

Report for An Bord Pleanála

on

**Appeal against Condition 5 and 10 on Fire Safety Certificate
FSC21057114DC (Submission Number SN3004060)**

for

The Proposed Residential Development (Block A1, A2, B & C)

at

Sandford Road Development, 132 Sandford Road, Dublin 6

Client:	An Bord Pleanála
An Bord Pleanála Ref:	315096-22
Our Ref:	ABP_R025_Issue 1
Date:	25 th June 2023

1.0 Introduction

This report sets out my findings and recommendations on the appeal submitted by Jensen Hughes, acting on behalf of Ardstone Homes Ltd., against Condition 5 and 10 on Fire Safety Certificate FSC21057114DC by Dublin City Council in respect of an application for works related to Proposed Residential Development (Block A1, A2, B & C) at 132 Sandford Road, Dublin 6.

It is noted that having regard to the nature of the Conditions under appeal, it is considered that the appeal can be adjudicated upon without consideration of the entire of the application.

1.1 Subject of Appeal

Condition 5 and 10 of the granted Fire Safety Certificate (FSC21057114DC) by Dublin City Council are as follows: -

Condition 5:

A suitable automatic sprinkler system is to be installed throughout all residential blocks (A, B & C) and the basement. The sprinkler coverage to these spaces will need to be sufficient to protect against the fire hazards within both the residential and non-residential areas. In this regard it is considered appropriate to protect the residential parts of the building using BS 9251: 2021 and the non-residential parts using IS EN 12845: 2015 +A1: 2019 as advised by Clause 4 of BS 9251: 2021.

Reason:

To comply with the provisions of Part B of the Second Schedule to the Building Regulations 1997 to 2021.

Condition 10:

Vehicle access for high-reach appliances is to be provided to the Blocks as follows:

Block A1 - 50% of the perimeter of the block,

Block A2 - 50% of the perimeter of the block,

Block B - 50% of the perimeter of the block,

Block C - 50% of the perimeter of the block,

The vehicle access routes for high reach appliances are to comply with Section 5.2.4 (Design of Access Routes and Hard standing). The minimum carrying capacity to be 26 tonnes and maximum jack spread 6.7m.

Reason:

To comply with the provisions of Part B of the Second Schedule to the Building Regulations 1997 to 2021.

2.0 Documentation Reviewed

- 2.1 Fire Safety Certificate Application (application form, compliance report and fire safety drawings) submitted by Jensen Hughes, on behalf of Ardstone Homes Ltd, on 7th September 2021.
- 2.2 Request for additional information from Dublin City Council dated 3rd December 2021.
- 2.3 Additional Information from Jensen Hughes to Dublin Fire Brigade dated 29th April 2022.
- 2.4 Granted Fire Safety Certificate No. FSC1477/22 from Dublin City Council dated 17th October 2022.
- 2.5 Letter of Appeal from Jensen Hughes, acting on behalf of Ardstone Homes Ltd., received by An Bord Pleanála on 14th November 2022.
- 2.6 Fire Officer's report on Fire Safety Certificate Appeal dated 13th December 2022 to An Bord Pleanála.
- 2.7 Jensen Hughes response to Fire Officer's report dated 23rd January 2023 to An Bord Pleanála.

3.0 Building Control Authority's Case

In response to the appeal of Condition 5 Dublin Fire Brigade offer the following rebuttal: -

BS 9251: 2021 Overview

BS 9251: 2021 was used by the applicant to justify the open plan layout apartments as permitted in Section 1.6.3 of TGD-B 2020. BS 9251: 2021 is clear in highlighting the requirements for sprinklers in other areas where the code of practice is being used for domestic and residential occupancies such as;

Subsection 4.1 of BS 9251 – Initial Consideration states as follows;

Note 3 'In buildings where there is a mix of residential, non-residential and commercial use (e.g. where flats are above shops, car parks, bin stores, offices and retail units), it is generally appropriate to protect the residential parts using this British Standard and the non-residential parts using BS EN 12845. See also 5.5 and 5.6'.

Section 5.4 states 'Sprinkler protection should be provided in all parts of the premises except for the areas listed in that section. The Guidance of item (h) would suggest that any ancillary space directly connected to a residential building should be sprinkler protected'.

If a car park (underneath a block of flats – as outlined in BS 9251: 2021) has an area less than 100m² a residential system in accordance with BS9251: 2021 is required. In car parks with an area greater than 100m² a sprinkler system in accordance with BS / IS EN 12845: 2015+A1: 2019 should be provided.

Technical Guidance Document B Review

Technical Guidance Document B 1997

In section 3.5.2 of Technical Guidance Document B 1997, the general principles for buildings used for car parks were as follows;

Buildings or parts of buildings used as parking for cars and other light vehicles are unlike other buildings in certain respects, and merit some departures from the usual provisions for the restriction of fire spread within buildings because;

- The fire load is well defined; and
- There is evidence that fire spread is not likely to occur between one vehicle and another, in well-ventilated above ground parking, and there is corresponding low probability of fire spread from one storey to another. Ventilation is all important in car parks, and as heat and smoke cannot be dissipated so readily from a car park that is not open-sided fewer concessions are made.

Technical Guidance Document B 2006 and 2020 (Reprint)

In Technical Guidance Document B 2006, Section 3.5.2 the general principles for buildings used for car parks are as follows;

- The fire load is well defined; and
- Where the car park is well ventilated, there is a low probability of fire spread from one storey to another. Ventilation is the important factor, and as heat and smoke cannot be dissipated so readily from a car park that is not open-sided fewer concerns are made. The guidance in paragraphs 3.5.2.2 to 3.5.2.5 is concerned with three ventilation methods; open-sided (high level of natural ventilation), natural ventilation and mechanical ventilation.

- Note: Because of the above, car parks are not normally expected to be fitted with sprinklers

Interestingly in 2006, the guidance in relation to car parks was modified, in particular the following statement was removed 'there is evidence that fire spread is not likely to occur between one vehicle and another'.

The following background research into car park fires (both conventional and EV cars) raises questions with regard to the principles adopted in TGD B and in particular, the clear statement outlining that the fire load is well defined in car parks.

TGD B-Basement Car Park Ventilation

It is noted that Section 3.5.2 of Technical Guidance Document B highlights the importance of the ventilation factor in car parks, however ventilation is required in car parks to allow for the transportation of products of combustion away from the fire location, which assists control of fire spread and is essential for protecting the lives of firefighters. The current minimum smoke ventilation for car parks is typically 10 air changes per hour for a basement - mechanical or natural ventilation having an aggregate area not less than 2.5% of the floor area at that level.

It is noted that in accordance with BS 7346-7:2013: Code of practice on functional recommendations and calculation methods for smoke and heat control systems for covered car parks, there is no requirement currently to meet any set visibility or temperature criteria for a safe means of escape or during the firefighting phase based on typical minimum smoke ventilation in car parks. The system only required to assist smoke movement and ensure that it doesn't adversely impact conditions during the course of a fire (typical clause 9 design). Such ventilation systems / design are very likely to be inappropriate for a multiple vehicle fire.

EV car fires produce higher volumes of smoke with a prolonged burn period which in turn exacerbates the risk in a basement as highlighted further in the report.

It is also noted that that the expected toxicity from failed batteries is of big concern also from a means of escape and fire-fighting phase perspective.

The subject case will have a naturally ventilated car park with an aggregate area of not less than 2.5% of the floor area.

Draft Building Regulations

The Draft Building Regulations (brown book) and the Proposed Building Regulations (blue book) contained a prescriptive requirement that basement car parks be provided with a sprinkler system to BS:5306. It is noted that this was the only area or building use where this was a requirement and circa 50 years later Dublin Fire Brigade are making the case for the same provision. In the interim the type of cars in use have drastically changed and have now far more plastics and combustible components as further reviewed throughout the report. In addition, the car parks are now going to contain electric vehicles and hybrid vehicles. By 2030 there will be more of these vehicles in the car parks than standard internal combustion engine cars.

Background Research into Car Fires

Dublin Fire Brigade's argument summarised as follows: -

- The cars used and the materials they were constructed from have a far lower calorific value
- than modern vehicles.
- Plastics are the predominant manufacturing material in cars now compared to when the
- above analysis was undertaken.
- Running fuel fires due to failure of plastic fuel tanks in the early stages of vehicle fires can be
- expected and will spread fire. It is estimated that 85% of European vehicles have plastic fuel
- tanks." (BRE Fire Spread in Car Parks BD2552 p.12
- Cars used for experiments are smaller than modern cars.
- Radiated heat and direct flame impingement, due to larger vehicles in restricted spaces and
- low ceilings, will give temperatures in excess of 1100°C (BD2552 p.64).
- Sprinklers are effective in both controlling a developing and fully developed fire. Without
- sprinklers fire is likely to spread from car to car and dangerous levels of smoke are likely for
- long periods (BD2552 p.46).
- Basement car parks can no longer be considered to have well defined fire loads.
- Concerns are raised with regard to assumptions that fire service attends 3 out of 5 fires within 3 minutes in metropolitan areas.

Case Studies

Dublin Fire Brigade list a number of case studies and their argument is that these demonstrate that the traditional view is that fires do not spread from the vehicle of fire origin and that fire load is well defined in a basement car park. The case studies highlight the increase in spread of fire to multiple cars which become involved. Fire will spread as a result of the intensity, in particular with high ceiling jet temperatures.

Electric Vehicles

Dublin Fire Brigade go into depth regarding EV's and their argument is summarised as follows:

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Dublin Fire Brigade is supportive of environmental policies and recognises the need to adapt to changing technologies with regard to alternative fuel sources for transportation. However, International and national guidance has not kept pace with the extensive use of plastics over the last 30 years or so, including plastic fuel tanks, which has significantly changed the way vehicles behave in fire. Modern vehicle design (such as EV's, with high capacity batteries) cannot be subject to the same lag between a significant change in the fire load within buildings such as the subject case and the guidance which is supposed to support their safe design.

Where guidance does lag, it may be said that buildings may be considered prohibitively dangerous for both their occupants and attending fire fighters. Research and innovation with battery technology continues to evolve which means that consideration needs to be given to how future technologies may behave in fire and potentially impacting on the built environment.

Dublin Fire Brigade calls for more research into fires in car parks, with a view to establishing improvements in guidance for the requirements of sprinklers in car parks within Technical Guidance Document B. Basement car parks should not be deemed low risk with a well-defined fire load.

Current guidance does not take into consideration the fire loading of modern vehicles, electric vehicles, Hydrogen vehicles and the risk of running fuel fires from plastic fuel tanks.

The outdated appreciation of fire load of modern vehicles in Technical Guidance Document B states that "Car parks are not normally expected to be fitted with sprinklers". Dublin Fire Brigade believe that a form of suppression such as sprinklers is vital to allow the suppression and control of fire development to allow for both safe means of escape for occupants (including persons with disabilities) and to allow fire crews to be able to access the basement for firefighting.

It is clear that EV car fires will become the common place. These occurrences in underground car parks will clearly expose residents and fire fighters to additional hazards. The installation of a sprinkler system to the underground car park appears to be the only viable solution in preventing fire spread to other vehicles and potentially from one storey to another at this point in time.

It is the view of Dublin Fire Brigade that a multi EV car fire will be of a significant challenge.

In response to the appeal of Condition 10 Dublin Fire Brigade offer the following rebuttal: -

Technical Guidance Document B,

Section 5.0.1-Scope states:

‘.....Fire Authorities have functions under the Fire Services Act, 1981 to provide fire brigades for the extinguishment of fires and for the protection and rescue of persons and property from injury by fire. Regulation B5 provides for the provision of access and other facilities to assist the fire service in the protection of life and property from fire.....’

To assist the fire service some or all of the following facilities may be necessary, depending mainly on the size of the building:

- Vehicle access to the building for fire fighting personnel.....’

Section 5.0.2 - Factors Determining Facilities Appropriate to a Specific Building states:

‘The main factor for determining the facilities needed to assist the fire service is the size of the building.

The facilities provided also depend on the expected method of fire fighting, whether this will be from outside or inside the building.....

- a)In deep basements and tall buildings.....
- b) In other buildings the combination of personnel access facilities offered by normal means of escape, and the ability to work from ladders and appliances on the perimeter is sufficient without special internal arrangements. Depending on the size of the building, vehicle access may be needed to some or all of the perimeter.....’

Section 5.2.1- Introduction states:

‘Fire brigade access to the exterior of a building is required to enable high reach appliances, such as turntable ladders and hydraulic platforms, to be deployed, and to enable pumping appliances to supply water and equipment for firefighting.

Access requirements increase with building size and height and also depend on whether the building is fitted with internal fire mains (see 5.1).

Access for fire appliances should be provided in accordance with the provisions outlined in 5.2.2.

Vehicle access routes and hard-standings should meet the criteria described in 5.2.4 if they are to be used by fire service vehicles.

Section 5.2.2-Provision of Vehicle Access states:

‘For effective firefighting operations, fire brigade appliances should be able to get within easy reach of a building.....larger buildings will require access to all or a number of elevations.

Vehicle access should be provided in accordance with the criteria indicated in Table 5.1.....

In the case of a building fitted with a dry internal fire main, access for a pump appliance should be provided to within 18m and within sight of the inlet connection point.....’

Section 5.2.4 - Design of Access Routes and Hard-standings states:

‘A vehicle access route may be a public or private road, or other route, which, including any manhole or other covers, meets the standards in Table 5.2, Diagram 32 and the following paragraphs.

Access routes to buildings with any storey at more than 10 m above ground level should meet the standards for high reach appliances.....

Where access is provided to an elevation in accordance with Table 5.2, overhead obstructions such as overhead cables that would interfere with the setting of ladders etc. should be avoided

in the area shown in Diagram 32.

Where access roadways are provided within the site of a building, turning facilities for appliances, in accordance with the requirements of Table 5.2 should be provided in any dead-end access route that is more than 20 m long.

It is clear from the requirements set out in Section B5-Access and facilities for the Fire Service (above) that high reach vehicle access is required for the proposed building.

- Jensen Hughes were informed that there was an issue with vehicle access for the fire service and that Dublin Fire Brigade required the building to comply in full with B5 of Technical Guidance Document B.
- The proposed building is to be constructed on a green field site that is fully capable of complying with Technical Guidance Document B.
- Access is to be provided to 50% of the perimeters for high reach appliances in accordance with Table 5.1 of Technical Guidance Document B.
- The vehicle access route is to be designed, installed and maintained in accordance with the technical guidance contained in Section 5.2 of Technical Guidance Document B with the following modifications for Dublin Fire Brigades current fire appliances:
 - The minimum width of the road between kerbs is 3.7 m with a jack spread of 5.7 mjacks extended to give the platform a stable base and to raise all wheels off the ground.
 - The maximum carrying capacity is 26 tonnes.
- Technical Guidance Document B, does not state 'if dry internal fire mains are installed in the building then the requirements for vehicle access are not required'.
- Jensen Hughes state 'In the case of a building fitted with a dry internal fire main, access for a pump appliance should be provided to within 18m and within sight of the inlet connection point', this doesn't apply to high reach appliances.

3.1 Appellant's Case

The appellant submits the following argument: -

Condition 5

The basis of compliance for the Fire Safety Certificate application is TGD - B: 2006 + A1: 2020 and BS 5588:1990 Part 1 for the building.

The reason given by the Building Control Authority for requiring sprinkler coverage to be provided to the nonresidential parts using IS EN 12845: 2015+ A1: 2019, was to comply with Part B of the Building Regulations.

The Fire Safety Certificate application was based on providing an automatic sprinkler system (Category 2) in accordance with BS 9251 covering all areas of the building including dwelling, apartments and a minimum 2 sprinkler heads in common corridors. Areas which will not be provided sprinkler coverage includes; bathrooms with a floor area of less than 5m², cupboards & pantries with a floor area of less than 2m² or where the least dimension does not exceed 1m and other exceptions set out in Section 5.4 of BS 9251. Amenity areas will be sufficiently separated from the residential areas via compartment construction and protected lobbies in accordance with BS 5588 Part 1 and therefore do not require sprinkler protection. Furthermore it was proposed to not provide sprinkler coverage in the basement level (including car park) based on the following: -

- The top storey height of the building development is less than 30m and therefore does not meet the criteria for providing sprinkler coverage to the entire building as outlined in the TGD - B: 2006 + A1: 2020.
- The basement level is designed as a separate compartment, is enclosed in 90 minutes fire resisting construction (including 90 minutes fire resistance for all elements of structure) and travel distances are compliant with the limits as set out in TGD - B.
- The basement level is smoke ventilated with at least 2.5% natural smoke ventilation and all stairs are protected with double lobby protection (including a smoke ventilated outer lobby served by a 0.4m² fire rated duct discharging to the external).
- Dry riser outlets will be provided within the basement level which will provide sufficient coverage by an adequate water supply and allow firefighting personnel to respond effectively to an incident anywhere in the Basement.

TGD - B: 2006 + A1: 2020, specifically notes that basement car parks are not normally, expected to be fitted with sprinklers. However, it is noted that Section 3.5.2 of TGD B denotes the following statements regarding car parks: -

1. The fire load is well defined and not particularly high:
2. Where the carpark is ventilated, there is a low probability of fire spread from one storey to another. Ventilation is the important factor, and as heat and smoke cannot be dissipated so readily from a carpark that is not open sided fewer concessions are made.

Note: Because of the above, car parks are not normally expected to be fitted with sprinklers.

An example of a normal car park would be one in which means of escape provisions, surface linings, compartmentation, ventilation and fire fighter access and facilities largely comply with the minimum recommendations of the TGD B. For example:

- Travel distances, protected escape routes, exit capacity etc. in line with code recommendations.
- Minimum requirements for smoke venting achieved (i.e. natural smoke vents sized based on 2.5% of the floor or alternatively a mechanical extract system achieving 10 ACH in a fire scenario).
- Fire fighter access to the car park is not unusually restricted.
- Exits sized based on 2 persons per space or 30m²/person.
- Stairs provided with lobby protection with permanent smoke vents to outside.
- Fire alarm system incorporating manual call points, automatic detection is not normally required to car parks.
- Class 1 (National) or Class C s3, d2 (European) linings.
- Appropriate period of fire resistance for elements of structure (i.e. 90 minutes in this case relevant to the height of the adjacent blocks).
- Car parks would not be expected to have a significant level of management or would not be expected to be fitted with CCTV.

An example of an abnormal car park would be if there are significant combustible wall and ceiling linings in the car park or there are large amounts of combustibles that are not fire separated from the car park.

Another example of a car park that is 'not normal' is a car park that includes automatic facilities where cars are stacked vertically on top of one another. In this case, fire spread could more readily occur between a car at floor level and a car stacked on top, particularly as the petrol tank may be exposed. This could result in a much larger fire.

It should also be noted that BS 7346 Part 7 components for smoke and heat control systems, excludes car parks where cars are stacked vertically on top of each other. This confirms that this is an example of an abnormal situation envisaged by the TGD B which could merit the consideration of sprinklers. As such, for these types of car parks, sprinklers could be recommended.

A further example of an abnormal car park is one in which there are non-code compliant issues such as multiple extended travel distances, unusually difficult fire brigade access, insufficient ventilation etc.

The basement car park in this development is considered to be a normal carpark. It has sufficient exit capacity, and the travel distances to the exits within the basement level are within code recommended limits. In addition to this natural smoke ventilation equivalent of in excess of 2.5% has been provided within the carpark, with 50% of this on opposing sides. These ventilation provisions will also afford a high standard of protection to the interconnecting stairs. The risk of smoke spreading from the carpark compartment to the upper floors of the development will also be further mitigated by the incorporation of double

lobby protection to each stair, where the outer lobby is provided with a minimum of 0.4m² permanent smoke ventilation direct to the external. There is sufficient access to the basement level via the fire fighting cores and escape stairs cores for fire fighters (each provided with internal fire mains). An automatic fire alarm, including manual call points have been incorporated into the design. All surface linings within the carpark will meet the Class 1 (national) or Class C s3, d2 (European) classification for surface spread of flame. In addition to this, there is access to three firefighting stair cores and four escape stairs within the basement and these will be accessible by the fire and rescue services. These stairs are provided with internal fire mains, and each firefighting stair will achieve 120 minutes fire resistance and each escape stair will achieve 90 minutes.

Based on the measures discussed above, installing sprinklers to the non-residential parts (including the basement carpark), will have no major advantages. Furthermore, the fundamental criteria for fire safety design are met as the means of escape for occupants are adequate, fire fighters are provided with an adequate level of safety and the building structure will not be compromised.

Therefore, the design does not require sprinklers to be incorporated within the non-residential parts using IS EN 12845: 2015 + A1: 2019 for compliance with Building Regulations.

Considering the above, we would request the Board to remove Condition 5 from the Fire Safety Certificate grant (Fire Safety Cert Ref: SN3004060 / FSC2105711DC).

Condition 10

Blocks A, B & C, Sandford Road is a proposed new apartment development which consists of 4 residential blocks (A1, A2, B & C) over a shared basement level (incorporating car parking, storage and plant areas).

The basis of compliance for the Fire Safety Certificate application is TGD-B: 2006 + A1: 2020 and BS 5588: 1990 Part 1 for the building.

Vehicle access to 50% of the building's perimeter is recommended from Table 5.1 of TGD - B: 2006 + A1: 2020 for buildings with a volume between 7,000 - 28,000 m³ and a top storey height of 10 m above ground.

Section 5.2.4 of TGD-B: 2006 + A1: 2020 states that: -

- A vehicle access route may be a public or private road, or other route, which, including any manhole or other covers, meets the standards in Table 5.2, Diagram 32 and the following paragraphs.
- Access routes to buildings with any storey at more than 10 m above ground level should meet the standards for high reach appliances. For lower buildings the access should be to the standards for pumping appliances.
- Where access is provided to an elevation in accordance with Table 5.2, overhead obstructions such as overhead cables that would interfere with the setting of ladders etc., should be avoided in the area shown on Diagram 32.
- Where access roadways are provided within the site of a building, turning facilities for appliances, in accordance with the requirements of Table 5.2 should be provided in any dead-end access route that is more than 20 m long.

Further to the items above, the code guidance for vehicle access also states the following from Section 5.2.2 of TGD-B: 2006 + A1: 2020: -

- For effective firefighting operations, fire brigade appliances should be able to get within easy reach of a building. For small buildings it is generally only necessary to have access to one external elevation, but larger buildings will require access to all or a number of elevations.
- Vehicle access should be provided in accordance with the criteria indicated in Table 5.1. Any elevation to which vehicle access is provided in accordance with Table 5.1 should contain a door giving access to the interior of the building.
- In the case of a building fitted with a dry internal fire main, access for a pump appliance should be provided to within 18 m and within sight of the inlet connection point.

Dublin Fire Brigade have conditioned that, vehicle access for high reach appliances should be provided to 50% of the perimeter of each of the blocks and comply with Section 5.2.4 (including Table 5.2 and Diagram 32) of the TGD - B: 2006 + A1: 2020, citing the reason as compliance with Part B of the Second Schedule to the Building Regulations, 1997 to 2021.

Proposal

Fire tender appliance access will be provided within the Sandford Road Development as demonstrated with a Swept Path Analysis (DWG No. 190226-DBFL-RD-SP-DR-C-1002) which was included in the Fire Safety Certificate application. This will meet the recommendations as set out in Table 5.2 of TGD - B: 2006 + A1:2020.

This analysis shows the access available for an aerial platform / turntable ladder / special appliance.

A turning circle is not provided within the development, however there is ample space provided for a fire appliance to perform a hammerhead maneuver. This is also shown in the Swept Path Analysis (DWG No. 190226-DBFLRD-SP-DR-C-1002)

Turning facilities are provided for appliances to allow for them to reverse direction and turn around. The turning facilities are provided at West of Block C (i.e. the end of a dead end access route), within the internal courtyard of Block B & Block C and West of Block A1.

The access route to the building will meet the standards for high reach appliances, with the exception of providing 50% perimeter access in accordance with Diagram 32 of TGD-B: 2006 + A1: 2020.

As an alternative to providing 50% perimeter access in accordance with Diagram 32 of TGD B: 2006 + A1: 2020, the Blocks will instead be provided with internal fire mains and vehicle access to within 18 m and within sight of a fire main inlet connection point. This arrangement is permitted under Section 5.2.2 of TGD - B: 2006 + A1: 2020 as follows: -

In the case of a building fitted with a dry internal fire main, access for a pump appliance should be provided to within 18 m and within sight of the inlet connection point.

Therefore, based on the above, it is clear that buildings fitted with dry risers do not have to comply with Table 5.1 in terms of vehicle access to the perimeter of the building but only need

to ensure that the fire appliance (high reach appliance in this case) can park within 18m and in sight of the dry riser inlet. The proposed building design (i.e., Blocks A1, A2, B & C) achieves this and therefore fire tender access is currently in compliance with the recommendations of the TGD-B 2006 + A1: 2020 and Part B5 of the Second Schedule to the Building Regulations, 1997 to 2019.

Discussion

High reach fire tender appliance access will be provided for the development as demonstrated in the Swept Path Analysis (DWG No. 190226-DBFL-RD-SP-DR-C-1002). The roads and access ways throughout the site will be sufficiently wide enough to accommodate high reach appliances. The roadways will also be structurally rated to accommodate the tender vehicle specified in that same analysis.

Vehicle access will be available in order for fire appliances to deliver firefighting personnel to building entrance/egress points, in addition to accessing dry riser fire mains and hydrants if required. As the Blocks are provided with dry internal fire mains, access for high reach appliances will be provided to within 18m and within sight of the inlet connection point. It is noted that vehicle access is available as indicated on the Site Plan FSC drawing.

The development is designed in accordance with the recommendations of the Technical Guidance Document B 2006 + A1: 2020 (TGD-B) and in accordance with Section 5.2.1 of this guidance document: -

"Access requirements increase with building size and height and also depend on whether the building is fitted with internal fire mains."

From the above, it is clear that fire mains are an important consideration when assessing fire brigade access. However, the intent of TGD B 2006 + A1: 2020 is clearer in Section 5.2.2: -

"Vehicle access should be provided in accordance with the criteria indicated in Table 5.1. Any elevation to which access is provided in accordance with 5.1 should contain a door giving access to the interior of the building. In the case of a building fitted with a dry internal fire main (i.e., dry riser), access for a pump appliance should be provided to within 18m and within sight of the inlet connection point."

Therefore, based on the above, buildings fitted with dry risers do not have to comply with Table 5.1 in terms of vehicle access to the perimeter of the building but only need to ensure that the fire appliance (high reach appliance in this case) can park within 18m and with sight of the dry riser inlet as highlighted within the Fire Safety Certificate Compliance Report. The proposed building design achieves this and therefore fire tender access is currently in compliance with the recommendations of the TGD-B.

There are also a number of protective measures to take into account for this building, regarding the requirement for vehicular access to a building.

The main purpose group of the development is 1(c) residential (i.e., flats & maisonettes). As such, the blocks are provided with a significant amount of compartmentation as every apartment is compartmented, which will contain any fire within a 60 minute fire rated enclosure (rated for loadbearing capacity, integrity and insulation). This will prevent the fire from spreading vertically or horizontally, in addition to limiting the overall size of the fire.

The development will employ a simultaneous evacuation strategy. Given the automatic fire

detection and alarm system, which is present throughout the building, occupants will be immediately alerted if a fire occurs anywhere. This will allow them to evacuate in the early stages of fire development. By the time the Fire Brigade arrive on the scene, most if not all of the occupants will have successfully evacuated and those who are not will be within the stair enclosure (i.e., waiting in a disabled refuge). They will remain safe until firefighting personnel can enter the building and evacuate them.

Within the multiple districts and councils which comprise County Dublin, there have been residential buildings (many of which are taller than Block D) where high reach appliance access to 50 % of the building perimeter was not required by the code guidance or requested by Dublin Fire Brigade. These are detailed in the case studies in appellants letter: -

- Case Study 1-Block A, Shanganagh Castle, Shankhill, Dun Laoghaire Rathdown.
Fire Safety Cert No: FSC2001121DR
Decision Order No: FSC/DR/232/21
- Case Study 2 Block 1, Griffith Wood Development, Griffith Avenue, Dublin City.
Fire Safety Cert No: FSC2102491DC/7DN
Decision Order No: FSC3460/21/7D
- Case Study 3 Blocks H, J, M & Q, The Grange, Stillorgan, Dun Laoghaire Rathdown.
Fire Safety Cert No: 19/8186/7day
Decision Order No: FSC/DR/141/21

Conclusion

The proposed vehicular access to Blocs A, B & C, Sandford Road Development is designed in compliance with both TGD-B 2006 + A1: 2020 and Part B5 of the Second Schedule to the Building Regulations, 1997 t 2021.

Vehicle access for high-reach appliances is provided in accordance with Section 5.2.4 (Design of Access Routes and Hard standing) and Table 5.2 (including a turning area) of Technical Guidance Document B.

Access for high-reach appliances is not required to 50% of the perimeter of each block in accordance with Diagram 32 of Technical Guidance Document B. A valid alternative (and widely accepted by Dublin Fire Brigade in the past) is to provide internal fire mains and access for a pump appliance to deliver firefighting personnel & equipment to within 18m and in sight of an inlet connection point.

Therefore, the design as detailed in the granted Compliance Report (Ref: DI/4541/R2 Issue 2) and the associated drawings is in compliance with Part B5 of the Second Schedule to the Building Regulations, 1997 to 2021 in regards to vehicle access to a building, and the condition to provide access to 50% of the perimeter of the blocks in accordance with Diagram 32 of TGD - B: 2006 + A1: 2020 should not be required.

Considering the above, we would request the Board to remove Condition 10 from the Fire Safety Certificate grant (Fire Safety Cert Ref: SN3004060 / FSC2105711DC).

The appellant responds to Meath County Council's comments as follows: -

The appellant responds to the Fire Officer Report as follows with respect to Condition 5: -

The purpose of residential sprinkler provision in TGD-B is to accommodate open plan layouts and / extensions of travel distances within common areas, which are not impacted by provisions of sprinkler system in the car park. The sprinkler system for the apartments will comply with the recommendations of BS 9251: 2021.

Therefore, sprinklers were not proposed within the basement car park in the Fire Safety Certificate design of the development, as this provision is not required to comply with the requirements of Building Regulations.

The Fire Safety Certificate application was based on providing an automatic sprinkler system (Category 2) in accordance with BS 9251, covering areas of the building including dwelling, apartments and a minimum of 2 sprinkler heads in common corridors. Areas which will not be provided sprinkler coverage includes bathrooms with a floor area of less than 5m², cupboards & pantries with a floor area of less than 2m² or where the least dimension does not exceed 1m and other exceptions set out in Section 5.4 of BS 9251.

Amenity areas will be sufficiently separated from the residential areas via compartment construction and protected lobbies in accordance with BS 5588 Part 1 and therefore do not require sprinkler protection.

In addition to the above, a qualitative comparative analysis between two buildings is set out below demonstrating how the provision of sprinkler within the car park in residential development, should be independent consideration from the provision of sprinkler coverage within the open plan design in the apartments above.

The buildings analysed are the following:

Building A Example: building as designed for Block A, B & C Sandyford, with the following design principles:

- Apartment height < 30m
- Open plan apartments design. In accordance with Section 1.6 of TGD-B, the flats will meet the following specific recommendations:
 - Compliance to Diagram 9A of TGD-B will be provided.
 - A sprinkler system in accordance with Section 1.8 should be provided.
 - The flat should be situated on a single storey only,
 - The travel distance from any point in the flat to the final exit from the flat should not exceed 20m,
 - Fire Detection and Alarm System will be provided. It should consist of interconnected self-contained mains powered / battery backed Smoke / Heat Alarms (Grade D LD1), which should be provided in all the following locations:
 - all circulation areas that form part of an escape route within the dwelling,
 - all high fire risk areas/rooms e.g. kitchen, living rooms, utility rooms, and all bedrooms.
- Smoke control system within the common corridor in line with the recommendation of Section 1.7.2 of TGD-B:
 - an automatic opening vent having a clear openable area of not less than 1 m² fitted at the top of the stairway enclosure, and
 - an automatic opening vent to a natural smoke shaft, which is designed in accordance with 1.7.3 of TGD-B.

- Single direction travel distances within the common corridor not exceeding 15m in accordance with Section 1.7.2 of TGD-B, based on provision of smoke control system in the common corridors and domestic sprinkler system designed in accordance with Section 1.8 of TGD-B.
- Basement car park provided with minimum 2.5% of natural smoke ventilation and travel distances in accordance with the limits set in TGD-B and BS 5588-1.
- Stair connecting the residential areas and basement car park provided with double lobby protection, with outer lobby provided with permanent 0.4m² ventilation to the outside.

Building B Example - Similar to Block A, B & C Sandyford, but without open plan apartment design, with the following design principles:

- Apartment height < 30m
- Protected entrance hall apartment design. In accordance with Section 9.5 and Figure 4 of BS 5588-1, the flats will meet the following specific recommendations: -
 - The flats are not planned that any habitable room is an inner room.
 - All habitable rooms are entered directly from a protected entrance hall.
 - Travel distance from the flat entrance door to the door of any habitable room does not exceed 9m.
 - Fire Detection and Alarm System will be provided. It should consist of interconnected self-contained mains powered / battery backed Smoke / Heat Alarms (Grade LD1), which should be provided in the following locations:
 - all circulation areas that form part of an escape route within the dwelling,
 - all high fire risk areas/rooms e.g. kitchen, living rooms, utility rooms, and all bedrooms.
 - The walls enclosing the protected entrance halls within the apartments will achieve 30 minutes fire resistance for insulation, integrity, and stability (if the wall is load bearing) from each side. These walls will be carried up to the underside of the structural floor (or roof if appropriate) above and all door openings in the protected enclosures will be fitted with FD30 doors (including self-closing devices).
- Smoke control system within the common corridor in line with the recommendation of Section 1.7.2 of TGD-B: -
 - an automatic opening vent having a clear openable area of not less than 1 m² fitted at the top of the stairway enclosure, and
 - an automatic opening vent to a natural smoke shaft, which is designed in accordance with 1.7.3 of TGD-B
- Single direction travel distances within the common corridor not exceeding 7.5m, in accordance with Section 3, Clause and Figure 12 of BS 5588-1. No sprinkler provision provided.
- Basement car park provided with minimum 2.5% of natural smoke ventilation and travel distances in accordance with the limits set in TGD-B and BS 5588-1.
- Stair connecting the residential areas and basement car park provided with double lobby protection, with outer lobby provided with permanent 0.4m² smoke ventilation to the outside.

As shown above in the Building A example and Building B example both are of the same height and use, with the only difference being the internal apartment layout. Building A example has open plan design apartments, while Building B example has protected internal hall design

apartments.

The Basement carpark recommendations within TGD-B, which provides compliance with the Building Regulations, are the same for both buildings analysed.

Based on the above, it is evident that sprinkler protection is required only in the Building A example due to the open plan apartment design, in accordance with Section 1.6 of the TGD-B. Due to the protected entrance halls in apartments in the Building B example, the provision of sprinkler installation would not be required.

The basement car park fire risk is the same for both blocks, however DFB are requesting sprinkler coverage within the car park in Building A only and not in Building B. Sprinkler protection is proposed to Building A to compensate a specific aspect of the fire design, i.e. open plan apartments and as an enhancement to allow increased travel distances in the common corridors serving the apartments. The sprinkler protection is not required for the basement in both buildings.

On this basis, we considered it unnecessary to require sprinkler coverage within the car park of Building A and not in Building B, simply because the internal planning of the apartments above is different, as the basement fire risk would be the same in both buildings.

It should also be noted that the specification for the sprinkler system, which includes defining the extent of required sprinkler coverage within the building, is developed by the sprinkler designer specialist, and as noted in Clause 4.2.2 of BS 9251: 2021 should take into account the fire strategy for the premises. This takes account the fire strategy design for the building.

4.2.2 Sprinkler specification

The sprinkler system designer should consult with stakeholders to develop and produce the specification (see 4.2.1).

The specification for the design should include the following information:

- a) occupancy types for sprinkler protected areas;
- b) available water supplies;
- c) how sprinkler system alarms interact with fire alarm system (see 5.18);
- d) details of any enhancements to sprinkler system (see 4.2.3); and
- e) where a fire strategy relies upon the design of the sprinkler system, a version-controlled copy of that fire strategy, including sufficient detail to understand the relationships and dependencies.

NOTE Particular attention is drawn to the need for the fire engineer to consider interactions between the sprinkler system and any smoke ventilation system when they are used in combination.

There may be occasions that a specification and/or fire strategy is not provided and in these situations, the sprinkler system should be designed in accordance with this British Standard.

In this instance the fire strategy is not based on full sprinkler protection of the building, as might be the case had the building exceeded a top storey height of 30m, but rather is based on partial sprinkler coverage, to accommodate open plan layouts and extensions of travel distances within common areas.

Therefore, based on the above, despite the wording of recommendations in Sections 4.1 and 5.4 of BS 9251: 2021, sprinkler protection should not be extended within the carpark, as it is not part of the fire strategy of the building.

Finally, an appeal was submitted earlier this year by Warringtonfire Consulting Ireland Ltd on behalf of their Client, MB Mc Namara Construction Ltd., for the same condition (sprinkler in the car park) and it was approved by ABP under the following ABP decision: ABP-312605-22.

Review of TGD-B provisions in 1997, 2006 and 2020 edition and in the Draft Building Regulations (brown & Blue book).

The Fire Safety Certificate application was based on the building being designed in accordance with Technical Guidance Document - B: 2006 + A1: 2020 (TGD-B) and BS 5588-1: 2004, which were and are still the design standards.

The travel distance in residential corridors exceeds 7.5m, and therefore in compliance with Building Regulations (Section 1.6 of TGD-B) a residential sprinkler system, designed in accordance with the recommendations of BS 9251: 2021, will be provided to all residential areas.

The purpose of residential sprinkler provision in TGD-B is to accommodate open plan layouts and / extensions of travel distances within common areas, which are not impacted by provisions of sprinkler system in the car park. Therefore, sprinklers were not required or proposed within the Basement car park in the Fire Safety Certificate design of the development, as this provision is not required to comply with the requirements of Building Regulations.

Considering the TGD - B, this document specifically notes that carparks are not normally, expected to be fitted with sprinklers. Furthermore, Section 3.5.2 of TGD-B denotes the following regarding car parks: -

"Buildings or parts of buildings used as parking for cars and other light vehicles are unlike other buildings in certain respects, and merit some departures from the usual provisions for the restriction of fire spread within buildings because:

1. The fire load is well defined and not particularly high:
2. Where the carpark is ventilated, there is a low probability of fire spread from one storey to another. Ventilation is the important factor, and as heat and smoke cannot be dissipated so readily from a carpark that is not open sided fewer concessions are made.

Note: Because of the above, car parks are not normally expected to be fitted with sprinklers."

Based on the above, it can be concluded that a 'normal' basement car park, intended for residential use only, naturally or mechanically smoke vented, does not require sprinklers to comply with Building Regulations.

An example of a normal car park would be one in which means of escape provisions, surface linings, compartmentation, ventilation and fire brigade access/ facilities largely comply with the minimum recommendations of the TGD-B, as is the case for this development.

An example of an abnormal car park would be one in which there are significant combustible

wall and ceiling linings, large amount of combustibles that are not fire separated from the car park, or non-code compliant issues, such as multiple extended travel distances, unusually difficult fire brigade access, insufficient smoke ventilation etc.

The basement carpark in this development is considered to be a "normal" carpark. For example: -

- The Basement level is designed as a separate compartment, is enclosed in 90 minutes fire resisting construction (including 90 minutes fire resistance for all elements of structure).
- Travel distances are compliant with the limits as set out in TGD-B, therefore providing sprinkler coverage to the Basement level will offer little improvement over the current design.
- The Basement level is smoke ventilated, with a minimum of 2.5% natural smoke ventilation.
- There is sufficient access to the Basement level, from the multiple escape stairs serving this level. An automatic fire detection and alarm system, including manual call points have been incorporated into the design.
- All surface linings within the ground floor undercroft carpark will meet the Class 1 (national) or Class C s3, d2 (European) classification for surface spread of flame.
- First aid firefighting equipment will be provided to the basement car park in the form of in the form of fire extinguishers.

The risk of smoke spreading from the carpark compartment to the upper floors of the development will also be further mitigated by the incorporation of double lobby protection to the internal stair, where the outer lobby is provided with a minimum of 0.4m² permanent smoke ventilation direct to the external. Therefore, although the car park smoke ventilation will protect against a buildup of pressure occurring, resulting in hot smoke forcing itself into the stair core lobbies, these permanently open passive smoke vents will provide a route for any smoke entering these lobbies to pass directly to the external, rather than resulting in a further buildup of pressure within the lobby, which could cause smoke to force itself into the secondary lobby and then into the escape stairs.

Further to the above, the following considerations should be noted as additional protection measures to omit sprinkler coverage in the basement car park based on the following: -

- The top storey height of the building is less than 30m and therefore does not meet the criteria for providing sprinkler coverage to the entire building as outlined within TGD-B.
- Dry riser outlets will be provided within the Basement level, which will provide sufficient coverage by an adequate water supply and allow firefighting personnel to respond effectively to an incident anywhere in the Basement.
- The evacuation strategy for the upper floor levels (i.e. the residential blocks) incorporates simultaneous evacuation to alert occupants to escape upon detection of a fire, rather than a stay put strategy that would present a high-risk situation for residents.

Further to the above, it should be noted also that at the time of writing, no Building Regulation guidance document in Ireland or the UK has been revised to recommend that sprinklers should be provided in car parks in any instance.

In fact, ADB (England and Wales) TBE (Northern Ireland), TGD-B (ROI) and BS 9999 have been revised to state the opposite, i.e., that sprinklers are not provided in car parks. This is also confirmed by BS 7346 Part 7, which states that sprinklers are not required in car parks to

comply with Building Regulations in England, Wales, Scotland and Northern Ireland.

Taking all the above into consideration, it is not deemed necessary to provide sprinklers to the non-residential parts, including the basement car park.

Background Research into Car Fires, in which the DCC reference various car park fires in Ireland, UK and Europe in which multiple cars were ignited.

On this topic we would like to outline the following: -

It is noted that research work, which was undertaken in 2006-2010, outlined by DFB is focused on vehicles fueled by petrol and diesel as opposed to EV cars. In addition, we would like to note that the guidance in TGDB 2006+ A1 2020 remained unchanged despite the subsequent amendments to UK ADB in 2010, 2013 and 2020 and 2021. In fact, as mentioned above, we would like to outline that we are aware, through engagement

Electric Vehicles

Based on NFPA research report 'Modern Vehicle Hazards in Parking Structures and Vehicle Carriers' in July 2020. The report carried out an analysis of the current understanding of the fire hazard of modern vehicles present in parking garages and marine vessels. An experiment was conducted that compared the heat release of two pairs of similar electrical vehicles (EVS) and internal combustion engine vehicles (ICE). The first pair were smaller vehicles, both around 1,100 kg while the second pair were larger at 1,400 kg and 1,500kg for the ICE and EV model respectively. Each pair of vehicles were ignited by a gas burner placed in the front seat, with the window open. The peak heat release rate results were similar for the first pair at 4.2MW and 4.8MW, with the ICE vehicle being higher. For the second larger pair, the EV had a peak of 4.7MW, while the ICE vehicle had a peak HRR of 6.1 MW.

It was concluded that while battery electric vehicles are now in larger production than in the past, these vehicles have not been shown to yield larger fires than vehicles with internal combustion sizes.

For natural venting of car parks for fire fighting purposes a vent area equivalent to 2.5% of the floor area is recommended for the release of hot smoke and gases. Based on the current design, the area of the Basement car park is 8,610m² and the total area allowed for natural ventilation is 251m². Therefore natural smoke ventilation equivalent to 2.9% is proposed within the carpark area, in excess of the minimum 2.5%. Sprinkler coverage is not required at Basement level for fire fighting purposes.

Dry riser outlets will be provided within the basement level which will provide sufficient coverage by an adequate water supply and allow firefighting personnel to respond effectively to an incident anywhere in the Basement level. It is noted that the provision of dry main landing valves is not normally required in single storey basements of this type and thus constitutes an enhancement on the minimum requirements of TGD-B 2020 i.e. Section 5.1.2(b) of TGD-B 2020 requires internal fire mains for basements which exceed 10m in depth, whereas the subject basement is circa 3.95m in depth.

The appellant responds to the Fire Officer Report as follows with respect to Condition 5: -

- We can confirm that Jensen Hughes received an additional information request on the 3rd of December 2021 indicating that Dublin Fire Brigade had concerns with vehicle access for the fire service and Dublin Fire Brigade required this building to comply in full with Section B5 of

TGD-B. Jensen Hughes responded to this additional information request via a letter in April 2022, which was submitted to Dublin Fire Brigade. In this response we outlined our reasons that the proposed building design achieves the requirements of Section B5 of the Technical Guidance Document B.

- In our additional information response letter dated 29th April 2022, a swept pass analysis (DWG No. 190226-DBFL-RD-SP-DR-C-1002) was attached, demonstrating the routes on the site that would meet the specifications for a high reach appliance, as outlined in Table 5.2 of the Technical Guidance Document B. However, given the current landscaping and site features (such as amenities, green spaces, design details, etc.) it is not feasible for a high reach appliance to get within 2m for 50% of the buildings perimeter without alterations that would have a significant impact on the planning application for the site, as the amount of green & amenity space and trees would have to be reduced for the overall SHD development in order to accommodate this condition.
- The requirements for high reach appliances set out in Table 5.1 of Technical Guidance Document B does not take into account the benefit of providing dry risers within the buildings. It is worthwhile referencing other widely accepted, international residential code guidance documents such as BS 9991: 2015 as it offers recommendations specially related to fire tender access in residential buildings rather than the guidance offered in TGD B that applies to all buildings.

- Section 5.1 of BS 9991 it states:

"The provisions made for vehicular access should be determined according to whether or not a fire main is provided (see 50.1.2, 50.1.3 and 51.1)."

It further elaborates in Section 50.1.3 that for buildings fitted with fire mains:

"Fire mains enables fire-fighters within a building to connect their hoses to a water supply. In buildings fitted with fire mains, pumping appliances should have access to the perimeter at points near the mains, so that fire-fighters can enter the building to make a hose connection from the fire appliance to pump water into the main ..."

...Buildings fitted with dry fire mains should have access for a fire appliance to within 18 m of each fire main inlet connection point, typically on the face of the building close to the entrance point leading to the fire-fighting shaft, with the inlet visible from the fire appliance..."

Therefore, it is considered acceptable in BS 9991 to have access for a fire appliance to within clear sight and 18m of a dry riser inlet close to the building, without also having to provide 50% perimeter access to within 2m of the building elevation. There are a large number of granted and built residential projects that have been designed and approved by Dublin Fire Brigade in accordance with this guidance recommendation.

- Jensen Hughes provided two such examples in the case studies for the Griffith Wood development and The Grange in the original appeal letter.
- It is also worth noting that Section B5.2 of the TGD-B has not received an update since 2006(the 2020 reprint did not include any update to the vehicle access requirements) and does not take into account the widespread application of sprinklers and additional protective measures that have been implemented for residential buildings that have become industry

standard in the meantime.

Vehicle access is in line with Table 5.2 (including a hammerhead turning area located to the NorthWest of the site) of TGD-B, as was demonstrated in the swept pass analysis (DWG No. 190226-DBFLRD-SP-DR-C-1002) that was conducted.

Technical Guidance Document does not state 'if dry internal fire mains are installed in the building, then the requirements for vehicle access are not required' but it does in Section 5.2.1 of TGD-B state that "access requirements increase with building size and height and also depend on whether the building is fitted with internal fire mains." The aforementioned statement would imply the level of access requirements for vehicle perimeter access would have a direct correlation to whether a dry riser system was provided or not.

SEP

- Furthermore, residential buildings are provided with a significant amount of compartmentation as every apartment is enclosed in compartment construction. In this building, all apartments are enclosed within a minimum of 60 minute compartment construction. This along with the residential areas of the building being provided with a Category 2 life safety sprinkler system in accordance with BS 9251: 2021, will prevent the fire from rapidly spreading vertically or horizontally, in addition to limiting the overall size of the fire. The provision of dry risers allows fire fighters to easily access water from each individual floor of the building without specialised equipment and fight fire from within the building. Therefore, it is not necessary for a high reach appliance to get within 2m of 50% of the buildings perimeter to fight a fire, given the availability of a safe alternative solution in the dry riser.
- The statement in TGD B 'In the case of a building fitted with a dry internal fire main, access for a pump appliance should be provided to within 18m and within sight of the inlet connection point' is because buildings fitted with a dry riser should not need high reach access to the perimeter, as the fire would be fought within the building from the dry riser outlet on each floor. This statement also suggests that where an internal dry fire main is provided access to a percentage of the perimeter is not required, and access for a pump appliance should be within 18m and within sight of the dry riser inlet. This view would be supported by guidance in Technical Booklet E (Northern Ireland), Approved Document B (England and Wales) and BS 9991 (2015), all of which require either perimeter access or access to a dry riser inlet.

4.0 Consideration

Condition 5

It is clear from Dublin Fire Brigades submission that they consider that multi EV car fires will be of a significant challenge and it is their view that all basement car parks should be provided with sprinkler protection. In their submission they refer to draft Building Regulations and multiple case scenarios. However, the building control function in assessing a Fire Safety Certificate application is to assess whether or not the application has demonstrated compliance with Part B of Second Schedule of the Building Regulations.

As per 'The Guidance' (page 3) of Technical Guidance Document B 2006 AMD 2020 'where works are carried out in accordance with the guidance in this document, this will, prima facie, indicate compliance with Part B of the Second Schedule of the Building Regulations.'

In paragraph 4 of section 5.4.3.1 of Technical Guidance Document B 2006 AMD 2020 it states the following: -

'Basement car parks are not normally expected to be fitted with sprinklers.'

Therefore, for prima facie compliance with Part B of the Second Schedule of the Building Regulations a basement car park does not have to be provided with sprinkler protection.

One potentially valid argument that Dublin Fire Brigade make is that because BS 9251: 2021 was used by the applicant to justify the open plan layout apartments as permitted in Section 1.6.3 of TGD-B 2020 then the recommendations of this British Standard with respect to sprinkler coverage must be adhered to, in particular, Subsection 4.1 of BS 9251 Note 3 and Section 5.4.

Subsection 4.1 of BS 9251 Note 3 states: -

'In buildings where there is a mix of residential, non-residential and commercial use (e.g. where flats are above shops, car parks, bin stores, offices and retail units), it is generally appropriate to protect the residential parts using this British Standard and the non-residential parts using BS EN 12845. See also 5.5 and 5.6'.

Section 5.4 states: -

'Sprinkler protection should be provided in all parts of the premises except for the areas listed in that section. The Guidance of item (h) would suggest that any ancillary space directly connected to a residential building should be sprinkler protected'.

Technical Guidance Document B 2006 was amended in 2020 and specifically allows for open plan apartments and extended travel distances in apartment corridors. It introduced guidance on the use of domestic sprinkler systems and allowed the following: -

- The means of escape requirements in open plan flats are determined by the maximum travel distance within the flat. Where the travel distance is less than or equal to 9m, the provisions of 1.1.2 apply. Where the maximum travel distance exceeds 9m, and where the appropriate alternative means of escape has not been provided, the following provisions apply:
 - A sprinkler system in accordance with Section 1.8 should be provided....

- Where every flat to a protected corridor / lobby on the same storey is provided with a sprinkler system and the same protected corridor / lobby is provided with a smoke control system, the travel distance on that storey can be further extended up to a maximum of 15m.

Section 1.8.1 states where a sprinkler system is provided, it should be in accordance with BS 9251: 2014, or equivalent.

The clear purpose of the provision of the sprinkler system is to protect the means of escape. Further it is noted that in the protection to the corridor it is clear the rest of the building does not have to be provided with sprinkler protection, only the impacted corridor.

Reference to BS 9251: 2014 (since superseded by BS 9251: 2021) is for the design of the sprinkler system not its coverage. The coverage is either in an open plan apartment or in apartments off a corridor with a dead-end travel of up to 15m. It allows for alternative design solutions for means of escape. Whether or not the basement car park is provided with sprinkler protection is irrelevant and has no bearing on the proposed means of escape from the apartments.

Condition 10

In Dublin Fire Brigade's response to the appeal, they set out the recommendations of TGD-B 2006 with respect to Fire Brigade Access. They state that for compliance with Section 5.2 of TGD-B 2006 Block D would require 50% high reach access.

The appellant in their application and later letter of appeal maintains that for compliance with Section 5.2 of TGD-B 2006 the provision of dry risers negates that recommendation for high reach access to 50% of the perimeter and make the argument this approach has been accepted in previous Fire Safety Certificate applications. In their response to the Dublin Fire Brigades submission, they appear to soften this claim (i.e. they acknowledge the requirements for high reach appliances set out in Table 5.1 of Technical Guidance Document B does not take into account the benefit of providing dry risers within the buildings) but still maintain that given previous approved developments and the guidance in BS 9991: 2017 that the provision of dry risers in lieu of high reach access should be acceptable.

It is noted that in my over 25 years as a Fire Safety Consultant this issue with regard dry risers and the perimeter access has come up numerous times. It is commonly known within the industry that this is a badly written section of TGD-B 2006. It is unfortunate that in 2006 and 2020 that the opportunity wasn't taken to clarify / amend this section and we can only hope that in the up coming new TGD-B that this area will be properly addressed.

It is noted that the draft TGD-B issued for comment earlier this year that it does amend this section and clearly distinguishes between buildings fitted with fire mains and those that are not. High reach perimeter access is not required to building fitted with fire mains. This is inline with International Best practice and in particular the recommendations of Approved Document B, BS9991 etc.

The Dublin Fire Brigade's interpretation of Section 5.2 of TGD-B 2006 is the correct one. TGD-B 2006 as it is written does not currently allow for the provision of dry risers in lieu of perimeter access to a building. However, the issue is not that simple. The mention of dry risers in this section has made the recommendation somewhat unclear. Especially when we

consider the guidance in BS 9991: 2015 and the UK Approved Document B. The UK Approved Document B is a particularly good example given its close similarities with TGD-B 2006.

UK Approved Document B 2019 (with 2020 amendments) states the following: --

Buildings not fitted with fire mains

- 15.1** For small buildings (up to 2000m², with a top occupied storey that is a maximum of 11m above ground level), vehicle access for a pump appliance should be provided to whichever is the less onerous of the following.
- 15% of the perimeter.
 - Within 45m of every point of the footprint of the building (see Diagram 15.1).
- 15.2** For all other buildings, provide vehicle access in accordance with Table 15.1.
- 15.3** Every elevation to which vehicle access is provided should have a door, a minimum of 750mm wide, to give access into the building. The maximum distance between doors, or between a door and the end of the elevation, is 60m (e.g. a 150m elevation would need a minimum of two doors).

Total floor area ¹⁾ of building (m ²)	Height of floor of top storey above ground (m) ²⁾	Provide vehicle access to:	Type of appliance
Up to 2000	Up to 11 Over 11	See paragraph 15.1 15% of perimeter	Pump High reach
2000–8000	Up to 11 Over 11	15% of perimeter 50% of perimeter	Pump High reach
8000–16,000	Up to 11 Over 11	50% of perimeter 50% of perimeter	Pump High reach
16,000–24,000	Up to 11 Over 11	75% of perimeter 75% of perimeter	Pump High reach
Over 24,000	Up to 11 Over 11	100% of perimeter 100% of perimeter	Pump High reach

NOTES:

- The sum of the area of all storeys in the building (excluding basements).
- For storage buildings (purpose group 7(a)), measure height to mean roof level (see Appendix D).

Buildings fitted with fire mains

- 15.4** For buildings fitted with dry fire mains, both of the following apply.
- Access should be provided for a pumping appliance to within 18m of each fire main inlet connection point. Inlets should be on the face of the building.
 - The fire main inlet connection point should be visible from the parking position of the appliance, and satisfy paragraph 16.10.
- 15.5** For buildings fitted with wet fire mains, access for a pumping appliance should comply with both of the following.
- Within 18m, and within sight of, an entrance giving access to the fire main.
 - Within sight of the inlet to replenish the suction tank for the fire main in an emergency.
- 15.6** Where fire mains are provided in buildings for which Sections 16 and 17 make no provision, vehicle access may be as described in paragraphs 15.4 and 15.5, rather than Table 15.1.

It is noted that versions of this document have been in circulation as long as TGD-B and all of them have taken the above approach. Perimeter Access is not considered with buildings fitted with fire mains, only access to within 18m of the dry riser inlet valves.

BS 9991: 2015 has the following approach: -

50.1.2 Buildings not fitted with fire mains

Houses not fitted with fire mains should allow access for a fire appliance to within 45 m of all points within the house, measured on a route suitable for laying hose.

Blocks of flats not fitted with fire mains should have vehicle access for a fire appliance not more than 45 m from all points within each dwelling, measured on a route suitable for laying hose.

NOTE If the internal layout of partitions, fittings, etc. is not known when plans are deposited, direct distances may be used for assessment. The direct distance is taken as two thirds of the travel hose laying distance.

Where sprinklers in accordance with BS 9251:2014 or BS EN 12845 (see 11.2, Table 2) are fitted throughout a house or block of flats:

- a) the distance between the fire appliance and any point within the house (in houses having no floor more than 4.5 m above ground level) may be up to 90 m;
- b) the distance between the fire and rescue service pumping appliance and any point within the house or flat may be up to 75 m (in houses or flats having one floor more than 4.5 m above ground level).

50.1.3 Buildings fitted with fire mains

Fire mains enable fire-fighters within a building to connect their hoses to a water supply. In buildings fitted with fire mains, pumping appliances should have access to the perimeter at points near the mains, so that fire-fighters can enter the building to make a hose connection from the fire appliance to pump water into the main. Fire mains should be provided in accordance with 51.1.

Buildings fitted with dry fire mains should have access for a fire appliance to within 18 m of each fire main inlet connection point, typically on the face of the building close to the entrance point leading to the fire-fighting shaft, with the inlet visible from the fire appliance.

Multi-storey buildings fitted with wet fire mains should have fire appliance access:

- a) within 18 m of, and within sight of, a suitable entrance giving access to the wet fire main; and;
- b) within sight of the inlet for the emergency replenishment of the suction tank for the wet fire main.

Again, it is noted that provision of access to within 18m of dry risers negates the need for further perimeter / fire brigade access.

In addition, it is noted that the appellant is correct when they say numerous developments have used this approach successfully and Dublin Fire Brigade have granted Fire Safety Certificates on this basis. It is noted that I personally have used this approach numerous times and recently within Dublin City had a large ten storey apartment block granted on the basis of the provision of access to within 18m of dry risers rather than the perimeter access recommendations of Table 5.1 of TGD-B 2006. However, in any development where I have seen this approach successfully used, it has been acknowledged that it is an alternative approach rather than a TGD-B 2006 compliant approach.

Irrespective of this it is noted that following established precedence and the guidance found in the UK Approved Document B and BS 9991 the provision of dry risers in lieu of perimeter access provision in accordance with section 5.2 of TGD-B 2006 is an acceptable approach to take.

6.0 Conclusions

Condition 5

If the guidance in Technical Guidance Document Part B AMD 2020 is followed, then prima facie, this is in compliance with Part B of the Second Schedule of the Building Regulations. Technical Guidance Document Part B AMD 2020 does not recommended sprinklers in basement car parks. Therefore, Condition 5 should be removed from the granted Fire Safety Certificate.

Condition 10

For compliance with the recommendations of Section 5.2 of TGD-B 2006 the development would require 50% high reach access. However, following established precedence and the guidance found in the UK Approved Document B and BS 9991 the provision of dry risers in lieu of perimeter access provision in accordance with section 5.2 of TGD-B 2006 should be considered acceptable. Therefore, Condition 10 should be removed from the granted Fire Safety Certificate.

7.0 Recommendation

On the basis of my findings and conclusions I recommend that An Bord Pleanála grant the appeal and instruct that Condition 5 and 10 are removed from the Fire Safety Certificate.

Signed by:

Des Fortune

MSc(Fire Eng), BSc(Eng), CEng MIEI, MIFireE

Date: **30th July 2023**