



H&H Artisan Gun Making Workshop

Ashby Farm, Ducks Hill Rd, Northwood HA6 2SS

Design Fire Strategy
(Approximate RIBA Stage 3)



1 Executive Summary

This report is a fire strategy for the purpose of establishing the fire safety measures in the building and how the functional fire safety requirements of the Building Regulations are to be met.

The strategy adopts a structured approach which largely follows Regulations B1 to B5 of the Building Regulations and assess the measures that facilitate the protection of people from fire. Any property protection issues, and business continuity issues assessed or mitigated in the report are either coincidental or are offered on a goodwill basis only – the primary purpose of the proposed assessment is life safety only.

The building incorporates timber-framed elements; while this construction is not fully aligned with the typical assumptions of Approved Document B, the building is neither large nor complex. Accordingly, a full performance-based fire engineering analysis is not considered necessary. Where approved guidance cannot be fully met, this strategy provides justified alternative solutions to demonstrate compliance with the Building Regulations.

In order to ensure that the proposed fire safety systems detailed within this report achieve the appropriate fire performance, it is recommended that all products, components, materials, and structures relating to the fire strategy are installed using competent companies/persons and that, where appropriate and applicable, third-party accreditation/certification is sought.

For the purpose of this strategy, it has been assumed that fire is an accidental event and that there is a single seat of fire. No account is taken of the potential for arson, which may typically be characterised by multiple seats of fire and the use of accelerants. However, it should be recognised that a number of the fire safety measures provided will also help to reduce the risk and consequences of arson, e.g. compartmentation, etc.

Demonstration of Safety

An adequate level of fire safety has been provided, and it is considered that the building meets the functional and performance requirements of the buildings (i.e. compliance with Parts B1 to B5 of the Building Regulations 2010).

The Gunmaker 'Holland and Holland' is proposing to create a new-build workshop for manufacturing facility for bespoke shotguns which will replace their existing facility in London on their estate at Northwood. The proposed building will be in the region of 1,416sqm GIA and 1,641sqm GEA.

The development site consists of a series of existing farm buildings which the client wishes to largely demolish as part of this development. In addition, there is at least one historic barn which has been identified onsite which will be retained as part of the proposed scheme. Adjacent to the proposed development is a derelict house which is also on land under the client's ownership. However, does not form part of the planning application nor fire strategy.

The proposed building incorporates elements of timber-framed construction. It is therefore considered unlikely that this form of construction represents a typical or common building type on which the assumptions of ADB are primarily based. Consequently, ADB may not be appropriate or sufficient as sole guidance in this instance.

ADB stems from the original post war building studies research based on full burnout of the fire confined to the room of origin. This is supported by the current ADB, the introduction states that the Approved Document contains *practical examples and solutions on how to achieve compliance for some of the more common building situations*. And goes on to suggest it may not provide appropriate guidance in the case of unusual design, technology, large timber buildings and some buildings that incorporate modern construction methods [1].

The history of fire resistance testing shows that the original methodology for determining fire resistance was predominantly for the compartment to contain a fire to the compartment of origin and resist complete burn out of the fire [2], the authors of these original studies were also cognisant that not all buildings are required to survive complete burn out and thereby allowed for buildings of lesser resistance in the knowledge these buildings were not expected to withstand complete burnout. This effectively resulted in a fire resistance of 60 minutes, or more being required to survive complete fire burn out; and a fire resistance of 30 minutes was not expected to resist burn out and it is reasonable to assume therefore the building to be lost to the fire.

In this instance, while the building includes timber elements, it is neither large nor complex in terms of layout or design. As such, a detailed performance-based fire engineering analysis is not considered necessary to demonstrate compliance with the functional requirements of the Building Regulations.



Where full compliance with ADB cannot be achieved due to the construction methodology, this fire strategy provides proportionate justification to demonstrate that the functional objectives of the Regulations are nonetheless satisfied.

It is also noted that there is no statutory requirement to adopt the recommendations of ADB, provided adequate evidence is presented to demonstrate compliance with the functional requirements of the Building Regulations by alternative means. However, where such departures are proposed, they would ordinarily be supported by a clearly defined fire safety strategy.

This report therefore defines the fire safety strategy for the building, with reference to meeting the functional and performance requirements of Parts B1 to B5 of the Building Regulations 2010 [3]. Consideration has been given to the fire safety provisions necessary to achieve a reasonable standard of life safety for occupants and other relevant persons. In particular, this strategy will:

- Establish means of warning and escape requirements.
- Establish acceptable limits for internal fire spread (linings).
- Establish acceptable limits for internal fire spread (structure).
- Establish acceptable limits for external fire spread.
- Establish requirements for access and facilities for the fire service.

Requirement B1 - Establishing Means of Warning and Escape Requirements.

The building shall be designed and constructed so that there are appropriate provisions for the early warning of fire, and appropriate means of escape in case of fire from the building to a place of safety outside the building capable of being safely and effectively used at all material times.

In most premises, the evacuation in case of fire will simply be by means of everyone reacting to the warning signal given when a fire is discovered, then making their way, by the means of escape, to a place of safety away from the premises. This is known as a simultaneous evacuation and will normally be initiated by the sounding of the general alarm over the fire warning system.

The evacuation protocol will therefore be Simultaneous Evacuation.

In line with the requirements of ADB [4, p. 9], all buildings should have arrangements for detecting fire and raising the alarm. Other than for some small buildings/premises, an electrically operated fire alarm system should be provided. In some situations, the alarm should be operated by a fire detection system.

BS5839-1:2017 [5, p. 131] recommends for common places of work, such as offices, shops, factories, warehouses and restaurants, that a Category M system normally satisfies the requirements of legislation. It is, however, often combined with a Category P system to satisfy the requirements of insurers, as company policy for protection of assets, or to protect against business interruption.

Whilst an M system could be considered adequate, the mix of office space and industrial processes increased the risk posed and as a result a level of automatic detection is also considered necessary to enable adequate warning.

Thereby a system will be provided designed and installed to BS5839-1:2017, Category L3.

The site is designed with an open plan layout, with both stairs separated by fire doors adjacent to each stair providing the separation between means of escape. 2 means of escape routes will be provided from the upper floor with the ground floor provided with 4 routes. The stairs will provide effective clear widths of 1000mm.

The WHO¹ says 15% of the worldwide population are disabled. The number of people in the UK, who reported a disability in 2019 to 2020 was 14.1 million. This means that nationally, 22% of people have a disability, of this figure almost 50% reported a mobility impairment, therefore it is assumed approximately 11% of the UK population have mobility impairments. [6] Whilst this figure may not be directly applied to the site a reasonable number of persons with mobility issues should be included.

The installation of lifts which can be used for evacuation purposes (accompanied by a management plan) provide a dignified solution.

However, the size of the site and limited requirements would make the provision of a dedicated evacuation lift complying fully to the requirements of Annex G to BS 9999 and BSEN 81-76/81-72 is not feasible.

¹ World Health Organization.



Therefore, the following is proposed:

- Platform lift to BSEN 41
- Within a 30-minute enclosure
- A separate intercom, and secondary power supply will be provided by way of a diverse supply or UPS enabling 2-3 cycles of the lift.

The lift will be provided in stair 1 with stair 2 being provided a refuge area only. The proposed refuge is located within a separate fire-resisting compartment, giving direct access to the stair. As this compartment provides the necessary protection, an additional protected lobby is not required. This wing of the building therefore provides the necessary temporary place of safety for refuge users awaiting assisted evacuation.

Requirement B2 - Establish Acceptable Limits for Internal Fire Spread (Linings).

The building shall inhibit the spread of fire within the building, the internal linings shall adequately resist the spread of flame over their surfaces; and have, if ignited, either a rate of heat release or a rate of fire growth, which is reasonable in the circumstances.

Internal linings comply with the recommendations of ADB Classification of internal linings, which are considered to reflect minimum requirements to limit internal fire spread over linings, which could affect the means of escape.

Requirement B3 - Establish Acceptable Limits for Internal Fire Spread (Structure).

The building shall be designed and constructed so that, in the event of fire, its stability will be maintained for a reasonable period

A wall common to two or more buildings shall be designed and constructed so that it adequately resists the spread of fire between those buildings.

Where reasonably necessary to inhibit the spread of fire within the building, measures shall be taken, to an extent appropriate to the size and intended use of the building, comprising either or both of the following—

(a) sub-division of the building with fire-resisting construction;

(b) installation of suitable automatic fire suppression systems.

The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.

Elements of structure will meet minimum recommendations to ensure sufficient time for occupant escape and prevent disproportionate collapse during a fire.

Minimum periods of fire resistance shall be 30 in office areas and 60 minutes in the main workshop.

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

Considering the most onerous purpose group (no limits on office) the building will not be greater than 7000 m² and therefore does not require sub-division using walls creating fire compartments to meet the minimum recommendations in ADB. Furthermore, the use of all of the areas of the building is ancillary to each other and under the control of the same company.

None of the floors in this case would need to be compartment floors.

The provision of an automatic fire suppression system (sprinklers) was considered during the development of the fire strategy. However, based on the building height, occupancy classification, and applicable guidance within Approved Document B, there is no regulatory requirement for the installation of sprinklers for this building type.

Following discussion with the design team and client, it was confirmed that an automatic fire suppression system will not be provided within the building.



Requirement B4 - Establish Acceptable Limits for External Fire Spread & Regulation 7.

The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use, and position of the building. The roof of the building shall adequately resist the spread of fire over the roof and from one building to another, having regard to the use and position of the building.

Building work shall be carried out with adequate and proper materials which—

(i) are appropriate for the circumstances in which they are used,

(ii) are adequately mixed or prepared, and

(iii) are applied, used or fixed so as adequately to perform the functions for which they are designed; and in a workmanlike manner.

The external envelope of a building should not contribute to undue fire spread from one part of a building to another part. The extent to which this is necessary depends on the height and use of the building.

Using the full building height elevation, the building is under 18m. Table 12.1 of ADB requires the external surfaces to be Class B-s3, d2 or better if less than 1000mm from a relevant boundary. If the distance is more than 1000mm, there are no provisions.

External wall construction will comprise a number of façade systems used across the development. The predominant wall build-up will consist of flint masonry cladding at lower levels with black corrugated metal cladding forming the upper wall areas. In selected locations, inset black timber cladding panels will be incorporated within the façade. The retained historic barn structure will utilise timber cladding. These façade treatments are distributed across the elevations as shown within the architectural drawings.

Requirement B5 - Establish Requirements for Access and Facilities for the Fire Service.

The building shall be designed and constructed so as to provide reasonable facilities to assist fire fighters in the protection of life. Reasonable provision shall be made within the site of the building to enable fire appliances to gain access to the building.

Access to the site should be designed in such way that the fire service can easily access the site in the event of a fire. Fire service vehicle access will be provided Ducks Hill Road. Appliance access will be available directly outside the entrance to the building.

Water supplies are considered adequate. There is 1 existing public fire hydrant within 90m of the entrance to the main entrance and likely fire service appliance parking location.

The height of the uppermost floor appears not to be over 18m tall and as such there is no requirement for a firefighting shaft or lift. Firefighting access will be provided by the main entrance and two staircases to the upper floors.

No further fire safety measures are required above those already recommended as part of this strategy.

Conclusion

Based on the provisions detailed in this report, and subject to the completion and verification of all outstanding remedial actions and confirmation measures identified within it, including remediation of the external wall systems, the fire safety measures described are considered sufficient to provide an appropriate level of life safety in accordance with the principles of the Building Regulations [5].



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3 Report Scope and Objectives

This report is a fire strategy for the purpose of detailing the fire safety measures in the building and how the functional fire safety requirements of the Building Regulations are to be met.

The fire strategy will cover all relevant fire safety design issues, in particular:

- Design, location, and protection of escape routes.
- Identification and specification of all fire safety systems that are required.
- Surface spread of flame requirements for surface materials.
- Structural fire resistance requirements.
- Fire compartmentation requirements including fire-stopping and cavity barriers.
- External fire spread.
- Access and facilities for fire services.

The strategy will adopt a structured approach which largely follows Regulations B1 to B5 of the Building Regulations and will assess measures that facilitate the protection of people from fire. Any property protection issues, and business continuity issues assessed or mitigated in the report are either coincidental or are offered on a goodwill basis only – the primary purpose of the proposed assessment is life safety only.

Where necessary, the report will provide recommendations for additional measures deemed necessary to reduce or maintain risk from fire at a tolerable level. The fire safety standards on site will be measured against a benchmark which may be based upon Approved Codes of Practice, British or European Standards, Government or Agency Standards documents or Industry Standard documents.

4 Design & Regulatory Basis

All buildings in England and Wales must comply with the requirements of the Building Regulations [3]. Part B of the regulations relates to fire safety. The regulations provide a series of functional objectives which must be satisfied for approval. For fire safety, the functional objectives of the Building Regulations relate to:

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

Guidance on meeting the minimum standards required to satisfy these functional requirements is provided Approved Document B volumes 1 & 2: 2019 (ADB) [4] [1].

The proposed building incorporates elements of timber-framed construction. It is therefore considered unlikely that this form of construction represents a typical or common building type on which the assumptions of ADB are primarily based. Consequently, ADB may not be appropriate or sufficient as sole guidance in this instance.

ADB stems from the original post war building studies research based on full burnout of the fire confined to the room of origin. This is supported by the current ADB, the introduction states that the Approved Document contains *practical examples and solutions on how to achieve compliance for some of the more common building situations*. And goes on to suggest it may not provide appropriate guidance in the case of unusual design, technology, large timber buildings and some buildings that incorporate modern construction methods [1].

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Where full compliance with ADB cannot be achieved due to the construction methodology, this fire strategy provides proportionate justification to demonstrate that the functional objectives of the Regulations are nonetheless satisfied.

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- Establish requirements for access and facilities for the fire service.

It is noted that the Building Regulations make requirements in relation to life safety alone and therefore, property protection is not explicitly accounted for. Notwithstanding this, the fire strategy has been developed with a certain amount of consideration to the everyday use of the building (i.e. life safety provisions will provide a degree of property safety).

The main fire legislation applicable to this building include;

- The Building Act 1984 [7]
- The Building Regulations 2010 [3]
- The Regulatory Reform (Fire Safety) Order 2005 [8]
- Fire Safety Act 2021 [9]
- The Fire Safety (England) Regulations 2022 [10]
- Building Safety Act 2022 [9]
- The Building etc. (Amendments)(England) Regulations 2022 [11]

Guidance documents also applicable to this building include;

- Approved Document B (ADB) - Volume 2 - Buildings other than dwellings 2019 edition incorporating 2020 and 2022 amendments [4].
- BS7974:2019 Application of fire safety engineering principles to the design of buildings - Code of practice [12].
- BS 9999: 2017: Code of Practice for Fire Safety Design, Management, and use of Buildings [13].

4.1 Basis of Design

All fires generally start small and can remain localised to the area around the ignition point. However, provided with sufficient fuel and ventilation, the potential exists for the fire to grow, and smoke and flames can spread to areas outside the immediate vicinity.

The recommendations and guidance given in this Fire Strategy are based on the assumption that under normal circumstances (i.e. except in the case of arson), a fire is unlikely to start in two different places in a building at the same time and, in the case of flats and maisonettes, a fire is most likely to start within the living space rather than in the common access routes or stairwells.

It is a fundamental assumption that features described in this fire strategy will require management and maintenance throughout the life of the building. Managing fire safety is the whole process throughout the life of a building, starting with the initial design, which is intended to minimise the incidence of fire and to ensure that, when a fire does occur, appropriate fire safety systems (including active, passive, and procedural systems) are in place and are fully functional. Materials used for repair or modification should not impair the fire safety strategy. Fire safety procedures and maintenance schedules should be developed at the design stage and included in the fire safety manual, which is handed over to the person responsible for the fire safety of the building to enable a suitable and sufficient fire risk assessment to be carried out.

This document forms a strategy for fire matters concerning The Building Regulations and The Regulatory Reform (Fire Safety) Order 2005. The design team should ensure that the contents of this report are incorporated into the design of the building. This concept will not prevent a fire occurring and good housekeeping is encouraged to reduce the likelihood and severity of fire.



The strategy is only valid where the systems are designed correctly and maintained in an operating condition. If there is a failure in the management approach and a fire occurs, this concept may not reduce the impact on contents and building damage. Until this report is agreed with the approving authorities, the content should only be used as preliminary information.

5 Reference Information

Key reference documentation considered to be the 'Benchmark Standards' have, where relevant, been referred to within this strategy as detailed in Appendix D - References on page 49. Additionally, this strategy is based on the Client's information provided as in Appendix F - Information Provided by the Client on page 54.

6 Building Description

The Gunmaker 'Holland and Holland' is proposing to create a new-build workshop for manufacturing facility for bespoke shotguns which will replace their existing facility in London on their estate at Northwood. The proposed building will be in the region of 1,416sqm GIA and 1,641sqm GEA.

The development site consists of a series of existing farm buildings which the client wishes to largely demolish as part of this development. In addition, there is at least one historic barn which has been identified onsite which will be retained as part of the proposed scheme. Adjacent to the proposed development is a derelict house which is also on land under the client's ownership. However, does not form part of the planning application nor fire strategy.

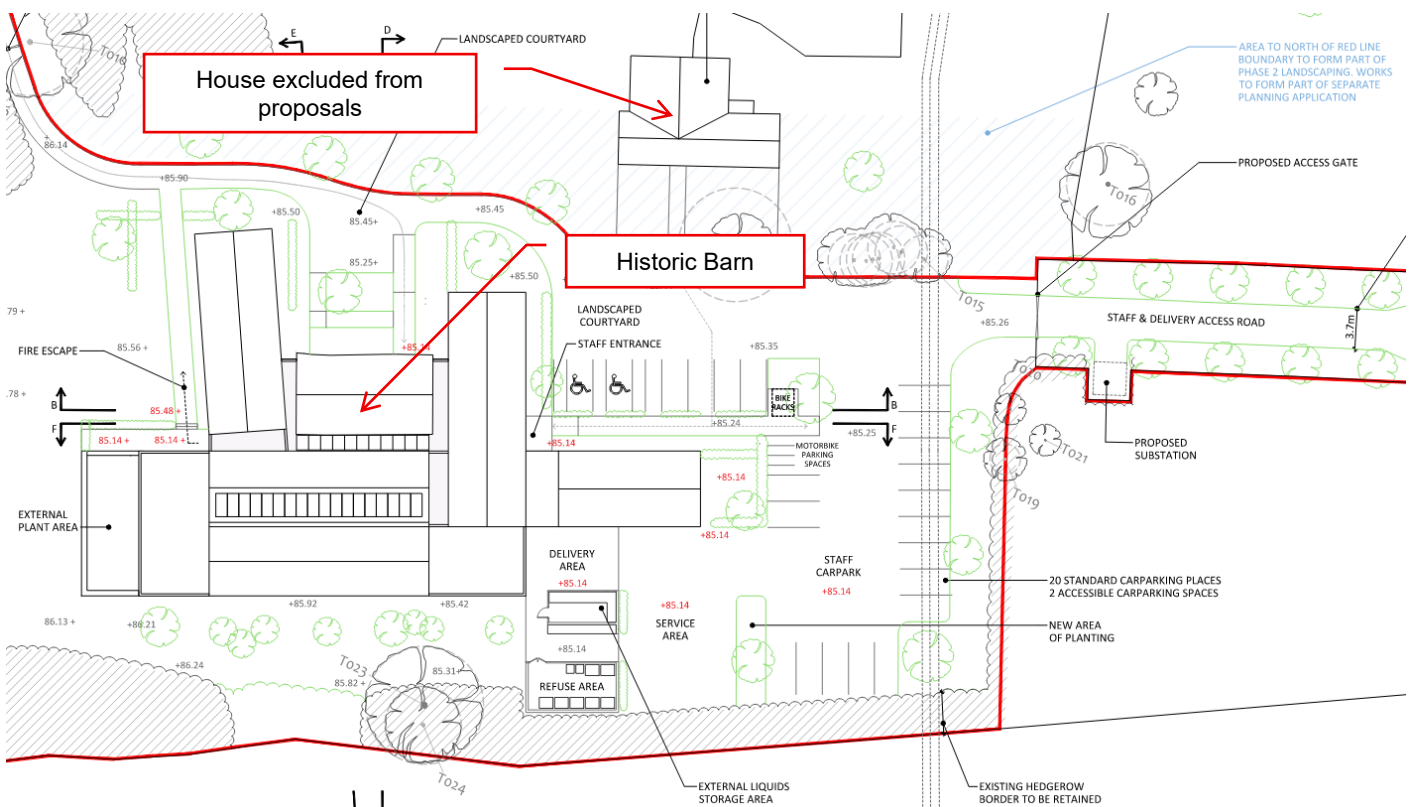


Figure 1 – Proposed site plan

The building's footprint will be approximately 50m by 30m. The building height is 8.5m to the roof, and appropriately 3.5m to the top occupied floor above ground or access level. The building is more than 1m from all relevant boundaries.

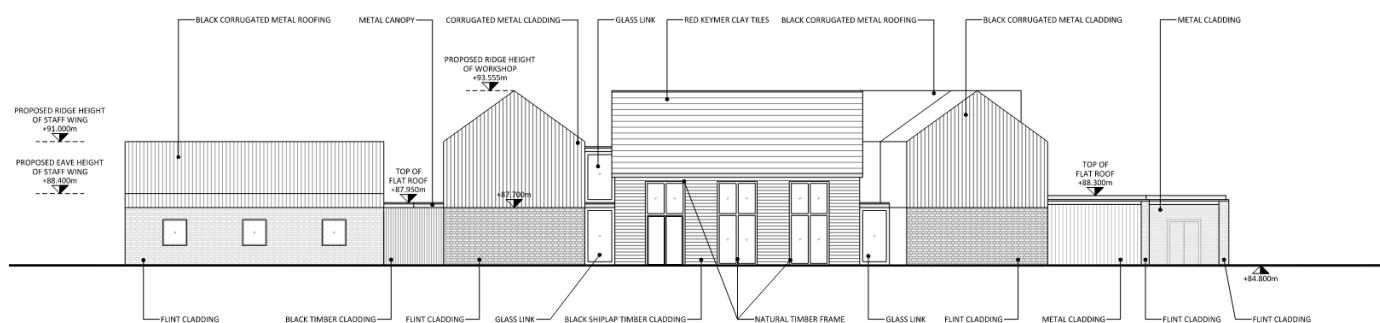


Figure 2 – Proposed view of the North elevation.

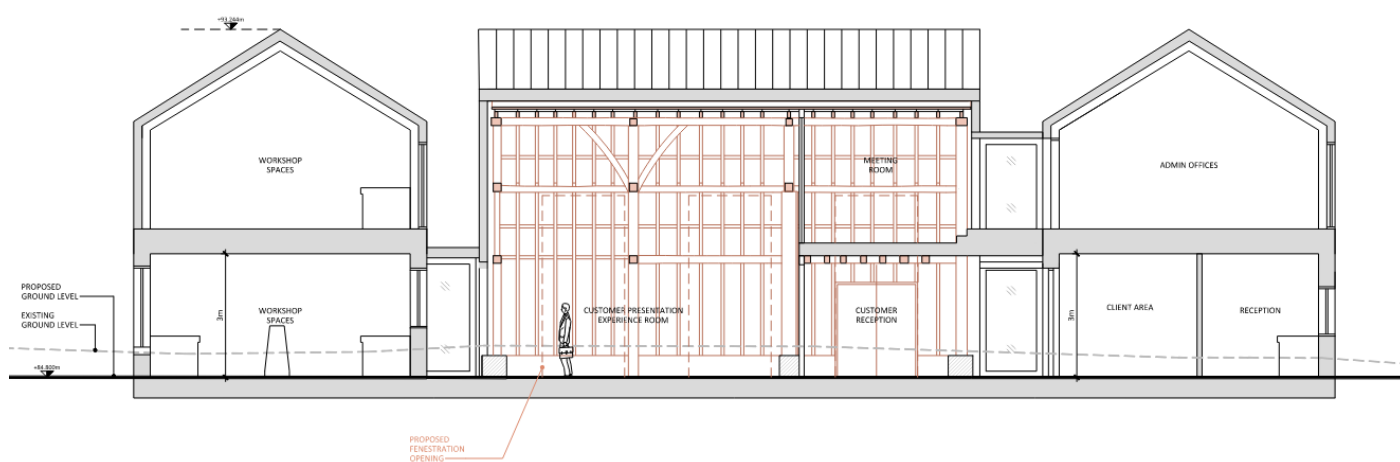


Figure 3 – Proposed section view showing the retained historic barn.

6.1 Construction Method

The first-floor structure above the machine shop will comprise a reinforced concrete slab. This concrete structure will extend beyond the machine shop footprint to form the roof structure of the single-storey flat-roofed areas located at either end of the machine shop.

The machine shop will be predominantly enclosed with masonry external wall construction. In several localised areas, including circulation cores and connecting links, a hybrid structural arrangement comprising concrete and steel elements will be provided.

The workshop spaces located above the machine shop will be constructed using a solid oak timber-framed structure forming both the wall and roof assemblies.

The primary structural system throughout the remainder of the building will generally consist of timber frame construction, including the first-floor and roof structures. The staff wing will also be constructed using timber frame construction. The retained historic barn will incorporate a timber structural frame with timber external cladding. In addition, limited areas of timber cladding will be provided to selected façade locations elsewhere within the development. However, the predominant façade materials across the site will comprise flint stone and brickwork at low level, with corrugated metal cladding above.

6.2 Occupancy Characteristics

For the purposes of achieving an appropriate set of fire safety provisions the occupancy will be considered to consist of trained staff who are familiar with the building, and able to self-evacuate, if any assistance is required staff procedures will be in place to ensure the buildings can be quickly evacuated. Occupancy numbers will be low, and any visitors will be accompanied by a member of staff.



6.3 Purpose Group

As detailed in section 0.20 of ADB [4] building uses are classified within different purpose groups, which represent different levels of hazard. A purpose group can apply to a whole building or to a compartment within the building and should relate to the main use of the building or compartment. For the purposes of achieving an appropriate set of fire safety provisions, the following purpose group will be used as a basis from which to consider the functional requirements:

Table 1 - Purpose Groups

Building Use (or part thereof)	Title	Purpose Group	Description
Office	Office	3	offices, or premises used in a similar manner.
Workshops & Factory areas	Industrial	6	Factories and other premises used for any of the following: <ul style="list-style-type: none">- manufacturing, altering, repairing, cleaning, washing, breaking up, adapting or processing any article- generating power- slaughtering livestock.

6.4 Fire Safety Management

The Regulatory Reform (Fire Safety) Order 2005 (FSO) [8] places a general duty of fire safety care on employers, occupiers, and owners of almost all premises, and requires them to take such fire precautions as may be reasonably required to ensure that premises are safe for the occupants and those in the immediate vicinity.

The responsible person has a duty to carry out a fire risk assessment which must focus on the safety in case of fire of all 'relevant persons'. The risk assessment should pay particular attention to those at special risk, such as the disabled and those with special needs or whom may need assistance to evacuate and must include consideration of any dangerous substance likely to be on the premises.

The Building Regulations and the FSO have been drafted to ensure co-ordination between design and operation phases of buildings. Ideally, the design should reflect the operational intent. Although compliance with the Building Regulations ensures the minimum standard of safety, additional or alternative measures may be necessary to enable the operational intent and compliance with the FSO. Therefore, the following approach has been applied in developing the strategy described herein:

- Where known or foreseeable, the operational intent has been accommodated within this report.
- The exact way in which the building will be operated is based on existing use and documentation provided by the Client. BEFS Ltd do not to accept liability/responsibility if used outside the understood scope.

This fire safety and management document forms part of the FSO process (fire risk assessment) and details the key fire safety design objectives and provisions within the building.

This fire safety strategy assumed that the building will be an actively managed site and that:

- All staff will receive regular fire safety training and records will be held as evidence.
- Regular fire evacuation drills will be completed.
- Regular testing and maintenance regimes will be established, and records held in line with guidance/industry best practice.
- Policies and procedures will be established and are kept under review at periods not exceeding those recommended in the fire risk assessment.

This report relies on suitable management procedures being in place to support fire safety on site as outlined above.

6.4.1 Management System Levels

The standard or quality of a fire risk management system is referred to here as the management system level. There are two management system levels:

Level 1 demonstrates best practice in which the organization's management system is determined to meet a management system standard such as PAS 7.



Level 2 demonstrates good practice with a basic level of management that satisfies the minimum requirements of legislation. This represents the default standard that is to be taken into account when designing a building.

This strategy assumes that a Level 2 management level will be in place in line with the requirements for conformity with legislation, good practice and Table 5 of BS9999 [13, p. 38]. Further information about the fire safety management operational procedures can be found in Section 9 of BS 9999 [13, pp. 220-254].

7 Requirement B1: Means of Warning and Escape

To ensure adequate warning is provided and safe means of escape are available from the building the following measures will be adopted:

7.1 Evacuation Protocol

In most premises, the evacuation in case of fire will simply be by means of everyone reacting to the warning signal given when a fire is discovered, then making their way, by the means of escape, to a place of safety away from the premises. This is known as a simultaneous evacuation and will normally be initiated by the sounding of the general alarm over the fire warning system.

The evacuation protocol will therefore be **Simultaneous Evacuation**.

7.2 B1.1 Fire Detection and Alarm Systems

In line with the requirements of ADB [4, p. 9], all buildings should have arrangements for detecting fire and raising the alarm. Other than for some small buildings/premises, an electrically operated fire alarm system should be provided. In some situations, the alarm should be operated by a fire detection system.

BS5839-1:2017 [5, p. 131] recommends for common places of work, such as offices, shops, factories, warehouses and restaurants, that a Category M system normally satisfies the requirements of legislation. It is, however, often combined with a Category P system to satisfy the requirements of insurers, as company policy for protection of assets, or to protect against business interruption.

Whilst an M system could be considered adequate, the mix of office space and industrial processes increased the risk posed and as a result a level of automatic detection is also considered necessary to enable adequate warning.

Thereby a system will be provided designed and installed to BS5839-1:2017, Category L3.

Category L3: systems designed to give a warning of fire at an early enough stage to enable all occupants, other than possibly those in the room of fire origin, to escape safely, before the escape routes are impassable owing to the presence of fire, smoke or toxic gases; To achieve the above objective it is normally necessary to install detectors in rooms which open onto an escape route. [5].

7.2.1 Interconnections

Interfacing the fire detection and alarm system with another system or piece of equipment should be as per the recommendations of the BS7273 [14] [15] suite of British Standards, including doors held open or secured shut. These systems include but are not necessarily limited to:

- Secured doors.
- ‘Held open’ doors.
- Plant/Equipment
- Lifts



7.2.2 System Design Intent

- The main fire alarm control and indicating equipment (CIE) will be in the reception area in the main entrance.
- Alarm sounder output 65 dB(A), or 5 dB(A) above the ambient noise level, whichever is greater in line with the requirements of BS5839 pt1.
- VID² will be used to supplement the audible alarm where appropriate, however it should be noted that some manufacturers don't make VIDs; they only make VADs.
- A single stage evacuation alert will be adopted.

7.2.3 Cause and Effect

- Single detector activation - full alarm to sound.
- Manual Call Point (MCP) activation, full alarm
- MCP activation or second detector activated – ARC contacted.
- When a fire detector or MCP is activated, it will release the locks for the door access systems allowing exit and entrance to the building.

7.2.4 Documenting Variations

BS 5839-1:2017, in paragraph 7.2a, recommends that “Any variations from the recommendations of this part of BS 5839 incorporated within a specification or design proposal should be clearly identified so that they are obvious to any party from whom approval of the specification or design proposal might be sought, such as the user, purchaser, enforcing authority or insurer”.

7.3 B1.2 Design for Horizontal Escape

Means of escape should be provided from any point on a storey to the storey exit, for all types of building. The general principle is that any person confronted by a fire within a building can turn away from it and escape safely. In some situations, it is acceptable for someone to only have access to a single escape route, but this is limited by how far a person can travel before they either reach a place of relative safety or access more than one alternative escape routes from the building. ADB defines these limits by restricting acceptable travel distances. These are the distances that a person needs to traverse.

7.3.1 Number of Occupants

The building design should, however, still be able to accommodate the number of occupants using the building and allow occupants to escape should they choose to do so or are instructed/aided to by the fire service.

Where occupancy is unknown, the likely maximum number of occupants any occupancy is likely to have, is generally determined by evaluating the likely floor area typically occupied, the floor space factor, in a typical use and dividing the total floor area available by this figure. ADB provided figures for various uses.

Table 2 - Estimated maximum occupancy

Floor	Use	Type of accommodation	Floor Area (m ²)	Floor Space Factor (m ² /person)	Occupancy
Ground	Hot Works Area	8. Art gallery, dormitory, factory production area, museum or workshop	24	5	4.8
Ground	Action & Barrel Shop	8. Art gallery, dormitory, factory production area, museum or workshop	92	5	18.4

² Section 17.1 of BS 5839-1 recommends that “Visual alarm signals need to be used to supplement audible alarm signals in situation in which the latter are likely to be ineffective, but normally ought not to be used on their own. Their use is principally in areas of high ambient sound levels, where hearing protection is likely to be worn. However, they are sometimes used, as the sole initial warning to staff, in situation in which the disturbance of an audible warning is undesirable (e.g. television and radio studios, cinemas, theatres and hospital operating theatres). Visual alarm signals can also be used as a means of giving warning of fire to people who are Deaf and hard of hearing”.

There are 2 different kinds of visual alarm devices – VIDs and VADs.

VIDs are used to supplement audible sounders as a secondary means of raising the alarm, whereas VADs are used as primary alarm devices either on their own, or in conjunction with audible sounders (e.g. for people who are hearing impaired). Because of their different intended uses, VIDs tend to be less bright than VADs – VADs are bright and produce a large amount of flashing light, whereas VIDs are less intense.



Floor	Use	Type of accommodation	Floor Area (m ²)	Floor Space Factor (m ² /person)	Occupancy
Ground	Machine Room	8. Art gallery, dormitory, factory production area, museum or workshop	350	5	70.0
Ground	Customer Pres Room	7. Shop sales area(6)	60	2	30.0
Ground	Walnut Pres Room	7. Shop sales area(6)	15	2	7.5
Ground	Meeting Room	9. Office	12	6	2.0
Ground	Hot Desk Area	9. Office	10	6	1.7
Ground	Cad Office	9. Office	16	6	2.7
Ground	Reception	9. Office	7	6	1.2
TOTAL GF					138.2

Floor	Use	Type of accommodation	Floor Area (m ²)	Floor Space Factor (m ² /person)	Occupancy
Ground	Staff Mess Room	4. Committee room, common room	29	N/A	0 ¹⁾
First	Engraving Room	8. Art gallery, dormitory, factory production area, museum or workshop	30	5	6.0
First	Repair Shop	8. Art gallery, dormitory, factory production area, museum or workshop	42	5	8.4
First	Qc Office	9. Office	19	6	3.2
First	Finishing Shop	8. Art gallery, dormitory, factory production area, museum or workshop	120	5	24.0
First	Machine Room	8. Art gallery, dormitory, factory production area, museum or workshop	40	5	8.0
First	Forge	8. Art gallery, dormitory, factory production area, museum or workshop	8	5	1.6
First	Blackening Room	8. Art gallery, dormitory, factory production area, museum or workshop	8	5	1.6
First	Gm Office	9. Office	14	6	2.3
First	Production Office	9. Office	14	6	2.3
First	Ops Office	9. Office	36	6	6.0
TOTAL FF					63.4
Max Occupancy					201.6

¹⁾ Likely made up from occupants of the other areas rather than additional occupants.

Note: Anticipated occupancy, including visitors etc. is anticipated to be low, initial assumption is based on occupancy of less than 60 persons overall, although above shows this could be greater if required.

7.3.2 Minimum Number of Escape Routes

An escape route can be rendered impassable by fire, smoke, or fumes. Generally, therefore, at least two alternative escape routes should be provided from every storey or floor level. In certain circumstances, however, a single direction of escape (from a dead end) can provide reasonable safety.

The number of escape routes and exits from any room, tier or storey should be not less than the minimum recommended in the table below for the intended number of occupants.

2 means of escape routes will be provided from the upper floor with the ground floor provided with 4 routes.

Table 3 - Number of escape routes per storey

Minimum number of escape routes and exits from a room, tier, or storey	
Maximum number of people	Minimum number of exit/escape route
60	1
600	2



The site layout ensures that the maximum travel distances will not exceed the following:

Table 4 - Maximum travel distances.

Purpose Group		Travel distance, in metres (m)			
		Two-way Travel		One-way Travel	
		Actual	Direct (m) ¹⁾	Actual	Direct (m) ¹⁾
3	Office	45	30	18	12
6	Industrial				
	Normal Hazard	45	30	25	16.5
	Higher Hazard ²⁾	25	16.5	12	8
2-7	Plant Room (distance within the room)	35	23	9	6

1) If the internal layout of partitions, fittings, etc. is not known, direct distances, rather than travel distances, should be assessed. The direct distance should be assumed to be two-thirds of the actual travel distance.
 2) Higher hazard includes manufacturing, processing or storage of significant amounts of hazardous goods or materials, including any of the following:

- Any compressed, liquefied or dissolved gas.
- Any substance that becomes dangerous by interaction with either air or water.
- Any liquid substance with a flash point below 65°C, including whisky or other alcoholic liquor.
- Any corrosive substance.
- Any oxidising agent.
- Any substance liable to spontaneous combustion.
- Any substance that changes or decomposes readily, giving out heat when doing so.
- Any solid substance with a flash point less than 120°C.
- Any substance that is likely to spread fire by flowing from one part of a building to another.

7.3.3 Inner Rooms

Inner rooms are in line with section 2.11 of ADB [16, p. 15]. The following rooms are considered inner rooms:

- Hot works room ground floor
- Stocking area and Quality Control Office on the first floor

7.3.4 Escape Route Widths

ADB gives the minimum escape route widths in Table 2.3, which is replicated below, the designs provided ensure minimum escape widths are at least 850mm:

Table 5 - Replicated Table 2.3 from ADB [16, p. 19]

Widths of escape routes and exits	
Maximum number of people	Minimum width (mm) ⁽¹⁾⁽²⁾⁽³⁾
60	750 ⁽⁴⁾
110	850

1) See ADB Appendix D for methods of measurement.
 2) Widths may need to be increased to meet guidance in Approved Document M. (outside this report's scope).
 3) Widths less than 1050mm should not be interpolated.
 4) Not applicable to the HQ and Training Facility

7.3.5 Enclosure of Corridors that are not Protected Corridors

Corridors used for a means of escape which are not protected corridors, even though the enclosing partitions may have no fire resistance, both of the following will be met to inhibit the spread of smoke.

- a) Partitions should continue to the soffit of the structural floor above, or to a suspended ceiling.
- b) Openings into rooms from the corridor should be fitted with doors, which do not need to be fire doorsets.

7.3.6 Division of Corridors

A corridor providing access to alternative escape routes will be divided by fire doorsets fitted with a self-closing device where both of the following apply.

- a) It is more than 12m long.
- b) It connects two or more storey exits.



The site is designed with an open plan layout, with both stairs separated by fire doors adjacent to each stair providing the separation between means of escape.

7.4 Design for Vertical Escape

7.4.1 Number of Escape Stairs

The vertical escape will be provided by the two escape staircases.

7.4.2 Design and Protection of Escape Stairs and Routes

The stairs will provide effective clear widths of 1000mm.

The internal escape stairs will be protected stairways³ (within a fire resisting enclosure). With stair 1 provided as the primary means of escape stair with a refuge and lift. Stair 2 is provided with a refuge point and will be open to the repair shop area, see section 7.4.5 below for further discussion on stair 2.

Doors onto escape stairs have a clear opening of 850mm.

7.4.3 Final exits

People should be able to leave the area around the building rapidly. Direct access to a street, passageway, walkway or open space should be available. The route away from the building will comply with the following:

- Be well defined.
- If necessary, have suitable guarding.
- Final exits will not present a barrier for disabled people. Where the route to a final exit does not include stairs, a level threshold, and, where necessary, a ramp should be provided.

7.4.4 Doors on escape routes

Doors will be readily openable to avoid undue delay to people escaping. In general, doors on escape routes (whether or not the doors are fire door sets) will be either of the following:

- Not fitted with a lock, latch or bolt fastenings.
- Fitted only with simple fastenings that are all of the following:
 - o Easy to operate; it should be apparent how to undo the fastening.
 - o Operable from the side approached by people escaping.
 - o Operable without a key.
 - o Operable without requiring people to manipulate more than one mechanism.
- Doors may be fitted with hardware to allow them to be locked when rooms are empty. If a secure door is operated by a code or combination keypad, swipe or proximity card, biometric data, etc., a security mechanism override should be possible from the side approached by people escaping.
- Electrically powered locks should return to the unlocked position in the following situations:
 - If the fire detection and alarm system operates.
 - If there is a loss of power, system error or fault with the fire detection and alarm system.
 - If the security mechanism override is activated.
- Security mechanism overrides for electrically powered locks should be a Type A call point, as described in BS 7273-4⁴. The call point should be positioned on the side approached by people escaping.
- All doors on escape routes should be hung to meet both of the following conditions.
 - o Open by a minimum of 90 degrees.
 - Open with a swing that complies with both of the following.
 - Is clear of any change of floor level other than a threshold or single step on the line of the doorway.
 - o Does not reduce the effective width of any escape route across a landing.

³ A protected stairway may only include any of the following:

- Sanitary accommodation or washrooms, as long as the accommodation is not used as a cloakroom. A gas water heater or sanitary towel incinerator may be installed in the accommodation, but no other gas appliance.
- A lift well.

⁴ BS 7273-4:2015+A1:2021 Code of practice for the operation of fire protection measures. Actuation of release mechanisms for doors



7.4.5 Lifts & Provision of Refuges & Assisted Evacuations

The WHO⁵ says 15% of the worldwide population are disabled. The number of people in the UK, who reported a disability in 2019 to 2020 was 14.1 million. This means that nationally, 22% of people have a disability, of this figure almost 50% reported a mobility impairment, therefore it is assumed approximately 11% of the UK population have mobility impairments. [6] Whilst this figure may not be directly applied to the site a reasonable number of persons with mobility issues should be included.

The installation of lifts which can be used for evacuation purposes (accompanied by a management plan) provide a dignified solution.

However, the size of the site and limited requirements would make the provision of a dedicated evacuation lift complying fully to the requirements of Annex G to BS 9999 and BSEN 81-76/81-72 is not feasible.

Therefore, the following is proposed:

- Platform lift to BSEN 41
- Within a 30-minute enclosure
- A separate intercom, and secondary power supply will be provided by way of a diverse supply or UPS enabling 2-3 cycles of the lift.

7.4.6 Management of the Lift Evacuation

As there is only one floor, the lift will operate as normal, however, it may be beneficial to default the car to the 1st floor, to minimise initial lift call time. In an emergency a staff member will be required to stay on the 1st floor with any occupants who need to use the lift and ensure the lift use is managed one occupant at a time, the refuge will provide at least 30 minutes of protection to enable more than one cycle to be completed.

Staff will be required to understand the lift operation and actions to take in the event of lift failure and basic training on the use of the lift emergency controls and action to take if lift fails will be required to be provided and incorporated into staff training. The fire safety management plan needs to provide clear details on the use of lifts and ensure when hall in use adequate numbers of staff (2 persons minimum) are available to assist, this would form part of PEEPs once the building is occupied.

Refuge Provision and Stair 2

A refuge area is required for Stair 2. A lift is not required in this stair as the evacuation lift is located within Stair 1.

In accordance with ADB Vol. 2, refuges form part of the building's management plan and provide a temporary safe waiting area for mobility-impaired occupants. Refuges are intended for short-term use only and must comply with the following principles:

- A refuge is required on every storey served by a protected stairway, other than plant-only levels.
- Refuges may be located outside the stair enclosure, provided they give direct access to the stair.
- They do not need to equal the total number of potential wheelchair users; sequential use during evacuation is assumed.
- Acceptable locations include protected lobbies, protected corridors, compartments, or suitably protected/open-air areas that are remote from fire hazards and have their own means of escape.
- Minimum clear space: 900 × 1400 mm, un-obstructing the escape route.
- EVC: Type B outstation communicating with the master station in accordance with BS 5839-9.
- Signage: "Refuge – keep clear" mandatory signage and appropriate fire-safety signs.

Application to Stair 2

For Stair 2, the proposed refuge is located within a separate fire-resisting compartment, giving direct access to the stair. As this compartment provides the necessary protection, an additional protected lobby is not required. This wing of the building therefore provides the necessary temporary place of safety for refuge users awaiting assisted evacuation.

ADB typically expects a door at the head of a protected stair to maintain the stair's compartmentation. In this case, however, the inclusion of such a door offers no meaningful improvement to life safety:

⁵ World Health Organization.



- In a fire within the open-plan area, occupants can move away from the fire and enter Stair 2, which leads directly to a place of relative safety.
- For smoke to compromise Stair 2, the entire compartment would need to become smoke-logged. The stair is located remotely from the principal risk area, with robust compartment lines preventing early smoke ingress.
- The ground floor is lobby-protected, ensuring that smoke cannot compromise final exit conditions.
- Automatic fire detection is provided well in excess of minimum ADB requirements, supporting early warning and reducing tenability concerns.
- Compartmentation between risk areas has been enhanced, further reducing the probability of smoke spread into the Stair 2 enclosure.

While the omission of the door at the head of the stair is a variation from the guidance in ADB, the overall arrangement provides an equivalent, or better, level of safety. This approach should be agreed with the Authority Having Jurisdiction (AHJ), supported by justification based on:

- robust compartmentation,
- early detection,
- protected final-exit routes, and
- the availability of an alternative stair and refuge strategy.

7.5 Heat and Smoke Control

Means of escape are in line with ADB, heat and smoke control is not considered necessary.

7.6 B1.3 General Provisions

7.6.1 Doors on Escape Routes

All fire doorsets will have the performance shown in Table C1 of ADB [4, pp. 136-139] and extracted in the Table 7 below. All fire doorsets will be classified in accordance with BS EN 13501-2 [17], tested to the relevant European method from the following.

- BS EN 1634-1 [18].
- BS EN 1634-2 [19].
- BS EN 1634-3 [20].

All fire doorsets will be fitted with a self-closing device, except for all of the following:

- a. Fire doorsets to cupboards.
- b. Fire doorsets to service ducts normally locked shut.

All fire doorsets will be marked with one of the following fire safety signs, complying with BS 5499-5, as appropriate:

- a. To be kept closed when not in use – mark 'Fire door keep shut'.
- b. To be kept locked when not in use – mark 'Fire door keep locked shut'.
- c. Held open by an automatic release mechanism or free swing device – mark 'Automatic fire door keep clear'.

All fire doorsets should be marked on both sides, except fire doorsets to cupboards and service ducts, which should be marked on the outside. Example of required signage:

Table 6 - Example of fire door signage required.



Doors with automatic hold open devices



Cross corridor and lobby doors



Service cupboards and risers



Cupboards containing electrical equipment.



Table 7 - Required fire door performance by location

Required fire door performance by location		
Position of door	Minimum fire resistance in terms of integrity (minutes) when tested to BS 476-22	Self-closing
1. In a compartment wall separating buildings	Same as for the wall in which the door is fitted, but a minimum of 60 minutes	Yes
2. In a compartment wall:		
a. if it separates a flat from a space in common use	FD30S ⁽¹⁾	Yes
b. enclosing a protected shaft forming a stairway wholly or partly above the adjoining ground in a building used for flats, other residential, assembly and recreation, or office purposes.	FD30S ⁽¹⁾	Yes
c. enclosing a protected shaft forming a stairway not described in (b) above	Half the period of fire resistance of the wall in which it is fitted, but 30 minutes minimum and with suffix S ⁽¹⁾	Yes
d. enclosing a protected shaft forming a lift or service shaft	Half the period of fire resistance of the wall in which it is fitted, but 30 minutes minimum	Yes
e. not described in (a), (b), (c) or (d) above.	Same as for the wall in which it is fitted, but add S ⁽¹⁾ if the door is used for progressive horizontal evacuation under the guidance to requirement B1	Yes
3. Forming part of the enclosures of:		
a. a protected stairway (except as described in item 7 or 9(b) below)	FD30S ⁽¹⁾	Yes
b. a lift shaft that does not form a protected shaft in 2(b), (c) or (d) above.	FD30S ⁽¹⁾	N/A
4. Forming part of the enclosure of:		
a. a protected lobby approach (or protected corridor) to a stairway	FD30S ⁽¹⁾	Yes
b. any other protected corridor	FD20S ⁽¹⁾	Yes
c. a protected lobby approach to a lift shaft	FD30S ⁽¹⁾	Yes
5. Giving access to an external escape route	FD30	Yes
6. Sub-dividing:		
a. corridors connecting alternative exits	FD20S ⁽¹⁾	Yes
b. dead-end portions of corridors from the remainder of the corridor	FD20S ⁽¹⁾	Yes
8. Any door that forms part of the enclosure:		
a. to a place of special fire hazard	FD30	Yes ⁽²⁾
b. to ancillary accommodation in care homes	FD30	Yes
⁽¹⁾ Unless pressurisation techniques that comply with BS EN 12101-6 are used, these doors should also comply with one of the following conditions. a. Have a leakage rate not exceeding 3m ³ /m/hour (from head and jambs only) when tested at 25Pa under BS 476-31.1. b. Meet the additional Sa classification when tested to BS EN 1634-3. ⁽²⁾ No self-closing device required to doors to storerooms or rooms which are kept locked shut.		

7.6.2 Smoke Control Requirements for Fire Doors.

In this instance due to the simplicity of design, there is no requirement for smoke control in the later stages of fire development. There is a staff led simultaneous evacuation and the time required for means of escape will be limited. No smoke control systems are being provided which require restrictions on air flow. Therefore, to meet the requirements of Building Regulations and ADB smoke control is only required for cold smoke at ambient temperatures in accordance with BS476:31.1 1983 / EN 1634-3:2004 smoke tests.

During BS EN 1634-3 cold smoke testing, the door threshold is sealed over (taped), and as such compliance does not require threshold smoke seals or restriction of the undercut to ≤3 mm. Accordingly, doors will be provided as follows:

- FD30 door
- manufacturers smoke (and combined heat) seals provided at head and jambs for cold smoke protection,
- Undercut not exceeding 8mm (or as per manufacturers recommendation) to achieve manufactures test specifications for FD30 doors.



7.6.3 Lighting

Adequate artificial lighting will be provided in all escape routes and the stairs of a sufficient standard to enable persons to safely escape. In addition to the system of artificial lighting, escape lighting should be provided.

The escape lighting system will conform to the appropriate recommendations of BS 5266: Part 1

In the event of a failure of the supply to the normal lighting, emergency escape lighting should be available to assist occupants to evacuate a building safely by:

- a) locating and identifying exit signs at doors and escape route direction signs.
- b) using the escape routes.
- c) conducting safety measures prior to evacuation, such as shutting equipment down safely or checking that all personnel have vacated the premises.

The duration of the emergency escape lighting should include time to evacuate disabled occupants or to release anyone trapped in a lift.

To ensure escape routes can be used at all times, the horizontal illuminance on the floor along the centre line of an escape route up to 2 m in width should be not less than 1 lx.

Emergency escape lighting will be provided in escape routes, open areas, high risk task areas, and points of emphasis including:

- near each exit door intended to be used in an emergency.
- near stairs so that each flight of stairs receives direct light.
- near any other change in level.
- externally illuminated escape route signs, escape route direction signs and other safety signs needing to be illuminated under emergency lighting conditions.
- at each change of direction.
- at each intersection of corridors.
- near to each final exit and outside the building to a place of safety.
- near each piece of fire-fighting equipment and call point.
- near escape equipment provided for disabled people.
- near refuges and call points, including two-way communication systems and disabled toilet alarm call position.
- near manual release controls provided to release electronically locked doors as recommended in BS 7273-4.
- External areas in the immediate vicinity of exits

NOTE 1 “near” is normally considered to be within 2 m measured horizontally.

NOTE 2 “at” means that the emergency luminaire would illuminate in both directions at the change of direction or intersection.

The escape stair lighting should be on a separate circuit from the electricity supply to any other part of the escape route.

7.7 Escape Signs on Common Escape Routes

Appropriate fire safety signage forms a key element of a buildings fire safety provision, for both occupiers and the fire service. Escape signage should be provided in accordance with BS5499-4:2013, Code of practice for escape route signing.

An escape route sign (see Figure 4) is a combination sign consisting of the emergency exit sign accompanied by a supplementary safe condition direction arrow and supplementary text.



Figure 4 - Examples of escape route signs

The supplementary text should aid understanding of the meaning of the graphical symbol so that it is fully understood, and it may convey additional information.



The supplementary text should not be used on its own and might need to be in more than one language.

A supplementary text sign reading “Exit” (as shown in Figure 5) should be used with an escape route sign to indicate a doorway or other suitable opening that leads to a place of safety. This is the route normally used to enter or leave the building.

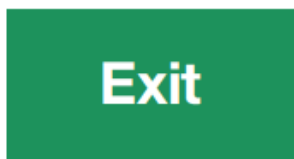


Figure 5 - Supplementary text: Exit

A supplementary text sign reading “Fire exit” (as shown in Figure 6) should be used with an escape route sign to indicate a doorway or other suitable opening that leads to a place of safety which has been provided specifically as an alternative exit to be used in the event of the evacuation of the premises.



Figure 6 - Supplementary text: Fire exit

Every escape route sign should be accompanied by a directional arrow. The arrow should indicate the direction of travel leading to the place of safety.

The use of an appropriate arrow should assist understanding of the direction of egress (see Figure 7 below and Table 1 of BS5499-4 (p9)) and also make the sign more conspicuous. The message of the upward vertical direction sign at an emergency exit door is “progress through this door”; the sign does not indicate decisions or directions that should be made on the other side of the door.



Figure 7 - Examples of directional arrows

The following principles should be applied:

- an arrow should not be used on its own
- arrows should be correctly orientated
- arrows should be used to indicate each change of direction or change of level
- arrows should be used wherever additional signs are provided
- an arrow should be provided wherever confusion might otherwise occur

To avoid confusion, all signs within a system of escape route signing should be of similar style, design, size and format.

7.7.1 Location of Signs

The following principles should be applied when locating signs:

- at least one escape route or doorway leading to an escape route should be visible from any place within every room or enclosure. Where this route is not conspicuous or confusion could occur, the route should be indicated by a sign
- where direct sight of the escape route or of the sign indicating the escape route is obstructed, one or more intermediate signs should be provided
- doors or passageways which might be confused as leading to a designated escape route should be marked clearly
- escape route signs should take precedence over all other signs. Signs with a potentially conflicting message (e.g. “no thoroughfare” and “fire exit”) should not be used in the same location. Where this conflict is unavoidable, a supplementary text sign (e.g. “except in an emergency”) should be provided to override the prohibition message



- all changes of direction in corridors, stairways and open spaces forming part of an escape route should be marked with intermediate signs. Each intermediate door or junction should be similarly signed
- signs should be evenly spaced and consistently located so that the evacuee can effectively and quickly predict the location of the next sign within the escape route
- additional signs should be provided where the line of sight to the next sign would otherwise exceed the recommended maximum viewing distance for the chosen size of the sign
- a sign should be provided wherever confusion could otherwise occur
- every designated escape route should lead to a place of safety.
- signs should not be fixed to doors or sited where they could be obscured by opening doors
- where commercial or artistic considerations require signs or objects which owing to their size, brightness, design, or proximity could be confused with or prevent recognition of an escape route sign; the location of the escape route sign may be slightly displaced provided safety is not compromised thereby. Otherwise, the confusing signs or objects should be removed
- the effectiveness of any escape route sign should not be adversely affected by the presence of other signs conveying directional information in a similar format or by other internally illuminated signs or by competing or distracting light sources.

7.7.2 Mounting Height

Escape route signs should be sited conspicuously within the normal field of vision.

Signs above doors or open spaces should be mounted between 2 m and 2.5 m from floor level, measured to the base of the sign and be sited as close to the centre line of the escape route as practicable

Signs sited on walls should be mounted between 1.7 m and 2 m, from floor level measured to the base of the sign

Signs should be sited at the same height throughout the escape route, so far as is reasonably practicable.

7.7.3 Lighting

To ensure that signs are identifiable and conspicuous, both in normal and in mains-failure conditions, escape route signs should be illuminated. It is not normally considered satisfactory to rely on daylight alone for satisfactory illumination.

Externally illuminated signs and phosphorescent signs - where a sign is illuminated by an external source, the vertical illumination should be not less than 100 lux under normal lighting conditions and should provide not less than 5 lux on any part of the face of the sign under mains-failure conditions.

Internally illuminated signs - The light source of an internally illuminated sign should provide a luminous contrast appropriate to its environment without producing glare. In premises with emergency lighting, the escape route sign under mains-failure conditions should conform to BS 5266-1.



8 Site Specific Hazards

8.1 Use of Acetylene

Acetylene cylinders present unique hazards: if exposed to heat, acetylene can decompose and explode. Fire services enforce hazard zones up to 200 m when acetylene is involved. The initial hazard zone of up to 200 m is a fire-and-rescue operational control whenever an acetylene cylinder is involved in a fire; even a single cylinder can trigger it. The size of your stock doesn't "exempt" you from that initial cordon.

Best practice is to minimise the number of acetylene cylinders kept on site, and to store them outdoors in a secure, ventilated, lockable cage, ideally:

- At least 4 m from buildings and boundaries (or separated by a fire wall)
- Protected from direct sun/frost.
- Kept upright, chained/secured, and locked against unauthorised access
- Oxygen and acetylene cylinders should not be stored in the same store; LPG must also be separated by a wall or at least 3 m clear space

The acetylene will be stored externally approximately 7m from the building in a secure flammable's storage area, with a retaining wall of masonry, and separation from the other flammable storage.

O² will be stored separately at least 4m from the acetylene.

8.2 LPG

LPG will be used onsite. The client has suggested that only a limited supply is required, which would not fall into bulk storage requirements, an estimate of 20-40kg of gas is required to be stored for daily use.

Internal storage of LPG cylinders presents a significantly higher fire and explosion risk due to the potential for gas accumulation in enclosed spaces, particularly as LPG is heavier than air and can pool at low levels. The acceptability of internal storage should be determined by a suitable competent DSEAR/gas specialist as part of H&S and fire safety management procedures which falls outside the scope of this fire strategy.

Outdoor storage is therefore strongly preferred.

Outdoor Storage

Gas cylinder stores should be located outdoors wherever practicable, with adequate natural ventilation, security, and compliance with prescribed separation distances. A store is only considered "outdoors" where at least 30% of the perimeter is open with no roof, or 50% open where a roof is provided; otherwise, it must be treated as internal storage with additional controls.

Outdoor stores should provide thorough ventilation to disperse any minor gas leakage, be constructed on a rigid, non-combustible, non-porous surface such as concrete, and be positioned no closer than the minimum separation distances from buildings, site boundaries, and fixed ignition sources, based on the total LPG quantity and stack configuration.

These distances range from 1 m for small quantities (≤400 kg) up to 20 m for large stores (>250,000 kg), unless reduced by suitable fire-resisting barriers, and are intended to limit thermal radiation from adjacent fires and reduce the likelihood of escaping LPG being ignited prior to dispersion.

Table 8 - Table A – Minimum Separation Distances for Total LPG ; Storage Code of Guidance for the Storage of Full and Empty LPG Cylinders and Cartridges

Total LPG in Containers (kg)	Min distance to boundary/building/ignition source (m) – <i>no fire wall</i>	Min distance with fire wall (m)
Up to 400	1	Nil
Above 400 to 1,000	3	1

The walls of the store are proposed to be fire walls built of solid construction from brick, concrete or solid masonry and should be capable of providing at least 30 minutes of fire resistance.



The fire wall should be at least as high of the stack of cylinders but not less than 2m.

Stores containing more than 400 kg should have no more than 2 fire walls and the remaining walls should be constructed so they do not impair the natural ventilation.

If the store contains less than 400 kg it may consist of 3 fire walls.

Gas cylinders should not be stacked against the fire wall except in a small store where 400 kg or less are kept. In other cases, a space of at least 1 m should be provided between the stack of cylinders and the wall to allow access for inspection or the removal of any faulty cylinders.

In all cases, in all storage areas, there shall be adequate, through and thorough ventilation. Ventilation is required to ensure that any small leakage of gas is adequately dispersed. Adequate ventilation will prevent or minimise the likelihood of a hazardous atmosphere being created.

An outdoor store with open sides and without a roof is generally considered to provide adequate ventilation. This is the preferred option.

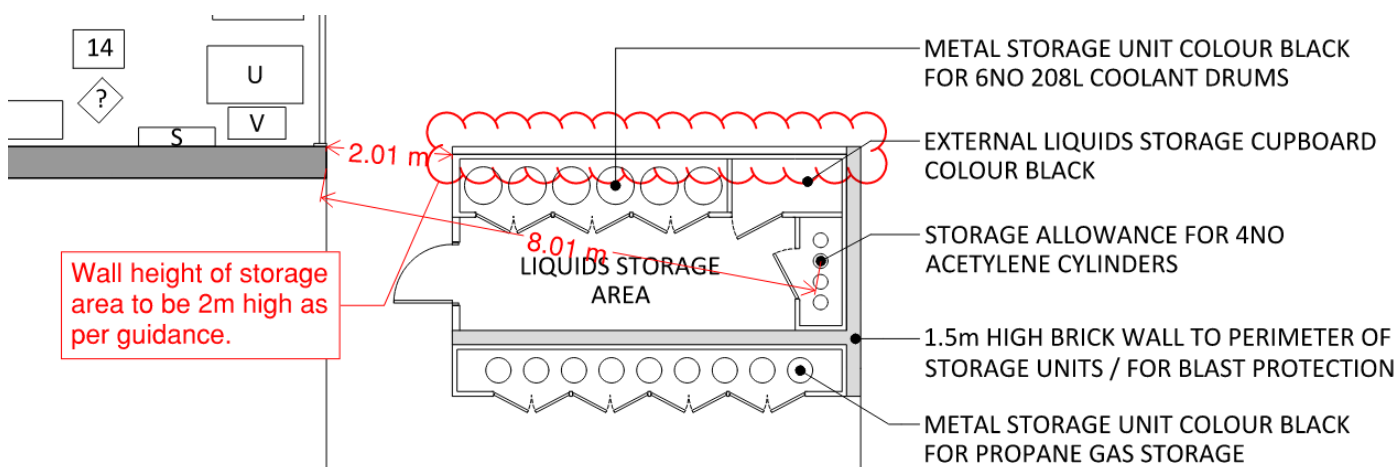


Figure 8 - proposed external flammable storage area



9 Requirement B2: Internal Fire Spread (Linings)

9.1 B2.1 Wall and ceiling linings

The wall and ceiling linings will meet the recommendations of ADB Table 6.1 [4, p. 55] Classification of internal linings, as extracted in the table below.

Table 9 – ADB Table 6.1 Classification of internal linings

Location	Classification
Other circulation spaces	Class B-s3, d2 (European) ⁽¹⁾ .
Other rooms	Class C-s3, d2
Small rooms of maximum internal area not more than 30m ²	Class D-s3, d2 (European).
⁽¹⁾ : Wallcoverings which conform to BS EN 15102, achieving at least class C-s3, d2 and bonded to a class A2-s3, d2 substrate, will also be acceptable.	

For the purposes of this requirement, a wall includes both of the following:

- The internal surface of internal and external glazing (except glazing in doors).
- Any part of a ceiling which slopes at an angle greater than 70 degrees to the horizontal.

For the purposes of this requirement, a wall does not include any of the following:

- Doors and door frames.
- Window frames and frames in which glazing is fitted.
- Architraves, cover moulds, picture rails, skirtings, and similar narrow members.
- Fireplace surrounds, mantle shelves, and fitted furniture.

Parts of walls in rooms may be of lower performance than stated in Table 6.1, but no worse than class D-s3, d2. In any one room, the total area of lower performance wall lining should be less than an area equivalent to half of the room's floor area, up to a maximum of 60m² in non-residential accommodation.

9.1.1 Thermoplastic materials

ADB makes provision for the use of thermoplastic materials in windows, roof lights, lighting diffusers and in suspended ceilings. BEFS Ltd is not aware of the use of thermoplastic materials within the construction. Should the designer choose to incorporate thermoplastic material, then account for the relevant sections of ADB should be taken.



10 Requirement B3: Internal Fire Spread (Structure)

To prevent the premature collapse of the structure of the building during means of escape and firefighting, the structure will have specified periods of fire resistance.

10.1 Provision of Fire Resistance

The minimum periods of fire resistance will be as follows:

Table 10 - Minimum periods of fire resistance

Purpose group of building	Height (m) of top floor above ground, in a building or separated part of a building	Minimum period of fire resistance (minutes)
3. Office: With or without sprinkler system	Up to 5m	30 min†
6. Industrial: Without sprinkler system		60 min
With sprinkler system ⁽¹⁾		30 min†
NOTES † For compartment walls that separate buildings, the period is increased to a minimum of 60 minutes. (1) 'With sprinkler system' means that the building is fitted throughout with an automatic sprinkler system in accordance with Appendix E.		

10.2 B3.1 Loadbearing Elements of Structure

The purpose of providing the structure with fire resistance is.

- To minimise the risk to occupants (life safety).
- To reduce the risk to firefighters who may be engaged on search and rescue operations.
- To reduce the danger to people in the vicinity of the building.

Minimum periods of fire resistance for loadbearing elements of structure are as follows:

Table 11 - Recommended Periods of Fire Resistance for elements of structure.

Part of building	Minimum provisions when tested to the relevant European standard (minutes) ⁽¹⁾	Minimum provisions when tested to the relevant part of BS 476 ⁽²⁾ (minutes)			Method of exposure
		Loadbearing capacity ⁽³⁾	Integrity	Insulation	
Structural frame, beam, or column	R See Table 10	See Table 10	N/A	N/A	Exposed faces
Loadbearing wall (which is not also a wall described in any of the following items)	R See Table 10	See Table 10	N/A	N/A	Each side separately
Floors ⁽⁴⁾					
a. between a shop and flat above	REI 60 or see Table 10 (whichever is greater)	60 or see Table 10 (whichever is greater)	60 or see Table 10 (whichever is greater)	60 or see Table 10 (whichever is greater)	From underside ⁽⁵⁾
b. in upper storey of two storey dwellinghouse (but not over garage or basement)	R30 and EI 15	30	15	15	
c. Any other floor, including compartment floors	REI See Table 10	See Table 10	See Table 10	See Table 10	
Roofs					
a. any part forming an escape route	REI30	30	30	30	From underside ⁽⁵⁾
b. any roof that performs the function of a floor.	REI See Table 10	See Table 10	See Table 10	See Table 10	



Part of building	Minimum provisions when tested to the relevant European standard (minutes) ⁽¹⁾	Minimum provisions when tested to the relevant part of BS 476 ⁽²⁾ (minutes)			Method of exposure
		Loadbearing capacity ⁽³⁾	Integrity	Insulation	
External walls a. any part a maximum of 1000mm from any point on the relevant boundary ⁽⁶⁾ b. any part a minimum of 1000mm from the relevant boundary ⁽⁶⁾ c. any part beside an external escape route	REI See Table 10	60	60	60	Each side separately
	RE See Table 10 I15	See Table 10	See Table 10	15	From inside the building
	RE30	30	30	No provision ⁽⁷⁾⁽⁸⁾	From inside the building
Notes: In the European classification: 'R' is the resistance to fire in terms of loadbearing capacity. 'E' is the resistance to fire in terms of integrity. 'I' is the resistance to fire in terms of insulation. The national classifications do not automatically equate with the alternative classifications in the European column, therefore, products cannot typically assume a European class unless they have been tested accordingly.					

Premature failure of the structure can be prevented by provisions for loadbearing elements of structure to have a minimum standard of fire resistance, in terms of resistance to collapse or failure of loadbearing capacity. The purpose in providing the structure with fire resistance is threefold, namely:

- to minimise the risk to the occupants, some of whom may have to remain in the building for some time while evacuation proceeds if the building is a large one.
- to reduce the risk to fire fighters, who may be engaged on search or rescue operations.
- to reduce the danger to people in the vicinity of the building, who might be hurt by falling debris or as a result of the impact of the collapsing structure on other buildings.

Structural elements that are self-supporting or support only a roof need not have any applied fire protection.

10.3 B3.2 Provision of Compartmentation & Fire Resisting Construction

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

Considering the most onerous purpose group (no limits on office) the building will not be greater than 7000 m² and therefore does not require sub-division using walls creating fire compartments to meet the minimum recommendations in ADB. Furthermore, the use of all of the areas of the building is ancillary to each other and under the control of the same company.

None of the floors in this case would need to be compartment floors. Minimum periods of fire resistance for fire resisting construction are therefore as follows:

Table 12 - Recommended Periods of Fire Resistance for compartmentation & FR Construction.

Part of building	Minimum provisions when tested to the relevant European standard (minutes) ⁽¹⁾	Minimum provisions when tested to the relevant part of BS 476 ⁽²⁾ (minutes)			Method of exposure
		Loadbearing capacity ⁽³⁾	Integrity	Insulation	
Protected shafts Excluding any firefighting shaft: a. any glazing described in Section 8 diagram 8.4 (ADB2) b. any other part between the shaft and a protected lobby/corridor described in Section 8 diagram 8.4 c. any part not described in (a) or (b) above.	E30	Not Applicable	30	No provision ⁽⁸⁾	Each side separately
	REI30	30	30	30	
	REI See Table 10	See Table 10	See Table 10	See Table 10	



Part of building	Minimum provisions when tested to the relevant European standard (minutes) ⁽¹⁾	Minimum provisions when tested to the relevant part of BS 476 ⁽²⁾ (minutes)			Method of exposure
		Loadbearing capacity ⁽³⁾	Integrity	Insulation	
Enclosure (which does not form part of a compartment wall or protected shaft to a: a. Protected stairway; b. Lift shaft)	REI 30 ⁽⁸⁾	30	30	30 ⁽⁸⁾	Each side separately
	REI 30	30	30	30	
Enclosure (which is not a compartment wall or to a: c. Protected lobby; d. Protected corridor)	REI 30 ⁽⁸⁾	30	30	30 ⁽⁸⁾	Each side separately
	REI 30 ⁽⁸⁾	30	30	30 ⁽⁸⁾	
Sub-division of a corridor	REI 30 ⁽⁸⁾	30	30	30 ⁽⁸⁾	Each side separately
Fire resisting construction a. construction that encloses places of special fire hazard b. construction between storerooms and sales area in shops c. fire resisting sub-division d. construction that encloses bedrooms and ancillary accommodation in care homes.	REI 30	30	30	30	Each side separately
	REI 30	30	30	30	
	REI 30	30	30	30	
	REI 30	30	30	30	
Cavity barrier	EI 30 ⁽¹¹⁾	Not applicable	30	15	From underside ⁽⁵⁾
Ceiling	E 30	Not applicable	30	30	From outside
Duct	E 30	Not applicable	30	No provision	From outside
Casing around a drainage system		Not applicable	30	No provision	From outside
Flue walls	EI Half the period specified for the compartment wall/floor	Not applicable	Half the period specified for the compartment wall/floor	Half the period specified for the compartment wall/floor	From outside

Notes:

1. BS EN 13501-2 Classification using data from fire resistance tests, excluding ventilation services. BS EN 13501-3 Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers. BS EN 13501-4 Classification using data from fire resistance tests on components of smoke control systems.

In the European classification:

'R' is the resistance to fire in terms of loadbearing capacity.

'E' is the resistance to fire in terms of integrity.

'I' is the resistance to fire in terms of insulation.

The national classifications do not automatically equate with the alternative classifications in the European column, therefore, products cannot typically assume a European class unless they have been tested accordingly.

2. BS 476-20 for general principles, BS 476-21 for loadbearing elements, BS 476-22 for non-loadbearing elements, BS 476-23 for fire-protecting suspended ceilings and BS 476-24 for ventilation ducts.

3. Applies to loadbearing elements only (see paragraph B19).

4. Guidance on increasing the fire resistance of existing timber floors is given in BRE Digest 208.

5. Only if a suspended ceiling meets the appropriate provisions should it be relied on to add to the fire resistance of the floor.

6. Such walls may contain areas that do not need to be fire resisting (unprotected areas). See Section 11.

7. Unless needed as part of a wall in item 5a or 5b.

8. Except for any limitations on uninsulated glazed elements given in Table B5.

Where one element has reliance for stability on another element with a lesser fire time requirement then the higher of the two periods will be applied to both elements.



10.4 B3.3 Sprinklers

The provision of an automatic fire suppression system (sprinklers) was considered during the development of the fire strategy. However, based on the building height, occupancy classification, and applicable guidance within Approved Document B, there is no regulatory requirement for the installation of sprinklers for this building type.

Following discussion with the design team and client, it was confirmed that an automatic fire suppression system will not be provided within the building.

10.5 B3.4 Cavities

10.5.1 Provision of 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.
- Where the corridor will be sub-divided to prevent fire or smoke affecting two alternative escape routes simultaneously.
- Within the void behind the external face of rainscreen cladding at every floor level, and on the line of compartment walls abutting the external wall of buildings
- At the edges of cavities (including around openings).

The specification of cavity barriers should not be confused with the specification of fire stopping between fire resisting elements, e.g. walls and floors, which will afford the same level of fire resistance as the fire resisting elements themselves. Cavity barriers shall offer a minimum of 30 minutes fire resistance in terms of integrity and 15 minutes fire resistance in terms of insulation.

It is important to continue any compartment wall up through a ceiling or roof cavity to maintain the standard of fire resistance. Therefore, compartment walls will be carried up to full storey height to a compartment floor or to the roof as appropriate.

Any junction between compartment floors, compartment wall, external walls or roofs will be appropriately fire stopped. The method of fire stopping will achieve the same fire resistance as the compartment (i.e. a higher provision than cavity barriers).

10.5.2 Extensive Cavities

Cavity barriers should be used to divide any cavity (including roof spaces). Table 17 sets out maximum dimensions for undivided cavities below.

Table 13 - Maximum dimensions of cavities

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

If a single room with a ceiling cavity or underfloor cavity exceeds the dimensions in Table 17, cavity barriers need only be provided on the line of the enclosing walls/partitions of that room, if both of the following apply.

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

If the cavity is over an undivided area that exceeds 40m in any direction, there is no limit to its size if all the following conditions are met.



- a. Both of the following apply.
 - The building is fitted with an automatic fire detection and alarm system that conforms to BS 5839-1.
 - Detectors are only required in the cavity to satisfy BS 5839-1.
- b. Both of the following apply.
 - The exposed surface of the material/product used in the construction of the cavity is class B-s3, d2 or better.
 - The supports and fixings in the cavity are class A1.
 - o Any pipe insulation system should achieve class C-s3, d2 rating or better.
 - o Any electrical wiring in the cavity is laid in metal trays or metal conduit.
 - o Other than those in (d)–(f), any materials are class A2-s3, d2 rated or better.

10.6 B3.5 Protection of Openings and Fire-Stopping

The performance of a fire-separating element should not be impaired. Every joint, imperfect fit, and opening for services should be sealed. Fire-stopping delays the spread of fire and, generally, the spread of smoke as well.

10.6.1 Openings for Pipes

Pipes passing through a fire-separating element, unless in a protected shaft, should comply with one of the alternatives A, B or C below.

Alternative A: Proprietary seals (any pipe diameter) provide a proprietary, tested sealing system that will maintain the fire resistance of the wall, floor, or cavity barrier.

Alternative B: Pipes with a restricted diameter. Where a proprietary sealing system is not used, fire-stop around the pipe, keeping the opening for the pipe as small as possible. The nominal internal diameter of the pipe should not exceed the relevant dimension given below:

Table 14 – Maximum nominal internal diameter of pipes passing through a compartment wall/floor

Situation	Pipe material and maximum nominal internal diameter (mm)		
	(a) High melting point metal ⁽¹⁾	(b) Lead, aluminium, aluminium alloy, uPVC ⁽²⁾ , fibre-cement	(c) Any other material
1. Structure (but not a wall separating buildings) enclosing a protected shaft that is not a stairway or a lift shaft	160	110	40
2. Any other situation	160	40	40
NOTES: 1. Any metal (such as cast iron, copper or steel) which, if exposed to a temperature of 800°C, will not soften or fracture to the extent that flame or hot gas will pass through the wall of the pipe. 2. uPVC pipes that comply with either BS 4514 or BS 5255.			

Alternative C: Sleeving. A pipe with a maximum nominal internal diameter of 160mm may be used with a sleeve made of a high melting point metal if the pipe is made of one of the following.

- a. Lead.
- b. Aluminium.
- c. Aluminium alloy.
- d. Fibre-cement.
- e. uPVC (pipes should also comply with either BS 4514 or BS 5255).

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

10.6.2 Openings for Ducts, Conduits, or Cable

Openings through a fire resisting element for, ducts, conduits or cable should be:

- i. As few as possible.
- ii. As small as practicable.
- iii. Fire-stopped (allowing thermal movement in the case of a pipe or duct).



Materials used for fire-stopping should be reinforced with (or supported by) materials rated class A2-s3, d2 or better to prevent displacement where the unsupported span is greater than 100mm and where non-rigid materials are used (unless subjected to appropriate fire resistance testing to show their suitability).

Proprietary, tested fire-stopping, and sealing systems may be used. Different materials suit different situations and not all are suitable in every situation. Fire-stopping materials include the following:

- Cement mortar.
- Gypsum-based plaster.
- Cement-based or gypsum-based vermiculite/perlite mixes.
- Glass fibre, crushed rock, blast furnace slag or ceramic-based products (with or without resin binders).
- Intumescent mastics.

These may be used in situations appropriate to the particular material. Not all materials will be suitable in every situation. Guidance on the correct use and appropriate fire stopping materials is given in Ensuring Best Practice for Passive Fire Protection in Buildings produced by the Association for Specialist Fire Protection (ASFP). Further information on generic systems, their suitability for different applications, and guidance on test methods is given in the ASFP Red Book.

To ensure the correct fire stopping details are specified and installed, the use of a specialist 3rd party accredited contractor is recommended.

Providing cable transits⁶ and sleeves should be considered to enable future upgrades without damaging any fire stopping provided.

10.6.3 Ventilation Ducts and Flues Passing Through Fire-Separating Elements

Ventilation ductwork provides a route for fire and smoke spread, and therefore provisions are required to limit this risk. Any ventilation equipment which is not required in fire mode will shut down on activation of the fire alarm.

Where ducts pass through fire separating elements, a fire damper will be used to protect the opening which achieves the same level of fire resistance as the element through which it passes.

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

If air handling ducts pass through fire-separating elements, the load-bearing capacity, integrity, and insulation of the elements should be maintained using one or more of the following four methods.

In most ductwork systems, a combination of the four methods is best.

- a. Method 1 – thermally activated fire dampers.
- b. Method 2 – fire resisting enclosures.
- c. Method 3 – protection using fire resisting ductwork.
- d. Method 4 – automatically activated fire and smoke dampers triggered by smoke detectors.

10.6.4 Protected Escape Routes

If the fire resisting construction of a protected escape route or bedroom is either of the following:

- a. Not carried to full storey height.
- b. At the top storey, not carried to the underside of the roof covering.

Then the cavity above or below the fire resisting construction should be either of the following:

- i. Fitted with cavity barriers on the line of the enclosure.
- ii. For cavities above the fire resisting construction, enclosed on the lower side by a fire resisting ceiling (minimum EI 30) that extends throughout the building, compartment, or separated part. The ceiling should meet the following conditions:

- a) Provide a minimum fire resistance of EI 30.
 - i. Soffit of ceiling – class B-s3, d2 or better.
 - ii. Ceiling surface/product exposed to cavity – class C-s3, d2 or better.

⁶ These are preformed firestopping units that can easily facilitate the removal, replacement and addition of cables at any future point. In walls or floors where cables have to be moved, changed or replaced on a regular basis without disturbing or damaging the fire-resistant properties of the fire-stop seal and therefore the building element.



- b) Be imperforate, except for an opening described in paragraph 9.17.
- c) Extend throughout the building or compartment.
- d) Not be easily demountable.

10.6.5 Ducts Passing Through Protected Escape Routes

Method 1 should not be used for extract ductwork passing through the enclosures of protected escape routes, as large volumes of smoke can pass thermal devices without triggering them.

An ES classified fire and smoke damper which is activated by a suitable fire detection system (method 4) may also be used for protected escape routes.

10.6.6 Mechanical Ventilation and Air-Conditioning Systems

Ventilation ductwork provides a route for fire and smoke spread, and therefore provisions are required to limit this risk. Any ventilation equipment which is not required in fire mode will shut down on activation of the fire alarm.

Where ducts pass through fire separating elements, a fire damper will be used to protect the opening which achieves the same level of fire resistance as the element through which it passes.

Dampers on duct work which passes into escape routes will be fire and smoke dampers. These will be actuated by smoke detector controlled automatic release mechanisms, in addition to being actuated by thermally actuated devices.

10.6.7 Flues

The wall of a flue, duct containing flues or appliance ventilation duct(s) should have a fire resistance (REI) that is at least half of any compartment wall or compartment floor it passes through or is built into

10.6.8 Fire-Stopping

In addition to other provisions in this document for fire stopping.

- Joints between fire separating elements shall be appropriately fire stopped; and
- All openings for pipes, ducts, conduits, or cables to pass through any part of a fire separating element shall be appropriately fire stopped.

Where services pass through compartment floors and/or fire resisting construction but are not contained with a service riser, they should be fire stopped at floor level, and any ducts passing through should be provided with fire dampers as per section above. This also applies to services passing out of a protected riser enclosure.



11 Requirement B4: External Fire Spread

To minimise the risk of fire spread externally the following measures will be adopted:

11.1 B4.1 Resisting Fire Spread Over External Walls

The external envelope of a building should not contribute to undue fire spread from one part of a building to another part. The extent to which this is necessary depends on the height and use of the building.

Using the full building height elevation, the building is under 18m. Table 12.1 of ADB requires the external surfaces to be Class B-s3, d2 or better if less than 1000mm from a relevant boundary. If the distance is more than 1000mm, there are no provisions.

Table 15 - Reaction to fire performance of external surface of walls

Building type	Building height	Less than 1000mm from the relevant boundary	1000mm or more from the relevant boundary
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
Any other building	18m or less	Class B-s3, d2 ⁽²⁾ or better	No provisions

NOTES:
In all cases, buildings of any height or use, consideration should be given to the choice of materials (including their extent and arrangement) used for the external wall, or attachments to the wall, to reduce the risk of fire spread over the wall.

11.1.1 External Wall Construction

External wall construction will comprise a number of façade systems used across the development. The predominant wall build-up will consist of flint masonry cladding at lower levels with black corrugated metal cladding forming the upper wall areas. In selected locations, inset black timber cladding panels will be incorporated within the façade. The retained historic barn structure will utilise timber cladding. These façade treatments are distributed across the elevations as shown within the architectural drawings.

11.1.2 Cavities and Cavity Barriers

Cavity barriers will be provided in accordance with Provision of Cavity Barriers on page 30.

11.2 B4.1 Resisting Fire Spread from One Building to Another

The following assumptions enable a reasonable standard of resistance to the spread of fire to be specified:

- a. The size of a fire depends on the compartmentation within the building. A fire may involve a complete compartment but will not spread to other compartments.
- b. The intensity of a fire is related to the building use but can be moderated by a sprinkler system.
- c. Fires in 'residential' and 'assembly and recreation' buildings (purpose groups 1, 2 and 5) represent a greater risk to life.
- d. A building on the far side of the relevant boundary meets both of the following conditions.
 - i. Has a similar elevation to the one in question.
 - ii. Is the same distance as the one in question from the common boundary.
- e. The radiated heat passing through any part of the fire resisting external wall may be discounted.

Where regulation 7(2) applies, that regulation prevails over the provisions within this section.

If a reduced separation distance between buildings, or increased amount of unprotected area, is required, smaller compartments should be considered.



11.3.2 External walls 1000mm or more from the relevant boundary

For Method 2 to be valid, the building should not exceed 10m in height. Each side of the building should meet the limits stated in Table 11.1. Any areas falling within the limits shown in Diagram 11.5 can be ignored. If a building is fitted throughout with a sprinkler system in accordance with Appendix E, either of the following is permitted. The boundary distance can be halved, to a minimum distance of 1m.

Table 17 – Permitted unprotected areas in small buildings or compartments

Elevation	Distance to relevant boundary	Table 11.1 Maximum total percentage of unprotected area (%) ⁽¹⁾	Interpolated Value	Total area of unprotected areas (%)	Acceptable / Unacceptable
1	5.3	40	42.4	0	OK
1	8.6	60	68.8	0	OK
1	16	100	N/A	N/A no restrictions	OK
2	27	100	N/A	N/A no restrictions	OK
3	13	100	N/A	N/A no restrictions	OK
4	13	100	N/A	N/A no restrictions	OK

11.3.3 Fire Spread Over Roofs

'Roof covering' describes one or more material layers but not the whole roof structure. As a minimum requirement, roof coverings shall now comply with Approved Document B Table 12.1.

The separation distance is the minimum distance from the roof, or part of the roof, to the relevant boundary. Approved Document B Table 12.1 sets out separation distances by the type of roof covering and the size and use of the building and is replicated below.

The roofs will be at least 6 m from the relevant boundary. Therefore, the roofs should meet C_{ROOF}(t4).

Table 18 - Limitations on roof coverings

Designation ⁽¹⁾ of covering of roof or part of roof	Distance from any point on relevant boundary			
	Less than 6m	At least 6m	At least 12m	At least 20m
B _{ROOF} (t4)	●	●	●	●
C _{ROOF} (t4)	○	●	●	●
D _{ROOF} (t4)	○	● ⁽²⁾⁽³⁾	● ⁽²⁾	●
E _{ROOF} (t4)	○	● ⁽²⁾⁽³⁾	●	● ⁽²⁾
F _{ROOF} (t4)	○	○	○	● ⁽²⁾⁽³⁾

● Acceptable ○ Not acceptable

NOTES:
 Separation distances do not apply to enclosed/covered walkways. However, see Diagram 8.2 if the roof passes over the top of a compartment wall.
 Polycarbonate and uPVC rooflights that achieve a class C-s3, d2 rating by test may be regarded as having a B_{ROOF}(t4) classification.

- The designation of external roof surfaces is explained in Appendix B of ADB
- Not acceptable on any of the following buildings.
 - Industrial, storage or other non-residential purpose group (purpose groups 6 and 7) buildings of any size.
 - Any other buildings with a cubic capacity of more than 1500m³.
- Acceptable on buildings not listed in (2) if both of the following apply.
 - Part of the roof has a maximum area of 3m² and is a minimum of 1500mm from any similar part.
 - The roof between the parts is covered with a material rated class A2-s3, d2 or better.



12 Requirement B5: Access and Facilities for the Fire Service

To minimise the risk to firefighters and enable adequate access for firefighting the following measures will be adopted:

12.1 B5.1 Vehicle Access

Access to the site should be designed in such way that the fire service can easily access the site in the event of a fire. Fire service vehicle access will be provided Ducks Hill Road. Appliance access will be available directly outside the entrance to the building.

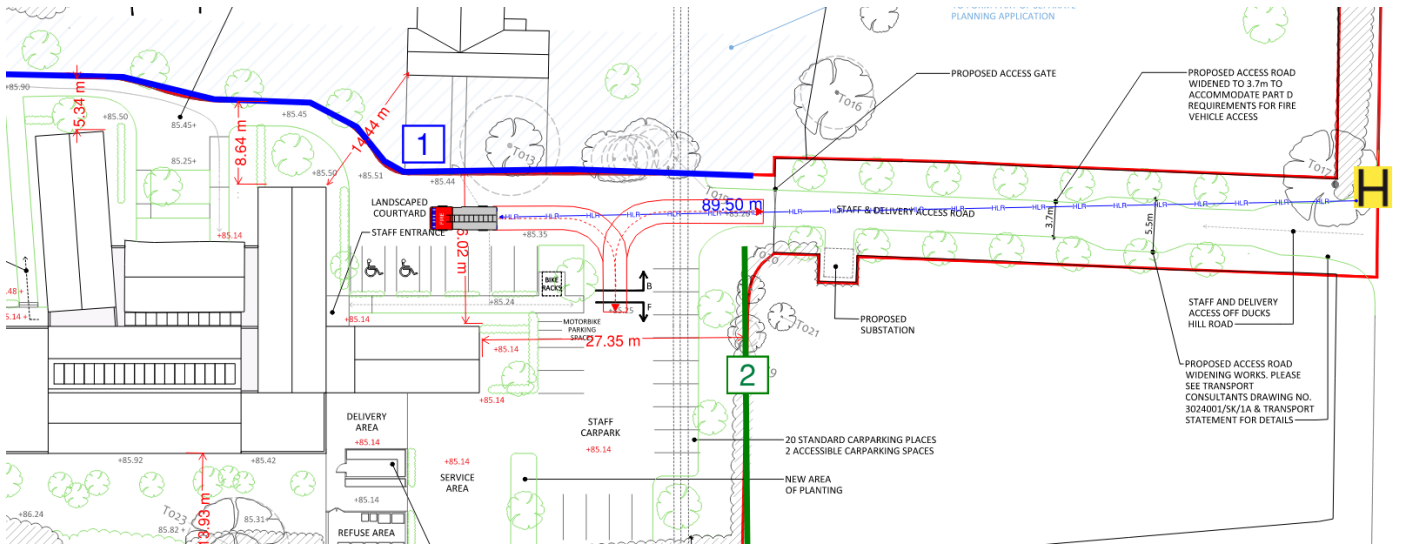


Figure 10 - Fire Service Vehicle Access Plan

As access is effectively via a private dead-end roadway longer than 20m turning facilities will be, in line with Diagram 15.2 of ADB and vehicle access routes will be as per table 15.3, ensuring the width of the road allows for appliance access.

12.2 B5.2 Fire Mains and Hydrants

Water supplies are considered adequate. There is 1 existing public fire hydrant within 90m of the entrance to the main entrance and likely fire service appliance parking location, as shown above.

Source : <https://dataservices.riscauthority.co.uk/map/index>

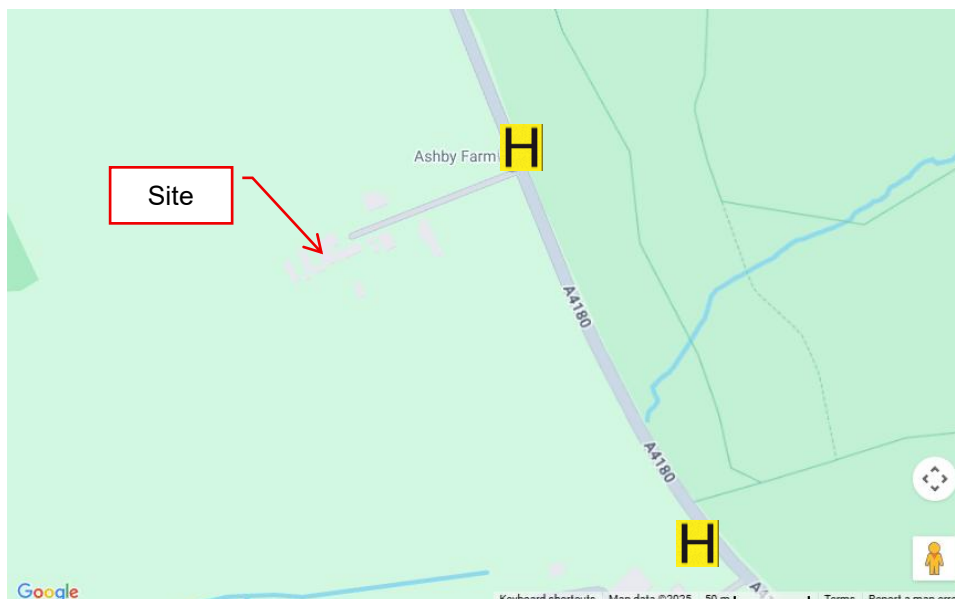


Figure 11 - Assumed hydrant locations



12.3 B5.4 Access to Buildings for Firefighting Personnel

The height of the uppermost floor appears not to be over 18m tall and as such there is no requirement for a firefighting shaft or lift. Firefighting access will be provided by the main entrance and two staircases to the upper floors.

No further fire safety measures are required above those already recommended as part of this strategy.

13 Supplementary Information

13.1 Cable Systems

Any cables or protection devices provided for critical systems recommended in this strategy application shall be selected as per the recommendations of the relevant system's standard, or BS 8519:2020⁷.

13.2 Secondary Power Supplies

All life safety or critical systems should be provided with adequate secondary power supplies. These should be per the manufacturer's recommendations or the relevant system standard or code of practice.

13.3 Materials and Workmanship

It should be ensured that all fire protection products and related services are fit for purpose, correctly installed, and maintained by competent persons following the manufacturer's instructions and the relevant British Standard/s.

Third-party certification schemes are an effective means of providing quality assurance, offering a level of quality, reliability, and safety that non-certificated products may lack. Appointment of Third-Party contractors does not mean products and services not third-party approved are less reliable; however, it is more challenging to demonstrate that such uncertificated systems or equipment will perform as required. Additionally, appointing Third-Party accredited contractors does not absolve the Client of responsibilities to undertake appropriate checks of the contractor's credentials and work quality or absolve the Client of any legal responsibilities.

13.4 Regulation 7 & 38: Fire Safety Information

Regulation 7

This strategy is based upon suitable workmanship and materials as per Part 2, Clause 7 of the Building Regulations.

Regulation 38

The aim of this regulation is to ensure that the person responsible for the building has sufficient information relating to fire safety to enable them to manage the building effectively. The aim of regulation 38 will be achieved when the person responsible for the building has all the information to enable them to do all of the following:

- a. Understand and implement the fire safety strategy of the building.
- b. Maintain any fire safety system provided in the building.
- c. Carry out an effective fire risk assessment of the building.

Prior to handover of the building, this strategy document and the below information is required to be provided to the client:

An as-built plan of the building showing all of the following.

- a. Escape routes – this should include exit capacity (i.e. the maximum allowable number of people for each storey and for the building).
- b. Location of fire-separating elements (including cavity barriers in walk-in spaces).
- c. Fire doorsets, fire doorsets fitted with a self-closing device and other doors equipped with relevant hardware.
- d. Locations of fire, heat and/or smoke detector heads, alarm call points, detection/alarm control boxes, alarm sounders, fire safety signage, emergency lighting, fire extinguishers, dry or wet fire mains and other firefighting equipment, and hydrants outside the building.
- e. Any sprinkler systems, including isolating valves and control equipment (if installed).

⁷ BS 8519:2020 Selection and installation of fire-resistant power and control cable systems for life safety, fire-fighting and other critical applications - code of practice



- f. Any smoke control systems, or ventilation systems with a smoke control function, including mode of operation and control systems.
- g. Any high-risk areas (e.g. heating machinery).

Details should be provided of all of the following:

- a. Specifications of any fire safety equipment provided, including routine maintenance schedules.
- b. Any assumptions regarding the management of the building in the design of the fire safety arrangements.
- c. Any provision enabling the evacuation of disabled people, which can be used when designing suitable personal emergency evacuation plans.

13.5 Construction Design and Management Regulations

Projects undertaken within Great Britain and Northern Ireland are subject to the requirements of the Construction (Design and Management) Regulations 2015 (CDM), health and safety requirements during construction, and maintenance of construction sites.

This fire strategy is the basis for compliance with the functional and performance requirements for meeting Part B of Schedule 1, Building Regulations 2010 for the finished building and forms part of the Building Regulations submission. Where any conclusions or recommendations have been arrived at which specify particular materials, products, or forms of construction these will have been assessed, in accordance with CDM Regulation 9 (duties for designers) and this information must be made available to the CDM coordinator.

The construction phase can represent a significant risk of fire due to operations and hot works on site, therefore the measures outlined in HSG168 should be adopted to ensure suitable fire safety arrangements are in place for the single direction of travel.

Where the architect or other consultants use all or part of this report to specify works, they are understood to be competent in alerting the client, CDM coordinator, designer, contractor, and principal contractor of any issues arising under the CDM Regulations 2015. Should any questions arise, they must be directed to BEFS as part of the consultation process.

13.6 Building Regulations - Functional Regulations

B1. The building shall be designed and constructed to provide appropriate provisions for the early warning of fire, and appropriate means of escape in case of fire from the building to a place of safety outside the building capable of being safely and effectively used at all materials times.

B2. (1) To inhibit the spread of fire within the building, the internal linings shall –
(a) Adequately resist the spread of flame over their surfaces; and
(b) Have, if ignited, a rate of heat release or a rate of fire growth, which is reasonable in the circumstances.
(2) In this paragraph 'internal linings' mean the materials or products used in lining any partition, wall, ceiling, or other internal structure.

B3. (1) The building shall be designed and constructed so that, in the event of fire, its stability will be maintained for a reasonable period.
(2) A wall common to two or more buildings shall be designed and constructed so that it adequately resists the spread of fire between those buildings. For the purposes of this sub-paragraph, a house in a terrace and a semi-detached house are each to be treated as a separate building.
(3) Where reasonably necessary to inhibit the spread of fire within the building, measures shall be taken, to an extent appropriate to the size and intended use of the building, comprising either or both of the following:
(a) Sub-division of the building with fire-resisting construction.
(b) Installation of suitable automatic fire suppression systems.
(4) The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited

B4. (1) The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use, and position of the building.
(2) The roof of the building shall adequately resist the spread of fire over the roof and from one building to another, having regard to the use and position of the building.

B5. (1) The building shall be designed and constructed so as to provide reasonable facilities to assist firefighters in the protection of life



(2) Reasonable provisions shall be made within the site of the building to enable fire appliances to gain access to the building.

14 Fire Safety Information

This section sets out the assumptions when developing this fire strategy and how these assumptions will inform ongoing management and maintenance for the building when in use with the aim of ensuring that the person responsible for the building has sufficient information relating to fire safety to enable them to manage the building effectively.

It will also aid with achieving the requirements of Regulation 38 as detailed above

Once occupied, the FSO [8] places a general duty of fire safety care on employers, occupiers, and owners of almost all premises, and requires them to take such fire precautions as may be reasonably required to ensure that premises are safe for the occupants and those in the immediate vicinity.

The responsible person has a duty to carry out a fire risk assessment which must focus on the safety in case of fire of all 'relevant persons'. The risk assessment should pay particular attention to those at special risk, such as the disabled and those with special needs or whom may need assistance to evacuate and must include consideration of any dangerous substance likely to be on the premises.

The Building Regulations and the FSO have been drafted to ensure co-ordination between design and operation phases of buildings. Ideally, the design should reflect the operational intent. Although compliance with the Building Regulations ensures the minimum standard of safety, additional or alternative measures may be necessary to enable the operational intent and compliance with the FSO. Therefore, the following approach has been applied in developing the strategy described herein:

- Where known or foreseeable, the operational intent has been accommodated within this report.
- The exact way in which the building will be operated is based on existing use and documentation provided by the Client. BEFS Ltd do not to accept liability/responsibility if used outside the understood scope.

This fire safety and management plan and fire strategy document forms part of the FSO process (fire risk assessment) and details the key fire safety design objectives and provisions within the building and ongoing management systems which will be required to be established to ensure the safety objectives of the strategy are maintained.

This fire safety strategy assumes that the building will be an actively managed site and relies on suitable management procedures being in place to support fire safety on site.

This report relies on suitable management procedures being in place to support fire safety on site as outlined in this strategy.

Article 11 of the FSO requires that:

“The responsible person must make and give effect to such arrangements as are appropriate, having regard to the size of his undertaking and the nature of its activities, for the effective planning, organisation, control, monitoring and review of the preventive and protective measures”.

This requirement requires that the “responsible person” ensure that an effective management approach to fire safety is employed and, where appropriate, ensure that staff fully understand how the different fire safety systems interact with each other and the requirements necessary on site for effective fire safety management.

BS9997 [21] has been used in the creation of this management strategy; BS9997 specifies requirements for an organizational fire risk management (FRM) system.

Reference is also made to BS5588-12 [22] which whilst superseded by BS9999 [13] still provides relevant and comprehensive information on managing fire safety, any use of BS5588 has been made with due consideration for the age and status of the document.

Within BS5588-12 and BS9997 there is an expected level of fire safety management by which the suitability of a solution can be assessed and there is a fundamental assumption that the building will remain managed throughout its lifetime.

Approved Document B notes that the Building Regulations do not impose any requirements on the management of a building and that the proper management is assumed. BS9997 and BS5588-12 go beyond this and recognises that



having designed a building; it is imperative that management ensures that the building still functions as it should. The documents provide guidance on the function of fire safety management and provides criteria against which that management function can be assessed.

14.1.1 Role of Management

Management will play required to play an active role in the prevention of fire by restricting smoking, maintaining good housekeeping, ensuring security, creating, and maintaining maintenance and testing procedures are in place to ensure that the fire systems within the building will respond to a fire.

The standard or quality of a fire risk management system is referred to here as the management system level. There are two management system levels:

Level 1 demonstrates best practice in which the organization's management system is determined to meet a management system standard such as PAS 7.

Level 2 demonstrates good practice with a basic level of management that satisfies the minimum requirements of legislation. This represents the default standard that is to be taken into account when designing a building.

This strategy assumes that a Level 2 management level will be in place in line with the requirements for conformity with legislation, good practice and Table 5 of BS9999 [13, p. 38].

14.1.2 Fire Safety Policy

On occupation the fire safety structure within the building will be required to be fully detailed in the fire safety policy. A Fire Safety Policy is recommended to include the following:

- Introduction
- Policy statement
- Nominated responsible persons (including senior management)
- Staff responsibilities
- Management responsibilities
- Fire risk assessment
- Liaison with emergency services
- Fire logbook
- Arrangements for people with additional needs
- Emergency action plan
- Protective measures provided for fire safety
- Maintenance
- Relevant appendix as required

14.1.3 Planning for Changes in Risk

Management systems will be required to include procedures for anticipating and taking into account, either on a permanent or a temporary basis, changes to the occupancy of the building and its contents over the life cycle of the building. These procedures will form part of the overall audit and review process for the fire safety strategy and should be able to determine whether any such changes will necessitate alterations to the fire precautions provided, including the management systems, and to put any such alterations into effect.

The procedures should anticipate and proactively identify the impact of any proposed building changes, including changes to the occupancy, periods of abnormal occupancy, such as when both the main event spaces are occupied at the same time.

The system established should identify any alternative protection and management measures that will be required as a result and ensure that they are implemented.

14.1.4 Resources and Authority

For the management of fire safety to be effective, the fire safety manager(s) need(s) to be empowered and able to command sufficient resources to maintain the systems required to maintain building safety.

Manager(s) with responsibility for fire safety will be required to be empowered to ensure that legislative requirements are met; initiate testing, initiate maintenance or repair, and, where necessary, have direct control of staff responsible for



these tasks. Such powers will be required to be supported by the necessary, sufficient, and appropriate resources, including funds.

The fire safety manual should outline who is responsible for the different fire safety systems and the client will be responsible for ensuring the appropriate resources are available to maintain all fire safety systems. Records will be required to be kept onsite for all servicing and maintenance.

14.1.5 Staffing Level

The role of staff is an important element of the fire safety package provided. The appropriate staffing level (for fire safety purposes) for a particular building is influenced by the use of the building and fire growth characteristics; the types of occupants; the fire safety systems in place; and the roles and levels of the staff concerned in ensuring the fire safety of the occupants.

The building is considered to be a simple building with a no fire safety engineered approach to the means of escape provision, a key element of this approach is to provide adequately trained staff to assist in an evacuation.

A system developed will also need to provide for contingencies such as training, sickness, and other unexpected absences etc.

14.1.6 Fire Training

Training of staff and others for action in the event of a fire is an essential element of fire safety management. Adequate training is required to be established and ensure that there are sufficient numbers of staff trained in all aspects of fire prevention, fire protection and evacuation procedures, and able to use the appropriate extinguishing equipment (and media), so as to provide full coverage of the building, with provision for contingencies, sickness or holiday absences.

14.1.7 Work Control

The management system will be required to control work on site, e.g. repairs to structure, and in particular hot work.

The work control system needs to be developed proactively with clear lines of responsibility; a permit system; logging and audit processes and routine checking and supervision.

14.1.8 Communications Procedures

Communications procedures will be required to be established and include a means of being alerted to a fire; communications between management, and between management and staff; messages to occupants; and communications with the fire and rescue service in the event of a fire.

The communications system will need to be able to ensure that all of those involved, or potentially involved, in an incident are informed rapidly and effectively, of relevant information. In addition, the systems will need to make use of alternative formats as necessary, with contingency plans for when the primary communications systems fail.

14.1.9 Maintenance and Testing of Fire Safety Systems

Maintenance and testing will be essential to ensure that fire safety systems will operate correctly in the event of a fire.

An effective maintenance system will be required to be established which includes monitoring of the fire safety systems, and the equipment to keep it fully functional at all the times the building is in use.

There will also need to be alternative/contingency procedures, etc., identified for those times when systems, equipment and other arrangements are not available or not functioning correctly.

Table 19 - Recommended maintenance and testing cycles

Fire Safety System/Procedure	Recommended Testing or Review Intervals
Fire Risk Assessment	Determined by risk assessment; see assessment methodology.
Fire Safety Policy	12 Monthly review.
Evacuation Procedure	12 Monthly review.
Fire Strategy	12/24 Monthly review.



Fire Safety System/Procedure	Recommended Testing or Review Intervals
Personal Emergency Evacuation Plans (PEEPs)	As required.
Training of staff (as/if required)	At start of employment, 12 Monthly.
Inspections during contractors' works	As required.
Fire drills (if applicable)	6/12 Monthly.
Fire Alarm and Detection System	Weekly - User Monthly - User Periodic inspection – Not exceeding 6 monthly by Competent Person
Emergency Lighting Systems	Monthly - User Periodic inspection – Annually by User/Competent Person
Fire Extinguishers and Hose Reels	Monthly - User Periodic inspection – Annually by User/Competent Person
Escape Routes (Internal and External) / Fire Doors and Fire Exits	Monthly – User Periodic inspection – not exceeding 6 monthly (for fire doors only)
Evacuation Lifts	Weekly - User Monthly - User Periodic inspection – Not exceeding 6 monthly by Competent Person
Gas Supply and Associated Equipment	Periodic inspection – not exceeding 12 monthly
Electrical Installation	The frequency of testing is specified in the Regulations and is determined by; 1. The type of installation 2. How often it is used 3. The external influences or environment to which the electrical installation is exposed. For many commercial businesses, an EICR, which used to be called a periodic testing report, will be required at the lowest frequency interval – every 5 Years. However, higher-risk environments will require 3 Yearly or even more frequent testing. It should be noted that all stated periods are maximum intervals. Deterioration of the installation may indicate a need to reduce the interval between testing.
Portable Electrical Equipment	Periodic inspection – Various, see Table 1 of guidance for suggested intervals

14.1.10 Liaison with Fire and Rescue Service

A good relationship with the fire and rescue service will have benefits for both the occupier and the fire and rescue service. In particular, it will ensure that the fire and rescue service are able to have an appropriate pre-determined response strategy for the premises concerned and will enable the occupier to seek advice where appropriate on:

- a) How to prevent fires and restrict their spread in their buildings and other property.
- b) The means of escape from buildings and other property in case of fire.

Proactive liaison with the fire service is recommended to be established and include effective arrangements for notifying the fire and rescue service of changes to the occupancy, periods of abnormal occupancy, fire growth characteristics, and other relevant factors. The arrangements should also allow for routine meetings with the fire and rescue service and additional meetings where a change in the building or its occupancy is proposed.

14.1.11 Contingency Planning

Contingency plans need to include preparation and response to a wide range of foreseeable events and take into account a wide range of possible emergencies and incidents. These are likely to include planning for logistical issues such as the provision of shelter, communications, transport, the weather, time of day, time of week, time of year (holidays, etc.) and traffic-related issues, as well as scenarios such as power failures or floods.

Contingency plans will be required to be established and drawn up as part of the building's major emergency planning.



14.1.12 Fire Safety Manual

The design of buildings needs to be documented for the benefit of the management of the premises and a fire safety manual created.

All relevant information should be included in a fire safety manual. The manual needs to set out the basis on which the fire safety design was planned, the type of management organization envisaged for running the building, and the consequential staff responsibilities. It needs to explain the operation of all the mechanical and electrical systems and to give information on routine testing and maintenance requirements.

The assumptions made at the design stage regarding these aspects should be recorded in the fire safety manual.

The fire safety manual should form part of the information package that contributes to any fire risk assessment that might need to be carried out.

14.1.13 Housekeeping

Good housekeeping is essential to reduce the chances of fire starting or developing, and escape routes being blocked. Below is an overview of the housekeeping systems which should be established to minimise the risk of fire:

- Combustible materials should be kept to a minimum and if possible, replaced with less flammable materials. All combustible materials should be held in the appropriate containers.
- The management team (and security) should carry out regular checks of the site to ensure escape routes are kept clear and waste disposal is kept under control.
- All hot works will require a permit to work before any work can commence.
- Cleaners will be required to be employed to ensure the general housekeeping is of an acceptable standard.

14.1.14 Equipment and Fittings Maintenance

Regular testing and maintenance of all fixed wiring and portable appliances will be required to be carried out and records held. Regular maintenance and testing will be required to be carried out as required on all non-fire safety related installations, including items such as: furniture, electrical heating, floor coverings and records will be held.

14.1.15 Security

Good security arrangements can reduce the risk of serious fires by arson. In order to reduce the likelihood of arson and to mitigate its effects if it does occur CCTV is recommended to be in operation on site and security employed 24 hours a day.

14.1.16 Fire Investigation and Incident Reporting

As part of the management system to be established, incidents, including near misses, should be reported and logged, any confirmed fire incidents will require investigating to determine the cause, and if any actions can be taken to stop the incident re-occurring. The fire risk assessments will require reviewing and systems may need changing to stop the same incident occurring again.

14.1.17 Key Fire Safety Arrangements For inclusion in the FRM

Whilst an understanding of the fire strategy as a whole is important, the below table highlights the key elements of this strategy and their associated management requirements:

Table 20 - Key sections of fire strategy

Key element of Fire Strategy	Report Section	Minimum Requirement / Established	Management
B1 – Means of Warning and Escape	7	Simultaneous evacuation strategy. Automatic fire detection and alarm system to BS 5839-1 Category L3. Two escape stairs from the upper floor and four exits at ground floor. Escape widths ≥850 mm with stairs ≥1000 mm. Travel distances within ADB limits. Refuges provided with EVC and platform lift within 30-minute enclosure for assisted evacuation. Emergency lighting to BS 5266 and signage to BS 5499.	Level 2 fire safety management assumed in line with BS 9999. Staff training, fire drills and maintenance of fire safety systems required. Assisted evacuation procedures to form part of the building management plan.



Key element of Fire Strategy	Report Section	Minimum Requirement / Established	Management
B2 – Internal Fire Spread (Linings)	9	Internal linings to meet ADB Table 6.1 classifications: circulation spaces Class B-s3,d2, other rooms Class C-s3,d2, with limited areas permitted at Class D-s3,d2.	Materials to be installed and maintained to preserve required fire performance. Any future alterations to maintain required classifications.
B3 – Internal Fire Spread (Structure)	10	Structural fire resistance provided in accordance with ADB. 30 minutes fire resistance to office areas and 60 minutes to main workshop areas. The building area (<7000 m ²) does not require compartment subdivision and floors are not required to be compartment floors. Cavity barriers and fire stopping will be provided within concealed spaces to inhibit unseen fire spread. Sprinklers were considered during design development but are not proposed as they are not required for this building type under ADB guidance.	Passive fire protection, fire stopping and cavity barriers to be installed by competent contractors and maintained throughout the life of the building.
B4 – External Fire Spread	11	Building height <18 m. External wall surfaces within 1000 mm of a boundary to achieve Class B-s3,d2 or better. External wall systems comprise flint masonry at low level with corrugated metal cladding above, with localised timber cladding elements.	External wall materials to be installed and maintained to ensure compliance with Regulation 7 and prevent undue fire spread.
B5 – Access and Facilities for the Fire Service	12	Fire appliance access provided from Ducks Hill Road with appliance access adjacent to the main entrance. Existing public hydrant within 90 m of the building. Building height <18 m therefore no firefighting shaft or firefighting lift required.	Access routes and hydrant availability to be maintained as part of site management procedures.



Appendix A – BS EN 13501-1:2018 – European Fire Classification

Class	Test method(s)	Classification criteria	Additional classification
A1	EN ISO 1182 ^a and	$\Delta T \leq 30^{\circ}\text{C}$; and $\Delta m \leq 50\%$; and $t_f = 0\text{s}$ (i.e. no sustained flaming)	-
	EN ISO 1716	$PCS \leq 2,0 \text{ MJ/kg}^a$ and $PCS \leq 2,0 \text{ MJ/kg}^{b\ c}$ and $PCS \leq 1,4 \text{ MJ/kg}^{2\ d}$ and $PCS \leq 2,0 \text{ MJ/kg}^e$	-
A2	EN ISO 1182 ^a or	$\Delta T \leq 50^{\circ}\text{C}$; and $\Delta m \leq 50\%$; and $t_f = 20\text{s}$	-
	EN ISO 1716 and	$PCS \leq 3,0 \text{ MJ/kg}^a$ and $PCS \leq 4,0 \text{ MJ/kg}^{b\ c}$ and $PCS \leq 4,0 \text{ MJ/kg}^{2\ d}$ and $PCS \leq 3,0 \text{ MJ/kg}^e$	-
	EN 13823	$FIGRA_{0,2\text{MJ}} \leq 120 \text{ W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{600\text{s}} \leq 7.5\text{MJ}$	Smoke production <i>f</i> and Flaming droplets/particles <i>g</i>
B	EN 13823 and	$FIGRA_{0,2\text{MJ}} \leq 120 \text{ W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{600\text{s}} \leq 7.5\text{MJ}$	Smoke production <i>f</i> and Flaming droplets/particles <i>g</i>
	EN ISO 11925 – 2 ⁱ : Exposure = 30 s	$F_s \leq 150 \text{ mm within } 60 \text{ s}$	
C	EN 13823 and	$FIGRA_{0,4\text{MJ}} \leq 250 \text{ W/s}$ and $LFS < \text{edge of specimen}$ and $THR_{600\text{s}} \leq 15\text{MJ}$	Smoke production <i>f</i> and Flaming droplets/particles <i>g</i>
	EN ISO 11925 – 2 ⁱ : Exposure = 30 s	$F_s \leq 150 \text{ mm within } 60 \text{ s}$	
D	EN 13823 and	$FIGRA_{0,4\text{MJ}} \leq 750 \text{ W/s}$	Smoke production <i>f</i> and Flaming droplets/particles <i>g</i>
	EN ISO 11925 – 2 ⁱ : Exposure = 30 s	$F_s \leq 150 \text{ mm within } 60 \text{ s}$	
E	EN ISO 11925 – 2 ⁱ : Exposure = 15 s	$F_s \leq 150 \text{ mm within } 20 \text{ s}$	Flaming droplets/particles <i>h</i>
F	EN ISO 11925 – 2 ⁱ : Exposure = 15 s	$F_s \leq 150 \text{ mm within } 20 \text{ s}$	

^a For homogeneous products and substantial components of non-homogeneous products
^b For any external non-substantial component of non-homogeneous products
^c Alternatively, any external non-substantial component having a $PCS \leq 2.0 \text{ MJ/m}^2$, providing that the product satisfies the following criteria of EN 13823: $FIGRA \leq 20 \text{ W/s}$ and $LFS < \text{edge of specimen}$, and $THR_{600\text{s}} \leq 4.0 \text{ MJ}$, and s1, and d0.
^d For any internal non-substantial component of non-homogeneous products
^e For the product as a whole
^f **s1** = $SMOGRA \leq 30\text{m}^2/\text{s}^2$ and $TSP_{600\text{s}} \leq 50\text{m}^2$; **s2** = $SMOGRA \leq 180\text{m}^2/\text{s}^2$ and $TSP_{600\text{s}} \leq 200\text{m}^2$; **s3** = not s1 or s2
^g **d0** = No flaming droplets/particles in EN 13823 within 600 s;
d1 = No flaming droplets/particles persisting longer than 10 s in EN 13823 within 600 s;
d2 = not d0 or d1.
Ignition of paper in EN ISO 11925-2 results in d2 classification
^h Pass = no ignition of the paper (no classification)
Fail = ignition of the paper (d2 classification)
ⁱ Under conditions of surface flame attack and, if appropriate to the end-use applications of the product edge flame attack

Table 21 - EN 13501-1:2018 BSI



Appendix B - Statement of Competence

Any person carrying out any building work or any design work must have the skills, knowledge, experience and behaviours necessary to carry out the building work in accordance with all relevant requirements.

I, Stephen McGrill, have prepared this report. I consider myself to be suitably qualified and competent to write this fire strategy. I hold a BEng (Hons) in Fire Risk Engineering and am an Incorporated Engineer (IEng) and Chartered Building Engineer (C.Build E MCABE) accredited by the Chartered Association of Building Engineers and the UK Engineering Council. My professional background includes maritime and aviation firefighting, developed through service with the Royal Navy and training at Warsash Maritime Academy.

I began my professional career in maritime and aviation firefighting with the Royal Navy and Warsash Maritime Academy moving into the fire safety sector 20 years ago and have, over time, developed extensive experience in fire safety and fire engineering within the construction and built environment. Throughout my career, I have gained detailed knowledge of building construction, fire safety principles, fire risk assessment, and applied fire science, developed through work on a wide range of projects. My experience spans a broad spectrum of building types and uses, including residential buildings, office and commercial premises, universities, hospitals, leisure and retail developments, military facilities, and industrial and commercial manufacturing environments.

My membership with the Institution of Fire Engineers as a Member (MIFireE), together with my status as an IFE Registered Fire Risk Assessor (Life Safety), reflects my commitment to maintaining industry standards and professional integrity. I have also achieved recognition through the Royal Institution of Chartered Surveyors Level 6 External Wall Systems Assessment Training Programme and hold a Level 7 Advanced Professional Award in Expert Witness Evidence, further strengthening my technical competence and professional credibility. I actively contribute to the development of industry guidance through my involvement with the British Standards Institution, including recently sitting on the steering group providing fire safety input to PAS 8700 and contributing to ISO CB301 for Modern Methods of Construction.

In parallel, I volunteer in support of the IFE Fire Risk Assessors Register and am currently undertaking training to join the EngTech Assessors Panel, reflecting my ongoing commitment to professional governance, competency development, and the advancement of fire safety standards across the sector. These qualifications and activities collectively enhance my comprehensive skill set, which I continue to develop through my current studies towards a Master's degree in Fire Engineering.

I now practise as a fire engineer, undertaking professional activities including building and façade-related surveying, fire risk assessment, external wall fire risk appraisal, fire strategy development, analytical and computational fire engineering, and general fire engineering consultancy. This work has provided me with substantial experience in assessing the fire performance of building construction, including external wall systems, across a wide range of building types and occupancy profiles.


I confirm that my field of professional interest includes the fire performance of building construction and that I hold qualifications meeting and exceeding the minimum competence expectations to complete this fire strategy, including a minimum Level 6 qualification in a science, engineering, or construction-related subject. Specifically, I confirm that:

- I have a career in fire safety and engineering for 30 years; and
- I have a Level 6 qualification in Fire Engineering (BEng (Hons)); and
- I have a Level 6 Award RICS External Wall Systems Assessment Training Programme, and
- I have a Level 5 Diploma Fire Engineering Design, and
- I am undertaking a Masters in Fire Engineering.

In addition, while not an engineering qualification, I hold a Level 7 Advanced Professional Award in Expert Witness Evidence, demonstrating further competence in the structured analysis, evaluation, and presentation of technical and engineering evidence within written professional reports.

There are no conflicts of interest of any kind other than any which are disclosed in the report.

The report's conclusions are the author's independent assessment of the risks. Any remedial actions made have not been influenced in any way by the opinions or actions of others except where stated.


Stephen McGrill
BEng (Hons) IEng C.Build E MCABE, MIFireE



Appendix C - Assumptions and Limitations

This document has been prepared using, Approved Document B, the appropriate British Standards and benchmark guidance where appropriate.

Our company does not specify, select, or install any construction materials. Furthermore, we do not inspect or check the work of others on site.

The purpose of this report is to ensure an appropriate standard of life safety of people within and around the building with respect to fire events, including building management and fire service personnel. The report does not address the risk to property or business continuity from fire.

The report is not a fire risk assessment, which is the responsibility of the Client. A fire risk assessment is required under The Regulatory Reform (Fire Safety) Order 2005 for all occupied areas in accordance with Article 9 under The Order (FSO).

This report is based, in part, on information provided by others. No liability whatsoever is accepted for the accuracy of such information.

Our advice is strictly limited to the scope of our current Project Ref PRJ240 provided for H&H Artisan Gun Making Workshop. We have not reviewed any other issues within the project other than those identified in our report. We offer no comment on any other aspects of the development and any absence of comment on such issues should not be regarded as any form of approval.

The final decision regarding the appropriateness and adequacy of any proposed design rests with the approving, regulatory bodies. It is essential that agreement from those bodies is achieved prior to the implementation of the recommendations within this report.

The adequacy of any proposed fire safety solution is based upon many inter-dependant factors and a 'one size fits all' approach cannot be adopted; particularly where vulnerable occupants are involved. For this reason, the advice within this report should not be used for any building other than H&H Artisan Gun Making Workshop.



Appendix D - References

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Appendix E - Terminology

NOTE: Items marked * are from the Building Regulations 2010.

NOTE: The terms defined below are key terms only. Refer to BS 4422 for further guidance on the definitions of common terms used in the fire safety industry which are not listed below.

Access room A room that the only escape route from an inner room passes through.

Alternative escape routes Escape routes that are sufficiently separated by direction and space or by fire resisting construction to ensure that one is still available if the other is affected by fire.

NOTE: A second stair, balcony or flat roof which enables a person to reach a place free from danger from fire is considered an alternative escape route for the purposes of a dwellinghouse.

Alternative exit One of two or more exits, each of which is separate from the other.

Appliance ventilation duct A duct to deliver combustion air to a gas appliance.

Atrium (plural atria) A continuous space that passes through one or more structural floors within a building, not necessarily vertically.

NOTE: Enclosed lift wells, enclosed escalator wells, building services ducts and stairs are not classified as atria.

Authorities Having Jurisdiction governmental or non-governmental entities responsible for enforcing building codes, fire codes, and other regulations in a given jurisdiction.

Automatic release mechanism A device that normally holds a door open, but closes it automatically if any one of the following occurs.

- Smoke is detected by an automatic device of a suitable nature and quality in a suitable location.
- A hand-operated switch, fitted in a suitable position, is operated. The electricity supply to the device, apparatus or switch fails.
- The fire alarm system, if any, is operated.

Basement storey A storey with a floor that, at some point, is more than 1200mm below the highest level of ground beside the outside walls. (However, see Appendix B, paragraph B26c, for situations where the storey is considered to be a basement only because of a sloping site.)

Boundary The boundary of the land that belongs to a building, or, where the land abuts a road, railway, canal or river, the centre line of that road, railway, canal or river.

***Building** Any permanent or temporary building but not any other kind of structure or erection. A reference to a building includes a reference to part of a building.

Building control body A term that includes both local authority building control and approved inspectors.

Cavity A space enclosed by elements of a building (including a suspended ceiling) or contained within an element, but that is not a room, cupboard, circulation space, protected shaft, or space within a flue, chute, duct, pipe or conduit.

Cavity barrier A construction within a cavity, other than a smoke curtain, to perform either of the following functions.

- Close a cavity to stop smoke or flame entering.
- Restrict the movement of smoke or flame within a cavity.

Ceiling Part of a building that encloses a room, protected shaft or circulation space and is exposed overhead.

NOTE: The soffit of a rooflight, but not the frame, is included as part of the surface of the ceiling. An upstand below a rooflight is considered as a wall.

Circulation space A space (including a protected stairway) mainly used as a means of access between a room and an exit from the building or compartment.

Common balcony A walkway, open to the air on one or more sides, that forms part of the escape route from more than one flat.

Common stair An escape stair that serves more than one flat.

Compartment (fire) A building or part of a building, comprising one or more rooms, spaces or storeys, that is constructed to prevent the spread of fire to or from another part of the same building or an adjoining building.

NOTE: A roof space above the top storey of a compartment is included in that compartment. (See also 'Separated part'.)

Compartment wall or floor A fire resisting wall or floor to separate one fire compartment from another.

NOTE: Provisions relating to construction are given in Section 7.

Corridor access A design of a building containing flats, in which each flat is approached via a common horizontal internal access or circulation space, which may include a common entrance hall.

Curtain Part of a solar shading device which is set in motion by the operating system and fulfils the purpose of a blind, awning or shutter.

Dead end An area from which escape is possible in one direction only.

Direct distance The shortest distance from any point within the floor area to the nearest storey exit, measured within the external enclosures of the building, and ignoring walls, partitions and fittings other than the enclosing walls and partitions to protected stairways.

***Dwelling** Includes a dwellinghouse and a flat.

NOTE: A dwelling is a unit where one or more people live (whether or not as a sole or main residence) in either of the following situations.

- A single person or people living together as a family.
- A maximum of six people living together as a single household, including where care is provided for residents.

***Dwellinghouse** Does not include a flat or a building containing a flat.

Element of structure Any of the following.

- A member that forms part of the structural frame of a building, or any other beam or column.
- A loadbearing wall or loadbearing part of a wall.
- A floor.
- A gallery (but not a loading gallery, fly gallery, stage grid, lighting bridge, or any gallery provided for similar purposes or for maintenance and repair).
- An external wall.
- A compartment wall (including a wall that is common to two or more buildings).

NOTE: However, see the guidance to requirement B3, paragraph 6.2, for a list of structures that are not considered to be elements of structure.

Emergency lighting Lighting for use when the power supply to the normal lighting fails.

Escape lighting The part of the emergency lighting that is provided to ensure that the escape route is illuminated at all material times.

Escape route The route along which people can escape from any point in a building to a final exit.

Evacuation lift A lift that may be used to evacuate people in a fire.

Exit passageway A protected passageway that connects a protected stairway to a final exit.



NOTE: Exit passageways should be protected to the same standard as the stairway they serve.

***External wall** 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.

Final exit The end of an escape route from a building that gives direct access to a street, passageway, walkway or open space, and is sited to ensure that people rapidly disperse away from the building so that they are no longer in danger from fire and/or smoke.

NOTE: Windows are not acceptable as final exits.

Fire alarm system Combination of components for giving an audible and/or other perceptible warning of fire.

Fire alarm system Combination of components for giving an audible and/or other perceptible warning of fire.

Fire damper A mechanical or intumescent device within a duct or ventilation opening that operates automatically and is designed to resist the spread of fire.

Fire and smoke damper A fire damper which, in addition to the performance of the fire damper, resists the spread of smoke.

Fire doorset A door or shutter which, together with its frame and furniture as installed in a building, is intended (when closed) to resist the spread of fire and/or gaseous products of combustion and meets specified performance criteria to those ends.

NOTE: A fire doorset may have one or more leaves. The term includes a cover or other form of protection to an opening in a fire resisting wall or floor, or in a structure that surrounds a protected shaft. A fire doorset is a complete door assembly, assembled on site or delivered as a completed assembly, consisting of the door frame, leaf or leaves, essential hardware, edge seals and glazing, and any integral side panels or fanlight panels in an associated door screen.

Firefighting lift A lift with additional protection and with controls that enable it to be used by the fire and rescue service when fighting a fire.

Firefighting lobby A protected lobby that provides access from a firefighting stair to the accommodation area and to any associated firefighting lift.

Firefighting shaft A protected enclosure that contains a firefighting stair, firefighting lobbies and, if provided, a firefighting lift together with its machine room.

Firefighting stair A protected stairway that connects to the accommodation area through only a firefighting lobby.

Fire resisting (Fire resistance) The ability of a component or a building to satisfy, for a stated period of time, some or all of the appropriate criteria given in the relevant standard.

Fire-separating element A compartment wall, compartment floor, cavity barrier and construction that encloses a protected escape route and/or a place of special fire hazard.

Fire-stop (Fire-stopping) A seal provided to close an imperfection of fit or design tolerance between elements or components, to restrict the spread of fire and smoke.

***Flat** A flat is a separate and self-contained premises constructed or adapted for use for residential purposes and forming part of a building from some other part of which it is divided horizontally.

Gallery A floor or balcony that does not extend across the full extent of a building's footprint and is open to the floor below.

Habitable room A room used, or intended to be used, for people to live in (including, for the purposes of Approved Document B Volumes 1 and 2, a kitchen, but not a bathroom).

Height (of a building or storey for the purposes of Approved Document B Volumes 1 and 2)

- Height of a building is measured as shown in ADB Appendix D, Diagram D4.
- Height of the floor of the top storey above ground level is measured as shown in ADB Appendix D, Diagram D6.

Inner room Room from which escape is possible only by passing through another room (the access room).

Live/work unit A flat that is a workplace for people who live there, its occupants, and for people who do not live on the premises.

Means of escape Structural means that provide one or more safe routes for people to go, during a fire, from any point in the building to a place of safety.

Measurement

- Width of a doorway, cubic capacity, area, height of a building and number of storeys are measured as shown in ADB Appendix D, Diagrams D1 to D6.
- Occupant number, travel distance, escape route and stairs are measured as described in ADB Appendix D, paragraphs D1 to D4.

Notional boundary A boundary presumed to exist between two buildings on the same site.

Open spatial planning The internal arrangement of a building in which more than one storey or level is contained in one undivided volume, e.g. split-level floors. For the purposes of this document there is a distinction between open spatial planning and an atrium space.

Perimeter (of a building) The maximum aggregate plan perimeter, found by vertical projection onto a horizontal plane.

Pipe Includes pipe fittings and accessories. The definition of 'pipe' excludes a flue pipe and a pipe used for ventilating purposes, other than a ventilating pipe for an above-ground drainage system.

Place of special fire hazard A room such as any of the following.

- Oil-filled transformer room.
- Switch gear room.
- Boiler room.
- Storage space for fuel or other highly flammable substance(s).
- Room that houses a fixed internal combustion engine.

Platform floor (also called an access or raised floor) A floor that is supported by a structural floor, but with an intervening cavity to house services.

Protected circuit An electrical circuit that is protected against fire.

Protected corridor/lobby A corridor or lobby that is adequately protected from fire in adjoining areas by fire resisting construction.

Protected entrance hall/landing A circulation area, consisting of a hall or space in a flat, that is enclosed with fire resisting construction other than an external wall of a building.

Protected shaft A shaft that enables people, air or objects to pass from one compartment to another, and which is enclosed with fire resisting construction.

Protected stairway A stair that leads to a final exit to a place of safety and that is adequately enclosed with fire resisting construction. Included in the definition is any exit passageway between the foot of the stair and the final exit.



Purpose group A classification of a building according to the purpose to which it is intended to be put.

Relevant boundary The boundary or notional boundary that one side of the building faces and/or coincides with, and that is parallel or at an angle of a maximum of 80 degrees to that side of the building.

Rooflight A dome light, lantern light, skylight, ridge light, glazed barrel vault or other element to admit daylight through a roof.

Room An enclosed space within a building that is not used solely as a circulation space. The term includes not only conventional rooms, but also cupboards that are not fittings and large spaces such as warehouses and auditoria. The term does not include cavities such as ducts, ceiling cavities and roof spaces.

School A place of education for children between 2 and 19 years old. The term includes nursery schools, primary schools and secondary schools defined in the Education Act 1996.

Self-closing device A device that closes a door, when open at any angle, against a door frame.

NOTE: If the door is in a cavity barrier, rising butt hinges (which are different from the self-closing device mentioned above) are acceptable.

Separated part (of a building) Part of a building that is separated from another part of the same building by a compartment wall. The wall runs the full height of the part and is in one vertical plane.

Sheltered housing Includes two or more dwellings in the same building or on adjacent sites, designed and constructed as residential accommodation for vulnerable or elderly people who receive, or will receive, a support service.

Single storey building A building that consists of a ground storey only. Basements are not counted as storeys in a building (see Appendix D). A separated part that consists of a ground storey only, with a roof to which access is only provided for repair or maintenance, may be treated as a single storey building.

Site (of a building) The land occupied by the building, up to the boundaries with land in other ownership.

***Solar shading device** A device attached to the external surface of an external wall for reducing heat gain within a building by shading or deflecting sunlight.

***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.

Storey Includes any of the following.

- Any gallery in an assembly building (purpose group 5).
- any gallery in any other type of building if its area is more than half that of the space into which it projects.
- A roof, unless it is accessible only for maintenance and repair.

NOTE: The building is regarded as a multi-storey building if both of the following apply.

- There is more than one gallery.
- The total aggregate area of all the galleries in one space is more than half the floor area of that space.

Storey exit A final exit, or a doorway that gives direct access into a protected stairway, firefighting lobby or external escape route.

NOTE: If an institutional building is planned to enable progressive horizontal evacuation, a door in a compartment wall is considered a storey exit for the purposes of requirement B1.

Suspended ceiling (fire-protecting) A ceiling suspended below a floor that adds to the fire resistance of the floor.

Thermoplastic material Any synthetic polymeric material that has a softening point below 200°C if tested to **BS EN ISO 306** Method A120. Specimens for this test may be fabricated from the original polymer where the thickness of material of the end product is less than 2.5mm.

Travel distance (unless otherwise specified, e.g. as in the case of flats) The distance that a person would travel from any point within the floor area to the nearest storey exit, determined by the layout of walls, partitions and fittings.

Unprotected area (in relation to a side or external wall of a building) All of the following are classed as unprotected areas.

- Any part of the external wall that has less than the relevant fire resistance set out in ADB Section 11.
- Any part of the external wall constructed of material more than 1mm thick if that material does not have a class B-s3, d2 rating or better, which is attached or applied, whether for cladding or any other purpose.
- Windows, doors or other openings. This does not include windows that are designed and glazed to give the necessary level of fire resistance and that are not openable.

NOTE: Recessed car parking areas as shown in ADB Diagram A1 should not be regarded as unprotected areas.



Appendix F - Information Provided by the Client

This Strategy is based on the information provided by the Client as detailed below:

- 1469-011 Proposed GA Site Plan
- 1469-012 Proposed GA Ground Floor Plan
- 1469-013 Proposed GA First Floor Plan
- 1469-014 Proposed GA Roof Plan
- 1469-018 Proposed GA Section B-B-018
- 1469-020 Proposed GA Section D-D
- 1469-021 Proposed GA North Elevation
- 1469-022 Proposed GA South Elevation
- 1469-023 Proposed GA West Elevation
- 1469-024 Proposed GA East Elevation
- 1469-025 Proposed GA West Courtyard Elevation
- 1469-026 Proposed GA East Courtyard Elevation
- 1469-027 Proposed GA North Courtyard Section
- 1469-028 Proposed GA South Elevation of Barn
- 1469-029 Proposed GA Staff Wing West Elevation
- 1469-030 Proposed GA Site Master Plan
- 1469-030 Proposed Site Masterplan
- 1469-031 Proposed GA Site Spoil Sections
- 1469-032 Proposed GA Site Sections

Document Control

This report has prepared this document for the sole use of our client (the 'Client') and in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed. Any information provided by third parties and referred to herein has not been checked or verified unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement.

Revision History:

Version	Date	Author	Comments
V1.0	27/01/2026	Stephen McGrill	Initial draft for discussion.
V1.1	04/03/2026	Stephen McGrill	Updated post client review and issue of final drawings.
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