

**PROTECTING PEOPLE
AND PLACES FOR**



A brief historical review of double exposure for internal loadbearing walls

Vasilis Koutsomarkos

Fire Engineer – Technical Policy Advisor

Technical Policy Team

Building Safety Regulator, Health and Safety Executive

Structures in Fire Forum

7th April 2025

Edinburgh

What the team does

Maintain and update the statutory guidance to the Building Regulations

Generate evidence to support policy

Engage with the sector and other government departments

Conduct appeals and determinations



STATUTORY INSTRUMENTS

2010 No. 2214

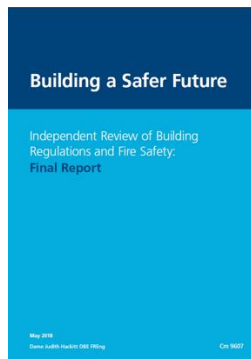
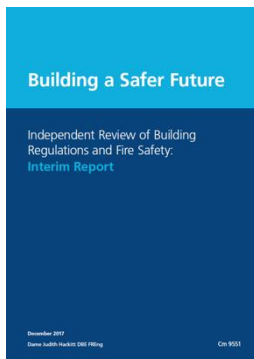
**BUILDING AND BUILDINGS,
ENGLAND AND WALES**

The Building Regulations 2010

Technical review of Approved Document B - 2018

Call for evidence description

This call for evidence seeks views on the future technical guidance contained within Approved Document B (fire safety). It will be used to set the agenda, terms of reference and programme for the review and to identify what research may be needed to inform the review. The proposal is in line with the Secretary of State's commitment to conducting a full-scale review of the guidelines commencing in the Autumn.



Latest updates to ADB

ONLINE VERSION
HM Government

The Building Regulations 2010

Fire safety **B**

APPROVED DOCUMENT

Volume 1: Dwellings
Requirement B1: Means of warning and escape
Requirement B2: Internal fire spread (linings)
Requirement B3: Internal fire spread (structure)
Requirement B4: External fire spread
Requirement B5: Access and facilities for the fire service
Regulations: 6(3), 7(2) and 38

2019 edition – for use in England
ONLINE VERSION

ONLINE VERSION
HM Government

The Building Regulations 2010

Fire safety **B**

APPROVED DOCUMENT

Volume 2: Buildings other than dwellings
Requirement B1: Means of warning and escape
Requirement B2: Internal fire spread (linings)
Requirement B3: Internal fire spread (structure)
Requirement B4: External fire spread
Requirement B5: Access and facilities for the fire service
Regulations: 4(3), 7(2) and 38

2019 edition incorporating 2020 amendments – for use in England

ONLINE VERSION
HM Government

The Building Regulations 2010

Fire safety **B**

APPROVED DOCUMENT

Volume 2: Buildings other than dwellings
Requirement B1: Means of warning and escape
Requirement B2: Internal fire spread (linings)
Requirement B3: Internal fire spread (structure)
Requirement B4: External fire spread
Requirement B5: Access and facilities for the fire service
Regulations: 4(3), 7(2) and 38

2019 edition incorporating 2020 and 2022 amendments – for use in England



STRUCTURES IN FIRE FORUM

ONLINE VERSION
HM Government

The Building Regulations 2010

Fire safety **B**

APPROVED DOCUMENT

Volume 1: Dwellings
Requirement B1: Means of warning and escape
Requirement B2: Internal fire spread (linings)
Requirement B3: Internal fire spread (structure)
Requirement B4: External fire spread
Requirement B5: Access and facilities for the fire service
Regulations: 6(3), 7(2) and 38

Also includes: 2025 amendments 2026 amendments 2029 amendments

2019 edition incorporating 2020 and 2022 amendments and forthcoming 2025, 2026 and 2029 changes – for use in England

2019 Edition

2020 Amendments

2022 Amendments

2025 Amendments

2026 Amendments

2029 Amendments

2 March 2025

30 September 2026

2 September 2029

CROSS report 1116

CROSS Safety Report

Fire protection to light gauge steel frame walls

Report ID: 1116 Published: 21 June 2022 Region: CROSS-UK

▶ [This report is over 2 years old](#)

Overview

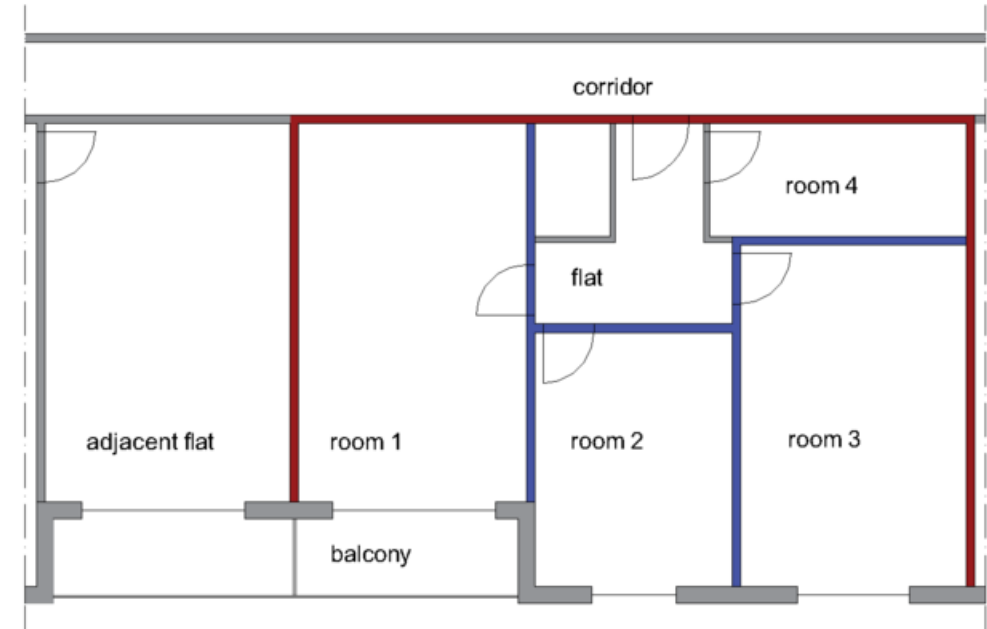
A disagreement between fire engineers and manufacturers on testing for the loadbearing performance of light gauge steel frame walls in case of fire has been reported.

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Table B1 Specific provisions of the test for fire resistance of elements of structure, etc.

Part of building	Minimum provisions when tested and classified to the relevant European standard (minutes) ⁽¹⁾ or assessed following the recommendations of paragraphs B1 to B5 (minutes) ⁽²⁾			Type of exposure
	Loadbearing capacity ⁽³⁾	Integrity	Insulation	
1. Structural frame, beam or column.	See Table B2	Not applicable	Not applicable	Exposed faces
2. Loadbearing wall (for a wall which is also described in any of the following items, the more onerous guidance should be applied).	See Table B2	Not applicable	Not applicable	Each side separately
3. Floors⁽⁴⁾				
a. between a shop and flat above	60 min or see Table B2 (whichever is greater)	60 min or see Table B2 (whichever is greater)	60 min or see Table B2 (whichever is greater)	From underside ⁽⁵⁾



Red line: Light Gauge Steel (LGS) frame would be exposed to fire on one side only - test evidence for these separating walls evidences fire resistance performance with exposure to fire from one side only

Blue line: Light Gauge Steel (LGS) frame would be exposed to fire on more than one side simultaneously. No testing of LGS appears to have been undertaken with exposure to fire from more than one side - fire resistance performance not evidenced.

Technical standards

BS EN 13501-2:2023

7.1.2.2 Exposure conditions

For separating elements that are required to be fire resisting from both sides, two specimens shall be tested (one for each direction) unless the separating element is fully symmetrical.

In such cases the fire resistance classification shall be based on the fire exposure from the side demonstrated as giving the lower fire resistance time.

Asymmetrical fire separating elements may be tested from one side only:

- a) if the weakest side can be assumed;
- b) where a classification for fire attack from one side only is envisaged.

If a fire separating element is tested from the assumed weakest side only, the assumption shall be based on laboratory experience and the relevant analysis shall be fully documented in the classification report.

If an asymmetrical element is classified for one side only, the classification report shall mention this explicitly.

Beams may be tested with a three- or four-sided exposure dependent upon the envisaged application.

Loadbearing walls may be tested with both sides exposed for some applications.

7.2.2 Classification of loadbearing walls without separating function

7.2.2.1 Test method and field of application rules

Loadbearing walls without a separating function shall be tested as columns by the method given in EN 1365-4. Extended application shall be carried out as described in EN 15080-12 and in EN 15725.

Technical standards

BRITISH STANDARD

Fire tests on building materials and structures —

Part 21: Methods for determination of the fire resistance of loadbearing elements of construction

**BS 476-21:
1987**

*Incorporating
Corrigendum No. 1*

A.6 Walls

A.6.1 *General*

Some walls, used in practice, act as wide columns which are not designed to provide fire separation, but are required for their loadbearing capacity. In such cases the methods specified in clause 8 may be used but normally the criteria for integrity and thermal insulation are not required. Owing to modern building design, situations can develop in a building, due to open plan design or the provision of doors that are not inherently fire resisting, where a wall that acts as a wide column can be exposed either partially or fully to fire on both faces simultaneously. Very few facilities are capable of exposing a realistic length of walling to fire exposure on both faces simultaneously. However, where the facility does exist, the basic methodology used in evaluating the single face exposure is appropriate for such situations.

Other researchers

STRUCTURAL DESIGN FOR FIRE SAFETY

224

Structural Design for Fire Safety

Second Edition

Andrew H. Buchanan & Anthony K. Abu
University of Canterbury, New Zealand

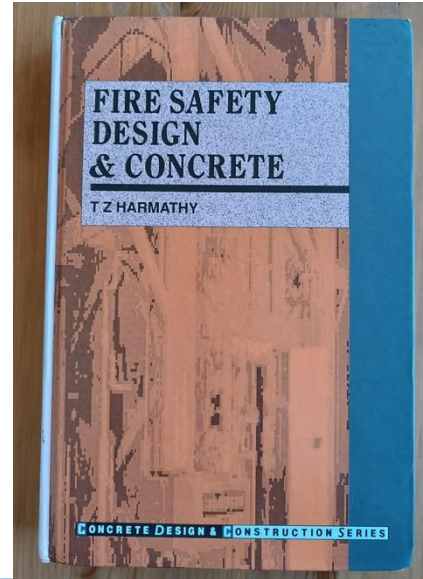
calculation methods given for columns. A difference is that columns are most often designed for fire exposure on all sides, but most walls are exposed to fire on only one side. In rare cases they may be exposed to fire on both sides.

Structural Fire Engineering of Building Assemblies and Frames **52**

Jean-Marc Franssen and Nestor Iwankiw

A wall that has a load-bearing function must support the applied load during the prescribed fire duration. In most situations, such a wall has also a separating function and is tested as exposed to the fire on one side only. It may yet occur that a load-bearing wall is subjected to the fire on both sides. This could be the case, for

Harmathy



12.5 Performance Requirements for Key Elements

There is one area, however, where some extra margin of safety is fully justified. As emphasized earlier in this chapter, it is imperative that all the key elements of a building be designed to remain structurally sound even if, owing to fire spread, they become exposed to fire from more than one direction.

Figure 12.11 illustrates situations that may arise in spreading fires (Harmathy 1977/1978). At a time $t = 0$, a fairly severe fire (characterized by a normalized heat load of $5.6 \times 10^4 \text{ s}^{1/2} \text{ K}$) develops in Compartment I, lying on Side I of a reinforced concrete slab 152.4 mm thick. The fire, spreading by convection, may reach Compartment II, lying on Side II of the slab, right at the start, i.e.

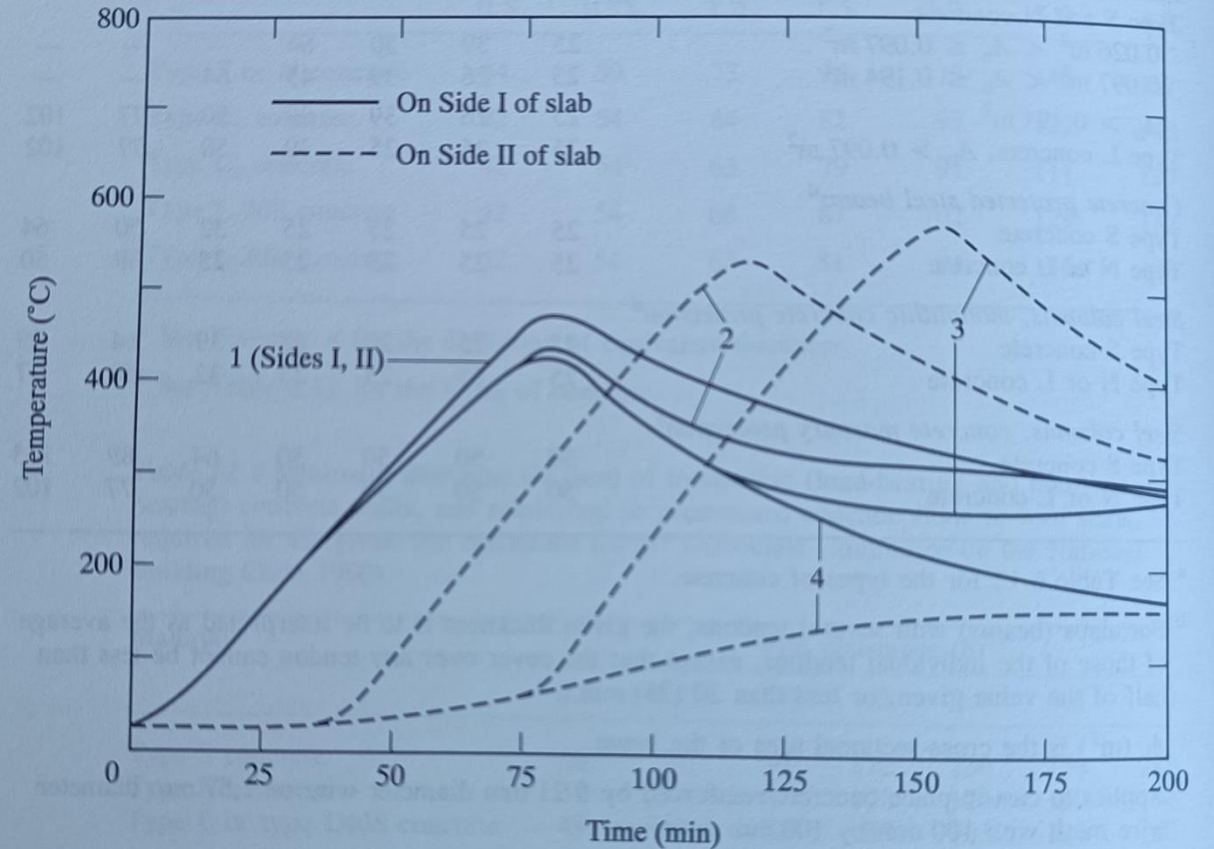


Fig. 12.11 Temperature of steel bars on the two sides of a reinforced concrete slab in spreading fires. Curves: 1, simultaneous exposure of two sides; 2, exposure of Side II delayed by 37.5 min; 3, exposure of Side II delayed by 75 min; 4, exposure of Side II delayed indefinitely (Harmathy 1977/1978)

Regulations and guidance

TH 242 G7 DEP



Department of the Environment
and
The Welsh Office

ODPM-DFT
Library & Information Centre
Ashdown House
2/124 AHV
123 Victoria Street
London SW1E 6DE
020 7944 3039 (GTN 3533)

The Building Regulations 1965

Fire

B

APPROVED DOCUMENT

B2/3/4 Fire spread

BASEMENT

Her Majesty's Stationery Office
1985

3396

STATUTORY INSTRUMENTS

1985 No. 1065

BUILDING AND BUILDINGS

The Building Regulations 1985

Made - - - - 11th July 1985
Laid before Parliament 17th July 1985
Coming into Operation 11th November 1985

ARRANGEMENT OF REGULATIONS

PART I: GENERAL

1. Title, commencement and application.
2. Interpretation.

PART II: CONTROL OF BUILDING WORK

3. Meaning of building work.
4. Requirements relating to building work.
5. Meaning of material change of use.
6. Requirements relating to material change of use.
7. Materials and workmanship.
8. Limitation on requirements.
9. Exempt buildings and work.

PART III: RELAXATION OF REQUIREMENTS

10. Power to dispense with or relax requirements.

PART IV: NOTICES AND PLANS

11. Giving of a building notice or deposit of plans.
12. Particulars and plans where a building notice is given.
13. Full plans.
14. Notice of commencement and completion of certain stages of work.

PART V: MISCELLANEOUS

15. Testing of drains and private sewers.
16. Sampling of material.
17. Supervision of building work otherwise than by local authorities.
18. Repeals.
19. Revocations.
20. Transitional provisions.

SCHEDULES:

- SCHEDULE 1 — REQUIREMENTS.
SCHEDULE 2 — FACILITIES FOR DISABLED PEOPLE.
SCHEDULE 3 — EXEMPT BUILDINGS AND WORK.
SCHEDULE 4 — REVOCATIONS.

STATUTORY INSTRUMENTS

1965 No. 1373

BUILDING AND BUILDINGS

The Building Regulations 1965

Made - - - - 6th July 1965
Laid before Parliament 22nd July 1965
Coming into Operation 1st February 1966



LONDON
HER MAJESTY'S STATIONERY OFFICE
1965

Further reports



MINISTRY OF HEALTH

CONSTRUCTION OF FLATS FOR THE WORKING CLASSES

FINAL REPORT OF DEPARTMENTAL COMMITTEE

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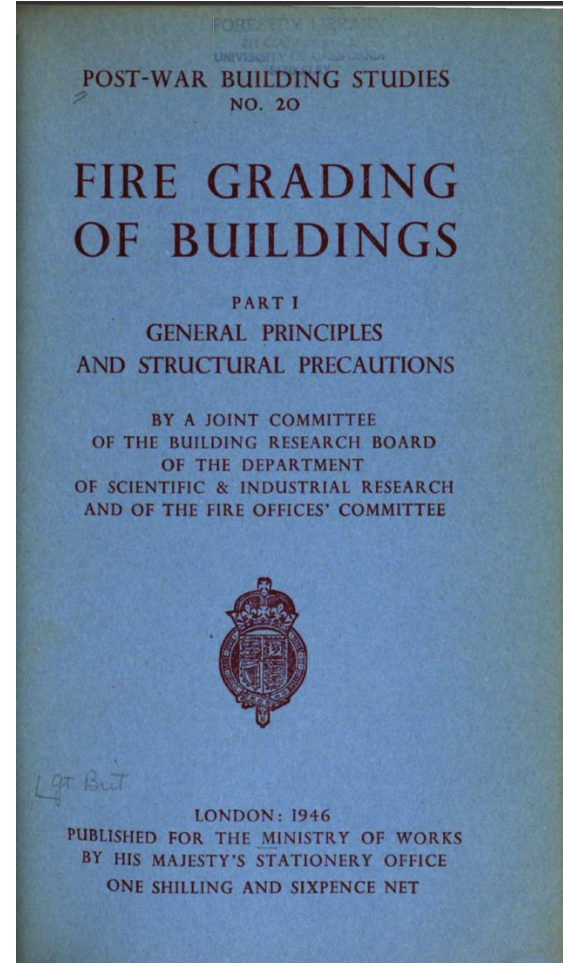
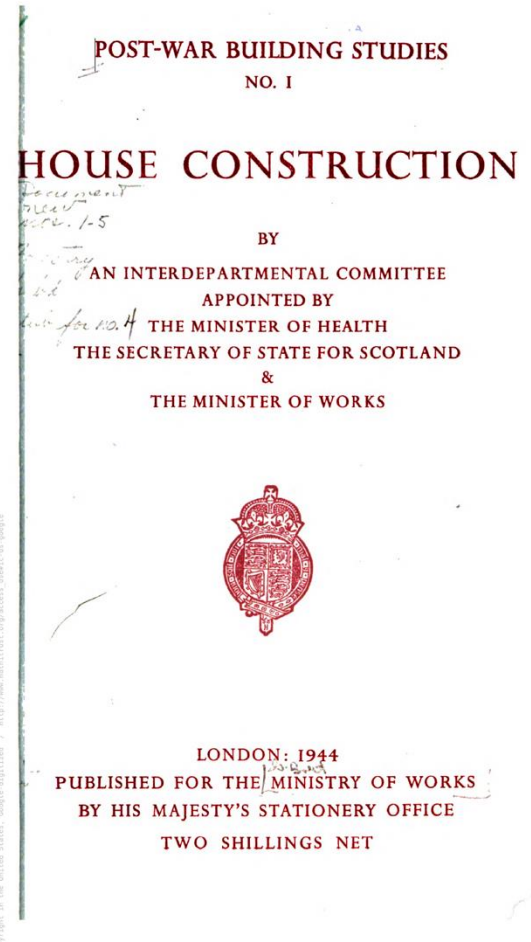
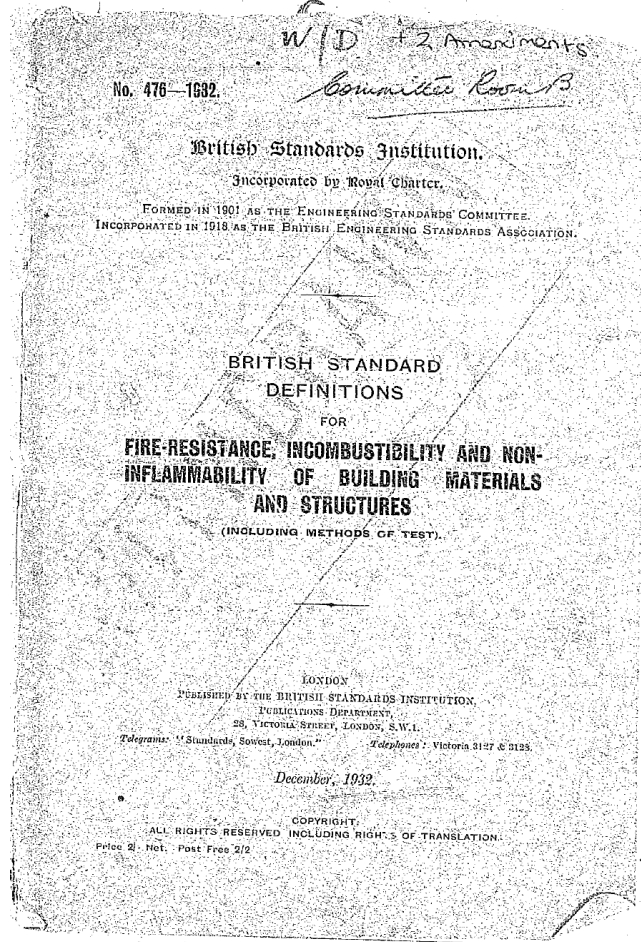
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1937
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August, 1937



GHA.1/1.

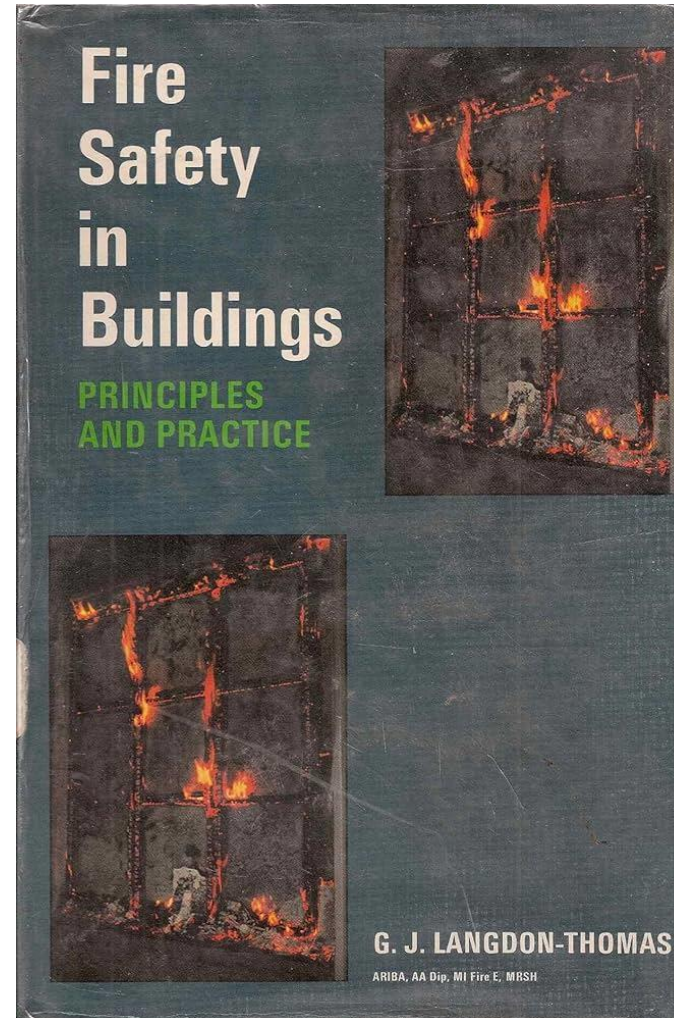


Analysis and thinking

Ministry of Housing and Local Government

**Homes
for today
& tomorrow**

LONDON: HER MAJESTY'S STATIONERY OFFICE, 1961



“If the element is loadbearing and can be attacked by fire from more than one side, it should strictly speaking be considered a column. In practice it is doubtful if this definition can, and for that matter should, be applied rigidly except in those circumstances where the stability of the building or compartment may be in doubt.”

Tudor Walters report

1919 Homes fit for heroes



J. Tudor Walters

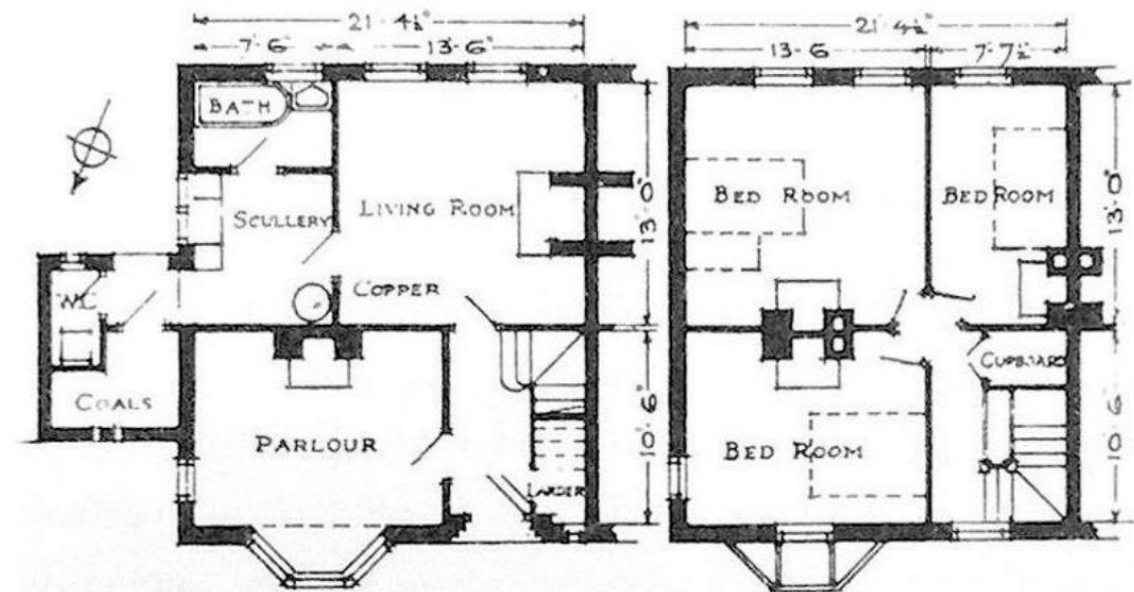
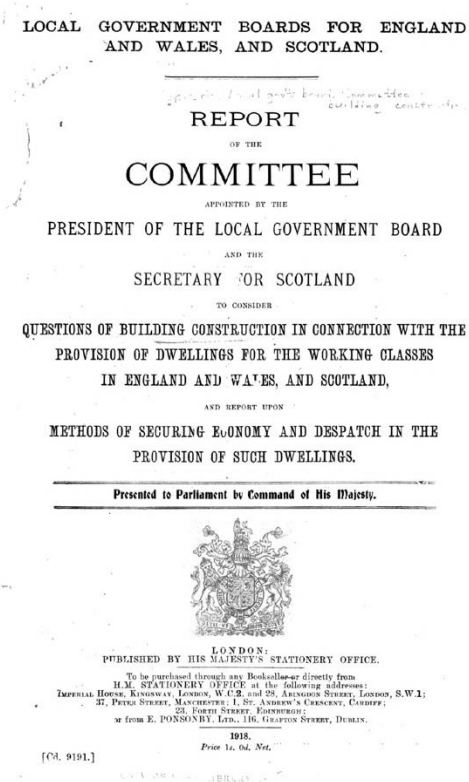


Figure 3: Tudor Walters type "C"

Frequently Asked Questions

Guidance

Approved Document B: Fire safety - frequently asked questions

Answers to frequently asked questions on Approved Document B including 2020 and 2022 amendments.

From: [Ministry of Housing, Communities and Local Government, Health and Safety Executive](#) and [Department for Levelling Up, Housing and Communities](#)

Published 23 August 2022

Last updated 21 February 2025 — [See all updates](#)

Published 23 August 2022

Last updated 21 February 2025 - [hide all updates](#)

21 February 2025

Added new FAQs section 'Requirement B2: Internal fire spread (linings)'.

14 March 2024

Four new FAQs have been added to provide more info on; relevance of exposure types in Table B3, use and selection of guidance for building elements in Table B3, clarification of guidance related to 9mm timber for external surfaces of walls and reminders about the scope and application of reaction to fire test results

23 August 2022

First published.

Frequently Asked Questions

15. Are the exposure conditions recommended in Table B3 applicable to all situations?

Table B3 in Approved Document B sets out the type of exposure relevant for parts of buildings in common situations. This includes the structural frame, internal walls, external walls and floors. Cases may arise where parts of buildings, for example internal floors within multi-level flats, load-bearing walls internal to a flat, or parts of external load-bearing walls above openings, may be subject to fire exposures, through the course of a fire event, that would not normally be covered in single sided exposures in standard fire resistance testing.

16. My building element could be described by several of the items in Table B3. Which one should I apply?

Some elements of a building may be considered as one or more of the parts listed in Table B3, for example an external wall may also be a load-bearing wall. When considering provisions for a building part, designers should apply the most credible individual provisions for R, E, I and type of exposure. Designers should consider the function(s) of their particular building element and the relevance of the guidance, understanding the intent of the provisions, ensuring that the overall relevant functional requirements will be met.

Table B1 Specific provisions of the test for fire resistance of elements of structure, etc.

Part of building	Minimum provisions when tested and classified to the relevant European standard (minutes) ⁽¹⁾ or assessed following the recommendations of paragraphs B1 to B5 (minutes) ⁽²⁾			Type of exposure
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a. between a shop and flat above	60 min or see Table B2 (whichever is greater)	60 min or see Table B2 (whichever is greater)	60 min or see Table B2 (whichever is greater)	From underside ⁽⁵⁾

Additional guidance

- 6.3 If a loadbearing wall is any of the following, guidance in other sections may also apply.
- A **compartment wall** (including a wall common to two **buildings**): Section 7.
 - Enclosing a **place of special fire hazard**: Section 7.
 - Protecting a **means of escape**: Sections 2 and 3.
 - An **external wall**: Sections 10 and 11.
 - Enclosing a **firefighting shaft**: Section 15.

Grenfell Tower Inquiry

Grenfell Tower Inquiry



Ministry of Housing,
Communities &
Local Government



Cabinet Office



Home Office

GRENFELL TOWER INQUIRY: PHASE 2 REPORT OVERVIEW

REPORT of the PUBLIC INQUIRY into the
FIRE at GRENFELL TOWER
on 14 JUNE 2017

The Panel:

Chairman: The Rt Hon Sir Martin Moore-Bick
Ali Akbar OBE
Thouria Istephan

September 2024

Policy paper

Grenfell Tower Inquiry Phase 2 Report: Government response (HTML)

Published 26 February 2025

Contents

Foreword from the Deputy
Prime Minister

Executive summary

The government's response to
the Inquiry's Phase 2 report

Presented to Parliament by the Deputy Prime Minister and Secretary of State for
Housing, Communities and Local Government

by Command of His Majesty

26 February 2025

Next steps

Recommendation 5

That the statutory guidance generally, and Approved Document B in particular, be reviewed accordingly and **a revised version published as soon as possible.** (113.11)

The government accepts this recommendation.

The Building Safety Regulator is undertaking a review of how statutory guidance, currently offered in the form of Approved Documents, might best be structured, updated and presented in order to provide accurate, up to date and coherent guidance to support designers in demonstrating compliance with the building regulations. Interim findings will be published by summer 2025 and a full list of recommendations will be published in 2026.

The guidance in Approved Document B has been updated several times since 2017 to make it clearer and to improve fire safety standards. **The government has committed to keep Approved Document B under continuous review, and the Building Safety Regulator will consult on further changes in autumn 2025.**

Other ongoing workstreams

Closed consultation

The Future Homes and Buildings Standards: 2023 consultation

Updated 4 March 2024

Fundamental Review of Building Regulations Guidance



Fundamental Review of Building Regulations Guidance

The Deputy Prime Minister has asked the Building Safety Regulator to undertake a fundamental review of how building regulations guidance is produced, updated, and communicated to the construction industry.

Construction Products Reform Green Paper – 2025

Consultation summary

Topic of this consultation

This consultation seeks views on a package of proposals for reform of the construction products regime.

Body/bodies responsible for the consultation

The Ministry of Housing, Communities and Local Government (MHCLG)

Scope of this consultation

This consultation sets out proposals for reform of the construction products regime. It does not represent settled government policy.

Out of scope are responsibilities associated with the use or running of buildings or infrastructure.

Duration

This consultation will last for 12 weeks from 26 February 2025 until 21 May 2025.

Review of Approved Document A: Structure - call for evidence

Overview

Closes 21 Apr 2025

Opened 10 Feb 2025

Scope of the call for evidence

Topic of this consultation:

This call for evidence seeks views on the future guidance contained within [Approved Document A](#) (Structure).

Contact

ADAcallforevidence@hse.gov.uk

Scope of this consultation:

Statutory Guidance.



Policy paper

Grenfell Tower Inquiry Phase 2 Report: Government response (HTML)

Published 26 February 2025

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[Foreword from the Deputy Prime Minister](#)

[Executive summary](#)

[The government's response to the Inquiry's Phase 2 report](#)

Presented to Parliament by the Deputy Prime Minister and Secretary of State for Housing, Communities and Local Government

by Command of His Majesty

26 February 2025

Thank you for your time

Contact: [gov.uk/guidance/contact-the-building-safety-regulator](https://www.gov.uk/guidance/contact-the-building-safety-regulator)

Series of updates

2018	Assessments in lieu of tests	Combustibles ban	Clarification	Call for Evidence
2019	Sprinklers in blocks of flats, Wayfinding signage for the fire service	GTI Phase 1		
2020		Gov response to GTI		
2021	Evacuation alert systems, secure information boxes, further clarifications	Review of the combustibles ban	Sprinklers in care homes, removal of national classes, and staircases in residential buildings	
2022				
2023				
2024	Continuous review of Approved Document B	GTI Phase 2		
2025		Gov response to GTI		

Updated SCI guidance

FIRE RESISTANCE OF LIGHT STEEL FRAMING



DESIGN OF LOADBEARING LIGHT STEEL WALLS EXPOSED TO FIRE ON TWO SIDES

SUPPLEMENT TO P424

