COIS ABHANN LIFFEY VALE BIODIVERSITY CENTRE.

FIRE SAFETY CERTIFICATE COMPLIANCE DOCUMENT.

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Site: Cois Abhann Liffey Vale

Project: Biodiversity Centre

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Client: Blackwood Associates.

ISSUE STATUS

Revision	Date	Prepared by	Checked by	Purpose
P1	Sept 20	Donald Aiken		Initial Analysis
P2	11th Dec 20	Donald Aiken		Revised Analysis
P3	18th Feb 21	Donald Aiken	David Robertson	Updated analysis
P4	8th Nov 21	Donald Aiken	David Robertson	Updated analysis

SECTION A: INTRODUCTION

SECTION A1: GENERAL

FLN Consulting Engineers (FLN) have been appointed by Blackwood Associates (BA) to act as Fire Engineers and to submit a Fire Safety Certificate Application (FSCA) as part of the project for the Biodiversity Centre at Cois Abhann Liffey Vale. This document we only be applicable to the Biodiversity Centre and not to the general Gardens.

The basis for this review is to ensure that when completed the Biodiversity Centre Project will comply with Building Regulations Technical Guidance Document 'B' (TGD'B') – Fire Safety, as produced by the Department of Environment, Heritage and Local Government and all other referenced documents and standards.

This document is intended to demonstrate that, if the Biodiversity Centre works are carried out in accordance with the requirements of this report and the associated drawings, then the building will comply with the requirements of Part B (Fire Safety) of the Second Schedule of the Building Regulations and Technical Guidance Document 'B' (TGD'B'), 2006, Parts B1 to B5, Reprinted Edition 2020, Amendments and Corrections Incorporated.

The Biodiversity Centre will comprise the alteration and upgrading of the current existing main historic house to provide office, meeting and exhibition space and the creation of a new build visitor café, multipurpose room / education space and associated accommodation.

The following text will address the proposed fire and life safety provisions for and within the Biodiversity Centre works.

Section A2 of this report provides an overview of the building construction area and occupancy as proposed.

Section B, of the report is subdivided into sections to demonstrate compliance with Part B as follows:

- Section B.1: Part B1 – Means of Escape in Case of Fire.
- Section B.2: Part B2 – Internal Fire Spread (Linings).
- Section B.3: Part B3 – Internal Fire Spread (Structure).
- Section B.4: Part B4 – External Fire Spread.
- Section B.5: Part B5 – Access and facilities for the Fire Service.

Drawings to be read in conjunction with the report are detailed below, with revisions as stated on the drawing register:

- F[58]-001 FSCA Site Plan – Rev P1
- F[58]-002 FSCA Block Plan – Rev P1

- F[58]-010 FSCA Legend – Rev P1
- F[58]-100 FSCA, Ground Floor Plan, Fire Compartmentation. FFL +5.150, +5.525, +5.995 & +6.485 – Rev P2
- F[58]-110 FSCA, Ground Floor Plan, Travel Distance & Escape Widths. FFL +5.150, +5.525, +5.995 & +6.485 – Rev P2
- F[58]-200 FSCA, Section A-A – Rev P2
- F[58]-201 FSCA, Section B-B – Rev P2
- F[58]-202 FSCA, Section C-C – Rev P2
- F[58]-203 FSCA, Section G-G – Rev P2
- F[58]-300 FSCA, North Elevation – Rev P2
- F[58]-301 FSCA, South Elevation – Rev P2
- F[58]-302 FSCA, East Elevation – Rev P2

SECTION A2: DESCRIPTION OF WORK

This compliance document covers the proposed redevelopment of the existing house as part of the Biodiversity Centre Project at Cois Abhann Liffey Vale.

For the purposes of this compliance document, the building will be assessed as "Place of Assembly" under purpose group 5, and as such will comply with the requirements of TGD'B' and in particular for section B1 1.1 to 1.3 BS 5588-6: 1991 – Fire precautions in the design, construction and use of buildings – Part 6 Code of practice for places of assembly.

The Biodiversity Centre will be located within ground on the northern banks of the River Liffey at Longmeadow's along Chapelizod Road. Access to the grounds is from Chapelizod Road.

The existing house is a Georgian House and a protected structure.

The proposed Biodiversity Centre accommodation is spread over various single storey levels through both existing derelict house and new visitor accommodation which will be connected by a serious of ramps to allow universal access to all areas.

In the main house the accommodation is split over three ground levels, with a meeting/office space and reception/introduction area at the entrance level, exhibition space at mid-level and at the lowest level a second exhibition space with access to outside veranda.

To the rear of the main house there is a ramped area, interconnecting the three-house levels with the new building education centre and café.

The education centre comprises multipurpose space/education room, café, servery, stores, and externally accessed toilets. The education centre is on the one level throughout.

The fabric of the existing house will be retained and sympathetically upgraded thermally where possible, while the new build will be of modern thermal construction.

The building although on various levels is single storey. The lowest external ground level around the building is +4.86, while the highest floor level is +6.485, hence the height to the top storey is 1.625m from lowest adjacent ground level.

The area, level, and height above grade for each floor within the development are given in Table A2.1 below.

Table A2.1: Floor Areas & Levels above Surrounding Grade

Level	Approximate Floor Area (m2)	Level Above or Below Surrounding Grade (& Floor Level) [A] (m)
House Top Level	43	+1.625 (+6.485)
House Mid-Level	36	+0.665 (+5.525)
House Lowest Level	19	+0.290 (+5.150)
Rear Ramped Area	45	Various
House Lowest to Mid-Level Ramped Area	16	Various
Education Centre & Cafe	88	+1.135 (+5.995)

Notes:
[A] Grade taken as +4.86. Note levels vary around the perimeter of the Building.

Table A2.2: Summary of Building Depths and Heights

Depth of Basement from Highest Ground Level (m).	Height to Top Storey from Lowest Ground Level (m).	Height of Building – Mean Ground to Mean Roof Level (m)
n/a	+ 1.625 m	6.0 m

This report is to demonstrate that when completed the House and Garden Re-Wilding project will comply with the requirements of Part B (Fire Safety) of the Second Schedule of the Building Regulations and Technical Guidance Document 'B' (TGDB), 2006, Parts B1 to B5, Reprinted Edition 2020, Amendments and Corrections Incorporated and BS 5588-6: 1991 – Fire precautions in the design, construction and use of buildings – Part 6 Code of practice for places of assembly.

Compliance of the works in accordance with the Second Schedule of the Building Regulations is demonstrated in Section B of this document.

SECTION B: DEMONSTRATION OF COMPLIANCE

B1: MEANS OF ESCAPE IN CASE OF FIRE

Requirements in relation to Means of Escape in Case of Fire is demonstrated by compliance with BS 5588-6: 1991 – Fire precautions in the design, construction and use of buildings – Part 6 Code of practice for places of assembly; for TGD'B' Sub Sections 1.2: Design for horizontal Escape, Sub Section 1.3: Design for vertical escape.

Thereafter reference shall be made to TGD'B' Sub Section 1.4: General previsions for means of escape.

B1.0 Purpose Groups [TGD'B' Clause 0.3.2]

The defined purpose group shall be in accordance with Table B0.1.

Table B1.0: Purpose Group

Use	Group	Purpose for which a building or compartment of a building are used.
Place of Assembly & Recreation	5	Place of assembly or recreation including the following: (i) A theatre, public library, hall or other building of public resort used for social or recreational purposes. (iv) a public house, restaurant or similar premises used for the sale to members of the public of food or drink for consumption on the premise.

B1.1 Means of Escape Provisions for Different Purpose Groups and Building Types [TGD'B' Clause 1.1]

B1.1.1 Purpose Group 5 Assembly and Recreation [TGD'B' Clause 1.1.6]

Guidance for means of escape for Purpose Group 5, place of assembly and recreation buildings shall be demonstrated by compliance with TGD'B' Sub Sections;

- 1.2: Design for horizontal Escape,
- 1.3: Design for vertical escape,

Compliance of the above will be achieved with reference to BS 5588-6: 1991 – Fire precautions in the design, construction and use of buildings – Part 6 Code of practice for places of assembly.

- 1.4: General previsions for means of escape.

B1.2. Design for Horizontal Escape

[BS5588 - 6 Clause 6.0]

B1.2.1 Occupancy

[BS5588 – 6 Clause 6.6 Table 3]

Occupancy levels for the House Project for the various areas are detailed in Tables B1.2.2.A & B1.2.2.B., "Horizontal Escape Summary" and have been based on BS5588 - Part 6, Clause 6.6 Table 3, TGD'B' table 1.1 and summarised in Table B1.2.1.A : Occupancy Load Factors below.

Table B1.2.1.A: Occupancy Load Factors

Room/Area	Occupancy Load Factor (m2/person)
Exhibition [1]	1.5 or 0.4 over clear circulation routes
Museum / Art Gallery [1]	5.0
Restaurant	1.1 to 1.5
Meeting / Staff Room [2]	1.0
Office (open plan) [2]	5.0
Kitchen [2]	7.0
Storage room [2]	30

Notes:
[1] Taken from BS5588 – Part 6 Table 3
[2] Taken from TGD'B' Table 1.1.

B1.2.2 Travel Distances

[BS5588 – 6 Clause 6.4 Table 2]

Critical travel distances are identified in Tables B1.2.2.B and B1.2.2.C, "Horizontal Escape Summary", for each room and are shown on the drawings associated with this application.

Within the building travel distances, where furniture or internal layout are known, is measured as the actual travel distance from the start point to storey exit.

In any other areas, where furniture/equipment layouts are unknown, the overall travel distance is calculated by multiplying the direct distance for the unknown section of travel by 1.5 and adding the remaining actual travel distance to the storey exit.

Travel distances have been based on BS5588 Part 6 Table 2 for open floor areas and table 8 for ancillary spaces, as noted and summarised in Table B1.2.2.A below.

Table B1.2.2.A: Maximum Travel Distances

Area	Escape in one direction only	Escape in more than one direction
All rooms	18m	45m
Plantroom (within Room)	9m	35m
Plantroom Total Travel (enclosed)	18m	45m

Table B1.2.2.B. Ground Floor Level - (FFL – +5.150, +5.525, +5.995 and +6.485: Level above Grade +0.29m, +0.665m, +1.135m and +1.625m)

Location/Room Reference	Occupancy Load Factor (m^2/person) [A]	Usage	Area (m^2)	Occupancy Actual or (Calculated)	Minimum Room Escapes Based on Occupancy		Maximum Travel Distance (m) [B]		Maximum Proposed Travel Distance (m) [C]	
					Req'd	Actual	One Direction of Travel	More than One Direction	One Direction of Travel	More than One Direction
@+6.485										
Entrance Corridor	Incidental	Circulation	6	Incidental	N/A	N/A	N/A	N/A	N/A	N/A
Office	No of seats or 5	Office open plan	21	8	1	1	18	45	10	N/A
Reception / Introduction	1.5	Exhibition	16.2	8 (10)	1	2	18	45	N/A	6.5
@+5.525										
Exhibition	1.5	Exhibition	36.5	30	1	3	18	45	N/A	14
@+5.150										
Exhibition	1.5	Exhibition	19	12	1	2	18	45	N/A	9
Ramped Area +5.150 to +5.525	Incidental	Circulation	29	Incidental	N/A	N/A	N/A	N/A	N/A	N/A

Location/Room Reference	Occupancy Load Factor (m^2/person) [A]	Usage	Area (m^2)	Occupancy Actual or (Calculated)	Minimum Room Escapes Based on Occupancy		Maximum Travel Distance (m) [B]		Maximum Proposed Travel Distance (m) [C]	
					Req'd	Actual	One Direction of Travel	More than One Direction	One Direction of Travel	More than One Direction
@Various levels										
Ramped Area (+6.485 to +5.525)	Incidental	Circulation	51	Incidental	N/A	N/A	N/A	N/A	N/A	N/A
Staff Toilet (+5.995)	Incidental	Toilet	4.6	Incidental	N/A	N/A	N/A	N/A	N/A	N/A
@+5.995										
Meeting / Interpretation	No of seats or 1	Meeting	48	(48)	1	3	18	45	9	N/A
Storage	30	Storage	8.7	Incidental	N/A	N/A	N/A	N/A	N/A	N/A
Cafe	No of seats or 1.5	Restaurant	29.9	15 (20)	1	2	18	45	6.5	N/A
Kitchen/ Servery	7	Kitchen	17.0	(3)	1	1	18	45	9.5	N/A
Store / Fridges	30	Storage	8.9	Incidental	N/A	N/A	N/A	N/A	N/A	N/A
Staff / Staff Toilet	Incidental	Toilet	4.4	Incidental	N/A	N/A	N/A	N/A	N/A	N/A
Total Occupants At this level				73 (131)						

Table B1.2.2C. External Accommodation (FFL +5.995: Level below Grade +1.135m)

Location/Room Reference	Occupancy Load Factor (m^2/person) [A]	Usage	Area (m^2)	Occupancy Actual or (Calculated)	Minimum Room Escapes Based on Occupancy		Maximum Travel Distance (m) [B]		Maximum Proposed Travel Distance (m) [C]	
					Req'd	Actual	One Direction of Travel	More than One Direction	One Direction of Travel	More than One Direction
Disabled Toilets	Incidental	Toilets	4.8	Incidental	1	1	N/A	N/A	3	N/A
Toilets	Incidental	Toilets	3.1	Incidental	1	1	N/A	N/A	N/A	N/A
Toilets	Incidental	Toilets	3.2	Incidental	1	1	N/A	N/A	N/A	N/A
Total Occupants At this level				0[D] (0)						

Notes
[A] – Occupancy figures based on number of seats or where number of occupant's unknown, they will be calculated with occupancy load factor.
[B] – Figure taken from Table B1.2.2.A: Maximum Travel Distances, are actual distance.
[c] – Distances quoted are actual distance to storey exit, which is worst case distance. (i.e. any direct travel x 1.5 + any actual travel)
[D] – Incidental use.

B1.2.3. Minimum Number of Escape Routes and Single Escape Route. [BS5588 – 6 Clauses 6.4.2]

A minimum of 2 number escape routes will be required for escape from each room or storey where the occupants do not exceed 600.

A single direction of escape will be allowed where:

- The occupancy of the area, room or storey is less than 50 people, and;
- The limits of travel for one direction of travel are satisfied.

Where single means of escape is employed, in any part of the travel distance, these will be identified in Tables B1.2.2.B & B1.2.2.C, "Horizontal Escape Summary", for each room and are shown on the drawings associated with this application.

Table B1.2.3.A: Minimum number of escape routes.

Number of Occupants	Minimum number of escape routes
1 to 50	1 (See restrictions above)
1 to 600	2
More than 600	3

B1.2.4. Planning of Escape Routes and Exits [BS5588 – 6 Clause 6.3.2]

The basic principle of escape route planning is to have very short escape routes or alternative means of escape.

The proposed building layout is mainly open plan and all rooms have an anticipated occupancy of less than 50 people. As such there are usually more than one escape route available and where there is only one escape route this can be reached within the one direction travel distance.

Due to the varying height difference of the spaces and the length of the interconnecting ramps, disabled escape has been considered to ensure access to exits are via two route where possible and within the required travel distances.

Existing building:

+6.485 escape is via the front entrance, while the reception area can escape through the rear ramped area to the Interpretation room.

+5.525 Escape is via front entrance, rear ramped area or via the lower exhibition space by ramp or doorway.

+5.150 Escape is direct to outside.

Note escapes down the rear ramp requires access through multi-purpose room to escape.

New build:

All rooms in the new build have direct access to outside for escape and can be reached within the one direction of travel distances.

Inner Rooms:

As the accommodation is open plan in the main existing areas there are no inner room but interconnected spaces.

The kitchen/servery areas is open plan but does require escape through an outer store room. The occupant will be familiar with the layout and it is open plan and hence is assumed to be acceptable.

The rear ramp is isolated and requires escape via other rooms, all within the max travel distances. The area will not be permanently occupied and as such is compliant.

Different Occupancy:

No areas have a different occupancy; hence all storeys/ rooms are in one ownership.

B1.2.5. Width of Escape Routes and Exits [BS5588-6 6.6.2]

The required and proposed escape route widths from the areas are detailed in Table B1.2.5.A, below.

Table B1.2.5.A Width of Escape Routes

Location/Room Reference	Max. Occupancy (No. of People) [A]	Required Minimum Width of Escape Route (mm) [B]	Proposed Minimum Width of Escape Route (mm)	Escape Route Capacity (No. of People) [C]
All rooms	48	800	900	110

Notes

[A] - Based on discounting one exit from area.
[B] - Based on BS5588-6 Table 4
[C] - Calculation of available escape route capacity takes account of the fact that the largest escape route may be unavailable.

Where door and a half or double door are provided the main door leaf should have the minimum required dimensions given above. Single doors will meet the widths quoted above.

Note the above widths will also apply to corridor doors on escape route to storey exit. The minimum corridors width will be a minimum of 150mm wider than the doors.

B1.2.6. Corridors [TGD'B' Clause 1.2.5]

A protected corridor will be provided at the main front entrance of the building, to protect the escape from the two front rooms from the main exhibition space.

Sub-division of corridors will not be required as there are no corridors over 12m in length connecting two escape routes.

The rear ramped area is over the 12m in length but due to the height of the space at approx. 4.5m high, is assumed to be compliant.

There are no dead-end corridors.

B1.3. Design for Vertical Escape [BS5588-6 Clause 7.0]

The building is a single storey building and hence has no vertical escape routes. Reference clause applicable to this project shall be reviewed as necessary in this report.

B1.3.1 Number of Escape Stairs [BS5588-6 Clause 7.1 & 7.2]

Not applicable.

B1.3.2. Width of Escape Stairs [BS5588-6 Clause 7.1.2]

Not applicable.

B1.3.3. Protection of Escape Stairways [TGD'B' Clause 1.3.6]

Not applicable

B1.3.4. Basement Stairways. [BS5588-6 Clause 7.2 TGD'B' Clause 1.3.7]

Not applicable

B1.3.4. Requirement for Protected Lobbies and Corridors. [BS5588-6 Clause 7.3.2 TGD'B' Clause 1.3.8.4]

Not applicable

B1.4. General Provisions for Means of Escape

B1.4.1. Protection of Escape Routes [TGD'B' Clause 1.4.2]

The fire resistance of all enclosures, door sets, and glazed elements will be to the minimum fire resistance test criteria and standards of performance to TGD'B' Appendices A & B and as indicated on Fire Safety drawings associated with this submission.

Fire rating of doors is in terms of integrity only and is demonstrated by testing in accordance with EN 1634 parts 1-3. The method of test exposure is from each side of the door separately.

B1.4.2. Doors on Escape Routes [TGD'B' Clause 1.4.3]

Where Security on final exit door is required when the building is not occupied then hardware which is fully removable should be used. As this is an assembly building then the following is recommended.

Escape route doors, from all areas holding more than 50 people, will either be free from fastenings or be fitted with panic bolts complying with I.S. EN 1125, 1997.

Doors, other than those exit doors identified above, shall be fitted only with simple fastenings that can be operated from the escape side of the door without the use of a key.

Fire Safety in Places of Assembly (Ease of Escape) Regulations 1985 (S.I. No. 249 of 1985) should be consulted.

Doors on escape routes from a place of special fire risk or any room that is expected to hold more than 20 (assembly building) will be hung to open in the direction of escape.

In all cases in rooms where there is more than 20 people the escape door will opening in the direct of escape.

It should be noted that the final exit door on the front elevation will open inward due to the conversation and historic nature of this entrance. The building has multiple exit and is low occupancy and hence this is deemed to be acceptable.

All doors on escape routes will be hung to open a minimum of 90° and hence avoid reducing the door clearance width. They will be positioned to avoid, on opening, any reduction in stair or escape width.

Vision panels will be fitted in any doors sub-dividing escape routes.

B1.4.3 Construction of Escape Stairways [TGD'B' Clause 1.4.4]

Not Applicable.

B1.4.4. Height of Escape Routes [TGD'B' Clause 1.4.5]

All escape routes will have clear headroom of minimum 2m.

B1.4.5. Floors of Escape Routes [TGD'B' Clause 1.4.6]

The floor of all escape routes should have non-slippery even surfaces.

Ramps shorter than 9m will not be steeper than 1 in 12 otherwise they shall be 1:20. Ramps will meet the requirements set out in TGD'K' & 'M'.

B1.4.6. Final Exits. [TGD'B' Clause 1.4.7]

Widths of the Final Exits from the building are as shown in Table B1.4.6.1.A.

Table B1.4.6.1.A – Final Exit Widths.

Floor	Aggregate Occupancy Using Escape Route (No. of People)[A]	Width of Escape stair (mm)	Width of Final Exit Required (mm)	Width of Final Exit Available (mm)	Final Exit Capacity (No. of People)
Front Door	61	N/A	900	896	220
Exhibition Area Door	61	N/A	900	900	110
Education Room	63	N/A	900	930	110
Cafe	39	N/A	900	930	110

Notes

[A] Figures calculated from maximum anticipated occupants existing from that area.

B1.4.7. Lighting of Escape Routes and Emergency Lighting [TGD'B' Clause 1.4.8]

Artificial lighting will be installed to illuminate the escape routes from the building development. Lighting installations shall be provided in accordance with CIBSE standards and guidance.

Emergency escape lighting will be provided:

a) To indicate clearly and unambiguously the escape route so that the means of escape can be safely and effectively used;

b) Provide illumination along such routes to allow safe movement towards and through the exits provided; and

c) To ensure fire alarm call points and first aid firefighting equipment can be readily located.

Emergency lighting shall be non-maintained luminaries providing prompt lighting automatically in the event of local or complete failure of the power supply.

Emergency lighting will be provided for "defined and undefined escape routes" in accordance with TGD'B' Table 1.8. The installation shall be supplied and installed in accordance with the relevant recommendations of IS 3217:2013+A1:2017 "*Code of Practice for Emergency Lighting*", IS EN 1838 "*Lighting Appliances – Emergency Lighting*" and including, but not limited to, the following:

- Horizontal illumination at ground level on the centre line of defined escape route – 1 lux minimum and 0.5 lux minimum on un-defined escape routes.
- Response time to restore 50% of emergency lighting in 5 seconds maximum and full illuminance within 60s.
- At call points (break glass units) the minimum emergency lighting level provided shall be 5 lux.
- At disabled refuges, disabled refuge panel & at fire call points minimum emergency lighting level provided shall be 5 lux.
- Luminaries to comply with IS/IEC598-2-22.
- Flammability of luminaries to comply with IEC598-1 and IEC695-2-1, all external parts to be self- extinguishing within 30 seconds.
- Non-maintained emergency luminaires combined system for escape routes (i.e. sustained luminaries with 2 lamps).

B1.4.8. Lifts [TGD'B' Clause 1.4.9]

No lifts are being installed as part of these works. Escape will be via ramps where required.

B1.4.8. Electrical Installation and Protected Circuits [TGD'B' Clause 1.4.10]

All works in relation to the electrical installations shall be carried out with the requirements of National Rules for Electrical Installations (ET101) published by the Electro-Technical Council of Ireland.

The insulation of all electrical systems will comprise but not be limited to the following:

- Cable insulations will be flame retardant conforming to BS EN 60332 and be of low smoke zero halogen (LS0H).
- Electrical fittings will have a minimum index protection rating of IP20, in accordance with BS EN 60529.
- Electrical light fittings will not create a concentration of heat (heat spots) which might present a fire risk.

Any motors installed for moving the compact storage should be limited to 0.75kW motor size.

B1.4.9. Ventilation Systems [TGD'B' Clause 1.4.11]

All ventilation systems shall be designed and installed in line with the guidance given with TGD'B' Clause 1.4.11.

B1.4.10. Refuse Chutes and Storage [TGD'B' Clause 1.4.12]

Refuse chutes and storage areas will not be allowed within the building.

A refuse bin storage area will be provided within an external area between servery and staff toilet.

B1.4.11. Fire Safety Signs [TGD'B' Clause 1.4.13]

Fire safety signs will be installed to guide users to escape routes and exit doors. All signs shall be illuminated either internally or externally. Signage shall also be provided at firefighting equipment, fire call points and fire doors in accordance with SI 132 of the Safety, Health & Welfare at Work (Signs) Regulations, 1995.

Fire doors will be fitted with kept shut signage in accordance with BS 5499: Part 5: 2002 unless they are held open by electromagnetic devices connected to the AFDA system.

The requirements of the Fire Services Act, 1981 & 2003, and BS 5499: "*Graphical symbols and signs – safety signs including fire safety signs, Part 5: Signs with specific safety meanings*" will also be met.

B1.4.12. Fire Detection and Alarm Systems [TGD'B' Clause 1.4.14]

Due to the nature of the building a minimum L3 system will be installed into the building in accordance with IS 3218: 2013.

The system will be either an aspirating detection system (ASD) or high sensitivity point detectors to provide a high sensitivity smoke detection.

The following standards shall be used and complied with:

- IS 3218: 2013 +A1:2019 Code of Practice for Fire Detection and Alarm Systems for Buildings.
- IS EN 54: Parts 5, 7 and 8 Detection Devices.

Call points will be sited to provide maximum 30m travel and generally be at final exit and stair landings.

The following will automatically activate when the AFD&A activates:

- Active fire safety systems will automatically operate as required by the AFD&A system.

B1.4.13. Provisions for People with Disabilities [TGD'B' Clause 1.4.15]

The Fire Brigade will not be relied upon to evacuate the building. This is the responsibility of the building occupier.

Staff shall be aware of the number of people requiring assistance in the event of an emergency evacuation and will have management procedures in place for this to occur (e.g. in the form of PEEP's).

The design of the building allows for level or ramped access to all areas of the building accommodation and the escapes have been designed to ensure that disabled occupants can self-escape within the travel distances noted in the report.

One disabled refuge has been allowed for at the front of the building, as the access ramp passes areas of glazing within 1.8m of the escape ramp. The glazing to the office adjacent to the disabled refuge will be 30min fire rated to protect the disabled refuge from any radiant fire threat from this space.

B1.4.14. First-Aid Fire-Fighting Equipment [TGD'B' Clause 1.4.16]

First-aid fire-fighting equipment will be provided in the form of portable fire extinguishers in accordance with TGD'B'.

The first-aid firefighting equipment will comply with IS 291:2015 and shall be installed, inspected & maintained in accordance with the requirements of EN3-7:2004+A1:2007.

Where the first aid firefighting equipment is located in recesses or concealed boxes, adequate signage shall be installed as to be easily identifiable. Signage shall comply with SI 132 of the Safety, Health & Welfare at Work (Signs) Regulations, 1995. The requirements of the Fire Services Act, 1981, and BS5499: "*Graphical symbols and signs – safety signs including fire safety signs, Part 5: Signs with specific safety meanings*".

B1.4.15. Heating Producing Appliances [TGD'B' Clause 1.4.17]

No new gas equipment is proposed for within the building under these works.

All proposed heat producing equipment shall be installed in accordance with the requirements of TGD'J'.

B1.5 Conclusion to Section B.1

When the Biodiversity Centre Project at Cois Abhann Liffey Vale is completed, it will comply fully with the requirements of Part B1, "Means of Escape Provisions for Different Purpose Groups and Building Types" of the Second Schedule of the Building Regulations.

B.2: INTERNAL FIRE SPREAD (LININGS)

Requirements in relation to Internal Fire Spread (Linings) is demonstrated by compliance with the relevant sections of Technical Guidance Document 'B', Section B2.

B.2.1. General Provisions [TGD'B' Clause 2.1]

Finishes on walls and ceilings will be restricted by their surface rate of flame propagation which is graded in accordance with National (or European) Classes per Appendix A to TGD'B' Clauses A6-A8. The classes of linings required for walls and ceilings are defined in Table 2.1 below.

Table 2.1. Class of Lining Required for Walls & Ceilings.

Class [1]	Rooms
Class B – s3, d2 (Class 0)	In rooms exceeding 30m^2 in Places of Assembly
Class B – s3, d2 (Class 0)	In places of special fire risk
Class B – s3, d2 (Class 0)	Circulation Spaces
Class D – s3, d2 (Class 3)	In bathrooms toilets and shower rooms.
Class C – s3, d2 (Class 1)	In all other rooms (not noted above)

[1] The Class Linings are defined as:

Class 0: achieved where:

- Either where the material and its substrate (if it is a composite product) is either composed throughout of materials of limited combustibility (when tested in accordance with BS476, Part 11; or
- A Class 1 material which has a fire propagation index (I) of not more than 12 and a sub-index (II) of not more than 6.

Class 1 or 3: Performance demonstrated by testing for surface spread of flame in accordance with BS476, Part 7.

B.2.2. Windows, Rooflights and Lighting Diffusers [TGD'B' Clause 2.3.2, 2.3.3 & 2.3.4]

Any new windows, rooflights and lay-lights that are installed into the building will not be constructed from thermoplastic materials.

The use of thermoplastic in lighting diffusers shall be in accordance with the guidelines in TGD'B' Clause 2.3.4.

B.2.3. Conclusion to Section B2

When the Biodiversity Centre Project at Cois Abhann Liffey Vale is completed, it will comply fully with the requirements of Part B2, "Internal Fire Spread (Linings)" of the Second Schedule of the Building Regulations.

B3: INTERNAL FIRE SPREAD (STRUCTURE)

Requirements in relation to Internal Fire Spread (Structure) is demonstrated by compliance with the relevant sections of Technical Guidance Document 'B', Section B3.

B.3.1. Fire Resistance Standard [TGD'B' Clause 3.1.2]

The required fire resistance of load-bearing elements of the structure is defined in Table 3.1

Table B3.1: Minimum Fire Resistance of Loadbearing Elements.

Location	Height/Depth (m)	Design Reference	Minimum Period of Fire Resistance (mins)
Load-bearing Elements	<5m	TGDB, Table A2	60 mins
Compartment walls & floors	<5m	TGDB, Table A2	60 mins
Areas Generally	<5m	TGDB, Table A2	60 mins
Protected Shafts	<5m	TGDB, Table A2	60 mins
Protected Lobby/Corridor	<5m	TGDB, Table A1	30 mins
Place of Special Fire Risk	<5m	TGDB, Table A2	60 mins
Cavity Barriers	<5m	TGDB, Table A1	30 mins
Static Invertor rooms and sub systems.	Any	IS 3217 Clause 10.4	120 mins
Any enclosure containing any distribution boards, generator, communication equipment and any other equipment associated with life safety and fire protection systems	Any	BS 8519	120 mins

1. For compartment walls, compartment floors and separating walls – fire resistance is defined in terms of Stability (S), Integrity (E) and Insulation (I) when tested in accordance with EN 1366.

2. For structural frames, beams or columns – fire resistance is defined in terms of Load-bearing capacity only.

3. Method of exposure:

i. Structural frame, beam or column – exposed faces.

ii. Load-bearing walls – each side separately

iii. Floors – from underside

iv. External wall – each side separately.

B.3.2. Compartmentation [TGD'B' Clause 3.2]

Compartmentation will be provided to help prevent the spread of smoke and fire and to help minimising the size of a fire. Details of compartmentation are given below.

B.3.2.1. Provision of Compartment Walls and Compartment Floors [TGD'B' Clause 3.2.4]

As the building is single storey, hence compartment floors will not be required.

The maximum compartment acceptable by TGD'B' for assembly buildings is 1900m^2 floor area on any one storey and a volume of 21,000m^3. The maximum floor area of the Biodiversity Centre Project is 247m^2 which is well below the maximum compartment sizes allowed. The building will comprise one compartment.

All junctions of compartment walls with compartment floors will be sealed to prevent the passage of fire products between compartments.

B.3.2.2. Fire Resistance of Timber Floor in Existing Buildings [TGD'B' Clause 3.2.5.3]

As the Biodiversity Centre Project is a historic building with timber floors. Where required they will be upgraded to ensure compliance with the minimum fire resistance standard noted above.

B.3.2.3. Compartment walls [TGD'B' Clause 3.2.5.4]

The compartment walls shall be constructed of materials of limited combustibility, apart from any wall surface complying with the requirements of B2, internal fire spread (linings).

B.3.2.4. Separating Walls [TGD'B' Clause 3.2.5.5]

There will be no separating walls.

B.3.2.5. Accommodation of Services in Compartment Walls/Floors and Separating Walls [TGD'B' Clause 3.2.5.7]

Where services pass through these compartment walls or floors, they will be contained in fire resistant ducts and the opening of the ducts protected and fire-stopped, in accordance with Clause 3.4 of TGD'B'.

No services will be allowed to breach the fire rating materials of the compartment wall. Any services mounted on a compartment wall will either be surface, accommodated in a services duct or service cavity created external to the unbreached linings of the fire compartment wall or floor.

B.3.2.6. Junction of Compartment Wall or Compartment Floor with Other Walls [TGD'B' Clause 3.2.5.9]

Where a compartment wall/floor meets another compartment wall or external wall the junction will maintain the fire resistance of the compartmentation as noted above.

B.3.2.7. Junction of Compartment Wall and Roof [TGD'B' Clause 3.2.5.11]

The junction, where any compartment walls meet the roof, shall be constructed to prevent the spread of fire between compartments. The gap between the top of the compartment wall and the roof structure shall be no greater than 50mm and shall be filled with a fire stopping material, to the rating of the wall, over the full width of the wall. Typical details are provided in Diagram 13 of TGD’B’.

B.3.2.8. Openings Between Compartments [TGD'B' Clause 3.2.6]

All doors openings in a compartment wall will be protected by means of a fire door, with the appropriate fire resistance.

Openings for the passage of ducts pipes and other services will be protected in accordance with Clause 3.4 of the TGD'B'.

B.3.2.9. Protected Shafts [TGD'B' Clause 3.2.7]

All service shafts will be enclosed in a minimum of 30 mins fire rated enclosure in accordance with Tables A1 and A2. Mechanical, electrical, telecommunications, and other breeches are to be appropriately dampered and/or patched with like fire resistance materials in accordance with Part B, Section 3.4.

Where the shafts penetrate compartment walls/floor they will be fire stopped at the floor level or the shaft will be fire rated through its entire height to the same rating as the compartment wall/floor.

The M&E risers will have minimum 60 mins fire rating or 120 mins where enclosing static inverters or associated emergency lighting system supply equipment.

Glazed elements that give at least 30 minutes fire resistance in terms of integrity only can be incorporated into part of the enclosure between the shaft and the corridor or lobby if the principles in Diagram 15 and the provisions of Table A4 of Appendix A are met.

B.3.3. Concealed Spaces (Cavities) [TGD'B' Clause 3.3]

B.3.3.1. Provisions of Cavity Barriers [TGD'B' Clause 3.3.2 & Clause 3.3.3]

Cavity barriers shall be provided in accordance with the recommendations of TGDB, Clause 3.3.2., Table 3.2. Cavity barriers shall be installed at a maximum of 20m apart along any voids.

B.3.3.2. Construction and fixing of Cavity Barriers [TGD'B' Clause 3.3.4 & Clause 3.3.5]

Every cavity barrier shall be constructed to provide a minimum fire resistance of 30mins (Integrity) and 15mins (Insulation) when tested in accordance with BS 476.

Cavity barriers may be formed by:

Timber construction – minimum 38mm thick.

Steel construction – 0.5mm thick.

Cavity barriers shall be tightly fitted to rigid construction and mechanically fixed into position. The fixings shall ensure that the barrier is unlikely to be made ineffective due to movement of the building, collapse in a fire of any services penetrating them, failure in fire of their fixings or failure in fire of any material or construction to which they abut.

Openings in the cavity barriers shall be limited to those identified in TGDB, Clause 3.3.5.

B.3.4. Protection of Openings and Fire-Stopping [TGD'B' Clause 3.4]

B.3.4.1. Protection of Openings [TGD'B' Clause 3.4.1]

All penetrations for services shall be fire stopped to prevent the spread of fire by sealing using proprietary fire-stopping materials in accordance with TGDB, Clause 3.4. In particular service penetrations of the designated barriers are to be protected in accordance with the relevant recommendations of BS 8313: 1997 and BS 5588.

B.3.4.2. Opening for Pipes [TGD'B' Clause 3.4.2]

Pipes passing through compartment walls or compartments floors will be installed to the provisions detailed in Alternatives A, B or C of TGD'B', Clause 3.4.2.

B.3.4.3. Venting Ducts [TGD'B' Clause 3.4.3]

Where these ducts pass from one compartment to another, they shall be protected in accordance with the recommendations contained in BS 5588 Part 9 for ventilation and air conditioning ductwork and in this case rated to the fire requirements of the wall they are passing through.

B.3.4.4. Fire-Stopping [TGD'B' Clause 3.4.5]

All service penetrations or openings shall be fire stopped in accordance with all the provisions of TGD'B', Clause 3.4.5.

B.3.5. Conclusion to Section B3

When the Biodiversity Centre Project is completed, it will comply fully with the requirements of Part B3, "Internal Fire Spread (Structure)" of the Second Schedule of the Building Regulations.

B4: EXTERNAL FIRE SPREAD (LININGS)

Requirements in relation to External Fire Spread is demonstrated by compliance with the relevant sections of Technical Guidance Document 'B', Section B4.

B.4.1. Construction of External Walls [TGD'B' Clause 4.1]

B.4.1.1. Fire Resistance Standard [TGD'B' Clause 4.1.2]

All external walls on the building are/will be constructed of Class B – s3, d2 (European) or Class 0 (National), non-combustible materials including masonry, metal cladding and glass.

They will not provide a medium for fire travel, and are in compliance with TGD'B', Table 4.1.

B.4.1.2. External Fire Spread [TGD'B' Clause 4.1.4]

External surfaces of the buildings have been constructed using materials with a Class B – s3, d2 (European) or Class 0 (National) rating where the external surface is less than 1m to the relevant boundary as building is less than 18m in height.

B.4.1.3. External Wall Construction [TGD'B' Clause 4.1.5]

The existing external walls which will remain and will not provide a medium for fire travel.

Over cladding of the building is not being proposed.

B.4.2. Space Separation [TGD'B' Clause 4.2]

B.4.2.1. Boundaries [TGD'B' Clause 4.2.2]

Boundaries for the Biodiversity Centre building are shown on Drawing No. F[58]-002.

B.4.2.2. External Walls 1m or More from the Relevant Boundary [TGD'B' Clause 4.2.8]

The external walls will remain as existing under this project and hence there will be no change to the external fire threat posed to the adjacent building, which are on the same site and ownership as the development.

Calculations were however undertaken based on BRE Report 187 and are shgown on drawings F[58]-300, 301 and 302.

All unprotected areas on the elevations are well within the distance to the relevant boundaries and are compliant.

B.4.2.3. Material Alteration of Existing Buildings [TGD'B' Clause 4.2.9]

Calculations, based on BRE Report 187, have been undertaken and are shown on Drawings F[58]-300, 301 and 302.

B.4.3. Roof Covering [TGD'B' Clause 4.3]

B.4.3.1. Classification of Performance [TGD'B' Clause 4.3.3]

The roof covering for the Biodiversity Centre Project will be as defined in Table B4.3.1.

Table 4.3.1: Designation of Roof Covering.

Location	Minimum Designation Required [1]	
	European Class	National Class
All Roofs	B_{Roof} (t4)	AA, AB or AC

Notes on Table 4.3.1:

[1] Performance in terms of the resistance of roofs to external fire exposure is determined either by:

- (European Tests) Commission Decisions 2005/823/EC amending Decision 2001/671/EC of 22nd November 2005 establishing a classification system for the external fire performance of roofs and roof coverings and any subsequent amendments;
- I.S.ENV 1187: 2002; or
- (National Tests) BS 476, Part 3: 2004.

B.4.3.2. Plastic Rooflights [TGD'B' Clause 4.3.5]

Plastic rooflights will not be used in the redevelopment.

B.4.3.3. Glass in Rooflights [TGD'B' Clause 4.3.6]

Roof lights will be installed within the rear ramped area to provide nature daylight to this space. The roof light will be glazing will be rated to comply with Table B4.3.1 above.

B.4.4 Conclusion to Section B4

When the Biodiversity Centre Project is completed, it will comply fully with the requirements of Part B4, "External Fire Spread" of the Second Schedule of the Building Regulations.

B5: ACCESS AND FACILITIES FOR THE FIRE SERVICE

Requirements in relation to Access & Facilities for the Fire Service is demonstrated by compliance with the relevant sections of Technical Guidance Document 'B', Section B5.

B.5.1. Provisions of Internal Fire Mains [TGD'B' Clause 5.1.2]

There will be no part of the building more than 20m above external ground level or greater than 10m below external ground and as such an internal fire main is not required.

B.5.1.2. Provisions of Hydrants [TGD'B' Clause 5.1.7]

The building will not require to have on site hydrants as it does not have a floor area of more than 1000m^2.

There are existing street located hydrants which have been highlighted on the site and block plans.

B.5.2. Vehicle Access [TGD'B' Clause 5.2]

B.5.2.1 Provisions of Vehicle Access [TGD'B' Clause 5.2.2]

In accordance with Table 5.1 access should be provide to the building on the basis of 2.4m for every 90m^2 of ground floor. Assuming a floor area of 260m2 then access will be required to 7.2m of the building perimeter by a pump appliance.

The front elevation of the building is approx. 14m and as such the building is therefore compliant.

B.5.2.2 Existing buildings [TGD'B' Clause 5.2.3]

The main structure of the building is existing and as the development has a floor area of 260m^2 and is single storey then the pumping appliance can be located within 45m of the principal entrance.

B.5.2.2. Design of Access Routes and Hard-standings [TGD'B' Clause 5.2.4]

Where access to the building is provided the following clearances would be required for a Pump Appliance:

- Minimum width of road between kerbs – 3.7m
- Minimum width of gateways – 3.1m.
- Minimum turning circle between kerbs – 16.8m.
- Minimum turning circle between walls – 19.2m
- Minimum clearance height – 3.7m.
- Minimum carrying capacity – 12.5 tonnes.

These dimensions have been shown on both Site and Block Plans F[58]-001 and 002.

B.5.3. Personnel Access to Buildings for Firefighting [TGD'B' Clause 5.3]

B.5.3.1. Provision of Firefighting Shaft [TGD'B' Clause 5.3.2]

No floor in the Biodiversity Centre is over 20m above ground level or 10m below ground and therefore firefighting shafts are not required.

B.5.4. Areas Requiring Special Considerations [TGD'B' Clause 5.4]

B.5.4.1. Boiler Rooms and Fuel Stores [TGD'B' Clause 5.4.1]

No Gas-fired equipment is proposed within the building.

B.5.4.2. High Voltage Discharge Lighting [TGD'B' Clause 5.4.2]

No high voltage discharge lighting is proposed within the building.

B.5.4.3. Ventilation of Heat and Smoke [TGD'B' Clause 5.4.3]

Not applicable.

B.5.5 Conclusion to Section B5

When the Biodiversity Centre Project is completed, it will comply fully with the requirements of Part B5, "Access and Facilities for the Fire Service" of the Second Schedule of the Building Regulations.