



Developed for:
Bowmer + Kirkland

Detailed Fire Safety Strategy

SRP1155-AFR-01-XX-T-K-0002

University Academy
Long Sutton

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Detailed Fire Safety Strategy

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Long Sutton

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The checker has provided an internal review of the technical content of the report.
The approver confirms the report has received quality assurance in accordance with the principles of ISO 9001 and authorises external release of the document on behalf of Ashton Fire.

EXECUTIVE SUMMARY

Ashton Fire has been commissioned by Bowmer + Kirkland to provide fire safety consultancy services for the University Academy development located in Long Sutton.

This document details the fire safety strategy as developed for the scheme, intended to assist the design team in progressing the detailed fire safety design of the project through to construction. This report may also be submitted to the building control body in support of the projects' Building Regulations submission.

This fire safety strategy details the minimum fire safety provisions expected for the proposed development to meet the functional requirements of the Building Regulations 2010 (as amended). This has been achieved by applying the recommendations for life safety contained within BS 9999 in the first instance. The strategy has not been developed to include specific measures for the protection of property. However, certain features included for life safety will contribute to property protection to some extent and continuity of use following a fire.

Apart from where noted in this report, the design will be in accordance with the recommendations of BS 9999. The key fire safety challenges and / or variations from the guidance documents are identified in Summary Table 1. These items constitute a project risk until they are discussed and agreed with the relevant authorities having jurisdiction (AHJs).

The project comprises the development of a new three storey (G+2) school building which will cater for students of secondary education age.

The block will consist of several typical secondary school classrooms arranged across three floors served by three stair cores, namely cores 1, 2 and 3. Classrooms are accessed via a common corridor. Escape from the upper storeys will be facilitated by a protected escape stairs and a lift core is planned to be positioned within a protected lobby at the central staircase (Stair core 2).

The top floor height of the building, measured from the adjacent ground level to the finished floor level of the topmost occupied storey is approximately 7.2 m.

A simultaneous evacuation regime is utilised for the entire building with an automatic fire and detection system being provided. There is no scope for a smoke control system to be provided within this building.

Given the building height, an automatic suppression system is not proposed for life safety purposes and therefore has not been considered during the production of this report.

All elements of structure will be designed to achieve a 60-minute fire resistance. The building will be constructed as a single fire compartment. Fire resisting construction is utilised in support of the means of escape arrangements, including cross-corridor divisions, protection to dead-end areas and enclosing ancillary areas.

Vehicular access for the fire and rescue service will be provided via Little London Road, which runs adjacent to the site of the development.

Access to the block will be provided internally via the general circulation routes within the building. Access to the ground floor ancillary spaces, such as the plant room, will be provided externally via perimeter doors, with the exception the level 03 plant room, which will be 60-minute fire protected and accessed via Stair core 1.

Suitable water supplies to support firefighting operations is expected to be provided via existing hydrant provisions available on site.

To facilitate ease of review, the proposed fire safety systems are outlined in Summary Table 2.

Summary Table 1 – Key fire safety strategy challenges.

Item	Description	Ref.
Location of SLT Office 03 access door	SLT Office 03 opens directly onto the stair discharge route which is a departure from guidance. The current door connection is to remain in place as it is necessary for the purpose of monitoring personnel who enter via Exit 2. This configuration is considered acceptable as this space will have low occupancy and will be occupied by staff familiar with the building.	4.6
FRS parking position exceeds 18 m distance from building entry point	West elevation does not have adequate parking facilities for an FRS vehicle as the distance between the nearest available parking location exceeds 18 m. Therefore, a hardstanding area should be provided to cater for this guidance departure.	7.2
FRS vehicle track exceeds 20 m	The maximum reversing distance for the FRS vehicles is 20 m. As this distance is exceeded on the south elevation (c. 53 m), suitable turning facilities should be provided.	7.2

Summary Table 2 – Fire safety systems.

Item	Description	Ref.
Fire detection and alarm systems	Category L2 in accordance with BS 5839-1.	3.1
Visual alarm	Provided where required in accordance with BS 5839-1.	3.2
Fire safety signage	All parts of the development will be fitted with appropriate fire safety signage conforming to BS ISO 3864-1, BS 5499-4 and BS 5499-10.	3.5
Emergency lighting	To be installed through occupied areas and escape routes.	3.6
Evacuation lift	Evacuation lifts will be designed and installed in accordance with the relevant provision of BS EN 81-20 and BS EN 81-70.	3.7
Emergency voice communication (EVC) systems	Each protected refuse space is to be provided with an EVC system with a Type B outstation.	3.8
Fire shutters	Designed and tested in accordance with BS EN 16034:2014 achieving at least 30 minutes fire resistance in terms of integrity and insulation when tested in accordance with BS EN 13501-2:2016.	3.9
Stand-by power	All life-safety systems will be provided with robust power supplies in accordance with BS 8519.	3.10

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1. INTRODUCTION

1.1 General

- 1.1.1 Ashton Fire has been commissioned by Bowmer + Kirkland to provide fire safety consultancy services for the proposed University Academy located in Long Sutton.
- 1.1.2 This report outlines the minimum fire safety provisions expected for the proposed new build University Academy development to satisfy the functional requirements of the Building Regulations 2010 (as amended).
- 1.1.3 The fire strategy should be submitted for review by the Building Control body (and the fire & rescue service in their capacity as a statutory consultee) as part of the Building Regulations approvals process for the scheme. Following full coordination and implementation, this strategy report may be used to support the end user of the building in the development of any fire safety management procedures and plans considered necessary to fulfil their responsibilities under the Regulatory Reform (Fire Safety) Order 2005 (FSO) [1] and any other applicable fire safety legislation.
- 1.1.4 This document is not intended to portray detailed design information for fire safety systems or construction specifications. As a strategic document supporting and informing the wider design, it should be read in conjunction with the wider project design documentation.
- 1.1.5 It should be noted that any alternative design solutions proposed within this report are subject to agreement and subsequent approval by the relevant authorities having jurisdiction (AHJs). Unless specifically covered in this report please refer to the adopted design guidance for further details.

1.2 Fire safety guidance

- 1.2.1 The principal guidance document being used to demonstrate compliance with the requirements of the Building Regulations is BS 9999:2017 [2], which is the applicable guidance at the time of writing this report. It is noted that this guidance document does not set out statutory requirements; it is intended to provide guidance only for generic building designs. An alternative solution can be applied to achieve an acceptable level of safety commensurate with the function requirements of the Building Regulations 2010 (as amended).
- 1.2.2 On the basis that recommendations made within the guidance documents are followed, it is considered that the requirements of the Building Regulations 2010 (as amended) will be fulfilled; and that an adequate level of fire safety will be provided throughout the premises.

1.3 Alternative fire engineering solutions

- 1.3.1 Fire engineering principles are employed to support alternative solutions where strict adherence to the guidance would conflict with the wider aspirations for the scheme. The use of a fire safety engineering approach is recognised within BS 9999 as an acceptable means of complying with the functional requirements.
- 1.3.2 Apart from where noted in this report, the design will be in accordance with the recommendations of BS 9999. Departures from the guidance are identified and alternative solutions proposed following the methodology outlined in BS 7974:2019 [3].
- 1.3.3 In accordance with the fire safety engineering principles detailed in the BS 7974:2019 codes of practice, all fire precautions are determined based on there being one seat of fire, as considered suitable for accidental fires.

1.4 Reference information

- 1.4.1 This document is based on information provided by the design team to Ashton Fire as listed in Table 1. Additional contradictory information or subsequent design variations to the information supplied may render the findings and recommendations of this report invalid.
- 1.4.2 The figures used within this report are indicative and used to express the principles of the fire safety strategy. They may not be representative of final arrangement. The principles contained within this report should be maintained throughout any design amendments during the life of the buildings.

Table 1 – Project documentation referenced

Description	Reference	Revision	Author
GA Floor Plan – L00	SRP1155-CPM-01-00-D-A-2020	P06	CPMG Architects Ltd
GA Floor Plan – L01	SRP1155-CPM-01-01-D-A-2021	P06	
GA Floor Plan – L02	SRP1155-CPM-01-02-D-A-2022	P06	
GA Roof Plan	SRP1155-CPM-01-RF-D-A-2023	P03	
Elevation Drawings	SRP1155-CPM-01-ZZ-D-A-2010	P03	
Site Plan	SRP1155-ONE-ZZ-ZZ-D-L-0003	P11	One Environments Ltd
Schedule of Accommodation	SRP1155-LBY-ZZ-ZZ-L-A-0001-019SS1-S5	P01	Department for Education

2. PROJECT DESCRIPTION

2.1 Building description

- 2.1.1 This report is specific to the proposed University Academy development located in Long Sutton.
- 2.1.2 University Academy is a new build education development, comprising three storeys (Ground + 2) and has a topmost occupied storey height of 7.2 m above ground level. An indicative site plan is shown in Figure 1.
- 2.1.3 Vertical circulation within the building is via three protected staircases (namely Stair 1, Stair 2, and Stair 3) and one lift (which will be configured as an evacuation lift as per Department for Education [DFE] requirements), of which the stairs are located at opposing ends to each wing of the building. Stair 1 and 3 discharge directly to the outside at Ground Floor, whilst Stair 2 leads to the evacuation lift lobby prior to the final exit. Each staircase serving the building has been denoted as indicatively shown in Figure 2 and Figure 3.
- 2.1.4 The Ground Floor comprises reception areas, dining hall, kitchen area, food prep rooms, assembly hall, activity studios, changing rooms, music rooms, art room, DT workshops, DT studio, staff workrooms, offices, special educational needs (SEN) resource / learning support rooms, and plant rooms.
- 2.1.5 The First Floor comprises classrooms, an art room, a library resource room, offices, SEN resource facilities, staff workrooms, plant room, staff workrooms, lighting and audio control room a medical room, a server room, teaching resource rooms and seminar rooms.
- 2.1.6 The Second Floor comprises ICT clusters, seminar room, offices, staff workrooms, staff room, science laboratories, science prep room, chemical store, and cleaners store.
- 2.1.7 A number of ancillary areas such as plant rooms, storerooms, and WCs will be present throughout the building.
- 2.1.8 The main use of the building is for teaching purposes, with staff and students attending the building on a regular basis and therefore, staff and students will be familiar with the building layout.
- 2.1.9 Indicative layouts are illustrated in Figure 2 and Figure 3.
- 2.1.10 Notwithstanding the above, out-of-hours use is provided to limited areas on the Ground Floor, namely the assembly hall and dining hall, see Section 4.15.

Table 2 - Building characteristics

Building characteristics	Description
Number of floors	G+2
Number of stairs	3
Building height	7.2 m (from ground access level to topmost occupied floor level)
Floor area (approx.)	GF - 2576 m ² 1F - 2613 m ² 2F - 2613 m ²
Fire detection and alarm system	Category L2 in accordance with BS 5839-1:2017 [4]
Automatic fire suppression system	No
Evacuation strategy	Simultaneous evacuation



Figure 1 - Indicative site plan

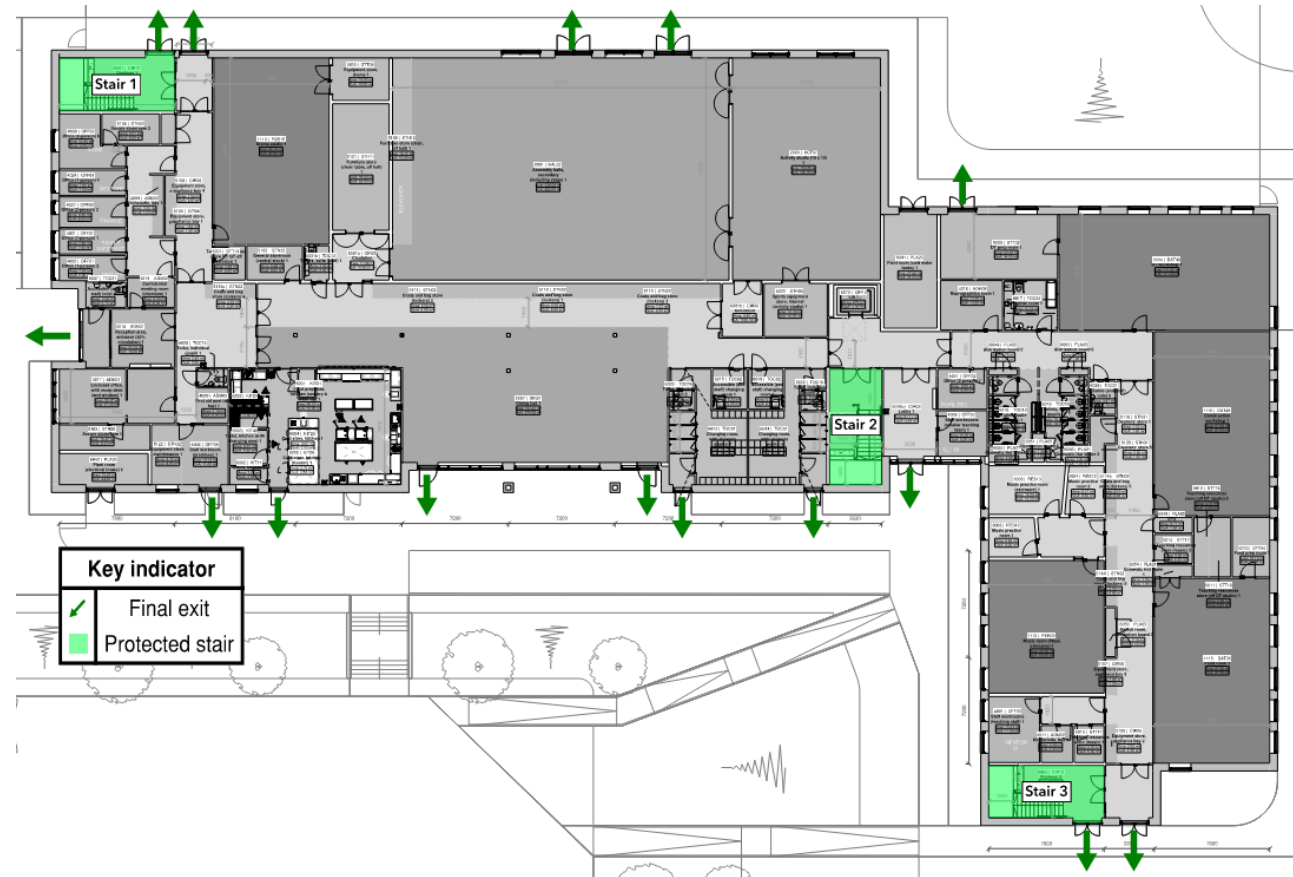


Figure 2 - Indicative Ground Floor layout

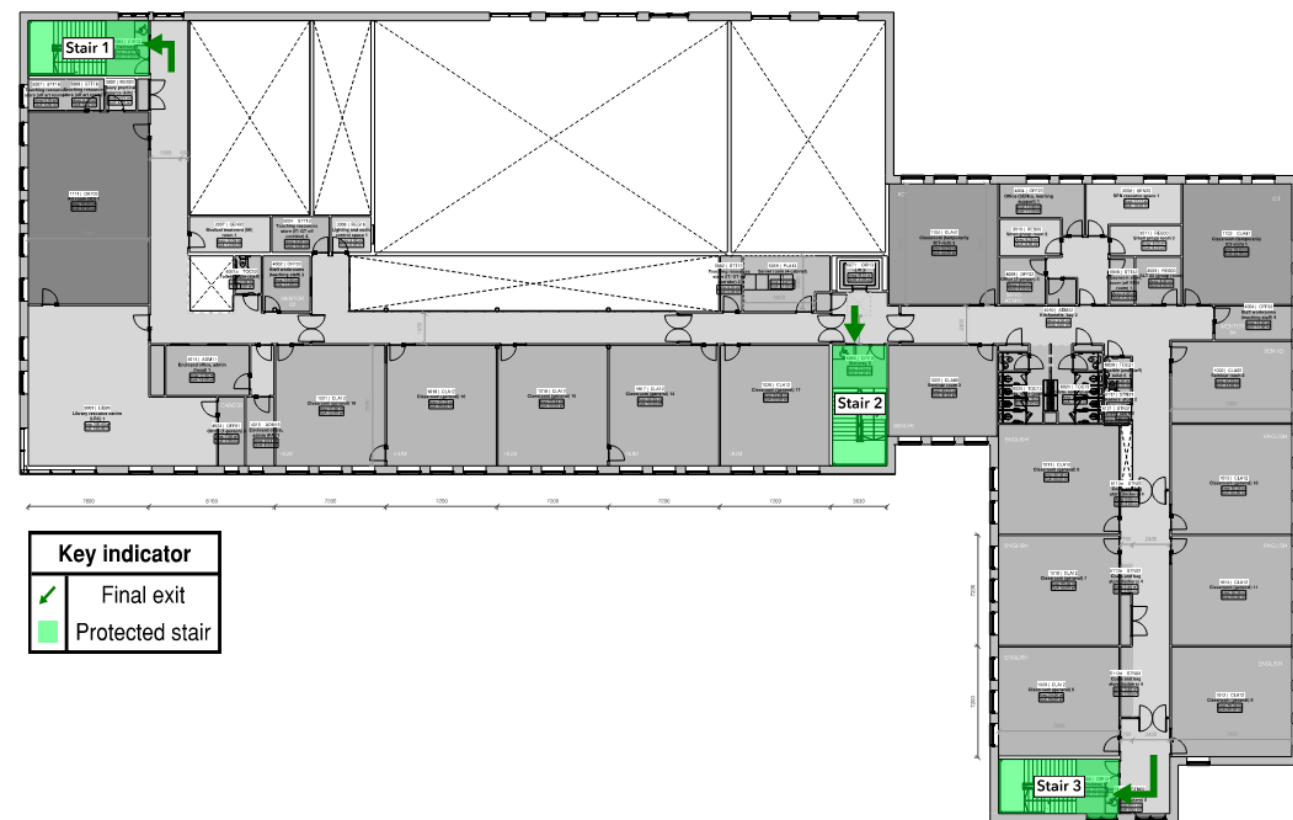


Figure 3 - Indicative First Floor layout

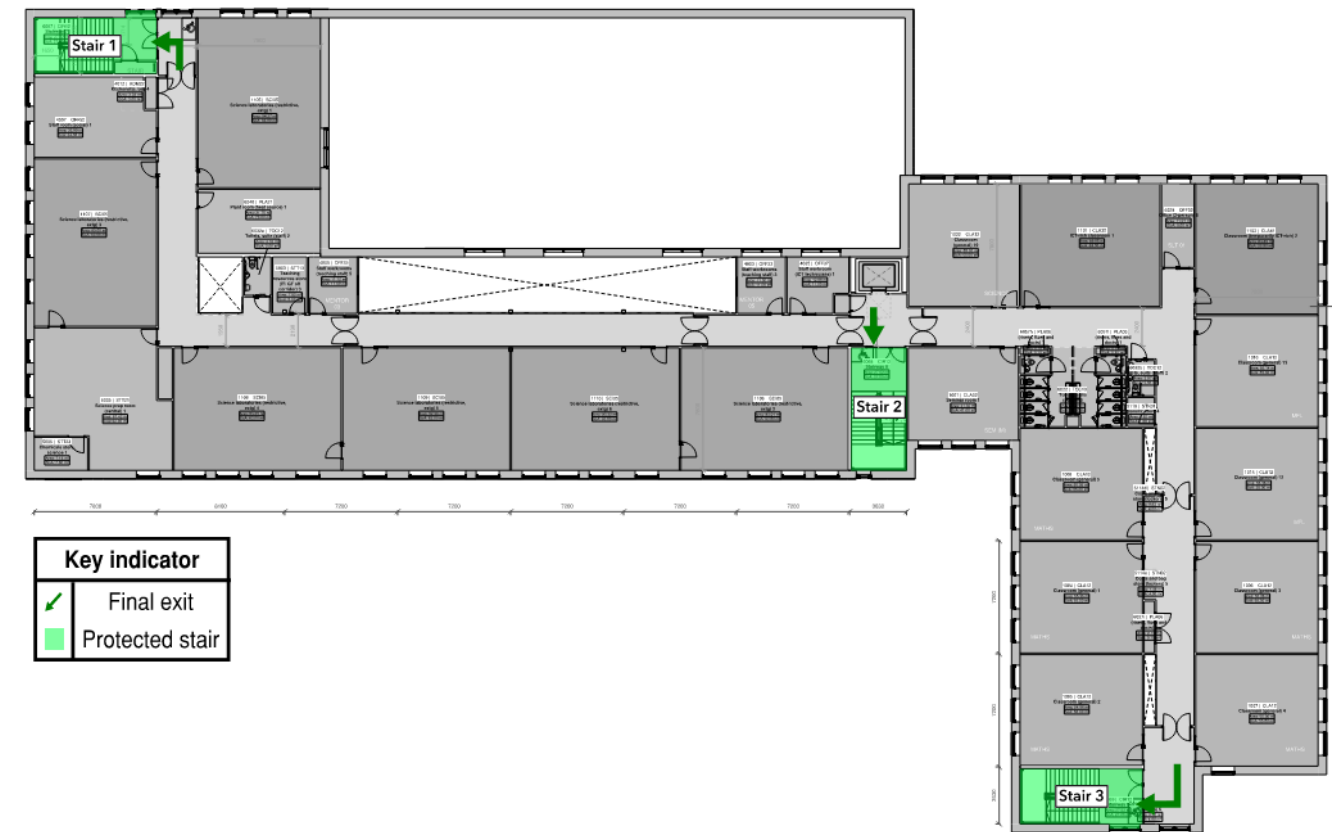


Figure 4 - Indicative Second Floor layout

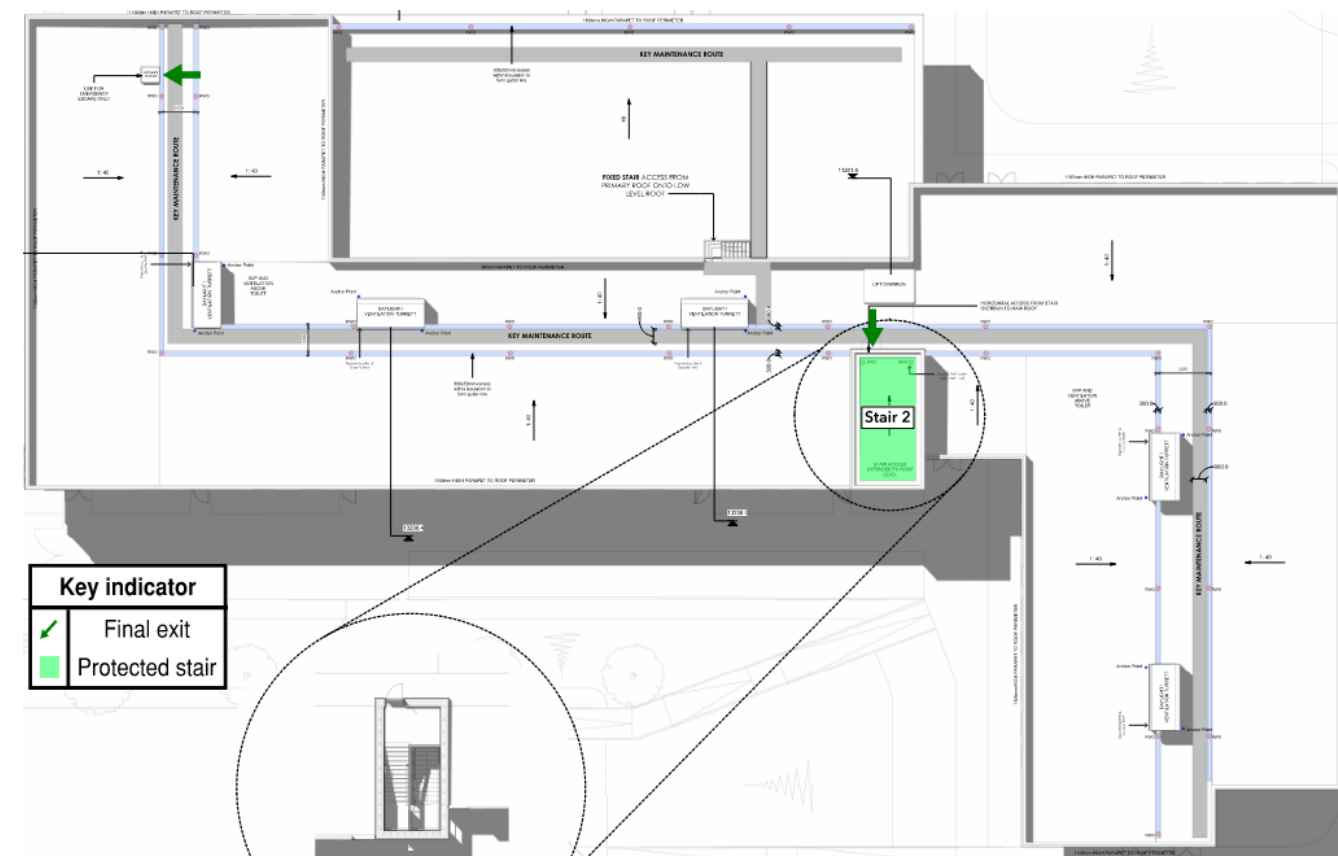


Figure 5 - Indicative Roof layout

2.2 Risk profile

2.2.1 As per the guidance contained in BS 9999, a risk profile is established to determine appropriate means of escape and other relevant fire safety provisions for life safety. The risk profile is a function of the occupancy characteristic and the fire growth rate.

Occupancy characteristics

2.2.2 The people who are likely to be present in the school are staff and students, who will be using the building regularly and therefore will be familiar with the building layout. Therefore, all areas occupied by staff and students within the building have been assigned an occupancy characteristic of 'A - Awake and Familiar'.

2.2.3 In addition to the above, specific areas of the Ground Floor - namely the dining hall, assembly hall, and changing rooms - will be let for community use. Members of the public who will be present in the building will likely not be familiar with the building layout and fire safety protocol, therefore areas accessed for community use will be categorised with an occupancy characteristic of 'B - Awake and Unfamiliar'.

2.2.4 Areas of the building which will be accessed for maintenance (e.g., staff rooms or plant rooms) will be accessed by staff only and will be assigned an occupancy characteristic of 'A - Awake and Familiar'.

Fire growth rate

2.2.5 The fire / loading content of a room is dependent on the use and contents of the room. Most areas which are occupied have a fire / loading content on an office / classroom and so will be assigned a fire growth rate of '2 - Medium'.

2.2.6 Plant rooms, storerooms, rooms with a higher fire risk (i.e., Science / DT rooms etc.) and similar areas are considered to have a fire growth rate of '3 - Fast' and will be separated from the rest of the building by at least 30-minutes fire-resisting construction.

2.2.7 The applicable risk profiles across the building are summarised in Table 3.

2.3 Design occupancy

2.3.1 The number of occupants expected in the building will be determined to ensure that the number and width of exits have sufficient capacity for means of escape purposes.

2.3.2 The design occupancy is based on all rooms being fully occupied. The total occupancy by floor level is summarised in Table 4. The breakdown of the occupancy on a room-by-room basis is summarised Appendix A.

2.3.3 The second column of Table 4 is worked out based on all rooms being occupied on the specified floor level, therefore with all floors occupied, the building has a capacity to accommodate 2056 people. However, the maximum number of people expected at any one time has been defined as 825 by the design team.

2.3.4 The maximum occupancy for each floor has been used to determine the horizontal means of escape provisions, the design occupancy of 825 for the entire building has been considered for vertical means of escape.

2.3.5 Therefore, each of the floor levels is allowed to be occupied up to the number shown in the second column of Table 4. However, the maximum occupancy of the entire building at any time will not exceed 1020 people as this is the limiting factor by the vertical means of escape provisions (see Section 4.11). The management will be made aware of the allowable occupancy of the building given in this section.

Table 3 - Risk profile summary

Area	Occupancy characteristic	Fire growth rate	Risk profile
Areas occupied by pupils and staff (i.e., wider school)	A - Awake & Familiar	2 - Medium	A2
Areas of higher fire hazard occupied only by members of staff and students (e.g., plant, kitchen, science / DT rooms etc.)	A - Awake & Familiar	3 - Fast	A3
Areas accessed for community use	B - Awake and Unfamiliar	2 - Medium	B2

Table 4 - Design occupancy summary

Floor	Floor occupancy	Total occupancy (full capacity)	Total occupancy (design capacity ^[1])
Total occupancy of the Second Floor	606 people	2056	825
Total occupancy of the First Floor	507 people		
Total occupancy of the Ground Floor	943 people		
Notes: 1) As advised by the architect, the maximum occupancy will be 750 pupils and 75 members of staff present in the building at any one time (825 total); the figures for each level above represent the potential occupancy at each level when occupied to capacity using the schedule of accommodation provided by the client.			

3. ACTIVE FIRE SAFETY SYSTEMS

3.1 Means of detection and alarm

- 3.1.1 Areas with an A2 or B2 risk profile are recommended to be provided with a minimum of a Category M detection and alarm system. Areas with an A3 risk profile are recommended to be provided with a minimum of a Category L2 alarm and detection system. To provide early warning throughout, an L2 system will be provided throughout the building, designed, and installed in accordance with BS 5839-1:2017 [4].
- 3.1.2 As an enhanced fire detection and alarm system will be provided throughout those areas occupying an A2 and B2 risk profile, this permits limited increases in travel distances and reduction in exit width factors in accordance with BS 9999.
- 3.1.3 A Category L2 automatic fire detection and alarm system is sufficient to be provided in areas occupying an A3 risk profile where this is recommended as a minimum in accordance with BS 9999. As such, given this is a minimum expectation, relaxations for travel distance and exit width will not be applicable to areas occupying an A3 risk profile (i.e., kitchen, plant rooms, science laboratories etc).
- 3.1.4 An automatic fire detection and alarm system is proposed within all rooms and escape routes within the building. It is recommended that heat detection is provided within the kitchen to limit the potential for false alarms to occur.
- 3.1.5 An alarm system will also be provided on the roof if it is accessed for maintenance, and will sound upon detection anywhere within the school building. Sounders and flashing beacons are recommended to support early warning and roof evacuation.

3.2 Visual alarms

- 3.2.1 Visual alarms will be provided where required in accordance with BS 5839-1.
- 3.2.2 In addition, areas that could facilitate occupants with hearing difficulties will also be provided with a visual alarm, as well as areas with high ambient sound levels.

3.3 Automatic suppression system

- 3.3.1 In accordance with BS 9999, sprinklers are recommended for buildings with a top floor above 30 m. Given the building height, a sprinkler system is not proposed for life safety purposes.

3.4 Smoke ventilation system

- 3.4.1 There is no recommendation for the school to be provided with a smoke ventilation system, in accordance with BS 9999.

3.5 Fire safety signage

- 3.5.1 Fire safety signs will be installed where necessary to provide clear identification of fire precautions, fire equipment and means of escape in the event of fire. All parts of the development will be fitted with appropriate fire safety signage to comply with The Health and Safety (Signs and Signals) Regulations 1996, i.e. signage to be specified in according to BS ISO 3864-1 [5], BS 5499-4 [6] and BS 5499-10 [7].
- 3.5.2 The purpose of fire signs is to direct persons towards fire exits, or to provide specific information or warning about particular equipment, doors, rooms, or procedures. They will be recognisable, readable, and informative, as they convey essential information to regular and infrequent users of the premises, and the fire and rescue service.

- 3.5.3 Fire notices will be permanently displayed in conspicuous positions throughout the building, including storey exits, and will be specific to it.
- 3.5.4 All fire doors will be marked with the appropriate fire safety sign conforming to BS 5499-1 (white on blue) according to whether the door is:
- to be kept closed when not in use ('FIRE DOOR - KEEP SHUT');
 - to be kept locked when not in use ('FIRE DOOR - KEEP LOCKED'); or
 - held open by an automatic release mechanism ('AUTOMATIC FIRE DOOR - KEEP CLEAR').
- 3.5.5 Any emergency securing device fitted to doors on escape routes are to be provided with instruction notices, adjacent to the device, indicating the method of operation.

3.6 Emergency lighting

- 3.6.1 Emergency lighting will be installed to provide temporary illumination in the event of failure of the primary power supplies to the normal lighting system. As part of the emergency lighting system, escape lighting will be provided to ensure the escape routes are illuminated at all material times. Adequate artificial lighting will be provided in all common escape routes and will be of a sufficient standard to enable persons to see to escape.
- 3.6.2 Emergency lighting will be installed in accordance with the recommendations of BS 5266-1:2016 [8], BS EN 1838:2013 [9] and BS EN 60598-2-22:2014+A1:2020 [10].
- 3.6.3 Emergency lighting will illuminate all occupied areas, common evacuation routes (internal and external as necessary) and essential areas including plant areas. It will also illuminate a safe exit route including fire exits, fire alarm call points, changes in level or direction and fire-fighting equipment. Lighting to escape stairs will be on a separate circuit from that supplying any other part of the escape route.
- 3.6.4 Primary and emergency lighting will be required for any external escape routes that will not be lit by surrounding street lighting.

3.7 Evacuation lift

- 3.7.1 As instructed by the DFE, the lift will be used for escape purposes and will be designed as an evacuation lift. The design of an evacuation lift will be in line with the relevant recommendations of Annex G of BS 9999.
- 3.7.2 Evacuation lifts will be designed and installed in accordance with the relevant provision of BS EN 81-20:2020 [11] and BS EN 81-70:2021+A1:2022 [12]. Where an evacuation lift is used, it is expected that the evacuation will be assisted by an authorised person.
- 3.7.3 The evacuation lift will be situated within a protected enclosure consisting of the lift well itself and will be provided with a protected route from the evacuation lift lobby at the final exit level, leading to a final exit. It will be associated with a refuge space (900 mm × 1400 mm) and will be clearly identified.
- 3.7.4 The evacuation lift will be provided with secondary power supplies.

3.8 Emergency voice communication system (EVC)

- 3.8.1 Each refuge space will be provided with an emergency voice communication (EVC) system. The system will comply with BS 5839-9:2021 [13] and will consist of a Type B outstation which communicates with the receiving station, typically situated adjacent to main fire alarm panel.

3.9 Fire shutter

- 3.9.1 The food prep area / kitchen will be enclosed in 30 minutes fire resistance including any openings.
- 3.9.2 Servery openings onto the dining hall on Ground Floor will therefore be provided with fire shutters which descend upon activation by a local heat sensor, such as a fusible link or electric heat detector, in the immediate vicinity of the shutter.
- 3.9.3 These shutters will be designed and tested in accordance with BS EN 16034:2014 [14] and will achieve at least 30 minutes fire resistance in terms of integrity and insulation when tested in accordance with BS EN 13501-2:2016 [15].

3.10 Emergency (life-safety) power supplies

- 3.10.1 All life-safety systems will be provided with robust power supplies in accordance with BS 8519:2020 [16].
- 3.10.2 The secondary power supply will be provided via a dedicated generator, UPS battery or a secondary substation on a different HV main.
- 3.10.3 The following fire safety systems will comply with their respective British Standards regarding secondary power supplies:
- Emergency lighting and signage;
 - Automatic fire detection and alarm system;
 - Emergency voice communication system;
 - Evacuation lift; and
 - Fire shutters.

4. MEANS OF WARNING AND ESCAPE

4.1 Evacuation philosophy

- 4.1.1 A simultaneous evacuation regime will be implemented within the building, whereby, in the event of fire anywhere in a building, all occupants will receive a signal to evacuate. This includes those occupying the roof, whereby activation of the fire detection and alarm system anywhere within the building will also prompt the evacuation of those occupying the roof.
- 4.1.2 The automatic fire detection and alarm system will be configured to support this evacuation philosophy, as set out in Section 3.1.

4.2 Travel distances

- 4.2.1 The maximum travel distances are summarised in Table 5 for the appropriate risk profile. Given the current layouts, escape from all areas within the building are within the single, and multi-directional travel distance limits provided.
- 4.2.2 The travel distances shown in the table are 'actual' travel distances and take into account of the internal layouts. This will be considered when fitting out the interior of the rooms within the building.
- 4.2.3 Where the internal layouts are not known, travel distances will be taken as 2/3rds of the values stated in Table 5.

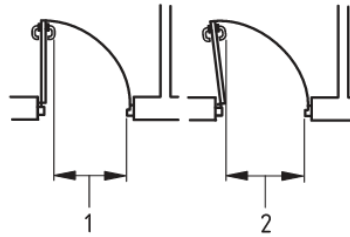
4.3 Exit width factors

- 4.3.1 The minimum width of exit doors, corridors and escape routes are based upon the number of occupants in the building / area and the relevant factors given in Table 6.
- 4.3.2 Irrespective of the door widths calculated from the factors given in Table 6, BS 9999 recommends that all doors should have a minimum clear width of 850 mm. This will be achieved for the design.
- 4.3.3 Corridors are required to have a minimum width of 1200 mm and will be at least 150 mm wider than any cross-corridor door located along it. Cross corridor doors sub-dividing corridors will have a clear width of at least 1050 mm. These will be provided in every corridor which exceeds a length of 12 m and fitted with self-closing devices.
- 4.3.4 Rooms serving more than 60 occupants will be provided with at least two exits, where doors will be hung to swing towards the direction of escape.
- 4.3.5 Doors hung to swing against the flow of escaping occupants are to serve a maximum of 60 people, irrespective of the available clear exit width.

Table 5 - Travel distance limitations

Risk profile	Travel distance	
	Single direction (m)	Multiple directions (m)
A2 (wider building)	25.3 ⁽¹⁾	63.2 ⁽¹⁾
A3 (kitchens, plant, science classrooms)	18.0	45.0
B2 (community usage)	23.0 ⁽¹⁾	57.5 ⁽¹⁾
Open air / roof areas	60	200
Notes:		
1) The travel distance has been increased by 15% based on the provision of an automatic Category L2 detection and alarm system in A2 and B2 areas of the building.		

Table 6 - Exit width factors

Risk Profile	Exit component	Minimum width factor (mm/person) ^{(2) (3)}
A2 (wider building)	Doors, corridors, escape routes	3.06 ⁽¹⁾
	Stair width serving two floors	3.23 ⁽¹⁾
A3 (kitchen, plant)	Doors, corridors, escape routes	4.60
B2 (community usage)	Doors, corridors, escape routes	3.485 ⁽¹⁾
Notes:		
1) The exit width factors have been decreased by 15% based on the provision of an L2 detection and alarm system for areas of A2 and B2 risk profile.		
2) Capacity of doors with a width of less than 1,050 mm should be assessed on the basis of 'Door capacity = 500 mm / exit factor'		
3) Exit widths are for clear widths measured in accordance with Figure 14 of BS 9999 (reproduced below).		
 Key 1 Effective clear width (door stop to projecting building hardware) 2 Effective clear width (door stop to door leaf)		

4.4 Horizontal means of escape – Roof

- 4.4.1 Escape from the roof will be facilitated from Stair 2 which extends up to the roof level, and an access hatch on top of Stair 1.
- 4.4.2 Maximum permitted travel distance from the roof is limited to 60 m in single direction and 200 m in alternative directions. Figure 6 illustrates that a second means of escape is provided at the northwest corner of the development and therefore all travel distances are within the recommended maximum permitted distances.
- 4.4.3 The roof hatch access above Stair 1 will be facilitated using a cat ladder conforming to BS EN ISO 14122-4:2016 [17]. The roof will be accessible for maintenance purposes by authorised personnel, only.
- 4.4.4 Sounders / beacons will be provided on the roof to provide warning of alarm activation in the event of fire within the school.

4.5 Horizontal means of escape – Upper Floors (Level 01 & Level 02)

- 4.5.1 Corridors connecting two or more storey exits and / or final exits that exceed 12 m in length will be subdivided by cross-corridor doors.
- 4.5.2 Cross-corridor doors will achieve a minimum of 30-minutes fire resistance with smoke seals (FD 30S) and will be configured such that they swing in both directions for escape. Cross-corridor doors will also incorporate vision panels in accordance with Paragraph 15.6.5 of BS 9999.
- 4.5.3 An indicative layout of these levels is illustrated in Figure 3 and Figure 4.
- 4.5.4 A lift is provided in the building which will be designed as an evacuation lift. In line with Annex G of BS 9999, the evacuation lift will be separated from the rest of the accommodation by a protected lobby / enclosure at all levels.
- 4.5.5 Several voids are proposed along the corridors connecting the First and Second Floor corridors. The recommendations for open spatial planning are met within the current design. Where an escape route from a classroom is within 4.5 m of an open void, an alternative exit via a pass door to an adjacent classroom will be provided – see Section 4.7.

4.6 Horizontal means of escape – Ground Floor

- 4.6.1 Corridors connecting storey and final exits that exceed 12 m in length will be subdivided by cross-corridor doors.
- 4.6.2 Cross-corridor doors will achieve a minimum of 30-minutes fire resistance with smoke seals (FD 30S) and will be configured such that they swing in both directions for escape. Cross-corridor doors will also incorporate vision panels in accordance with Paragraph 15.6.5 of BS 9999.
- 4.6.3 All protected staircases will discharge directly to the outside or via a protected exit passageway at Ground Floor level. Exit arrangements are in accordance with BS 9999, whereby Stairs 1 and 3 discharge directly to outside. Stair 2 discharges into the evacuation lift lobby which subsequently leads to outside.
- 4.6.4 Some of the rooms at Ground Floor Level will discharge directly to the outside, as indicated in Figure 2.
- 4.6.5 An indicative layout of the Ground Floor is shown in Figure 7 with the occupation numbers sited using the schedule of accommodation provided by the client. Exits that are expected to be used by the general circulation population are also illustrated.
- 4.6.6 SLT Office 03 opens directly into the lobby (stair discharge route) adjacent to Exit 2 which is a departure from the guidance (noted in callout in Figure 7). This door connection is to remain in place as it is

necessary for the purpose of monitoring personnel who enter or leave via Exit 2. This is considered acceptable as the office will be of low occupancy, with occupants who are familiar with the building.

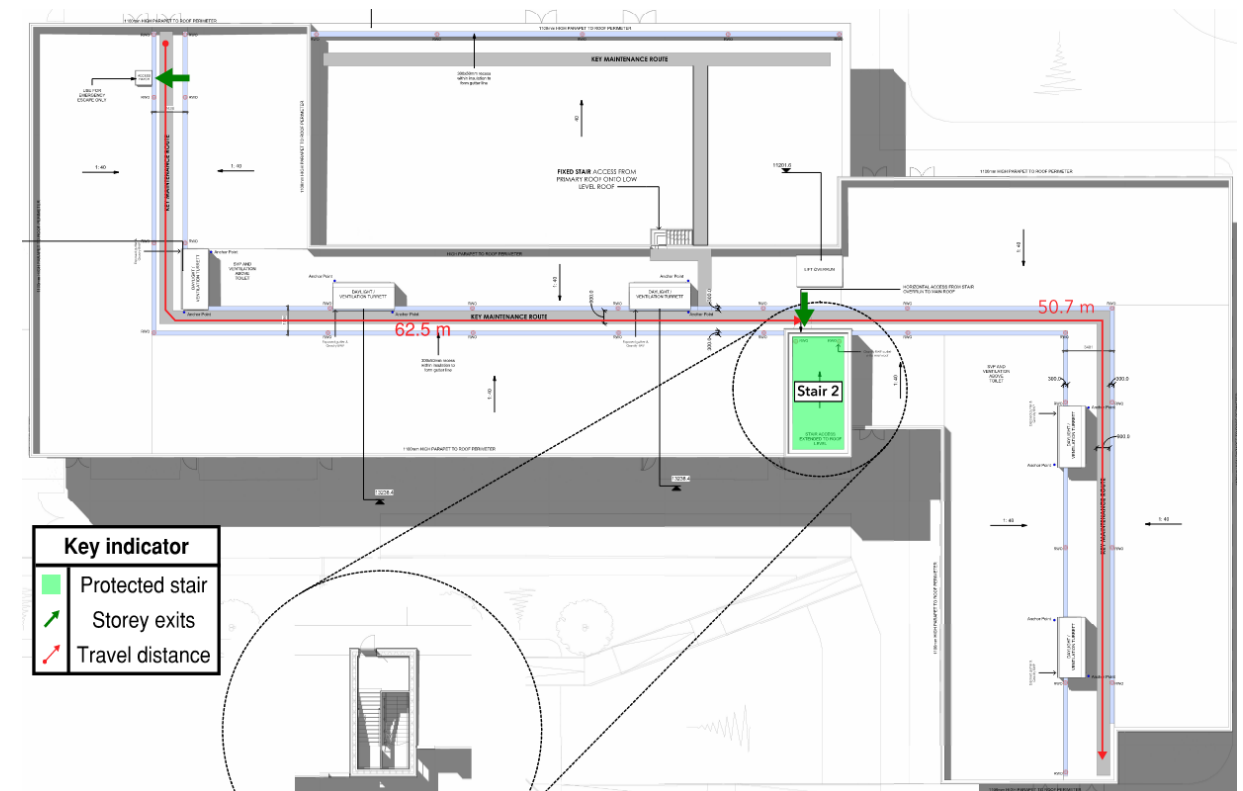


Figure 6 – Roof level exits with extended travel distance defined in the northwestern corner

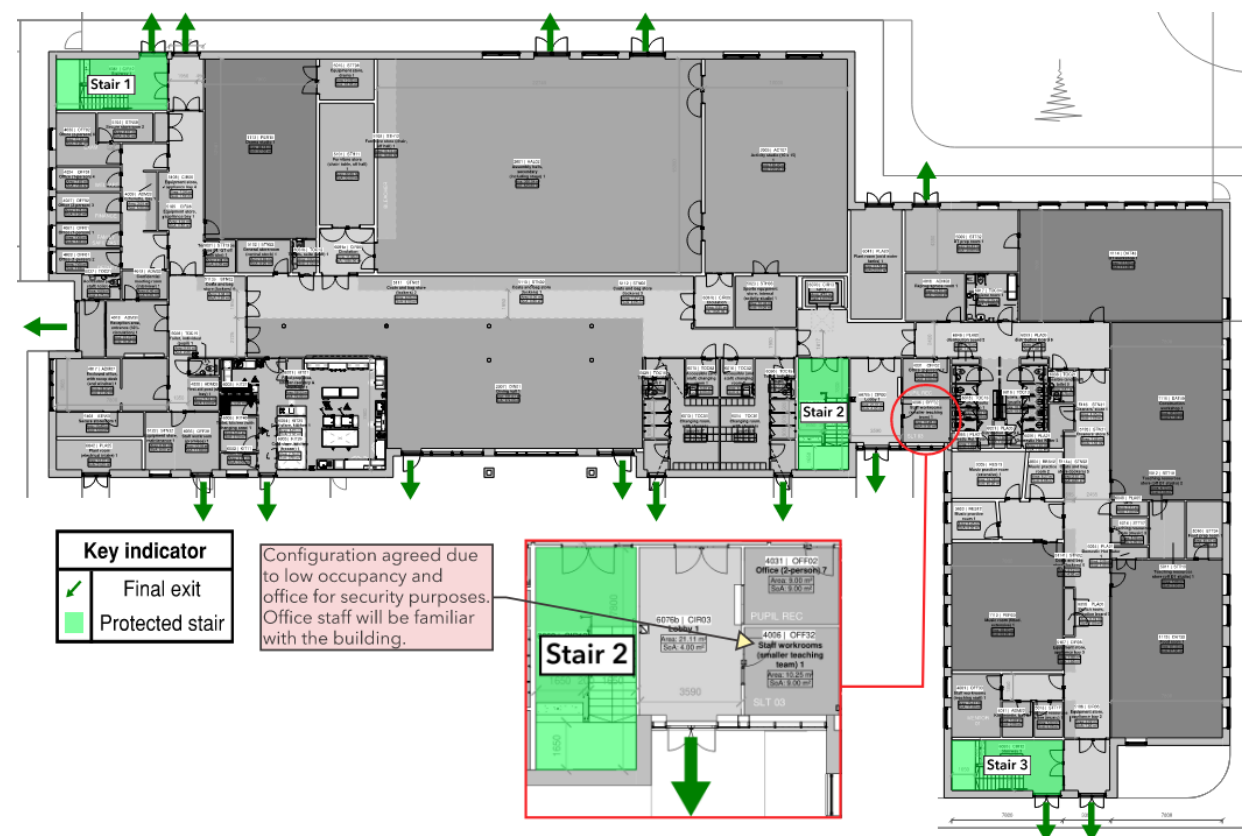


Figure 7 – Ground Floor exits

4.7 Openings spatial (vertical) planning

4.7.1 In accordance with BS 9999, the building incorporates open spatial planning on the first and Second Floor, therefore the following are considered:

- Storey exits will be sited away from the open connection so that escape routes do not approach the opening;
- Maximum travel distances from the opening to the nearest storey exit will not exceed the distances appropriate to the building without open spatial planning; and
- Escape will be away from the opening and the subsequent escape route will not pass within 4.5 m of the opening.

4.7.2 Figure 8 and Figure 9 illustrate that the current arrangement is acceptable for both first and Second Floor level as the above conditions are satisfied. The storey exits are sited away from the open connections by being positioned at either end of the building with fire rated construction and pass doors between appropriate classrooms providing alternative escape route from the void.

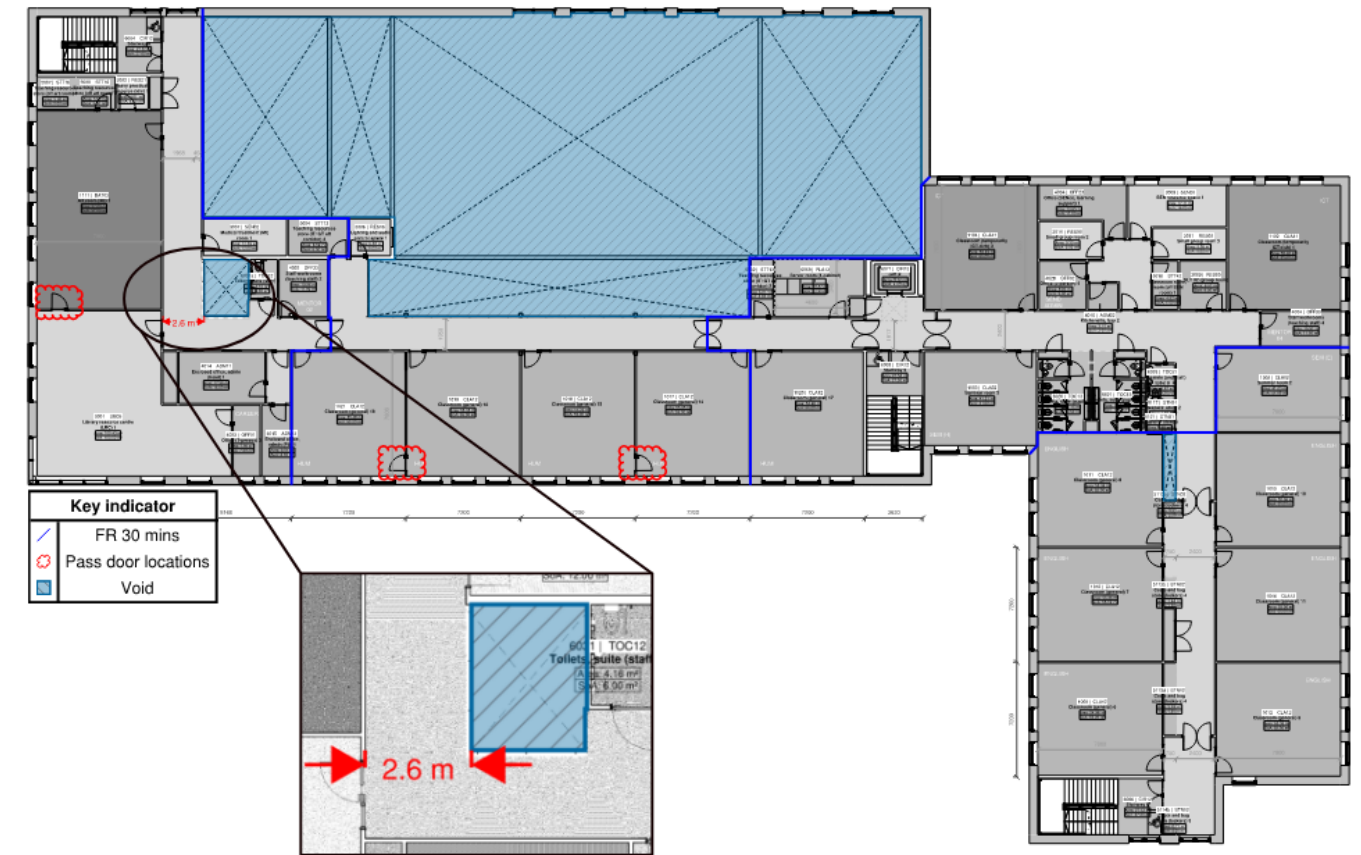


Figure 8 - Void opening on First Floor

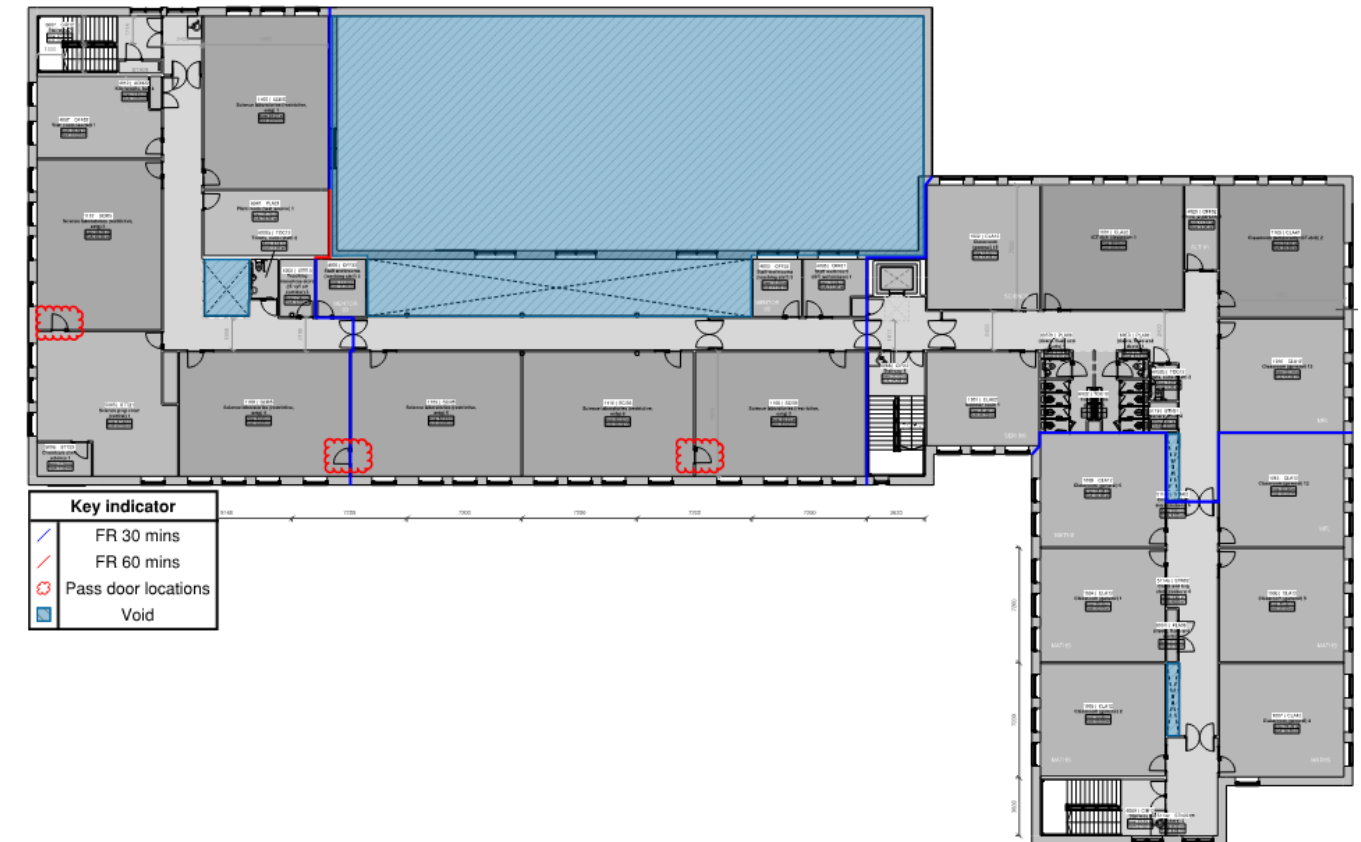


Figure 9 - Void opening on Second Floor

4.10 Lockers

- 4.10.1 Lockers will be located outside of protected lobbies and stairs, as well as dead end portions of corridors.
- 4.10.2 Lockers on escape routes will be of limited combustibility and should feature sloped tops to deter storage being placed on top.

4.11 Vertical means of escape

- 4.11.1 In accordance with BS 9999, for buildings with a topmost occupied storey height of below 7.5 m from fire service access level, they are not required to be provided with a firefighting shaft.
- 4.11.2 Egress from the upper storeys of the school is facilitated by three protected escape stairs.
- 4.11.3 It is understood that all stairways have a minimum clear width of 1650 mm. Therefore, based on a stair width of 1650 mm and a capacity factor of 3.23 mm/person for an A2 risk profile, the stair capacity is determined as 510 people per stair.
- 4.11.4 Discounting one stair, the remaining two stairs would have capacity for up to 1020 occupants. Given that the maximum number of occupants is 825 as advised by the design team, the staircase capacity is considered sufficient.
- 4.11.5 Where handrails intrude 100 mm or less, these can be ignored when assessing the clear width of the communal stair. The stair will be kept free for a vertical distance of 2 m.

4.12 Final exits / merging flow

- 4.12.1 Merging flow occurs where occupants using the stair share a final exit with occupants on the final exit level (Ground Floor level). The final exit must therefore be suitably sized for all occupants simultaneously.
- 4.12.2 It is expected that merging flow would occur where occupants are escaping at Exit 2 on the Ground Floor and the occupants descending from First and Second Floor via Stair 2.
- 4.12.3 The merging flow calculation is based on the following formula:

$$W_{FE} = BX + 0.75S_{Up}$$

Where:

W_{FE} = Width of the final exit;

B = Number of people served by the final exit level storey exit;

X = Minimum door width per person; and

S_{Up} = Width of the stair.

- 4.12.4 The merging flow calculation is summarised in Table 9. The above equation is rearranged to calculate the number of occupants that can safely use the final exit. This formula becomes:

$$B = \frac{W_{FE} - 0.75S_{Up}}{X}$$

- 4.12.5 Based on the above, Exit 2 can facilitate 134 people from the Ground Floor during an evacuation event.
- 4.12.6 Ground Floor has six final exits directly to outside. Therefore, the reduced capacity of Exit 2 is not expected to have an impact to the Ground Floor occupancy. This has been taken into consideration as part of horizontal storey exit capacity assessment in Section 4.8.

Table 8 – Stair width calculation

Stair provisions	Occupancy	Capacity factor ⁽²⁾	Allowable occupancy
Stair 1 – 1650 mm ⁽¹⁾ Stair 2 – 1650 mm Stair 3 – 1650 mm	825 ⁽³⁾	3.23 mm/person	1020 person
Note: 1) One of the stairs has been discounted. 2) Reduced minimum width of escape stairs using A2 (3.8 mm/person) by 15% due to automatic Category L2 detection and alarm system in A2 and B2 areas of the building. 3) This is the maximum occupancy in the building at any one time as given by the design team. Refer to occupancy calculation in Table 4.			

Table 9 – Merging flow capacity summary

Exit	Clear width of final exit (W_{FE})	Capacity factor (X)	Width of the stair (S_{Up})	Number of occupants (B)
Exit 2	1650 mm	3.06 mm/person	1650 mm	134

4.13 Means of escape for disabled persons

- 4.13.1 It should be noted that under the Regulatory Reform (Fire Safety) Order 2005 [1], it is the duty of the responsible person along with their appointed safety assistants to assist everyone to a place of ultimate safety outside the buildings in the event of an emergency.
- 4.13.2 All protected stairs will contain a 1400 mm x 900 mm refuge area on each upper floor to facilitate disabled escape. The refuge area will be equipped with an emergency voice panel (EVC), designed, and installed in accordance with BS 5839-9 (see Section 3.8).
- 4.13.3 Refuges will be located such that they are not to impede on the movement of occupants onto stairways or escape routes, be clearly identified and provided with emergency voice communication between the refuges and management / security positions.
- 4.13.4 To ensure an inclusive design, the provision of an evacuation lift has been requested by the DFE. This evacuation lift is accessed via the main circulation corridor.
- 4.13.5 As occupants using the evacuation lift will be required to wait for a short period of time for the lift to be called and land at the respective floor, adequate protection to the lift is required to be provided. This report is primarily concerned with ensuring suitable protection to the evacuation lift. The evacuation lift will be provided with a protected escape route at Ground Floor to the outside. The evacuation lift will discharge into a protected lobby with a direct route to the pupil entrance lobby, which discharges direct to outside.
- 4.13.6 Generally, evacuation lifts will be manually operated by a suitably trained, competent person.
- 4.13.7 Any disabled member of staff will have a Personal Emergency Evacuation Plan (PEEP) and the procedures will be practised. A Generic Emergency Evacuation Plan (GEEP) will need to be written for members of the public who would need assistance to escape. Further information can be found in BS 8300-2:2018 [18] and the DCLG Publications "Fire Safety Risk Assessment Supplementary Guide - Means of Escape for Disabled People" [19].

4.14 Escape beyond final exits

- 4.14.1 Travel beyond the building final exits must be away from the building, towards a place of safety, and not be jeopardised by unprotected openings of the building. It is proposed that this is achieved through a combination of some of the following (relevant to each location):
- External fire-rated construction provided where people are required to pass within 1800 mm of an external wall;
 - Where final exits discharge within 1800 mm of an external wall at 90° or less to the plane of the final exit, fire-rated construction will be provided to external walls within 1800 mm of the final exit;
 - Exit paths provide that lead away from the building; and
 - Alternative paths along the building that cannot be impacted by a single fire location.

4.15 Out-of-hour / community use

- 4.15.1 The school is accessible by members of the public for community use; refer to Figure 11 for areas for community use.
- 4.15.2 As discussed in Paragraph 2.2.3, the occupancy characteristic of the building will change in areas of community use, from an A2 to and B2 risk profile. This is not anticipated to have an impact to the fire safety provisions, as the out of hour's occupancy levels will be much lower numbers, compared to school hours.

- 4.15.3 Escape from the areas available for out-of-hour use is facilitated by multiple exits which lead directly to outside.
- 4.15.4 All doors along the escape routes will be unlocked and readily available for occupants using the premises during these times.

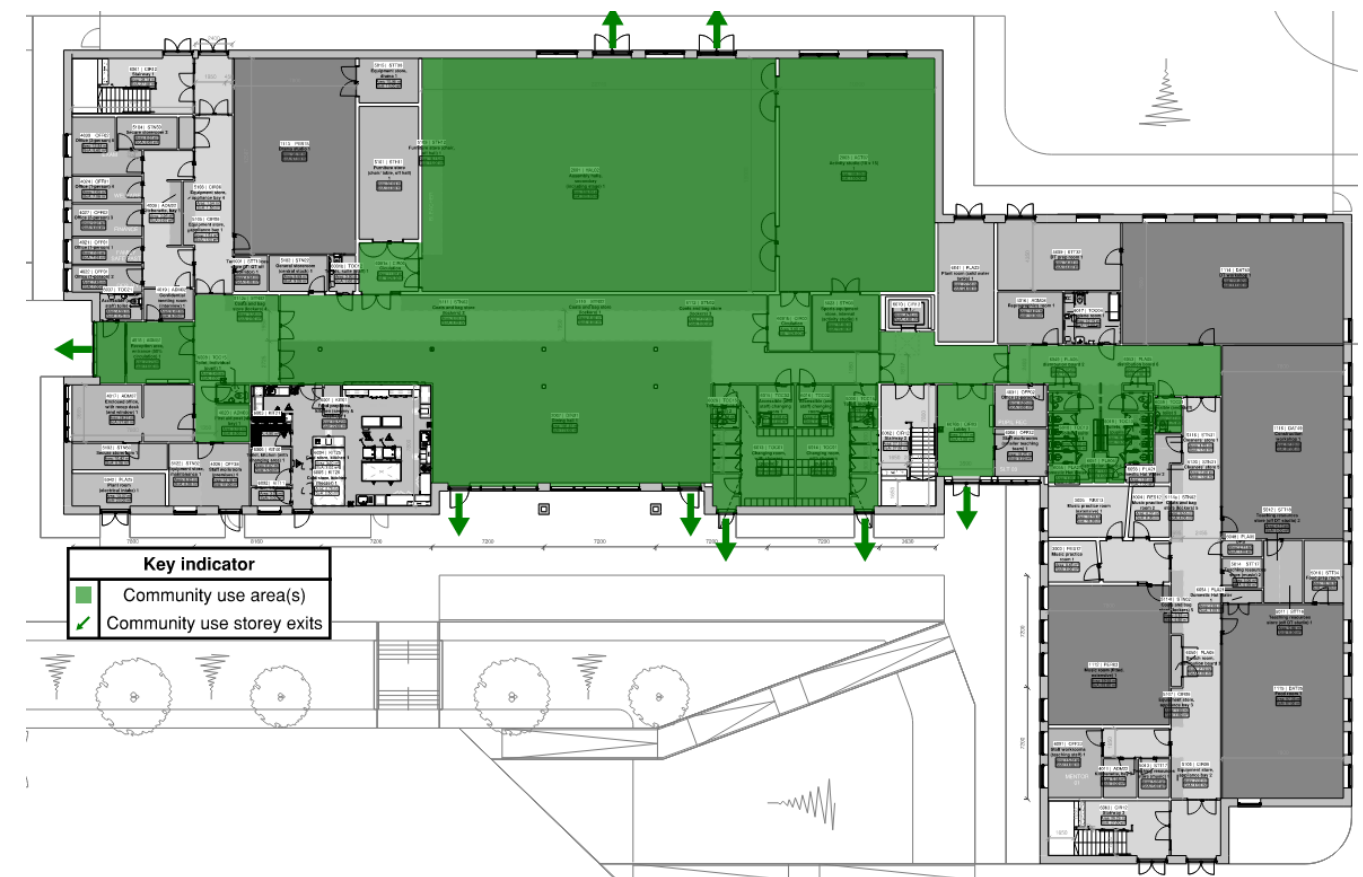


Figure 11 - Community use areas (Ground Floor)

4.16 Inner rooms

- 4.16.1 An inner room is a room from which the only escape route is via another room (the access room). The inner room arrangements within the building will be in accordance with Paragraph 16.3.4 of BS 9999, reproduced below:
- Occupant capacity of the inner room will not exceed 60 persons;
 - The inner room is entered directly from the access room;
 - Escape does not pass through more than one access room;
 - The travel distance from any point within the inner room to the exit(s) from the access room does not exceed the allowable one-way travel distance;
 - The access room is not a place of special fire hazard and is in the control of the same occupier as the inner room; and
 - The access room is protected by an automatic smoke detector.
- 4.16.2 The common circulation corridors are not constructed as protected corridors, as such all rooms off the corridor are regarded as inner rooms with the corridor treated as the access room. The dining area is considered an access room as it is located in the same area as the circulation corridor.
- 4.16.3 Such arrangement is considered acceptable due to the provision of L2 detection and alarm system and the recommendations in Paragraph 4.16.1 being met.

5. PASSIVE FIRE PROTECTION

5.1 Internal wall and ceiling linings

- 5.1.1 All wall and ceiling linings within the building will meet the recommendations of BS 9999 when tested under the European Classifications (in accordance with BS EN 13501-1:2018 [20] as summarised in Table 10.

5.2 Structural fire resistance

- 5.2.1 The recommended period of fire resistance of the structural elements within the school has been based upon the recommendations within Table 23 of BS 9999.
- 5.2.2 Buildings with a topmost occupied floor located below 18 m, as well as an A2 main risk profile, will have a minimum structural fire resistance of 60 minutes.
- 5.2.3 Where a construction element with a lower fire resistance supports or provides stability to another element of structure, then the protection to the supporting structure will be at least the same as the structure it is supporting.
- 5.2.4 Elements of structure that only supports a roof do not require fire resistance. Structure is considered to support more than only a roof if it supports a load other than the roof itself (e.g., plant) or is essential to the stability of a fire-resisting wall (internal or external).

5.3 Compartmentation and fire-resisting construction

- 5.3.1 Based on the overall risk profile for the building (A2), there is a no limit for the compartment, with a limit for B2 risk areas of 8000 m² (which has been adhered to within the design), the building does not require to be subdivided into separate fire compartments.
- 5.3.2 Depending on the type of cooking equipment present, the kitchen within the school may also require a proprietary suppression system to extinguish cooking fires. This is to be reviewed upon receipt of further information. The kitchen will be separated from the rest of the building by 30 minutes fire resistance.
- 5.3.3 Rooms and areas that are considered to present a higher fire risk (A3) (kitchen, science laboratories, storage areas, etc.) will be separated from the rest of the building by a minimum of 30 minutes fire resistance.
- 5.3.4 Plant rooms are considered as a high fire risk and will be separated from the rest of the building by 60 minutes fire resistance.
- 5.3.5 The fire resistance for the building is summarised in Table 11.

Table 10 – Reaction to fire performance requirements for linings

Location	Euro Class
Small rooms ≤ 30 m ²	D-s3, d2
Other rooms	C-s3, d2
Circulation spaces (communal)	B-s3, d2

Table 11 – Periods of fire resistance for fire-separating elements

Part of building	Minimum fire resistance rating when tested to the relevant European standard (minutes)	Methods of exposure
Structural elements	R 60	Exposed faces
Loadbearing walls	R 60	Each side separately
External walls (see section 6.4): Any part less than 1000 mm from a point on the relevant boundary	REI 60	Each side separately
Any part more than 1,000 mm from the relevant boundary	RE 60 I 15	From the inside
Any part beside an external escape route	RE 30	From the inside
Service riser	REI 60	Each side separately
Protected stairway Protected lobby	REI 30	Each side separately
Lift shaft	REI 30	Each side separately
Sub-division of a corridor	REI 30	Each side separately
Kitchen, science laboratories, storage areas, etc	REI 30	Each side separately
Plant rooms	REI 60	Each side separately
Plantrooms and control rooms associated with life safety systems and fire protection systems	REI 120	Each side separately
Cavity barriers	E 30 I 15	Each side separately
Note: In the European classification, the resistance to fire is specified in terms of loadbearing capacity 'R', integrity 'E' and insulation 'I'.		

5.4 Fire doors

- 5.4.1 Fire doors will be provided as summarised in Table 12, in accordance with the recommendations of BS 9999.
- 5.4.2 Doors on escape routes will not be fitted with locks, latch or bolt fastenings or will only be fitted with simple fastenings that can be readily operated (without the use of a key) from the side approached by occupants making an escape.
- 5.4.3 Where doors on escape routes need to be secured against unauthorised use by electrically powered access control measures when the building or part of the building is occupied, it will also be overridden from the side approached by occupants making an escape. Electrically powered doors will return to the unlocked position:
- On operation of the detection and alarm system; and
 - On loss of power or system error.
- 5.4.4 Manual door release units (Type A) will be designed to BS EN 54-11:2001 [21] and will be positioned at side of the door that is approached by people making their escape. Where the door provides escape in either direction, a unit will be installed on both sides of the door.

5.5 Fire-stopping and penetrations through fire-resisting construction

- 5.5.1 Fire-stopping will be provided at the junction of fire-separating walls and external walls in order to maintain the fire resistance period of fire-separating walls, and thereby prevent a fire from travelling around the junction and into the neighbouring space. Penetrations through lines of fire-resisting separation will be fire-stopped using a system which will achieve the same fire resistance rating as the penetrated wall or floor.
- 5.5.2 In order to maintain the fire resistance of separating construction, any pipe or cable penetrations through lines of fire-resisting separation will be fire-stopped in accordance with Section 32.5.9 of BS 9999. Figure 12 is provided to assist in the interpretation of the above.

5.6 Cavity barriers and concealed spaces

- 5.6.1 Cavity barriers are provided in order to prevent the rapid spread of unseen fire or smoke in voids and prevent the spread of fire around compartmentation via voids.
- 5.6.2 Cavity barriers will have a fire resistance rating of at least 30 minutes for integrity (E) and 15 minutes for insulation (I). In general, cavity barriers will be at 20 m centres, and in line with compartment wall and floors within cavities.
- 5.6.3 Concealed cavities require cavity barriers to sub-divide them, in accordance with Figure 35 of BS 9999, also reproduced in Figure 13 below.
- 5.6.4 Cavity barriers provided around openings within the external wall may be formed of:
- Steel at least 0.5 mm thick or timber at least 38 mm thick; or
 - Polythene-sleeved mineral wool, or mineral wool slab under compression when installed cavity; or
 - Calcium silicate, cement-based or gypsum-based boards at least 12 mm thick.

Table 12 – Fire doors

Position of Door	Tested to BS 476-22	Tested to BS EN 1634-2
Enclosing an A3 risk profile	As per the wall it is fitted in	As per the wall it is fitted in
Enclosing a protected lobby / corridor	FD 30S	E 30S _a
Cross-corridor doors	FD 30S	E 30S _a
Enclosing a protected stair	FD 30S	E 30S _a
Enclosing a service riser	FD 60S	E 60S _a
Enclosing a lift shaft	FD 30	E 30
Along an external escape route	FD 30	E 30

Notes:

The ratings shown above are for integrity only.

Smoke seals are indicated by the suffix 'S' (to BS 476-31 [22]) or S_a (to BS EN 1634-3 [23]) and are required in all doors which form the enclosure to protected escape routes.

All fire doors should be self-closing except for doors which are normally locked shut, such as to places of special fire hazard or service risers, which should also be provided with appropriate signage.

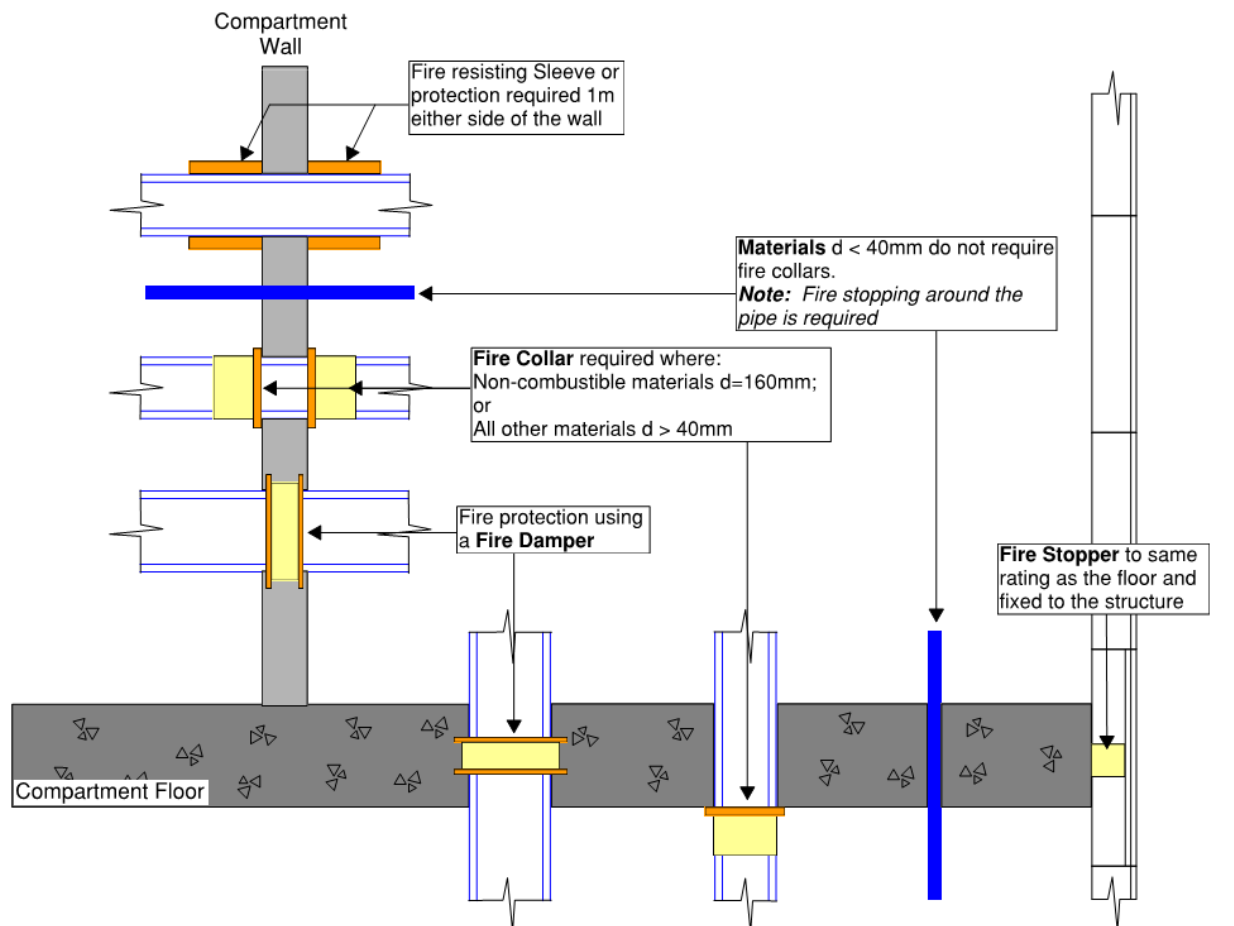


Figure 12 – Fire stopping expectations

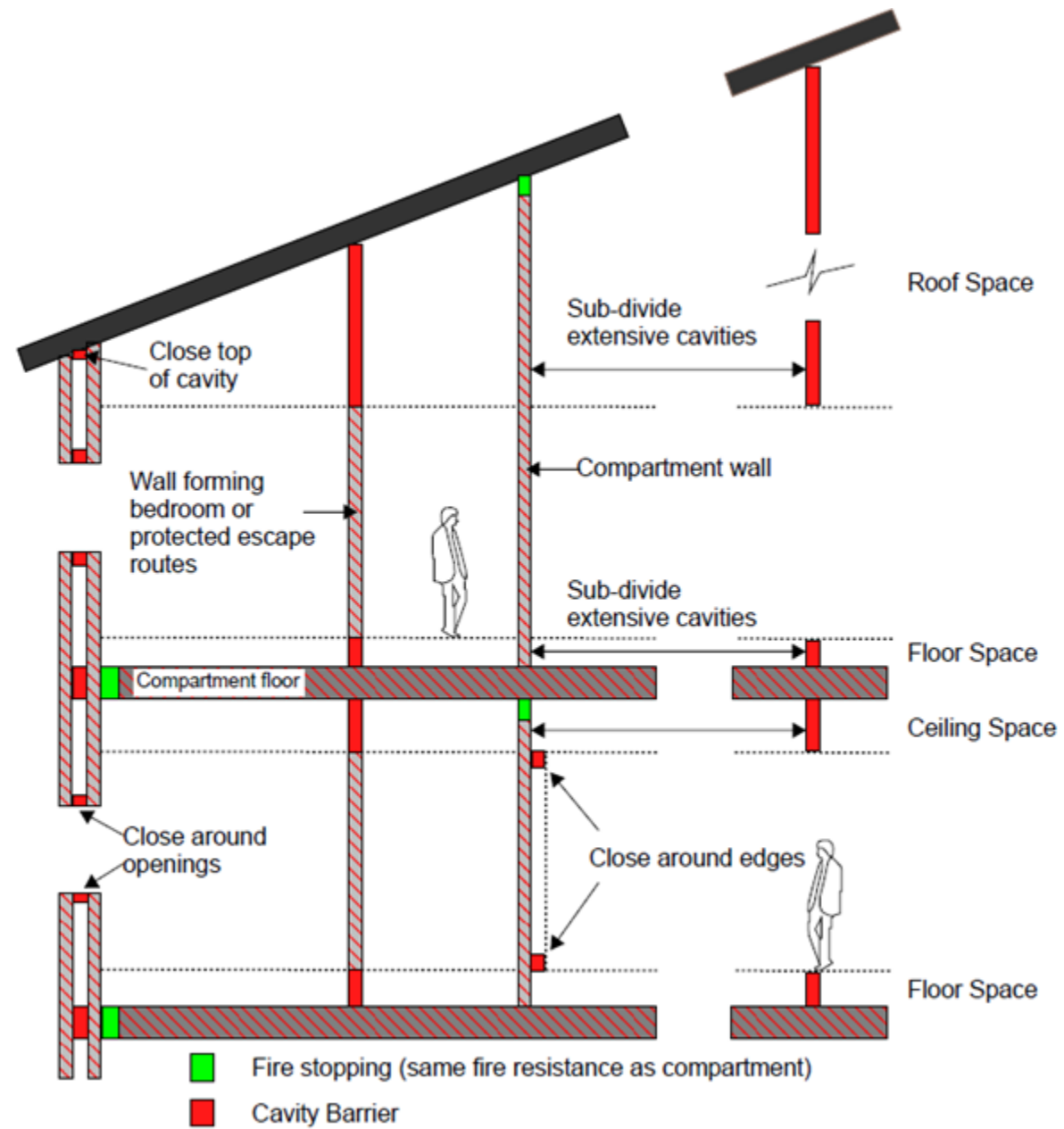


Figure 13 - Cavity barrier and fire stopping locations

6. EXTERNAL FIRE SPREAD

6.1 External wall construction

- 6.1.1 BS 9999 recommends that the external walls of a building will be constructed such that they will not support fire spread in a manner that is likely to threaten people in or around the building.
- 6.1.2 The wider building has been assigned an A2 risk profile. The buildings are accessible for out-of-hour use, of which the associated areas are assigned a B2 risk profile. Access is provided across Lower Ground and Ground Floor within the school; therefore, the most onerous recommendations will be considered.
- 6.1.3 As such, external surface of walls will meet Euro Class B-s3, d2 or better in accordance with BS EN 13501-1:2018 [20].
- 6.1.4 For buildings less than 18 m in height, insulation or filler materials in the external wall are permitted to be combustible, provided that the external façade does not actively promote fire spread and meets the remainder of the recommendations for the external façade construction and materials. However, its recommended that the use of any combustible materials is agreed with the client / their insurer, as property protection requirements may be onerous.

6.2 Roof coverings

- 6.2.1 The relevant test and classification standards for the external fire performance of roof systems is BS EN 13501-5:2016 [24] (European Class).
- 6.2.2 Table 13 below summarises the separation distances from the relevant boundary according to the type of roof covering as described in Section 35.4 of BS 9999.

6.3 Roof photovoltaic (PV) panels

- 6.3.1 There are no recommendations in BS 9999 with regards to life safety and the installation of photovoltaic (PV) panels in buildings. However, the following recommendations can be considered:
 - PV panels will use non-combustible supports on a minimum B_{ROOF}(t4) roof.
 - PV panel arrays will not be continuous across compartment walls, this includes cabling that will be enclosed in fire-resisting cable ducts and shaft. A separation of 1.2 m of PV panels on each side of compartment walls will be used (increased to 2.5 m when roof structure contains combustible materials). This separation can be omitted with fire resisting roof.
 - A firefighters' isolation switch will be installed in a readily available accessible location (such as next to the fire alarm panel).
 - Arc fault detection will be provided to mitigate the risk of ignition.

Table 13 – Limitations on roof coverings

Distance from relevant boundary	European Class		
	B _{ROOF} (t4)	C _{ROOF} (t4)	D _{ROOF} (t4)
Less than 6 m	✓	✗	✗
At least 6 m	✓	✓	✗
At least 20 m	✓	✓	✓

6.4 Space separation and unprotected areas of the façade

- 6.4.1 Should a fire occur in a building, heat will radiate through non-fire resisting openings in the external walls. This heat can be enough to set fire to nearby buildings. In order to reduce the chance of this occurring, the guidance place limits on the area of the external elevation with no fire resistance, known as the unprotected area.
- 6.4.2 The relevant boundaries are the reference point at which the potential for fire spread will be considered and may be taken as:
- The site boundary;
 - A notional boundary created on the centreline of an adjacent carriage way; or
 - A notional boundary created midway between the considered building and an adjacent building.
- 6.4.3 It should be noted that where an external wall is within 1.0 m from the relevant boundary, that external wall will have 0% unprotected area and is required to have the same fire resistance as the structure of the building. This is not applicable for this development as no elevation for the proposed arrangement encroaches within the 1.0 m boundary.
- 6.4.4 Considering the guidance of the BR 187 [25], the size of the emitter will correspond to the width and height of each elevation and analysis of the results will be dependent on the relevant boundaries for the building as noted above. Note that the elevation widths do not include the width of protected stairs.
- 6.4.5 As recommended in BR 187, different radiation intensities will be applied, depending on the different occupancy types, as follows:
- 84 kW/m² for classrooms; and
 - 168 kW/m² for store rooms / laboratories / workshops / plant rooms
- 6.4.6 The amount of unprotected area depends on the height and width of the fire compartment and the distance between the façade and relevant boundary – See Figure 14 for the distance to each relevant boundary.
- 6.4.7 A boundary distance of 8.5 m has been taken to the site boundary for Elevation 1. The enclosing height has been taken as 3.7 m instead of the full enclosure height, this is on the basis that the void spaces above the dining and sports hall are not having substantial fire load and are discounted from the radiating panel, this is depicted in Figure 15.
- 6.4.8 The results of the external fire spread are detailed in Table 14, it is indicated that all elevations can be fully unprotected i.e., they do not have to be fire resisting for the purpose of external fire spread.

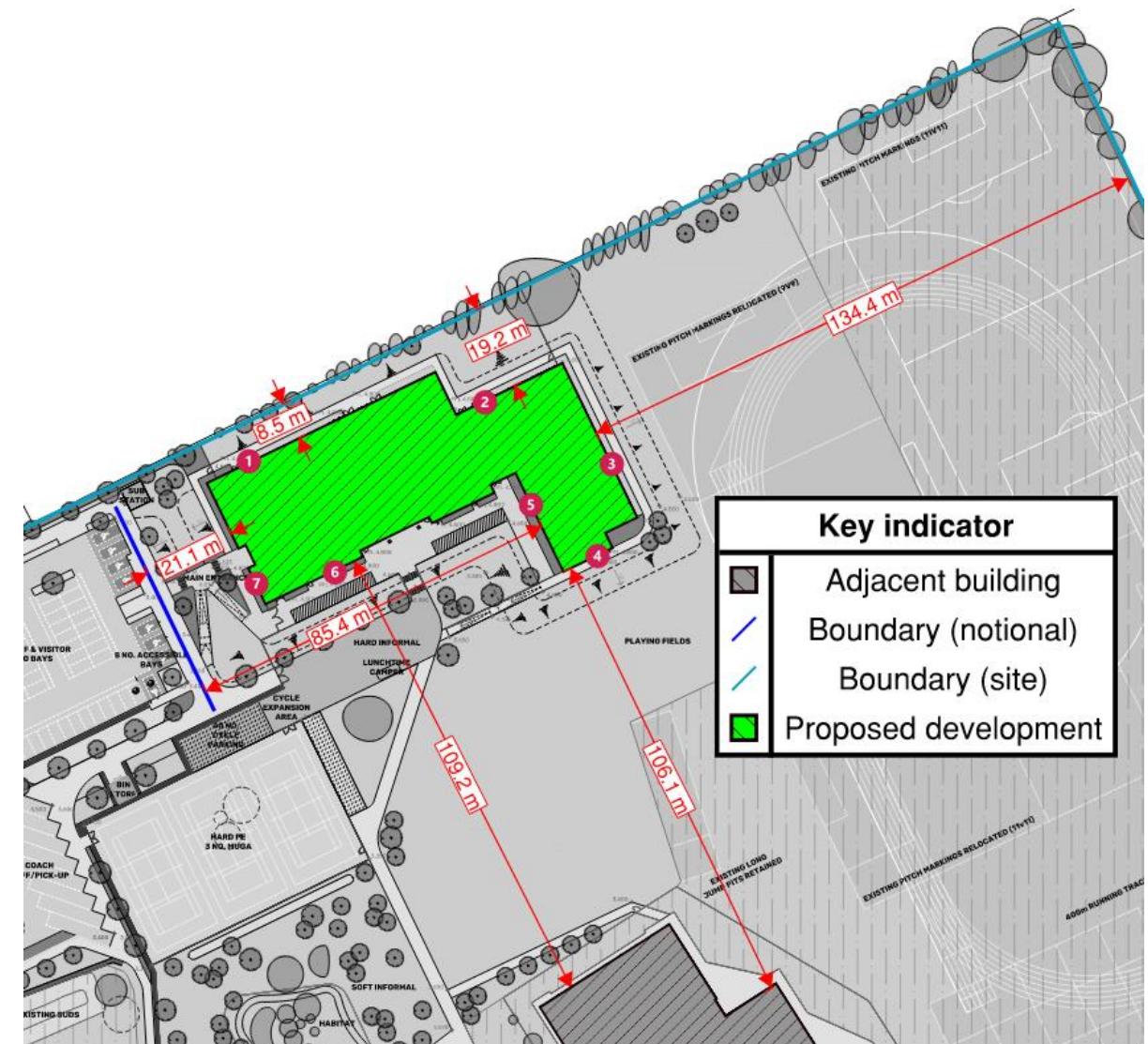


Figure 14 - Distance to relevant boundaries

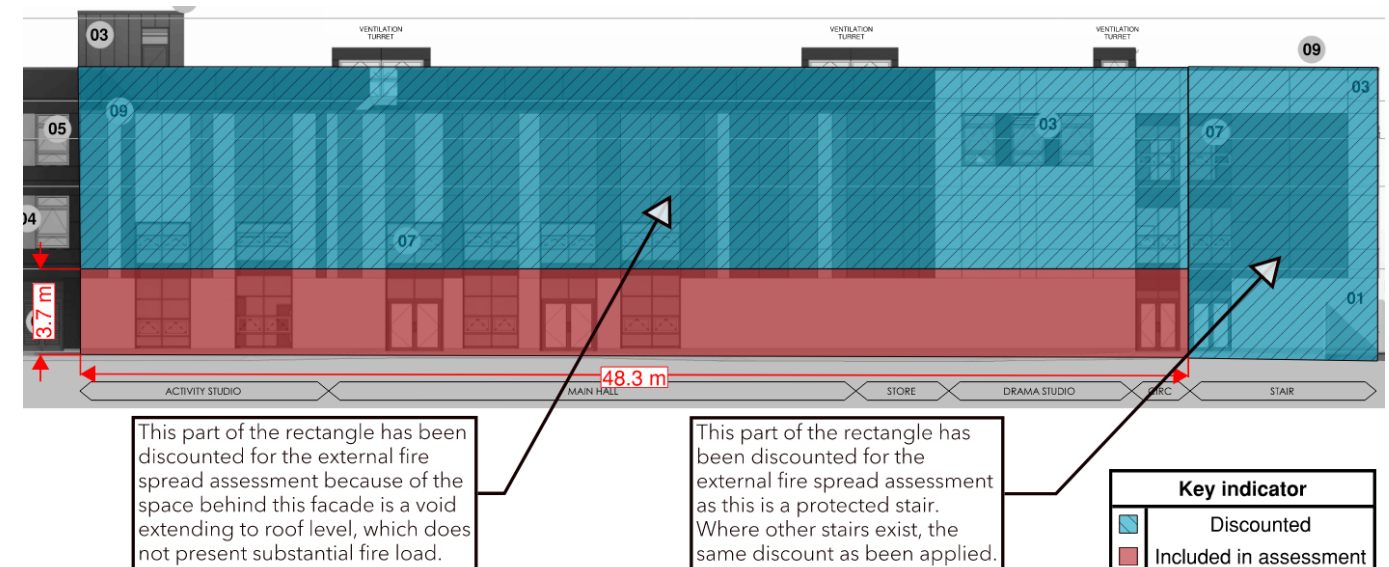


Figure 15 - Enclosing rectangle of Elevation 1

Table 14 – Summary of external fire spread assessment

Elevation	Enclosing rectangle dimensions (m)		Radiation intensity (kW/m ²)	Boundary distance (m)	Allowable unprotected area (%)
	W	H			
1	48.3	3.7	84	8.5	100
2	27.0	12.4	168	19.2	100
3	53.2	12.4	168	134.4	100
4	11.9	12.4	84	106.1	100
5	20.7	12.4	84	85.4	100
6	64.4	12.4	84	109.2	100
7	26.2	12.4	84	21.1	100

7.1.1 In the event of a fire, the fire and rescue service (FRS) will be notified by a member of staff. The FRS will be met by a member of staff when they arrive on site.

7.2 Vehicle access to and around the site

7.2.1 Access to site is provided from public roads to the west, namely Little London Road.

7.2.2 Entry to the school will be provided from public roads. As the aggregate floor area of the school is less than 8000 m², access for the pumping appliance will be provided to 15% of its perimeter. The perimeter of the building is approximately 288 m and 15% of the perimeter equates to 43 m. As shown in Figure 16, the accessible perimeter for the FRS is c. 42 m and therefore meets the recommended 15% of the perimeter given in BS 9999.

7.2.3 FRS vehicle parking position will be within 18 m of this 15% of the perimeter. This is achieved when considering the south elevation but not for the west elevation. A hard standing area should be provided to allow a suitable parking position for the FRS appliance at this point, as currently this measurement is exceeded (c. 20 m), see Figure 17.

7.2.4 The maximum reversing distance for the FRS vehicles is 20 m. As this distance is exceeded on the south elevation (c. 53 m), suitable turning facilities should be provided, as indicated on the south elevation in Figure 16.

7.2.5 Any elevation to which access is provided will have a door, not less than 750 mm wide, giving access to the interior of the building. Doors will be provided such that there is no more than 60 m between each door and / or the end of that elevation.

7.2.6 The access routes and hardstandings for the FRS vehicles will meet typical values noted in Table 15. It should be noted that a typical carrying capacity is presented in the table and the final weight should be confirmed with the local FRS.

7.2.7 If any gates are being provided, they will be opened prior to the arrival of the FRS.

7.3 Access into and through the building

7.3.1 Access to Ground Floor is available via doors in the building façade with a minimum width of 750 mm. The upper storeys in the building can be accessed via the protected escape stairs.

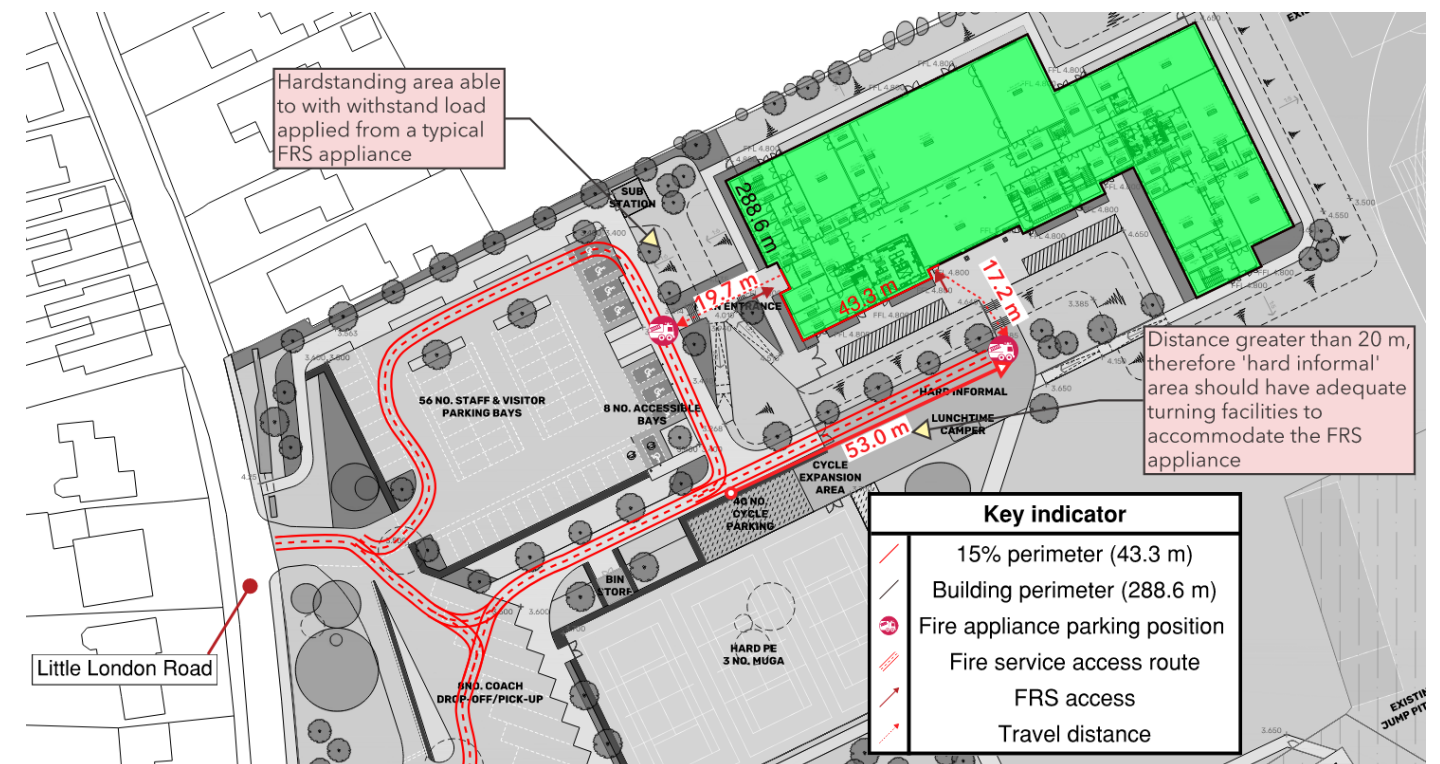


Figure 16 – Indicative FRS access route



Figure 17 - Indicative location for hardstanding area at west elevation

7.4 Water supplies

- 7.4.1 Hydrants will be provided in the vicinity of the buildings to support firefighting operations. The location of existing hydrants will need to be confirmed.
- 7.4.2 If the buildings are more than 90 m from an existing hydrant, new hydrants will be provided within 90 m of the entry point to the buildings and not more than 90 m apart.
- 7.4.3 If fire hydrants are to be installed, they will be included as part of a ring fire main system. They will preferably be sited immediately adjacent to roadways or hard-standing facilities suitable for FRS appliances. To ensure that they remain usable during a fire, they will be sited with consideration of the effect that falling debris and other possible occurrences during a fire might have on the continuing viability of the location and as such will be not less than 6 m from the buildings.
- 7.4.4 All hydrants will be designed and installed in accordance with BS 9990:2015 [26] and will have signage in accordance with BS 3251:1976 [27].

7.5 First-aid firefighting

- 7.5.1 First-aid firefighting provisions should be assessed and provided as part of the fire risk assessment for the development, including consideration for the day-to-day management of these provisions.
- 7.5.2 In general, fire points should be located within the ancillary areas presenting a significant fire risk and to ensure coverage of at least one fire point for every 200 m² of floor area. The type and size of extinguisher(s) at each fire point should be chosen in accordance with the guidance given in BS 5306-8:2023 [28].
- 7.5.3 The type and size of extinguisher(s) at each fire point should be chosen in accordance with the guidance given in BS 5306-8, as summarised by Table 15 and the classification of fire fuel hazards are listed below:
 - Class A – fires involving solid materials, usually of an organic nature (general hazards);
 - Class B – fires involving liquid or liquefiable solids (such as liquid fuels, lubricants, paints, etc.);
 - Class C – fires involving gases;
 - Class D – fire involving metals; and
 - Class F – fires involving cooking media (vegetable or animal oils or fats).
- 7.5.4 The plant rooms should be provided with extinguishers suitable for their risks. In general, it would be expected that CO₂ extinguishers would be provided for electrical risks, where this may be for higher voltage equipment. Powder extinguishers should not be used within these confined spaces, where breathing in of the powder is harmful to the health of lungs.
- 7.5.5 Wet chemical extinguishers are typically provided for kitchens having a risk of oil-based fires. Fire blankets should also be provided for extinguishing cooking fires within kitchen areas.

Table 15 – Typical pump-type firefighting appliance access requirements

Minimum access route specification	Dimension
Width between kerbs	3.7 m
Width between gateways	3.1 m
Turning circle between kerbs	16.8 m
Turning circle between walls	19.2 m
Clearance height	3.7 m
Carrying capacity	12.5 tonnes (or as confirmed by the local fire service)

Table 16 – Fire extinguisher types and application guidance

Medium	Colour code	Application	Do NOT use for
Water	Red	Class A fires	Liquid, electrical, metal or cooking fires
Powder	Blue	Class A, B or C fires	Metal or cooking fires
Foam	Cream	Class A or B fires	Electrical*, metal or cooking fires
CO ₂	Black	Class B fires	Metal or cooking fires
Wet chemical	Yellow	Class A or F fires	Liquid, electrical or metal fires
* AFFF Foam extinguishers may be used for electrical fires up to 35 kV (dielectric test) and where operated from a distance of at least 1m.			

8. FIRE SAFETY MANAGEMENT

8.1 Overview

- 8.1.1 Management procedures have a pivotal role to play in fire prevention, control and evacuation of occupants should a fire incident occur. This management is the responsibility of the responsible person, supported by the building fire safety design and handover of fire safety information. In all other areas, the Regulatory Reform (Fire Safety) Order 2005 (FSO) places legal obligations on management.
- 8.1.2 This section is intended to introduce the FSO, its obligations and provide initial guidance in fulfilling these duties. It is the responsibility of the landlords / building management to ensure that all fire safety systems are tested and maintained to ensure their continuous effectiveness. Building management need to be aware of all fire safety features provided and their purpose.
- 8.1.3 It is important that management are aware of their responsibilities detailed in this document and agree that they are sufficiently capable of adequately performing them. Effective arrangements should be put in place to manage all aspects of fire safety in the premises and the details of those arrangements need to be recorded, e.g. within a fire safety management plan.
- 8.1.4 In accordance with BS 9999, there are two management system levels. One of which should be implemented and are summarised in Table 17.

8.2 Regulatory Reform (Fire Safety) Order 2005

- 8.2.1 The Fire Safety Order came into effect in October 2006 and replaced over 70 pieces of fire safety law. The Order applies to all non-domestic premises in England and Wales, including the common parts of blocks of flats or houses in multiple occupation. The Order removed the legal status of fire certificates, which are no longer enforceable by the Fire Authorities. The 'responsible person' has a duty to make the premises safe and must undertake regular fire risk assessments. It is the responsible person who should be held accountable under the new legislation for any breaches in fire safety. It is expected that the building is managed and maintained to a standard in accordance with the expectations of the FSO.
- 8.2.2 In workplaces, the responsible person is the employer. In other cases, the owner or person in control of the premises is the responsible person, e.g. landlord, building management company.
- 8.2.3 Under the Order, the 'responsible person' must carry out a fire safety risk assessment and implement and maintain a fire management plan. The assessment should be kept under regular review and reassessed if the use of the building has been varied or a material alteration has been made. The significant findings must then be recorded, along with the measures taken to address the risks identified. A competent person should carry out the fire risk assessment.

8.3 Management responsibilities in support of the fire strategy

- 8.3.1 Management of fire safety must be integrated with all other management systems. If this management is lacking, then there is a danger that all the other areas such as security measures and alarm systems should be ineffective. To ensure there is no doubt as to where the responsibility for fire safety rests, and to enable consistency of approach, it is important that each establishment appoints a designated Fire Safety Manager. It may be possible to appoint a professional to take on this role but that should depend on the size of the premises, costs, etc.
- 8.3.2 The appointed person should have the necessary authority and powers of sanction to ensure that the standards of fire safety are maintained. The main duties of the Fire Safety Manager include:
- Management to minimise the incidence of fire; e.g. good housekeeping and security;

- Producing an emergency fire plan;
 - Being aware of all of the fire safety features provided and their purpose;
 - Being aware of any particular risks on the premises (e.g. Issues relating to hot work);
 - Being aware of their responsibilities towards disabled people;
 - Attendance at the premises when members of the public are present, or the building is occupied. It is acceptable for a competent person other than the fire safety manager to be in attendance, provided that this person has been delegated in writing and that cover is not interrupted;
 - Liaising with, and where necessary seek the advice of, the fire authority, the licensing authority and other relevant enforcing authorities;
 - Having powers to deal with individuals who sabotage or tamper with safety systems, who ignore any smoking policy or who block exits;
 - Liaising with other fire safety managers in a multi-occupancy arrangement;
 - Ensuring that tenants, concessionaires and caretakers are appropriately briefed;
 - Ensuring that appropriate communication systems are in place to deal with any fire incident;
 - Checking the adequacy of fire-fighting equipment and ensuring its regular maintenance;
 - Ensuring fire escape routes and fire exits are unobstructed and doors operate correctly;
 - Ensuring that fire detection and protection systems are maintained, tested, with records kept; and
 - Ensuring any close down procedures are followed.
- 8.3.3 Good housekeeping is to ensure that the effectiveness of the fire safety provisions is not adversely affected, including the adequate provision for the disposal of waste and / or rubbish. Maintenance procedures are to be enacted so that equipment should operate effectively. Maintenance staff are to be trained in the importance of the fire safety systems and planned maintenance.
- 8.3.4 Suitable assembly points outside the building should be identified. These should be remote from the access routes used by the FRS.
- 8.3.5 Internal escape routes will generally have wall and ceiling linings achieving a European class B-s3, d2 reaction to fire performance, apart from permitted exceptions noted in this report. These finishes must be maintained for the lifetime of the building. Display features or items such as posters, artwork pieces, etc. may be included with appropriate consideration, justification and on-going control.

Table 17 - Management levels

Level	Management	Robustness	Minimum assurance	Conformity
1	Enhanced	Best practice	High level of assurance	Conformity with a management level such as BS 9997:2019 [29]
2	Adequate	Good practice	Adequate level of assurance	Conformity with requirements of legislation

8.4 Evacuation lifts

- 8.4.1 Suitable management procedures will be required to be developed by the building operator to ensure suitable operation of the evacuation lift in the event of an emergency. A comprehensive design will be required for the evacuation lift installation and careful consideration will be given to the development of appropriate management procedures. General guidance is provided in this section, in accordance with the recommendations in BS 9999.
- 8.4.2 It is expected that the evacuation of mobility impaired users will be assisted by an authorised person, in accordance with Annex G of BS 9999. Therefore, an adequate number of trained staff will be designated and capable of carrying out their duties at all times when the building is occupied. Staff immediately available at the final exit level will be designated and trained as evacuation lift operators and their duties will include:
- An operator designated to take control of the lift will operate the evacuation lift switch and will:
 - Determine the storey and part of the building indicated as the location of the fire;
 - Determine the storey at which people are awaiting assistance; and
 - Take control of the lift and proceed to move people requiring assistance to the final exit level.
 - A designated person will ensure that:
 - Any people requiring assistance in the storey for which that person is responsible move to the nearest protected refuge to await the lift; and
 - The person controlling the evacuation lift is aware that a person or persons is / are waiting for the lift.
- 8.4.3 Unless a different order has been agreed with the fire authority, evacuation will normally take place in the following order:
- The fire floor;
 - The floor immediately above the fire floor;
 - Other floors above the fire floor starting at the top storey;
 - All remaining floors.
- 8.4.4 The actual fire conditions, however, might necessitate changes in the planned sequence, and this should be taken into account.
- 8.4.5 When the FRS arrive, the officer in charge will be briefed by the designated member of staff coordinating the evacuation of both the position and circumstances of the fire, and the progress of the evacuation. Subsequent priorities for the use of the evacuation lifts will then be as decided by the FRS.

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APPENDIX A – OCCUPANCY OF THE BUILDING

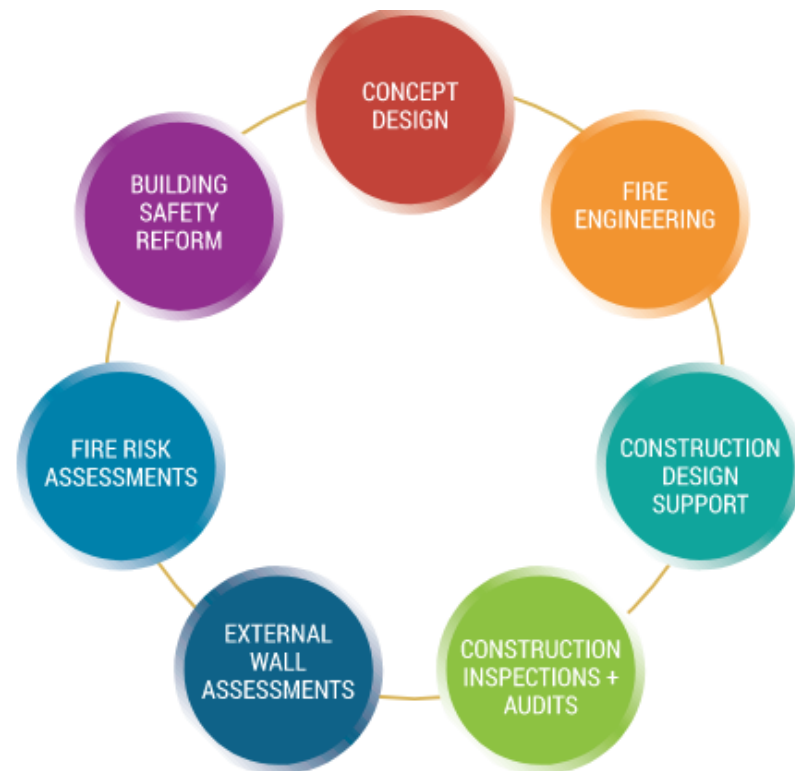
Table 18 – Design occupancy summary

Room/ Space	Occupancy per room ⁽²⁾
Second Floor	
Seminar room 1	22
Toilets, suite (pupils, other) 5	2
Classroom (general) 1	30
Classroom (general) 2	30
Classroom (general) 3	30
Classroom (general) 4	30
Classroom (general) 5	30
Classroom (general) 6	30
Classroom (general) 7	30
Classroom (general) 12	30
Classroom (general) 13	30
Classroom (general) 19	30
ICT-rich classroom 1	30
Classroom (temporarily ICT-rich) 2	30
Science laboratories (restrictive, extg) 1	30
Science laboratories (restrictive, extg) 2	30
Science laboratories (restrictive, extg) 3	30
Science laboratories (restrictive, extg) 4	30
Science laboratories (restrictive, extg) 5	30
Science laboratories (restrictive, extg) 6	30
Staff workrooms (teaching staff) 3	3
Staff workrooms (teaching staff) 5	3
Staff room (social) 1	20
Kitchenette, bay 4	1
Office (2-person) 5	2
Staff workroom (ICT technicians) 1	2
Science prep room (central) 1	4

Room/ Space	Occupancy per room ⁽²⁾
Toilets, suite (pupils) 5	6
Accessible (and staff) toilet 6	1
Total occupancy of the Second Floor	606 people
First Floor	
Toilets, suite (pupils, other) 3	2
Toilets, suite (pupils, other) 4	2
Seminar room 2	22
Seminar room 3	22
Classroom (general) 8	30
Classroom (general) 9	30
Classroom (general) 10	30
Classroom (general) 11	30
Classroom (general) 14	30
Classroom (general) 15	30
Classroom (general) 16	30
Classroom (general) 17	30
Classroom (general) 18	30
Classroom (temporarily ICT-rich) 1	30
Classroom (temporarily ICT-rich) 3	30
Art room (3D) 1	30
Library resource centre (LRC) 1	37
Lighting and audio control space 1	3
Medical treatment (MI) room 1	5
SEN resource space 1	7
Small group room 1	4
Small group room 2	4
Small group room 3	4
Staff workrooms (teaching staff) 2	3

Room/ Space	Occupancy per room ⁽²⁾
Staff workrooms (teaching staff) 4	3
Kitchenette, bay 2	1
Enclosed office, admin (head) 1	6
Enclosed office, admin (PA) 1	1
Office (1-person) 3	1
Office (2-person) 4	2
Toilets, suite (pupils) 3	6
Toilets, suite (pupils) 4	6
Toilets, suite (staff) 1	2
Office (SENco, learning support) 1	4
Total occupancy of the First Floor	507 people
Ground Floor	
Music room (fitted, extensive) 1	30
Drama studio 1	30
DT workshop 1	24
Food room 1	24
Construction workshop 1	16
Assembly halls, secondary (including stage) 1	467
Activity studio (10 x 15) 1	30
Dining hall 1	180
Music practice room 1	4
Music practice room 2	4
Music practice room (extensive) 1	7
Staff workrooms (teaching staff) 1	3
Staff workrooms (smaller teaching team) 1	2
Kitchenette, bay 1	1
Kitchenette, bay 3	1
Reprographics room 1	2
Enclosed office, with recep desk (and window) 1	6
Confidential meeting room (interview) 1	4

Room/ Space	Occupancy per room ⁽²⁾
First aid post (sick bay) 1	1
Office (1-person) 1	1
Office (1-person) 2	1
Office (1-person) 4	1
Office (2-person) 3	2
Office (2-person) 6	2
Office (2-person) 7	2
Staff workroom (premises) 1	2
DT prep room 1	3
Food prep area, kitchen (servery & wash-up) 1	10
Office, kitchen 1	1
Toilet, kitchen (with changing area) 1	2
Changing room, with showers (pupils) 7	25
Changing room, with showers (pupils) 8	25
Accessible (and staff) changing room 1	2
Accessible (and staff) changing room 2	2
Hygiene room 1	4
Toilets, suite (pupils) 1	6
Toilets, suite (pupils) 2	6
Toilet, individual (pupil) 1	1
Toilet, individual (pupil) 2	1
Toilet, individual (pupil) 3	1
Accessible (and staff) toilet 5	1
Toilets, suite (pupils, other) 1	2
Toilets, suite (pupils, other) 2	2
Toilets, suite (staff) 2	2
Total occupancy of the Ground Floor	943 people
Notes: 1) While the building can cater for an occupancy of up to 2,335 people it is understood there will only be 800 pupils and 73 members of staff (55 full time and 18 part time) present in the building at any one time. 2) Occupancy numbers taken from architectural drawings as detailed in Table 1.	



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