

# Field of Application Report

IFC Report PAR/22672/04 Revision A

## Fire Resistance Standard:

EN 1363-1: 2012 and ASFP TGD19 (2017)



## Prepared for:

Tenmat Limited

## Assessed Product/System:

Field of Application for Tenmat 'FF102-50' Ventilated Cavity Barriers which form Horizontal Fire-Separating Elements in Cavities within Walls

## Assessed Performance:

Up to 120 minutes fire resistance for cavities of different widths with a maximum air gap of 44mm

## Issue Date

March 2023

## Expiry Date

March 2028

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## International Fire Consultants Ltd

International Fire Consultants is part of the **Kiwa UK Group**. The company is a specialist engineering consultancy delivering independent, honest and practical fire safety solutions to professionals across the built environment. The sought after fire safety advice protects life, preserves property and safeguards business continuity.

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This report should not be manipulated, abridged or otherwise presented without the written consent of International Fire Consultants.

<b>Report Reference Number:</b>	IFC Report PAR/22672/04 Revision A
<b>Prepared on behalf of:</b>	Tenmat Limited
<b>Address:</b>	Ashburton Road West Trafford Park Stretford Manchester M17 1TD
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## Issue and Amendment Record

REV	DATE	AUTHOR	REVIEW	SECTION	AMENDMENTS
- #22672	November 2021	KW/CS	DC	-	-
A #23997	March 2023	ES	DC	Various	Inclusion of additional fire resistance test evidence, associated changes, review, revalidation and updating into current format

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# 1. Introduction

This Engineering Assessment Report has been prepared by International Fire Consultants Ltd (IFC), on the instruction of Tenmat, to define the Field of Application for the FF102-50 range of ventilated cavity barriers, that are required to provide up to 120 minutes fire resistance performance, when installed as a horizontal fire-separating element in the concealed cavity within a composite wall <sup>Note 1</sup>. The cavity barriers will be adjudged against the test conditions of EN 1363-1: 2012 and the additional criteria defined in Technical Guidance Document TGD19 (hereafter referenced as TGD19), issued by the ASFP <sup>Note 2</sup>.

This assessment has been produced using the principles outlined in the Passive Fire Protection Forum (PFPF): *'Guide to Undertaking Technical Assessments of Fire Performance of Construction Products Based on Fire Test Evidence, 2021, Industry Standard Procedure'*.

When establishing the variations in the construction that can achieve the required fire resistance performance, IFC complies with the principles found in the following documents:

- BS ISO/TR 12470-2: 2017 *'Fire resistance tests - Guidance on the application and extension of results from tests conducted on fire containment assemblies and products. Part 2: Non-load bearing elements'*
- EN 15725: 2010 *'Extended application reports on the fire performance of construction products and building elements'*

The assessment is based upon the information supplied to us, (detailed in Section 2), and upon the fire resistance test evidence for parts of the constructions (detailed in Section 3). An analysis of the fire resistance performance of the cavity barriers is presented in Section 4, herein which also defines the scope of approval by IFC. The omission of information on any components or manufacturing methods does not imply a lack of approval of those details, but these would need to be the subject of a separate analysis. Only variations specifically mentioned are supported by this assessment document, all other aspects must otherwise be as proven in tests summarised in Section 3, herein. Refer to Section 6 for recommendations with respect to audit and verification of the manufactured/installed assembly.

*Note 1 It is acknowledged that ventilated cavity barriers, such as that under consideration herein, are designed for use in the cavity between the inner and outer constructions forming the 'external wall' of a building. However, this report by IFC considers the fire resistance of such products using the test arrangement described in Technical Guidance Document TGD19, published by Association for Specialist Fire Protection (ASFP). TGD19 does not refer to an 'external' wall and so this report, by IFC, does not use the term 'external' in relation to the test constructions. The typical test specimens shown in TGD19 do not attribute terms of reference for the construction elements forming each face of the cavity. For the purposes of this report, by IFC, the two construction elements will be referenced as 'inner' and 'outer', respectively. The cavity barrier is fitted to the inner wall, facing the cavity.*

*Note 2 There is no BS or EN standard for fire testing of ventilated cavity barriers, such as that under consideration herein. Ad-hoc testing of such products is usually employed by the test laboratory using the arrangement described in Technical Guidance Document TGD19, published by the ASFP (All references to TGD19, herein, apply to the edition dated November 2017) and the furnace conditions of BS EN 1363-1: 2012. (This standard was updated in 2020 but the changes do not affect the tests evaluated here)*

## 2. Proposal

### 2.1 General Overview

The test reports summarised in Section 3, herein, demonstrate the efficacy of the FF102-50 ventilated cavity barrier when installed as a horizontal ‘open-state cavity barrier’, (using the arrangement described in TGD19); and tested to the furnace conditions of BS EN 1363-1: 2012 <sup>Note 2</sup>. The specimens were tested with a variety of cavity widths, and it is proposed that these barriers will also provide certain levels of fire resistance, with intermediate cavity widths.

For the sake of clarity, this Engineering Assessment Report, by IFC, only considers the cavity barriers when installed as a horizontal ventilated cavity barrier; because this is the only arrangement described in ASFP TGD19. It is not appropriate to use evidence for a horizontal cavity barrier to evaluate the same cavity barrier in a vertical application.

The specification of the cavity barrier is briefly summarised in Section 2.2, below; based upon the details in the test reports. Further details of the parameters for the proposed application are described in Section 4 herein.

### 2.2 General Product Description

The FF102-50 cavity barrier comprises a graphite-based intumescent strip, ((Material Ref. FF102, 75mm high x 6mm thick) it is supplied in individual lengths, 1000mm long; and each length is covered in aluminium foil.

The FF102-50 cavity must be fixed directly to the inner wall using screws. See Section 4.2 for full details.

The proposed scope is summarised in Table 1, below, but refer to Section 4.2, herein, for primary parameters and limitations that must be adopted.

Maximum Air Gap (mm)	Cavity Width (mm) Including Air Gap	Integrity (minutes)	Insulation (minutes)	Construction of Inner Wall	Construction of Outer Wall	Fixings or L-Bracket Requirement
44	50	120	120	Oriented Strand Board on timber frame	Concrete	Direct screw fix; See Section 4.2
44	50	120	120	Non-combustible board on steel frame systems or concrete (refer to section 4.3 for further details)	Concrete	
19	25	120	120	Concrete	Hardie® Plank Weather Board	
29	35	120	120	Concrete	Hardie® Plank Weather Board	
29	35	120	120	Concrete	Hardie® VL Plank Weather Board	
44	50	120	120	Concrete	Hardie® VL Plank Weather Board	
9	15	120	120	Cement particleboard on steel frame system	Stone Wool External Wall Slab	
19	25	120	120	Cement particleboard on steel frame system	Stone Wool External Wall Slab	

*Table 1. Scope of Approval for FF102-50*

### 3. Test Evidence

The test evidence used to support this Field of Application Report is summarised in Table 2, below. Full specifications of the tested product are recorded in the test report; copies of which are held on confidential file by IFC.

Test Laboratory Test Number Specimen Reference	Cavity Width (mm)	Air Gap (mm)	Inner Wall Surface/ Construction <i>Note 6</i>	Insulation On Inner Wall	Fixed With Screws/ Brackets	Integrity Cotton Pad/ Sustained Flaming	Insulation Surface/ Suspended
Warringtonfire WF436599 Specimen A	25 <i>Note 2</i>	19 <i>Note 2</i>	Concrete	None	Screws	133 <i>Note 3</i>	133 <i>Note 3</i>
Warringtonfire WF436599 Specimen B	35 <i>Note 2</i>	29 <i>Note 2</i>	Concrete	None	Screws	133 <i>Note 3</i>	133 <i>Note 3</i>
Warringtonfire WF436599 Specimen C	50	44	Concrete	None	Screws	133 <i>Note 3</i>	133 <i>Note 3</i>
Warringtonfire WF436599 Specimen D	35	29	Concrete	None	Screws	133 <i>Note 3</i>	133 <i>Note 3</i>
Warringtonfire WF436600 Specimen B	25	19	Cement particleboard on steel frame system	None	Screws	132 <i>Note 3</i>	132 <i>Note 3</i>
Warringtonfire WF436600 Specimen C	15	9	Cement particleboard on steel frame system	None	Screws	132 <i>Note 3</i>	132 <i>Note 3</i>
Warringtonfire WF514284R Specimen B	50	44	9mm Oriented Strand Board on timber frame system	150mm thick RWA45	Screws	121 <i>Note 3</i>	121 <i>Note 3</i>

*Table 2. Summary of test evidence for FF102-50*

*Note 2* Hardie® Plank weather board was tested with an overlapping detail resulting in a varying cavity size of up to 8mm greater than the timber batten depth.

*Note 3* Test terminated without failure of this criterion.

*Note 4* All specimens had a total length of 1000mm, screw fixed to the inner surface at minimum 250mm centres.

None of the test evidence referenced in this Engineering Assessment Report is more than 5 years old. In accordance with industry practice, the evidence is valid, in that respect; but IFC have still performed a review of the test evidence, to check that the levels of accuracy and detailing are suitable to form the basis of this approval.

The test standard ASFP TGD19 has been revised since some of the earlier testing was performed. The current version is dated 2017 but the revisions to the test standard do not affect the outcome of the tests nor the analysis in this Assessment Report.

In all specimens, the time taken for 'closure' of the air gap, by the activating intumescent material, met the requirement defined in ASFP Technical Guidance Document - TGD-19 Fire Resistance Test for 'Open-State' Cavity Barriers (i.e. within 5 minutes of commencement of testing).



## 4. Analysis and Approved Scope

### 4.1 Analysis

The test reports summarised in Section 3, herein, demonstrate the efficacy of the proposed FF102-50 ventilated cavity barriers when installed as a horizontal 'open-state cavity barrier', (using the arrangement described in TGD19); and tested to the furnace conditions of BS EN 1363-1: 2012 <sup>Note 2</sup>. The specimens were tested with a variety of cavity widths and it is reasonable to expect that identical barriers will also provide certain levels of fire resistance, as shown in Table 1, with intermediate cavity widths.

### 4.2 Installation Details and Parameters for Approval

1. Where cut lengths of barrier are necessary, (see also other bullet points in this clause), at least one screw must remain in the cut length.
2. Each length of FF102-50 barrier shall be fixed to the 'inner wall'.
3. The FF102-50 shall be fixed directly to the inner wall, using screws with a minimum 6mm and maximum 16mm diameter head, fitted through the centre line of the 75mm thickness of the FF102-50. Screws shall be fitted at maximum 250mm centres and a maximum 125mm from both ends of each length of FF102-50; i.e. 4 screws for a 1000mm length. (Cut lengths of barrier must always include at least 1no screw). Screws shall not be over-torqued, to avoid damage to the face of the intumescent strip. The type and length of screw depends upon the construction of the inner wall; see later clauses.
4. At the extreme end of each 'run' of cavity barrier, the end of the individual pieces shall be a friction-fit against the adjacent structure/element.
5. The air-gap width may be less than 9mm, without affecting the efficacy of the barrier under fire resistance test conditions; but it is the responsibility of other parties to determine whether a smaller air gap is suitable for other performance criteria.

### 4.3 Parameters of the Inner and Outer Walls

The inner wall/floor shall be constructed from either concrete, or a proprietary steel or timber framed construction, with direct and applicable fire test evidence to demonstrate that it can provide the required level of fire resistance, as applicable, when tested to EN 1364-1 or EN 1365-2 with the selected facing material, unless stated otherwise. The construction of the outer wall shall be as described herein.

#### 4.3.1 Timber Frame Inner and Outer Wall

The timber framed system must have an oriented strand board (OSB) sheathing board of at least 9mm thick. This system does not require test evidence with OSB on the face opposite the intumescent since the use of this combustible facing material has been verified in the test WF 514284R in Table 2 provided that it is fixed securely to a concrete sub-facing. However, there must be no direct path for the spread of fire within the cavity through the rear of the OSB (i.e., the cavity within the wall/floor directly against which the FF102-50 product directly abuts should incorporate timber framing at least of the specification as that tested, such that the fire cannot break into the cavity of the timber framed wall and circumnavigate the cavity barrier). Furthermore, the test evidence should demonstrate that the system does not deform or deflect in such a way that it would adversely affect the performance of the cavity barrier.

When the inner wall comprises of a timber frame system with OSB facing, the outer wall (i.e., the wall against which the intumescent strip will react against) shall either be OSB with a minimum thickness of 9mm, directly secured to concrete, or concrete alone. If the OSB is not supported by concrete (as per the tested detail), it is considered that the cavity barrier shall perform for as long as the OSB remains intact, stable and does not deflect or fall away to such a degree that the size of the cavity is altered, or the composition of the board at the location of the cavity barrier is compromised.

#### 4.3.2 Concrete Construction Inner Wall with Hardie® Plank Weatherboard or Hardie® VL Weatherboard or Stone Wool External Wall Slab Outer Wall

When the inner wall is concrete, the outer wall may comprise of Hardie® Plank Weatherboard, or Hardie® VL Weatherboard, for cavities between 25mm and 50mm wide. Hardie® Plank Weatherboard was tested with an overlapping detail resulting in a varying cavity size of up to 8mm greater than the timber batten depth.

For cavities between 15mm and 25mm wide, a stone wool external wall slab of the same type, thickness, and density as that tested, or greater, may be used. These outer walls must be used with the above parameters as these are the only substrates against which it has been proven in the testing detailed in Section 3.

#### 4.3.3 Cement Particleboard Inner Wall

In some specimens, the fixings that supported the FF102-50 passed through the board and engaged into the underlying steel frame system. For other specimens, the fixings were only engaged into the board material. These fixing details did not appear to adversely affect the overall fire performance of the specimens in the quoted fire tests. Where the FF102-50 is installed in conjunction with a proprietary board/steel frame system, (using one of the options defined in Table 1), it is the responsibility of others to ensure that the positioning of the steel frame system coincides with the necessary positions for fixings for the FF102-50, where applicable; and/or that the selected board material is capable of accepting fixings for the FF102-50. <sup>Note 6</sup>

*Note 6 This report does not imply that the tested/assessed details for a particular wall construction should be modified to suit any of the clauses listed herein; and the specifications of the tested wall construction shall already comply with these clauses.*

### 4.4 General Comment – Cavity Barriers

This Engineering Assessment Report evaluates the fire resistance of a cavity barrier as if a 'representative specimen' of the proposed products were installed between two concrete constructions, which do not exhibit any significant degradation or deflection under heating, as was the case with type-testing of the proposed products; and when evaluated against the criteria of the prescribed fire test standard (BS EN 1363-1: 2012 and ASFP TGD19: 2017).

It is the responsibility of others to establish whether the proposed product (and the prescribed test method) meets the requirements for fire spread and life safety, as defined in documents such as the Building Regulations, and the Fire Strategy Strategy/Fire Risk Assessment for the project.

Users of this report are also reminded that performance under the prescribed fire resistance test conditions should not be used as the sole means of determining the potential fire performance of the element in use and whether they reflect the actual behaviour in fires. The above principles apply to all cavity barriers and not just those specific examples proposed herein.

The performance of any cavity barrier is dependent upon the void width and the air gap which are both reliant upon accurate and consistent alignment of the walls forming the cavity. It is the responsibility of others to ensure that construction tolerances do not result in a cavity width and/or air gap that is greater than that prescribed herein. It is also the responsibility of other parties to ensure that the width of the cavity will not vary in service, under all conditions.

## 5. Conclusion

Based upon the offered test evidence, and the analysis above, if a representative sample of the Tenmat FF102-50 Ventilated Cavity Barrier, as described in Section 2 herein, were manufactured and installed in accordance with the requirements of this Field of Application Report, and tested for fire resistance using the furnace conditions of BS EN 1363-1: 2012, (together with additional criteria defined in ASFP Technical Guidance Document 19 (TGD19) (2017)), it is reasonable to expect that the sample would satisfy the integrity and insulation criteria of the standard for the relevant periods defined in Table 3 below.

Since the proposed cavity barrier includes a ‘ventilated air-gap’, the integrity and insulation of the barrier will not be monitored until after the time at which the intumescent material reacts to seal the gap as defined in ASFP TGD19 (2017).

For the sake of clarity, this Engineering Assessment Report, by IFC, only considers the ventilated cavity barriers when installed as a horizontal ventilated cavity barrier; because this is the only arrangement described in ASFP TGD19 (2017).

Maximum Air Gap (mm)	Cavity Width (mm) Including Air Gap	Integrity (minutes)	Insulation (minutes)	Construction of Inner Wall	Construction of Outer Wall	Fixings or L-Bracket Requirement
44	50	120	120	Oriented Strand Board on timber frame	Concrete	Direct screw fix; See Section 4.2
44	50	120 <i>Note 7</i>	120 <i>Note 7</i>	Non-combustible board on steel frame systems or concrete (refer to section 4.3 for further details)	Concrete	
19	25	120	120	Concrete	Hardie® Plank Weather Board	
29	35	120	120	Concrete	Hardie® Plank Weather Board	
29	35	120	120	Concrete	Hardie® VL Plank Weather Board	
44	50	120	120	Concrete	Hardie® VL Plank Weather Board	
9	15	120	120	Cement particleboard on steel frame system	Stone Wool External Wall Slab	
19	25	120	120	Cement particleboard on steel frame system	Stone Wool External Wall Slab	

*Table 3. Scope of Approval for FF102-50*

*Note 7 This has been assessed by IFC on the basis that a combustible Oriented Strand Board on a timber frame has successfully achieved 133 minutes (see test report Warringtonfire WF 514284R in Table 2) so a non-combustible board on a non-combustible steel frame is expected to achieve at least as good a performance under the same conditions.*

## 6. Declaration by the Applicant

Kiwa IFC Engineering Assessment Report	PAR/ 22672/04 Revision A
Client	Tenmat Limited
Address	Ashburton Road West Trafford Park Stretford Manchester M17 1TD
<p>We the undersigned confirm that we have read and complied with the obligations placed on us by the</p>	
<p><b>Passive Fire Protection Forum (PFPF) - Industry Standard Procedure 2021</b>  <b>‘Guide to Undertaking Technical Assessments of Fire Performance of Construction Products Based on Fire Test Evidence’</b></p>	
<ul style="list-style-type: none"> <li>• We confirm that any changes which are subject of this assessment have not to our knowledge been tested to the standard against which this assessment has been made.</li> <li>• We agree to withdraw this assessment from circulation should the component or element of structure, or any of its component parts be the subject of a failed fire resistance test to the standard against which this assessment is being made.</li> <li>• We understand that this assessment is based on test evidence and will be withdrawn should evidence become available that causes the conclusion to be questioned. In that case, we accept that new test evidence may be required.</li> <li>• We are not aware of any information that could affect the conclusions of this assessment. If we subsequently become aware of any such information, we agree to ask the assessing authority to withdraw the assessment.</li> </ul>	
Signature	
Name	
Position	
Company Name	Tenmat Limited
Date	

## 7. Limitations

This report addresses itself solely to the ability of the proposed cavity barrier to satisfy the criteria of the fire resistance test and does not imply any suitability for use with respect to other unspecified criteria.

It is the responsibility of others to establish whether the proposed product meets any other relevant requirements, including any other requirements for fire performance and life safety, as defined in documents such as the Building Regulations, and the Fire Strategy/Risk Assessment for the project.

This document only considers the cavity barriers described, herein, and assumes that the surrounding construction will provide no less restraint than the tested assembly and that it will remain in place and be substantially intact for the full fire resistance period.

This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to International Fire Consultants Ltd (IFC) the assessment will be unconditionally withdrawn and the applicant will be notified in writing. Similarly, the assessment evaluation is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence.

As per the guidance outlined in the Passive Fire Protection Forum (PFPF): *'Guide to Undertaking Technical Assessments of Fire Performance of Construction Products Based on Fire Test Evidence, 2021, Industry Standard Procedure'*, appropriate action has been taken to mitigate the risk of a conflict of interest arising during the preparation of this report. All individuals involved in the production, or subsequent review, of this assessment have declared any perceived conflicts of interest, with regards to the sponsor or subject(s) of this report, prior to working on this project.

The assessor and reviewer have been deemed suitable for involvement in the production of this assessment in accordance with the guidance outlined in the Passive Fire Protection Forum (PFPF): *'Guide to Undertaking Technical Assessments of Fire Performance of Construction Products Based on Fire Test Evidence, 2021, Industry Standard Procedure'*.

Where the constructional information in this report is taken from details provided to International Fire Consultants Ltd (IFC) and/or from fire resistance test reports referenced herein, it is, therefore, limited to the information given in those documents. It is necessarily dependent upon the accuracy and completeness of that information. Where constructional or manufacturing details are not specified, or discussed, herein, it should not, therefore, be taken to infer approval of variation in such details from those tested or otherwise approved.

The analysis and conclusions within this report are based upon the likely fire resisting performance of a cavity barrier that is manufactured and installed in accordance with this document; and offered for fire resistance testing in 'perfect' condition. In practice, management procedures must be in place in any building where the cavity barrier is installed, to ensure that no parts of the cavity barrier, or the adjacent walls, are damaged or faulty.

Any such shortfalls in respect to the condition of the cavity barrier/walls will invalidate the approval by IFC; and may seriously affect the ability of the assemblies to provide the required level of fire resistance performance. Determination of what constitutes wear or damage, and any corrective actions in order to return assemblies to the required condition, should only be carried out following consultation with the manufacturer and IFC.

This report is not intended to be a complete specification for the proposed cavity barrier and it is the responsibility of others to ensure that the products/assemblies are suitable for the intended purpose; whilst incorporating the requirements of this report. Further, the products/assemblies must be manufactured/installed by experienced/trained personnel using appropriate and established working practices/techniques.

The assessed products/installations have not been subject to an on-site audit by International Fire Consultants Ltd. It is the responsibility of anyone using this report to confirm that all aspects of the assemblies fully comply with the descriptions and limitations, herein.

Any materials specified in this report have been selected and judged primarily on their fire performance. IFC do not claim expertise in areas other than fire safety. Whilst observing all possible care in the specification of solutions, we would draw the reader's attention to the fact that during the construction and procurement process, the materials used should be subjected to more general examination regarding the wider Health and Safety, and CoSHH Regulations. Designers, manufacturers and installers are reminded of their responsibilities under the CDM Regulations but particularly with regard to installation and maintenance of heavy or inaccessible items.

The primary test evidence was undertaken to BS EN 1363-1:2012. Whilst this report follows the general guidance for extension of test results, as outlined in EN 15725, this report does not purport to follow the guidance regarding direct or extended application of test results outlined in EN product standards. The approval, herein, shall not be used as supporting evidence for CE marking.

This Report is provided to the sponsor on the basis that it is a professional independent engineering evaluation as to what the fire performance of the construction/system would be should it to be tested to the named standard. It is IFC's experience that such an evaluation is normally acceptable in support of an application for building approvals, certainly throughout the UK and in many parts of Europe and the rest of the world.

However, unless IFC have been commissioned to liaise with the Authorities that have jurisdiction for the building in question for the purpose of obtaining the necessary approvals, IFC cannot assure that the document will satisfy the requirements of the particular building regulations for any building being constructed.

It is, therefore, the responsibility of the sponsor to establish whether this evidence is appropriate for the application for which it is being supplied and IFC cannot take responsibility for any costs incurred as a result of any rejection of the document for reasons outside of our control. Early submittal of the Report to the Authorities will minimise any risks in this respect.

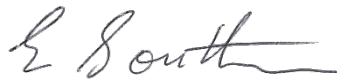
## 8. Validity

This Field of Application Report has been prepared based on International Fire Consultants Ltd's present knowledge of the products described, the stated testing regime and the submitted test evidence.

The assessment is valid initially for a period of five years after which time it is recommended that it be submitted to International Fire Consultants Ltd for re-evaluation. For this reason, anyone using this document after March 2028 should confirm its ongoing validity.

This assessment report is not valid unless it incorporates the declaration, in Section 7, duly signed by the applicant.


Prepared by:

A handwritten signature in black ink, appearing to read "Eric Southern".

**Eric Southern**

BSc (Hons) PhD FInstP FIMMM  
Principal Fire Safety Engineer  
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Reviewed by:

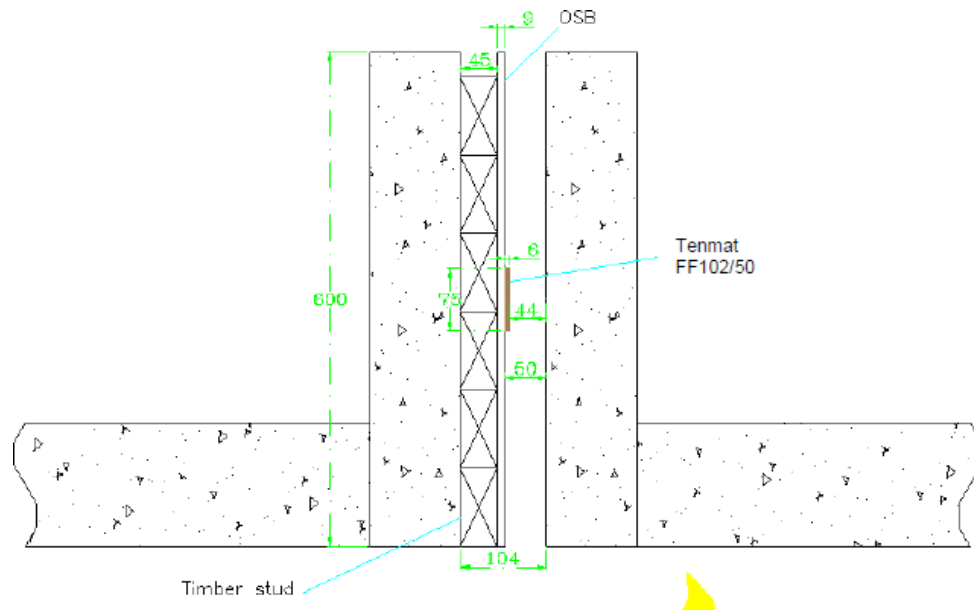
A handwritten signature in black ink, appearing to read "David Cooper".

**David Cooper**

BEng (Hons) AIMMM AIFireE ACABE  
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## Appendix A



*Figure 1 – Typical installation of Tenmat FF102-50 cavity barrier  
(Drawing taken from Warringtonfire report WF 376150A)*