Fire Regulations Review

Project name: SHD Castle Street Bray

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0.0 INTRODUCTION

0.1 Scope

The function of the following report is to outline the means by which compliance with Part B (Fire) of the Building Regulations 1997 -2021 is to be achieved for the proposed development.

The development to which this application relates are collectively known as SHD Castle Street Bray.

The client is Silverbow LTD.

This document is subdivided into sections dealing with each of the specific requirements of Part B as follows:

B1 Means of Escape in Case of Fire

B2 Internal Fire Spread (Linings)

B3 Internal Fire Spread (Structure)

B4 External Fire Spread

B5 Access and Facilities for the Fire Service.

0.2 Outline Description of the Development-

The works will comprise of the demolishing of existing building and the construction of two apartment blocks over a car park. There will also be a creche and retail units constructed as part of the development.

0.3 Building evaluation

In this document it is demonstrated that the development, if constructed in accordance with the report, will comply with the requirements of Part B (Fire) of the Second Schedule to the Building Regulations 1997-2017.

The objective of the fire safety measures set out in this report is to satisfy the obligations of the Regulations, (i.e. health, safety and welfare of persons in and about the building) and not, per se, to protect against the risk to property and consequential loss.

0.4 Purpose Group Classification

The Purpose Group classifications are in accordance with Table 0.1 of Technical Guidance Document B as follows:

- *Apartment Block A and B defined as Purpose Group 1(c)*
- *Basement level Car Park defined as Purpose Group 7(b)*
- *Creche defined as Purpose Group 5*
- *Retail Unit defined as Purpose Group 4a*

0.5 Primary Reference:

Throughout the following report achievement of compliance with the functional requirements B1 to B5 of the Regulations is demonstrated by reference to: -

- BS 5588 Part 1
- BS 5588 Part 11
- TGD B

1.1 MEANS OF ESCAPE IN THE CASE OF FIRE Apartments

1.1 MEANS OF ESCAPE IN THE CASE OF FIRE

1.1 DESIGN FOR HORIZONTAL MEANS OF ESCAPE –

1.1.1 Basis for compliance

BS 5588 Part 1

1.1.2 Internal planning of flats and maisonettes

1.1.2.1 Ground Floor Units and first floor units

The first floor is less than 4.5m above ground floor level. All flats will be provided with entrance hallways.

The proposed internal layout of the flats will comply with the provisions of Clause 9.4 of BS 5588 Part 1 as:

No habitable room will be an inner room.

1.1.2.2 Upper floor unit [second floor plus]

These flats are more than 4.5m above ground level.

The proposed internal layout of the flats will comply with the provisions of Clause 9.5 and Figure 4 of BS 5588 Part 1 as:

- No habitable room will be an inner room
- All habitable rooms are entered directly from a protected entrance hall i.e. corridor enclosure will afford a half hour fire resistance and all rooms will be accessed via doors of type FD 30 fire doors.
- The travel distance from flat entrance door to the door of any habitable room will not exceed 9m.

1.1 MEANS OF ESCAPE IN THE CASE OF FIRE

1.1.3 Escape Routes from units with a corridor or lobby approach

The escape routes will be designed per Clause 12 and Figure 13 of BS 5588 Part 1. It is noted that the extended travel distance proposed in the corridors in a number of locations is [greater than 15m]. In such locations, the additional measure of a residential sprinkler system installation to each of the flat accessed from the corridor can be use to extend the distance within the corridor to 15m. This is per in Item 1.7.1 TGD B.

In all instances, dead end corridors serving flats [common corridor] must be provided with 1.5m2 AOV or smoke shaft equivalent.

1.1.3.1. Sprinkler System Design

Where a sprinkler system is provided, it should be in accordance with BS 9251:2014. The sprinkler system should be in accordance with sections.

1.1 MEANS OF ESCAPE IN THE CASE OF FIRE

1.1.4 Stairs and Final Exits

1.1.4.1 Width of common stairs

The unobstructed width (measured between the walls) of each common stair will be not less than 1000 mm;. The width will be kept clear for a vertical distance of 2.0 m. This is per Clause 14.2.2 of BS 5588 Part 1.

1.1.4.2 Enclosure of common stairs

The common stair within this block will comply with Clause 14.3 of BS 5588 Part 1 in that:

1. No store room will open into a common stair.

2. Where a common stair projects beyond, is recessed from, or forms an internal angle of, the external enclosures to a building, the distance between any opening in the external enclosure of the building and any opening in the enclosure to the common stair will be not less than 1.8 m. Where a window opening is provided within this 1.8m zone, the window will be fixed shut and the glazing will achieve 60minute fire resistance integrity and insulation.

1.1.4.2 Discharge from common stairs and final exits

Discharge from common stairs and final exits serving them will be in accordance with Clause 14 of BS 5588 Part 1 in that:

1. The common stair will discharge directly to a final exit or will discharge to a final exitway a protected passageway.

2. The final exit will be immediately apparent to persons using a common stair. This will be done with the use of exit sign posting.

1.2 MEANS OF ESCAPE IN THE CASE OF FIRE

Carpark

1.2 MEANS OF ESCAPE IN THE CASE OF FIRE

Car Park

1.2 DESIGN FOR HORIZONTAL MEANS OF ESCAPE –

1.2.0 Basis for compliance

Section 1.2 and 1.3 of TGD B.

1.2.1 Travel Distance-

The recommended limits are taken from Table 1.2 of TGD B, i.e 18m dead end and 45 m to the alternative.

1.2.2 Number of escape routes and width of exits

The numbers of escape routes from the car park and the individual rooms within the area are in accordance with Table 1.3 of Technical Guidance Document B. The width of the exits are in accordance with Table 1.4 of Technical Guidance Document B. All exit widths from the car park must be a minimum of 750 mm clear.

1.2.3 Inner Rooms –

Each inner room will comply with Item 1.2.3.1 of Technical Guidance Document B in that;

- The inner rooms will not have occupancy of more than 20 persons.
- The escape route from the inner room will not pass through more than one outer (access room).
- The travel distance from any point in the inner room to the exit from the access room does not exceed the appropriate limit given in Table 1.2 of TGD B for dead end travel distance.
- The access room will not be a place of special fire risk and it is in the control of the same occupier.
- The access room will be fitted with a suitable fire detection and alarm system to warn the occupants of the inner room that an outbreak of fire has occurred in the access room.

1.3 General Provisions for Means of Escape

1.0 MEANS OF ESCAPE IN THE CASE OF FIRE ./..

1.3 General Provision Of Means Of Escape

1.3.1 Fire protection of escape routes-

1.3.1.1 Fire resistance of enclosures-

All enclosures will meet the fire resistance requirements of Table A1 and Table A2 of Technical Guidance Document B.

Fire resistance of enclosures [escape routes]				
Enclosure	**Fire resistance in minutes** [1]			**Reference**
	Load bearing capacity	**Integrity**	**Insulation**	
Entrance hallway of the flats	30	30	30	Item 14, Table A1, TGD B.
Between flats and common lobbies	60	60	60	Item 7, Table A1, TGD B.
Between common lobby and common stair	30	30	30	Item 8b, Table A1, TGD B.

[1] Refer to Table below for commentary on glazed elements and their fire resistance.
[2] The fire resistance between the car park and the common lobby will be 60/60/60 fire resistance.

1.3.1.2 Fire resistance of doors-

The fire resistance of the doors is in accordance with Table B1 of Technical Guidance Document B.

Fire resistance of doors [escape routes]		
Position of doors	**Type of door [1]**	**Reference**
Doors within the protected entrance hallways.	FD 30	Item 9b, Table B1, TGD B.
Between flats and common lobbies	FD 30 s	Item 2a, Table B1, TGD B.
Between common lobby and common stair	FD 30 s	Item 2b, Table B1, TGD B.
Between stair and car park	FD 30 s	Item 2c, Table B1, TGD B.

[1] Refer to Table below for commentary on glazed elements and their fire resistance.

1.0 MEANS OF ESCAPE IN THE CASE OF FIRE ./..

1.3.1.3 Fire resistance of glazed elements-

Glazed elements within fire doors and protected enclosures will be the equivalent fire resistance as the door/protected enclosure where it is located and will include the insulation criteria, other than were un-insulated glazing is permitted in accordance with Table A4 of Technical Guidance Document B.

Limitations on the use of uninsulated fire resisting glazed elements on escape routes - Block A			
Position of glazing	**Maximum area of non-insulating glazing**		**Reference**
	Wall / Partition	Fire Door	
Entrance Hallway of the flats	Fixed fan light	Unlimited above 1.1.m	Item 2, Table A1, TGD B.
Between flats and common lobbies	Nil	Nil	Item 3, Table A1, TGD B.
Between common lobby and common stair in Block A	Unlimited above 1.1.m	Unlimited above 0.1.m	Item 5a, Table A1, TGD B.

1.3.2 Door on escape routes

1.3.2.1 Door Fastenings – All Areas

Entrance doors to the flats:
Entrance doors to the residential units will be in accordance with Clause 18.8.2 of 5588 Part 1 as, the doors will be fitted with a lock that can be opened by a handle from either side and can be locked from the outside by a key and locked on the inside by a manually operated bolt [Thumb Turns].

Storey Exits and Final Exits
These will not be fitted with a lock, latch or bolt fastenings and will be fitted only with simple fastenings that are readily operated in the direction of escape without the use of a key in accordance with Item 1.4.3.2 of TGD-B.

Door to ancillary rooms
These will not be fitted with a lock, latch or bolt fastenings and will be fitted only with simple fastenings that are readily operated in the direction of escape without the use of a key with Item 1.4.3.2 of TGD-B.

1.0 MEANS OF ESCAPE IN THE CASE OF FIRE ./..

1.3.2.2 Direction of opening

The following are not required to open in the direction of escape, as the doors will not be used by more than 50 persons. This is per Item 1.4.3.3 of Technical Guidance Document B.

Flats	Car Park
All doors within the flats. Entrance doors to flats.	Doors to individual ancillary rooms.

All other doors within the development will open in the direction of escape, i.e. final exits at ground floor level and storey exit.

1.3.2.3 Amount of opening and the effect on associated escape routes

All accommodation:

All doors on escape routes will be hung:

- to open at least 90^{o}
- with a swing that is clear of any change of level, other than a threshold on the line of the doorway.
- so as not to reduce the width of any escape route.

The above is per Item 1.4.3.4 of TGD B.

1.3.2.4 Vision Panels

Vision panels will be provided where doors are provided to sub-divide corridors or where the doors are designed to swing both ways.

The above is per Item 1.4.3.5 of TGD B

1.0 MEANS OF ESCAPE IN THE CASE OF FIRE ./..

1.3.3 Construction of Escape Stairways

The stairs and landings will be constructed of a material of limited combustibility - concrete. The width of the stairways and dimension of the steps are adequate for the means of escape. The stairs will comply with semi-public standard as specified in TGD K.

The above is per Item 1.4.4 of TGD B.

1.3.4 Height of escape route

All escape routes will have a 2.0 m clear height, other than the door frame.

The above is per Item 1.4.5 of TGD B.

1.3.5 Floor on escape routes

All parts of escape routes will have a non-slippery even surface.

The above is per Item 1.4.6 of TGD B.

1.3.6 Final exits

All final exits are sited as to ensure that when occupants disperse from the building they will be free from smoke and heat. Refer to Items 1.1.4.1 and 1.2.1.4 of this document for additional commentary.

1.0 MEANS OF ESCAPE IN THE CASE OF FIRE ./..

1.3.7 Lighting of escape routes

Emergency lighting will be provided in accordance with Table 1.8 of Technical Guidance Document B as indicated below.

Lighting of escape routes		
Location	**Purpose Group**	**Area requiring emergency escape lighting**
Apartment Blocks	1(c)	Provided to defined escape routes. [Common escape routes]
Car Park	7 b	Defined escape routes
Ancillary Room	1(c)	Defined escape routes
Retail space	4 (a)	Defined and undefined escape routes

Notes:

1. Emergency lighting will be designed and installed in accordance with I.S. 3217:2013+A1:2017 Code of practice for emergency lighting.

2. Emergency escape lighting will be provided to-
   - •Indicate clearly and unambiguously the escape route so that all means of escape can be clearly and effectively used.
   - •Provide illumination along such routes to allow safe movement towards and through the exits provided.
   - •Provided to ensure all fire alarm call points and first aid fire fighting equipment can be clearly located.

3. Emergency lighting will be provided to ensure immediate, automatic lighting in the event of a complete failure or localised failure and will last for the duration of three hours.

4. Emergency lighting will be provided to external escape routes in the case that the public lighting is not adequate.

5. Emergency lighting will consist of a number of emergency lighting fittings, exit signs and emergency power packs. Emergency lighting shall be provided using non-maintained Lighting Luminaires provided with 3-hour emergency Packs. All emergency exit signs shall be the maintained type and they shall be fitted with emergency battery pack for three hour duration.

6. Adequate artificial lighting is to be provided to all internal and external escape routes.

1.0 MEANS OF ESCAPE IN THE CASE OF FIRE ./..

1.3.8 Fire protection of lift installations

The lift will be enclosed in 60 minute compartment construction incorporating FD 60 fire doors in accordance with Tables A1, A2 and B1 and Item 1.4.9.2 of TGD B.

1.3.9 Electrical installations and protected circuits

Electrical installation – i.e. wiring, sockets, switches, fuse boards, distribution boards, circuits breakers, lighting installation etc. will be installed in accordance with the National Rules for Electrical Installations IS 10101:2020.

1.3.10 Ventilation systems

1.3.10.1 Natural ventilation

Natural ventilation will be in accordance "*Building Regulations 2009 Technical Guidance Document F Ventilation"*.

1.3.11 Refuse Chutes and Storage

Refuse stores must be enclosed in construction achieving 60 minutes fire resistance incorporating an FD 60S fire door. The stores must be lobby protected with 2 no. FD30S self – closing fire doors. The lobby with be provided with permanent ventilation to the outside of the building achieving 0.2m^2 as per Item 1.4.12 of TGD B.

1.3.12 Fire safety signs

Exit signposting will be located at all final exits. Supplementary directional signage will be provided where an exit would otherwise be unclear. All exit signposts will be maintained and capable of operating for a minimum of three hours. Signs will be provided to indicate the location of all fire alarm call points and all fire fighting equipment. All escape route signage will be in accordance with the recommendations of BS 5499: Part 4: 2013. Exit signposts provided will be in accordance with S.I. No. 299 of 2007 "Safety, Health and Welfare at Work (General Application) Regulations 2007."

Signs in accordance with EN ISO 7010 : 2012 + A7 : 2017 will be provided to all fire doors indicating that they will be kept shut [excluded entrance doors to flat and doors within flats]. All new fire doors will be permanently identified in accordance BS 8214: 2016 indicating the period of fire resistance, the manufacturer and the year of manufacture.

1.0 MEANS OF ESCAPE IN THE CASE OF FIRE ./..

1.3.13 Fire detection and alarm

Individual flats
Each flat will be provided with its own independent mains linked/battery backed Grade D type LD 2 fire detection and alarm system [other than flats with galleries which will be provided with LD 1 system]. The systems will incorporate interconnected smoke/heat alarms to each flat entrance hallway, kitchen/living space and bedrooms.
The Grade D Type LD 2 system will be designed and installed in accordance with Clause 10.2.1.2(b) of IS 3218:2013

Common Escape Routes
The entire building [Blocks A, B and Car Park] must be provided with an A type L3X system. The system will be in accordance with the I.S. 3218:2013+A1:2019 Code of Practice for Fire Detection and Alarm Systems. The system will incorporate detections to the following:

- All common escape routes – Smoke detection.
- All protected lobbies to ancillary accommodation – Smoke detection.
- All ancillary accommodation – Smoke detection.
- The car park – Smoke detection or heat detection – to be decided by Fire Detection and Alarm Designer.
- Entrance hallways to flats - Heat detection.

Sounders will be provided throughout to ensure the following:

- Common escape routes - 65 db or 5 db above ambient noise level, whichever is greater.
- Within the flat entrance hallways - 65 db or 5 db above ambient noise level, whichever is greater.
- The car park - 65 db or 5 db above ambient noise level, whichever is greater.
- The ancillary accommodation - 65 db or 5 db above ambient noise level, whichever is greater.

It should be noted that Factfire are not the designers of the system. **A qualified engineer will be engaged to design the system.**

1.3.14 Provision for the disabled-

A designated disabled refuge area [measuring 1400mm x 900mm] will be provided at each upper floor level. The refuges will be located either within the landings of the stair or the protected lobby leading to the stair in accordance with 1.4.15 of TGD B. The refuge space will be equipped with an emergency voice communication (EVC) system conforming to BS 5839: Part 9: 2011 which will communicate with the master station.

1.0 MEANS OF ESCAPE IN THE CASE OF FIRE ./..

1.3.15 First aid fire fighting equipment

Common Escape routes
First-aid fire fighting equipment is required in buildings that are used by the occupants, with appropriate training and where it is safe to do so. The common escape routes will be used by the residents of the buildings. These residents will more than likely have no training in the use of fire extinguishers, as such it is our opinion the common escape routes at ground and upper floor level are not provided with first aid fire fighting equipment.

Ancillary Accommodation.
All ancillary accommodation will be provided with Fire Extinguishers. The selection, commissioning and installation of the fire extinguishers will be in accordance with I.S 291: 2015.

Individual flats
As is recommended in DoE, “Fire Safety in Apartments” that the kitchen area of each flat should be provided with a fire blanket. The fire blankets will comply with BS EN 1869:1997. The blanket will be properly secured and clear instructions on use will be provided.

Car park
The car park will be provided with two number hose reels. The hose reels will be per BS 5306 – 2006 and BS EN 671 – 2002.

Provision of Hose Reels		
No. of hose reels required as per Item 1.4.16 of TGD-B	Floor area of carpark (m^2)	No. of hose reels provided
1 per every 800m^2 of floor area	Circa 2000	3

1.3.16 Heat producing appliances-

Should heat-producing appliances be installed they will comply with the requirements of Part J of the Building Regulations. In addition they will comply with relevant provisions of Section B3 of Technical Guidance Document B. Gas heating installations [if any] will be in accordance with I.S. 820.

B2 INTERNAL FIRE SPREAD (LININGS)

2.0 INTERNAL FIRE SPREAD (LININGS)

2.1 Basis for compliance

- Section 2 Technical Guidance Document B, 2006.

2.2 Fire Spread and Lining Materials

2.3 General Provisions

Table 10 – Linings General Provisions

Room Type	Class of Lining	
	National	European
Common escape routes	Class 0	Class B – s3, d2
Ancillary rooms	Class 0	Class B – s3, d2
Car Park	Class 0	Class B – s3, d2
All areas of Flats	Class 1	Class C – s3, d2
Creche	Class 0	Class B – s3, d2
Retail	Class 1	Class C – s3, d2

2.0 INTERNAL FIRE SPREAD (LININGS) ./..

2.4 Variations and Special Provisions

2.4.1 Walls

At present it is not known what lining materials will be used. However any areas which deviate from the above recommendations will be in accordance with Item 2.2.1 i.e.:

Parts of walls in a room may be a class lower than specified in the Table above (but not lower than a Class 3 material) if the area of the part (or if there are two or more parts, the aggregate of those parts) does not exceed the lesser of the following: -

1. half the floor area
2. 20m^2

No part of the material will be greater than 5m^2 and will be separated from any other such part by a distance of not less than 2 m.

2.5 Thermoplastic Materials

2.5.1 Windows

External windows in rooms (not circulation spaces) containing thermoplastic materials will achieve TP (a) classification. Internal glazing, where present, will meet the classification set out above in section 2.1 of the Technical Guidance Document B.

2.5.2 Rooflights

The rooflights (if any) to rooms and circulation areas which may contain thermoplastic materials will have the following classification:

- the lower surface will have a TP(a) or TP(b) classification
- their size and disposition will satisfy the limitations set out in Table 2.1 of the Technical Guidance Document B.

2.0 INTERNAL FIRE SPREAD (LININGS) ./..

2.5.3 Lighting diffusers-

Where lighting diffusers are used they will achieve a classification of TP (a) (rigid) or a classification of TP (b) – which will meet the limits set out in Table 2.1 of the Technical Guidance Document B.

Table 11 - Limitations applied to thermoplastic lighting diffusers in suspended ceilings and thermoplastic rooflights.

Minimum classification of lower surface	Use of space below the diffusers or roof light	Max. area of each diffuser panel or roof light	Max. total area of diffuser panels or rooflights as a % of floor area of the space in which the ceiling is located	Min. distance between diffuser panels or rooflights [1]
TP(a) Rigid	Any except protected stairway	No Limit	No Limit	No Limit
TP (b)	Rooms Circulation spaces, except protected stairways	$5m^2$ $5m^2$	50 15	3m 3m

Note 1:
Smaller panels can be grouped together provided that the overall size of the group and the space between one group and any others satisfy the dimensions provided in Diagram 10 of the Technical Guidance Document B.

B3 INTERNAL FIRE SPREAD (STRUCTURE)

3.0 INTERNAL FIRE SPREAD (STRUCTURE)

3.1 Basis for compliance

- Section 3 of Technical Guidance Document B, 2006.

3.2 Load Bearing Elements of Structure

3.2.1 Fire Resistance

In accordance with Tables A1 and Item 1 of Table A2 of Technical Guidance Document B, as the building is not more than 20m high, 60 minutes fire resistance is required for the following elements of structure.

- Load bearing elements except for those which solely support the roof.
- External walls other than permitted unprotected areas .
- All floors [compartment floors].
- Protected Shafts.

In accordance with Tables A1 of Technical Guidance Document B, 60 minutes fire resistance is required for the following:

- Compartment wall separating flats.
- Compartment wall between the flats and the common lobbies.
- Wall to ancillary accommodation.
- Compartment wall separating creche.
- Compartment wall enclosing retail units.

In accordance with Tables A1 of Technical Guidance Document B, 30 minutes fire resistance is required for the following:

- Wall enclosing the entrance hallways within the flats.
- Protected lobbies to ancillary accommodation.

3.0 INTERNAL FIRE SPREAD (STRUCTURE) ./..

3.3 Compartmentation

3.3.1 Provision of compartments

The following will be constructed as compartment walls or floors in accordance with 3.2.4 of TGD B.

- The floors within the buildings (excluding the lowest floor).
- Walls enclosing the common escape routes.
- Any walls separating the flat from any other part of the building and from flat to flat.
- Wall between the carpark and the common escape routes.

Compartment sizes

With respect to flats and the car park, there is no limitation on areas and volumes in accordance with Table 3.1 of Technical Guidance Document B.

3.3.2 Construction of compartment walls

The compartment walls and floors within this premises will be constructed in accordance with Item 3.2.5 of Technical Guidance Document B in that they:

1. Form a complete fire barrier between the separate compartments.
2. Have fire resistance as indicated in Section 3.2 of this document.
3. Be constructed as indicated in Items 3.3.2.1 and 3.3.2.3 of this document.

3.3.2.1 Compartment floors in high buildings

As the height of the top storey of the proposed building is greater than 10m the compartment floors will be constructed of non-combustible materials, apart from any floor finish as per Item 3.2.5.2. of TGD B.

3.3.2.2 Compartment walls

As the height of the top storey of the proposed building is greater than 10m the compartment walls will be constructed of material of limited combustibility as per Item 3.2.5.4. of TGD B.

3.0 INTERNAL FIRE SPREAD (STRUCTURE) ./..

3.3.2.3 Accommodation of Services in Compartment Walls/Floors -

The integrity compartment construction will not be breached to allow for the installation of services, e.g. pipes, wires, flues, except where necessary to allow services pass through these compartment walls or floors. Services may be surface mounted or accommodated in service ducts or within service cavities created external to the unbreached linings of the fire resistant compartment wall or floor. Where services pass through these compartment walls or floors they will be fire-stopped in accordance with Item 3.5 of this report.

3.3.2.4 The junction of a compartment wall or compartment floor with other wall-

Where a compartment wall and a compartment floor meet any other wall, the junction will maintain the 60-minute fire resistance of the compartment.

3.3.2.5 Junction of compartment walls and roofs-

The compartment walls will be carried to the underside of the floor or roof construction and be appropriately fire stopped. The method will comply with Diagram 13 of TGD B.

The stair shaft will be carried to the underside of a concrete slab. Refer to section AA and BB.

3.3.3 Openings in compartment walls and compartment floors other than separating walls

All openings in compartment walls and floors will be limited to the following:

- Fire resisting doors, refer to Item **1.3.1.2** of this document.
- Openings that will meet the requirement of Section 3.4 of Technical Guidance Document B - refer to item 3.5 of this document for commentary.
- Protected shafts- refer to Item 3.3.4 of this document for commentary.

3.0 INTERNAL FIRE SPREAD (STRUCTURE) ./..

3.3.4 Protected shafts

Common stair shafts will be constructed as protected shafts.

The protected shafts will be constructed to form complete fire barriers between the different compartments.

M & E risers may be constructed as protected shafts.

3.3.4.1 The construction of protected shafts

The protected shafts will be constructed to form complete fire barriers between the different compartments. Protected shafts will be constructed in accordance with Section 3.2.7 of TGD B.

Common Stair:
Refer to Item 1.3.1.1 of this document for commentary.

M & E Risers:
This shaft will be enclosed in 60-minute fire resisting compartment construction incorporating FD 60 S fire doors.

Refer to Item 3.3.2 above for commentary on the construction of compartment walls within this building.

3.3.4.2 Glazed screens to protected shafts

Refer to Item 1.3.1.3 of this document for commentary.

3.3.4.3 Pipes for oil or gas in protected shafts

No pipes conveying oil or gas will be located in the protected escape stairs.

3.0 INTERNAL FIRE SPREAD (STRUCTURE) ./..

3.4 Concealed Spaces

All concealed space will be in accordance with Section 3.3 of TGD B.

3.4.1 Provision of Cavity Barriers

The external walls

The proposed external walls will consist of a mixture of concrete walls and glazed construction. Where any cavities exist in the external envelope of the building they will be provided with cavity barriers at the junction of any fire rated construction such as compartment floors, compartment walls and fire rated barriers in accordance with Diagram 16 of TGD-B.

Fire barriers

At the upper most levels of each block, all fire barriers will be carried to the underside of the roof or 30 minute fire rated ceiling and appropriately fire stopped or to the underside of the roof. See Section AA and BB.

At all other levels all fire barriers will be carried up to the underside of the compartment floor construction and appropriately fire stopped.

Dimension of concealed spaces

Cavity Barriers will be provided to ensure no cavity is greater than 20 x 20 metres apart.

3.0 INTERNAL FIRE SPREAD (STRUCTURE) ./..

3.5 Protection of openings and fire stopping

3.5.1 Opening for pipes

All openings for services, joints/imperfections of fit in or between the designated fire barriers are to be firestopped in accordance with the relevant parts of Section 3.4 of Technical Guidance Document B to ensure the fire resistance of the element is not impaired. Two number methods are proposed.

Method 1

All pipes will be enclosed in 60-minute fire resistant protected shafts. If the pipe is made from a material which is non-combustible (iron or steel – Refer to Note 1 of Table 3.4 of Technical Guidance Document B) a 60minute fire rated intumescent collar will be used at the point of penetration if the nominal internal dimension of the pipe is greater than 160 mm. If less than 160 mm the pipe will be fire stopped the full width of the wall.

If the pipe is made from lead, aluminium or aluminium alloy, fibre cement or uPVC (uPVC pipes complying with EN 1329-1: 2014, and uPVC pipes complying with BS 5255: 1989) a 60 minute fire rated intumescent collar will be used at the point of penetration if the nominal internal dimension of the pipe is greater than 110 mm. If less than 110 mm the pipe will be fire stopped the full width of the wall.

If the pipe is made from any other material a one hour fire rated intumescent collar will be used at the point of penetration if the nominal internal dimension of the pipe is greater than 40 mm. If less than 40 mm the pipe will be fire stopped the full width of the wall. Please note where collars are proposed in walls, they must be provided both sides of the walls.

Method 2:

<u>Compartment floors/walls</u>
Pipes that breach compartment floors/walls will be provided with intumescent collars at the point of penetration if the nominal dimension of the pipe is greater than 40 mm. If nominal internal dimensions of the pipe are equal to or less than 40 mm, the pipes will be fire stopped the full width of the wall or floor.

3.0 INTERNAL FIRE SPREAD (STRUCTURE) ./..

3.5.2 Ventilating ducts-

Fire and Smoke Dampers will be provided to ventilation ductwork wherever the ductwork penetrates fire barriers in accordance of BS 9999: 2017.

3.5.3 Fire stopping

In addition to the fire stopping recommended within this document, the following areas will be fire stopped

The joints between elements, which serve as barriers to fire. Refer to enclosed floor plans and sections for the location of fire resistance elements.

All openings for pipes, ducts, conducts or cables which pass through any part of any fire barrier will be

- Kept as few in number as possible.
- Kept as small as practicable.
- And fire stopped in accordance with Item 3.4.5 of Technical Guidance Document B.

3.0 INTERNAL FIRE SPREAD (STRUCTURE) ./..

3.6 Special Provisions – Car Park

Fire resistance
All materials used in the construction of the car park compartment will be non-combustible and achieve 60 minute fire resistance, other than the ceiling lining. The ceiling lining will achieve a minimum surface spread of flame - Class B - s3, d2 (European).
This is per Item 3.5.2.1 of TDG B.

Ventilation
The basement car park must be provided with permanent ventilation. This must be equal to 2.5% the floor area of the car park. At least 50% of this ventilation [1.25% of the floor areas of the basement car park] must be provided on opposing sides [0.625% of the floor area of the basement car park on either sides]. Please note the following:

The permanent vents will be a combination ceiling level vents and high level wall mounted vents.
Where vent area provided louvres/grilles/ bird guards or similar devices, the equivalent area provided will take into account the restriction caused by these devices.

Part of the permanent ventilation is provided by car entrance / exit ramps, entrances, etc. 50% of the this area is assumed to be available.

See Table 12 below for the proposed permanent ventilation in the carpark. The ventilation requirement is per Item 3.5 of and Item 5.3.2.1 of TGD B.

Table 12 – Parament ventilation to car park

Area of car park	2.5% of car park area	1.25% of car park area	Comments
2,118m^2	53m^2	26.479m^2	50 % of the car ramp is used as part of the ventilation to the car park. This is 6.6m^2.

B4 EXTERNAL FIRE SPREAD

4.0 EXTERNAL FIRE SPREAD

4.1 Basis for compliance

- Section 4 of Technical Guidance Document B, 2006.
- BRE Report BR 187 (2014) “Building Separation and Boundary Distances”

4.2 Construction of External Walls

4.2.1 External Surfaces

Blocks A and B:
The majority of the facades on both blocks A and B are more than one 1m to the boundary and both building are more than 18m in height.

Façades more than 1m to the boundary.
The facades that are more than 1m to the boundary will be in accordance with Item 1 of Table 4.1 in that the external façade will be a minimum Class C - s3-d2 (European) from 0m to 10 m. Above 10m there is no restriction on the external surface. If any timber cladding is provided between 0m to 10m, it will be a minimum 9mm as recommended in Note 1 of Table 4.1

4.2.2 External Wall Construction

It is recommended that the external wall is completely constructed of non combustible materials

4.3 Space Separation

The method proposed for calculating the acceptable unprotected area is enclosing rectangle method taken from the Building Establishment Report(BR 187) “External fire spread: building separation and boundary distance”. See calculation set out below justifying the relationship of the facades to relevant boundaries for the critical (i.e. the largest) unprotected area on the façade.

4.0 EXTERNAL FIRE SPREAD ./..

Space Separation						
Elevation	**Enclosing Rectangle**	**Unprotected Area.**	**Unprotected Area (%)**	**Permitted distance to relevant boundary [2]**	**Actual distance to relevant boundary**	**Drawing Reference**
North-West	3 x 6m (18m^2)	8.57m^2	50%	1.5m	3.8m (Site Boundary	CSB-HJL-AB-ZZ-DR-A-2011
North-East	3 x 12m (36m^2)	15.95m^2	50%	2.0m	6.3m (Site Boundary)	CSB-HJL-AB-ZZ-DR-A-2011
South-West	6 x 21 (126m^2)	59.36m^2	50%	7.0m	12.2m center of the road.	CSB-HJL-AB-ZZ-DR-A-2011
South-East	6 x 18 (108m^2)	55.84m^2	60%	7.5m	16.2m (Road Centre)	CSB-HJL-AB-ZZ-DR-A-2011
Section C-C (1)	3 x 24 (72m^2)	58.78m^2	90%	4.0m	9.3m (Site Boundary)	CSB-HJL-AB-ZZ-DR-A-3011
Section D-D	3 x 12 (36m^2)	16.00m^2	50%	2.0m	8.8m (Block B)	CSB-HJL-AB-ZZ-DR-A-3011
Section E-E	3 x 3 (9m^2)	3.63m^2	50%	1.5m	10.3 (Block A)	CSB-HJL-AB-ZZ-DR-A-3012
Section F-F	3 x 15 (45m^2)	2.90m^2	20%	1.0m	5.1m (Site Boundary)	CSB-HJL-AB-ZZ-DR-A-3012

1. The Bike Store is assumed to be classified as low risk.

4.4 Roof Coverings

All roof coverings must achieve a BROOF(t4) classification.

B5 ACCESS AND FACILITIES FOR THE FIRE SERVICE

5.0 ACCESS AND FACILITIES FOR THE FIRE SERVICE ./..

5.1 Basis for compliance

- Section 5 of Technical Guidance Document B, 2006.

5.2 Fire Mains

5.2.1 Number and Location of Internal Fire Mains

Stairs A01 and A02 in Block A and B01 in Block B will be provided with dry risers. The dry riser outlet points will be located within the stair enclosures at all upper levels.

It is noted that dry risers are being provided as a compensatory measure.

5.2.2 Provision of Hydrants.

The combined ground floor area is approximately 2,600m^2; therefore 3 no. hydrants are required in accordance with item 5.1.7 of TGDB. It is noted that the building is located within an urban area. One of the existing hydrants will be able to serve the building. These are proposed locations and will comply with the provisions of Item 5.1.7 and Diagram 30 of Technical Guidance Document B, in that:

- the distance from the buildings will be a minimum of 6m and a maximum of 46m.
- the distance from the hydrants to a vehicle access roadway or hard standing will be a maximum of 30m.
- the hydrants will be located having regard for vehicle access for fire appliances.
- the hydrants will be located on a public roadway adjacent to the site.

The hydrants will be conspicuously marked in accordance with BS 3251: 1976. The hydrants will comply with the recommendations of EN 14339: 2005.

5.0 ACCESS AND FACILITIES FOR THE FIRE SERVICE ./..

5.3 Vehicle Access

Vehicle access to the premises will be in accordance with Table 5.2 of Technical Guidance Document B as may be seen in the table below.

Vehicle Access				
Volume of building (m^3)	**Height of top storey above ground floor level (m)**	**Required vehicle access [%]**	**Proposed vehicle access [%]**	**Type of appliance**
56000-85000	Over 10m	75%	50% Note 1	Pump appliance

Note 1:
Less than 75% required vehicle access is proposed in this instance as such dry mains are proposed to all stairs as a compensatory measure.

5.3.1 Design of access route and hard standing

Vehicle Access Route Specifications			
Minimum width between kerbs	**Minimum clear height**	**Minimum turning circle**	**Minimum carrying capacity**
3.7m	4.0m	16.8m [1]	16.25 tonnes

Note 1:
Hammerhead turning area to be provided in lieu of turning circle.

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5.0 ACCESS AND FACILITIES FOR THE FIRE SERVICE ./..

5.4 Ventilation of Heat and Smoke

5.4.2 Escape stair Ventilation

Smoke control to aid the fire brigade will be provided to the escape stairway in accordance with 5.4.3.2 of TGD B and the relevant clauses of BS 5588 Part 1 as shown below.

The stair will be provided with an automatically open vent at the top of the stair enclosure. The vent will open upon activation of the smoke detection provided within the stair and will also open upon activation of the smoke detection in the common lobbies. Fire fighters manual override switches for the AOVs will be provided adjacent to the final exit at ground floor level. The vent will have a minimum free area of 1 m^2.