

Fire Safety Certificate for material alterations in existing office building at 81 Merrion Square South, Dublin 2

Consideration of Appeal against Condition 4 attached to Fire Safety Certificate (Reg Ref: FA/16/1069)

MSA Reference > 16019

ABP Reference > FS 29B.FS0541

For An Bord Pleanála

MMS

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1 INTRODUCTION

This report sets out my findings and recommendations on the appeal submitted by Jeremy Gardiner Associates (JGA) Fire Engineering Consultants against Condition 4 attached to the Fire Safety Certificate (Reg Ref No. FA/16/1069) granted by Dublin City Council on 24th June 2016, for the proposed material alteration to an existing office building at 81 Merrion Square South, Dublin 2.

1.1 Subject of Appeal

An application was made by JGA to Dublin City Council on 12th February 2016 for a Fire Safety Certificate (Reg Ref No. FA/16/1069) for the material alterations of an existing office building at 81 Merrion Square South, Dublin 2. The application was made to cover the proposed removal of a pressurization system and lobbies to the stair, supported by installation of an AOV (1 m²) in escape stairway and carrying out computer smoke modelling on the stair.

The Fire Safety Certificate granted on 24th June 2016 with 4 No. Conditions attached, condition 4 of which is the subject of this appeal. The condition being appealed is;

Condition 4: *“The fire alarm detection system for the basement residential apartment is to be interlinked with the fire alarm detection system for the office building in line with the provisions of IS 3218: 2013. The L1 fire detection and alarm system complete with associated manual call points shall be an aspirating type system and shall cover the entire extent of the office premise and shall be designed, installed and maintained in accordance with IS 3218: 2013.*

Reason: *To comply with Part B1 of the Second Schedule to the Building Regulations, 1997 to 2014”*

1.2 Documents Reviewed

Fire Safety Certificate Application and Supporting Documentation

- Application for a Fire Safety Certificate to Dublin City Council submitted on 12th February 2016 comprising of;
 - Fire Safety Certificate Compliance Report; prepared by JGA Fire Engineering consultants (February 2016)
 - Additional requested information including an urban place map (OS Map) highlighting 81 Merrion Square South and the proposed ground floor layout drawing (4th March 2016).
 - Supplementary submission added 14/06/2016 with revised drawings of the proposed ground, first and second floor layouts
- Dublin Fire Brigade Report dated 16th June 2016 with recommendation to grant the FSC subject to 4 Conditions.
- Appeal submissions to An Bord Pleanála

- Submission dated 19th July 2016 lodged by JGA Fire Engineering Consultants
- Submission dated 26th August 2016 lodged by JGA Fire Engineering Consultants
- Submission dated 18th October 2016 lodged by JGA Fire Engineering Consultants
- Submission dated 10th August lodged by Building Control Authority
- Submission dated 26th October 2016 lodged by Building Control Authority

/2 FINDINGS & RECOMMENDATIONS

2.1 Condition 4

“The fire alarm detection system for the basement residential apartment is to be interlinked with the fire alarm detection system for the office building in line with the provisions of IS 3218: 2013. The L1 fire detection and alarm system complete with associated manual call points shall be an aspirating type system and shall cover the entire extent of the office premise and shall be designed, installed and maintained in accordance with IS 3218: 2013.

Reason: To comply with Part B1 of the Second Schedule to the Building Regulations, 1997 to 2014”

2.1.1 Case made by Appellant

The Appellant’s case is based on the following key points:

- a) The pressurization system within the escape stair and lobby protection conflict with the conservation requirements of the building. The building is categorized as a protected structure with high profile heritage elements throughout the building
- b) An L1 fire detection and alarm system exceeds code recommendations for an office building where the minimum provisions in an office building is for manual call points only. The proposed L1 fire detection system comprising point detectors (smoke) in each room provides the early warning to the occupants of the building. The Appellant contends that while aspirating detection may detect fire earlier than point detection, the difference would be negligible and no significant benefit achieved. Accordingly they contend that the imposition of an aspirating system in such a small building is unreasonable.
- c) A similar Georgian style building with a single escape stair serving 3 storeys over ground (9-10 Eustace Street) obtained a Fire Safety Certificate which also had a condition requiring the installation of an aspirating system. This was appealed to An Bord Pleanála (29B.FS0507) and the Bord directed the local authority to remove the condition requiring the aspirating system.
- d) The Appellant submitted results of comparative analysis between proposed case and a code compliant case using the CFAST 2 Zone Model and they submit that the results of this analysis shows that the proposed case compared favourably with the Code Compliant case and is accordingly acceptable. In their appeal submission of 26/08/2016 they refer to demonstration by CFD (Computational Fluid Programmes) being undertaken to show that conditions in the proposed stair core were at least as good as in a typical code compliant building. On being requested for details and

results of this CFD analysis by the Bord in a letter dated 03/10/2016, JGA, in their response dated 18/10/2016, noted that no CFD analysis had been undertaken and that the previous reference to this was a typographical error. JGA did, in their response of 18/10/2016, clarify their position regarding basement layout and usage and submitted a drawing of this level which although outside the scope of this appeal connects with the office stair at ground level via a door opening protected by a fire doorset.

2.1.2 Case made by the Building Control Authority

In the Dublin Fire Brigade submission of 03/08/2016 and 26/10/2016 the reasoning for the attachment of this Condition is stated to be:

- a) 81 Merrion Square South is an existing building provided with 3 floors above ground including a basement residential apartment. The upper floors are served by a single means of escape stairs which also communicates with the residential apartment at the rear of the building on ground floor. Due to the heritage nature of the building and the omission of critical lobbies at ground, first and second floor level, it was felt that the condition was required to obviate the risk.
- b) In addition the condition was imposed due to the nature and extent of occupancies and accommodation within the building (e.g., the offices on upper floor levels are under separate tenancy).

2.1.3 Findings and Recommendation

The key issues in considering the validity of the comparative analysis submitted in support of the appeal are:

- A 2 zone model such as CFAST has serious limitations in realistically modelling conditions within a stair core where smoke plume complexity due to interaction with stair flights and landings is not considered in the model. On the other hand a CFD model could adequately simulate these conditions if it had been used
- The analysis undertaken did not consider the potential benefits of lobby protection to the stairs in a code compliant case and simply appeared to consider that both lobby and stair doors from fire room being fully open.

A comprehensive comparative analysis could have been undertaken to:

- Derive probability of door protection to the stairs being reduced due to:
 - Doors being wedged open
 - Doors being damaged and partially open

Clearly in a code compliant case the probability of loss of door protection is reduced significantly due to provision of the lobbies (2 door protection).

A comprehensive programme of CFD modelling considering the potential different scenarios and the geometry complexity in the stairs should have been undertaken to demonstrate potential benefits of the high ceilings and additional smoke detection in the proposed case, the results of which could be assessed qualitatively (or quantitatively if necessary) against the results of the probabilistic comparative analysis of reduced door protection to the stair referred to above.

In the absence of such analysis the Appellant has not demonstrated that compliance with B1 Means of Escape in Case of Fire is being achieved in the proposed design.

The Appellants have also disputed the validity of the Condition 4 requirement to provide aspirating smoke detection by reference to an appeal decision made by the Bord in relation to 9-10 Eustace Street (Ref 29B FS0509).

I have reviewed this file and Consultants' Report in the aforementioned appeal and note that:

- 9-10 Eustace Street is a 4 storey building (ground and three upper floors) which doesn't have any basement floor
- There is no connection between the stairs and the ground floor accommodation and lobby protection is provided at all floors except one level, i.e, 1st floor.

In this proposed there is a connection via stair flight to basement level and this single stairs connects with ground and all upper floors without any lobby protection being provided. Furthermore it is noted that the Consultant in the 9-10 Eustace Street appeal made reference to a UK Guide on the Risk Assessment in Existing Office Buildings which permits a single stairway office building up to four storeys (ground and three upper stories) without lobby protection. This guidance cannot be relied upon in this instance where we have five storeys including a basement floor (in different occupancy) connecting with a single stair.

The Appellant has not provided adequate demonstration of compliance or with justification for removal of Condition 4.

On the other hand, the wording of Condition 4 is not sufficiently robust in so far as it doesn't specify the Class of system required so by default a Class C system (sensitivity of 2 dB/ m) which would be deemed equivalent to conventional point smoke detectors as provided by the appellant would be adequate.

I have accordingly considered two options in dealing with the appeal.

Option 1 – recommend that the BCA be directed to refuse the application given the inadequate case made by the Appellant in demonstrating compliance with Part B (B1) of the Building Regulations. Or

Option 2 - Disallow the appeal against Condition 4 but direct the Building Control Authority to strengthen the wording of the conditions specifying a Class B enhanced sensitivity aspirating system (0.15 dB/m).

I have undertaken a qualitative assessment of the benefits of such an enhancement as a trade off measure and am of the opinion that this can be considered adequate for Part B (B1) compliance in this instance.

2.1.4 Recommendation

I recommend that the Bord disallows the appeal against Condition 4 and directs the Building Control Authority to amend the condition to read as follows:

Revised Wording of Condition 4: *“The fire alarm detection system for the basement residential apartment is to be interlinked with the fire alarm detection system for the office building in line with the provisions of IS 3218: 2013. The L1 fire detection and alarm system complete with associated manual call points shall be Class B enhanced sensitivity*

aspirating type smoke detection system complying with IS EN 54-20 and shall cover the entire extent of the office premises including the office staircase and stair flight connection to basement level and shall be designed, installed and maintained in accordance with IS 3218: 2013.

Reason: *To comply with Part B1 of the Second Schedule to the Building Regulations, 1997 to 2014”*

Signed: _____

Michael Slattery, BE MSc (Fire Eng) CEng FIEI MSFPE EUR ING