



Eastbourne Academy  
Outline Fire Safety Strategy

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# QM

Issue/revision	Issue 1		
Remarks	Issued to design team for Comments		
Date	October 2011		
Prepared by	Ukaxk044		
Signature			
Checked by	Ukrxr013		
Signature			
Authorised by	Uksfl002		
Signature			
Project number	P2482-9566		
File reference	3.2		

Property and Development  
The Victoria  
150-182 The Quays  
Salford  
Manchester  
M50 3SP

Tel: +44 (0)161 886 2400  
Fax: +44 (0)161 886 2401  
<http://www.wspgroup.com>

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# 1 Introduction

## 1.1 GENERAL

1.1.1 WSP has been appointed to provide fire engineering advice on the Eastbourne Academy development.

1.1.2 This document is confidential and for the exclusive benefits of Kier Southern (the Client). It may not be assigned to or relied upon by a third party without the agreement of WSP UK Limited (WSP) in writing. WSP retains all copyright and other intellectual property rights in the document and its contents unless transferred by written agreement between WSP and the Client.

1.1.3 The findings and opinions expressed are based on the conditions encountered and/or the information reasonably available at the date of issue of this document and shall be applicable only to the circumstances envisaged herein.

1.1.4 No person except the Client shall have the benefit of this document by virtue of the Contracts (Rights of Third Parties) Act 1999.

## 1.2 OBJECTIVES

1.2.1 The objective of this outline fire strategy report is to describe the approach to the significant issues relating to the fire safety provisions for the building.

1.2.2 The primary purpose of the fire strategy is to identify how the Functional Requirements of Part B (Fire Safety) of the Building Regulations 2010 will be satisfied. A further detailed fire strategy will be produced which will demonstrate that these requirements have been achieved.

1.2.3 Whilst the measures proposed for life safety purposes will have a beneficial effect for the protection of the building and its contents, property protection measures are not specifically addressed in this strategy. It is recommended that the insurers for the building are consulted to ascertain if any additional measures are advised or required to protect the building, contents and business continuity.

## 1.3 REFERENCE DOCUMENTS

1.3.1 The main reference document used in preparing this fire strategy is BS 9999:2008 Code of practice for fire safety in the design, management and use of buildings (BS 9999).

1.3.2 This report gives the relevant details of how the provisions within BS 9999 are applied to this particular design to achieve an acceptable level of fire safety.

1.3.3 Other key reference documents referred to in this report are;

- BS 5839-1:2002 Fire detection and fire alarm systems for buildings. Part 1 Code of practice for system design, installation, commissioning and maintenance.
- BS 5839-9:2003 Fire detection and fire alarm systems for buildings. Part 9 Code of practice for the design, installation, commissioning and maintenance of emergency voice communications systems.
- BS 5499-1:2002 Graphical symbols and signs. Safety signs, including fire safety signs. Part 1 Specification for geometric shapes, colours and layout.

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- BS 5499-4:2000 Safety signs, including fire safety signs. Part 4 Code of practice for escape route signing.
  - BS 5266-1:2005 Emergency lighting. Part 1 Code of practice for the emergency lighting of premises.
  - BS 5266-7:1999 Lighting applications - Emergency lighting.
  - BS 5306-8:2000 Fire extinguishing installations and equipment on premises. Part 8 Selection and installation of portable fire extinguishers - code of practice.
  - BS 7273-4: 2007 Code of practice for the operation of fire protection measures. Part 4 Actuation of release mechanisms for doors.
  - PD 7974-2: 2002 Application of fire engineering principles to the design of buildings. Part 2 Spread of smoke and toxic gases within and beyond the enclosure of origin (sub-system 2).
  - BR187 External Fire spread: Building Separation and Boundary Distances (BRE).

1.3.4 Where these documents are referred to in the body of the report an abbreviated form of the title is used.

## 1.4 DRAWINGS

1.4.1 This has been developed based on the Feilden Clegg and Bradley Studios drawings "The Eastbourne Academy" dated October 2011.

## 1.5 LEGISLATIVE FRAMEWORK

1.5.1 The building works include a refurbishment of the existing school building, including approximately 76% refurbishment and 24% new building works.

1.5.2 For the purposes of the refurbishment works, these are not considered to be a material alteration as, at the end of the works the provisions for the existing school will be shown to comply with the relevant requirements of the Building Regulations (B1, B3, B4 and B5) to the following level:

- If the existing building complied with the provisions of a requirement, it will still meet the provisions of that requirement at the end of the works.
- If the existing building did not comply with the provisions of a requirement, then the level of compliance will not be more unsatisfactory at the end of the works.

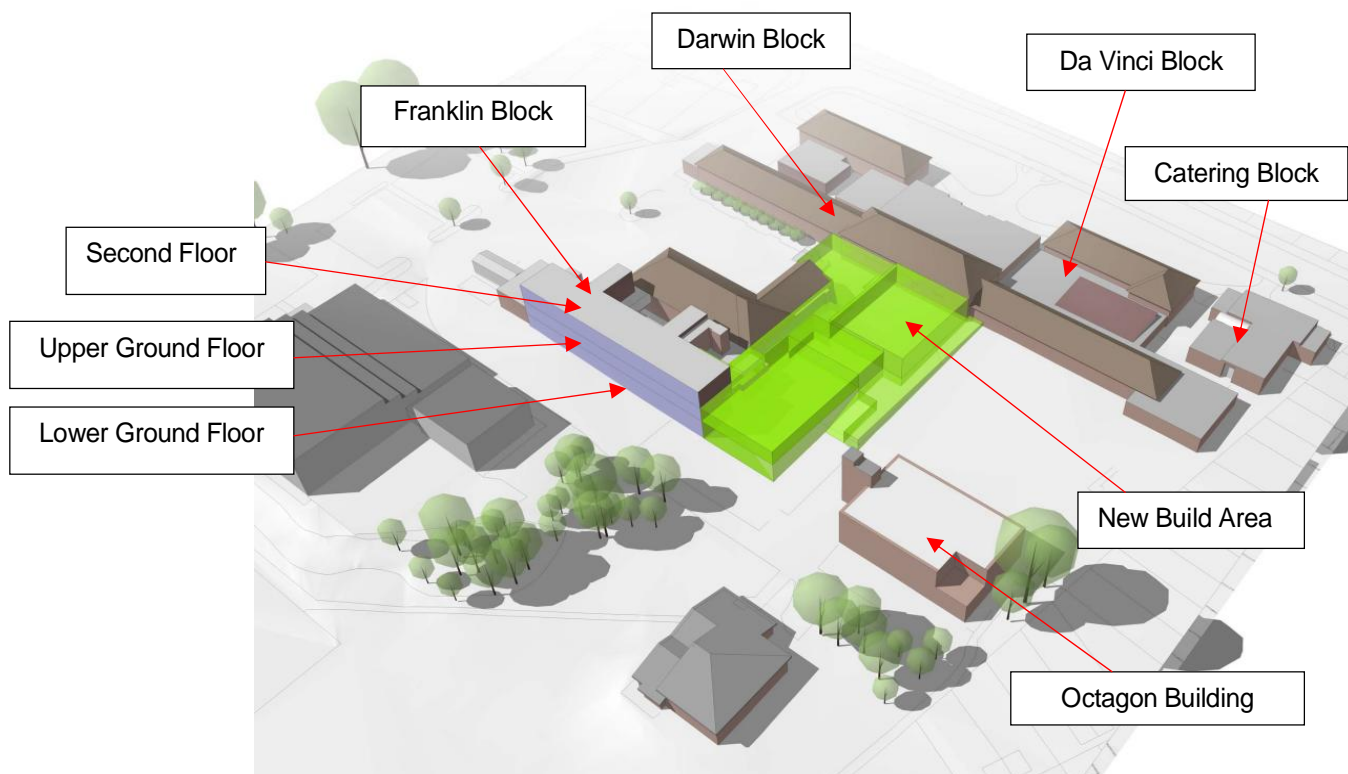
1.5.3 The new building works are required to comply with all of the provisions of the Building Regulations.

1.5.4 The way this will be approached in this Outline Strategy is to treat the works as if they were new. Where an issue of non-compliance is identified in the refurbishment works, then it will be identified. The Detailed Strategy will demonstrate that the level of compliance is not made more unsatisfactory, satisfying the requirements of Section 4 of Building Regulations 2010.

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## 1.6 BUILDING DESCRIPTION

1.6.1 The building is a two level building on a sloping site. The existing building is shown in the following figure.



**Figure 1 Building layout**

1.6.2 The building has three levels, but due to the sloping site most of the building is single level with only the southern portion being multi-level.

1.6.3 The majority of the works include refurbishment, with some new build areas on Lower and Upper Ground Floors in Franklin Block, including a new hall and food tech area. Any works to the Second Floor are cosmetic in nature and do not constitute Material Alterations.

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## 2 Risk Profile

### 2.1 INTRODUCTION

2.1.1 The risk profile is established to determine appropriate means of escape and other fire safety provisions are provided. The risk profile is a function of the occupancy of the building and the fire growth rate.

### 2.2 OCCUPANCY CHARACTERISTIC

2.2.1 Whilst the majority of building users will be staff and students (who could be classified as occupancy characteristic A - awake and familiar with building), it is recognised that there will be use of the building by the community. This includes the potential to let parts of the building for use by third parties outside teaching hours.

2.2.2 It is therefore appropriate to apply an occupancy characteristic of **B - awake and unfamiliar with the building** - to the whole building. This permits complete flexibility for the school to use any part of the building for out of hours/community use without having to introduce any additional fire safety precautions.

2.2.3 Areas such as the school office areas will be treated as **A – Awake and familiar with the building**.

### 2.3 FIRE GROWTH RATE

2.3.1 The appropriate fire growth rate for a typical school building is **2 – Medium**.

2.3.2 There are some areas which might have additional fire risk and therefore have a slightly higher fire growth rate. This includes kitchens, large store rooms and plant rooms and the LRC. It is appropriate therefore to apply a growth rate of **3 – Fast** to such rooms / areas.

### 2.4 RISK PROFILE

2.4.1 The basic risk profile for the building is B2.

2.4.2 Areas of higher fire risk mentioned in 2.3.2 above are considered to be B3.

**Table 1 Risk Profiles**

Area	Risk Profile
Plant rooms, large store rooms, kitchens	B3
Other areas	B2
Office	A2

2.4.3 The approach to this assessment is based on building is not sprinkler protected. Thus allows the building to be assessed under the most conservative occupation conditions.

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## 3 Fire Detection and Warning

### 3.1 DETECTION AND WARNING PROVISION

3.1.1 Table 8 of BS 9999 does not require automatic fire detection for buildings of fire risk profile of B1, B2 and A2.

3.1.2 It is proposed to install a fire alarm system of L2 in the new building areas (in the upper level of the Franklin Block) to satisfy specific fire safety objectives and address the fire engineering solutions. The existing alarm system is to be maintained throughout the existing building (through the remainder of the Franklin Block, and the Darwin and Da Vinci Blocks).

3.1.3 New inner room situations are suitably protected as there will be automatic fire detection provided in the access rooms.

3.1.4 The fire alarm will be connected to other equipment in the new build area in order to ensure operation / closedown as appropriate. This includes;

- Security systems released on exit doors as required.
- Gas supply valves (Science labs and kitchens).
- Lift controls.
- Door hold open devices either on local or general activation of fire alarm.



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## 4 Means of Escape

### 4.1 GENERAL

4.1.1 The arrangements for means of escape will generally be in compliance with BS 9999 guidance.

4.1.2 Evacuation will be based on the principle of simultaneous evacuation of all areas.

4.1.3 Community use outside of normal teaching hours will be supported by ensuring that appropriate exit provision can be maintained without compromising security and safe management.

### 4.2 OCCUPANT NUMBERS

4.2.1 The maximum occupant load of each section based upon the number of classrooms (30 occupants per classroom).

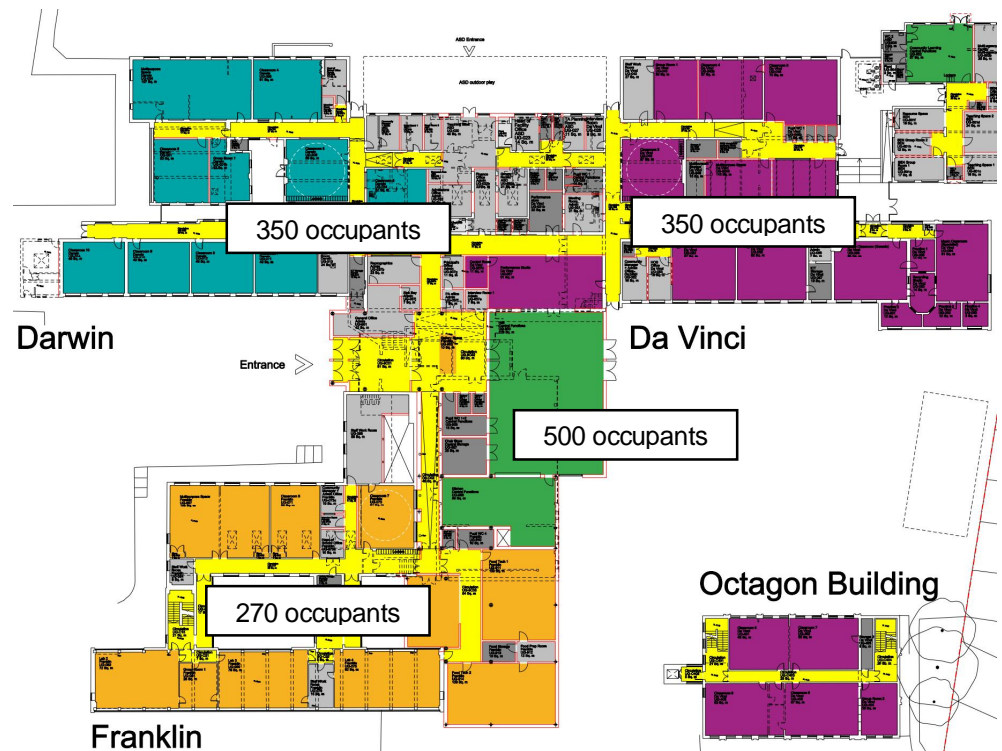
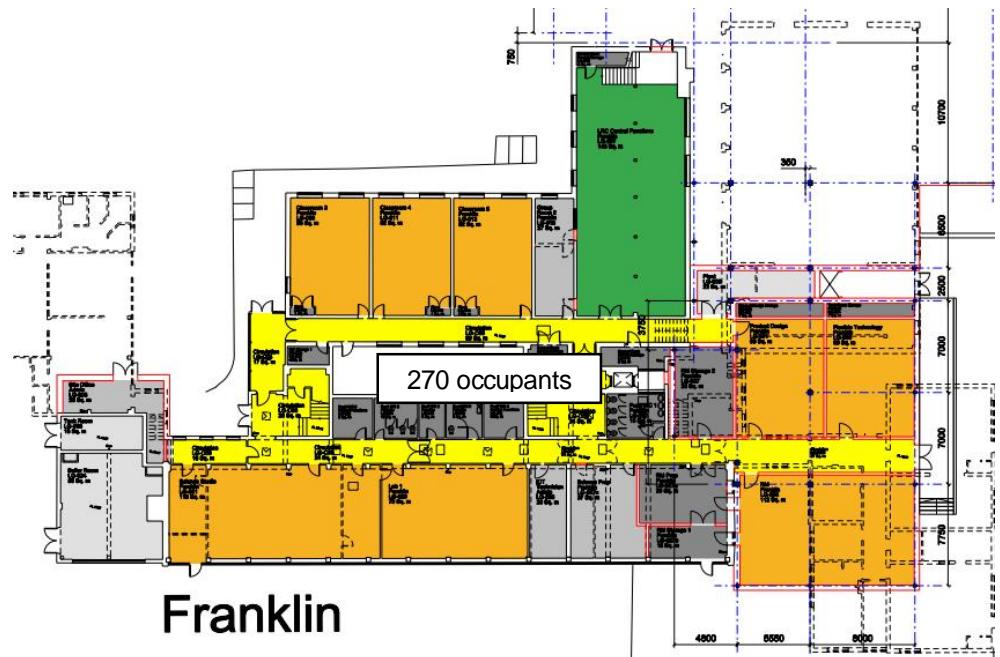


Figure 2 Occupant load (Upper Ground Floor)



**Figure 3 Occupant load (Lower Ground Floor)**

4.2.2 There are assumed to be 90 occupants in the Second Floor based on the three classrooms.

#### 4.3 HORIZONTAL ESCAPE

4.3.1 Travel distance will comply with the maximum stated in Table 2.

**Table 2 Travel Distances**

Risk Profile	Maximum travel distance where travel is possible in:	
	One direction only (m)	More than one direction (m)
B3	16	40
B2	20	50
A2	22	55

4.3.2 Travel distances are measured to the nearest final exit, storey exit or adjacent fire compartment. Where a horizontal evacuation via an adjacent compartment is used, travel distance can be measured to the door into the adjacent fire compartment.

4.3.3 Exit widths are defined based on the provisions of the B2 risk profile, i.e. 4.1 mm per person. When determining the required escape capacity the largest storey exit is discounted to account for the location of the fire.

## Franklin Block

4.3.4 No changes are proposed to the layout of the Second Floor of the Franklin Block. The existing escape provisions into the two protected stairs are maintained.

4.3.5 The occupants on the Upper Ground Floor have exits directly to the exterior at Grade and also have access to the two protected stairs discharging at the Lower Ground Floor. The three

4.3.6 Storey exits on the Lower Ground Floor are of sufficient width based on estimated total number of occupants.

4.3.7 The escape routes from the new build area on the Upper Ground Floor provides occupants with a primary escape route through the internal corridor (UG-9C03) and then have the choice of evacuating to the north to the exit at grade or evacuating to the west through the line of compartmentation and exit using the protected stairs.

4.3.8 The occupants have a secondary escape route through Lab 4. This route takes the occupants through a line of compartmentation. This alternate exit route ensures the occupants have more than one escape route available from the circulation corridor. Suitable signage is required at the door to Lab 4 and the Lab 4 door should be provided with a vision panel to allow occupants in the corridor to confirm that there is no fire within that space before entering it.

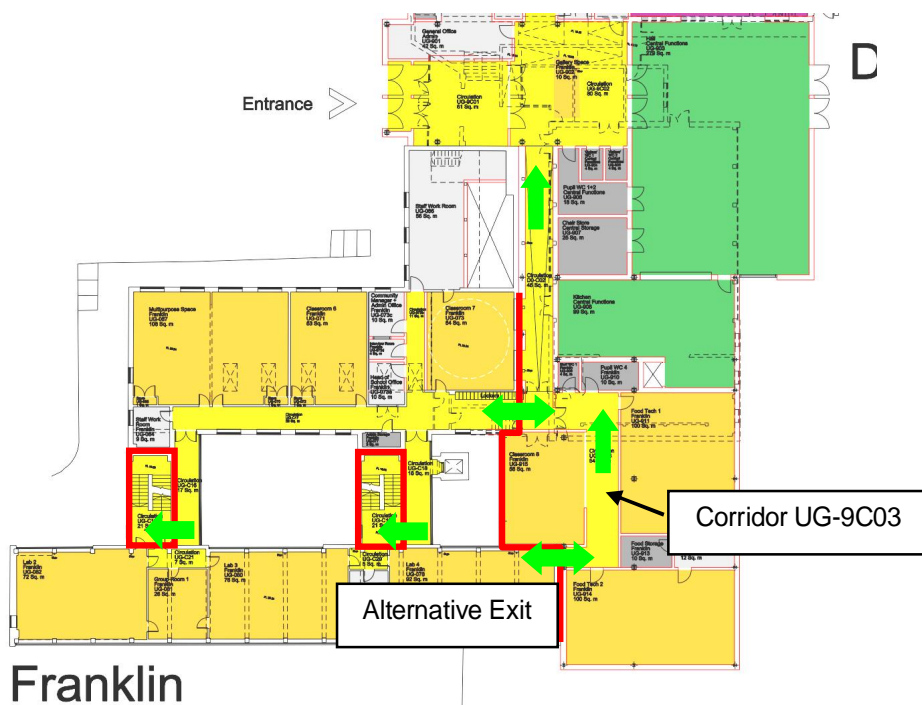


Figure 4 Escape routes – Upper Ground Floor

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## Darwin, Catering and Da Vinci Blocks

4.3.9 These blocks have access at grade and have sufficient exit width. Travel distances and escape routes from rooms are no worse than the existing situation.

## 4.4 VERTICAL ESCAPE

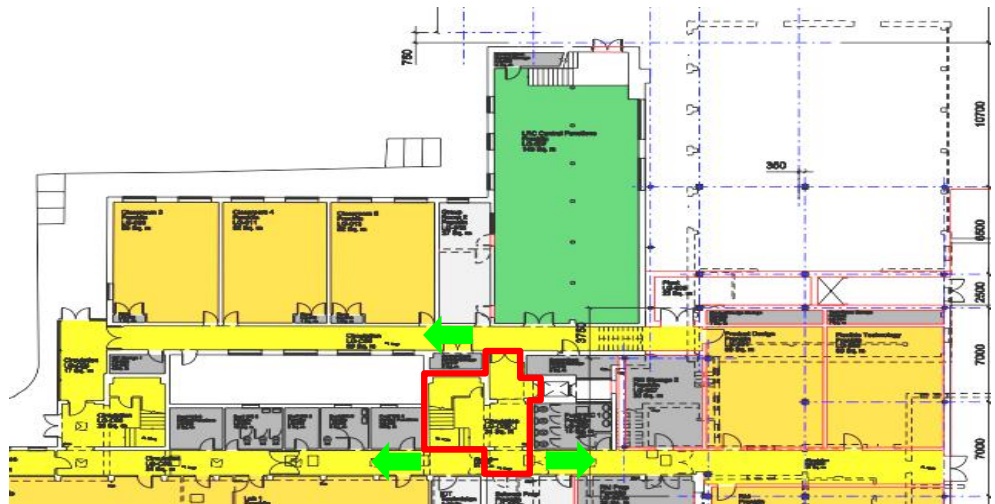
### Franklin block

4.4.1 The capacity of the western stair will form a lobby protected stair and will be based on B2 risk profile.

4.4.2 Each of the stairs has a width of 1300 mm wide and serves two levels providing a stair capacity of 325 people.

4.4.1 Assuming that one stair is compromised means that the 90 occupants on the Second Floor need to use one of the stairs, leaving a capacity of 235 for the Upper Ground Floor. The horizontal exit at the Upper Ground Level is able to cater for the full 270 occupants, so there is sufficient escape capacity provided.

4.4.2 The stair discharge on the Lower Ground Floor needs to be assessed. The eastern stair is located within the middle of the building and does not have a direct link to the exterior. However, occupants can exit the stair enclosure in three directions such that a single fire cannot compromise all exit routes simultaneously. Vision panels should be provided in each door existing the stair to enable occupants to confirm that the corridor is available..



**Figure 5 Eastern stair discharge**

## 4.5 ESCAPE FOR PEOPLE WITH DISABILITIES

4.5.1 Escape for people with mobility impairments will be supported by the provision of refuges in both protected escape stairs, measuring at least 1400 mm x 900 mm. An emergency voice communication system will also be provided to enable two-way communications with people using refuges, if one is not already present.

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#### 4.6 LIGHTING AND SIGNAGE'S

4.6.1 Emergency lighting in accordance with BS 5266 Parts 1 and 7 will be provided as necessary to cover all escape routes, internal and external in the new build areas. Existing systems will be altered to account for internal layout changes in the existing buildings.

4.6.2 Fire safety signage conforming to BS 5499 Parts 1 and 4 will be provided throughout the building.

4.6.3 Wherever security locking devices are fitted to doors required for means of escape, suitable electronic controls will be included to ensure automatic unlocking when the fire alarm operates. Manual overrides should also be provided.

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## 5 Internal Fire Spread

### 5.1 LININGS

5.1.1 Fire spread will be limited by ensuring that internal linings conform to the description in Table 3.

**Table 3: Internal Linings**

Location	National Class of Lining	European Class of Lining
Within rooms not more than 30m <sup>2</sup>	3	D-s3, d2
Other rooms	1	C-s3, d2
Circulation spaces	0	B-s3, d2

### 5.2 STRUCTURE

5.2.1 The new loadbearing elements of structure should have fire resistance (stability) of 60 minutes. The fire resistance of existing structure is to be maintained.

### 5.3 COMPARTMENTATION

5.3.1 Existing compartmentation provisions between levels is to be maintained. Note that a new compartments floor between the Lower and Upper Ground Floors is to be provided.

5.3.2 Cavity barriers are to be provided to subdivide extensive cavities.

5.3.3 The maximum compartment size for the building is 8000 m<sup>2</sup> (appropriate to B2 category in BS 9999). The largest compartment is under 5000 m<sup>2</sup> with the new extension separated by fire resisting compartmentation.

### 5.4 ANCILLARY ACCOMMODATION

5.4.1 Ancillary accommodation includes store rooms and plant rooms. Fire resisting structures will be provided as appropriate to separate these areas from other parts (60 minutes or 30 minutes, based on Table 31 of BS 9999).

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## 6 External Fire Spread

### 6.1 EXTERNAL WALLS

6.1.1 External walls of the new built area will have an appropriate resistance to ignition and fire spread.

6.1.2 Treatments to existing external walls are to be maintained or any replacement systems are to provide at least the same level of fire performance as the existing system.

### 6.2 SPACE SEPARATION

6.2.1 The new build areas will be assessed for fire spread across the boundary using the methodology within BRE 187. Note that the new build areas are located remote from the boundary.

6.2.2 Existing facades will be assessed to determine whether the refurbishment process changes the existing level of compliance with external fire spread provisions.

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## 7 Access and Facilities for Fire-Fighting

### 7.1 FIREFIGHTING WATER SUPPLIES

7.1.1 The existing hydrant provisions should be maintained. This should be included within any changes to the landscaping and main entrance to the building site.

### 7.2 ACCESS FOR FIRE SERVICE VEHICLES

7.2.1 Aggregate of the floor areas of the all storeys is less than 8000 m<sup>2</sup> and the height of the top storey is less than 11 m. Therefore, appliance access should be provided to 15 % of the building perimeter.

7.2.2 Existing fire appliance access provisions to the building are to be maintained.

7.2.3 Access to interior of the building will be available through the suitable doors not less than 750 mm wide in every elevation to which vehicle access is provided. Maximum distance between each door will be limited to 60 m.

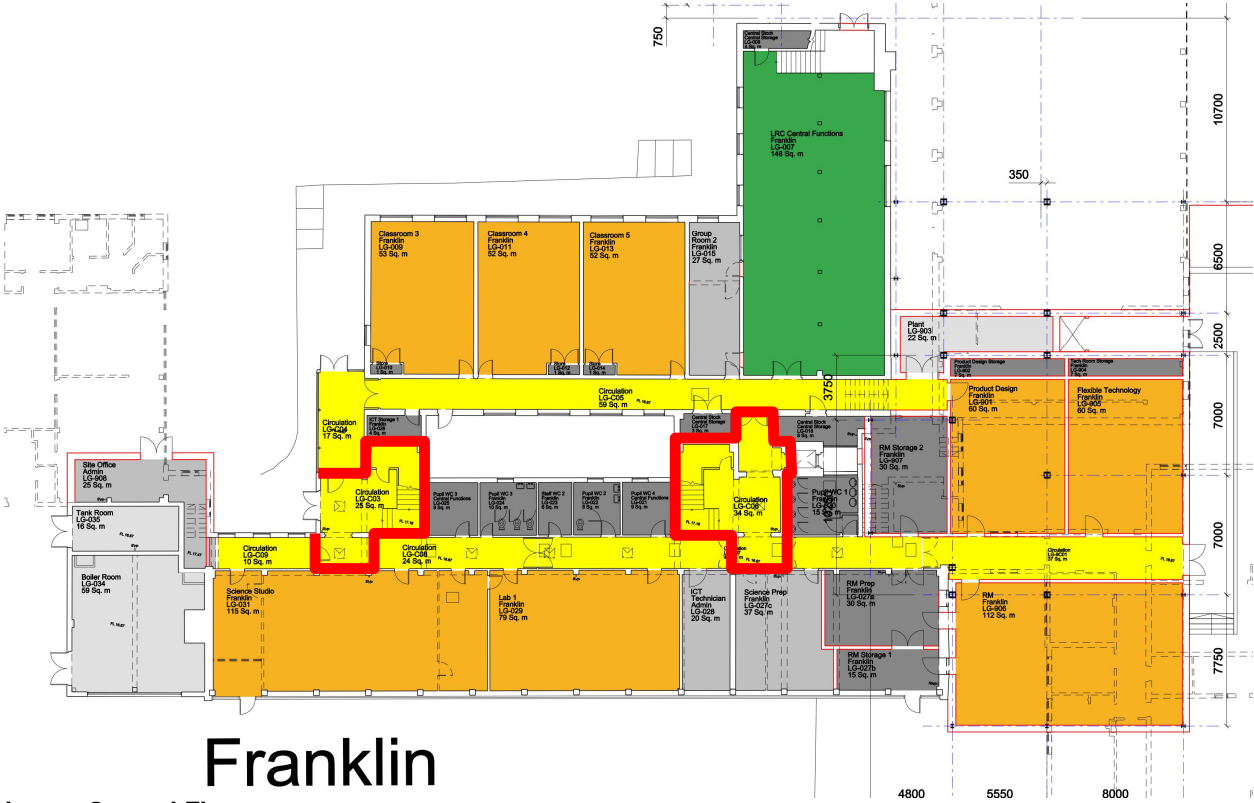
7.2.4 Existing hydrant provisions should be checked. However, as this is an existing building, the existing situation is not being made any worse by the building works.



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## Appendices, Figures & Tables

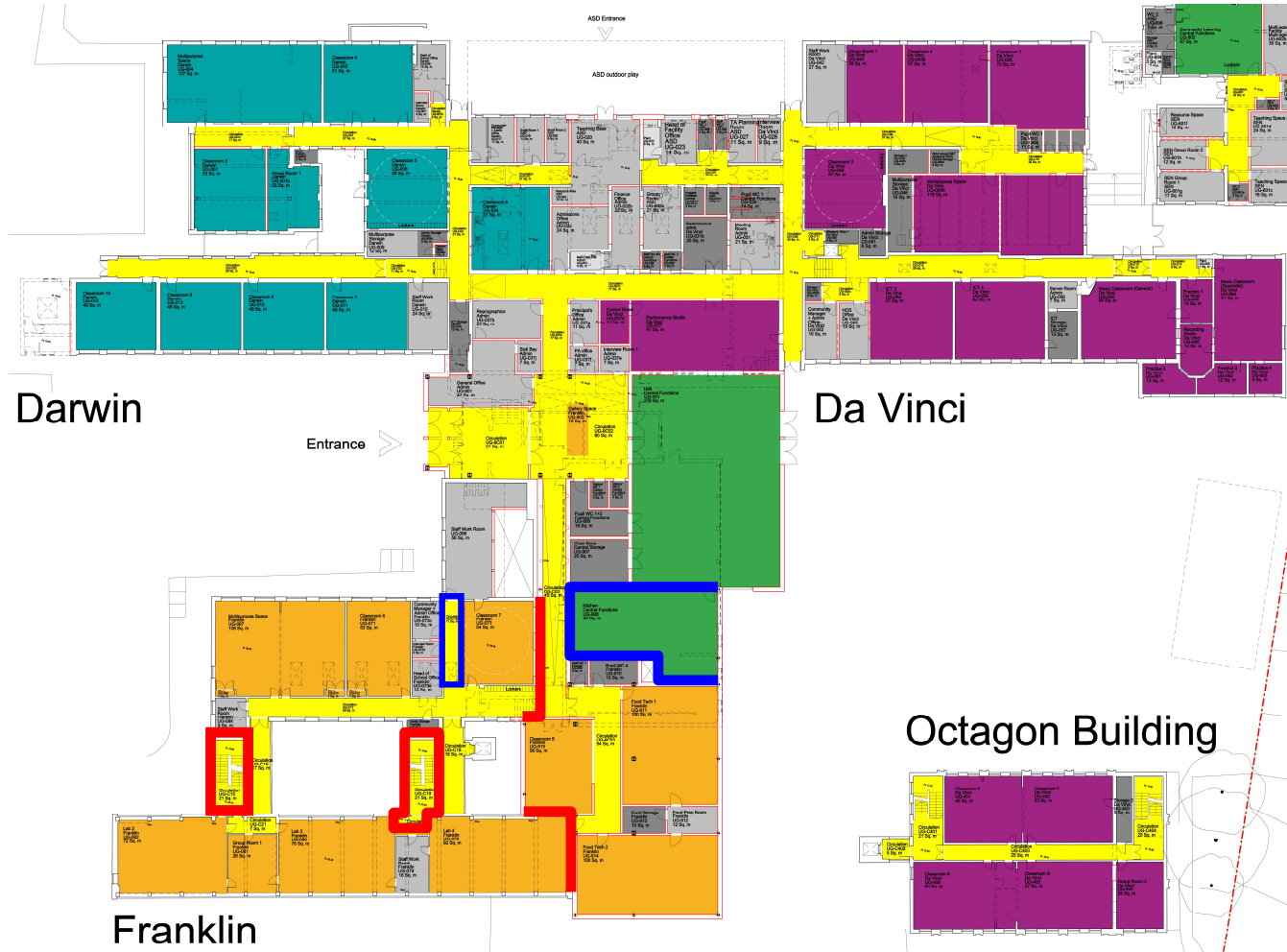
# Appendix A Indicative Fire Compartmentation



Key	
60 minutes	<span style="color: red;">—</span>
30 minutes	<span style="color: blue;">—</span>

**Franklin**

Lower Ground Floor

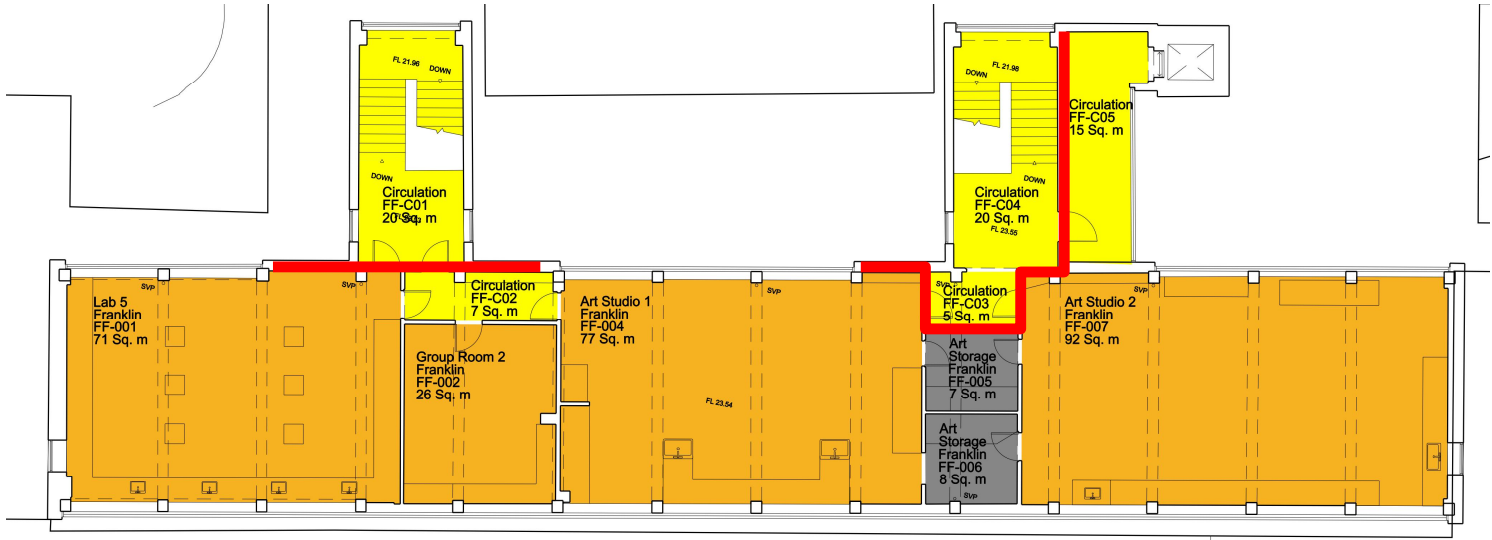


**Key**

60 minutes —

30 minutes —

Upper Ground Floor



**Second Floor.**