FSC Report
ABP-318442-23

Appeal v Condition(s)	Appeal against Condition 11
Development Description	Watery Lane Apartments, Development of 60 apartments in two adjacent blocks with a basement car park and some retail units on the ground floor of one block.
Building Control Authority Fire Safety Certificate application number:	FSC3008773
Appellant	Vincent Cosgrave
Agent	GSP Fire Ltd.
Building Control Authority:	South Dublin County Council
Inspector	Bryan Dunne

Contents

1.0 **Introduction**

1.1. The development consists of two blocks of three and five story residential apartments over a basement car park. The development will have 60 No. 1, 2 & 3 bedroom apartments split over the two blocks Block A & Block B. The blocks will be interlinked at basement level and constructed around a central courtyard area.

1.2. The application made to the Building Control Authority (BCA) was for a 7 Day Notice application.

1.3. A decision was made by the BCA to grant an Fire Safety Certificate (FSC) with eleven conditions, of which, only Condition 11 is being appealed.

> *Condition 11:*
>
> *The proposed Basement car park shall be provided with a sprinkler system in accordance with I.S. E.N. 12845: 2015+A1: 2019.*
>
> *Reason:*
>
> *To comply with the provisions of Part B of the Second Schedule of the Building Regulations 1997-2022.*

2.0 **Information Considered**

2.1. The information considered in this appeal comprised of the following:

- An Bord Pleanála Case No. ABP-318442-23.
- A copy of the drawings and report dated 19th August 2022 prepared by Thomas P. English & Associates
- A copy of the report dated 24th August 2022 prepared by Thomas P. English & Associates
- A copy of the drawings and report dated 17th February 2023 prepared by Thomas P. English & Associates
- A copy of the drawings and report dated 19th May 2023 prepared by Thomas P. English & Associates

- A copy of the drawings and report dated 19th June 2023 prepared by Thomas P. English & Associates
- A copy of the drawings and report dated 18th September 2023 prepared by GSP Fire Ltd.
- Fire Safety Certificate Grant issued by the BCA, Ref: FSC3008773, dated the 12th October 2023.
- Appeal submission by the appellant to An Bord Pleanála dated 10th November 2023.
- Fire Officers report of the 14th February 2024.

3.0 **Relevant History/Cases**

3.1. I am not aware of any relevant Building Control history relating to this appeal site. There was no documentation of any previous Fire Safety Certificate (FSC), Revised FSC, Regularisation FSC or any dispensation/relaxation of the Building Regulations (relating to this site) included in the file being reviewed.

4.0 **Appellant's Case**

4.1. The appellant is appealing the attachment of Condition 11 to the grant of the FSC on the basis that it sets out requirements that are not necessary to demonstrate compliance with Part B of the Building Regulations. The following points are set out in support of their appeal:

- The appellant states that the building has been designed to comply with BS 5588 Part 1: 1990 and Technical Guidance Document B (TGD B) 2006+A1: 2020.
- The development comprises of two blocks, Block A (5 storey over basement) and Block B (3 storey over basement). Each block is served by two protected stairways connected by a common corridor which continue down to serve the basement. The basement car park is provided with single lobby protection from the basement stairs and the lobby is provided with 0.4m2 ventilation. The basement stairs is separated from the stairs serving the upper levels at ground floor level.

- In addition, the appellant notes that the amount of natural ventilation proposed (approx. 5.5%) for the car park exceeds the 2.5% recommended under section 3.5.2.4 of TGD-B.
- The point is made that TGD B it makes no reference to the provision of sprinkler systems in basement car parks or in buildings of less than 30 meters in height to the top floor and that Section 5.4.3.1 specifically states that *'basement carparks are not normally expected to be fitted with sprinklers'.*
- The appellant lists five other appeals for similar developments where sprinkler systems conditioned by the Building Control Authority (BCA) were removed:
    - ABP 312605-22
    - ABP 300409-17
    - ABP 305955-19
    - ABP 307232-20
    - ABP 307983-20

On the basis of the above points the appellant recommends the removal of Condition 11.

5.0 Building Control Authority's (BCA) Case

5.1. In support of their case for sprinkler protecting the proposed basement car park the BCA's response to this appeal was broken down under the following headings:

(a) Observations and Assessment of the FSC Application
(b) Review of evidence derived from research into the fire risks associated with modern vehicles
(c) Case Studies
(d) Structural Integrity / Fire Protection concerns
(e) Basement car park ventilation
(f) Conclusion

(a) Observations and Assessment of the FSC Application

- The BCA open their rebuttal by pointing out that Technical Guidance Documents (TDG B in this instance) are provided to assist individuals in

complying with the requirements of the Building Regulations and that these documents cannot prescribe to every aspect of building design. They believe that they need to consider changes in technology and materials that may not currently be addressed in the guidance documents.

- At an early stage in the application process the BCA made the appellant aware that it was their policy to sprinkler protect the basement car parks due to the additional risks associated with EV and internal combustion engine cars. The appellant responded by way of additional information stating that:
    - Basement car parks are not normally expected to be fitted with sprinklers (Section 5.4.3.1 of TGD B (2006 +A1 2020) and that
    - Additional ventilation was being provided within the car park (5% as opposed to the standard 2.5%)

(b) Review of evidence derived from research into the fire risks associated with modern vehicles

As part of their submission the BCA makes reference to the following documents:

1. Fire Note 10 “Fire and Car Park Buildings” produced by The Ministry of Technology and Fire Offices Committee Joint Fire Research Organisation, 1968 – this document explored the likelihood of fire spread between vehicles which in turn determined the fire resistance requirements of structures
2. “Fire Spread in Car Parks” produced by the BRE in 2006 after been commissioned by the UK Department of Communities and Local Government
3. NFPA, Modern Vehicle Hazards in Parking Garages & Vehicle Carriers, 2020

A summary of the research above identified the following key points:

- Cars manufactured in the 50’s were smaller than the car park spaces provided and as such there was greater distance between cars, thus reducing effects of radiating heat

- From visual observations made during the test (Ref: Fire Note 10) smoke was mainly at ceiling level which would have caused the fire brigade little or no difficulty in dealing with the outbreak
- 4 out of every 5 fires in metropolitan areas were attended to within 3 minutes therefore it was difficult to see how a sustained fire could take hold
- In a number of incidents, a running fuel fire was reported, which spread the fire (BD 2552 Car Fire p.14)
- Sprinklers are effective in 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 (BD 2552 Research p.15)
- Fire conditions in partial or fully closed car parks are much more severe than in open sided car parks (BD 2552 research p.16)
- Between 1970s and 2018 (in western markets) there has been a large increase in the use of plastic materials in vehicle construction adding to the total fuel load of the average vehicle
- Some tests of modern vehicles in parked garages have shown rapid fire spread between vehicles. Based on these findings it's clear the data from older vehicles should not be used as a basis for development of codes and regulations
- The requirement for sprinkler protection appears adequate to control a vehicle fire until firefighting personnel arrive

The BCA reference the 2023 addition of NFPA 88A, stating that all car parks are now required to have a sprinkler system installed in accordance with NFPA 13.

They point out that in a publication dated the 28th November 2022, the NFPA stated that the ever growing presence of lithium ion batteries in our day-to-day lives are changing the fire characteristics of our built environments and fire professionals need to stay on top of these changes to ensure the safety of people and property.

(c) Case Studies

The BCA includes a list and brief summary of relevant case studies from car park fires both nationally and internationally where fire spread beyond the vehicle of origin and involved multiple vehicles which in some instances resulted in fatalities. They also set out some of the specific challenges that operational personnel typically face with both Internal Combustion Engine & Electrical Vehicle car fires.

(d) Structural Integrity/Fire Protection Concerns

In this section the BCA make reference to the research carried out by Mr. Martin Shipp et al for the BRE on enclosed car park fires which concluded that as a result of the presence of alternative fuels further research should be undertaken on the structural protection to enclosed car parks. They give the example of a Merseyside car park fire which caused significant spalling to the car park structure.

(e) Basement Car Park Ventilation

They note that under Section 3.5.2 of TGD-B the current minimum ventilation requirements for mechanical or natural ventilation are typically 10 air changes per hour or 2.5% of the car park floor area, with the ventilation being provided primarily to move the products of combustion away from the fire location which in turn assists in the control of fire spread and protects the lives of fire fighters. The BCA make the point that there is currently no requirement in BS 7347-7: 2013 to meet any set visibility or temperature criteria for either the means of escape or the firefighting phase of any fire incident and that the existing ventilation requirements are very likely to be inappropriate for multiple vehicle fires.

In addition, they note that EV car fires produce higher volumes of smoke with a prolonged burn period which in turn exasperates the risk in the basement from both a means of escape and firefighting operations point of view.

Finally, they question whether or not the current recommended ventilation requirements in basement car parks are adequate for the higher volumes of smoke along with the vapor cloud produced when Li-Batteries are in thermal

runaway and reference the recent research carried out by Professor Paul Christensen et al in Durham and Darlington in 2022.

Broader Implications Considered

The BCA state that management of EV car fires require an overhaul as the following considerations present:

- The significant amount of water required to extinguish an EV fire
- An increase in the number of responding appliances to 2 possibly 3 pumps per incident
- The high quantity of toxic water runoff
- Toxic gases contaminating firefighters PPE requiring a full change after each EV fire
- The increase in the number of EV's increases the potential for multi-EV incidents putting additional demands on BCA resources
- The transport of the EV post suppression to mitigate against the potential for re-ignition
- The likely hood of the fire brigade having to escort the transported EV post fire incident
- The possible need for the BCA to consider full vehicle immersion technology post suppression

It is their view that the provision of sprinkler systems in basement car parks allows for suppression and control of a developing fire, which provides for both safe means of escape of building occupants and allows fire crews access the basement for firefighting. In addition, they make the point that the provision of sprinklers would also alleviate concerns relating to the fire protection to structural elements e.g. floors/columns and beams in basement car parks.

(f) Conclusion

The BCA state that based on their first-hand experience in tackling fires involving modern vehicles, past assumptions in relation to car park fires e.g. '*the fire load is defined and not particularly high'* can no longer be relied upon. They are of the view that the provision of sprinklers in sizeable basement car parks is appropriate

based on the fire load and rate of fire spread associated with modern vehicle fires.

To further support their reasons for sprinkler protecting the car park the BCC put forward the following points:

- Dublin Fire Brigades operational staff are encountering larger fires within car parks which are spreading to multiple vehicles
- The aim of the Building Regulations is to provide for safety and welfare of people in and about buildings including firefighters
- The functional nature of the Building Regulations allows for the consideration of new hazards to changes in technology and materials as well as recognizing the limitations of assumptions based on historical data which may not reflect the modern fire risks
- Dublin Fire Brigade are of the view that the minimum standards outlined in TGD B are insufficient to address the new risk being presented by EV vehicles in underground car parks
- They are of the view that the severity of car fire in an underground car park will have further implications on the sustainability of buildings
- The point is made that the fire load and rate of fire spread associated with modern vehicle fires is sufficient reason to require the provision of sprinklers in any sizeable basement car park in order to meet the requirements of Part B of the Second Schedule of the Building Regulations

For the above reasons, the BCA included Condition 11 on the granted FSC.

6.0 **Assessment**

6.1. ***De Novo assessment/appeal v conditions***

Having considered the drawings, details and submissions on the file and having regard to the provisions of Article 40 of the Building Control Regulations 1997, as amended, I am satisfied that the determination by the Board of this application as if it had been made to it in the first instance would not be warranted. Accordingly, I consider that it

would be appropriate to use the provisions of Article 40(2) of the Building Control Regulations, 1997, as amended'.

6.2. ***Content of Assessment***

While the BCA goes to some lengths to explain their reasoning for this condition the fact remains that the requirement under Section 5.4.3.1 of TGD B (reprinted edition 2020) is very clear in that "basement car parks are not normally expected to be fitted with sprinklers", see below.

5.4.3.1 Basements - Smoke ventilation from basements generally take the form of outlets vents connected directly to the open air. Such ventilation should be provided from every basement storey except in the following:

(a) a basement in a dwelling house (Purpose Group 1(a) and 1(b));

(b) a basement having an area less than 200 m^2 and a floor which is not more than 3 m below the adjacent ground level.

Smoke vents should be sited at high level and should be distributed around the building perimeter to maximise the effectiveness of cross-ventilation. The clear cross-sectional area of all smoke vents, allowing for frames and louvres, should not be less than 2.5% of the basement storey served. Where a basement is compartmented, each compartment should be ventilated separately. Generally, smoke vents from basements should be permanently open and unobstructed, but where they are readily accessible from the outside, consideration can be given to suitably indicated removable covers. Smoke vents should not be positioned where they would prevent the use of the means of escape from the building.

As an alternative to outlet vents as described above, a system of mechanical extraction may be provided, where the basement is also protected by an appropriate sprinkler system complying with BS 5306: Part 2: 1990. The ventilation system should meet the criteria set out in 3.5.2.5 and should operate automatically on activation of the sprinkler system.

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

It would be my opinion that not having the basement car park sprinkler protected is in compliance with Section 5.4.3.1 of TGD B which would generally be accepted as prima facie compliance with Part B of the Second Schedule of the Building Regulations. In addition, I would be of the view that conditions such as this that are imposed by some

BCA's lead to inconsistency in building design nationally which is something I believe is to be avoided.

Furthermore, it is worth noting that a new version of TGD B (2024) has recently been published by the Department of Housing, Local Government and Heritage and there is no mention of basement car parks requiring sprinklers.

7.0 **Recommendation**

On the basis of my assessment, I recommend that An Bord Pleanála grant the appeal and instruct the BCA to remove Condition 11 from the Fire Safety Certificate for the reasons and considerations set out below.

8.0 **Reasons and Considerations**

Having regard to the original FSC application and appeal made, I am of the opinion that the appellant has demonstrated that there is no requirement for the basement car park to be sprinkler protected to meet the requirements of TGD B. Therefore, condition number 11 as originally attached by the BCA to the fire safety certificate is not necessary to meet the guidance set out in TGD B or accordingly to demonstrate compliance with Part B of the Second Schedule to the Building Regulations 1997, as amended and should be removed.

9.0 **Conditions**

N/A - on this occasion Condition 11 should just be removed.

10.0 **Sign off**

I confirm that this report represents my professional assessment, judgement and opinion on the matter assigned to me and that no person has influenced or sought to influence, directly or indirectly, the exercise of my professional judgement in an improper or inappropriate way.

Bryan Dunne

MSc, BSc, Dip(Eng), CEng, MIEI, Eur Ing

26th November 2024