

2 Fire Engineering Report

2.1 Introduction

This development will comprise 2 no residential blocks known as Blocks A and B – Skehard Rd, Cork. The development will also comprise an independent bin store. The proposed development varies in height from three to five storeys over ground floor.

The Fire Engineering proposals have been developed in an interactive process between Fire Engineer, the Architects and other members of the design team. In order to obtain the optimum and most compliant solution, the Fire Safety Engineering proposals are developed through liaising with the Architect. The Fire Safety Engineer initially carries out a design appraisal of the Architectural design scheme and issues a report on all the fire safety engineering issues relevant to the scheme. These issues were discussed and the optimum fire strategy was agreed.

The fire safety strategy for the means of escape from the residential units will be based on the recommendations of Technical Guidance Document B, 2024.

2.2 Means of Escape

Flats

The means of escape will be designed in accordance with Section 1.6 of Technical Guidance Document B. The internal planning of the flats will comply with Section 1.6.2.3.5. of Technical Guidance document B such that:

- (i) the flat will have a sprinkler system in accordance with **Para 8.4.1**; and
- (ii) the flat will be situated on a single storey only; and
- (iii) the travel distance from any point in the flat to the final exit from the flat should not exceed 20m; and
- (iv) the flat layout should be designed such that an occupant escaping the flat should not have to approach within 1.8 m of the kitchen's main cooking appliance.
- (v) the entrance door into each residential unit will be an FD 60S.

Common escape routes / Single stairs

The residential blocks will be provided with a single stairs. The means of escape will comply with Diagram 28 of Technical Guidance Document B such that:

All residential units will be accessed from a corridor provided with a smoke control ventilation system. As the building is sprinklered the maximum travel distance in the corridor from the residential unit to the door or the protected lobby will not exceed 15m

General

All doors will have a clear width of 750mm including ironmongery.
 The stairs will be a minimum of 1000mm clear width.

The stairs will be provided with ventilation of 1sqm AOV at the top of the stairs.

Disabled refuges will be provided at every storey level in the stairs.
 Ancillary accommodation will be provided with lobby protection.
 The bin store will be approached by way of a ventilated protected lobby.
 Any windows / doors within 3m of the ESB room will achieve 30 minutes and will be fixed shut.

.2.3 Internal Fire Spread (Linings)

Surface linings will meet the following:

Location	Surface Spread of Flame Classification
Common stairs.	Class B – s3, d2 (European)
Circulation in apts	Class B – s3, d2 (European)
Rooms	Class c – s3, d2 (European)
Toilets	Class D – s3, d2 (European)

32.4 Internal Fire Spread (Structure)

The minimum period of fire resistance for the elements of structure in this building is 60 minutes in accordance with the relevant tables in Technical Guidance Document B.

Area of Compartment

Each unit will form a separate compartment.

Construction

All compartment walls will achieve 60 minutes fire resistance.

The floor / ceiling combination will achieve 60 minutes fire resistance.

All cavity barriers will achieve 30 minutes fire resistance.

All compartment walls will be carried up to the underside of the roof / structural floor over.

All walls enclosing the stairs will be carried up to the underside of the roof and fire stopped.

Provision of Cavity barriers

External walls if constructed of cavity block wall construction will comply with Diagram 17 or alternatively cavity barriers will be provided in accordance with Diagram 16 such that cavity barriers are provided at the junction of compartment walls with the external wall and fire resisting barriers and the external wall.

All corridors that are subdivided, will comply with Diagram 20 of Technical Guidance Document B.

Cavity barriers will comply with the recommendations set out in Diagram 53 of Technical Guidance B

- Every fire barrier will be constructed to achieve 30 minutes fire resistance.
- Cavity barriers will be tightly fitted to rigid construction and mechanically fixed in position wherever possible, where this is not possible the junction will be fire stopped.
- Cavity barriers will be fixed so that performance is unlikely to be made ineffective by:
 1. Movement of the building.
 2. Collapse in a fire of any services penetrating them.
 3. Failure in a fire of their fixings.
 4. Failure in a fire of any material or construction which they abut.

Fire Stopping

Pipes which pass through a compartment wall or floor or any other designated fire barrier will meet the appropriated provision of alternatives A, B or C in Technical Guidance Document B 2024 i.e.

- Enclosed in protected shaft and proprietary seals as services penetrated the walls of the shafts.
- Fire Stopping on a floor by floor basis.

All openings for services, joints/imperfections of fit in or between the designated fire barriers will be fire stopped in accordance with the relevant parts of Section 3.4 of Technical Guidance Document B 2024 so as to ensure the fire resistance of the element is not impaired.

- Pipes passing through a compartment wall or floor will be fire stopped in accordance with the provisions of Table 3.4. Pipes penetrating compartment floors and walls which have a nominal internal diameter not greater than 40mm will be fire stopped around the pipe, keeping the opening as small as possible. Any pipes greater than this diameter will be provided with proprietary seals, which have been shown by tests to maintain the fire resistance of the barrier they penetrate.

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

- Kept as few in number as possible.
- Kept as small as practicable.
- Fire stopped in accordance with Item 3.4.5 of Technical Guidance Document B 2024.

The following materials may be used for fire stopping purposes at joints.

- cement or lime mortar
- intumescent mastics
- gypsum based plaster

All fire stopping materials and products will be assessed for suitability of application and demonstration of the appropriate tests to BS EN 13501 will be required prior to installation. The fire engineer will inspect fire stopping on a regular basis.

All fire stopping will be marked on a drawings tagged and photo'd by a specialist contractor.

It should also be noted that all ventilation ductwork will comply with the recommendations of Technical Guidance Document B - dampers or encased in fire resisting ductwork or fire resisting construction. No ventilation ductwork will penetrate the protected entrance halls. All dampers will be installed as per manufacturers specifications and will be suitably restrained.

2.5 External Fire Spread

The external wall construction of the building will be of non – combustible construction as the height of the building exceeds 15m. The external surface of the wall will achieve a class 0 surface spread of flame.

All elevations of the building are sufficiently remote from the relevant boundaries to be 100% unprotected.

The roof will achieve a B_{Roof}T4.

2.6 Fire Fighting Facilities

Each of the blocks will be provided with an internal fire main. The inlet will be not more than 18m from the parking position of the fire tender and will be on the elevation and visible. There will be an outlet on every upper landing level in the stairs. No point within the building will exceed 45m from the outlet.

The blocks will be served by at least 2 no. hydrants. Hydrants will be located not more than 46m from the parking position of a fire tender and not closer than 6m to the building. The normal flow rate and pressures required proposed for firefighting requirements is 20 litres/s with a pressure of 2.5 bar.

The building is greater than 10m in height above the adjacent ground level. However, as the buildings will be fitted with a dry main, vehicle access for a pump appliance will be provided. Therefore, access for high reach appliance to 15% of the perimeter is required, which is achieved.

All fire appliance access routes will be a minimum of 3.7m wide. To comply with the TGD B, no dead ends are proposed.

The escape stairs will be provided with a 1sqm AOV at the top of the stairs.

A fire mans isolation switch will be provided if PV panels are proposed on the roof.

2.7 Active Fire Safety Systems

An L3X fire detection and alarm system will be provided in the common escape routes. The panel will be near the main entrance of the building.. Evacuation of the building will be simultaneous. Manual call points will be fitted at storey / final exits.

Each unit will be provided with an LD2 Grade D fire detection and alarm system.

The fire detection and alarm system will comply with I.S 3218: 2024 Code of practice for fire detection and alarm systems for buildings – system design, installation, and servicing.

Emergency lighting will be provided to defined escape routes and all other locations as required in accordance with IS 3217: 2023

2.8 Fire Safety Certificate

As outlined in the introduction, the fire safety engineering design process involved the fire engineer undertaking an initial review of the proposed layouts in order to advise on compliance with statutory legislation and propose alternative solutions in order to achieve compliance.

After the initial review was undertaken and circulated, the preferred strategy was decided upon for submission to the Local Authority for approval by way of a Fire Safety Certificate.

Once the application is submitted to the local authority, the fire safety engineer will liaise with the Fire Officer dealing with the application to discuss the technical details. The Fire Officer may request clarification on a number of items throughout the course of the application, which is dealt with by way of additional information, until such time that a grant is issued.

The fire engineer will monitor that compliance with the Fire Safety Certificate grant takes place on site. This will be done through a series of site inspections during construction and attendance at relevant site meetings.

A final inspection will be carried out at practical completion stage and following review of the various fire safety systems certificates, the fire engineer will issue an opinion of compliance with the Building Regulations Part B and will provide ancillary certificate of completion as required in accordance with the Building Control Amendment Regulations 2014.