Michael Slattery Associates
Fire Safety Engineers

The Railyard, Apartment Development at Albert Quay, Albert Street, Cork

Fire Safety Certificate Application
Compliance Report©

Project Number > 18446-3
Reference > 18446-3R002

For: Progressive Asset Holdings Unlimited Company / Cluid Housing

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The Railyard, Residential Apartment Development Albert Street, Albert Quay, Cork City

18446-3

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/1 INTRODUCTION

1.1 SCOPE

This report is submitted with drawings and other documentation in support of an application for a Repeat Fire Safety Certificate in place of the previously approved FSC under which FSC2303240CY was granted under Part III of the Building Control Regulations 1997-2021 for the construction of the Railyard Residential Apartment Development at Albert Street, Albert Quay, Cork City.

In this Report, it is demonstrated that the building, if constructed in accordance with the drawings and design details submitted with the application together with performance requirements prescribed in this Report, will comply with the requirements of Part B (Fire Safety) of the Second Schedule to the Building Regulations 1997-2024. It is noted that the objective of the fire safety measures set out in this Report is to satisfy the obligations of the Building Regulations, which are concerned with the health, safety and welfare of persons in and about the proposed building.

Additional measures may be necessary to protect against the risk of property and consequential loss; such measures are however a matter for the client and the clients Insurers.

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

- Section /2 Requirement B1: Means of Escape in Case of Fire.
- Section /3 Requirement B2: Internal Fire Spread (Linings).
- Section /4 Requirement B3: Internal Fire Spread (Structure).
- Section /5 Requirement B4: External Fire Spread.
- Section /6 Requirement B5: Access and Facilities for the Fire Services.
- Appendix A - Fire Performance Ratings for Materials / Structure / Doorsets.
- Appendix B - Qualitative Design Review
- Appendix C – Previously approved FSC Report 18446R001RevD on foot of which FSC2303240CY was granted

This Report shall not be treated as a specification for the works.

As this is a repeat FSC application, we note that further to grant of Fire Safety Certificate application FSC2303240CY for the above-mentioned development, we hereby submit that this FSC application satisfies the criteria as set out in Article 26(3) of the Building Control Regulations 1997 to 2021.

On this basis we note, on our client's behalf, that a refund in the amount of 75% of the fee lodged with this current application, in accordance with Article 26(2) of the Building Control Regulations 1997 – 2021 would be due to be refunded to the client.

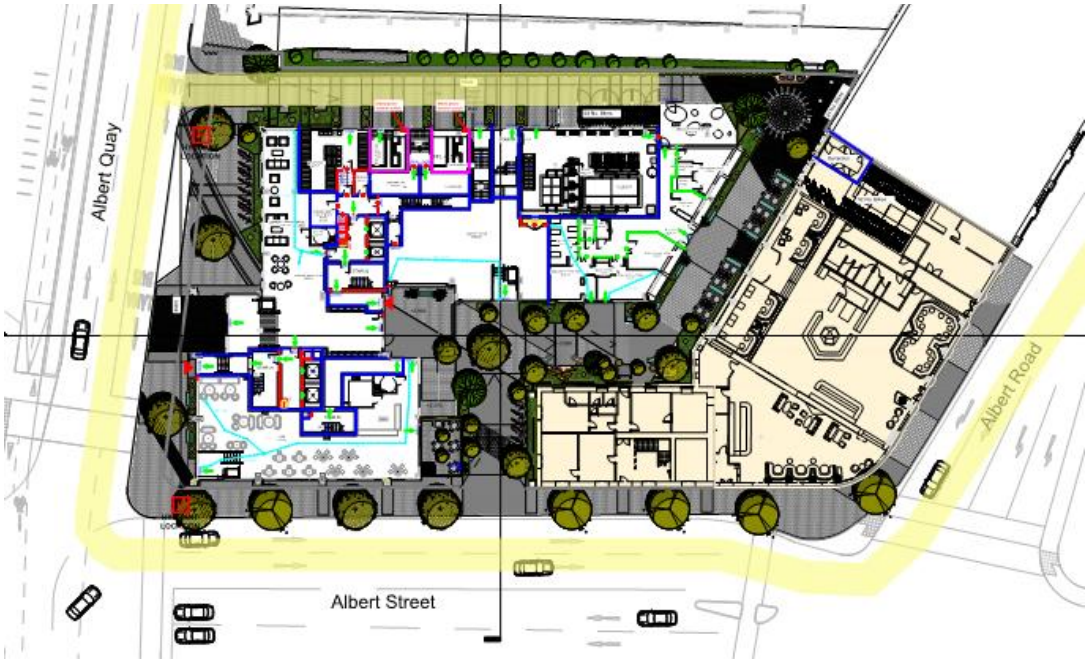
1.2 OUTLINE DESCRIPTION OF THE DEVELOPMENT

1.2.1 General

The Railyard Residential Apartment Development is a 217-no. unit residential development bounded by Albert Quay East, Albert Street, Albert Road, and the existing Navigation Square Site. The development will consist of two residential blocks with bike storage and plant space at lower ground level along with shared residential facilities at Ground ,1st and 2nd Floor Levels. A Community Space and Creche are also proposed at Ground Floor.

A separate Fire Safety Certificate application will be lodged for the proposed works to the existing Carey House and former Station Terminus (Protected Structure). See Figure below illustrating the site layout of the Railyard development.

Figure 1: Indicative Railyard Apartment Ground Floor and Site Layout



1.2.2 Scope of Works

This Repeat Fire Safety Certificate application is being submitted to Cork City Fire Brigade on foot of the recently approved Fire Safey Certificate under which FSC2303240CY was granted 22nd January 2024.

This FSC relates to the layout of the Railyard Apartment Development and will take the form of an L in terms of the building shape and shall be provided with four stair cores. Two of the stair cores (Core 1 & 2 in Block 1) shall serve the tower element of the building with top floor height of circa 79m. The remaining two stairs (3 & 4 in Block 2) shall serve lower sections of the building with top floor height of circa 40m. Cores 1 & 3 shall be designed as fire-fighting shafts and Core 2 & 4 designed as protected shafts.

Both Blocks 1 and 2 will primarily consist of a mix of open plan apartments, studios and apartments with a protected entrance hall. All are over a single level (no duplexes). All apartments will be provided with an automatic water fire suppression system. These apartment designs are further detailed within this compliance report.

All Apartments within the Railyard development will be served by two escape stairs. Design of escape stair and common corridor design is further detailed within this compliance report.

The Railyard development shall also contain ancillary commercial spaces at Ground level namely 1 No. Community Space and 1 No. Creche. The Community Space shall be subject to a future fit-out Fire Safety Certificate application.

Lower Ground to 2nd levels shall also contain residential amenity areas and facilities available to residents only.

As the building height exceeds 30m it shall be provided with sprinkler protection throughout.

To assist with fire service operations, each firefighting stair will be provided with a wet rising main. As noted above, all four stair cores shall serve floor levels in excess of 20m in height and 1 in each area shall therefore be designed as fire-fighting shafts given that the max area of the floors in the tower and the lower Block on the Eastern side of the site will be less than 900m^2 (i.e. max c 860m^2 for the East block). Fire tender access shall be provided via the roadway on the perimeter of the building. The inlet point shall be provided within 18m of the fire tender set down location for replenishment of the Wet Riser Tank.

1.3 DESIGN APPROACH

As noted above, the majority of the Railyard will comprise of residential accommodation.

As specific guidance on open plan apartments is now included in the latest Technical Guidance Document B (Reprint 2020) guidance, herein termed TGD B: 2020, it is proposed that the residential levels of the Railyard Residential development shall be designed in line with this document.

It is noted that Section 1.1.2 of TGD B: 2020 refers to BS 5588: Part 1: 1991 and it is therefore considered appropriate to use the guidance contained in this document. Where TGD B: 2020 references BS 5588: Part 1 or where specific guidance is not provided in TGD B: 2020 as best practice. Referenced documents are clearly outlined within this report. It shall be noted BS 5588-1:1990 + Amendments 1 & 2 Fire precautions in the design, construction and use of buildings. Code of practice for residential buildings will be used in conjunction with TGD B:2006 +2020. From here on in the report, these may be referred to as TGD B, TGD B:2006, TGD B:2020, BS 5588-1, BS 5588-1:1990 etc. Other documents, where referenced for the first time, will be referred to as their full title initially and then abbreviated.

1.4 Management

We note that in accordance with Condition 2 of the first approved FSC under which FSC 2303240CY was granted, we can confirm that the ‘person having control’ of the building will comply with the ‘Fire Safety Guide for Building Owners and Operators - Guide for Persons Having Control’ (March 2022) under Section 18(2) of the Fire Services Acts 1981 and 2003.

We further note that, in accordance with Condition 3 of the first approved FSC under which FSC 2303240CY was granted, a fire safety assessment of this building will be carried out at least every three years by a competent fire safety assessor in accordance with the ‘Code of Practice for Fire Safety Assessment of Premises and Buildings (March 2022)’.

1.5 SCHEDULE OF DRAWINGS

Table 1: Drawing Schedule

DRAWINGS TITLE	NUMBER	REVISION NO.	PREPARED BY (1)
Site Location Map	MSA-18446-3-001-FSC-(OS Map)-A1	-	MSA
Site Layout Plan	MSA-18446-3-002-FSC-A1	A	MSA
Lower Ground Floor Plan	MSA-18446-3-003-FSC-A1	A	MSA
Ground Floor Plan	MSA-18446-3-004-FSC-A1	C	MSA
First Floor Plan LEVEL 01	MSA-18446-3-005-FSC-A1	A	MSA
Second Floor Plan LEVEL 02	MSA-18446-3-006-FSC-A1	A	MSA
Third Floor Plan LEVEL 03	MSA-18446-3-007-FSC-A1	A	MSA
Fourth Floor Plan LEVEL 04	MSA-18446-3-008-FSC-A1	A	MSA
Fifth Floor Plan LEVEL 05	MSA-18446-3-009-FSC-A1	A	MSA
Sixth Floor Plan LEVEL 06	MSA-18446-3-010-FSC-A1	A	MSA
Seventh Floor Plan LEVEL 07	MSA-18446-3-011-FSC-A1	A	MSA
Eight Floor Plan LEVEL 08	MSA-18446-3-012-FSC-A1	A	MSA
Ninth Floor Plan LEVEL 09	MSA-18446-3-013-FSC-A1	A	MSA
Tenth & Eleventh Floor Plan LEVEL 10-11	MSA-18446-3-014-FSC- A0	A	MSA
Twelve & Thirteenth Floor Plan LEVEL 12 - 13	MSA-18446-3-015-FSC- A0	A	MSA
Fourteenth to Seventeenth Floor Plan LEVEL 14-17	MSA-18446-3-016-FSC-A0	A	MSA
Eighteenth to Twenty-First Floor Plan LEVEL 18-21	MSA-18446-3-017-FSC-A0	A	MSA
Twenty-Two to Twenty-Four LEVEL 22-24	MSA-18446-3-018-FSC- A0	A	MSA
Roof Plan LEVEL 25	MSA-18446-3-19-FSC-A1	A	MSA
North Elevation	MSA-18446-3-020-FSC-A1		
Southwest Elevation	MSA-18446-3-021-FSC- A1	-	MSA
Southeast Elevation	MSA-18446-3-022-FSC-A1	-	MSA
Northeast Elevation	MSA-18446-3-023-FSC-A1	A	MSA
Section AA	MSA-18446-3-024-FSC-A1	-	MSA
Section BB	MSA-18446-3-025-FSC-A1	-	MSA
Perimeter Section – Typical Slab edge detail	5003	-	HJL
Firefighting shafts – typical core layout	FR4000	-	HJL
Techrete Billet Details	-	-	Techrete

Note

1. MSA = Michael Slattery Associates, 19 Windsor Place, Lower Pembroke Street, Dublin 2

   HJL – Henry J Lyons, 51-54 Pearse St. Dublin 2

/2 REQUIREMENT B1: MEANS OF ESCAPE IN CASE OF FIRE

2.1 BASIS FOR COMPLIANCE

2.1.1 Residential Areas – TGD-B:2020 Supplemented by BS 5588-1

Compliance with Requirement B1 Means of Escape in Case of Fire is demonstrated by reference to the relevant recommendations of TGD B: 2020, supplemented with BS 5588-1 guidance where required.

2.1.2 Common Areas – TGD-B:2020

Compliance with Requirement B1 Means of Escape in Case of Fire is demonstrated by reference to the relevant recommendations of TGD B: 2020,

2.2 SUMMARY OCCUPANCY LEVELS

Table 2: Estimated Peak Occupancy Levels of Ancillary Areas

Location	Area (1) (m^2)	Usage	Occupant Load Factor (m^2/Person) (2)	Estimated Peak Occupancy Level (Persons)
Lower Ground Level				
Bicycle Store	157	Storage	30.0	6
Plant	121	Plant	30.0	4
Ground Level				
Bin Store	48	Storage	30.0	2
Communal Amenity Space	160	Amenity	# of Seats	31
Amenity Area	150	Amenity	5.0	30
Community Space	205	Assembly	2.0	103
Comms / Control Room	11	Office	7.0	2
Sub-Station 1	8.7	Plant	30.0	1
LV Switch Room 1	11	Plant	30.0	1
Sub-Station 2	8.7	Plant	30.0	1
LV Switch Room 2	11	Plant	30.0	1
Plant	146	Plant	30.0	5
Creche	See section 2.4 below			
First Floor				
Communal Amenity Space	153	Amenity	# of Seats	35
Second Floor				
Communal Amenity Space	165	Amenity	# of Seats	51
9th Floor				
Outdoor amenity Terrace area	120	Assembly	2 (3)	60
12th Floor				
Outdoor amenity Terrace area	430	Assembly	2 (3)	215

Notes:

1. *Refers to area of room or storey, as appropriate, with area calculated in accordance with Paragraph 1.0.10(a)(i) of TGD B: 2020.*
2. *Occupancy load factors as per Table 1.1 of TGD B 2020.*
3. *Considered appropriate for residential amenity area.*

2.3 HORIZONTAL MEANS OF ESCAPE - ANCILLARY AREAS

It is noted that Community Space Unit will be subject to future fit-out Fire Safety Certificate. This Fire Safety Certificate Application therefore assesses the shell and core design of this unit only.

2.3.1 Minimum Number of Escape Routes

Commercial/amenity areas shall be provided with 2 no. exits therefore meeting the recommendations of Section 1.2.2.4 of TGD-B:2020. Where single escape routes are proposed, they shall comply with section 1.2.2.5 of TGD B.

Community Space Unit on Ground Floor level is provided with two escape routes.

2.3.2 Exit Widths

All rooms / areas with an occupancy of 50 persons or less are to be provided with a minimum of one room/storey exit having a width of not less than 750mm. The table below outlines the minimum room/storey exit width recommendations for each ancillary area with an occupancy of more than 50 persons.

Table 3 – Exit capacities

Location / Room Reference	Estimated Peak Occupant Level (1) (persons)	Proposed Minimum Exit Widths (2) (mm)	TGD B Exit Capacity (3) (persons)
Community Space	103	3 x 850	200
Second Floor Amenity	51	2 x 850	100
9th Floor Terrace	60	1 x 950	150
12th Floor Terrace	215 (4)	2 x 1100	220

1. *Extracted from Table 2 above.*
2. *Width refers to:*
   - *(a) effective clear width of doors measured from door stop to projecting building hardware (subject to the door leaf opening to an angle of at least 90º). Door hardware which does not encroach more than 100mm into this width may be ignored.*
   - *(b) Clear width of corridor/passageway measured between walls or other obstructions such as columns, at shoulder level (i.e., 1500mm above floor level). Handrails which do not encroach more than 100mm into this width may be ignored.*
3. *Allowing for the discounting of one (widest) exit (where two exits exist) in accordance with Section 1.2.4 of TGD B: 2020.*
4. *There are2 exits from this floor accessing 2 no. stairs, No. 1 & 4. Each stair is 1200mm in width which in accordance with Table 1.6 of TGD B, has a capacity over one level for 240 people which is in excess of the estimated occupancy level.*

2.3.3 Sub-division of corridors

The relevant recommendations in Section 1.2.5.3. of TGD-B:2020 shall be complied with where necessary where the corridor shall be subdivided where it provides access to alternative escape routes.

2.3.4 External Escape Routes

Not applicable within ancillary areas.

2.3.5 Travel Distance

The travel distances within all ancillary areas are to meet the maximum travel distance limits set out in Table 4.

Table 4 – Travel Distances

Location	Maximum Distance Proposed (m)		Recommended (1) Limits (m)	
	Dead End	Alternative	Dead End	Alternative
Community Space	9	<45	18(1)	45(1)
Ground Floor Amenity Areas	<18	<45	18(1)	45(1)
First Floor Amenity Area	<18	<45	18(1)	45(1)
Second Floor Fitness Area	9	<45	18(1)	45(1)
High Risk Plant	<9	<18	9(1)	18(1)
Plant	<18	<45	18(1)	45(1)
9th Floor Terrace	<18	<45	18(1)	45(1)
12th Floor Terrace	<18	<45	18(1)	45(1)

1. *As per Table 1.2 of TGD B: 2020*

As can be seen from the above table, and as illustrated on accompanying FSC drawings, travel distances within ancillary areas are within permitted limits.

2.3.6 Inner Rooms

An inner room is a room whose only escape route is through another room which is called the access room. Inner rooms, where provided, will meet the following design criteria in line with Section 1.2.3.1 of TGD B: 2020:

- The occupant capacity of the inner room will not exceed 20 people.
- The inner room will not be a bedroom.
- The escape route from the inner will not pass through more than one access room.
- The travel distance from any point in the inner room to the exits of the access room shall not exceed the limitations outlined in Table 4
- The access room shall not be a special place of fire hazard and it will be in control of the same occupier.
- One of the following will be provided:
  - The enclosures (walls or partitions) of the inner room will be stopped at least 500mm below the ceiling; or
  - A vision panel of sufficient size will be provided to the door or wall of the inner room; or
  - The access room will be fitted with an automatic fire alarm and detection system.

2.3.7 Open Connection Between Floors

Not applicable within ancillary areas.

2.3.8 Planning of Exits in a Central Core

All relevant recommendations of Section 1.2.3.3 of TGD-B:2020 shall be complied with.

2.3.9 Access to Storey Exits

Not applicable within ancillary areas.

2.3.10 Separation of Circulation Routes from Stairways

Not applicable within ancillary areas.

2.4 HORIZONTAL MEANS OF ESCAPE - CRECHE

It is noted that the Creche at ground floor level will be designed in accordance with TGD B:2020 along with the addition guidance given in:

- Fire Safety in Preschools (1999)
- Universal Design Guidelines for Early Learning and Care Settings

Table 5 – Estimated Occupancy of Creche

Location	Area (1) (m^2)	Usage	-	Occupant Load Factor (m^2/Person) (2)	Estimated Peak Occupancy Level (Persons)
Ground Floor					
Care Rooms	-	-	*Age group*	*Children & Teachers*	-
Babies Room	21	Class room	<1 year	6 + 2	8
Sleep Room	12	Sleep room	<1 year		
Class room 1-2	22.5	Class room	1-2 years	8 +2	10
Class room 3-6	18.6	Class room	3-6 years	8 +1	9
Care Room 2-3	20	Class room	2-3 years	8 + 2	10
Accommodation and ancillary rooms					
Reception / Waiting area	36	Office	-	No. of seats	4 (4)
Staff room	8	Office	-	2.0	4
Total					**45**

Notes:

1. *Refers to area of room or storey, as appropriate, with area calculated in accordance with Paragraph 1.0.10(a)(i) of TGD B: 2020.*
2. *Occupancy load factors as per Table 1.1 of TGD B 2020.*

2.4.1 Escape Routes

Escape routes are provided to meet the recommendations of Section 3.3.2 of Fire Safety in Preschools (1999) in that:

- Escape routes may be by way of a door leading directly to a place of safety outside the premises, or may be by way of a hallway, a corridor. All escape routes must lead to a place of safety in the open air at ground floor level.
- Escape is not provided through another room

2.4.2 Travel Distance

The travel distances within all areas of the Creche are to meet the maximum travel distance limits set in section 3.3.3. of Fire Safety in Preschools (1999) as set out below.

Table 6 – Creche Travel Distances

Location	Maximum Distance Proposed (m)		Recommended (1) Limits (m)	
	Dead End	Alternative	Dead End	Alternative
Care rooms (active children)	<7	<45	18	45
Sleeping rooms (children or infants)	<9	<<45	10	20
Accommodation and Ancillary rooms	<10	<<45	18	45

Notes:

1. *As per Table 3.3.3 of Fire Safety in Preschools (1999)*

As can be seen from the above table, and as illustrated on accompanying FSC drawings, travel distances within the Creche areas are within permitted limits.

2.4.3 Alternative Escape Routes

Alternative escape routes are required where the travel distance for a single escape route indicated in Table 3.3.3 is exceeded or where the number of children in any room/area exceeds 20.

Alternative escape routes are provided. These routes are by way of either an exit door directly to the outside of the premises, through a hallway, or by way of a corridor which is protected from fire and smoke by fire resisting construction.

It is noted that a window which is suitable for escape or rescue shall be provided from each room that will accommodate children. The opening section of the window should be approximately 850 mm high and 500 mm wide and the bottom of the opening should be between 800 mm and 1100 mm above the floor.

2.4.4 Exit Widths

All rooms / areas with an occupancy of 50 persons or less are to be provided with a minimum of one room/storey exit having a width of not less than 850mm.

2.4.5 Final Exits

It is noted that the final exits have been dimensioned to facilitate the evacuation of the Creche simultaneously and are sized accordingly.

Main entrance / Exit	850mm
Corridor Exits	850mm each.
Estimated Occupancy	45 people.
Total exit capacity	100 people discounting one exit.

2.4.6 Sub-division of corridors

Not applicable to this application.

2.5 HORIZONTAL MEANS OF ESCAPE – RESIDENTIAL AREAS

The design of Horizontal Means Of Escape in the Residential areas is in accordance with the previously approved FSC under which FSC2303240CY was granted.

2.5.1 Recommendations for Means of Escape from Flats & Maisonettes

The apartments within the Railyard building will be designed Studios, Open Plan arrangements and Protected Entrance Hallways (PEH). The proposed apartments shall be accessed via internal common corridors.

Section 1.1.2 of TGD B: 2020 recommends means of escape in buildings containing flats and maisonettes (Purpose Group 1(c)) be designed in accordance with BS 5588: Part 1: 1990, Fire precautions in the design, construction and use of buildings, Part 1, Code of practice for residential buildings; and Sub-sections 1.4 (general provisions for means of escape), 1.6 (open plan flats), 1.7 (protected corridors / lobbies serving all flats), and 1.8 (domestic sprinkler systems).

2.5.2 Open Plan Apartment Proposals

Open plan apartments within the Railyard building shall be designed in accordance with the recommendations of Section 1.6 and Diagram 9A of TGD B: 2020 in that.

- Each door between the flat and a protected corridor/lobby will have the same period of fire resistance as the wall in which it is situated, but not more than 60 minutes, in accordance with Appendix B of TGD B: 2020.
- The unit shall be provided with a residential sprinkler system (BS 9251:2021 Fire sprinkler systems for domestic and residential occupancies - code of practice), see section 2.20.
- The apartment shall be situated on a single level only.
- The maximum travel distance from any point in the apartment to the final exit door will not exceed 20m.
- A fire detection and alarm system shall be provided, consisting of interconnected self-contained mains powered/ battery backed smoke/heat alarms (Grade D LD1), which will be installed in the following areas.
    - Throughout the dwelling, including all circulation areas that form part on an escape route and,
    - All high fire risk areas/rooms such as kitchen, living rooms, utility rooms,

    See section 2.13 for additional information on the fire detection and alarm system.
- The kitchen area, which is not enclosed in storey height construction, shall be designed such that an occupant escaping the apartment will not have to approach within 1.8m of the main kitchen cooking appliance. Note a main kitchen cooking appliance is a cooking apparatus with a fixed connection to the dwelling's gas or electric energy infrastructure (e.g., an over and/or hob).

2.5.3 Protected Entrance Hallway Apartment Proposals

All apartments with a PEH shall be designed in accordance with Section 9.5 of BS 5588: Part 1 in that;

- No apartment shall be so planned that any habitable room is an inner room.
- The apartment shall be so planned that all habitable rooms are entered directly from a protected entrance hall, and the travel distance from the flat entrance door to the door of any habitable room does not exceed 9m.
- The protected entrance hall shall be designed with 30-minute fire resistance and FD30 fire doors complete with self-closing devices.
- The apartment entrance door shall be designed as an FD30S fire door complete with self-closing device.

2.5.4 Studio Apartment Proposals

All Studio apartments shall be designed in accordance with Figure 5 of BS 5588: Part 1 in that;

- the travel distance from the flat entrance door to any point in any habitable room does not exceed 9 m (see Figure 5); and
- the position of any cooking facilities is remote from the dwelling entrance door and does not prejudice the escape route from any point in the flat.

2.5.5 Common Corridor Escape Routes

Apartments within all areas of the building will be afforded egress via two protected escape stairs. The common corridor design is further detailed below for each egress stair scenario.

2.5.6 Two Escape Stairs

The design of the common horizontal escape routes in a two-stair scenario is in accordance with Section 12.2 and Figure 13 of BS 5588-1 as detailed below. It shall be noted that each of the Open plan residential units will be sprinkler protected to a category 4 standard, in accordance with BS 9251:2021 Fire sprinkler systems for domestic and residential occupancies - code of practice:

- The common corridor will be provided with a smoke control system in accordance with Section 1.7 of TGD B. Refer to Section 2.9.1 of this report. Firefighter override switches will be provided within the stair core at each level to operate the smoke ventilation system on that level.
- A 1m² AOV shall be provided at the head of each stair. The vent will be automatically activated upon detection of a fire in the corridor and controllable by a switch at Fire Service access level.
- The common corridor will be enclosed in at least 60 minutes fire resisting construction.
- Self-closing FD30S & FD60s fire doors will be provided to flat entrances in accordance with TGD B: 2020.
- The corridor will be sub-divided at approximately its mid-point with an FD30s fire door, where the maximum distance from the flat entrance door to the stair exceeds 15m.

2.5.7 Corridor / Lobby Travel Distances in Buildings with a Single Stairway

In accordance with section 1.7.1 of TGD B, as the residential areas are sprinkler protected and provided with smoke control in the form of an AOV being provided in the corridor, it is noted that the travel distance is increased to maximum 15m.

2.5.8 Private Balcony Compliance

All external apartment balconies can be defined to be open balconies and accordingly by reference to D.2 of Annex D of BS 9991: 2015 are not required to be considered as inner rooms.

All communal roof terraces/gardens will comply with the recommendations of Annex D.4 of BS 9991: 2015. For further info, refer to section 2.22.

Annex D of BS 9991 recommends sounders be provided to apartment balconies more than 4.5m above ground level, where occupants are required to evacuate through an access room with an unenclosed kitchen area. The automatic fire alarm system within the apartment units shall therefore be capable of achieving 65dB on the adjoining balcony areas to satisfy this recommendation.

2.5.9 Communal Balcony Compliance

The communal roof terraces / gardens will comply with the recommendations of Annex D.4 and D.6 of BS 9991: 2015 in that:

- The floor of the terrace area will achieve 120-minute Fire resisting construction.
- Travel distance in a single direction externally shall be <18m.
- Access to communal roof gardens shall be from a protected stairway enclosure or a protected ventilated lobby/corridor.
- An alarm, audible throughout the roof garden, shall be sounded upon activation of any fire detection system in the stairs or lobby/corridor access space.

In addition to the above, further guidance is given in BS 8579: 2020.Refer to section 2.21 below.

2.6 VERTICAL MEANS OF ESCAPE – NON-RESIDENTIAL AREAS

2.6.1 Below ground

The Plant room and Bike store are each provided with a stair as means of escape. The plant room also has an alternative escape route via the bike store.

Table 7 – Stairs serving below ground level and exit capacity

Stair Reference	Minimum Stair Width (mm) (1)	No. of Levels Served	Maximum Number of Persons Accommodated on One Stair of Width (3)	Stair Exit Capacity (2) (Persons)
Bike	800	1	50	50
Plant	800	1	50	50
Total Stair Exit Capacity (Persons) (2)				**50 each**

1. *Width refers to the clear width between walls or balusters subject to handrails not intruding more than 100mm.*
2. *As per Table 1.6 of TGD-B:2020*
3. *Each area has a low occupancy as per Table 2above.*

2.6.2 Above Ground Areas

First and Second Floors have Communal Amenity Areas and have the following exits and egress capacities:

Table 8 – Stairs and Exit capacity.

Stair Reference	Stair Width (mm) (1)	No. of Levels Served	Maximum Number of Persons Accommodated on One Stair of Width (3)	Stair Exit Capacity (2) (Persons)
Stair 1	1200	2	285	285
Stair 2	1000	2	190	190
Total Stair Exit Capacity (Persons) (2)				**190**
Total 1st plus 2nd Floor Amenity Area Occupancy				**86**

1. *Width refers to the clear width between walls or balusters subject to handrails not intruding more than 100mm.*

2. *Discounting one of the stairs -- stair 01*
3. *As per Table 1.6 of TGD-B:2020*
4. *The above ground stairs all have a storage capacity between levels in excess of the occupancy to the residential level served. It would not therefore impact the flow capacity to that stairs where they serve ancillary areas.*

2.6.3 Final Exits

It is noted that the final exits have been dimensioned to facilitate the evacuation of the development simultaneously and are sized accordingly.

2.6.4 Discharge from Stairs

The exit discharge route from a stairway shall be at least as wide as the stair leading to it, i.e., 1200mm or 1000mm.

2.6.5 Phased Evacuation

Not relevant within the scope of this application as the strategy is based on simultaneous evacuation.

2.6.6 Enclosure of Escape Stairways

Each Firefighting stairway shall be enclosed in 120-minute fire rated construction complete with FD60S doorsets (FD30 to lift door) at all levels.

Each protected stairway shall be enclosed in 60-minute fire rated construction complete with FD30S doorsets at all levels.

2.6.7 Exits from Protected Stairways

Each protected stair at ground level shall discharge occupants direct to external either via a final exit or via a protected exit passageway to a final exit.

2.6.8 Separation of Adjoining Stairways

In accordance with Section 1.3.6.4 of TGD B, where two protected stairways (or exit passageways leading to different final exits) are adjacent, they shall be separated by an imperforate enclosure.

2.6.9 Use of Space Within Protected Stairways

Use of space within protected stairways will be in accordance with Section 1.3.6.5 of TGD B 2020. Residential cores may discharge through small entrance foyers. Residential foyers shall be small in area with minimal fire risk due to the nature of the space being used for general circulation to lifts/stairs. Any post boxes shall be constructed of non-combustible construction and shall either be recessed into the wall or provided with a sloped top to avoid risk of materials being stored on top of the post box. Any electrical meters shall be appropriately separated from the foyer with 60-minute fire resistance and FD60s doorsets.

2.6.10 Fire Resistance and Openings in External Walls of Protected Stairways

The recommendations outlined in Section 1.3.6.6 & Diagram 7 of TGD-B:2020 shall be complied with. Please see accompanying drawings.

2.6.11 Gas Service Pipes in Protected Stairways

Gas service pipes shall not be incorporated within protected stairways as per Section 1.3.6.7 of TGD B 2020.

2.6.12 Separation of Special Fire Risk Areas

Places of special fire risk shall not communicate directly with the enclosure of a protected stair as per Section 1.3.6.8 of TGD B 2020. Refer to section 4.9 for further information.

2.6.13 External Escape Stairways

Not relevant to the scope of this application.

2.7 VERTICAL MEANS OF ESCAPE – RESIDENTIAL AREAS

2.7.1 Stairways

The table below provides an overview of the stair cores provided within Railyard Building.

Table 9 – Stair Design

Stair Ref	Height of Topmost Floor Served (m)	Stair Design	Clear width (mm)
Stair 1	>20	Fire-fighting shaft	1200 (1)
Stair 2	>20	Protected stair	1000
Stair 3	>20	Fire-fighting shaft	1200
Stair 4	>20	Protected stair	1200 (2)

Notes:

1) *It is noted that the stair section serving from the 24th floor up to the plant area at the roof will be a minimum 800mm in width in accordance with Table 1.5 of TGD B:2020 in that its only serving plant on roof and <50 people.*

2) *It is noted that the stair section serving from the 11th floor up to the 12th floor roof terrace will be a minimum 1100mm in width in accordance with 2.3.2 above.*

2.7.2 Final Exits

It is noted that the final exits have been dimensioned to facilitate the evacuation of the development simultaneously and are sized accordingly.

2.7.3 Discharge from Stairs

The exit discharge route from a stairway shall be at least as wide as the stair leading to it, i.e., 1200mm or 1000mm.

2.8 LIFT SHAFTS – ALL AREAS

2.8.1 Fire Protection

Table 10: Protection of Lift Shafts

Lift Shaft Reference	Protection Proposed
Above Ground	All Lift shafts to be enclosed in 120-minute fire rated construction within firefighting shafts (as per Table 15 and Section 6.7 recommendations) and fitted with FD30 landing doors. It is noted that the lift lobby will be ventilated via a smoke control system as part of the firefighting shafts.

2.8.2 Lift Controls

Lift cars are to be provided with the necessary controls to ensure the achievement of the interfaces prescribed in Section 2.13 below. Lifts to conform to EN 81-20.

2.9 VENTILATION OF ESCAPE ROUTES (ALL AREAS)

2.9.1 Residential Common Lobbies

The residential corridors at all levels will be provided with smoke control systems in accordance with Section 36.2.3 and Figure 13 of BS 5588-1 and Section 1.7 of TGD B: 2020. Detail on AOV/smoke shaft design is outlined below. The proposed method of smoke control for each core is detailed in Section 2.9.2.

Mechanical Smoke Shafts & Supply Shafts

A mechanical smoke extract shaft (COLT type or other approved) is to be provided in accordance with Section 1.7 of TGD B as detailed as follows:

- The top of the lobby vent will be located as close to the ceiling of the lobby as is practicable and will be at least as high as the top of the door connecting the lobby or corridor to the stairwell.
- The lobby vents, in the closed position, shall have a minimum fire and smoke resistance performance of 30 min and integrity (leakage) no greater than 360 $m^3/h/m^2$ when tested in accordance with BS EN 1366-2.
- No services other than those relating to the smoke shaft will be contained within the smoke shaft.
- The design of the mechanical smoke ventilation system will limit pressure differentials so that the door opening forces do not exceed 100N at the door handle when the system is in operation.
- A secondary power supply will be provided to the fans and all actuators and controls.
- Fan sets will be provided with a standby fan that operates automatically upon failure of the duty fan.

2.9.2 Proposed Corridor / Lobby Ventilation Strategy

The below table outlines the proposed ventilation strategy for each core on above ground levels. The proposed ventilation strategy for each core is clearly illustrated on the accompanying FSC drawings.

Table 11 – Corridor/Lobby Ventilation Strategy

Corridor / Lobby Ventilation Strategy	
Core / Area	**Above Ground Levels**
Stair 1	Central fire -fighting lobby provided with supply air shaft. Residential corridors off the fire-fighting lobby then provided with mechanical smoke extract shafts
Stair 2	Protected by mechanically ventilated lobby, stair is adjacent to stair 01
Stair 3	Central fire-fighting lobby provided with supply air shaft. Residential corridors off the fire-fighting lobby then provided with mechanical smoke extract shafts as illustrated on accompanying plans.
Stair 4	1.5m^2 AOV located at head of the shaft.
Bin Store	Natural permanent 0.2m^2 ventilation

The above ventilation strategy for the mechanical smoke extract shafts is currently being developed by a specialist ventilation contractor, with computational fluid dynamics (CFD) analysis to be submitted as part of this Fire Safety Certificate application in due course prior to occupation of the building.

2.9.3 Waste Management Store

As recommended in TGD-B:2020, all refuse bin stores provided shall be provided with a ventilated protected lobby. The lobby will be provided with a 0.2m^2 natural permanent ventilation. The fire rated ductwork will meet the appropriate fire

resistance when tested in accordance with BS 476-24 or BS EN 1366-6 and classified in accordance with BS EN 13501-3.

2.10 EGRESS FOR DISABLED

2.10.1 Residential Levels

In accordance with Section 1.4.15 of TGD B: 2020, refuge spaces shall be provided on each residential level. Refuge spaces (min 1400mm x 900mm) will be located in a common escape stairway or protected corridor/lobby. This protected corridor/lobby will not directly connect to an apartment or ancillary accommodation and will provide direct access to the stairway. Refuge points will be provided with two-way communication devices linked to fire service entry points.

Refuges are to be provided with an emergency voice communication system linked to the fire control centre in accordance with the recommendations of BS 5588-8:1999, the Emergency Voice Communications Systems (EVCS) designed, installed, and commissioned to comply fully with the requirements of BS 5839-9:2021.

It is noted the Community Space and ground floor amenity area (150sqm) have an alternative means of escape by means of a platform lift which leads direct to outside. In the event of a power failure, a secondary power supply will allow a wheelchair user to make own un-assisted escape. This negates the need for a refuge space internally.

2.11 PROTECTION OF ESCAPE ROUTES – ALL AREAS

Table 12: Protection of Escape Routes

Location	Form of Protection
Fire-fighting shafts	Fire-fighting shafts to be enclosed in 120-minute fire rated construction complete with FD60s door sets (FD30 to lift door)
Protected Escape Stairs	Protected Escape Stairs to be enclosed in 120-minute fire rated construction, complete with FD60s
Residential Common Corridors	Residential common lobbies to be enclosed in a minimum of 120 minutes fire rated construction and fitted with FD60S doorsets between the apartments and the lobby in line with TGD B: 2020 recommendations.
Unprotected Corridors – Non-Residential Areas	The enclosures to all unprotected corridors shall be carried up to the underside of the structural floor above (or to a suspended ceiling) and all openings in the corridor enclosure fitted with doors.

2.12 LIGHTING ON ESCAPE ROUTES AND EXIT SIGNPOSTING – ALL AREAS

2.12.1 Normal Artificial Lighting

Normal artificial lighting is to be provided on all escape routes in accordance with relevant CIBSE lighting standards.

2.12.2 Escape Lighting

Escape lighting will be designed and installed in accordance with IS EN 1838:2013 read in conjunction with IS 3217:2023 Code of Practice for Emergency Lighting. The extent of the coverage of the escape lighting to be installed is in line with Table 1.8 of TGD B: 2020, outlined below:

- Defined escape routes within residential areas, other than within dwellings.
- Defined and undefined escape routes in assembly and recreation areas.
- Emergency generator room, switch room, plant room, battery room for emergency lighting.

- External escape routes as required, except where there is sufficient external lighting from a public or other independent source.

2.12.3 Exit Signposting

Exit signage will be located at storey and final exit doors supplemented with directional signposting where the location of the exit would otherwise be unclear or where viewing distance criteria (1) require additional signs.

***Note 1**: Viewing distance criteria are set out in EN 1838:2013 as follows:*
(Viewing distance) = (Height of pictogram) x (S)
S = 200 for internally illuminated signs
S= 100 for externally illuminated signs

The exit signage will be designed to conform to Statutory Instrument No. 299 of 2007 “Safety, Health and Welfare at Work (General Application) Regulations 2007”. The mode of operation will be internally or externally illuminated.

2.13 FIRE DETECTION AND ALARM SYSTEM

2.13.1 Non-Residential Areas

An automatic fire detection and alarm system (AFDAS) will be installed to the non-residential areas to a Category L3X standard. The system will be designed and installed in accordance with IS 3218: 2013 +A1:2019 Code of Practice for Fire Detection and Alarm Systems.

Manual call points will be located at all storey and final exits.

The location of the fire alarm panel / repeater panels will be provided in accordance with the recommendations of IS 3218: 2013 +A1:2019.

In addition to providing early warning to occupants in the event of a fire, the system shall be provided with the following interfaces on activation of the AFDS: (subject to programming):

- Doors held open on hold open devices (if any) are to be automatically re-leased.
- Lifts to return to Ground floor level or non-fire floor.
- All electric locks on doors on escape routes are to release (if any).
- Re-circulating HVAC systems are to shut down.

2.13.2 Residential Areas

Automatic fire detection and alarm systems (AFDAS) will be installed in the residential areas throughout the building as detailed below.

Residential Apartments

Each apartment will be provided with a self-contained fire detection and alarm system, in line with Section 1.5.5 (apartments/maisonettes) and Section 1.6.3(d) (open plan apartments) of TGD B: 2020. The fire detection and alarm system is to be designed in accordance with IS 3218:2013 +A1:2019 as set out in

Table 13.

Table 13: Residential Fire Detection & Alarm System

Location	System Grade/Type	Areas to be Covered
All Apartments	Grade D LD2	- Heat detector in units with a PEH - Smoke detection in the entrance hall - Heat detection in kitchen

		- Smoke detection in dining/living areas - All bedrooms - All high-risk rooms i.e., utility rooms

Note:

1. *Grade D system comprises interconnected mains powered smoke/heat alarms with integral standby power supply.*

The system in individual apartments is to be "standalone" in nature i.e., not connected to the common alarm system.

Common Fire Alarm System

In accordance with Clause 1.4.14.4 of TGD B: 2020 a common fire detection and alarm system (Type L3X) conforming with IS 3218: 2013 +A1:2019 is to be installed within the common escape routes of the apartments. The system will comprise:

- A heat detector in each flat, located adjacent to the entrance door to the flat.
- Sounder in each apartment adjacent to entrance door. Additional sounders, meeting the requirements of EN 54-3, are to be provided where necessary in the circulation area to ensure sounders are positioned not more than 5m from any bedroom door.
- Smoke detector and sounders in all common escape routes.
- Smoke or heat detector (as appropriate) in ancillary accommodation.
- The smoke detectors in the stairways/corridors are to operate the AOV's.
- Smoke detectors in the ancillary areas (Bin and bike store)
- Manual call points at each floor level storey exit.
- Internal sounders provision to ensure that 65dB is achieved on all private balconies with the external doors in a closed position
- Combined sounder / strobe and manual call points on the roof(s) / external terraces

The system will be provided with the following interfaces on activation of the AFDS: (subject to programming):

- Lifts to return to Ground Floor level.
- Vents at top of stairs are to open.
- Smoke control system in common corridors to operate on activation of a specific corridor detector.

The location of the fire alarm panel will be provided in accordance with the recommendations of IS 3218: 2013 +A1:2019 and will generally be at the entrance to each protected escape stair.

2.14 FIRST AID FIRE FIGHTING EQUIPMENT

2.14.1 Portable Fire Extinguishers

Portable fire extinguishers are to be provided as follows in accordance with the recommendations of IS291:2015 +A1:2022 and are to be manufactured to an appropriate standard such as IS EN3.

- Common facilities/amenities e.g., residential amenities areas
- Plant rooms and similar ancillary accommodation.

Note: It is noted that it is not recommended practice to provide fire extinguishers in the common lobbies or stairs in apartment blocks.

2.15 GENERAL PROVISIONS FOR MEANS OF ESCAPE

2.15.1 Doors

Any reference to fire doors in this report is intended to mean a complete door assembly which includes the door leaf or leaves, the door frame, ironmongery (hinges, latches, closers, etc.) and any seals where required between the frame and the leaf or between leaves, and which is installed in a building and is capable of meeting the required performance.

2.15.2 Fire Resistance of Doors

Any reference to fire doors in this Report is intended to mean a complete door assembly which includes the door leaf or leaves, the door frame, ironmongery (hinges, latches, closers, etc.) and any seals required between the frame and the leaf or between leaves, and which is installed in a building and is capable of meeting the required performance. This shall comply with section 1.4.2.2 of TGD B.

2.15.3 Doors on Escape Routes

Doors on escape routes shall comply with the guidance give in section 1.4.3 of TGD B:2006. In respect of door fastenings, direction of opening, amount of opening and effect on associated escape routes, vision panels.

2.15.4 Door Fastenings

In particular it is noted that all doors on escape routes are only to be fitted with simple fastenings that can be readily operated in the direction of escape without the use of a key [(1)].

1. *Where doors on escape routes are to be secured with electrically powered locks these are to conform to the following:*

   (i) are to be the electromagnetic plate type.

   (ii) are to be interlinked with the AFDAS system to release on alarm activation.

   (iii) are to be provided with emergency break glass release switches located in prominent positions on the escape side which on activation are to release the associated lock i.e., are to be hardwired directly to the lock.

   (iv) the systems are not to reengage upon deactivation of the FDAS panel and should have a manual reset arrangement at the security panel.

   (v) where these systems are fitted to final exit doors, they may be supported by the use of panic bars to allow security to be maintained until the door is manually opened.

2.15.5 Direction of Opening

All doors on escape routes can be readily operated in the direction of escape without the use of a key where applicable in accordance with section 1.4.3.3 of TGD B.

2.15.6 Amount of Opening

The recommended method of measurement of door widths is as set out in Figure 1 of TGD B:2006 is demonstrated below.

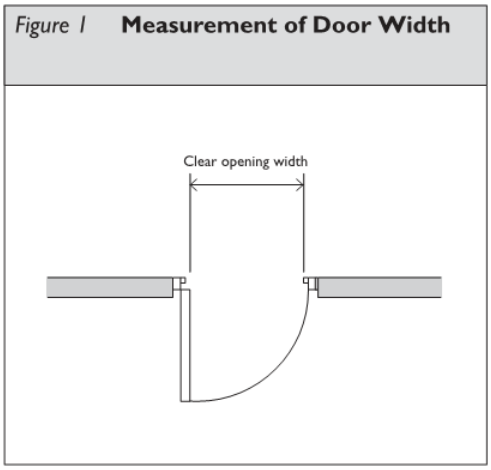


Figure 2: Measurement of Door Widths

The width of a doorway is the clear width when the door or doors are open. Door hardware which does not intrude more than 100 mm into this width may be ignored. (See Figure 1) above. Note: It is assumed that the door or doors are free to open to an angle of at least 90°.

All doors on escape routes shall be hung to open not less than 90°, and with a swing that is clear of any change of floor level, other than a threshold on the line of the doorway and does not reduce the required width of any escape route across a landing.

Similarly, where it is necessary to recess a door that is opening towards a corridor, then the depth of recess shall be sufficient that the door swing does not reduce the required width of the corridor.

2.15.7 Vision Panels

Where doors on escape routes subdivide corridors, vison panels are used, they shall be provided in accordance with section 1.4.3.5 of TGD B:2006.

2.15.8 Revolving and Automatic Doors (If any)

Where automatic doors on escape routes are used, they shall be provided in accordance with section 1.4.3.6 of TGD B:2006.

Automatic doors shall comply with BS 7036-0:2014 Power Operated Pedestrian Doorsets - Safety in Use - Part 0: Code of Practice for Risk Assessment and Risk Reduction and either:

(a) they are arranged to fail safely to outward opening from any position of opening; or

(b) they are provided with a monitored fail-safe system for opening the doors if the mains power supply fails.

2.15.9 Fire Door Signage

In accordance with Appendix B6, all fire doors shall be marked with the appropriate fire safety signage conforming to BS EN ISO 7010:2020+A6:2023 Graphical symbols. Safety colours and safety signs. Registered safety signs.

All fire doors, except apartment doors and lift doors, shall be marked (at about eye level) with the appropriate fire safety sign in accordance with Table A.1 in BS 5499-10:2014 according to whether the door is:

- to be kept closed when not in use;
- to be kept locked when not in use; or

- held open by an automatic release mechanism.

Fire doors to cupboards and to service ducts shall be marked on the outside. All other fire doors shall be marked on both sides. Lift doors do not require signage.

2.15.10 Identification

All fire doors installed in the building shall be permanently identified in accordance with the recommendations of BS 8214:2016 Timber-based fire door assemblies - code of practice, to indicate the period of fire resistance, the manufacturer, year of manufacture, and other pertinent details.

2.15.11 Height of New Escape Routes

i.e., 2000mm min clear headroom with no projections below this level except door frames which in turn are not to reduce the headroom to less than 1960mm.

2.15.12 Floors of New Escape Routes

The floors of all escape routes (including steps and landings) shall have non-slippery even surfaces. Where a ramp forms part of an escape route, it shall not be steeper than 1 in 12 if it is shorter than 9 m, otherwise it shall not be steeper than 1 in 20. Any sloping floor or tier shall be constructed with a pitch of not more than 35° to the horizontal.

2.15.13 Fire Safety Signs

Fire Safety signs are to be provided within the scope of this application in accordance with BS 5499-5:2002 (since withdrawn) and BS EN ISO 7010:2020 +A6:2023 and section 1.4.13 of Technical Guidance Document “B” Fire Safety 2006. All fire safety signs including Exit signs and markings shall comply with Chapter 1 of Part 7 of Statutory Instrument No.299 of 2007 “Safety Signs at Places of Work”, as amended by the Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2007 (S.I. No. 732 of 2007) relating to safety signs at places of work.

In addition to this, photoluminescent signage shall be provided within the stairwells clearly identifying each level.

2.15.14 Construction of Escape Stairways

In respect of construction and geometry of stairways. It is noted that stairways are to be constructed of materials in accordance with the Table in (i) below and are to satisfy in full the recommendations of TGD-K in respect of:

(ii) Rise, going and pitch, i.e.

Stairs Reference	Category of Geometry	Form of Construction
All stairs	Semi Public	Concrete / steel Non-Combustible

(iii) Construction of steps.

(iv) Length of flights.

(v) Handrails and guarding.

In relation to doors opening onto stairways it is submitted that the recommendations of TGD-K are flawed and are inconsistent with other codes / guides on this issue. It is proposed that the clear stairway width be maintained, in this instance, between the arc formed by the swing of the doors and an arc of not less than the stairway width from the face of the balustrade.

2.15.15 Height of Escape Routes

2000mm min clear headroom with no projections below this level except door frames which in turn are not to reduce the headroom to less than 1960mm.

2.15.16 Floors of Escape Routes

Surfaces and slopes to be even and non-slip. In particular, ramps are to have slopes not exceeding the following [(1)]:

- 1 in 12 for ramps less than 9m in length.
- 1 in 20 for ramps exceeding 9m in length.

Note 1: *More onerous requirements may attach to ramps which form part of the access routes or internal circulation routes for disabled persons – refer Approved Document M for guidance.*

2.16 ELECTRICAL INSTALLATIONS

Electrical installations are to be designed and installed in accordance with relevant recommendations of Electro-Technical Council of Ireland's "*National Rules for Electrical Installations*" (IS 10101: 2020 +AC1:2020).

Protected circuits which are required to continue to function in fire conditions (i.e., fire alarm sounders circuits, emergency lighting, etc.) are to meet the requirements of BS 8519:2010.

2.17 VENTILATION SYSTEMS

Section 1.4.11.2 of TGD B: 2020 recommends mechanical ventilation and air conditioning systems be designed in accordance with BS 5588: Part 9 which has since been superseded by BS 9999: 2017. Mechanical ventilation and air conditioning systems are therefore to be designed in accordance with recommendations of Section 32.5 of BS 9999: 2017. It is noted that the apartments are being provided with a recirculating type of charcoal filter cooker hood and no ductwork is proposed from the kitchen areas.

2.18 HEAT PRODUCING APPLIANCES

To be installed in accordance with the relevant recommendations of TGD J and the standards called up therein.

2.19 GAS INSTALLATIONS

To be installed in accordance with recommendations of IS 820 for non-domestic gas installations and IS 813 for domestic gas installations.

2.20 AUTOMATIC FIRE SUPPRESSION

All apartments within the Railyard development will be provided with a residential sprinkler system in line with Section 1.8 of TGD B: 2020. The system shall be designed in accordance with BS 9251:2021 and will have the following minimum requirements.

- Category 4 system
- A minimum duration of operation of 60 minutes
- A minimum design discharge density of 4 mm/min for single head operation, or 2.8 mm/min through each sprinkler operating simultaneously up to a maximum of 4 sprinklers in a single area of operation.
- A primary and secondary power supply.
- A duty and standby pump.

- An on-site water storage capacity, suitable to meet the flow requirements and duration of the system, but not less than $3m^3$.
- Monitored isolation valve to be provided for each apartment in the ceiling void outside the respective apartment in the common corridor (EN standard requires all valves to be accessible).

2.21 TERRACES & BALCONIES

The terraces at the 9th and 12th Floors and all the residential balconies are to be designed in accordance with recommendations of BS 8579-2020 Guide to the design of balconies and terraces.

2.22 COMMUNAL ROOF TERRACES/GARDENS

In addition to the above guidance in section 2.21, guidance given in Annex D3 & D6 of BS 9991:2015 in that:

- Roof spaces, terraces or balconies (used as a common amenity) having a travel distance exceeding 45 m shall have an alternative escape route provided.
- The staircase leading to or from the roof garden, terrace or balcony shall be protected from all floors (excluding an open roof area) in accordance with 14.1.3 for buildings exceeding 11 m in height.
- Access to communal roof gardens and similar places should be from a protected stairway enclosure or a protected ventilated lobby/corridor.
- An alarm, audible throughout the roof garden, shall be sounded upon activation of any fire detection system in the stairs or lobby/corridor access space.

/3 REQUIREMENT B2: INTERNAL FIRE SPREAD (LININGS)

3.1 BASIS FOR COMPLIANCE

Compliance with B2 Internal Fire Spread: Linings, is demonstrated as follows by reference to the relevant recommendations of Section 2 of TGD B: 2020.

3.2 MATERIAL CLASSIFICATION

Internal wall and ceiling linings and thermoplastic material to be used in windows, rooflights, and ceilings / lighting diffusers are to comprise materials which meet the appropriate classifications specified in Section 2 of TGD B: 2020. In particular, wall and ceiling linings are to achieve the following minimum classifications:

Table 14: Classification of Linings

Location	National Classification (1)(2)	European Classification (1)(2)
Toilets, bathrooms, shower rooms	Class 3	D-s3, d2
Circulation spaces within dwellings	Class 1	C-s3, d2
Other rooms	Class 1	C-s3, d2
Other circulation spaces, including the common areas of blocks of apartments	Class 0	B-s3, d2
Places of special fire risk	Class 0	B-s3, d2
Community Space	Class 0	B-s3, d2
Amenity areas	Class 1	C-s3, d2

1. *Performance criteria as specified in Appendix A of TGD B: 2020.*
2. *Apart from limited areas of wall linings where variations and special provisions are permitted subject to the limits specified in section 2.2 of TGD B: 2020*

If materials with performance ratings obtained in accordance with test methods and standards not specified in TGD B: 2020 are to be used (e.g., DIN or other European Standard) the equivalence of the rating of these materials in TGD B: 2020 performance terms is to be demonstrated.

3.3 THERMOPLASTIC MATERIALS

Thermoplastic windows, rooflights or lighting diffusers are to achieve TP(a) or TP(b) classification in the event that they do not achieve the ratings given in Table 14, and their usage shall be confined to those areas specified in Section 2.3 of TGD B: 2020.

If materials with performance ratings obtained in accordance with test methods and standards not specified in TGD B: 2020 are to be used (e.g., DIN or other European Standard) the equivalence of the rating of these materials in TGD B: 2020 performance terms are to be demonstrated.

3.4 TIMBER PRODUCTS IN CLASS 0 RATED LOCATIONS

Any timber products in Class 0 (National) or Class B – s3, d2 (European) rated areas are to comprise impregnated timber achieving these classifications.

/4 REQUIREMENT B3: INTERNAL FIRE SPREAD (STRUCTURE)

4.1 BASIS FOR COMPLIANCE

Compliance with B3 Internal Fire Spread: Structure, is demonstrated as follows by reference to the relevant recommendations in the following design guidance:

- Sections 3 of TGD B: 2020, and
- Other relevant design references where appropriate.

4.2 FIRE RESISTANCE OF ELEMENTS OF STRUCTURE

The development shall be provided with the fire resistance shown below, as per Table A2 of TGD B: 2020.

Table 15: Required Fire Resistance Ratings

Area	Levels Served	Height/Depth (1) (m)	Minimum Proposed Period of Fire Resistance (mins) (2)
Lower Ground Level	1	-2.55	60(3)
Above Ground Levels	24	79.15	120

Notes:

1. *Refers to height of top storey above access level or depth of lowest basement storey below access level as per Appendix C of TGD B: 2020 using ground level of 2.9m*
2. *As per Table A2 of TGD B: 2020*
3. *Note elements of structure within the lower ground level, which support above ground levels, shall be provided with the higher period of fire resistance of 120minutes in line with the requirements for the above ground levels.*

Table 16: Schedule of Elements of Structure

Location	Elements of Structure (1)
All Areas	Structural frame i.e., beams, columns, etc. (2), Floors and supporting structures Compartment walls Compartment Floors Loadbearing walls Protected shafts (protected stairs, lifts and service risers) External walls apart from walls on unprotected areas

Notes:

1. *Elements of structure as defined in Appendix D of TGD B: 2020.*
2. *It is noted that elements which only support the roof do not fall within the scope of the "elements of structure" definition and therefore do not require any fire resistance.*
3. *See Section 4.4 of this report for further in formation in relation to service risers*

4.2.1 Reinforced Concrete Structure

Any reinforced concrete elements are to be designed to achieve the required fire ratings in accordance with BS 8110. Where reinforced concrete elements are designed to Eurocode 2 then structural fire design is to be designed to EN 1992-1-2and the associated National Annex's.

4.2.2 Structural Steelwork (If any)

Any structural steelwork coming within the scope of schedule of elements in Table 16 is to be designed/protected as necessary in accordance with BS5950: Part 8: 1990 or BS EN 1993-1-1 & 1-2 and the associated Annex's and "Fire Protection of Structural Steel in Buildings" by the ASFPCM and Steel Construction Institute, to achieve the specified fire ratings in Table 15. The form of protection is to be concrete encasement, sprayed coating, board protection or intumescent coating as appropriate to the application and the end use conditions, having regard to the requirements of TGD D: "Materials and Workmanship" of the Building Regulations: 1997-2024.

4.2.3 Masonry Wall Construction

Masonry construction is to be designed and detailed in accordance with BS EN 1996-1-2 and the associated Annex and/or BRE Guidelines for the Construction of Fire Resisting Structural Elements to achieve the specified fire ratings.

4.2.4 Framed Wall Construction

Framed wall construction is to be designed and detailed in accordance with BRE 'Guidelines for the Construction of Fire Resisting Structural Elements', other relevant Codes of Practice and/or with relevant manufacturer's details to achieve the minimum fire ratings specified above.

Any new framed wall construction is to be designed and detailed in accordance with BRE '*Guidelines for the Construction of Fire Resisting Structural Elements'*, other relevant Codes of Practice and with relevant manufacturer's details to achieve the minimum specified fire ratings specified above.

4.3 COMPARTMENTATION

4.3.1 Maximum Size of Compartments

In accordance with the Table 3.1 of TGD B: 2020, it is noted that there is no maximum compartment size set out within the guidance residential developments (Purpose Group 1(c)). The maximum compartment areas for non-residential and retail areas are outlined in the Table below.

Table 17: Maximum Compartment Size Proposed

Location	Purpose Group	Maximum Permitted Compartment Area ($m^{2)}$	Maximum Permitted Cubic Capacity (m^2) (1)	Proposed Compartment Area (m^2)	Proposed Cubic Capacity (m^3)
Community Space	5	1900	21000	250	1100
Amenity Areas	3	4600 (1)	28000	c. 160	C 480
Creche	5	1900	21000	c. 160	c. 600

4.3.2 Limitations on Non-Insulating Fire Resisting Glazed Elements

Non-Residential Areas

The extent of non-insulated fire resisting glazing is to comply with the recommendations of Table A4 of TGD B: 2020

4.3.3 Compartment Walls: Materials of Construction

It is proposed that compartment walls be of concrete, masonry or steel stud partition construction.

4.3.4 Compartment Wall to Roof Junctions

A compartment wall shall be taken up to meet the underside of the slab or roof, with fire-stopping where necessary at the wall junction to maintain the continuity of fire resistance in accordance with Section 3.2.5.11 and Diagram 13 of TGD B: 2020.

4.3.5 Compartment Wall / Floors Junctions to Other Walls

Where compartment walls/floors meet another compartment wall, or external walls, the junction is to be fire stopped to maintain the fire resistance of the compartmentation in accordance with Section 3.2.5.9 of TGD B: 2020. i.e.

- Junction between compartment floors and external Techrete panels will be fire stopped at every level to achieve 120minute fire resistance.
- Junction between compartment walls and external Techrete panels will be fire stopped at every junction to achieve 120minute fire resistance.

4.3.6 Accommodation of Services within Compartment Walls/Floors

The integrity of the linings of compartment walls and floors shall not be breached to allow for the installation of services such as pipes, wires and flues, except where necessary to allow services to pass through these compartment walls or floors. Services shall instead be surface mounted or accommodated in services ducts or within service cavities created external to the unbreeched linings of the fire-resistant compartment wall or floor in accordance with Section 3.2.5.7 of TGD B: 2020.

4.4 PROTECTED SHAFTS

The shafts described in Table 18 are to be constructed as protected shafts.

Table 18: Protected Shafts

Item	Form of Protection
Fire-fighting shaft	Enclosed in 120-minute fire resistance complete with FD60s door sets (EI60 glazing) (FD30 door to lift) and FD30S doorset from Fire Fighting lobbies to stairs within firefighting shaft
Protected Escape Stairs	Escape stairs and lifts to be enclosed in 120-minute fire resistance complete with FD60s door sets
Protected Risers	All protected risers will be enclosed with 120 minutes fire resistance with FD60S fire doors

4.5 CONCEALED SPACES (AMENITY AREAS)

4.5.1 Cavity Barrier Provision

Cavity barriers shall be provided in accordance with Table 3.2 of TGD B: 2020, which is noted in the following locations.

a) At the top of an external cavity wall which does not comply with Diagram 17 of TGD B: 2020 and the junction of any such wall with a separating wall.

b) At the junction between an external cavity wall which does not comply with Diagram 17, and every compartment floor and compartment wall.

c) At the junction between a cavity wall which does not comply with Diagram 17 of TGD B: 2020 and every compartment floor, compartment wall, or other wall or door assembly which forms a fire-resisting barrier.

d) In a protected escape route, above any fire-resisting construction which is not carried full storey height, or (in the case of a top storey) to the underside of the roof covering.

e) In the case of the ancillary assembly/office areas (commercial areas), to sub-divide any cavity void so that the distance between cavity barriers does not exceed the dimensions in Table 3.3 of TGD B: 2020.

4.5.2 Maximum Dimensions of Concealed Spaces

Cavity barriers shall be used to subdivide any cavity so that the distance between cavity barriers does not exceed the dimensions given in Table 3.3 of TGD B: 2020 (20 x 20m where exposed surfaces in void are minimum Class C-s3,d2 or Class 1. For any other surface classification, barriers are to be provided at 10m x 10m intervals).

The above cavity barrier space provisions to not apply to any cavity described below;

1. Where any single room with a ceiling cavity or underfloor service void exceeds the dimensions given in Table 3.3 of TGD B: 2020, cavity barriers need only be provided on the line of the enclosing walls/partitions of that room, subject to the cavity barriers being no more than 40m apart and the surface of the material / product exposed in the cavity being Class C-S3,d2 or better or Class 0/Class 1.
2. Where the cavity is over an undivided area and is used as a plenum and exceeds 40m, there is no limit to the size of the cavity if;
    a) The room and cavity together are compartmented form the rest of the building.
    b) An automatic fire detection and alarm system is fitted in the building with smoke detectors in the cavity and in the return air ducting, which stops circulation of the ventilation and switches it to extract.
    c) The surfaces if materials exposed within the cavity / concealed space are Class 0 (National) / Class B-s3, d2 (European) and the supports and fixings in the cavity are of non-combustible construction.
    d) The flame spread rating of any pipe insulation is Class 1 (National) / Class C-s3, d2 (European)
    e) Any electrical wiring in the cavity is laid in metal trays or in metal conduit, and
    f) Any other materials within the cavity are of limited combustibility of Class A2 (European)

3. In a wall which shall be fire-resisting only because it is loadbearing.
4. In a masonry or concrete cavity wall as illustrated in Diagram 17 of TGD B: 2020.
5. In a floor or roof where the cavity is enclosed on the lower side by a fire-resisting ceiling (as illustrated in Diagram 19 of TGD B: 2020) which extends throughout the building, compartment or separated part, subject to a limit of 30m on the extent of any such cavity;
6. Below a floor next to the ground or oversite concrete, if the cavity is less than 1m in height or if the cavity is not normally accessible by persons, unless there are openings in the floor such that it is possible for litter to accumulate in the cavity (in which case cavity barriers shall be provided, and access shall be provided to the cavity for cleaning).
7. Formed by over-cladding an existing masonry (or concrete external wall, or an existing concrete roof, provided that the cavity does not contain combustible insulation.
8. Between double-skinned corrugated or profiled roof and wall sheeting if the sheeting is a material of limited combustibility and both surfaces of the insulating later have a surface spread of flame of at least Class C-s3,d2 (European) or Class 1 (National) and make contact with the inner and outer skins of cladding as per Diagram 21 of TGD B: 2020.

4.5.3 External Wall Cavities

No cavities are proposed. The external wall build up is as follows:

- 225 / 275mm Techrete / precast concrete panel,
- 100 / 150mm Cavity full filled with Rockwool Duoslab insulation.
- 70mm Gypliner with full fill Rockwool insulation
- 12.5mm plasterboard

Please refer to HJL Drawing 5003 submitted with this report.

4.5.4 Construction and Fixings for Cavity Barriers

Every cavity barrier shall be constructed to provide at least 30-minute fire resistance (30-minute integrity and 15-minute insulation) as per Table A1 of TGD B: 2020. It is noted that, in the case of a stud wall or partition, the cavity barrier may be formed of:

a) Steel Studs: not less than 0.5mm thick

b) Timber Studs: not less than 38mm thick

c) polythene sleeved mineral wool, or mineral wool slab, in either case under compression when installed in the cavity

A cavity barrier may be formed by any other construction provided for another purpose if it meets the provisions for cavity barriers. Cavity barriers shall be tightly fitted to rigid construction and mechanically fixed where possible. Where this is not possible, the junction shall be fire stopped.

Cavity barriers shall be fixed so that their performance is unlikely to be made ineffective by;

a) Movement of the building due to subsidence, shrinkage or thermal change.

b) Collapse in a fire of any services penetrating them.

c) Failure in a fire of their fixings.

d) Failure in a fire of any material or construction which they abut.

4.5.5 Cavity Barrier Provision – Residential areas

Cavity barriers shall be provided in the residential areas in accordance with Purpose Group 1 (c) Table 3.2 of TGD B: 2020.

4.6 PROTECTION OF OPENINGS AND FIRESTOPPING

All openings, joints, imperfections of fit in or between the designated fire barriers (i.e. compartment walls / floors, fire-rated partitions, etc.) are to be fire-stopped or protected by sealing in accordance with Section 3.4 of TGD B: 2020 so that the fire resistance rating of the barrier is not impaired. In particular service penetrations of the designated barriers are to be protected in accordance with the relevant recommendations BS8313: 1997 (Section 13).

In general it is intended to use proprietary products to seal any penetrations in a fire separating element. The selection of the sealing system to be used in each particular application will be based on criteria in the ASFPCM Publication “Fire Stopping and Penetration Seals for the Construction Industry” (Red Book), depending on the limitations shown in the table below.

Table 19: Limitations on Firestopping

Limitations on Use	Special Compatibility Considerations
Size of Opening Penetration Services Flexibility of Seal(s) Smoke / Gas Tightness Ambient Conditions Design Life Frequency of Change to Services Parent Construction	Intumescent Systems in Lightweight Constructions Rigid Seals in Dynamic Barriers Large Spans and Thermal Expansion Smoke/Toxicity in Populated Zones

4.6.1 Service Ducts, Pipes and Shafts

Where ventilation ducts penetrate the various fire barriers (i.e. compartment floor/walls, fire rated floors/walls or cavity barriers) they are to be protected in full accordance with the relevant recommendations of BS 9999: 2017, which it is noted will typically involve the fitting of fire/fire and smoke dampers at ductwork penetrations (fire and smoke dampers to be provided in areas of sleeping risk or where ventilation ducts penetrated protected escape routes). These dampers are to be installed in strict accordance with the manufacturer’s instructions with particular reference to the fitting of installation frames and the secure anchoring of these frames to the substrate (i.e. mechanical fixing or the use of a rigid mortar type firestopping system) or alternatively the use of sleeved fixings.

Where services are incorporated in a service duct and these services penetrate floors the following design options apply:

- Option 1: Firestop at floor level to the rating of the floor assembly (see Table 15)
- Option 2: Service duct to be treated as a protected shaft as per Section 4.4.

4.7 FIRE DAMPERS / FIRE AND SMOKE DAMPER

Where ventilation ducts penetrate the various fire barriers (i.e., fire rated floors, walls, or cavity barriers) they are to be protected in full accordance with the relevant recommendations of BS 9999 which, it is noted will typically involve the fitting of fire/fire and smoke dampers at ductwork penetrations. These dampers are to be installed in strict accordance with the manufacturer’s instructions with particular reference to the type

of construction damper is passing through (i.e. masonry/concrete or plasterboard partition), the fitting of installation frames and the secure anchoring of these frames to the substrate (i.e. mechanical fixing or the use of a rigid mortar type fire stopping system) or alternatively the use of sleeved fixings.

All fire dampers will be fully compliant with the European Construction Products Regulation (CPR) and the mandatory CE marking.

The design of the spacing and installation of the fire dampers, will follow the guidance within the Heating and Ventilating Contractors' Association document DW145 'Installation of Fire and Smoke Dampers'.

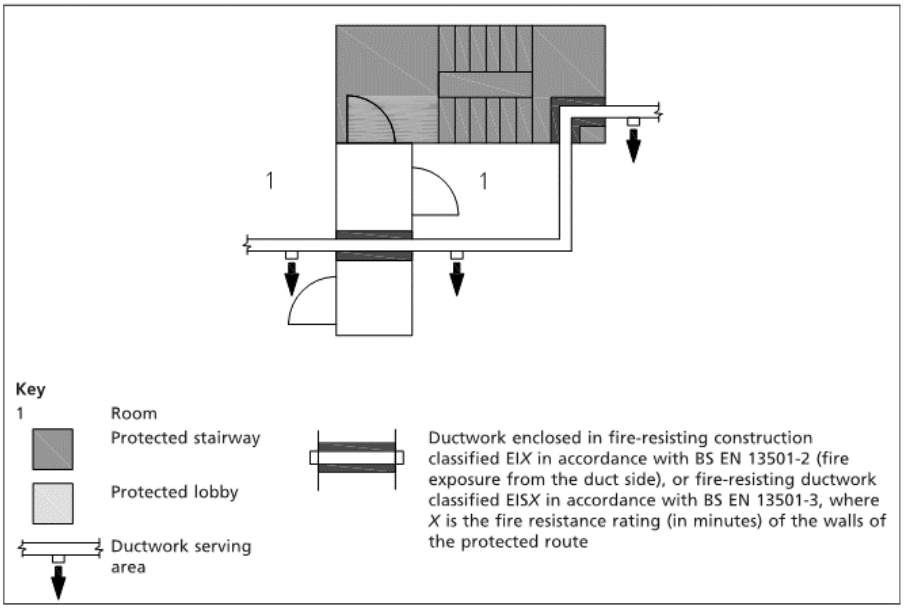
The DW145 guide highlights and clarifies the important aspects of fire and smoke barrier / damper installation, including the responsibilities of all parties involved in the overall sequence from system specification through to a compliant installation. The importance of installing damper arrangements that have been selected / specified by the system designer and that have been successfully fire tested by an independent body on behalf of the damper manufacturer is emphasised throughout the guide.

In particular the following is noted:

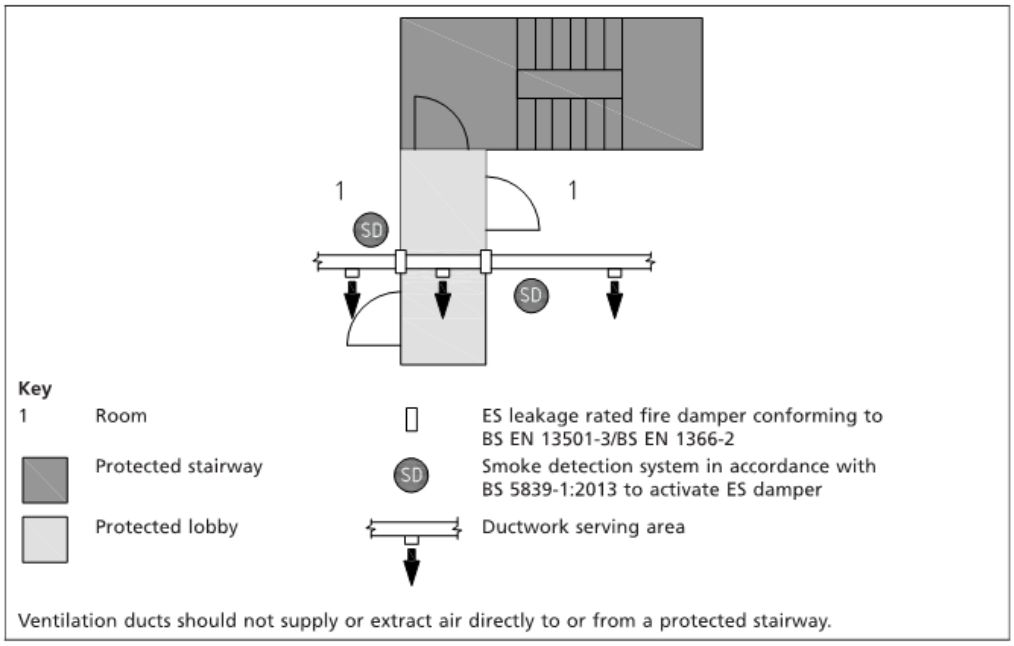
- Method of installation and strict compliance with the manufacturer's requirements,
- Multi-duct single openings – to be avoided or specific method to be agreed with the damper manufacturer,
- Multiple fire damper assemblies – assemblies must be separated either by builders work of a minimum width as directed by the damper manufacturer or by factory made steel centre mullions formed from channel-formed sections of a material and gauge that has been proven by test i.e. multiple assemblies.

Note 1: Fire / smoke dampers will be installed where required and as outlined in Section 32.5 of BS 9999: 2017. Refer specifically to Section 32.5.2.3 which relates to installation of dampers where duct penetrates escape routes.

Ductwork passing through protected routes (Method 2 or Method 3)



Ductwork passing through protected routes (Method 4)



4.8 ACCESS HATCHES/PANELS

Access hatches, if provided, should be of a construction that has at least the same fire resistance rating as the element in which they are fitted.

4.9 AREAS OF ANCILLARY ACCOMODATION / PLACES OF SPECIAL FIRE RISK

Areas of ancillary accommodation shall be designed in accordance with Section 5 clauses 19, 20, 21 and Table 3 of BS 5588-1 in that:

Table 20: Areas Of Ancillary Accommodation / Places Of Special Fire Risk

	Location / Room	Proposed Period of Fire Resistance
1	Cleaners' store / Storage rooms Communal lounges and amenity areas	Robust construction having a minimum standard of fire resistance of 30 minutes complete with FD30S door set.
2	Transformer, switchgear, and battery rooms for low-voltage or extra-low-voltage equipment	Robust construction having a minimum standard of fire resistance of 30 minutes complete with FD30S door set.
3	Engineering Services Installation rooms other than those covered by items 2 and 5 to 7 inclusive	
4	Refuse storage area	Robust construction having a minimum standard of fire resistance of 60 minutes complete with FD60S door set.
5	Engineering services installation rooms housing fixed internal combustion engines	Robust construction having a minimum standard of fire resistance equivalent to that required for the elements of construction of the building and in no case less than 60 min complete with FD60S door set.
6	Boiler Rooms and Fuel Storage spaces	

7	Transformer and switchgear rooms for equipment above low voltage	
8	Any electrical enclosure containing any distribution board, generator, powered smoke control plant, pressurization plant, communication equipment, and any other equipment associated with life safety and fire protection systems	Robust construction having a minimum standard of fire resistance of not less than 120 min and any openings in the required construction shall be protected by doors having a fire resistance not less than 60 min with smoke seals
9	ESB Substations	Robust solid non-combustible construction having a minimum standard of fire resistance of not less than 240 min as per ESB Requirements.

Table 3 — Structural fire protection of areas of ancillary accommodation

Ancillary accommodation	Cross-reference	Structural fire protection: the area of ancillary accommodation should be separated from other parts of the building by:
1. Communal lounges and common amenity areas	**17.4**, **19.1**	Robust construction having a minimum standard of fire resistance of 30 min (see Note)
2. Transformer, switchgear and battery rooms for low voltage or extra low voltage equipment	**20**	
3. Engineering services installation rooms other than those covered by items 2 and 6 to 8 inclusive	**19.3**	Robust construction having a minimum standard of fire resistance of 60 min (see Note)
4. Refuse chutes and refuse storage areas	**21**	
5. Covered car parks within or adjoining the building and not greater than 450 m^2 in area	**22**	
6. Engineering services installation rooms housing fixed internal combustion engines	**19.3**	Robust construction having a minimum standard of fire resistance equivalent to that required for the elements of construction of the building and in no case less than 60 min (see Note)
7. Boiler rooms and fuel storage spaces	**20.1**, **20.2**	
8. Transformer and switchgear rooms for equipment above low voltage	**20**	
9. Covered car parks within or adjoining the building and greater than 450 m^2 in area	**22**	
NOTE Any openings in the required construction should be protected by doors having a similar standard of fire resistance and capable of resisting the passage of smoke at ambient temperature.		

/5 REQUIREMENT B4: EXTERNAL FIRE SPREAD

5.1 BASIS FOR COMPLIANCE

Compliance with B4 External Fire Spread is demonstrated as follows by reference to the relevant recommendations in the following design guidance:

- Section 4 of TGD B: 2020 and
- BRE Report BR187 (2014) “Building Separation and Boundary Distances”

5.2 EXTERNAL WALLS

5.2.1 External Fire Spread

To prevent the spread of fire from one building to another, limitations are placed upon the amount of unprotected area permissible upon a building façade. These limits are prescribed as a function of the distance to the boundary. Notional boundaries for the development have been measured to the site boundary line, mid-point between neighbouring buildings or the mid-point of adjoining roadways / river.

The external fire spread for each block has been assessed and the results of the most onerous scenario are demonstrated below:

Table 21 – External Fire Spread Assessment

Elevation	Unprotected Area (m^2)	Enclosing Rectangle W x H (m^2)	% of unprotected area of enclosing rectangle	Required boundary distance	Actual boundary distance
North Amenity Ground Floor	107	24m x 6m = 144	74%	2.875m	>20m
North East Apartment First Floor – SE Corner	8.7 x 2.8 = 24.36	9m x 3m = 27	90%	1.5m	c6.0m
South West Community Space Ground Floor	24.9 x 5.4 = 134.5	27m x 6m = 162	83%	6.65m	>7m
South Creche - Ground Floor	19 x 3.4 = 64.6	21 x 6m = 126	51.2%	4.1m (6)	4.38m (7)
South West Creche - Ground Floor	11 x 3.8 = 41.6	12 x 6m = 72	58%	3.7m (6)	4.5m

1. *Enclosing rectangle based upon worst case scenario (largest compartment) on each elevation.*
2. *Measured from elevations prepared by HJL.*
3. *‘Relevant’ boundary as defined in Section 4.02 of TGD B: 2020.*
4. *Ex calculation methods of BR187*
5. *The worst cases have been considered for each of the elevations.*
6. *Distance from BR187 halved with Sprinklers.*

7. *Boundary Distance is taken as a relevant boundary from the opposing Terminus Building. That Building will require a relevant boundary distance of 3.5m, and given there is 7.88m between the facades, 4.38m is available for the Creche. The Terminus Building will have a FSCA submitted in the future.*

Based on the above assessment it is observed that additional fire rating to the building elevations is not required for Railyard Building to satisfy external fire spread requirements.

5.3 CONSTRUCTION OF EXTERNAL WALLS

5.3.1 Surfaces of External Walls

Surfaces of external walls will satisfy the recommendation of Section 4.1.4 and Table 4.1 of TGD B: 2020 as outlined below.

Table 22 – External Wall Surfaces

Provision of External Wall Surfaces		
Height of Building	Distance from Boundary	
	Less than 1m	1m or more
Less than 18m	Class B-s3, d2 or Class 0	No Provision (other than requirements outlined in Note 1)
More than 18m	Class B-s3, d2 or Class 0	Class B-s3, d2 or Class 0 (See Note 2)

1. *Any part of a building containing flats or maisonettes or assembly and recreation purpose group, which is 10m or less above ground or above a roof or any other part of the building to which people have access, shall be Class C-s3,d2 (European) or have an index of performance (I) not more than 20 (National). Timber cladding at least 9mm thick is also acceptable.*

2. *Surfaces between 0 and 18m above the ground may comprise of any material of Class C-s3,d2 (European) or have an index of performance (I) of not more than 20 (National). Timber cladding at least 9mm thick is also acceptable.*

5.3.2 Cavity Insulation

As the building will contain top floor areas exceeding 18m above external ground level, the insulation used in the cavity is to be of limited combustibility as defined in Section 4.1.5 of TGD B: 2020.

Alternatively, the insulation shall meet the performance criteria given in BRE Report BR 135 for cladding systems using full scale test data from BS 8414-1 or BS 8414-2.

5.4 ROOF COVERINGS

Table 23: Minimum Required Designations

Location	Separation Distance (1) (m)	Minimum Designation Required (2)
Roof Coverings	<6.0	AA, AB, AC
	>6.0	BA, BB, BC

1. *Distance to "relevant" boundary or compartment wall to roof junction as appropriate.*

2. *Designation in accordance with the test methods specified in BS476: Part 3 2004.*

5.4.1 Proposed Roof Specifications

The proposed roof construction for the building is to be specified to achieve a minimum class AA, AB or AC, which by reference to Table 4.4 of TGD B:2020 can be used without restriction.

5.4.2 Plastic Roof Lights

Plastic roof lights which do not achieve the minimum designations specified in Table 23 are to be limited in extent as set out in Table 4.5 of TGD B: 2020.

5.4.3 PV Panels

None proposed as part of this application.

5.4.4 GREEN ROOF

Green roof areas will not be provided as part of this scheme.

/6 REQUIREMENT B5: ACCESS & FACILITIES FOR THE FIRE SERVICE

6.1 BASIS FOR COMPLIANCE

Compliance with B5 Access & Facilities for the Fire Service is demonstrated as follows by reference to the relevant recommendations in the following design guidance:

- Section 5 of TGD B: 2020,
- Other relevant design references where appropriate

6.2 EXTERNAL FIRE MAINS AND HYDRANTS

As the ground floor area of Railyard Building is in excess of 1000m^2 (c 1500m^2 approx.), A minimum of 1 hydrant per 1000m^2 will be required to serve the development in accordance with the requirements of Technical Guidance Document B. 2 no. hydrants are required Refer to site plan for indicative locations of hydrants.

Existing Local Authority Hydrants are available which comply with the requirements of BS 750:2012 Specification for Underground Fire.

Distance from building is not less than 6m or more than 46m.

Distance from hydrant to vehicle access roadway or hard standing area for fire appliances will not be more than 30m. Hydrants are distributed around the perimeter of the Railyard development having regard to the provision of access for fire appliances.

6.3 INTERNAL FIRE MAINS

6.3.1 General

Stair cores No.'s 1 and 3 within the Railyard building shall be provided within internal fire mains. The Internal wet rising fire mains shall be designed and installed in accordance with IS 391:2020 Fire mains for buildings - Installation, commissioning, maintenance and testing. Inlet point to replenish the wet mains tank shall be positioned within 18m of the fire tender set down point. Refer to accompanying site plan for location of wet rising main replenishment inlet point.

The wet main system will have the additional features:

- Be 150mm in diameter.
- All outlets will have twin heads at all levels >
    - This will be achieved by the provision of a single fire main outlet in accordance with BS 5041 -1 located in a landing valve box in accordance with BS 5041 -4 with a separate 70mm dividing breech provided in each fire main landing box at each level. This dividing breeching shall conform to BS 336

    -
- A 4-way breeching inlet valve will be provided in accordance with BS 5041-3

- The minimum flow rate shall be 1500 L/min with a design operating pressure of 8 bar.

6.3.2 Siting and Location of Wet Rising Mains Replenishment Valve

A breeching inlet for the replenishment of the wet rising main will be located on an external wall adjacent to a Fire Service access point in a location which is clearly visible to the Fire Service and is no more than 18m away from the point of fire service arrival.

Dual head outlets for the wet riser will be provided within the firefighting lobbies at each level within the firefighting shafts. See note above in section 6.3.1

The wet rising main will be designed and installed in accordance with section 4.1.4 of IS 391:2020 Fire mains for buildings - Installation, commissioning, maintenance and testing.

6.4 FIRE BRIGADE ACCESS

6.4.1 Vehicle Access – Buildings Fitted with Fire Mains

In accordance with Section 21.4 of BS 9999:2017, fire brigade access will be available for a high reach appliance within 18m of the fire main breeching inlet connection point and the inlet shall be visible from the appliance for topping up of wet riser/sprinkler tank. Location of inlet noted on site layout drawing.

The building volume is circa 90,000 m^3.

In accordance with section 5.2.2 and Table 5.1 of TGD-B, fire brigade access ~~would be required~~ should be provided for a high reach appliance to 100% of the building perimeter. We note the following:

Firefighter access points to the building (firefighting shafts) is

- North Elevation on Albert Quay – stairs 01 of block 01
- West Elevation (plaza) – stair 03 in block 02

Vehicle access is provided all along the North and West Elevations as seen on the site layout plan.

There is access for a high reach vehicle all along the East elevation of Block 2 given that the width of the access road is >3.1m and width of hardstanding is 5.0 to 5.5m. It would be advisable that a driver reverses down this side of the building as no turning space is possible. Access is available to c. 66% of the building perimeter.

The vehicle access roadway shall achieve the following for a pump / high reach appliance:

- Minimum width of road between kerbs = 3.7m
- Minimum width of gateways between kerb = 3.1m
- Minimum vehicle clearance height = 4m
- Minimum carrying capacity = 16.25 tonnes

6.5 FIREFIGHTING SHAFTS

6.5.1 Provision of Firefighting Shafts

The proposed Railyard Building will vary in height. The below table therefore outlines the proposed stair design for section of the building, i.e., protected stair/fire-fighting shaft. In accordance with section 5.3.3 and table 5.3 of TGD B, the no. of firefighting shafts provided is 1 per block and the location of firefighting shafts has been chosen such that every part of every storey, other than fire service access level, is no more than 60 m from the entrance to a firefighting lobby, measured on a route suitable for laying hose.

Table 24 – Fire-fighting Shaft Provision

Stair Ref	Height of Topmost Floor Served (m)	Stair Design	Clear width (mm)	Fire Main
Stair 1	>20	Fire-fighting shaft	1200	Wet
Stair 2	>20	Protected stair shaft	1000	-
Stair 3	>20	Fire-fighting shaft	1200	Wet
Stair 4	>20	Protected stair shaft	1200	-

Two cores shall therefore be designed as fire-fighting shafts with the remaining core designed as a protected escape stair.

Fire-fighting shafts will comprise of the following.

- Fire-fighting stair.
- Fire-fighting lobby.
- Fire-fighting lift.
- Wet rising / falling fire main in accordance with IS 391:2020.
- 1m^2 AOV located at the head of the stair.

TGD B: 2020 recommends fire-fighting shafts be designed in accordance with BS 5588: Part 5 2004 which has since been superseded by BS 9999: 2017. Fire-fighting shafts shall therefore be designed in line with BS 9999: 2017 recommendations, supplemented with the updated recommendations of TGD B: 2020 with respect to fire-fighting shafts within residential buildings as outlined below.

6.5.2 Firefighting Stairs

It is confirmed that the firefighting stair shall be compliant with the recommendations of Section 20.2.4 of BS 9999: 2017.

6.5.3 Firefighting Lift

The firefighting lift installations will satisfy the recommendations in 20.4 of BS 9999 with the exception of Clauses 20.4.2 and 20.4.3 which are not applicable.

Suitable precautions shall be taken to minimise water penetration into the firefighting lift shaft. This will be as per Annex N of BS 9999: 2017:

- The use of a drainage grid to the lift entrance

The remaining passenger lifts in the building shall be constructed in accordance with the recommendations of EN81-20: 2020.

6.5.4 Firefighting Lift Control System

Firefighting lift control systems are to be in compliance with BS EN 81-72 and 20.4.7 / 20.4.8 of BS 9999 2017 with reference to;

- Operation of the firefighting lift control system
- Changeover from primary to secondary power supply
- Firefighting lift communication systems

6.5.5 Fire Resistance of Firefighting Shafts

The firefighting shaft is to be enclosed in 120 min fire resisting construction complete with FD60S doorsets and protected against external fire where necessary in accordance with 20.3.1 and Figure 23 of BS 9999 2017. Internal walls within the fire-fighting shaft i.e., walls separating fire-fighting lift from fire-fighting stair, are to achieve 60-minute fire resistance complete with FD30s doorsets.

The enclosing and separating walls, if not in brick or concrete, are to meet the resistance to damage criteria (severe duty) as per Section 20.3.2 and Table 18 of BS 9999 2017.

Drawing FR4000 from HJL which shows the construction type of proposed typical core layouts of the Firefighting shafts. This indicates which walls will be constructed in concrete / precast structure and which walls will be Gypsum construction (either 60 min or 120min fire resisting construction). The 60/120-minute fire resisting partitions shall be constructed to satisfy Table 18 of BS 9999:2017 as tested in accordance with BS 5234-2:1992 Annex F (severe duty).

Where the firefighting shaft meets the exterior wall and forms a junction, protection shall be provided in accordance with clause 20.3.1 and Figure 23 of BS 9999.

6.5.6 Flooring within Fire-Fighting Shafts

Flooring and floor coverings within the firefighting lift shaft are to be specified and detailed to meet the slipperiness and fire performance criteria in 20.3.3 of BS9999 2017.

Textile floor coverings shall:

a) when tested, together with any underlay, in accordance with BS 4790, using the test procedure reflecting the method used for securing the floor covering to the floor, either:
   1) not ignite; or
   2) have effects of ignition on both the use- and under-surfaces not extending beyond a circle of radius 35 mm centred on the central point of application of the nut;

b) be firmly secured to the floor, with any adhesive used being non-water soluble; and

c) be interrupted at all doors to and within the fire-fighting shaft along the line of the threshold of the doorway with a metal or other non-combustible strip not less than 50 mm wide.

6.5.7 Doors to Fire-Fighting Shafts

The fire-fighting shaft is to be provided with FD60s doorsets between the fire-fighting lobby and adjacent accommodation. FD30s fire doors are to be provided between the fire-fighting stair and the fire-fighting lobby.

The stair door height is to be limited to max of 2.2 m to meet the criteria in 20.3.4 of BS 9999 2017

6.5.8 Siting and Location of Fire Mains

A double outlet from the wet rising main will be provided within the fire-fighting lobby at each level as per Diagram 33 of TGD B: 2020.

The systems shall comply with IS 391:2020.

6.5.9 Access level

In accordance with Section 20.2.2 entry to the fire-fighting shaft at fire and rescue service access level, the access is via directly from the open air.

6.5.10 All other levels

All other levels served by the firefighting shaft are in accordance with Section 20.2.3 of BS 9999. Access to the accommodation at each level from the firefighters lift and stair is through a fire-fighting lobby.

6.5.11 Fire Fighting Lobby

Size of Lobby

In accordance with section 20.2.5 of BS 9999:2017, each firefighting lobby shall be a minimum of $5m^2$ (principal dimensions not less than 1.5m). The door between the firefighting lobby and the firefighting staircase will be kept free of any type of fastening.

Fire-fighting lobbies containing lifts shall be clearly and conspicuously marked with a notice conforming to BS ISO 3864-1, stating “Firefighters lift lobby: do not obstruct lift doors. Do not use for storage.”

Venting of Lobby

All proposed firefighting shafts, will be provided with a powered Mechanical Shaft exhaust system (or equal approved) to ventilate the lobbies and stairway.

The Mechanical Shaft is a mechanical fire-fighting shaft system which provides equivalent performance to a BRE shaft for the ventilation of common corridors and fire-fighting lobbies. It can therefore be considered to meet the recommendations of BS 9999 for ventilation of stair cores.

6.6 FIRE HOSE REELS

None proposed as part of this application.

6.7 SMOKE / HEAT VENTING

6.7.1 Common Corridor Ventilation

Smoke control within common corridors / lobbies will be provided by:

- Mechanical smoke extract shafts and supply air shafts.

Additional detail on the methods of smoke control for each core is outlined in Section 2.9.1 of this report and illustrated on the accompanying drawings.

6.7.2 Protected Stairs

Each of the escape stairs, including fire-fighting stairs, will be provided with an Automatically Operating Vent (AOV) at the top of the shaft having a free area of not less than 1.0m^2.

6.7.3 Plant Room (Lower Ground Level)

It is noted that he Plant room (c.105m^2) located in the (Basement) Lower Ground Level will not be provided with ventilation based on the following:

Section 5.4.3.1 of TGD B-2020 exempts basements with a floor area of less than 200m^2 and with a depth of not more than 3m.

It is further noted The Plant room is naturally ventilated at ground floor via grills and louvres in the external walls along the East Elevation.

6.7.4 Bike Store (Lower Ground Level)

The bike store has an access stair direct to outside; a motorised fire damper will be provided over the door that will open upon local detection to ventilate the space should a fire occur.

6.7.5 Manual override

Manual override / control switches shall be provided for the fire service so that they can manually control the ventilation systems.

The AOVs in each stair and shall be provided with a manual override switch at Ground Floor Level in each stair. Override switches for the common corridor ventilation system shall be provided within the protected escape stair at each level. Fire and rescue service override controls shall not permit multiple lobby vents to be open simultaneously.

6.8 SECONDARY POWER SUPPLY

Common lobby ventilation systems will be provided with primary and secondary power supplies, with the secondary means of power coming from a life-safety standby generator system and be provided with a dedicated communication, surveillance and control system in accordance with relevant parts of Section 37.2.3.3 of BS 9999 and in accordance with of EN 81.

Secondary power supplies will be located in a fire protected area, Primary and secondary power supplies will be separated from each other.

Protected circuits which are required to continue to function in fire conditions (i.e., fire alarm sounder circuits, emergency lighting, etc.) are to meet the requirements of BS 8519:2020.

Appendix A

Fire Performance Ratings for Materials / Structure / Doorsets

Where a fire performance rating for materials, structure or doorsets is referred to in this Report it shall be taken as meaning (except as noted otherwise in this Report) that the material, structure or doorset satisfies the performance criteria prescribed in Appendices A and B of Technical Guidance Document B 2006.

In particular:

a) Where a fire resistance rating for elements of structure and others forms of construction is specified in this Report it shall mean that the item satisfies the performance criteria prescribed in Table A1 of TGD-B 2006 (i.e. loadbearing capacity, integrity and insulation as appropriate) as determined by reference to BS 476: Parts 20-24: 1987 (or to BS476: Part 8: 1972 in respect of elements tested or assessed prior to 1 January 1988) or the relevant European Test Standards. In the case of elements in which uninsulated fire resisting glazing is permitted the extent of such glazing shall be limited in accordance with Table A4 of Technical Guidance Document B 2006 except as noted otherwise in this Report.

b) Doorsets which are designated as FDx are to achieve "x" minutes integrity rating to BS 476: Part 22: 1987 (or BS 476: Part 8: 1972 for doors tested or assessed prior to 1 January 1988) and where designated Ex are to achieve "x" minutes integrity rating when tested to the relevant European Test Standard. Where the doors are additionally prescribed as having an "FDxS" rating in this Report the doors shall have fitted smoke seals which limit the leakage past the head and jambs to a value not exceeding $3m^3/m/hour$ when tested at 25Pa under BS 476: Section 31.1 and where designated ExSa are to meet the additional classification requirements for Sa, when tested in accordance with IS EN 1634-3: 2004. All fire resisting doorsets are to have fitted approved self-closing devices capable of closing the door against any latches fitted to the door with the exception of the following:

   i) doors to service ducts or cupboards which are normally kept locked shut.

   ii) other doors specifically noted as not having self-closers fitted in the appropriate sections of the report.

c) Linings which are designated as follows:

   Using National Classifications

   - Class 1 or 3 are rated for performance by reference to BS476 Part 7: 1971 or 1987 when tested for surface spread of flame.
   - Class 0 are, in the case of the lining material or the surface together with its substrate in case of a composite product, either:

     i) composed throughout of materials of limited combustibility determined by reference to the test method in BS476: Part 11: 1982, or

     ii) a Class 1 material which has a fire propagation index (I) of not more than 12 and a sub-index (i) of not more than 6 determined by reference to the test method in BS476: Part 6: 1968, 1981 or 1989.

Using European Classifications

- A Class B-s3, d2 rated material or product when tested in accordance with I.S. E.N. 13501-1 or any construction product with this class in Commission Decision 2003/43/EC of 17th January 2003 establishing the classes of reaction to fire performance for certain construction products and any subsequent amendments
- A Class C-s3, d2 rated material or product when tested in accordance with I.S. E.N. 13501-1 or any construction product with this class in Commission Decision as in Class B-s3, d2 rated materials above.
- A Class D-s3, d2 rated material or product when tested in accordance with I.S. E.N. 13501-1 or any construction product with this class in Commission Decision as in Class B-s3, d2 rated materials above.

i) Materials that have been tested to Class A1 also meet Class A2 and lower performances.

ii) Materials that have been tested to Class A2 also meet Class B-s3-d2 and lower performances.

iii) Materials that have been tested to Class B-s3-d2 also meet Class C-s3-d2 and lower performances.

iv) Materials that have been tested to Class C-s3-d2 also meet Class D-s3-d2 performances.

v) National Classifications do not directly equate to an equivalent European Classification.

d) Where a “smoke retarding construction” is referred to in this report or on the drawings it shall be taken to mean:

i) Toughened glass to BS6206: Class A (the performance of toughened glass is dependent on the rate of temperature rise and the method of glazing. Accordingly, the performance of the glass and glazing system is to be assessed against the predicted time-temperature of the smoke layer), or

ii) Laminated glass with a polyvinyl butyral (pvb) interlayer, provided that fire engineering studies indicate that hot gases will not exceed 400oC temperature (if laminated glass is required for other reasons and the hot gases may exceed 400oC, the glass used in the laminate construction should be toughened glass in accordance with BS 6206 Class A), or

iii) Smoke curtains to relevant recommendations of BS EN 12101-1, or

iv) Construction capable of resisting the calculated time-temperature of the smoke layer, or

v) Construction achieving 30 minutes fire resistance rating (integrity).

All doors in such construction are to be self-closing doors. If glazed they are to conform with (i), (ii) or (iii) above, and are in any event to have fitted seals which limit the leakage at the jambs and head to a rate not exceeding 3m3/hour per metre when tested to BS 476: Section 31.1 or Sa classification when tested in accordance with IS EN 1634-3:2002. Joints between such construction and any abutting element should be tight and preferably sealed with a filler conforming to BS EN 1366-3 or BS EN 1366-4 (e.g., plaster), a mastic, or a flexible strip (e.g. neoprene), as appropriate.

In addition, any grilles or other openings in the smoke retarding enclosures are to be fitted with fire alarm activated smoke dampers, and all joints in the construction are to be tight and preferably sealed with a filler, a mastic or a flexible strip as appropriate.

Appendix B

Qualitative Design Review

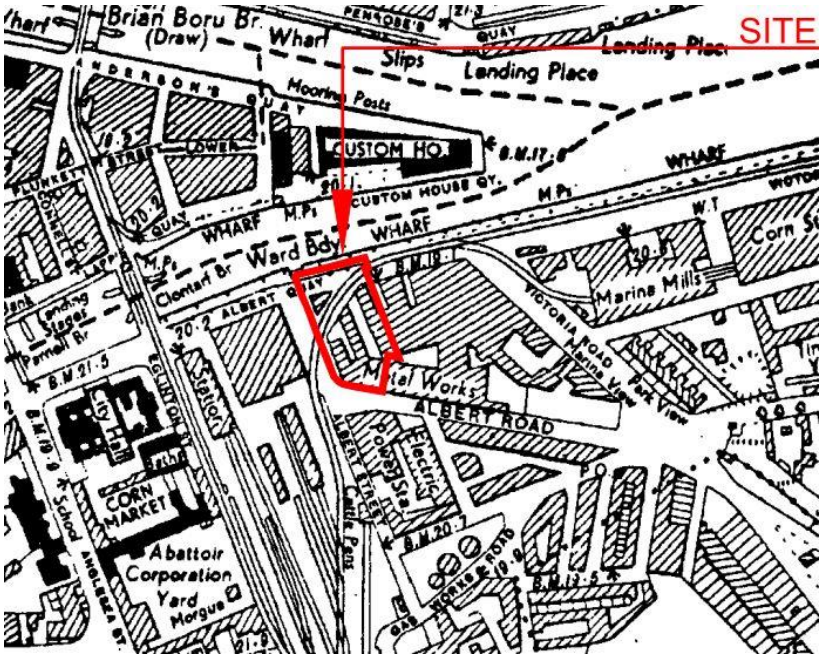
/0 QUALITATIVE DESIGN REVIEW

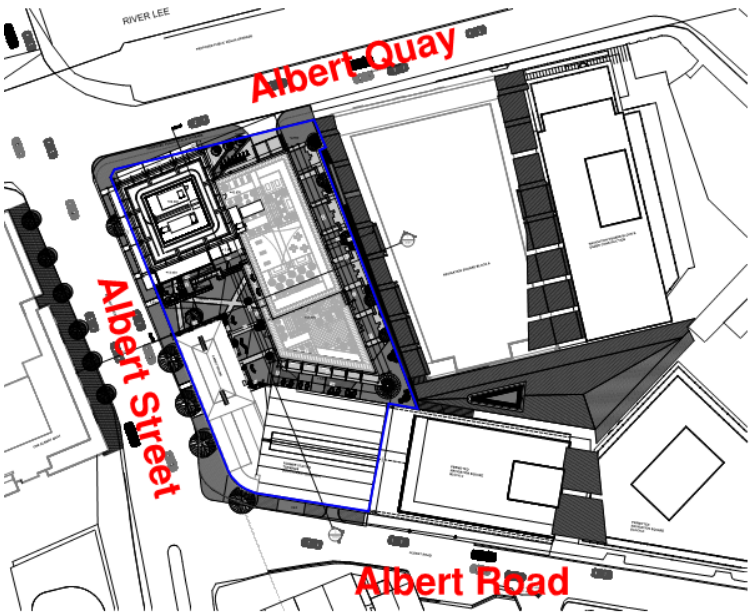
0.1 BUILDING DESCRIPTION

As seen in section 1.2, the development consists of the construction of a 25-storey residential building.

The Fire Safety Certificate strategy is designed in accordance with TGD B and BS 5588-1. With reference to section 0.1.5 Tall and Complex buildings containing Flats and section 0.2 Alternative Approaches to Fire Safety requirements in TGD B, a QDR in accordance with BS 7974 is included with this FSCA.

The site is located on the south of Albert Quay and is bounded by Albert Street to the West and Albert Road to the South





The building will be primarily constructed of reinforced concrete and steel with a combination of block and heavy-duty robust plasterboard partitions internally.

0.2 INTRODUCTION TO QDR

0.2.1 QDR

The interaction of fire, buildings and people give rise to an almost infinite number of possible scenarios; therefore, before attempting to carry out detailed quantified analysis, the significant fire hazards shall be identified, the problem simplified and the required extent of quantification established. This process is described as the Qualitative Design Review (QDR).

0.2.2 BS 7974

This appendix documents the Qualitative Design Review (QDR) for Albert Quay 2 based on the framework guidance provided in BS 7974:2019 and as per the following recommendations of TGD B.

In accordance with section 0.1.5 Tall and very tall buildings of TGD B:

"As the height of buildings containing flats increases, the complexity, and risks presented to occupants and firefighters may also increase. Therefore, for tall buildings containing flats (Purpose Group 1(c)), adequate provisions which are reasonable and proportionate to the risks presented by the particular building design, in addition to the provisions set out in this document, should be considered.

In very tall buildings containing flats (Purpose Group 1 (c)), a fire safety engineering approach (see 0.2.4), that takes into account the total fire safety package, should be considered. In using such an approach, the factors contained in 0.2.2, and measures specified in 0.2.3 should be addressed."

0.2.3 Assessment of Risk in Tall and Very Tall buildings containing Flats

With reference to section 0.3.8 of TGD B,

"As building height increases, so does the complexity and risks presented to occupants and firefighters. Therefore, for such buildings, additional measures may need to be considered.

For buildings containing flats (purpose group 1(c)), buildings with a floor level greater than 30 m may require additional provisions to the requirements specified in this document, such as the provision of a sprinkler system (see 1.8), the appropriateness of the smoke control system, or other measures.

In very tall buildings containing flats (purpose group 1(c)), a holistic fire safety engineering approach (see 0.2.4) that takes into account the total fire safety package should be considered. In using such an approach, the factors contained in 0.2.2, and measures specified in 0.2.3 should be addressed"

The engineering approach in BS 7974 may be used in conjunction with other standards It may also be used to justify alternative approaches to those in other standards

Whilst FSE procedures can be used to evaluate the entire set of fire, people and building interactions, in many practical applications their most common use is to evaluate specific departures from design codes (e.g., the evaluation of extended travel distances in a building which otherwise conforms to design codes).

It is noted that the Albert Quay 2 Building does not deviate from the TGD B design requirements and there are no areas of the building that are not in compliance with the requirements of TGD B.

It is further noted that the proposed residential building whilst tall, is not complex in nature.

0.2.4 BS 7974 Basic Design Process Framework

Under BS 7974, the basic design process comprises the following main stages, as illustrated in Figure 5 of BS 7974:

a) Qualitative Design Review (QDR) (see Figure 6 and Clause 5);

b) performing the analysis (see Clause 6 and Clause 7);

c) assessment against acceptance criteria (see Clause 8);

d) internal peer review, quality assurance (see Clause 9);

e) reporting and presentation of review/approval

0.3 BACKGROUND TO THE ASSESSMENT

0.3.1 Fire Safety Certificate Application

This QDR assessment has been undertaken as part of a request from Cork Fire Brigade following a design review of the fire strategy for the project. Typically, fire strategies are developed based on reference to prescriptive codes and guidance documents that provide standard approaches to a set of specific building parameters, which is applicable where the building design falls within these parameters. However, given the prescriptive nature of the guidance documents, they often do not always take into account all design factors. BS 7974-Table 25 summarises the advantages and disadvantages typically associated with design codes.

Table 25: BS 7974 Table 1

Advantages	Disadvantages
> Simple to use > Embody past experience > Provide a consensus view > Familiarity to stakeholders and authorities having jurisdiction	> Often not flexible. > Unable to anticipate all eventualities. > Do not necessarily provide optimum solution. > Might lag many years behind design practice. > Unresponsive to changes in construction methods, technology and materials > Might result in compliance taking precedence over wider safety considerations

The main stages in the QDR are to:

a) review architectural design and selection of materials including their suitability and fire properties, occupant characteristics and client requirements;

b) establish functional objectives for fire;

c) identify fire hazards and possible consequences;

d) establish trial FSE designs;

e) set acceptance criteria;

f) identify method of analysis;

g) establish fire scenarios for analysis; and

h) document outputs of QDR.

The information and findings associated with each stage have been detailed within this report. It shall be noted that PD 7974:2019 notes that while the QDR stages will generally fall in this order, it is subject to project particular circumstances. In this instance, the fire safety objectives have been identified first.

0.4 FUNCTIONAL FIRE SAFETY OBJECTIVES

BS 7974:2019 recommends that the functional objectives of the fire safety design shall be clearly defined at the early stage of the design process. Functional objectives may be one or more of the following

1) Life safety.

2) Loss control and organisational resilience and

3) Environmental impact/protection.

The following fire safety objectives have been established, note these may be subject to revision as the QDR process develops:

- The occupants are ultimately able to leave the building in reasonable safety.
- Firefighters can operate without undue risk,
    - to Assist evacuation when necessary.
    - Affect rescue when necessary.
    - Prevent fire spread.
- Collapse does not endanger people (including fire-fighters) who are likely to be in or near the building.

0.5 ARCHITECTURAL DESIGN REVIEW AND OCCUPANT CHARACTERISTICS

BS 7974 recommends that the architectural design shall be reviewed at an early stage as a means of ensuring the fire safety measures and architectural design are developed uniformly. Information about the building, its occupants and uses are provided below.

Area of review	Item	Comment
Building Design	Number of storeys (above and below ground).	• 1 floor below ground – Lower Ground • 25 storeys above ground level ○ Ground floor level to twenty-fourth floors
	General dimensions.	>50m (c78.725m in height.) Site area is c.3789m^2
	Nature of construction.	Reinforced concrete structure with steel frame. The elements of the façade are proposed to meet not less than Class A2-s1,d0. The frame and walls will generally meet the above too.
	Geometry and interconnection of spaces.	The building contains ancillary areas along with one commercial area as noted below: > Level 00 - Community Space > Level 00 - Creche The Community Space & Creche area are accessed directly from the external route and does not communicate with the residential building internally.
	Internal subdivision of building.	The building is proposed to have substantial internal subdivision as highlighted below: > Fire-fighting Stair and lifts – 120-minute compart-ments. > Service risers – 60/120-minute fire separation. > Ancillary areas – Separated by 60/120-minute com-partmentation. > Commercial unit – 120-minute separation.
	Escape routes.	The escape routes are primarily the common corridor connecting to the ventilated lift lobbies and to the protected stairs from the upper levels.
	Provision for dispersal of people from vicinity of building.	The occupants can move away from the building via the egress routes at ground floor. The streets and roads around the building allow dispersal of residents
	Fire Brigade response time.	The fire service response time shall be very quick given the nearest station is 0.5km away.

Area of review	Item	Comment
	Access for fire appliances.	Fire service access to the building is via Albert St. to the West of the building. Fire appliance access to the building is via the main roads around the site (Albert St. & Albert Quay)
	Fire-fighting access within the building.	Fire access internal to the building is via the main stairs cores and the fire-fighting shafts within the building.
	Possible fire and smoke spread along routes.	Smoke spread is limited and restricted due the presence of fire doors and is also addressed as follows: > Firefighting lobbies are each independently mechanically ventilated > Residential ventilated corridors
	Proposed fire detection and fire alarm systems	Common areas: > L3X Residential units > Grade D LD1 Community Space / Creche > L2/L3X
	Location relative to other buildings or site boundary.	The site is located adjacent to another office block (Navigation Sq.) The external fire spread of the development is assessed within the fire strategy report.
	Planning constraints (e.g., listed building of historical interest).	None that are relevant.
	Any other factor that might influence the fire safety design.	The Residential areas of the building are sprinkler protected to BS 9251
	Carpark Ventilation	Not applicable in this building
Occupants	Number and distribution.	The residential areas shall be of typical occupancy (2-6 people per apartment) The bike store will have a low occupancy who are awake and familiar with the area. Community Space is independent and has its own escape Creche is independent and has its own escape
	Single or multiple tenancy of use.	The development is residential use Each Resi floor is sub divided into separate units

Area of review	Item	Comment
	Mobility, vulnerability and need for assistance.	Any floor could have mobility / visually impaired occupants. Disabled Refuges are provided where necessary, refer to Section 2.10 The building is provided with firefighting lifts for the use by the fire and rescue service. These lifts can also assist in the evacuation of disabled occupants.
	State of wakefulness.	Mix - Residents could be asleep or awake in the building.
	Familiarity with the building.	Residents will be familiar with the common areas at lower ground, ground, first and second floor levels of the building. Access is restricted to residential parts of the building due to security reasons so there are areas they will not be familiar with.
	Roles and responsibilities of key individuals.	The 'Person having Control' of the building shall comply with the 'Fire Safety Guide for Building Owners and Operators' – Guide for persons having control under Section 18(2) Fire Services Acts 1981 and 2003. The 'Person having Control' will have additional management roles as per Health and Safety and Welfare at Work Act 2005. Adequate level of management system is proposed as per section 8.2 of BS 9999
	Commitment to an activity (e.g., eating in a restaurant).	Ground floor Community Space / retail with light commercial use. Community Space is independent and has its own escape Creche will have babies, toddlers and young children, managed by staff.
	Presence of a focal point (e.g., stage).	No focal point.
	Any other factor that might influence the fire safety design.	None.
Fire hazards / Room or compartment	Unusual fire hazards (e.g., flammable liquids stored in offices).	None.
	Potential ignition sources.	Various typical electrical items associated within Resi units. E-Bikes / Scooters
	Combustible contents.	Areas of the building will be generally limited to the furniture within the common spaces, bicycles within specific storage area. Plant equipment in plant rooms

Area of review	Item	Comment
	Fire load density.	limited to the furniture within the residential spaces, bicycles within storage area.
	Fire Growth Rate	Reduced to medium fire growth rate given the presence of Sprinklers
	Wall lining.	The wall linings will comply to TGD B recommendations.
	Ceiling lining.	The ceiling linings shall comply to TGD B recommendations.
	Ambient noise levels.	None that are considered out of the ordinary. Where necessary, additional sounders can be provided e.g. balconies / terraces
	Ventilation systems.	As relevant, systems passing through fire rated elements provided with appropriate fire rated encasement. Fire / smoke dampers.
	Possible fire and smoke spread routes.	As relevant concealed cavities closed and sub-divided by cavity barriers.
	Escape routes.	Protected escape routes to be maintained free of accumulated fire load.
	Any other factor that might influence the fire safety design.	None.
Management of fire safety	Quality and extent of continuing management control.	It is understood the building will not have a management presence in the form of 24-hour coverage. It is noted that a Fire Safety Assessment of the building shall be carried at least every three years by a competent fire safety assessor in accordance with the 'Code of Practice for Fire Safety Assessment of Premises and Buildings (March 2022).
	Number of people with responsible for the fire safety management.	The main management team is most likely to be 1-2 people.
	Staff to occupant ratio.	N/A.
	Level of fire safety training.	To be determined by the individual needs
	Security arrangements which might conflict with	None.

Area of review	Item	Comment
	evacuation strategy.	
	Level of control over work on site (e.g., hot works).	Hot work permits are recommended. Any works to be undertaken on site shall be subject to permits which are to be control by appropriate protocols as to be derived by management.
	Level of planning and adaptability for changes to risk on site.	Changes shall be controlled under Fire Safety Management policies / lease agreements
	Level of knowledge and understanding to implement the fire safety strategy developed.	To be determined by the individual needs
	Contacts for provision of additional information.	TBC.
	Any other factor that might influence the fire safety design.	None.
Other factors	Contacts for provision of additional information.	TBC.
	Quality and extent of continuing management control.	To be determined by the individual needs
	Planning constraints (e.g., listed building of historical interest).	N/A (no elements to consider).

/1 WHAT IF STUDY

A “What if” study has been produced below which includes possible failures such as:

- Sprinkler failure
- Smoke control system failure
- Fire door failure
- Fire doors held open by fire hoses before evacuation is complete
- Wet riser failure
- Power supply failure
- Fire safety management system related failures

The study is based on worst case credible scenarios which include:

1) A fully developed fire at a low level in the building – 2nd floor
2) A fully developed fire at Level 20 & 21.

Worst case scenario #1	What if situation	Systems still functioning and actions
A fully developed fire at a low level in the building – 2nd floor	Sprinkler failure	Firefighting lobby ventilation still functions
		Firefighting lifts still function
		Wet rising fire mains still functions – firefighter connect into outlet and proceed onto floor to extinguish fire
		All fire doors perform as intended
		Firefighting operations are capable from either firefighting shaft provided
		Occupants are evacuated
A fully developed fire at a low level in the building – 2nd floor	*Smoke control system failure (one firefighting lobby ventilation system fails)*	Sprinkler suppression still functions

		Other Firefighting lobby ventilation system still functions – firefighting operations will be performed from the active shaft.
		Firefighting lifts still function
		Wet fire mains still function
		All fire doors have performed as intended
		Firefighting operations are capable from the access to either floor and from the firefighting shafts provided
		Occupants are evacuated
A fully developed fire at a low level in the building – 2nd floor	*Fire door failure – a fire door close to the firefighting shaft off the lift lobby has failed.*	Sprinkler suppression still functions
		Firefighting lobbies ventilation systems still function
		Firefighting lifts still function
		Wet rising fire mains still function
		All other fire doors function
		Firefighting operations are capable from protected firefighting shaft provided. One lobby may be compromised but the other is still protected.
		Occupants are evacuated
A fully developed fire at a low level in the building – 2nd floor	*Fire doors held open by fire hoses before evacuation is complete*	Sprinkler suppression still functions
		Firefighting lobby ventilation system still functions – one is compromised as firefighters have their hose through the door. This door is managed by fire fighters and breathing apparatus team. They assist

		any remaining occupants on the fire floor escape.
		Firefighting lifts still function
		Wet fire mains still function
		All other fire doors function as intended
		Firefighting operations are capable from either of the firefighting shafts provided.
		Occupants are evacuated whilst the fire brigade extinguish the fire.
A fully developed fire at a low level in the building – 2nd floor	*Wet riser failure –* *It is noted that there is a duty and stand by pump. (In this scenario, it is assumed that both have failed.)*	Sprinkler suppression still functions – this either extinguishes or controls fire spread of the fire
		Firefighting lobbies ventilation systems still function
		Firefighting lifts still function
		Firefighting operations are capable from the access to 2nd floor from the firefighting shafts provided – hose will need to be brought up either of the stairs and through a lobby out into the floor if necessary. This will require communication between the FF team at 2nd floor and the BAECO/ pump operator at ground level.
		All fire doors have performed as intended
		Occupants are evacuated
A fully developed fire at a low level in the building – 2nd floor	*Power supply failure – in this building, power is provided by main and a backup power supply (generator).*	If Mains power supply fails (power from ESB substation distributing to other distribution boards and rooms, cables are fire rated.) The backup generator will start within 15seconds and provide power to lift safety systems

		Sprinkler suppression will still function
		Firefighting lobbies ventilation will still function
		Firefighting lifts will still function
		Wet fire mains will still function
		Firefighting operations are capable from the firefighting shafts provided
		All fire doors have performed as intended
		Occupants are evacuated
A fully developed fire at a low level in the building – 2nd floor	*Fire safety management system related failures –* *key staff out of the building at the time of the fire.*	FDAS still functions and occupants are alerted
		Sprinkler suppression still functions – this either extinguishes or controls fire spread of the fire
		Firefighting lobbies ventilation systems still function
		Firefighting lifts still function
		Wet fire mains will still function
		All fire doors have performed as intended
		Responding fire crews will deal with the fire whilst other crews can assist the evacuation of the building. Key personnel will be contacted and operations conducted from the fire control room. Management procedure for such a scenario to be developed into their training schedule.

Worst case scenario #2	What if situation	Systems still functioning and actions
A fully developed fire at Level 20 & 21.	Sprinkler failure	Firefighting lobby ventilation still functions
		Firefighting lifts still function
		Wet rising fire mains still functions – firefighter connect into outlet and proceed onto floor to extinguish fire
		All fire doors perform as intended
		Firefighting operations are capable from either firefighting shaft provided
		Occupants are evacuated
A fully developed fire at Level 20 & 21.	*Smoke control system failure (one firefighting shaft lobby ventilation system fails)*	Sprinkler suppression still functions – this either extinguishes or controls fire spread of the fire
		Other Firefighting lobby ventilation system still functions – firefighting operations will be performed from the active shaft.
		Firefighting lifts still function
		Wet fire mains still function
		All fire doors have performed as intended
		Firefighting operations are capable from the protected firefighting shaft provided
		Occupants are evacuated
A fully developed fire at Level 20 & 21.	*Fire door failure – a fire door close to the firefighting shaft off the lift lobby has failed.*	Sprinkler suppression still functions – this either extinguishes or controls fire spread of the fire
		Firefighting lobbies ventilation systems still function

		Firefighting lifts still function
		Wet rising fire mains still function
		All fire doors have performed as intended
		Firefighting operations are capable from protected firefighting shaft provided. One lobby may be compromised but the other is still protected.
		Occupants are evacuated
A fully developed fire at Level 20 & 21.	*Fire doors held open by fire hoses before evacuation is complete*	Sprinkler suppression still functions – this either extinguishes or controls fire spread of the fire
		Firefighting lobby ventilation system still functions – one is compromised as firefighters have their hose through the door. This door is managed by fire fighters and breathing apparatus team. They assist any remaining occupants on the fire floor escape.
		Firefighting lifts still function
		Wet fire mains still function
		Other fire doors function as intended
		Firefighting operations are capable from either of the firefighting shafts provided.
		Occupants are evacuated whilst the fire brigade extinguish the fire.
A fully developed fire at Level 20 & 21.	*Wet riser failure –* *It is noted that there is a duty and stand by pump. (In this scenario, it is assumed that both pumps have failed) It is further noted that the wet fire main system is split into 2*	Sprinkler suppression still functions – this either extinguishes or controls fire spread of the fire

		Firefighting lobbies ventilation systems still function
		Firefighting lifts still function
		Firefighting operations are capable from the access to 20th or 21st floors from the firefighting shafts provided – hose, if required, will need to be brought up either of the stairs and through a lobby out into the floor. This will require communication between a team at the lower section of working wet raiser and the FF operation floor (BAECO) 20+21st floors.
		All fire doors have performed as intended
		Occupants are evacuated
A fully developed fire at Level 20 & 21.	*Power supply failure – in this building, power is provided by mains and a backup power supply.*	If Mains power supply fails (power from ESB substation distributing to other distribution boards and rooms, cables are fire rated.) The backup generator will start within 15seconds and provide power to lift safety systems
		Sprinkler suppression will still function
		Firefighting lobbies ventilation will still function
		Firefighting lifts will still function
		Wet fire mains will still function
		Firefighting operations are capable from the firefighting shafts provided
		Occupants are evacuated as per the recommendations in Annex M of BS 9999.
A fully developed fire at Level 20 & 21.	*Fire safety management system related failures –* *key staff out of the building at the time of the fire.*	FDAS still functions and occupants are alerted

		Sprinkler suppression still functions – this either extinguishes or controls fire spread of the fire
		Firefighting lobbies ventilation systems still function
		Firefighting lifts still function
		Wet fire mains will still function
		All fire doors have performed as intended
		Responding fire crews will deal with the fire whilst other crews can assist the evacuation of the building. Key personnel will be contacted and operations conducted from the fire control room. Management procedure for such a scenario to be developed into their training schedule.

Appendix C

Previously approved FSC Report 18446-2R001RevD on foot of which FSC2303240CY was granted