

AN BORD PLEANÁLA
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ABP- 314382-22
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Time: 1.35pm By: Carrier

Report for An Bord Pleanála

on

**Appeal against Refusal to Grant Fire Safety Certificate (Submission
No. 3007128 / BCMS Reference No. FSC2202208GY/7D)**

for

**Material Alteration to Fixing of Living Wall System over part of
External Wall**

at

Hyde Hotel, Galway

Client: An Bord Pleanála
An Bord Pleanála Ref: ABP-304851-19
Our Ref: ABP_R004_Issue 2
Date: 21st April 2023

1.0 Introduction

This report sets out my findings and recommendations on the appeal submitted by Eimear Hanly of VHA Architects, on behalf of their client Mr John Carmody, against the decision to refuse to issue a Fire Safety Certificate (Submission No. 3007128 / BCMS Reference No. FSC2202208GY/7D) by Galway City Council with respect to proposed Material Alteration of Fixing of Living Wall System over part of External Wall at Hyde Hotel, Galway.

1.1 Subject of Appeal

Galway City Council issued a Refusal to Grant the Fire Safety Certificate for the following reason: -

Reason:

The application does not demonstrate compliance to 4.1.5 External Wall Construction and Table 4.1 of TGD-B 2006 Fire Safety.

2.0 Documentation Reviewed

- 2.1 7 Day Notice Fire Safety Certificate Application (application form, compliance report and fire safety drawings) submitted by Eimear Hanly of VHA Architects (with assistance from John O'Shaughnessy) on behalf of their client John Carmody, on 29th April 2022.
- 2.2 Email from Eimear Hanly of VHA Architects to Michael Cunningham of Galway County Council dated 15th June 2022
- 2.3 Email from Eimear Hanly of VHA Architects to Michael Cunningham of Galway County Council dated 16th June 2022
- 2.4 Notice of Refusal to Issue a Fire Safety Certificate from Galway City Council dated 21st July 2022.
- 2.5 Letter of Appeal from by Eimear Hanly of VHA Architects on behalf of their client John Carmody, dated 15th August 2022.
- 2.6 Fire Officer's report on Fire Safety Certificate Appeal dated 7th September 2022 to An Bord Pleanála.
- 2.7 Letter from Eimear Hanly of VHA Architects on behalf of their client John Carmody, dated 10th October 2022 in response to Fire Officer's report.
- 2.8 Letter from Galway County Council dated 11th November 2022.

3.0 Building Control Authority's Case

The decision of the Building Control Authority to refuse the application is for the following reasons: -

- The applicant has provided details which inform that the 'Living Wall' system consists of several components: -
 - The pockets constructed of Fytotextile which are fabricated from three layers a waterproofing layer, and two additional layers that compose the pockets the assembled pockets material which is treated with flame retardant Florimp K Verde.
 - PVC pipework irrigation system
 - Galvanised Metal steel support frame
 - Growing medium & Plants
- The certification for these pockets are of questionable performance over the long term period of use.
- There is no information on the performance of PVC irrigation system in terms of reaction to fire.
- There is concern if the water supply is not maintained and 'dry out' occurs the system could contribute to external fire spread and be non-compliant to Building Regulations
- The fabric material Fytotextile used in the 'Living Wall' has been granted a Fire Reaction classification of Class B -s2,d0 as to EN 15501 Part 1. This classification was provided by Applus Laboratories in Spain, File No. 17/13914-491 Part 1 English Version 16/05/2017. The test method the test laboratory used for this assessment was UNE-EN 11925-2: 2011 and UNE-EN 13823: 2012+A1: 2016.

The test certificate indicates that the Fytotextile has been pretreated with Florimp K Verde flame retardant, prior to the test.

Paragraph 9 Physical & Chemical properties of the Material Safety Data Sheet for the Florimp K Verde states that it is miscible in water & the Technical Specifications Sheet states the concentrate can be diluted in water for application by spraying the surface of the material or immersing the material in the concentrated Florimp K Verde. The Technical Specification Sheet also states that the Active agent is guaranteed for a minimum 12 months in a closed container.

As this fabric material is to be used as the matrix into which the growing medium for the plants will be held and an irrigation system will be provided as part of the living wall there will be a constant flow of water trickling through the Fytotextile fabric treated with the Florimp K Verde flame retardant. It is reasonable to conclude based on the information from the Performance Specification and Safety Data sheets that the fire retardancy material will wash out of the fabric over time. This brings into question the ongoing performance of the Class B -s2,d0 rating for this fabric.

- In addition, the PVC piping and the vegetation will add to the fire load of the cladding if it becomes dehydrated, and there is no life safety monitoring system to guard against 'Drying Out'.
 - Note 1 of Table 4.1 of TGD-B 2006 states 'Other Residential, Assembly and Recreation purpose groups, which is 10m or less above the ground or above a roof or any other part of the building to which people have access, should be Class C - s3,d2 (European) or have an index of performance (I) not more than 20 (National).
 - The Fire Authority contends that it has not been demonstrated this material consistently maintains the minimum requirement of Class C -s3,d2 classification over the lifetime of this product.
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- In their letter date 11th November 2022 they note that as per the commentary from the applicant and their technical representatives there is a large degree of reliance on manual intervention for the management of the installation to maintain fire retardancy. They note that they are concerned about the reliability of this manual intervention always being maintained.

4.0 Appellant's Case

The appellant's case for against the refusal is as follows: -

- The FSC application is for the inclusion of a surface mounted 'living wall' which includes industrially produced flexible multilayer modules, containing pockets which hold various type of plants, installed over part of the existing hotel external wall. The modules connect to each other using a metal framework which is attached to an existing resistant wall. The system is fitted with a water irrigation system to provide plants with the necessary level of moisture to encourage growth.
- Living walls are becoming popular in urban areas due to their significant biodiversity / environmental characteristics and benefits including improvements of air quality. Living walls are a common feature on buildings, both internally and externally all over Europe and the UK. The living wall system in question has been successfully installed in more than 21,000sqm of living walls all around the world.
- The proposed living wall system has been developed and patented by Terapia Urbana at the University of Sevilla in Spain, and tested by Applus Laboratories in Barcelona. The product tested consists of the Fytotextile multilayer modules and the sub-structure where they are fixed. The multilayer modules are made up of 3 layers (of which the outer layer is shaped like pockets for the plants to sit in) and the product is treated with an appropriate flame retardant as outlined in the fire test report.
- When choosing which living wall system to use, the appellant carefully researched which systems would meet the requirements of the Building Regulations, in particular focusing on meeting the required minimum European classification for external surface of walls.
- The system chosen not only meets, but exceeds, the external surface requirements outlined in the Building Regulations (test certificate from Applus Laboratories) confirming fire reaction classification Class B -s2,d0.
- Section 4.1.5 of TGD-B 2006 states 'In the case of the outer cladding of a wall with a drained and/or ventilated cavity, the surface of the outer cladding which faces the cavity should also meet the provisions of Table 4.1'

Table 4.1 of TGD-B 2006 outlines that buildings less than 18m in height are required to meet a minimum rating of Class B -s3, d2 (European) or Class 0 (National)'. As noted the proposed living wall achieves a superior rating both in terms of smoke (s2 as opposed s3) and droplets (d0 as opposed d2).

It is noted that the fire test by Applus Laboratories was carried out with the plants insitu in the pockets. The Appellant has taken further steps to ensure that the growing medium for the plants is non-combustible. The horticulturists report (included in this letter) lists the measure taken in terms of the growing material and materials, to mitigate against fire risk. These measures include removing all organic materials, including peat, from the growing substrate. By decreasing the organic matter in the growing medium and by increasing the non-combustible content the fire risk is considerably reduced.

In response to the Fire Officer's report the Appellant makes the following additional case: -

- With respect to the Fire Officers concern over the long-term performance of the certified system and in particular that the fire retardancy of the material will wash out of the fabric over time, Terapia Urbana have advised the following: -
 - The irrigation system of the living wall will not affect the exterior layer of the material, where flame retardant is applied as the water from the irrigation system of the living wall does not wash the exterior layer. The water from the pipelines / dripper will be distributed through the intermediate layer.
 - They have confirmed that the fire retardant Florimp K Verde is applied in their factory under controlled conditions, which ensures there are no humidity issues that may influence the products grip as flagged in the product data sheet under special features.
- With respect to the Fire Officers concern that the pvc piping and the vegetation will add to the fire load if it becomes dehydrated the appellant contends the following: -
 - that a comprehensive and robust management, maintenance, and monitoring system is in place to ensure that the irrigation system does not dry out or dehydrate.
 - The continual hydration of the system is necessary to keep the plants (in which there has been a significant financial investment) alive and healthy.
 - The mechanical contractor who was appointed to carry out the installation of the water irrigation system conforms that they included a 900 litre storage tank for the stored water which in turn pumped through a Grundfoss Scala2 Pump from the cold water storage room within the basement of the premises. In addition they have installed a water meter which is monitored daily and recorded to make sure the correct water consumption is being used.
 - The appellant confirms that Harris Landscaping have been contracted for the maintenance and the upkeep of the living walls. These have confirmed that the wall is watered daily and overall amounts of water dispersed to the wall are metered and recorded at source ensuring consistent water levels can be maintained. They have also conformed that as part of their duties they will carry out manual checks on the wall three times weekly doing visual checks and taking moisture level readings in a cross section of pockets. This process confirms the irrigation system is distributing water evenly across the living wall and acts as an early detection system in the event of a blockage.
- The appellant is committed to the ongoing maintenance and monitoring of the irrigation system, which, as outlined in the letter from Terapia Urbana, is a critical feature of the living wall system. They would therefore have no objection should the Bord wish to attach a condition relating to the same.

- The inclusion of photographs of a fire in an external planter on a balcony of a hotel is completely different scenario to the living wall system that is the subject of this appeal and not comparable in terms of irrigation, soil or material classification.

5.0 Consideration

The Building Control Authority's main issue of concern seem to be as follows: -

- That the fire retardancy of the material could wash out of the fabric over time.
- That the pvc piping and the vegetation will add to the fire load if it becomes dehydrated

Both Building Control Authority's and Appellant refer to TGD-B 2006, specifically Table 4.1 of TGD-B 2006, which is as follows: -

Height of building (m)	Distance from any point on the relevant boundary *	
	Less than 1 m	1 m or more
Less than 18	Class B - s3, d2 (European) or Class 0 (National)	No provision (unless it is a building described in Note (1))
More than 18	Class B - s3, d2 (European) or Class 0 (National)	Class B - s3, d2 (European) or Class 0 (National) (2)

Notes.

* The relevant boundary might be a national boundary.

(1) Any part of the wall of a building comprising flats or maisonettes, or a building in the Residential (Institutional), Other Residential, Assembly and recreation purpose groups, which is 10 m or less above the ground or above a roof or any other part of the building to which people have access, should be Class C - s3-d2 (European) or have an index of performance (I) not more than 20 (National). Timber cladding at least 9 mm thick is also acceptable.

(2) Surfaces between 0 and 18 m above the ground may comprise of any material of Class C - s3 - d2 (European) or have an index of performance (I) not more than 20 (National). Timber cladding at least 9 mm thick is also acceptable.

It is clear from Table 4.1 that an external surface of wall with a Class B -s3, d2 will meet the recommendations of TGD-B 2006 and therefore prima facia meet the requirements of the Building Control Regulations.

It is noted that the fire test and accompanying documentation by Applus Laboratories, a highly accredited testing company, was for a fire test carried out with the plants insitu in the pockets. It is therefore clear what the intended use of the tested product was. These tests demonstrated that the proposed living wall achieved a Class B -s2, d0.

The concerns of the Building Control Authority's with respect to the fire retardant Florimp K Verde has been addressed by Terapia Urbana and their response appears reasonable.

The appellant has addressed the dehydration issue by stating that they are committed to the ongoing maintenance and monitoring of the irrigation system that will ensure that dehydration will not occur. As part of their submission, they have stated that they would have no objection should the Bord wish to attach a condition relating to the same. This also appears to be reasonable.

The use of a living wall is a new concept in Ireland and the TGD-B 2006 and other codes of practice do not adequately address their use. The concerns of the Fire Officer / Building Control Authority's with respect to dehydration are valid. However, if such systems are to be used in Ireland and the current legislation is not up to the task the onus is on the user (in this case the appellant) to ensure that the proposed system meets the intent of the current recommendations. I believe the robust maintenance regime proposed by the appellant, if adhered to, should ensure that the living wall does not become dehydrated.

The reliability of the system is therefore dependant on the maintenance regime. However, the same can be said for numerous life safety systems (i.e. fire detection alarm systems, sprinklers system, smoke control systems etc), without adherence to strict maintenance these systems would also fail in the event of a fire incident. However, this reliance on a maintenance regime does not preclude their use. Nor should it preclude the use of a living wall.

6.0 Conclusions

Given the consideration above the proposed living wall appears to be a reasonable proposal. To ensure that the maintenance is adhered to it is recommended that a Condition relating to the maintenance of the living wall is provided.

7.0 Recommendation

On the basis of my findings and conclusions I recommend that An Bord Pleanala should accept the Appeal and grant the Fire Safety Certificate with the following Condition added: -

Condition 1:

The maintenance of the proposed living wall should be in accordance with the recommendations of BS 5588 Part 12: 2004 'Managing Fire Safety' or Section 9 of BS 9999: 2017 'Managing occupied buildings'. A fire safety manual detailing and recording the proposed maintenance should be kept on site and be readily accessible for review.

Reason:

To comply with Part B4 of the Second Schedule to the Building Regulations 1997 to 2020.

Signed by:



Des Fortune.
MSc(Fire Eng), BSc(Eng), CEng MIEI, MIFireE

Date: 21st April 2023
