Report for Clerkenwell Lifestyle UK

FIRE STRATEGY FOR OFFICE REDEVELOPMENT AT VINE HILL, CLERKENWELL, LONDON



Fire Safety Consultants

June 2021

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FIRE STRATEGY FOR OFFICE REDEVELOPMENT AT VINE HILL, CLERKENWELL, LONDON

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ANNEX A Architects' Stage 4 Fire Strategy Plans

1. INTRODUCTION

- 1.1 This report has been prepared by C.S. Todd & Associates Ltd ("CSTA") for Clerkenwell Lifestyle UK (the Client). The report sets out the fire safety requirements for the refurbishment of an existing office building at 18 Vine Hill, Clerkenwell, London EC1R 5LB. The works also include a relatively small infill extension to one side of the building and a new mezzanine floor on the top storey.
- 1.2 The fire safety provisions in this fire strategy will be based on the requirements relating to Office (Group 3), predominantly by reference to Approved Document B to the Building Regulations 2010 (ADB)¹. The Building Regulations are functional and there is no obligation to follow the recommendations in ADB. This revision contains minor amendments agreed with BRCS to reduce the number of fire curtains to protect lifts.
- 1.3 Additional measures are applied, in this case, to account for a single stair serving the new mezzanine floor. The floors will be upgraded to compartment floors to reduce the magnitude of radiant heat flux for external fire spread calculations.
- 1.4 It has been agreed with the Approved Building Control Body that substantive components of the building are regarded as "accepted existing provisions", for example, the alternative protected escape stair that is approximately 880mm wide.
- 1.5 It is anticipated that this fire strategy report will be used by the design team to support a Building Regulations' application under the Building Regulations 2010 and, consequently, the report aligns with Stage 4 of the RIBA Plan of Work (2013).
- 1.6 The plans contained within this report have been copied or extracted from those prepared by Leach Rhodes Walker ("LRW") ("the Architects"), unless otherwise stated. Where CSTA has added marking to plans, this is made clear in the relevant section of this report.

¹ Approved Document B (Fire safety) Volume 2 – Buildings other than dwelling houses (2019 edition).

1.7 This fire strategy should be read in conjunction with the following provisional drawings prepared by the Architects (see below and in Annex A).

Fire Strategy Drawing Number	Floor
LRW_8060_L(42)010D	Lower ground floor
LRW_8060_L(42)011C	Upper ground floor
LRW_8060_L(42)012C	First floor
LRW_8060_L(42)013C	Second floor
LRW_8060_L(42)015A	Second floor mezzanine

- 1.8 The recommendations in this fire strategy are intended to satisfy life safety requirements only. They are not directed towards property protection. Consultation with the building insurers is recommended in case increased levels of property protection are considered necessary.
- 1.9 The consultant who produced this fire strategy statement is Mr S. Robinson who has an Honours degree in Fire Engineering, a Master's degree in Fire Safety Engineering, and is a Chartered Engineer, registered under licence by The Institution of Fire Engineers (IFE).
- 1.10 The submission of this report constitutes neither a warranty of future results by C.S. Todd & Associates Ltd, nor an assurance against risk. The report represents only the best judgement of the consultant involved in its preparation, and is based, in part, on information provided by others. No liability whatsoever is accepted for the accuracy of such information.

2. STATUTORY REQUIREMENTS

The London Plan

- 2.1 Policy D12 of The London Plan requires that the fire safety of developments should be considered from the outset. For this purpose, for all major developments, a fire statement (fire strategy) must be prepared by a Chartered Fire Engineer or other suitably qualified person.
- 2.2 Policy D12 Fire safety requires the following:
 - A In the interests of fire safety and to ensure the safety of all building users, all development proposals must achieve the highest standards of fire safety and ensure that they:
 - 1) identify suitably positioned unobstructed outside space:
 - a) for fire appliances to be positioned on
 - b) appropriate for use as an evacuation assembly point;
 - are designed to incorporate appropriate features which reduce the risk to life and the risk of serious injury in the event of a fire; including appropriate fire alarm systems and passive and active fire safety measures;
 - are constructed in an appropriate way to minimise the risk of fire spread;
 - 4) provide suitable and convenient means of escape, and associated evacuation strategy for all building users;
 - 5) develop a robust strategy for evacuation which can be periodically updated and published, and which all building users can have confidence in;
 - 6) provide suitable access and equipment for firefighting which is appropriate for the size and use of the development.
 - B All major development proposals should be submitted with a Fire Statement, which is an independent fire strategy, produced by a third party, suitably qualified assessor. The statement should detail how the development proposal will function in terms of:
 - 1) the building's construction: methods, products and materials used, including manufacturers' details;
 - the means of escape for all building users: suitably designed stair cores, escape for building users who are disabled or require level access, and associated evacuation strategy approach;
 - features which reduce the risk to life: fire alarm systems, passive and active fire safety measures and associated management and maintenance plans;
 - 4) access for fire service personnel and equipment: how this will be achieved in an evacuation situation, water supplies, provision and

positioning of equipment, firefighting lifts, stairs and lobbies, any fire suppression and smoke ventilation systems proposed, and the ongoing maintenance and monitoring of these;

- how provision will be made within the curtilage of the site to enable fire appliances to gain access to the building The London Plan – Intend to Publish version December 2019 160;
- 6) ensuring that any potential future modifications to the building will take into account and not compromise the base build fire safety/protection measures.

Building Regulations 2010

- 2.3 Material alteration of the building is subject to the statutory requirements of the Building Regulations 2010, Part B of which relates to fire safety; the building will be categorised as Office (Group 3).
- 2.4 The Building Regulations 2010 include the provision of fire safety issues within certain classes of buildings. Part B of Schedule 1 to the Building Regulations includes five functional requirements, namely:
 - a) Requirement B1: Means of escape.
 - b) Requirement B2: Internal fire spread (linings).
 - c) Requirement B3: Internal fire spread (structure).
 - d) Requirement B4: External fire spread.
 - e) Requirement B5: Access and facilities for the fire and rescue service.

Regulatory Reform (Fire Safety) Order 2005

- 2.5 The Regulatory Reform (Fire Safety) Order 2005 ('the FSO') applies to the building. In accordance with this legislation, the Responsible Person (employer) and/or any other person in control of the premises must carry out a fire risk assessment in order to determine the fire safety provisions necessary to comply with the Order. Once the refurbishment is completed, a fire risk assessment will need to be completed by, or on behalf of, the Responsible Person.
- 2.6 The Government has issued guidance documents setting out general fire precautions for existing buildings and, where relevant, this strategy will make reference to the document, namely Fire Safety Risk Assessment, Offices and Shops (ISBN 13: 978 1 85112 8150).

Statutory Consultation

2.7 During the Building Regulations application process, the building control body is required to formally consult with the local fire authority. The purpose of this consultation is to give to the fire authority an opportunity to make observations

with respect to the Building Regulations and to provide an opportunity to make the applicant aware of action that may have to be taken to meet the requirements of the FSO.

2.8 It is proposed that this draft fire strategy document should be used as a basis for discussion with the design team and approved building control body. However, until such time as a Building Regulations' application is submitted and an approval, conditional or otherwise, is issued, the document cannot be considered as approved, irrespective of any discussions that have taken place.

Building Regulation 38

- 2.9 Where a building is erected or extended, or has undergone a material change of use, and the FSO applies to that building or extension, Regulation 38 of the Building Regulations requires that a package of fire safety information ("as built" information, which records the fire safety design of the building or extension) must be assembled and given to the person responsible for the premises.
- 2.10 The fire safety information provided should include all fire safety design measures in appropriate detail, and with sufficient accuracy, to assist the Responsible Person to operate and maintain the building in reasonable safety. Where a fire safety strategy, or a preliminary fire risk assessment, has been prepared, these should also be included.
- 2.11 The exact amount of information and level of detail necessary will vary depending on the nature and complexity of the building's design (further guidance on information to be provided is given in Appendix G of Approved Document B Volume 2).
- 2.12 A practical way of meeting the requirement of Regulation 38 is to develop a building fire manual, based on the guidance contained in BS 9999².

² BS 9999: 2017. *Fire safety in the design, management and use of buildings.* Code of practice.

3. FIRE SAFETY PHILOSOPHY

- 3.1 Ensuring the safety of staff, and others working in, or visiting, the premises is the principal fire safety objective that has been applied to the fire safety design of the building. This objective underpins the fire safety provisions set out in this fire strategy.
- 3.2 Accordingly, the fire safety design of the building incorporates the following components:
 - a) Suitable means of escape to enable occupants to reach a place of safety unaided and assist the fire and rescue service. The building will be provided with two protected stairs. The stairs will not be lobby protected.
 - b) An automatic fire curtain to protect the single stair serving the new mezzanine floor from a fire under the mezzanine.
 - c) Automatic fire curtains to protect dual entry lifts.
 - d) Supporting provisions for the means of escape, such as emergency escape lighting and fire safety signs.
 - e) Compartmentation to limit fire development and spread. In this case, elements of structure will provide 60 minutes' fire resistance.
 - f) An enhanced automatic fire detection and alarm system, to provide an early warning of fire. In this case, this will satisfy the recommendations of BS 5839-1³ for a Category L1 system (see Section 5).
 - g) Means for the evacuation of disabled occupants. In this case, this is based predominantly on use of evacuation chairs from refuges associated with the main stair only (see Section 7).
 - h) Fire extinguishing appliances to allow first aid fire-fighting by trained staff.
 - i) Enhanced fire compartmentation to prevent the spread of fire to adjacent buildings. The building will be provided with compartment floors.
 - j) A dry rising main will be provided in the main stair to assist the fire and rescue service
- 3.3 This fire strategy predominantly addresses the life safety requirements of the Building Regulations 2010. While it is likely that the measures specified will, to some extent, reduce property damage and business disruption arising from a fire, it is important to note that property damage and financial loss are not specific objectives of this fire strategy. Further guidance on these matters is contained in PD 7974-8⁴. Additional guidance can be provided on these matters, if required.

³ BS 5839-1: 2017. Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises

⁴ PD 7974-8: 2012. Application of fire safety engineering principles to the design of buildings. Property protection, business and mission continuity, and resilience

4. BUILDING DESCRIPTION

4.1 This brick building in Clerkenwell, London, built in 1878, comprised the former Victorian Ragged School but has been used, in recent times, as office accommodation. The proposals include complete refurbishment, marginal extension of the building footprint and creation of a mezzanine floor in the former hall, a large space on the top floor of the building with a double-height ceiling.



Site Location – Google Maps

- 4.2 The main office accommodation in the refurbished building will be on the lower ground, upper ground, first, second and new second floor mezzanine floors. Small mezzanines will be provided in the tower on the upper ground, first and second floors, with a small store in the tower at 3rd floor level.
- 4.3 The maximum floor height of the building is taken to be 16.78m. This is the floor height measured in the tower section from fire and rescue service access level in Vine Hill (where the dry riser inlet valve will be located) to the store on the third floor of the Tower. However, this reduces to approximately 14m if measured to the new 2nd floor mezzanine level, i.e. occupied level.



Elevation of the Offices Showing Floor Heights (Measured between Vine Hill entrance (15.8m) and third floor store (32.58m)) 4.4 The upper floors of the building comprise the upper ground floor, first floor, second floor with new mezzanine and small rooms associated with the tower (see combined floor plan below). The occupancy of the building is provided in the table below and is based on 6m²/person (NIA). These figures are a basis for means of escape calculations only (see Section 7) and do not account for any other factors such as toilets facilities, etc. The lower ground floor has direct escape routes (independent of stairs) and has means of escape capacity for a greater number of people than shown in the table below. Constraints on stair capacity mean that for the other floors 6m²/person is a maximum for the available escape routes.

Level	NIA (sq./m)	People (6m ² /person)
Lower ground	300	50
Upper ground	401 (Includes 77 in tower) (Reception excluded)	67
First	485 (Includes 70 in tower)	81
Second	369 (includes 65 in tower)	62
Second mezzanine	122	20
Total		280

- 4.5 New walls to form the extension will be of masonry construction. Existing masonry walls will be retained.
- 4.6 The site slopes, hence final exits are available from both the upper and lower ground floors.
- 4.7 Two passenger lifts will be provided for use by building occupants. Where these open directly to office accommodation areas, fire curtains will be provided to protect the lift shaft and maintain the integrity of the compartment floors.
- 4.8 The building will be provided with a dry rising main with outlets located in the main stair enclosure and a fire and rescue service inlet on Vine Street.
- 4.9 The following is a description provided by the Architects in relation to the construction methods and materials used in the development:

"The existing office is of load bearing masonry construction with masonry inner & outer leaves.

All floors are of mixed construction, with either timber joists and flooring board or filler joists.

The majority of the original existing facades are to be left in place as existing. Openings to the east elevation exposed by the removal of the modern extension will be partially infilled with a cavity wall construction of masonry inner & outer leaves & mineral wool insulation in the cavity. The proposed extension the north & west elevations is summarised below:

Facing brickwork external leaf to match the existing with 10mm bucket profile lime mortar joints.

Wall ties / support angles to suit British standards, fixed to: SFS with mineral wool insulation in the stud zone & cavity (frame sections in line with wind loadings and specialist recommendations), 12mm cement particle board & Class B-S1, d0(2) rated breather membrane to external face, and 2no 15mm plasterboard on VCL to internal face.

The proposed roofs / terraces are designed to achieve Broof(t4), with an inverted roof system, and tile or concrete paving on pedestals.

Both existing & proposed floors will be underdrawn with fire line board to achieve 90min resistance between floors."

5. MEANS OF FIRE WARNING

- 5.1 The new building will be provided with comprehensive fire detection and alarm system, which will meet the recommendations for a Category L1 system, as defined in BS 5839-1.
- 5.2 This is a significantly higher specification than the baseline requirement for office premises and is provided as a compensatory measure for the marginally undersized existing alternative stair and storey exits to the stair. The rationale behind this is that the reduced time for a fire to be detected and an alarm to be given will compensate for any slight increase in time necessary for occupants to enter the alternative stair, in the unlikely event that the main stair becomes completely untenable.
- 5.3 The office fire alarm control and indicating panel will be provided within reception on the upper ground floor.
- 5.4 Any smoke dampers, installed into the ventilation systems to comply with the requirements of Part B of the Building Regulations, will be linked into the fire detection and alarm system so as to close on fire alarm activation. Similarly, any gas plant and HVAC plant will be shut down and lifts will ground on fire alarm activation. (See also below for further details of the operational sequence.)
- 5.5 The fire detection and alarm system will be programmed for a single stage alarm.
- 5.6 Facilities will be provided (programming of the panel and/or a manual override key switch) to prevent the shutting down of plant and allow the override of lifts during testing periods.
- 5.7 Any electrically-operated, hold-open devices provided on fire-resisting doors will be interfaced to the fire detection and alarm system. (See also below for further details of the operational sequence.)
- 5.8 Any doors on escape routes that are fitted with electronic locks will be interfaced with the fire detection and alarm system to deactivate the door locking system on fire alarm activation, or in the event of a power failure.
- 5.9 Any sliding doors on an escape route will similarly be interfaced with the fire detection and alarm system to open the doors on fire alarm activation, or in the event of a power failure. (Additional recommendations relating to powered sliding doors are provided in Section 7 of this report.) Any such doors on escape routes will be provided with a manual door release unit (green 'break glass' call point), positioned by the door on the approach side and wired directly in series with the power supply to the locks.

- 5.10 More generally, any electronic door locks on escape routes will comply with the recommendations of BS 7273-4⁵.
- 5.11 The fire detection and alarm system will be programmed to reflect the principles set out on the pages that follow.

⁵ BS 7273-4: 2015. Code of practice for the operation of fire protection measures. Actuation of release mechanisms for doors.

FIGURE 1

FIRE ALARM CONDITION - OFFICES

MANUAL CALL POINT OPERATED	
OR	
HEAT DETECTOR OPERATED	
OR	
SMOKE/MULTI-SENSOR DETECTORS ACTIVATE	ED
Evacuation signal given throughout offices, with associated cause and effect logic actioned	
(See Figure 2)	

FIGURE 2

CAUSE AND EFFECT LOGIC OVERVIEW



6. GENERAL FIRE EVACUATION STRATEGY

- 6.1 A single stage fire alarm system will be provided at the premises. Due to the slight under-sizing of the alternative stair, it is not proposed to provide an initial alarm to allow for a search to confirm an alarm arising from a single smoke detector.
- 6.2 The evacuation procedure must be supported by a written fire evacuation plan that will form part of staff fire safety training and be practised routinely during fire drills.
- 6.3 Where fire/smoke curtains form part of the protection of escape routes, it is essential that the curtain does not delay staff actions in responding to an alarm or implementing the fire evacuation plan.

7. MEANS OF ESCAPE

Means of Escape Routes

- 7.1 The means of escape will generally (see below) meet the requirements of ADB with respect to travel distance, number and width of exits and capacity of protected stairs.
- 7.2 Travel distances will generally comply with the recommendations in ADB, as shown in the table below:

Location	Travel Distance (m) (single direction)	Travel Distance (m) (more than one direction)
Offices	18	45
Plant Room:		
Within room	9	35
Overall total distance	18	45
Open air	60	100

- 7.3 The building is provided with two protected stairs. Neither stair will be lobby protected.
- 7.4 The main stair (A) is approximately 1,480mm wide and will be provided with storey exits of at least 850mm clear width.
- 7.5 The alternative stair (B) is approximately 880mm wide and will be provided with storey exits approximately 800mm wide. The slight under-sizing of the stair and doors has been accepted by the Approved Building Control Body as an existing condition. If the main stair (A) was completely unavailable, then the evacuation time to a place of relative safety from the upper floors would, potentially, be marginally increased beyond the notional 2.5 minutes implicit in ADB. This is justified on the following basis.
 - 1. The extent of the material alterations to the building are not considered significant enough to justify the major structural works associated with replacing the stair. The building has recently been used as offices, and originally as an assembly building where a higher occupancy than currently proposed is likely.
 - 2. An early warning of fire will be provided by the Category L1 fire detection and alarm system.
 - 3. The travel distance to stairs is relatively short. Storey exits are separated by a distance of only approximately 19m.

- 4. The upgrade to compartment floors significantly reduces the likelihood of fire spread between floors.
- 5. The building is low rise and, hence, the time to evacuate the building will be short.
- 6. Given that stairs will be protected by new FD30S doorsets, it is considered very unlikely that the main stair would become untenable before a significant proportion of the building occupants could make their escape down it.
- 7. The second floor is double height and acts as a plenum, delaying smoke impingement to the storey exit to the alternative stair.
- 8. Other technical fire safety guidance (BS 9999) implicitly accepts notional evacuation times in excess of 2.5 minutes into a protected stair for office buildings (generically considered low risk).
- 9. Government guidance for exiting offices recommends that a door width of at least 750mm can accommodate 100 people in normal risk premises
- 7.6 Final exits from stairs or doors along protected corridors connecting a stair with a final exit will be as wide as the stair served. This may be reduced to circa 1,000mm for the final exits from the main stair, which has final exits on both the lower and upper ground floors.



Lower Ground Floor Final Exits

<u>Note:</u> The windows marked green on plan will be 30 minutes fire resisting (integrity only) to protect the narrow external escape route between buildings.



Upper Ground Floor Final Exit

7.7 Notional stair capacity is provided below. Each stair serves three upper floors.

Stair	Width (mm)	Capacity (people)	Occupancy(people) (total for floors served)
A (main)	1,480	420	222
B (alternative)	880	230*	

* Capacity for 1,000mm stair cited.

- 7.8 From the previous paragraphs, it can be seen that Stair B places a limit on the occupancy of upper floors (UG, 1 and 2 with mezzanine and upper tower rooms) of the building of circa 230 occupants.
- 7.9 The lower ground floor has two dedicated exits as well as exits via each stair enclosure. Therefore, merging from the lower ground floor through stair enclosures will be minimal.
- 7.10 The building has external routes to the west and east of the building, which are marked with green arrows on the plan below.



Proposed External Route (flats/hotel building not shown)

- 7.11 Significant, but not all, areas of the upper floors are served by passenger lifts, so are accessible to non-ambulant staff and visitors.
- 7.12 Evacuation of disabled people will be managed by tenants using evacuation chairs designed for this purpose.
- 7.13 Refuge positions, measuring 1,400mm x 900mm, will be provided within main stair (A) or lobbies associated with the stair. Communications equipment, complying with the recommendations of BS 5839-9⁶, will be provided at disabled persons' refuge points, with the master station by the fire alarm panel.
- 7.14 It has been agreed with the Approved Building Control Body that it is not necessary to provide refuge positions in alternative stair (B). As previously discussed, stair B is an existing relatively narrow stair and, hence, not suitable for evacuation of occupants with a disability. Consequently, it is recommended that personal emergency evacuation plans (PEEPs) are provided for any staff requiring assistance to descend stairs, including siting of normal work stations in proximity to stair A.
- 7.15 Where level access is not available from a building final exit, a suitable ramp, platform lift, or other means agreed with the Approved Building Control Body, should be provided.
- 7.16 The new second floor mezzanine floor will be provided with a single spiral stair. Details are as follows:
 - 1. The mezzanine will be open to the offices below on both of the longer sides and one short side.
 - 2. The mezzanine will be regarded as an element of structure, with fire resistance appropriate to the height and use of the building.
 - 3. The underside of the mezzanine will provide surface spread of flame performance to National Class 0 or equivalent.
 - 4. Smoke detection will be provided to the underside of the mezzanine.
 - 5. The mezzanine will be open plan layout with no inner rooms or other forms of cellular design.
 - 6. A single spiral stair will be located at the middle edge of the mezzanine. The spiral stair will be designed to meet the recommendations of BS 5395-2⁷ for a semi-public stair.
 - 7. Assuming an occupancy density of approximately 6m²/person, the occupancy of the mezzanine is unlikely to be greater than 21 people.

⁶ BS 5839-9: 2011. Fire detection and fire alarm systems for buildings. Code of practice for the design, installation, commissioning and maintenance of emergency voice communication systems. ⁷ BS 5395-2: 1984. Stairs, ladders and walkways. Code of practice for the design of helical and spiral stairs.

- 8. The travel distance from the furthest point of the mezzanine to the base of the spiral stair is approximately 16m. Furniture and fittings will be arranged so as not to materially increase this distance.
- 9. From the base of the spiral stair, there are well-separated routes to alternative protected stairs (12m and 8m travel distance).
- 10. To protect the stair from smoke spilling through the stair opening from the underside of the mezzanine, smoke curtains (see below) will be installed on the underside of the mezzanine. The smoke curtains will be operated automatically by the smoke detectors on the underside of the mezzanine. The curtains will be designed to drop down from the underside of the mezzanine, to divert a flowing layer of smoke away from the stair.
- 7.17 The protection of mezzanine floors in office buildings is not particularly well covered in Approved Document B. From first principles, there are arguably four pertinent issues to consider and satisfy, namely:
 - 1. Travel distance is reasonable.

Initial single direction travel across the mezzanine, and subsequent two direction travel, are considered reasonable in this case and well within benchmark limits.

2. A single stair has suitable capacity.

The mezzanine will have low occupancy, circa 21 people.

3. Early warning of fire so the occupants of the mezzanine are subject to a minimum pre-movement time in the event of a fire.

Early warning of fire will be provided by the two open mezzanine edges, with good line of sight to all parts of the floor beyond the mezzanine; there will be avoidance of cellular construction on the mezzanine, and smoke detection to the underside of the mezzanine and throughout the building more generally.

4. Ensuring that occupants moving towards the edge of a void in open plan design are not subject to a spill plume from below, the automatic smoke curtain will divert smoke away from the mezzanine stair opening.



Second Floor Mezzanine and fire curtains to underside of the floor

Active Fire Barriers

- 7.18 Fire and smoke curtains will be incorporated into the design to protect lift doors opening into office accommodation spaces. These are necessary because the office floors are being upgraded to form compartment floors. In addition, fire and smoke curtains will be provided to the underside of the mezzanine floor to provide protection to the spiral stair opening serving the floor (see above).
- 7.19 Fire curtains protecting the lifts will operate when the fire alarm activates (regardless of cause). The mezzanine curtains will operate if smoke is detected on the second floor, including to the underside of the mezzanine floor.
- 7.20 The curtains are required to be designed according to the requirements of BS 8524-1⁸ and specified, installed and commissioned to BS 8524-2⁹. The appointed contractor will be required to provide a design specification, based on the content of Tables 1-3 of BS 8524-2, suitable for the location and size of the curtain. This will be required to include, but not be limited to, the following criteria:
 - 60 minutes' integrity rating.
 - Smoke containment performance of not less than 3m³/m/h.
 - That C1 reliability criterion is met.

⁸ BS 8524-1: 2013. Active fire curtain barrier assemblies. Specification.

⁹ BS 8524-2: 2013. Active fire curtain barrier assemblies. Code of practice for application, installation and maintenance.

- That both a mains and secondary power supply is provided if a gravity fail safe is not provided.
- That a suitable test facility (button/switch) in a readily accessible location, for use by staff, is provided. In this case, the fire strategy requires that all curtains descend when the fire alarm operates.
- Installation checklist and certificate, and a commissioning certificate, must be provided by the appointed contractor, in line with the examples provided in the appendices to BS 8524-2.
- 7.21 The fire curtains shown on the fire strategy drawings on the lobby side of the lifts at lower ground floor level <u>are not required</u>. In the event of a fire alarm, the lifts should ground to this level and the doors open on the corridor side leading to a final exit.

Powered Sliding Doors

- 7.22 Powered sliding doors are not currently proposed but may be incorporated on a designated escape route, subject to the following provisions. Powered sliding doors on escape routes should be designed, installed and tested in compliance with the requirements of BS EN 16005¹⁰ and BS 7273-4. Sliding doors should provide a clear, free opening of sufficient capacity for the route served.
- 7.23 In the case of powered sliding doors without a hinged 'break out' facility, the opening of the doorset should be guaranteed by a fail-safe system according to Performance Level "d" of BS EN ISO 13849-1¹¹. Any electrical faults preventing normal operation of the doorset will be required to either be detected automatically, or detected (within 15 seconds) after activation of the doorset, and cause the doorset to automatically open and remain open. The fail-safe system should be automatically tested at least once every 24 hours.
- 7.24 Fail-safe systems that use stored electrical energy should have a monitoring system checking that the energy level stored is enough for at least one cycle of operation. This check should be carried out immediately after connection to the power supply and, subsequently, at least once every 24 hours. If the check fails, or is not performed, the doorset should automatically open and remain open.
- 7.25 The design or configuration of sliding door release mechanisms should be such that power is required to maintain the release mechanisms in the nonfire state, so that the release mechanisms fail safe in the event of failure of their power supply. When the mains power goes off, sliding doors should automatically open within five seconds and remain in the open position.
- 7.26 Sliding doors on escape routes should automatically open whenever a fire signal (but not a pre-alarm warning) is given at the fire alarm control panel.

¹⁰ BS EN 16005: 2012. Power operated pedestrian doorsets. Safety in use. Requirements and test methods.

¹¹ BS EN ISO 13849-1:2015. Safety of machinery. Safety-related parts of control systems. General principles for design.

This includes circumstances when a door may be in a secured, locked mode, such as during the night. Where a building has a staff alarm arrangement, powered sliding doors need not release or open on operation of an automatic fire detector, other than a heat detector, until fire alarm sounders operate.

7.27 A clearly labelled and identifiable manual control, to actuate the relevant release mechanism, readily distinguishable from a fire alarm manual call point (i.e. a green' break glass' manual control), should be provided in close proximity to each set of electrically-powered sliding doors on means of escape routes. Operation of the control should cause interruption of the power supply to the door release mechanism, thereby causing the door(s) to open.

Emergency Escape Lighting

- 7.28 There will be comprehensive coverage of emergency escape lighting. The emergency escape lighting will comply with the recommendations of BS 5266-1¹² and the requirements of BS EN 1838¹³ and BS 5266-8¹⁴.
- 7.29 Emergency escape lighting will be provided in all escape routes, open areas, high risk areas and points of emphasis, including:
 - a) At each exit door intended to be used in an emergency.
 - b) Near stairs so that each flight of stairs receives direct light.
 - c) Near any other change in level.
 - d) Mandatory emergency exits and safety signs.
 - e) At each change of direction.
 - f) At each intersection of corridor.
 - g) Near to each final exit and outside the building to a place of safety.
 - h) Near each piece of fire-fighting equipment and call point.
- 7.30 The emergency lighting system may comprise a mixture of self-contained, non-maintained and maintained luminaires, with integrated battery packs and inverter units.
- 7.31 All emergency luminaires will have a standby operation of three hours, with their associated charger units able to suitably recharge within 24 hours. Testing facilities will be key switches, located adjacent to local distribution boards.
- 7.32 Emergency lighting will be designed to a minimum of 1 lx on all escape routes, with 10% of the general illumination level over all distribution boards, switchboards and plant items. Open areas larger than 60m² floor area will be provided with horizontal luminance of not less than 0.5 lx at the floor level of the area, excluding a border of 0.5m around the perimeter.

¹² BS 5266-1: 2016. Emergency lighting - Code of practice for the emergency lighting of premises.

¹³BS EN 1838: 2013. *Lighting applications – Emergency lighting.*

¹⁴ BS 5266-8: 2004 (BS EN 50172: 2004). Emergency escape lighting systems.

Fire Exit Signs

- 7.33 Escape routes will be provided with suitable 'FIRE EXIT' signs in compliance with the following standards.
 - a) BS 5499-4: 2013. Safety signs. Code of practice for escape route signing.
 - b) BS ISO 3864-1: 2011. Graphical symbols. Safety colours and safety signs. Design principles for safety signs and safety markings.
 - c) BS EN ISO 7010: 2012 + A7: 2017. Graphical symbols. Safety colours and safety signs. Registered safety signs.
 - d) BS 5499-10: 2014. *Guidance for the selection and use of safety signs and fire safety notices.*
- 7.34 Fire assembly points will be finalised by the occupiers as part of the process of formulating their evacuation plans. However, suitable width pavement areas are available to the north and south of the development on Eyre Street Hill or, alternatively, pavement areas along Vine Hill and further to that along Clerkenwell Road could be utilised.

8. GENERAL PROVISIONS RELATING TO FIRE DOORS

- 8.1 The general recommendations in Section 5 of ADB will be applied. This includes, but is not limited to, the following provisions:
 - a) Fire-resisting glass, fire rated solely for integrity, will be subject to the limitations in Table A4 of ADB. The appointed contractor's door schedule should be closely verified against this criterion.
 - b) Doors on escape routes will open in the direction of travel through a minimum of 90 degrees.
 - c) Doors on escape routes will be free from locks and unsuitable fastenings. Electronic locks may be used where additional security measures are necessary. However, where used, the recommendations of BS 7273-4 will apply.
 - d) Fire-resisting doors sub-dividing corridors, or which swing in two directions, will be provided with suitable vision panels.
 - e) Fire-resisting doors opening onto corridors or stairways will be recessed, if necessary, to prevent the door from encroaching onto the stairway or corridor.
 - f) Revolving or automatic doors will not be used on escape routes, unless suitable additional safeguards are in place.
 - g) Fire-resisting doors will be fitted with self-closing devices, complying with the requirements of BS EN 1154¹⁵ for the size of door fitted and specified to overcome any latch or lock fitted to the door. Fire-resisting doors to stores and cupboards may be kept locked shut as an alternative to fitting self-closing devices. Fire-resisting doors should be marked with signs, either 'FIRE DOOR KEEP SHUT' or 'FIRE DOOR KEEP LOCKED SHUT', as appropriate.
 - h) For doors on escape routes, there should be an unobstructed space of at least 300mm, on the pull side of the door, between the leading edge of the door and any return wall.

¹⁵ BS EN 1154:1997 Building hardware. Controlled door closing devices. Requirements and test methods.

9. INTERNAL FIRE SPREAD

Linings/furnishings

9.1 In order to control the spread of flame across surfaces, all finishes to walls and ceilings will meet the performance classification recommended in ADB (Table 6.12 of ADB Volume 2: 2019). Therefore, the classification of the surfaces of walls and ceilings within the building will comply with the following:

Location	European class
Small rooms of area not more than 30m ² in non-residential accommodation and 4m ² in residential accommodation:	D-s3, d2
Other rooms:	C-s3, d2
Other circulation spaces:	B-s3, d2

9.2 Suitable limitations will be applied to control the use of building elements and services comprising thermoplastic materials.

10. INTERNAL FIRE SPREAD (STRUCTURE)

Elements of Structure

- 10.1 For the purpose of Table B4 of ADB Volume 2: 2019, the height of the highest occupied level is less than 18m, when measured in accordance with Diagram D5 of ADB Volume 1: 2019. Therefore, the elements of structure will be specified to provide not less than 60 minutes' fire resistance¹⁶.
- 10.2 Fire resistance means the level of performance of the element of structure, when tested in accordance with the requirements of BS 476 Parts 20-24¹⁷ or EN equivalent.
- 10.3 Elements of structure in an existing building are usually accepted. The extent to which the fire resistance of new elements of structure are dependent on the performance of existing elements of structure should be subject to review by the appointed structural engineers. It is noted that, where one element of structure supports, or carries, or gives stability to another, the fire resistance of the supporting element will be no less than the minimum period of fire resistance for the other element, whether that element is loadbearing or not.
- 10.4 The new second floor mezzanine floor is an element of structure and will provide 60 minutes' fire resistance.

Fire Compartmentation

- 10.5 All floors of the building will be upgraded using suitable materials to provide 60 minutes' fire resistance from the underside. Compartment floors are required to mitigate the risk of external fire spread from unprotected openings in external walls.
- 10.6 All service shafts will be constructed as protected shafts with the appropriate fire resistance, as specified in Table B4 of ADB Volume 2: 2019.
- 10.7 Staircase enclosures will form protected shafts providing 60 minutes' fire resistance.

¹⁶ Reduced to 90 minutes for elements not forming part of the structural frame

¹⁷ BS 476-20:1987. *Fire tests on building materials and structures. Method for determination of the fire resistance of elements of construction (general principles)*

BS 476-21: 1987. Fire tests on building materials and structures. Methods for determination of the fire resistance of loadbearing elements of construction

BS 476-22: 1987. Fire tests on building materials and structures. Methods for determination of the fire resistance of non-loadbearing elements of construction

BS 476-23: 1987. Fire tests on building materials and structures. Methods for determination of the contribution of components to the fire resistance of a structure

BS 476-24: 1987. Fire tests on building materials and structures. Method for determination of the fire resistance of ventilation ducts

- 10.8 Each party wall will form a compartment wall providing 60 minutes' fire resistance.
- 10.9 Places of special fire risk, e.g. plant rooms, boiler rooms, stores, etc. will be enclosed with fire-resisting construction having not less than 30 minutes' fire resistance.

Concealed Spaces, Ducting, Dampers and Fire Stopping

Cavity Barriers

- 10.10 Concealed spaces or cavities in the construction of a building provide a route for smoke and flames to spread. Cavity barriers will be provided to restrict the spread of smoke and flames where a cavity passes through a fire-resisting wall or floor, and to sub-divide large cavities that could allow extensive hidden fire spread. As necessary, cavity barriers will be provided as follows:
 - a) At the top of cavity walls to close the cavity.
 - b) In line (above or below) with compartment walls, walls or doors forming a fire-resisting barrier, or walls or doors protecting an escape route.
 - c) Around openings in a cavity wall exposed to form a window.
 - d) At the junction between an external cavity wall and every compartment floor and compartment wall.
 - e) At the junction between an internal cavity wall and every compartment floor, compartment wall or other wall or door assembly, that forms a fire-resisting barrier.
 - f) A cavity affecting alternative escape routes.
 - g) To sub-divide an extensive cavity (see below).
- 10.11 Cavity barriers will be used to sub-divide any extensive cavities exceeding the dimensions set out in Table 9.1 of ADB Volume 2: 2019.

(purpose groups	2 to 7)	
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

(Note: Some exceptions to the above are permitted by paragraphs 9.10-9.12 of ADB Volume 2: 2019)

General ventilation ductwork

- 10.12 Any ventilation ducts and flues that pass through fire-resisting partitions or floors will be protected, either using fire dampers, fire-resisting enclosures or fire-resisting ductwork.
- 10.13 Ducting should have the same fire integrity rating as the building element breached.
- 10.14 Fire dampers (where fitted) should conform to BS EN 15650¹⁸. They should have an E classification equal to, or greater than, 60 minutes. Fire and smoke dampers should also conform to BS EN 15650. They should have an ES classification equal to, or greater than, 60 minutes. Further information on fire and smoke-resisting dampers is given in the ASFP Grey Book.

Fire Stopping

- 10.15 All openings around pipes and services passing through a fire-resisting wall or ceiling will be adequately protected by sealing or fire stopping, so that the fire resistance of the element is not impaired. Openings for pipes through a fire-separating element may be dealt with by proprietary sealing, restricted pipe diameter or sleeve.
- 10.16 To ensure that systems are compatible, only penetration seals that have been tested or assessed in conjunction with a specific duct or damper should be used.

¹⁸ BS EN 15650: 2010. Ventilation for buildings. Fire dampers.

11. FIRE SUPPRESSION

- 11.1 Portable fire extinguishers will be provided to protect special and general risks in the building.
- 11.2 Portable fire extinguishers of the foam (for Class A fires) and carbon dioxide (for Class B fires) types will be positioned on escape routes, close to the exit from the room or floor, or the final exit from the building. Similarly, where the particular fire risk is specifically located, e.g. flammable liquids, the appropriate fire extinguisher is near to the hazard, so located that it can be safely used.
- 11.3 Fire extinguishers should be placed on a dedicated stand, or hung on a wall at a convenient height, so that staff can easily lift them off (at about 1m for larger extinguishers and 1.5m for smaller ones, to the level of the handle). Ideally, no-one should have to travel more than 30m to reach a fire extinguisher. If there is a risk of malicious use, it may be necessary to use alternative, and more secure, locations.
- 11.4 Further guidance on the selection of portable fire extinguishers is contained in BS 5306-8¹⁹.

¹⁹ BS 5306-8: 2012. *Fire extinguishing installations and equipment on premises - Selection and positioning of portable fire extinguishers - Code of practice.*

12. EXTERNAL FIRE SPREAD

- 12.1 The fire construction of external walls to prevent fire spread up the outside of a building, and the separation between buildings to prevent the spread of fire between buildings, must be subject to suitable controls.
- 12.2 Consequently, the following considerations are necessary:
 - Fire resistance of external walls.
 - The surface spread of flame of the wall.
 - Resistance of external walls to ignition and fire spread over the surface.
 - Provision of cavity barriers in external walls.
 - Limiting unprotected openings to prevent fire spread to an adjacent building by thermal radiation. (Unprotected openings are parts of the wall not having specified fire resistance.)

Fire-resisting Standard of External Walls

12.3 The external walls of the building will have the fire resistance specified in Table B4 of ADB Volume 2: 2019 (with the exception of those parts of an external wall that are permitted unprotected openings), namely:

Any part less than 1m from any point on the relevant boundary

 60 minutes' fire resistance (stability/integrity/insulation) when tested from each side.

Any part 1m or more from the relevant boundary

• 60 minutes' fire resistance (stability/integrity) (15 minutes' insulation) when tested on the inside of the building.

(See Architects' fire plans in Appendix A)

External Wall Construction to Prevent Surface Fire Spread

12.4 The external surfaces (i.e. outermost external material) of external walls should comply with the provisions in Table 12.1 ("any other building"). The provisions in Table 12.1 apply to each wall individually in relation to its proximity to the relevant boundary. For the purpose of the table, the building has a height of more than 18m. Height for this provision is building height and not top storey height.

Building type	Building height	Less than 1000mm from the relevant boundary	1000mm or more from the relevant boundary
'Relevant buildings' a regulation 7(4) (see p	as defined in Daragraph 12.11)	Class A2-s1, d0 ⁽¹⁾ or better	Class A2-s1, d0 ⁽¹⁾ or better
Assembly and recreation	More than 18m	Class B-s3, d2 ⁽²⁾ or better	From ground level to 18m: class C-s3, d2 ⁽³⁾ or better
			From 18m in height and above: class B-s3, d2 ^[2] or better
	18m or less	Class B-s3, d2 ⁽²⁾ or better	Up to 10m above ground level: class C-s3, d2 ⁽³⁾ or better
			Up to 10m above a roof or any part o the building to which the public have access: class C-s3, d2 ⁽³⁾ or better ⁽⁴⁾
			From 10m in height and above: no minimum performance
Any other building	More than 18m	Class B-s3, $d2^{(2)}$ or better	From ground level to 18m: class C-s3, d2 ⁽³⁾ or better
			From 18m in height and above: class B-s3, d2 ^[2] or better
	18m or less	Class B-s3, d2 ⁽²⁾ or better	No provisions

the provisions of paragraph 12.6.

In all cases, the advice in paragraph 12.4 should be followed.

1. The restrictions for these buildings apply to all the materials used in the external wall and specified attachments (see paragraphs 12.10 to 12.13 for further guidance).

2. Profiled or flat steel sheet at least 0.5 mm thick with an organic coating of no more than 0.2mm thickness is also acceptable.

3. Timber cladding at least 9mm thick is also acceptable.

4. 10m is measured from the top surface of the roof.

External Fire Spread

- 12.5 Reasonable measures must be in place to prevent fire spread to adjacent buildings by radiant heat flux from unprotected openings in the event of a fire.
- 12.6 The method used in this report for assessing the external fire spread risk to adjacent buildings is the method of enclosing rectangles provided in the Building Research Establishment document BR 187²⁰.
- 12.7 In the method of enclosing rectangles, the elevation is viewed and a rectangle drawn around the unprotected areas; a table (see BR 187) then gives the minimum boundary distance for this size of rectangle and this proportion of unprotected area.
- 12.8 To apply the method of enclosing rectangles, it is necessary to identify appropriate boundaries as a basis for analysis. The use of the distance to a

²⁰ BR 187: External fire spread: building separation and boundary distances; Second edition published 2014 ISBN 978-1-84806-319-8, Fire Research Station

relevant boundary, rather than to another building, when measuring the separation distance, makes it possible to calculate the allowable proportion of unprotected areas, regardless of whether or not there is a building on an adjacent site, and regardless of the location of that building, or the extent of any unprotected areas it might have. In this analysis, depending on the elevation under analysis, the relevant boundary is either the site boundary or a notional boundary, e.g. measured to the centre line of the adjacent public roadway.

12.9 An office building of this height does not require compartment floors. However, in this case, compartment floors are necessary as the external walls include a high proportion of unprotected openings and boundary conditions would, otherwise, be limiting.

Space Separation to Prevent External Fire Spread

- 12.10 Reasonable measures must be put in place to prevent fire spread between adjacent buildings by radiant heat flux from unprotected openings in the event of a fire. The location of the building and adjacent buildings is shown in the plan extract below.
- 12.11 Relevant boundaries have been marked adjacent to the external walls. To the East, there is a shared yard with a new hotel and affordable accommodation building, to be constructed by the same developer for the office refurbishment and extension to which this strategy applies. CSTA are preparing a separate fire strategy for the hotel/accommodation building. The space between the buildings is approximately 3.3m. Following discussion with the Approved Building Control Body it has been agreed to set the notional boundary 2m from the offices and 1.3m from the hotel/affordable accommodation.





Boundary Analysis

East Elevation

12.12 The lower ground, ground and first floors (each forming a separate compartment) are equivalent for the purpose of analysis. The analysis below is based on the upper ground floor but is representative of the lower ground floor and the first floor. The analysis assumes a maximum of seven windows in a compartment. Additional windows, e.g. those associated with a stair enclosure, toilets etc will be separated by 60 minutes' fire-resisting compartment walls and fire doors. These separated areas represent smaller emitter areas for thermal radiation and, hence, are acceptable without separate calculation if the larger emitter area is adequate. The results are shown in the illustrations below and indicate that the 2m available notional boundary position is not exceeded.



East Elevation - Upper Ground Floor

12.13 The analysis of the second floor high space, which includes the mezzanine, assumes a maximum of seven lower level windows in a compartment and the high level window. Additional windows will be separated by 60 minute fire-resisting compartment walls and fire doors. These separated areas represent smaller emitter areas for thermal radiation and, hence, are acceptable without separate calculation if the larger emitter area is adequate. The results are shown in the illustrations below and indicate that the 2m notional boundary position is not exceeded.



East Elevation – Second Floor High Space

North Elevation

12.14 There are no unprotected openings on the lower ground floor. Unprotected openings on the upper ground and first floor are coincident with the relevant boundary. The windows enclosed by the dotted line in the drawing below will be specified as 60 minutes' fire resisting (integrity and insulation in a suitable framing system).



North Elevation – Upper Ground and First Floor

12.15 On the east elevation, the second floor high space sits back from the relevant boundary by 3.8m at the nearest point (see below). The analysis of the second floor high space, which includes the mezzanine, assumes a maximum of four lower level windows in a compartment and the high level window. Additional windows (staircase) will be separated by 60 minute fire-resisting compartment walls and fire doors. These separated areas represent smaller emitter areas for thermal radiation and, hence, are acceptable without separate calculation if the larger emitter area is adequate. The results are shown in the illustrations below and indicate that the 3.8m notional boundary position is not exceeded.



North Elevation – Second Floor High Space Distance to Boundary



North Elevation – Second Floor High Space

West Elevation

12.16 The upper ground and first floor provide the most challenging condition. In each case, analysis assumes a maximum of six windows in a compartment. Additional windows will be separated by 60 minute fire-resisting compartment walls and fire doors. These separated areas represent smaller emitter areas for thermal radiation and, hence, are acceptable without separate calculation if the larger emitter area is adequate. The results are shown in the illustrations below and indicate that the 2.1m notional boundary position is not exceeded (see below).



West Elevation – Upper Ground Floor

South Elevation

12.17 The south elevation is a party wall and has no unprotected openings. There are some unprotected openings in the tower, but these are an existing condition unchanged by the works.

13. ACCESS AND FACILITIES FOR THE FIRE AND RESCUE SERVICE

General

- 13.1 The offices do not have a floor greater than 18m above fire and rescue service access level.
- 13.2 Due to limited boundary access for a fire appliance, a dry rising main will be provided. The outlets for the dry rising fire main will be located within the main stair enclosure or lobbies to the stair. The inlet valve assembly will be located on an external wall in Vine Hill Street, within 18m of a parking position for a fire and rescue service appliance.
- 13.3 Access to the upper floors for the fire and rescue service will be via the two protected stairs.

14. COMMISSIONING AND TESTING

- 14.1 All equipment and fire safety systems should, where appropriate, be subject to testing and commissioning, to ensure that they operate correctly in accordance with the relevant design or performance standards, as well as the provisions of this fire strategy. At the completion of commissioning, it also should be confirmed that all relevant documentation has been handed over to the occupier.
- 14.2 The organization or person responsible for commissioning the system might, or might not, be the same organization that designed and/or installed the system, and the responsibility for commissioning needs to be clearly defined prior to the start of the installation work.
- 14.3 It should be noted that it is not, in general, the responsibility of the commissioning engineer to verify compliance of the design, or of the installation/equipment. In general, the responsibility of the commissioning engineer is to verify that the system/equipment operates correctly in the manner designed and that the installation workmanship is generally of an adequate standard.
- 14.4 The system/equipment should be commissioned by a competent person who has access to the requirements of the designer (i.e. the system specification) and any other relevant documentation or drawings. At commissioning, the entire system/equipment should be inspected and tested to ensure that it operates satisfactorily.

15. DOCUMENTATION

- 15.1 It should be ensured that adequate records and other documentation are provided to the building occupier to verify compliance with this fire strategy and the standards referenced.
- 15.2 Generally, documentation should be provided for design, installation and commissioning of fire systems or systems that must respond or have specified performance in a fire condition, as well as to certify the performance of products used in the construction and fitting out of the building.
- 15.3 Where appropriate, operations and maintenance information with respect to fire safety systems and equipment should also be provided to the building occupier.
- 15.4 The responsibility for provision of the documentation will invariably rest with a number of companies, suppliers and sub-contractors. At commissioning, it should be ensured either, that all appropriate documentation has been provided to the building occupier, or their representative, or that any missing documentation is identified for appropriate action.
- 15.5 Particular importance needs to be attached to the preparation and accuracy of "as fitted" drawings and operation and maintenance manuals. The manuals should be adequately specific to the system/equipment. Without these drawings and manuals, maintenance or future modification of the system will be difficult.
- 15.6 Provision of documentation and records supporting this fire strategy are a requirement of Regulation 38 of the Building Regulations 2010. These documents and records must be available to the building occupier to ensure the correct basis for meeting the requirements of the FSO.

16. MANAGEMENT

- 16.1 This fire strategy assumes that the tenant/s of the building will provide levels of fire safety management suitable for the size and use of the building.
- 16.2 All employers are 'Responsible Persons' under the FSO and have management responsibilities at the building. Under the FSO, an employer must complete a fire risk assessment, record the significant findings, complete any action points arising from the assessment and keep the assessment under review.
- 16.3 BS 9999 provides comprehensive guidance on managing fire safety at a building. Recommendations are provided for:
 - Planning for changes in risk profile.
 - Resources and authority.
 - Staffing levels.
 - Staff training.
 - Work control.
 - Communication procedures.
 - Maintenance and testing of fire safety systems.
 - Liaison with the fire and rescue service.
 - Contingency planning.
- 16.4 A minimum level 2 management (BS 9999) is recommended. No reliance has been placed in developing this fire strategy on achieving higher levels of management to those recommended, which, in turn, are considered compatible with reasonable workplace management procedures.
- 16.5 It is recommended that the tenant/s should provide and maintain a fire safety manual, setting out key building information and including details of how the above matters will be managed at the building.
- 16.6 This fire strategy should be used as the basis to develop a fire evacuation plan. This will allow specific procedures to be included to address any special fire safety features in the building. The document should also be used to ensure that the management fully understands the fire safety features in the building and any additional testing requirements that are required because of the fire strategy.

ANNEX A

ARCHITECTS' STAGE 4 FIRE STRATEGY PLANS

The floor plans on the pages that follow have been extracted from those produced by the Architects and sent to CSTA on 6 April 2020 and are provided for reference. The Architects' plans should be referred to for higher definition and references.



Key to Plans



Lower Ground Floor



Upper Ground Floor



First Floor



Second Floor



Second Floor Mezzanine