsibility of anyone carrying out building work to comply with the relevant requirements of the Building Regulations. The Approved Documents associated with the Regulations provide guidance for some of the more common building situations. However, there may well be alternative ways of achieving compliance with the requirements.

The *Building Regulations and Fire Safety Procedural Guidance* was updated in July 2020. This guide explains the steps involved in approving the fire safety aspects of building work, and the interaction between the Building Regulations and other statutory requirements in England and Wales. If the procedures described in this guide are followed prior to work commencing on site, developers and designers will be able to receive fire safety information relevant to the Building Regulations and other statutory approvals in time to avoid abortive work. Although the Procedural Guide has no legal force, it is intended that all Building Control Bodies and fire safety enforcing Authorities should use the consultation procedures described in it as a model for arrangements they make.

<https://www.labc.co.uk/sites/default/files/2020-07/LABC.Building-Regulations-and-Fire-Safety-Procedural-GuidanceV2.150720.pdf>

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1.3 FIRE SAFETY OBJECTIVES

This report aims to satisfy the following statutory fire safety objectives.

Occupants' life safety

The occupants must be able to escape the building without being exposed to hazardous or untenable conditions. This shall be satisfied by meeting the Functional Requirements B1 to B3 of The Building Regulations 2010 (as amended in 2020).

Protection of adjoining buildings

Structures must not collapse onto adjacent property and fire spread by radiation shall not occur. This shall be satisfied by meeting the Functional Requirement B4 of The Building Regulations 2010 (as amended in 2020).

Firefighters' life safety

Firefighters must be given a reasonable time to rescue any remaining occupants before hazardous conditions develop or structure collapse occurs. This shall be satisfied by meeting the Functional Requirement B5 of The Building Regulations 2010 (as amended in 2020).

1.4 SOURCES OF INFORMATION

This report is based on the drawings referenced in Appendix A.

1.5 LIMITATIONS AND ASSUMPTIONS

This report is based on the following assumptions and limitations.

- This report is based on the information provided by Graham Simpkin Planning, the latest Fire Risk Assessment (FRA) report dated 28/07/2021 by Active Fire Management Ltd and the drawings listed in Appendix A;
- The description of the works which have been covered by the report are listed in §1.1;
- It has been assumed that all other parts of the building design are in accordance with The Building Regulations 2010 (as amended in 2020);
- It is assumed that the completed development will be used as defined (under the specific purpose groups and level of fire risk attached to these uses). Any change to the use or level of fire risk within the development and its surroundings will require further assessment and potentially a new fire strategy report to achieve compliance;
- The development is to be managed, operated and maintained in accordance with the guidance provided in each relevant section of this report;

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2 INTRODUCTION

2.1 SITE LOCATION

The site is located at 19 Royal Pier Road, Gravesend, DA12 2BD, as shown in the figure below.

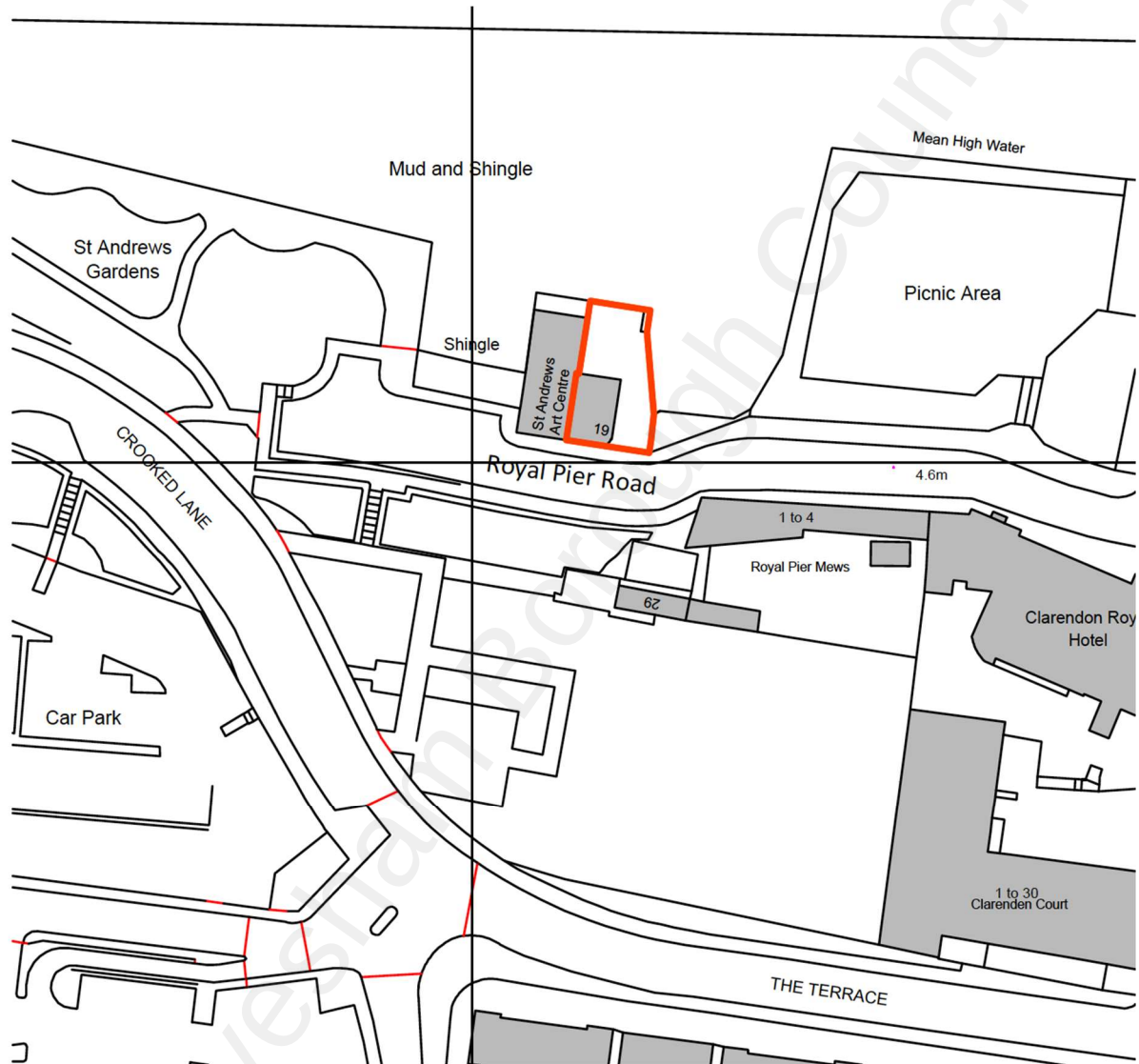


Figure 1: Site location

2.2 BUILDING DESCRIPTION

The Mission House is an existing residential building that is proposed to be converted to office accommodation. It will consist of Basement and Ground to 2nd floor level and will be served internally by two protected stairs (i.e. Stair A, spanning Ground to 2nd floor level and Stair B, spanning Basement to Ground).

The description of the type of accommodation per floor level is detailed in the table below.

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Floor	Accommodation		Served by	Height/Depth ^{A)}
Basement	Ancillary	Storage ¹⁾	Stair B	Comment ²⁾
Ground to 2 nd	Office	Office	Stair A	Comment ²⁾
	Ancillary	Staff room, WC		

Note ^{A)}: The height is measured from ground floor to the floor slab of the top floor level that includes habitable space.

Comment ¹⁾: The drawings provided currently do not illustrate the exact use; however, the FRA report classifies the rooms on this floor level as storage.

Comment ²⁾: No section or elevation drawings have been provided currently and therefore, the depth/height of the building have been assumed to be less than 3.00m/less than 11.0m, respectively. This is subject to further clarification by the design team.

Table 1: Type of accommodation/Floor level(s)

The figure below illustrates the layout of all floor levels (i.e. Basement to 2nd floor level).

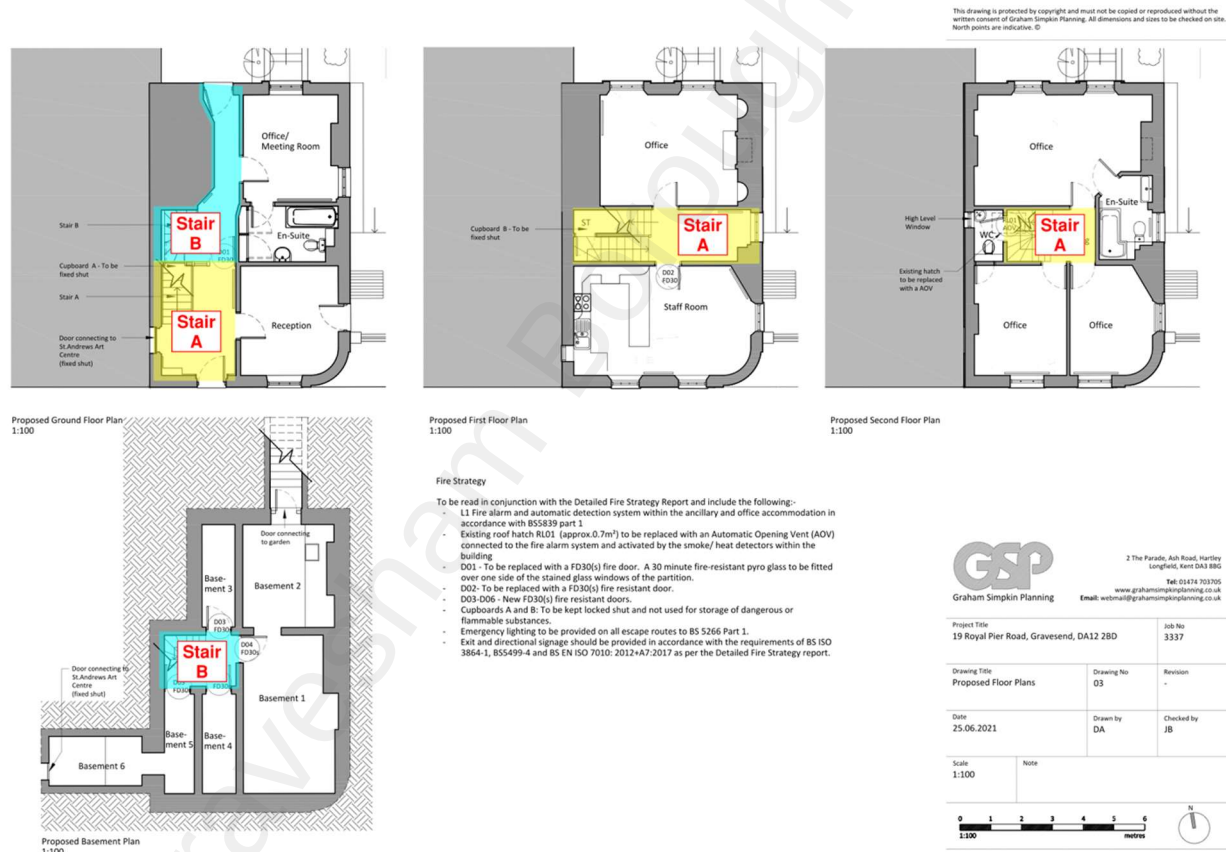


Figure 2: Basement to 2nd floor level layout

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3 VARIATIONS TO STANDARD GUIDANCE

The table below lists the deviations from the guidance of ADB, in addition to the analysis methodology proposed for the fire engineering justification.

The following actions should be registered as approvals risk items until agreed with the Approving Authorities.

Clause/Recommendation	Deviation/Justification
Office buildings provided with a single staircase should include protected lobbies or corridors to the means of escape.	The building is assumed to be below 11.0m in height and is therefore considered acceptable to be provided with a single means of escape (i.e. via Stair A). However, as the building is only provided with a single stair, a stair lobby is required on all floor levels (except the top storey), as per Section 3.34 of ADB. This is not currently provided and considering the nature of the building (i.e. Grade II listed), providing a lobby is not considered a feasible option. Therefore, it is proposed that the OV at the top of the staircase is designed as an automatic openable vent (AOV) which will achieve at least 0.7m² free opening area and connected to the fire alarm system to operate following activation of the smoke/heat detector anywhere in the building. This has been discussed with the clients Design Team.
Places that could contain hazardous materials should not open directly into the means of escape.	It is understood from the drawings provided that both on Ground and 1st floor levels, a storage cupboard is included within Stair A. As the aforementioned cupboard could potentially be utilised for storage of flammable substances, it is classified as a place of special fire hazard for the worst-case scenario and thus, a protected lobby provided with 0.4m² passive ventilation should be included between Stair A and the aforementioned unit, as per Section 3.35 of ADB. This is not currently provided and considering the nature of the building (i.e. Grade II listed), providing a lobby is not considered a feasible option. Therefore, it is proposed that the storage unit is not utilised for storage and is kept locked shut at all times. This has been discussed with the clients Design Team.

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The minimum width for doors utilised for means of escape is set to be 750mm, as per ADB.	None of the office or ancillary rooms within the building is expected to include more than 60 occupants at any one time. On this basis, the number of exits provided are considered sufficient. However, the doors are measured to be less than 750mm wide (i.e. measured to 710mm); on the basis that the total occupancy of the building will be limited to less than 60 people, it is considered acceptable to utilise the current escape doors.
Where escape is not direct to the outside, refuge areas should be provided.	Typically, within an office accommodation, where escape is not available directly to the outside (i.e. 1st and 2nd floor level), refuge areas should be provided within the main staircase. However, it is understood that no occupants are proposed to use the building who have a known disability or impairment and a lift has not been provided to access the upper floors, therefore, the provision for refuge points is not considered a reasonable adjustment. Where temporary impairments are identified to building users, specific access and evacuation plans are to be put in place, noted and recorded in the building fire risk assessment. This is subject to agreement with the Approving Authorities and until then should be registered as an approvals risk.

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4 MEANS OF WARNING AND ESCAPE

4.1 EVACUATION PHILOSOPHY

The evacuation strategy for the entire building (i.e. office and ancillary accommodation) will be simultaneous on activation of the fire alarm and automatic detection system.

4.2 AUTOMATIC FIRE DETECTION AND ALARM

A summary of the fire alarm and detection systems is shown in the table below.

Accommodation	Detection and alarm category designed in accordance with BS 5839: Part 1		
	Minimum level	Proposed level	Comments
Office	Manual	L1	automatic detection/Alarm system
Ancillary	Manual	L1	automatic detection/Alarm system

Table 2: Fire alarm and detection systems

The fire alarm and automatic fire detection system within the **office** accommodation will be designed in accordance with BS 5839 Part 1 to a category L1 Standard.

The fire alarm and automatic fire detection system within the **ancillary** accommodation will be designed in accordance with BS 5839 Part 1 to a category L1 Standard.

The above standard has been confirmed to be achieved in the FRA report by Active Fire Management.

Fire Alarm Systems (Voice messaging system)

Fire Alarm Systems (Voice messaging system) are not required in this building and compliance is achieved with a standard cause and effect fire alarm.

4.3 CAUSE AND EFFECT

The cause and effect principles are summarised in the table below.

Accommodation	Cause	Effect
Office	Smoke/Heat detector activated	Alarm signal sounds throughout the building. AOV at the head of Stair A will activate ^{A)} ;
Ancillary	Smoke/Heat detector activated	Alarm signal sounds throughout the building;
Note ^{A)}: No roof plan has been provided currently and thus, the provision for an AOV at the head of Stair A is subject to further confirmation by the design team.		

Table 3: Cause and effect

The above is only an indicative cause and effect matrix, presented in order to assist the design team. A detailed cause and effect design will be developed by the specialist fire alarm/electrical contractor.

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4.4 TRAVEL DISTANCES

Travel distances for the different parts of the building should be in accordance with the guidance stated in ADB, presented below.

Accommodation	Travel within	Maximum travel distance			
		Single Means of Escape		Alternative Means of Escape	
		Direct ^{A)}	Actual	Direct ^{A)}	Actual
Office		12.0m	18.0m	30.0m	45.0m
Ancillary	Places of special fire hazard ^{B)}	6.00m	9.00m	12.0m	18.0m
	Elsewhere	12.0m	18.0m	30.0m	45.0m
Note ^{A)}: Where the internal layout (i.e. internal fittings, furniture arrangement, etc.) is not known, the travel distance is assessed on a direct basis (i.e. 2/3^{ds} of the actual travel distance). Note ^{B)}: The following are classified as places of special fire hazard: transformer rooms, switch gear rooms, boiler rooms, storage space for fuel and flammable substances.					

Table 4: Travel distance requirements

4.5 ESCAPE WITHIN THE OFFICE ACCOMMODATION

The building is assumed to be below 11.0m in height and is therefore considered acceptable to be provided with a single means of escape (i.e. via Stair A). However, as the building is only provided with a single stair, a stair lobby is required on all floor levels (except the top storey), as per Section 3.34 of ADB. This is not currently provided and considering the nature of the building (i.e. Grade II listed), providing a lobby is not considered a feasible option. Therefore, it is proposed that the OV at the top of the staircase is designed as an automatic openable vent (AOV) (which will achieve at least 0.7m²) free opening area and, connected to the fire alarm system and to operate following activation of the smoke/heat detector anywhere in the building. This has been discussed with the clients Design Team.

It is understood from the drawings provided that both on Ground and 1st floor level, a storage cupboard is included within Stair A. As the aforementioned cupboard could potentially be utilised for storage of flammable substances, it is classified as a place of special fire hazard for the worst-case scenario and thus, a protected lobby provided with 0.4m² passive ventilation should be included between Stair A and the aforementioned unit, as per Section 3.35 of ADB. This is not currently provided and considering the nature of the building (i.e. Grade II listed), providing a lobby is not considered a feasible option. Therefore, it is proposed that the storage unit is not utilised for storage and is kept locked shut at all times. This has been discussed with the clients Design Team.

The travel distance requirements stated in Table 4 of this report above are satisfied within the office accommodation and thus, no further comments or recommendations are made.

A number of inner room situations are currently included in the design; therefore, these should be designed in accordance with Section 2.11 of ADB.

It is stated in the FRA report that the door separating basement to ground floor is replaced with an FD30(s) type, self-closing fire door in addition to fitting clear 30-minute fire-resistant *pyro* glass over one side of the existing stained-glass windows of the partition.

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4.6 ESCAPE WITHIN THE ANCILLARY ACCOMMODATION

The travel distances within the ancillary accommodation (assumed to be storage units, as stated in the FRA report) should be in accordance with the travel distance requirements stated in Table 4 of this report, following the fit-out design.

It is understood that the Staff Room on 1st floor level will include cooking facilities ^{A)}; therefore, it will be enclosed in 30-minute fire-resisting construction and an FD30(s) standard fire door.

Note ^{A)}: Although the FRA report makes statement about microwave facilities only, it has been confirmed by the clients Design Team that a hob is also included and thus, the Staff Room is treated as having cooking facilities.

4.7 WIDTH OF ESCAPE ROUTES/EXITS

General

Where the expected occupancy to be accommodated exceeds 60 people, then the door should open towards the direction of escape.

The accommodations should be designed based on the minimum number of routes/exits and widths presented in the tables below.

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

Table 5: Minimum number of escape routes/exits

Maximum number of persons	Minimum width of escape routes/exits
60	750mm
110	850mm
220	1050mm
More than 220	5mm per person

Table 6: Minimum widths

Occupancy and escape routes/exit assessment

None of the office or ancillary rooms within the building is expected to include more than 60 occupants at any one time. On this basis, the number of exits provided are considered sufficient; however, the doors are measured to be less than 750mm wide (i.e. measured to 710mm); on the basis that the total occupancy of the building will be limited to less than 60 people, it is considered acceptable to utilise the current escape doors.

4.8 WIDTH OF ESCAPE STAIRS

General

The stairs should be at least as wide as the exits opening onto them.

The final exit route from the stairs and the final exit door from the stairs should be at least as wide as the stairs.

The stairs should maintain their width throughout the building.

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Staircase width assessment

Stair A is measured to be approximately 1000mm wide

Stair B is measured to be approximately 750mm wide.

None of the office or ancillary rooms within the building are expected to include more than 60 occupants at any time; therefore, the stair widths provided are considered sufficient for this purpose.

4.9 AUTOMATIC FIRE SUPPRESSION

The building will not be provided with an automatic fire suppression system.

4.10 EMERGENCY LIGHTING

Emergency lighting should typically be provided throughout the development in accordance with the recommendations of BS 5266-Parts 1 and 7 and will be included in the following areas (where applicable).

Areas requiring escape lighting	Escape lighting duration required
Premises used as sleeping accommodation	3 hours non-maintained to all escape routes/corridors/stairs
Access rooms	3 hours non-maintained
Open-plan areas greater than 60m ²	3 hours non-maintained
Areas outside the building leading to a place of safety	3 hours non-maintained

Table 7: Emergency lighting

Emergency lighting shall be provided on all escape routes. The installation shall also comply with the Codes of Practice for Emergency Lighting BS 5266 Part 1.

4.11 ESCAPE ROUTE SIGNAGE

Escape signage should typically be provided above storey exits and final exit doors from the common areas within the accommodation (where applicable).

Emergency escape signage will be required to meet the requirements of the Regulatory Reform (Fire Safety) Order 2005. Exit and directional signage should be provided in accordance with the requirements of BS ISO 3864-1, BS 5499-4 and BS EN ISO 7010: 2012+A7:2017 and will be located as follows (except for escape routes which are in ordinary use).

- All designated escape routes or escape routes across open areas will be provided with signage, especially stairs and other changes in level and direction;
- The position of all doors and other exits sited on escape routes, including storey exits and final exits will be identified by signs;
- Where an escape route from a room is not conspicuous or confusion could occur, the route will be indicated by a sign, including intermediate signs where necessary;
- All changes of direction in corridors, stairways and open spaces forming part of an escape route will be marked with intermediate signs. Each intermediate door or junction will be similarly signed.

It is recommended that the final signage provision is agreed with the Approving Authorities prior to occupation of the building.

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Other Signage

Fire resisting doors, fire exit doors and escape routes in and around the building will be provided with signage meeting the recommendations of BS5499-Part 5.

4.12 OCCUPANTS WITH A DISABILITY OR IMPAIRMENT

Typically, within an office accommodation, where escape is not available directly to the outside (i.e. 1st and 2nd floor level), refuge points should be provided. However, it is understood that no occupants with a disability or impairment will be visiting the aforementioned levels as a lift has not been provided, and therefore this is subject to agreement with the Approving Authorities and until then should be registered as an approvals risk.

Gravesham Borough Council

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5 INTERNAL FIRE SPREAD

5.1 INTERNAL LININGS

The wall and ceilings should meet the recommendations presented in the table below.

Location	Class of lining	
	National class ^{A)}	European class ^{B)}
Small rooms of area up to: • 30m ² in non-residential accommodation;	3	D-s3, d2
Other rooms	1	C-s3, d2
Circulation spaces	0	B-s3, d2
Note ^{A)}: National Classifications are based on tests in BS 476 Part 4, 6 and 7. Note ^{B)}: The European classifications are described in BS EN 13501-1.		

Table 8: Wall and ceiling linings

The class of linings recommended in the table above can be downgraded (but not less than Class 3 or D-s3, d2) in walls of rooms, providing the total area of those parts in any one room does not exceed one half of the floor area of the room and subject to a maximum of 60m² in non-residential accommodation.

It should be noted that the reduction in classification does not apply to circulation routes/escape routes but small rooms outside of these areas.

5.2 ELEMENTS OF STRUCTURE

Where one element of structure supports or gives stability to another, the supporting element should have no less fire resistance than the other element. The measures also provide for elements of structure that are common to more than one building or compartment and these should be constructed to the relevant provisions. Any elements of structure which only support themselves or a roof do not require any fire resistance.

Elements of the structure are based on the height of the top floor level within the building.

The height of the building is assumed to be less than 11.0m, but over 5.00m from ground floor and Fire Service access level.

Based on the above, the minimum period of fire resistance for all elements of structure is to be 60 minutes.

Including, but not limited to, structural frame, load bearing walls, protected shafts and any space that connects compartments such as stairs and service shafts should be considered a protected shaft and should be constructed accordingly. Openings within a protected shaft (doors, etc.) will be fire resistant to at least half the recommended rating of the shaft in which they are located.

5.3 FIRE RESISTANCE

General

Places of special fire hazard (transformer rooms, switch gear rooms, boiler rooms, storage space for fuel and flammable substances) will be enclosed into fire resisting construction affording at least 30 minutes of fire resistance.

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Openings in compartment walls will be limited to the passage of service ducts and access doors fitted with smoke seals. Where service ducts pass through compartment walls these will be provided with a fire and smoke damper. All openings will be provided with a period of fire resistance which is half to the wall they are provided within, and the fire doors are to be locked closed.

Fire resistance/Fire door assessment

The elements within the building will follow the follow recommendations, in regard to the fire resistance.

Element	Fire resistance	Fire door
Elements of structure	60 minutes	N/A
Compartment floor (Basement/Ground)		N/A
Stair A & B		FD30(s)
Staff Room (1 st floor level)	30 minutes	FD30(s)
Places of special fire hazard		FD30(s)

Table 9: Fire resistance/Fire door requirements

5.4 FIRE STOPPING

Any openings for services (exceeding a dimension set out in the table below) breaching compartment walls will be fire stopped (unless protected throughout their entire length with fire resisting material).

This is to prevent the passage of fire and assist in retarding the movement of smoke. Joints between elements of structures that serve as barriers to fire will be fire-stopped to prevent the passage of fire and smoke.

Situation	Pipe material and maximum nominal internal diameter (mm)		
	Non-combustible material	Lead, Aluminium, Aluminium alloy, uPVC, Fibre cement	Any other material
Structure (but not a wall separating buildings) enclosing a protected shaft which is not a staircase or a lift shaft	160	110	40
Compartment Wall or Compartment floor	160	160 (stack pipe) 110 (branch pipe)	40
Any other situation	160	40	40

Table 10: Permitted pipe penetration details

The figure below illustrates typical fire stopping details. It is only indicative and is presented in order to assist the design team. A detailed fire stopping design will be developed by the specialist contractor in accordance with ASFP guidance (coloured books).

Fire Strategy

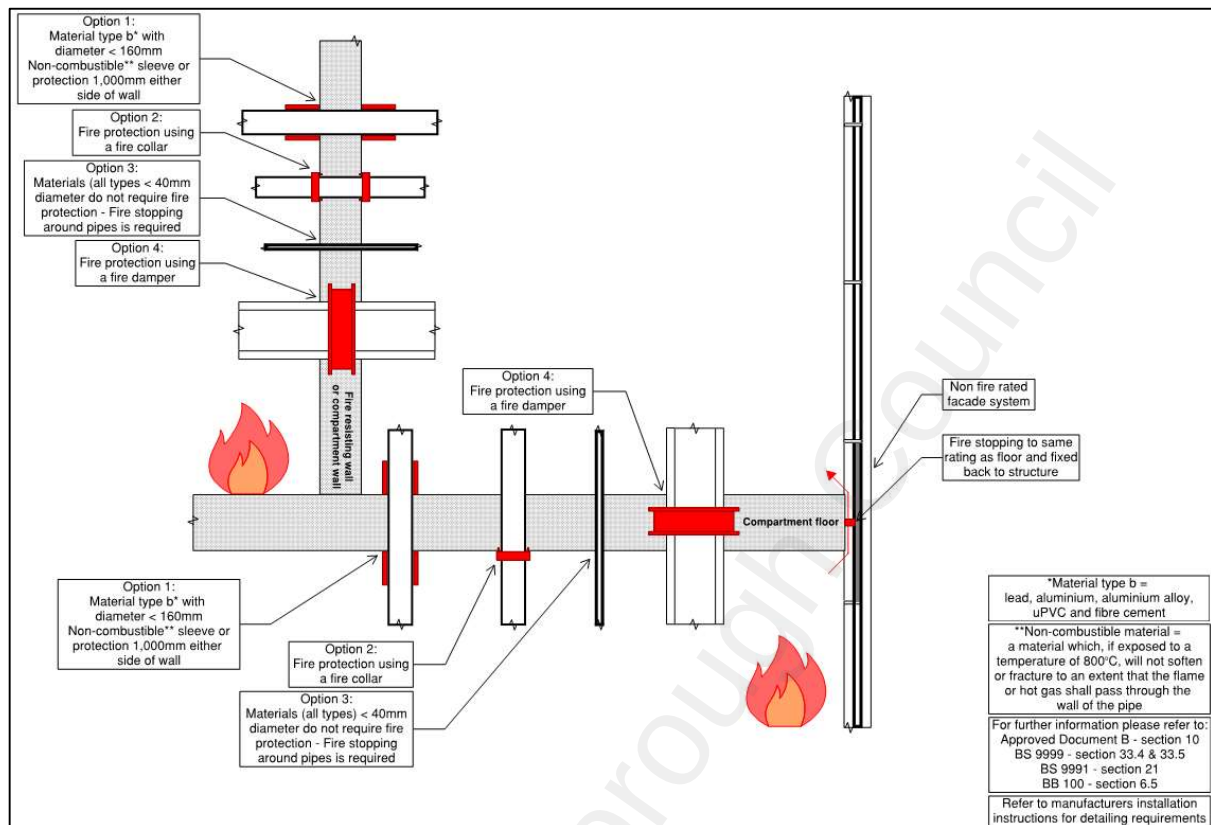


Figure 3: Fire stopping details

5.5 CAVITY BARRIERS

Cavity barriers will be included in any large cavity with the potential for extensive unseen fire spread. The key areas that require cavity barriers are as follows:

- At the junction between an external cavity wall and a compartment wall that separates buildings; and at the top of such an external cavity wall;
- At the junction between an external cavity wall and every compartment floor and compartment wall;
- At the junction between a cavity wall and every compartment floor, compartment wall, or other wall or door assembly that forms a fire-resisting barrier;
- In a protected escape route, above and below any fire-resisting construction that is not carried full storey height;
- Within the void behind the external face of rain screen cladding at every floor level and on the line of compartment walls abutting the external wall;
- At the edges of cavities (including around openings, i.e. windows).

In addition to the above locations, cavity barriers are also normally required in cavities (including ceiling voids and under floor service voids) where the cavity exceeds 20m. However, ADB makes the recommendation those cavity barriers (including dampers in air conditioning ductwork) can be omitted, resulting in unlimited cavity sizes providing the criteria outlined in Paragraph 9.12 of ADB are adopted.

There are a number of certain situations that have to be achieved for the removal of cavity barriers in this situation and each project must be assessed on its individual conditions and merits as stated below.

If larger cavities are required a summary of the necessary provisions are listed below:

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ADB recommendations from §9.12
A) The room and the cavity together are compartmented from the rest of the building
B) An automatic fire detection and alarm system meeting the relevant recommendations of BS 5839-Part 1 is fitted in the building (however detectors are not required in the cavity) if it meets certain criteria ^{A)}
C) The cavity is used as a plenum and the recommendations about re-circulating air distribution systems in BS9999 are followed
D) The surface of the ceiling exposed in the cavity is Class 0 and the supports and fixings in the cavity are non-combustible construction
E) The flame spread rating of any pipe insulation system is Class 1
F) Any electrical wiring in the void is laid in metal trays, or in metal conduit
G) Any other materials in the cavity are of limited combustibility
Note ^{A)}: Detectors are required in voids that exceed 800mm in depth, in order to satisfy the requirements stated in BS5839-Part 1.

Table 11: Cavity details

The cavity barriers will provide at least 30 minutes fire rating (i.e. 30 minutes integrity and 15 minutes insulation).

Any penetrations through the cavity barriers will be either fitted with a proprietary sealing system, or pipes of limited diameters that are sealed with fire-stopping or sealed with sleeving of non-combustible pipe material.

The figure below illustrates typical cavity barrier details. It is only indicative and is presented in order to assist the design team. A detailed cavity barrier design will be developed by the specialist fire stopping contractor.

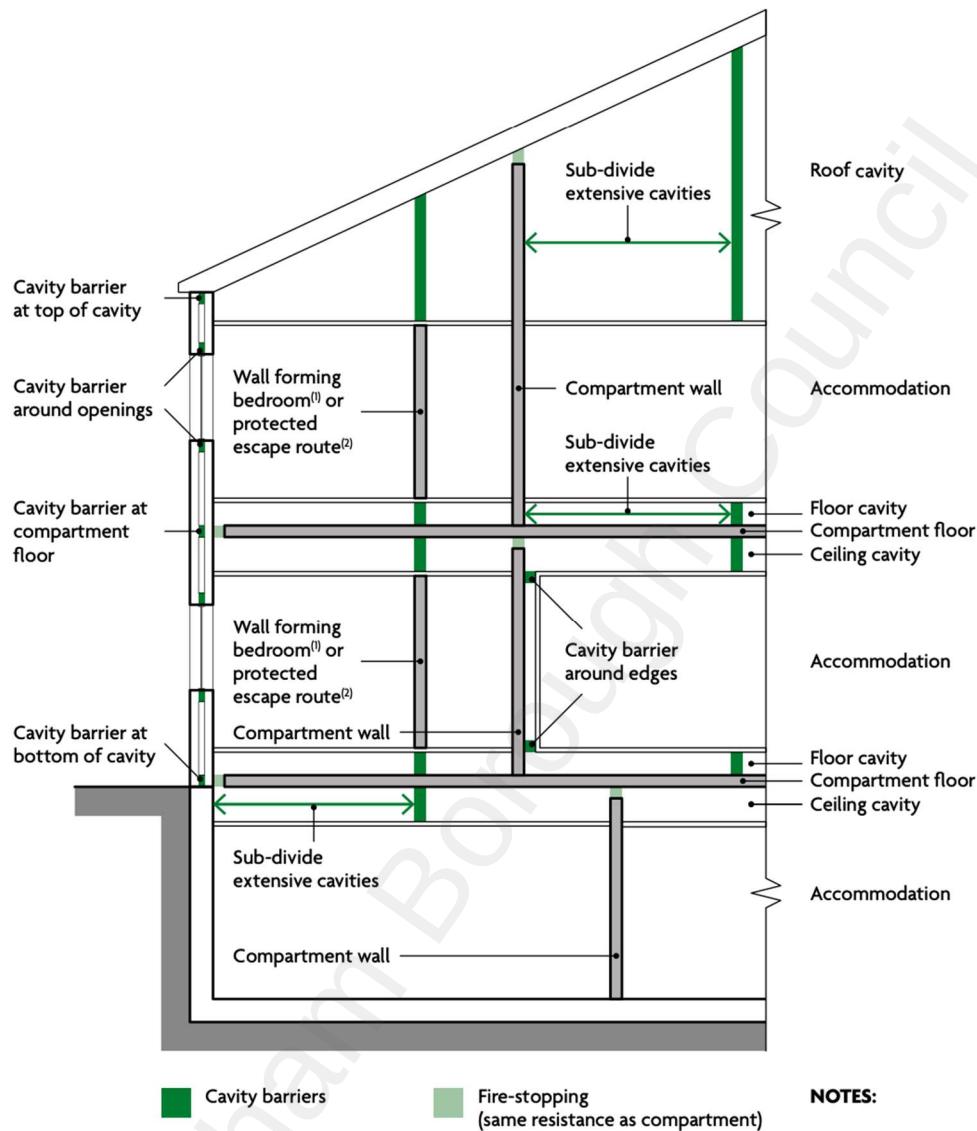


Figure 4: Cavity barrier details

5.6 BUILDING SERVICES COORDINATION

Primary and secondary power supplies

In the event of a failure of the mains power supply a secondary backup power supply will be provided to supply all life safety systems that require electricity to function as intended. The secondary supply will be appropriate for the life safety system concerned. The following life safety systems will include a backup power supply.

- Automatic fire alarm and detection system;
- Automatic smoke control system ^{A)};
- Emergency lighting;

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Note A: No roof plan has been provided currently and thus, the provision for an AOV at the head of Stair A is subject to further confirmation by the clients design team.

As a life safety system, dual power supplies will be needed as part of this system. It is recommended that where practicable, power supplies should be provided via two separate intakes into the building from the same external substation or via a single intake and a standby generator. Where neither of these options is technically viable, e.g. a risk assessment has been undertaken which concludes that a life safety generator would not be suitable, a single intake from the external substation may be provided as the only alternative option remaining, provided that the following recommendations are met.

- a) The life safety system should be connected to an independent distribution board used exclusively for that system.
- b) The life safety distribution board should be clearly marked at the point of isolation with a warning explaining that isolation would switch off the life safety system.
- c) The life safety distribution board should be located in a separate fire-resisting enclosure (with a minimum of 60-minutes fire resisting construction) to the primary main electrical distribution board and should not be accessible directly from the communal areas of the building or from a part of the building where dual supply is required (such as a shaft serving an evacuation lift).
- d) The enclosure surrounding the primary main electrical distribution board should be provided with a minimum of 60-minutes fire resisting construction.
- e) The substation or transformer room should be either located outside the building or separated by 120-minutes fire resisting construction and directly accessible from the outside.

The diverse (primary and secondary) power cables should only come together in the fire compartment housing the control panel by means of an automatic change-over switch, unless the cable route is via a fire compartment, which does not open onto areas requiring protection via the relevant life safety system.

5.7 MAXIMUM COMPARTMENT SIZE

No maximum compartment size is applicable for office or ancillary accommodation and therefore, no further comments or recommendations are made.

5.8 FIRE DOORS

Each fire door provided should be tested and achieve the appropriate performance as stated in BS476-22.

All doors utilised as means of escape should be openable without the use of a key at all material times.

The FRA report makes comments about fire doors within the building that do not achieve the required specifications; however, it is understood that replacement FD30(s) doors have already been ordered by the client and thus, no further consideration is required at this stage.

6 EXTERNAL FIRE SPREAD

6.1 BUILDINGS AND BOUNDARIES

Unprotected areas are the areas of the façade that are not fire rated and have to be limited in size so that fire spread is unlikely to occur to buildings on the adjacent site or to separate fire compartments/buildings on the same site which may be under the same occupation and ownership.

Calculations should be carried out ^{A)} for the required boundary distance based on the height of the floor with the biggest elevation available. The calculations should be conducted ^{A)} for the building facades based on the guidance given in BR187 – *External fire spread: building separation and boundary distances*.

In accordance with BR187, a notional boundary can be taken from the midway section of the surrounding road.

Note A): No section or elevation drawings have been provided currently and therefore, it has not been possible to proceed with the unprotected areas calculations. This is subject to further clarification by the design team.

6.2 EXTERNAL WALL CONSTRUCTION

General

The external wall of a building includes all of the following.

- Anything located within any space forming part of the wall;
- Any decoration or other finish applied to any external (but not internal) surface forming part of the wall;
- Any windows and doors in the wall;
- Any part of a roof pitched at an angle of more than 70 degrees to the horizontal (if that part of the roof adjoins a space within the building to which persons have access, but not access only for the purpose of carrying out repairs or maintenance);

A specified attachment includes any of the following.

- A balcony attached to an external wall;
- A device for reducing heat gain within a building, by deflecting sunlight which is attached to an external wall;
- A solar panel attached to an external wall;

The following are exempt from this Regulation.

- Membranes, however, membranes used above ground level should achieve at least Class B-s3, d0 to meet Requirement B4;
- Window frames and glass, however window spandrel panels and infill panels must comply with Regulation 7;
- Door frames and doors;
- Electrical installations;
- Insulation and water proofing materials used below ground level;
- Intumescent and fire stopping materials, where the inclusion of the materials is necessary to meet the requirements of Part B of Schedule 1;
- Seals, gaskets, fixings, sealants, and backer rods;
- Thermal break materials, where the inclusion of the materials is necessary to meet the thermal bridging requirements of Part L of Schedule 1. However, thermal break materials should not span two compartments and should be limited in size to the minimum required to restrict the thermal bridging (the principal insulation layer is not to be regarded as a thermal break).

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Regulation 7

Regulation 7 requires that the materials used in the construction are appropriate for the circumstances in which they are used, adequately mixed or prepared, and are applied, used or fixed so as to adequately perform the functions for which they are designed.

The Building Regulations 2010 (incorporating 2020 Amendments) place specific regulatory requirements upon materials incorporated into external wall construction, for any development which falls under the following categories.

1. Is over 18m in height (measured from the lowest ground floor level to the floor slab of the top storey); and
2. Contains any of the following:
 - Dwelling(s);
 - An institution;
 - A room for residential purposes (excluding hostel, hotel or boarding house).

Regulation 7 is not applicable to this building. However, FCS-live advise that materials forming part of an external wall or specified attachment achieve at least Class A2-s1, d0 or Class A1.

It is confirmed within the FRA report that the building does not have combustible external cladding.

Surface spread of flames

Regulation 7 is not applicable to this building. However, FCS-live advise that the external façade is provided with Class A2-s1, d0 or Class A1 materials to limit the surface spread of flames, tested in accordance with BS EN 13501-1.

It is confirmed within the FRA report that the building does not have combustible external cladding.

Where an external escape route is beside an external wall of the building, the external wall should be of fire resisting construction in both of the following zones.

- Within 1.8m of the escape route;
- Up to 1.1m above the surface of the escape route.

It is advised that where adjoining compartments include unprotected openings, these should be positioned so that 1.8m distance is achieved, in order to limit the transfer of fire between compartments/protected areas.

Material

Regulation 7 is not applicable to this building. However, it is advised that all significant elements (cladding, insulation, sheathing board and internal wall lining) of the external wall construction achieve at least Class A2-s1, d0 or Class A1 in accordance with BS EN 13501-1.

It is confirmed within the FRA report that the building does not have combustible external cladding.

Cavity barriers

Cavity barriers are required in the following locations of any external cavity walls, or behind rainscreen cladding.

- In line with all compartment walls and floors;

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- Around all windows and openings within the external wall;

All cavity barriers should be mechanically fixed to the structure of the building and in all cases be installed in accordance with the recommendations of the manufacturer.

Cavity barriers should achieve at least 30 minutes fire resistance for integrity and 15 minutes for the insulation value; no structural fire resistance is required.

6.3 ROOF COVERINGS

To limit the spread of fire over the roof of the building, roof coverings are to be provided in order to limit and reduce the risk of a fire impacting the surface of a roof and potential spreading the fire into other compartments.

All roof coverings are to be tested, installed and designed in accordance with BS EN 13501-5.

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7 ACCESS AND FACILITIES FOR THE FIRE SERVICE

7.1 HYDRANT PROVISION

Approved Document B (Requirement 5) states that fire hydrants should be located within 90m of an entrance to the building.

In addition, where there is no piped water available or there is insufficient capacity or flow in an existing public water main, alternative means of providing water for firefighting should be considered.

A site survey should be carried out to confirm the above criteria is achieved based on any existing hydrant provisions. If this survey establishes that the existing hydrants are inadequate, then an additional private hydrant or water supply will need to be included on the site. However, it is expected that the aforementioned requirements are met, considering the existing nature of the building.

7.2 FIRE SERVICE VEHICLE ACCESS

Due care should be given to ensure that the vehicle access route meets the requirements for a pump appliance as shown in the table below.

Appliance type	Min. width of road between kerbs	Min. width of getaways	Min. turning circle between kerbs	Min. turning circle between walls	Min. clearance height	Min. carrying capacity
Pump	3.7m	3.1m	16.8m	19.2m	3.7m	12.5t

Table 12: Fire Service vehicle – Appliance type

Dead-end access routes longer than 20m require turning facilities. This should be confirmed to Royal Pier Road by a specific vehicle tracking plan.

Any access/security measures in and around the site (especially any bollards preventing vehicle access) will need to be by-passable by the Fire Service. The details of the bypass arrangements will need to be developed and agreed with the Fire Service as applicable.

7.3 FIRE SERVICE PERSONNEL ACCESS

Internal firefighting access will be incorporated via two protected staircases (i.e. Stair A and B). Each staircase will be enclosed in 60-minutes fire resisting construction with FD30(s) self-closing doors.

The main building entrance should be kept sterile and free of combustible materials to enable Fire Service personnel access.

All parts of the building will be within 45.0m of the Fire Service vehicle parking location and therefore, no further comments or recommendations are made.

7.4 FIRE MAINS PROVISION

The building will not be provided with dry rising mains.

7.5 SMOKE CLEARANCE/CONTROL

A 1.00m² AOV will be provided at the head of Stair A ^{A)}.

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Note A: No roof plan has been provided currently and thus, the provision for an AOV at the head of Stair A is subject to further confirmation by the design team.

7.6 FIRE CONTROL ROOM

It is recommended that a single point of control/management for all life safety systems within the building is introduced, mainly for the following.

- Automatic fire alarm and detection system;
- Automatic smoke control system;

The fire alarm panel should be visible to the Fire Service at the main entrance of the building, so that in the event of a fire, they can determine where the fire has occurred, in order to activate the firefighting strategy and operations.

8 FIRE SAFETY MANAGEMENT

8.1 GENERAL

Given the use and likely occupancy of the building, management procedures will assist in the prevention and control of fire and the evacuation of occupants.

Good housekeeping standards should be enforced to ensure that the effectiveness of the fire safety provisions is not affected.

Maintenance procedures should be developed to ensure that all equipment and services within the building are able to operate effectively.

An adequate Fire Risk Assessment should be carried out by the occupier/developer of the building (coordinated by the landlord where multiple tenants are present) nearer to the development completion and be in place on occupation to meet the Regulatory Reform (Fire Safety) Order (RRO) 2005. The assessment should be maintained and act as a record of the provision and measures, passive and active, used to minimise fire risk within and around the building.

8.2 KEY MANAGEMENT ISSUES

This section describes each of the key management areas that will need to be implemented and maintained during the lifetime of the building:

- All necessary fire safety systems must be regularly maintained and tested.
- The building management will regularly monitor and control the specification and use of combustibles within the escape routes and circulation areas. These areas will generally be maintained free of all combustibles and the escape routes will be unobstructed at all times.
- An adequate Fire Risk Assessment should be developed and kept up to date at all times and especially when any physical changes are made or the use of the building changes.
- All building staff and tenants will receive regular training including roles and responsibilities for key members of staff.

Control of Evacuation and Fire Safety Planning/Implementation

A detailed fire safety plan will be drawn up by the building management, which will provide clear simple advice for the occupants in the event of an emergency.

The fire safety plan will be prepared, maintained and implemented by the fire personnel responsible for the building in question and will include:

- The procedures to be adopted in the event of a fire signal being given.
- Procedures for evacuation of occupants.
- Procedures for equipment maintenance.
- Procedures for recording and monitoring equipment maintenance and any fire incidents.
- Special procedures which are in place for occupants who may have a disability and procedures which are in place to ensure that all occupants are made aware to staff when they are in the building.

Expanding on the information given above, the fire strategy includes a number of risk critical areas resulting in the need to formalise the fire safety management in the building. To develop and maintain the safety of the building, the building management should formulate a policy statement appropriate to the building configuration, location, occupation, and if relevant, to the building users. The policy statement should include:

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- a) General safety issues related to the use of the building
- b) Possible fire scenarios
- c) Aims and objectives of the proposed management system and its methodology

This policy should be endorsed by a strategic level of management.

8.3 REGULATION 38

To satisfy Regulation 38 of The Building Regulations 2010 (as amended in 2020) it is proposed that a full package of building design information is passed to the end user. It is proposed that the following relevant information is provided to the end users:

- This fire strategy report;
- Any management information proposed in addition to that contained in this strategy;
- Details of all passive fire safety measures (including compartmentation, cavity barriers, fire doors, self-closers, and duct dampers);
- Details of the fire alarm and detection systems, emergency lighting, emergency signage, access controls, door hold-open devices;
- Details of all active fire safety measures including the smoke control system design, mode of operation and control systems; (where applicable)
- Any high-risk rooms and equipment present;
- As built plans for the building;
- Fire strategy drawings of every floor level within the building.
- O&M Manuals for the building systems, including commissioning information and certification.

This information will be passed as a package of information by the main contractor at handover of the building.

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APPENDIX A – ARCHITECTS DRAWINGS REFERENCED

Architect	Drawing ref.
Graham Simpkin Planning	3337-01- Site Location and Block Plan
	3337-03- Proposed Floor Plans
Provider	Document ref.
Active Fire Management	FRA dated 28/07/2021 (ref GEN V022020) - The Mission House, 19 Royal Pier Road, Gravesend, Kent DA12 2BD NEW 2020

Gravesend Borough Council