

Material Alterations and Extensions to Existing Industrial Unit to form new Whiskey and Gin Distillery at AF2, Industrial Estate, Garranearage, Valentia Road, Cahirsiveen, Co Kerry

Consideration of Appeal against Conditions 1 and 4 attached to Fire Safety Certificate (Reg Ref: FSC19/152/20/103)

MSA Reference > 21000

ABP Reference > FSC19/152/20/103

For An Bord Pleanála

MMS

CONTENTS

/1	INTRODUCTION	1
1.1	Subject of Appeal	1
1.2	Documents Reviewed	2
/2	FINDINGS	3
2.1	Case made by the Building Control Authority	3
2.2	Case Made by the Appellant	3
/3	CONCLUSIONS AND RECOMMENDATIONS	4
3.1	Condition 1	4
3.2	Condition 4	5

©This report and/or its contents, information and its design principles are the exclusive property of Michael Slattery Associates and are not to be reproduced in any means or to be used for any other project without written agreement of Michael Slattery Associates.

All rights reserved by the law of copyright are reserved by Michael Slattery Associates and may be protected by court proceedings for damages and/or injunctions and costs.

/1 INTRODUCTION

This report sets out my findings and recommendations on the appeal submitted by DFA Fire against Conditions 1 and 4 attached to the Fire Safety Certificate (Reg Ref No. FSC19/152/20/103) granted by Kerry County Council on 18th September 2020 for the material alterations and construction of an extension to an existing industrial unit to form a new whiskey and gin distillery at AF2 Industrial Estate, Cahirsiveen, Co Kerry.

1.1 Subject of Appeal

A Fire Safety Certificate application was made to Kerry County Council on 8th October 2019 for the material alterations and construction of an extension to an existing industrial unit to form a new whiskey and gin distillery at AF2 Industrial Estate, Cahirsiveen, Co Kerry.

The Fire Safety Certificate granted on 18th September 2020 which had 4No. conditions attached, as follows:

Condition 1:

An automatic sprinkler system should be provided throughout any compartment of the building used for the production and storage of material which is classified as a high risk or a hazardous material (i.e., distillation & storage of spirits).

Reason:

In the interest of fire safety

Condition 2:

- (a) The proposed liquefied petroleum gas installation, i.e., storage tank(s), pipework and fittings should be certified as being designed, installed and commissioned in accordance with the requirements of IS 3216: 2010 Code of Practice – Bulk storage of liquefied petroleum gas (LPG) – (Edition 2)

Reason:

In the interest of fire safety

- (b) All gas supplies should be provided with automatic and manual shutdown valves

Reason:

In the interest of fire safety

Condition 3:

Provide an alternative means of escape from the fourth-floor observation terrace level. This additional means of escape from the observation terrace level should be designed and detailed in appropriately scaled drawing(s) and submitted to this Building Control Authority for approval prior to commencement of works on site.

Reason:

In the interest of fire safety

Condition 4:

A ready and adequate supply of water for fire-fighting purposes is to be provided to comply with provision B5 of the Building Regulations. This provision can be satisfied by the provision of suitably located fire hydrant(s) on the property and/or hydrant(s) provided by the Sanitary Authority. The supply can also be provided by or augmented by static storage vessels with suitable fire brigade connections and by open sources of adequate year-round supply with suitable access.

In all instances the minimum supply should be arrived at scientifically considering the necessary relevant parameters, e.g., maximum compartment size, quantity and combustibility of all items within each compartment, type of building construction etc. Also consider the capability and requirements of the predetermined attendance of the County Fire Service for a large-scale incident in the premises.

Where fire hydrants are installed, they should be positioned so they remain usable in the event of a fire occurring. They should be positioned in such a way that the parking, loading and unloading of vehicles is unlikely to obstruct them. (See also Diagram 30 – External Fire Mins & Hydrants TGD Part B.)

Note:

The minimum flow to be provided should be 35 litres per second for a duration of 120 minutes. A proportion of this supply may be provided by on-site storage at the approval of the Fire Authority.

Hydrants should be of the screw-down type in compliance with the requirements of BS 750. The depth of the hydrant outlet below finished ground level should not exceed 200mm.

Any fire-fighting water storage tank(s) should be clearly identifiable for use by the Fire Service. Where any fire-fighting water storage tank(s) are proposed they should be provided with a low water level alarm and be monitored and inspected regularly. Fire-fighting water storage tank(s) should be designed with suitable fire brigade connections so as to enable the County Fire Service to connect to the tanks.

Any fire-fighting water storage tank(s) should be designed and constructed with a suitable sump within the tank(s) to enable the full volume of the tank to be used by the Fire Service.

Reason:

In the interest of fire safety.

1.2 Documents Reviewed

- Application for a Fire Safety Certificate to Kerry City Council submitted on 8th October 2019 comprising of;
 - Fire Safety Certificate Compliance Report; prepared by DFA Fire
 - Plans, Sections and Elevations; by George Boyle Designs.
 - Supplementary submissions dated 07/08/2020 by the Applicant to Kerry County Council with revised drawings which addressed the list of items/concerns raised by Kerry County Council in a further information report
- Appeal submissions to An Bord Pleanála
 - Submission dated 8th October 2020 by DFA
 - Submission dated 10th November 2020 by Kerry County Council.
 - Submission dated 26th November 2020 by DFA.

/2 FINDINGS

2.1 Case made by the Building Control Authority

In their response to the Appeal Submission the Building Control Authority:

- Note their concerns re the increased intensity of fires involving alcohols and the risk of early structural collapse and fire spread to adjoining compartments
- Make reference to BS9999 2017 as being a more up to date design reference which deals specifically with potential for ultra-fast fires. They are interpreting BS9999 as requiring sprinkler protection in this instance in the distilling areas. They also make reference to PD 7974-5 as supporting this contention:
- Refer to the benefits of automatic fire suppression systems in reducing risk to life (occupants and firefighters) and in terms of property protection, environmental protection and business continuity

In relation to Condition 4 the Building Control Authority notes that the applicants in their response to the further information request during the Fire Safety Certificate application process, had committed to the provision of fire flow rate of 35 l/sec and to the provision of fire water tank on site if this flow is not available in the local authority mains. They note that the Appellant is now seeking to reduce the flow rate to 25 l/sec for a duration of 45 mins.

The Building Control Authority refer to two other sources of guidance in support of the requirements cited in Condition 4 (minimum 35 l/sec for a duration of 120 mins)

- BS PD 7974 Part 5 where using equations in the guidance they have derived flow rates in the range of 42 – 47 l/sec
- Water UK National Guidance Document on provision of water for fire fighting (2007). They conclude by reference to the guidance that 35 l/s is the minimum fire water flow required.

They also note that by provision for a duration of 120 mins that the additional fire water storage will also allow for discharge of peak flows higher than 35 l/s

2.2 Case Made by the Appellant

In regard to Condition 1 the Appellant notes that the fire strategy for the development is based on Technical Guidance Document B (Fire) 2006 which does not have any requirement for sprinkler protection by reference to Section B3 Internal Fire Spread (Structure).

The Appellant notes correctly that:

- The distillery falls within a high hazard more than one storey industrial building category in Table 3.1 of TGD-B
- Table 3.1 specifies maximum compartment limits of 2800 m² (floor area of any one storey) and 17000 m² in a non-sprinklered building. It is noted that these limits are doubled where sprinklers are provided.
- The largest compartment in the distillery has a max area of 1063 m² and volume of 9354 m³ which are well inside the limits in Table 3.1 for a non-sprinklered building

- On this basis using Technical Guidance Document B for prima facie compliance there is no requirement for a sprinkler system

In the supplementary submission of 26/11/2020 to the Board the Appellant responds to the Kerry County Council commentary in their submission of 10/11/2020 and notes

- The basis of compliance as being TGD-B and not BS9999 2017 or DD 7974-5 (referred to by Kerry County Council in their submission)
- That the design also complies with the Scottish Technical Standards 2019 which cites “spirit distilling” as being in Factory Class 1 and does not have any requirement for sprinklers where compartment limits of 3000 m²/floor or 6000 m² total are not exceeded.

In regard to Condition 4 (incorrectly noted as Condition 3 in the Appeal submission of 08/10/2020) the Appellant refers to Section 9.3.1 of BS5306 Part 1 1976 as the basis for compliance. This recommends in an internal wet fire main system in high rise buildings a flow rate of 25 l/s (1500 l/m) for a period of 45 mins. Accordingly, the Appellant is suggesting that this flow rate and duration should be adequate for a hydrant main and suggests that the condition be amended to reflect that.

In the supplementary submission of 26/11/20 to the Board the Appellant again makes reference to BS5306 Part 1 as being an appropriate basis for compliance.

/3 CONCLUSIONS AND RECOMMENDATIONS

3.1 Condition 1

The Appellants are correct in their assertion that by reference to Technical Guidance Document B 2006 (amended 2020) there is no requirement to provide sprinkler protection in the distillery areas in this development given the limited compartment sizes. They are also correct in their interpretation of the Scottish Technical Standards which they are citing in support of the Appeal. In regard to the Building Control Authority reference to BS9999 2017 in support of their position while it could be interpreted under this Code that the fire growth rate could be either in ultrafast fire (Category 4) or fast fire (Category 3) category such a categorization is subject to a detailed fire risk assessment of the distilling process risk.

In so far as the design is based on and compliant with Technical Guidance Document B and supported in turn by reference to the Scottish Technical Standards which specifically references distilleries, it seems unnecessary and unreasonable to refer to another Code of Practice (BS9999) and to then use a conservative interpretation of this Code (ultra fast fire classification) to justify the requirement for sprinkler protection.

On the other hand, consideration needs to be given to the adequacy of compartmentation between the distillery and the adjacent staff and public assembly spaces and the potential impact of a serious fire in the distillery area on the integrity and stability of the compartment walls in the event of structural failure and on the integrity and tenability of escape routes from upper floor levels (e.g., in the event of fire breaking through the roof). The Appellant appears to acknowledge this potential issue in the submission of 26/11/20 in so far as there is reference to a potential upgrading of compartmentation. The key issues I have identified in regard to this issue are:

- The distilling area structure appears to be a steel portal frame, in which case failure and collapse of the portal frames or other roof structures connected with or tied into the compartment walls would likely cause failure of the compartmentation

- At 2nd and 3rd floor levels some of the escape routes immediately adjacent to non-fire resisting roof construction and which do not appear to be adequately protected against fire breaking through the roof.
- It is also noted that in the Fire Safety Certificate Application a fire rating of 60 mins is proposed for compartment walls and floors and supporting structure with 30 mins rating proposed for the Mezzanine Floors in the distillery. This is not strictly in accordance with the recommendation in Technical Guidance Document B which recommends the following:
 - o 90 mins fire rating in an industrial building in height range 5 – 20 m
 - o 60 mins fire rating in a public assembly building (visitor centre)

In so far as the building height is in the range 5 – 20 m (visitor centre part) it could be interpreted that this attracts a 90 min rating for the entire building where the more onerous provision in TGD-B is applied throughout. However, TGD-B does permit separated areas of different heights to be assessed separately where the separation between the two parts of the building is by a compartment wall which runs the full height of the separated parts and is in one plane as per definition in Appendix D and diagram 30 in TGD-B 2006.

Significantly this has not been explicitly addressed by the Appellant either in the Fire Safety Certificate application or appeal. On the other hand, if the building is sprinklered a 60 min rating could be deemed as adequate throughout the building.

While I am of the opinion that there is no requirement for an automatic sprinkler system as per Condition 1, I am recommending the attachment of a revised Condition 1 which remove this requirement, but which introduces requirements to address the issues raised above.

Recommended Revised Condition 1:

“A 90 min fire resistant compartment wall meeting the performance requirements of Appendix A of TGD-B and the requirements in Appendix D of TGD-B with regard to separated parts, is to be provided on the line indicated on George Boyle Design drawing No 326 (purpose Groups – Block plans) to provide adequate compartmentation between the two Purpose Groups 5 (Assembly) and 6 (Industrial – distilling). This compartment wall is to be extended to also provide 90 min separation of Stairs B from the industrial risk over the full height of the stairs (to protect against exposure to fire of the distillery breaking through the roof. In addition, any element of structure which is connected with, supports or gives stability to compartment wall is to be fire protected so as to also achieve a 90 mins fire resistance meeting the performance requirement in Appendix A.”

Reason: To meet the requirements of B1 Means of Escape in case of fire and B3 Internal Fire Spread Structure of the Building Regulations

3.2 Condition 4

I have considered the arguments put forward by the Appellant which is based on BS5306 Part 1: 1976, supporting the case for a fire water flow rate of 25 l/s. In reviewing this I have also made reference to BS9990 2015 which supersedes and replaces BS5306 Part 1 1976 which has been withdrawn.

BS9990 2015 recommends in Clause 6.1 that generally a water supply to external hydrants capable of providing a minimum of 1500 l/min (25 l/sec) is required. I have

also reviewed the Water UK National Guidance Document on the provision of water for fighting (2007) and note that the Guidance contains the following recommendations for industrial risks.

The recommended fire fighting water supplies in the water supply infrastructure to an industrial estate are given as follows:

Up to 1 hectare	20 l/sec
1 – 2 hectares	35 l/sec
2 – 3 hectares	50 l/sec
Over 3 hectares	75 l/sec

In so far as the area of the Skellig Six/8 distillery site is less than 1 hectare it could be argued that a fire flow rate of 20 l/sec would be adequate. It could be deemed unreasonable to impose a requirement based on the larger site area as the Building Control Authority appear to be doing in invoking the 35 l/sec figure.

It is noted that the Building Control Authority in their appeal submission have also made reference to BS PD 7974 Part 5 and have derived flow rates using the methodology in this guidance, adopting it appears a conservative approach in their analysis.

While the Appellant's case that a fire flow rate of 25 l/sec for a period of 45 mins appears strong by reference to the guidance cited, it seems reasonable in all the circumstances to take on board the Building Control Authority proposal that a min flow rate of 35 l/sec, given their local knowledge of water supplies infrastructure.

However, I disagree with their proposal that this should be for a duration of 120 mins which I consider excessive and note that the duration specified has a major impact on the storage tank size required to make up shortfall in flow rate available from the hydrant main.

While BS5306 Part 1 recommends a supply duration of 45 mins in the determination of water storage to supplement the basic supply, for wet rising mains I do not consider that this appropriate in determining requirement for external fire fighting water supplies noting that an internal wet rising main system would also be supplemented by the external hydrant main water supplies. I have therefore referred to IS EN 12845 2015 "Automatic sprinkler systems" which gives recommendations for water supplies duration where the sprinkler system stored water supplies are also used to supply a hydrant main (combined water supplies 9.6.4). It is noted in Annex A of BS EN 12845 alcohol distilleries are categorised as Ordinary Hazard Group 4 and that accordingly by reference to 8.1 the stored water supply should have capacity for a 60 min duration.

While sprinkler protection is not being proposed in this instance, it is reasonable to make reference to IS EN 12845 given its particular recommendation where duration is related to risk.

On the basis of the foregoing findings and calculation I am recommending Condition 4 be amended to read as follows:

Condition No 4

A ready and adequate supply of water for fire-fighting purposes is to be provided to comply with provision B5 of the Building Regulations. This provision can be satisfied by the provision of suitably located fire hydrant(s) on the property and/or hydrant(s) provided by the Sanitary Authority. The supply can also be provided by or augmented by static storage vessels with suitable fire brigade connections and by open sources of adequate year-round supply with suitable access.

Fire hydrants are to be positioned so they remain usable in the event of a fire occurring and in such a way that the parking, loading and unloading of vehicles is unlikely to obstruct them.

Note: The minimum flow to be provided should be 35 litres per second for a duration of 60 minutes. A proportion of this supply may be provided by on-site storage at the approval of the Fire Authority.

Hydrants should be of the screw-down type in compliance with the requirements of BS 750. The depth of the hydrant outlet below finished ground level should not exceed 200 mm.

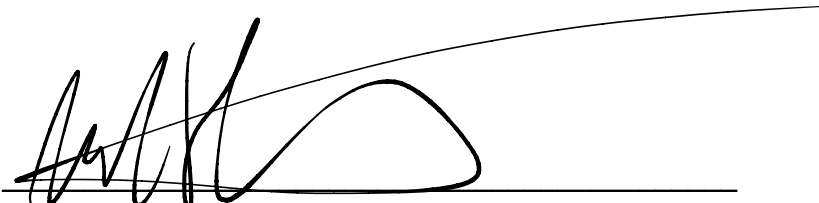
Any fire-fighting water storage tank(s) should be clearly identifiable for use by the Fire Service. Where any fire-fighting water storage tank(s) are proposed they should be provided with a low water level alarm and be monitored and inspected regularly.

Fire-fighting water storage tank(s) should be designed with suitable fire brigade connections so as to enable the County Fire Service to connect to the tanks.

Any fire-fighting water storage tank(s) should be designed and constructed with a suitable sump within the tank(s) to enable the full volume of the tank to be used by the Fire Service.

Reason: To meet the requirements of B5 "Access and Facilities for the Fire Service" of the Building Regulations.

Signed: _____



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