

# BDM02 Fire protection of buildings – Core Document – Compartmentation and Sprinkler Rules

Revision 2 – August 2022

## REVISION NOTES

In 2022 the *LPC Design Guide for fire protection of buildings* published in 1999 was phased out as the update of *BDM01 Fire protection of buildings - Essential principles Version 2* published in 2015 was replaced with an A to Z of Essential Principles that better relate to the RIBA Plan of Work 2020.

<https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work>

The RISC Authority series of Building Design Management (BDM) guidance was

to be further updated and consolidated in 2022. In that process *BDM02 Fire protection of buildings - Core Document - Compartmentation*, first published 2008, was updated to align the fire resistance of compartmentation with the expectations in the *LPC Rules for Automatic Sprinkler Installations 2015 incorporating BS EN 12845:2015+A1:2019 Fixed firefighting systems. Automatic sprinkler systems. Design, installation and maintenance*. The LPC Sprinkler Rules include Technical Bulletin

TB206: 2020 Rev 1 *Passive fire protection of sprinklered buildings*, which replaces BS EN 12845:2015+A1:2019 clauses 5.1, 5.2 and 5.3. TB 206 Tables T1 and T2 provide the two Insurer supported options for property protection.

<https://www.riscauthority.co.uk/member-download/39>

This update of BDM02 therefore supports the update of BDM01 A to Z Essential Principles and remains a Core Document in the BDM series.

## IMPORTANT NOTICE

This document has been developed through RISC Authority and published by the Fire Protection Association (FPA). RISC Authority membership comprises a group of UK Insurers that actively support a number of focused and expert working groups developing and promulgating best practice for the protection of people, property, business and the environment from loss due to fire and other risks. The technical expertise for this document has been provided by the Technical Directorate of the FPA, external consultants, and experts from the insurance industry who together form the various RISC Authority Working Groups.

Although produced with insurer input it does not (and is not intended to) represent a pan-insurer perspective. Individual insurance companies will have their own requirements which may be different from or not reflected in the content of this document.

FPA has made extensive efforts to check the accuracy of the information and advice contained in this document and it is believed to be accurate at the time of printing. However, FPA makes no guarantee, representation or warranty (express or implied) as to the accuracy or completeness of any information or advice contained in this document. All advice and recommendations are presented in good faith on the basis of information, knowledge and technology as at the date of publication of this document.

Without prejudice to the generality of the foregoing, FPA makes no guarantee, representation or warranty (express or implied) that this document considers all systems, equipment and procedures or state-of-the-art technologies current at the date of this document.

Use of, or reliance upon, this document, or any part of its content, is voluntary and is at the

user's own risk. Anyone considering using or implementing any recommendation or advice within this document should rely on his or her own personal judgement or, as appropriate, seek the advice of a competent professional and rely on that professional's advice. Nothing in this document replaces or excludes (nor is intended to replace or exclude), entirely or in part, mandatory and/or legal requirements howsoever arising (including without prejudice to the generality of the foregoing any such requirements for maintaining health and safety in the workplace).

Except to the extent that it is unlawful to exclude any liability, FPA accepts no liability whatsoever for any direct, indirect or consequential loss or damage arising in any way from the publication of this document or any part of it, or any use of, or reliance placed on, the content of this document or any part of it.

# Contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
1.1	Objectives	2
1.2	Limitations	4
1.3	Fire engineering	5
<b>2</b>	<b>Scope</b>	<b>7</b>
<b>3</b>	<b>Depicting passive fire protection measures</b>	<b>10</b>
3.1	Primary structure	10
3.2	Roofs	12
3.3	Compartment walls	13
3.4	External walls	13
3.5	Compartment floors	14
<b>4</b>	<b>Insurer recognised automatic sprinkler installations</b>	<b>15</b>
<b>5</b>	<b>Purpose Group Tables relating to the LPC Sprinkler Rules</b>	<b>17</b>
	BDM02 Table 1 Residential Dwellings	18
	BDM02 Table 2 Residential other than Dwellings	19
	BDM02 Table 3 Office	20
	BDM02 Table 4 Shop, Commercial and Large Retail	21
	BDM02 Table 5 Assembly and Recreation	22
	BDM02 Table 6 Industrial	23
	BDM02 Table 7 Storage and Car Parking	24
	Notes to Table	25

# 1 Introduction

Legal provisions for fire protection are intended to assure a minimum level of life safety protection. This remit extends only to the point of successful evacuation of the building, and it is on this “evacuation-based” timescale that the performance of methods, products, and systems are tested as being fit for purpose.

Sprinkler (and watermist) systems therefore designed and installed to life safety standards can have little or no relevance to stakeholders with interest in additionally assuring the recoverability of the building and the activities conducted within it, such as the building owner or operator and their insurer.

*LPC Rules for Automatic Sprinkler Installations 2015 incorporating BS EN 12845:2015+A1:2019 Fixed firefighting systems.*

*Automatic sprinkler systems. Design, installation and maintenance* provides the two Insurer supported options for augmenting BS EN 12845:2015+A1:2019 for property protection

<https://www.thefpa.co.uk/shop/lpc-sprinkler-rules>

The LPC Sprinkler Rules have been specifically designed for the protection of property. In the context of this document compartments fitted with life safety suppression systems are treated as “unsprinklered” and no extension of compartment size or relaxation of fire resistance in floors and walls can be warranted.

Other property protection focused sprinkler installation rule sets such as those produced by Factory Mutual (FM) and National Fire Protection Association (NFPA) might be considered equivalent to the LPC Sprinkler Rules, but this would need to be confirmed with the building Insurer.

RISCAuthority is supported by a significant group of insurance companies through a series of expert working groups furthering best practice for the protection of property and business from loss due to fire and other risks.

The technical expertise for RISCAuthority BDM02 *Fire protection of buildings – Core Document – Compartmentation and Sprinkler Rules* Revision 2 – 2022 is provided by the FPA and by insurance industry representatives, and in particular the membership of the RISCAuthority Passive Working Group and Sprinkler Work Group.

## 1.1 Objectives

The Building Act 1984 instructs legislation in national Building Regulations to ensure a reasonable standard of life safety is provided in the event of fire. For England and Wales it is the Building Regulations 2010, for Scotland it is the Building (Scotland) Regulations 2004, and for Northern Ireland it is the Building Regulations (Northern Ireland) 2012 that apply.

The Building (Amendment) Regulations 2018 and the Building etc. (Amendment)(England) Regulations 2022 were enacted as legislation in England in response to the Grenfell Tower fire on 14 June 2017. This additional legislation amended the law of Regulation 7 of the Building Regulations 2010 to prescribe the combustibility of specific parts of the external wall in designated “Relevant Buildings” with a Storey over 18m above ground. Neither the 2018 nor the 2022 amendments to the 2010 iteration of Regulation 7 addressed fire resistance in compartmentation. Similar amendments were being made in the other devolved administrations in 2022 at the time of publication.

The national Building Regulations in the devolved administrations are then articulated in statutory guidance as a non-mandatory but practical way of complying with the legal requirements for common building situations. The statutory guidance for the devolved administrations is available here:

- England – Approved Documents  
<https://www.gov.uk/government/collections/approved-documents>
- Scotland – Technical Handbooks  
<https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/>
- Wales – Approved Documents  
<https://gov.wales/building-regulations-approved-documents>
- Northern Ireland – Technical Booklets  
<https://www.finance-ni.gov.uk/articles/building-regulations-technical-booklets>

This document refers only to Table 0.1 Classification of Purpose Groups in the English statutory guidance of Approved Document Part B (ADB). The objective of relating English Purpose Groups to the differentiated Scottish, Welsh and Northern Irish treatment of compartmentation and sprinklers will follow in a subsequent Revision of BDM02 *Fire protection of buildings – Core Document – Compartmentation and Sprinkler Rules*.

BDM02 Compartmentation and Sprinkler Rules Revision 2 – 2022 has been produced as a core document for reference in Volumes 1 and 2 of the Insurer ADB 2022, being prepared following the Amendments to the Approved Documents. The English Purpose Groups were maintained in 2022, but clarification of scope was provided for 2(a) Residential (Institutional) buildings.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1080214/ADB\\_amendment\\_booklet\\_June\\_2022.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1080214/ADB_amendment_booklet_June_2022.pdf)

References are made within the ADB statutory guidance to dedicated guidance for particular occupancies within Purpose Groups published by other government departments. Such as the range of healthcare buildings in 2(a) Residential (Institutional), or educational buildings, which being Purpose Group 5 Assembly and Recreation buildings may also include Purpose Group 3 Office occupancies and possibly 2(a) Residential (Institutional) occupancies. There are many cases where a complex building has a mix of occupancies or uses. Judgement is required to arrange these according to compartmentation and sprinkler protection.

Mixed use buildings shall be addressed as a complex of Purpose Groups to achieve the minimal legal objective of a reasonable standard of life safety as Section 1 of the Building Act 1984, which informs Regulation 8 of the Building Regulations 2010.

Whether complex or common building situations, further property protection requires enhanced compartmentation than is provided for life safety in statutory guidance, and Insurers value commitment to the sprinkler installations that follow the LPC Sprinkler Rules.

There is no definition of the common building situations referred to in statutory guidance, and construction innovation may be expected to outpace the periodic updating of statutory guidance. But in all cases compliance with statutory guidance is expected to ensure a reasonable standard of life safety is provided in the event of fire. The significance of public disclosures through the Grenfell Tower Inquiry is that compliance with the statutory guidance may fail to ensure a reasonable standard of life safety required in law, and the requirements of the Building Regulations may be insufficient for their legal objective.

The legislation explicitly limits fire safety to a standard of life safety in the event of fire as a matter of public policy. Other aspects of the devolved Building Regulations have policy objectives that go beyond life safety. But not fire safety. Consequently the RISC Authority series of Building Design Management (BDM) guidance recognised that the protection of property, including the building itself and the resilience of businesses, requires additional fire safety measures.

It is the objective of RISC Authority guidance to describe aspects of fire safety in buildings which will both reduce the risk of fire and make them better able to cope with the effect of fire in the event it should break out. The aims are to:

- reduce the likelihood of fire, either accidental or malicious;
- minimise the spread of fire and smoke;
- minimise the effect of fire and the consequential loss;
- protect the buildings owned and operated as an asset;
- maintain the health and safety of those in and around the building (including firefighters); and
- protect the environment from the consequences of fire and firefighting.

These aims are substantially achieved by fulfilling the essential principles recommended by RISC Authority in the design, construction and management of commercial and industrial premises. This BDM02 Compartmentation and Sprinkler Rules guidance is a core document extensively referred to in the Insurer ADB 2022 which relates to BDM01 A to Z Essential Principles. Publishing BDM02 separately avoids repetition across other documents.

## 1.2 Limitations

BDM01 A to Z Essential Principles are not directly intended to deliver life safety. For life safety appropriate advice should be obtained from the Building Control Authority (BCA) and reference made to parts of statutory guidance approved for understanding the national Building Regulations.

Reference shall also be made to legislation for the fire safety management of buildings. Notably the Regulatory Reform (Fire Safety) Order 2005 augmented by the Fire Safety Act 2021 and the Building Safety Act 2022, the requirements of which depend upon full disclosure in the exchange of fire safety information. At the time of publication the Building Safety Act 2022 for England had progressed through the Houses of Parliament, achieving Royal Assent on 28 April 2022. Some provisions have commenced while others require secondary legislation in the following two years. Other legislation for the devolved administrations will follow.

<https://www.legislation.gov.uk/uksi/2005/1541/contents>

<https://www.legislation.gov.uk/ukpga/2021/24/contents>

<https://www.legislation.gov.uk/ukpga/2022/30/contents/enacted>

The legislative aim is the creation of a new fire safety regime for buildings in all devolved administrations. This hoped for legislative transformation in the strategic development, contracted collation and exchange of fire safety information will inform updates to RISC Authority essential principles and core documents.

In England the Regulatory Reform (Fire Safety) Order 2005 and the Fire Safety Act 2021 depend upon enforcement of Regulation 38 of the Building Regulations 2010. Both Volumes of the Approved Document Part B Fire Safety (ADB)(2019 as amended 2020) as statutory guidance in England have sought to articulate the content of a Regulation 38 fire safety information exchange. However this disclosure is often insufficient for Insurers, and often not provided in practice. Insufficient disclosure is a concern in the construction industry. RISC Authority is currently developing Insurer guidance on Regulation 38 fire safety information exchange.

<https://www.legislation.gov.uk/ukxi/2010/2214/contents>

<https://www.gov.uk/government/publications/fire-safety-approved-document-b>

Regulation 38 fire safety information exchange shall necessarily relate to Purpose Groups in Table 0.1 in both Volumes of ADB (2019 as amended 2020) as the statutory guidance in England to the 2010 Building Regulations. Tables developed in BDM02 Compartmentation and Sprinkler Rules Revision 2 – 2022 are based on the Purpose Groups in England. The Scottish, Welsh and Northern Irish approaches will be addressed in a subsequent Revision of BDM02.

Anticipated changes affecting the LPC Sprinkler Rules, which will require an update of this document, are addressed in BDM02 Section 4 Insurer recognised automatic sprinkler installations. Not all sprinkler systems recognised in statutory guidance are valued by Insurers for property protection.

The importance of the interface with openings for fire door and shutter assemblies, building service and other penetrations are addressed. But these subjects were dealt with more fully in the core document BDM06 *Fire protection of buildings – Core Document – Protection of openings and service penetrations from fire*. Much of that BDM06 document will in future be subsumed into the updated BDM01 A to Z Essential Principles.

<https://www.riscauthority.co.uk/public-resources/documents/resource/bdm06-fire-protection-of-buildings-core-document-protection-of-openings-and-service-penetrations-from-fire-278>

### 1.3 Fire engineering

All devolved national administrations recognise fire engineering as an alternative to following the statutory guidance in pursuit of the standard of life safety expected in the law of the Building Regulations. One way of meeting the essential principles in the design of a building is to follow the guidance contained in BDM13 *Fire Safety Engineering – A Guide for Insurers* Version 02 first published 2002.

<https://www.riscauthority.co.uk/public-resources/documents/resource/bdm13-fire-safety-engineering-a-guide-for-insurers-727>

Recognising the advance in the profession of fire engineering RISC Authority published a *Fire Engineering Guide for Property Protection and Business Resilience* Version 1 in 2020. Deciding the resilience expected is a matter of strategic importance at the start of the BDM01 A to Z Essential Principles.

<https://www.riscauthority.co.uk/public-resources/documents/resource/fire-engineering-guide-for-property-protection-and-business-resilience-2020-745>

Rather than repeat BDM01 content this document BDM02 recognises fire engineering may be an alternative to the life safety limited statutory guidance.

For property protection and resilience the fire engineering approach must be based on protection of the structure, fabric of the building and contents. This BDM02 document is explicitly concerned with the relationship between fire resisting compartmentation in loadbearing and non-loadbearing floors and walls and the Insurer recognised options for sprinkler installation, according to the Purpose Group for building use or occupancy.

The fire engineering strategy should be strategically developed, contractually collated and exchanged with the building owner or operator so that ongoing fire risk management is able to account for when material changes are made to the structure, internal layout, use or occupancy which affect the contents of the building.

The relationship between structural engineering and fire engineering is sophisticating through considerable professional effort, and the Insurance sector encourages that synthesis of specialisms. Greater effort is needed to raise familiarity with construction methods between specialist engineers and Insurers.

## 2 Scope

The advice contained in this BDM02 document is applicable to:

- all new buildings, including dwellings whether houses or flats;
- major extensions; and
- refurbishment and upgrading of existing buildings.

Which is a widening of scope from the previous Revision of BDM02 in 2008. This core document continues to address the fire resistance of compartments and the interaction between structure and compartment floors and walls or roofs, particularly in relation to stair and lift cores, service risers and ventilation shafts. However the Insurer recognised options for sprinkler installations are explicitly related to compartment fire resistance and size for a Purpose Group.

The Purpose Groups are addressed in separate Tables as follows:

### **BDM02 Table 1 Residential Dwellings**

- 1(a) Residential (Dwellings) Flat with Car Parking as 7(b)
- 1(b) Residential (Dwellings) Dwellinghouse >4.5m above Ground
- 1(c) Residential (Dwellings) Dwellinghouse <4.5m above Ground

### **BDM02 Table 2 Residential other than Dwellings**

- 2(a) Residential (Institutional)
- 2(b) Residential (Other)

### **BDM02 Table 3 Office**

### **BDM02 Table 4 Shop, Commercial and Large Retail**

- 4(a) Shop and Commercial other than 4(b)
- 4(b) Large Retail Warehouse or Superstore in which stock is on display

### **BDM02 Table 5 Assembly and Recreation**

### **BDM02 Table 6 Industrial**

- 6(a) Industrial Ordinary Hazard 1 to 2 as Table A.2 in Annex A of BS EN 12845:2015+A1:2019
- 6(b) Industrial Ordinary Hazard 3 to 4 as Table A.2 and High Hazard Process as Table A.3 in Annex A of BS EN 12845:2015+A1:2019

## BDM02 Table 7 Storage and Car Parking

7(a) Storage categorised in TB217, which relates to Clause 6 and Annex B and C of BS EN 12845:2015+A1:2019

7(b) Car Parking for light vehicles

Technical Bulletin TB217: 2018: Rev 1 – *Categorisation of goods in storage* is part of the RISC Authority documentation available to members.

<https://www.riscauthority.co.uk/member-download/48>

The Purpose Groups in the Tables of this document referencing TB 206 Tables T1 and T2 correspond with Table 0.1 in ADB statutory guidance for England, discussed in BDM02-1.1 Objectives. The statutory guidance for England, Scotland, Wales and Northern Ireland differs in the way compartment wall and floor fire resistance and size, and allowances for Sprinklers, are categorised and specified according to building use and height. All devolved administrations publish statutory guidance on the principle of life safety before collapse rather than property protection, discussed in BDM02-1.2 Limitations.

In practice buildings are often of more than one Purpose Group. Buildings of Mixed Use shall either be divided by compartment walls and floors to separate use or occupancy. The Tables of this document are not to be read by attempting to impose a single purpose group for Mixed Use buildings. Rather the Tables of this document shall be read to achieve a building specific Mixed Use design selection that ensures:

- Different uses or occupancy are arranged vertically in the building with sufficient fire resistance to avoid premature collapse of fire protected primary structure and premature failure of compartmentation in the event of fire in any compartment on any Storey; and
- Different uses or occupancy are arranged horizontally on every Storey with sufficient fire resistance to avoid premature collapse of fire protected primary structure and premature failure of compartmentation in the event of fire in any compartment.

Primary structure is discussed in BDM02-3.1. The correct selection for fire protection to primary structure, the minimum fire resistance of walls and floors, and maximum size for each compartment, is related to the Purpose Group of that compartment.

Moreover the correct selection for minimum fire resistance of walls and floors and maximum size for each unsprinklered compartment is related to the Purpose Group of that unsprinklered compartment and not to the Purpose Group of the otherwise sprinklered building.

A typical example is a fully sprinklered storage warehouse with unsprinklered communicating offices. The compartmentation requirements of the unsprinklered office shall be related to Purpose Group 3 Office, and NOT to Purpose Group 7(a) Storage.

Building specific Mixed Use design selection according to Purpose Group of each compartment requires consideration of the location of the compartment in the building. Where further design freedom is sought to combine uses or occupancies within a compartment the most onerous protected primary structure and compartment wall and floor fire resistance and size, subject to any allowance for sprinklers to the LPC Sprinkler Rules, shall be the design selection.

Basements are always to be considered separately to Storeys above Ground Level. Note [1] to the Tables states that the compartment floor over a basement, or if there is more than one basement the floor over the topmost basement, should meet the provisions for the ground floor and upper Storeys if the fire resistance for compartmentation is higher.

The Method of Measurement is for the Overall Height (m) of the building, or Overall Depth of Basement, in accordance with the LPC Sprinkler Rules. This is in contrast to the Height of the Top Storey as the Method of Measurement in ADB. The Tables of this document are not to be read as measuring the Height or Depth of a particular Storey. That means taller or deeper buildings tend to more onerous requirements for compartmentation with or without sprinklers.

The Scope of BDM02 extends to Mixed Use buildings differentiated by Storey using the most onerous requirements for the Purpose Group of each compartment, according to the Overall Height above ground or basement Depth of the building, subject to any allowance for sprinklers to the LPC Sprinkler Rules. Consistent with the LPC Sprinkler Rules the Tables in BDM02 adopt the Overall Height (m) of the building and do not refer to a measurement of Height of Top Storey as the Approved Document in England.

## 3 Depicting passive fire protection measures

### 3.1 Primary structure

In the simplest of terms the primary structure may be:

- loadbearing floors and walls; or
- loadbearing frames of columns and beams with loadbearing floors spanning between beams.

Frame structures often have non-loadbearing walls, some of which are required to provide fire resistance for compartmentation. The non-loadbearing walls may be solid masonry construction or secondary frame infill boarded construction, often with cavities between to assist with acoustic separation. The fire resisting compartment wall may be built up from several adjacent wall and lining constructions.

Wind load resistance is achieved by bracing the frame. The frame can be braced between columns and beams, horizontally and vertically. It is common to achieve bracing by providing wind load resistance to frame structures in the lift and stair cores, which may be related to service risers and ventilation shafts. Such structural cores are often loadbearing floors and walls but can also be braced framed structures. Core structures also provides fire resistance for compartmentation.

The relationship between loadbearing structure and non-loadbearing infill is slightly more complicated in Modular buildings. The loadbearing 3D Volumetric room sized structures are supported in a stack, again usually around a lift and stair core providing wind load resistance. Some Modules can be braced to resist wind load in all directions too. In any event they must be capable of being lifted on a crane without racking of the structure. While the floors must be loadbearing as the base to the Modules the tops may be non-loadbearing ceilings or soffits as infill. Some Modular walls are loadbearing but are often a Module frame infilled with and protected by fire resisting non-loadbearing walls. The Modular stack consequently has cavities between tops and bases, and between adjacent Module walls. There is no longer a single compartment floor but a matrix of internal cavities. RISC Authority has published guidance on “Permanent Stacked Modular Buildings” in the form of an Insurer Questionnaire IQ8 and a Technical Checklist as two related documents organised against Schedule 1. of the 2010 Building Regulations:

#### **IQ8 Buildings System Questionnaire - Permanent Stacked Modular Buildings - Interactive**

<https://www.riscauthority.co.uk/public-resources/documents/resource/iq8-buildings-system-questionnaire-permanent-stacked-modular-buildings-interactive-748>

#### **IQ8 Technical Checklist for England - Permanent Stacked Modular Buildings**

<https://www.riscauthority.co.uk/public-resources/documents/resource/iq8-technical-checklist-for-england-permanent-stacked-modular-buildings-753>

The primary structure may be architecturally expressed or concealed combinations of any loadbearing materials, ranging from stone and brick masonry to reinforced concrete, steel and timber frames. Most buildings are compositions of many materials,

and vanishingly few have mono-material structures. Composite structures are common. Some structural materials are better in compression, in tension, or acting through combination in bending. It may not be immediately obvious which parts of the building construction are loadbearing and non-loadbearing.

Schedule 1. Part A in the 2010 Building Regulations simply states the legal functional requirements for structure:

#### **Loading**

A1-(1) The building shall be constructed so that the combined dead, imposed and wind loads are sustained and transmitted by it to the ground –

- (a) safely; and
- (b) without causing such deflection or deformation of any part of the building, or such movement of the ground, as will impair the stability of any part of another building.

A1-(2) In assessing whether a building complies with sub-paragraph (1) regard shall be had to the imposed and wind loads to which it is likely to be subjected in the ordinary course of its use for the purpose for which it is intended.

#### **Ground movement**

A2 The building shall be constructed so that ground movement caused by –

- (a) swelling, shrinkage or freezing of the subsoil; or
- (b) land-slip or subsidence (other than subsidence arising from shrinkage), in so far as the risk can be reasonably foreseen, will not impair the stability of any part of the building.

#### **Disproportionate collapse**

A3 The building shall be constructed so that in the event of an accident the building will not suffer collapse to an extent disproportionate to the cause.

Requirement A3 does not explicitly consider the event of fire to be an accident. The A3 Disproportionate Collapse requirement was introduced in response to the gas explosion that collapsed the loadbearing walls and floors of Ronan Point flats in 1968. A fire might be accidentally rather than deliberately ignited. However the event of fire is to be expected by the structural engineering. Requirement A1-(1)(a) is to be satisfied for a sufficient time during a fire in any part of the building for Schedule 1. Part B in the 2010 Building Regulations to be satisfied. There can be no structural collapse in Part A that jeopardises life safety in Part B of Schedule 1.

<https://www.legislation.gov.uk/ukxi/2010/2214/schedule/1/made>

All the loads presented by or imposed upon a building acting in combination in the event of fire shall be considered by structural engineering. The primary structure needs to maintain its loadbearing capacity in a fire for a minimum and defined duration. The loadbearing primary structure requires a period of stability. For life safety in ADB that duration may be shorter than is recommended for property protection in this document BDM02. For no Purpose Group will the period of engineered structural stability required for property protection be shorter than that required for life safety.

Structural stability is measured in time and denoted as classification (R) through fire resistance testing under BS EN 13501-2:2016 *Fire classification of construction products and building elements – Classification using data from fire resistance tests, excluding ventilation services*.

National fire resistance test and classification standards in the BS 476 series have been sustained in parallel with European fire resistance test and classification standards. The decision to approve the BS 476 fire resistance tests and classifications in parallel to BS EN 13501-2 was taken by government in response to the RADAR 1 report of 2000. RADAR is the acronym derived from Revision of Approved Document And Revision. RADAR 1 was not published in Module 6, Phase 2 of the Grenfell Tower Inquiry, when RADAR 2 was published. RADAR 2 concerned the external wall, discussed in BDM02-3.4. At the time of publication of BDM02 the reason is unclear. There may be a specialist technical review of the transposition between National and European measures of fire resistance characteristics.

Structural materials often require protection against the effects of fire by the application of a protective product, material or coating. Frequently structure is built into walls and floors that in their fire resistance for compartmentation provide some or all of the fire protection required by the primary structure. The structural fire resistance may be impaired where associated fire protecting construction is physically altered, has degraded, or becomes damaged, perhaps by water.

The service life of the structure and any associated fire protection is of great importance. For primary structure the service life should be no less than the design life of the building unless there is a practical means to replace structure as a secondary component. This is an aspect of durability more fully addressed in BDM01.

### 3.2 Roofs

Roofs must protect the building interior from the weather. They are conventionally differentiated from walls when they are steeply sloping at less than 70 Degrees to the horizontal, and range in angle through shallow pitched to “flat roof” forms. Consequently construction may slope up to 30 Degrees from the vertical and be considered External Walls in BDM02-3.4, though made to appear as part of the roof. An example is the “mansard” roof.

The maximisation of non-combustible construction in the roof is in addition to and different from any requirement for fire resistance.

Roofs shall make no significant contribution to a developing fire but shall meet any requirements specified, such as quantifiable performance for weathertightness, airtightness, condensation risk, thermal and acoustic insulation, daylighting, ventilation, and durability in addition to descriptions of architectural qualities. BDM01 A to Z Essential Principles refers to BS EN 13501-5:2016 *Fire classification of construction products and building elements – Classification using data from external fire exposure to roofs tests* and addresses why the BS 476 series is no longer to be referred to.

The decision to approve the BS 476 series tests and classifications in parallel to BS EN 13501-5 was taken by government in 2000, though it appears without conclusion of the proposed RADAR 3 research. Which is the acronym derived from Revision of Approved Document And Revision. There may be a specialist technical review of the transposition between European and National measures of exposure to fire in roofing.

Roof structures that are not providing or affecting any means of escape may be engineered to collapse in the event of fire without any risk to life safety. But for property protection that may be unsatisfactory. BDM01 also addresses the need to agree a fire resisting

protected zone of roof structure and covering both sides of any internal compartment wall. These protected zones of roofing shall resist fire from inside to outside and from outside to inside.

The fire resistances recommended in this document BDM02 differentiate between floor and wall compartmentation and the structure that provides stability (R). It is necessary to refer to BDM01 to consider how the internal fire resistances in BDM02 Tables by Purpose Group relate to the protected zones in roofs.

### 3.3 Compartment walls

Internal compartment walls provide vertical barriers to prevent fire spreading horizontally between compartments within a building.

Compartment walls may provide fire resisting separation as a shared or “party wall” between buildings. Often a “party wall” may be constructed as a pair of fire resisting walls each belonging to the adjacent buildings with an inaccessible cavity between them, unexposed to the weather. Where courtyards or “light wells” exist such “party walls” may be exposed to the weather and include glazing. In these instances compartment walls within a building can begin to become an external wall as discussed in BDM02-3.4, though facing into the building rather than facing out to the surrounding urban or rural landscape.

The Tables in BDM02 are differentiated between compartment walls and floors for loadbearing stability (R) where structural, integrity (E) and insulation (I) through fire resistance testing under BS EN 13501-2:2016 *Fire classification of construction products and building elements - Classification using data from fire resistance tests, excluding ventilation services*. Loadbearing compartment walls will be tested and classified (REI) while non-loadbearing compartment walls will be tested and classified (EI) for a duration of fire resistance in Minutes.

In all cases a compartment wall shall extend from top to underside of compartment floors. Where non-loadbearing construction provides compartmentation a fire resisting deflection head detail is required to allow the structure to deflect without imposing load on the wall. This is necessarily a linear joint of fire stopping. It is not recommended in BDM01 for cavity barriers to be installed in place of full height compartment walls that are non-loadbearing.

Fire resistances of compartment walls shall be tested and classified from both sides, with consideration in BDM01 to non-fire resisting linings creating cavities through which fire can spread.

### 3.4 External walls

Compartment walls can be exposed to the weather within courtyards or “light wells” to become external walls, and steeply pitched roofs may need to be treated as external walls. However most external walls face out to the surrounding urban or rural landscape and must protect the building interior from the weather.

The maximisation of non-combustible construction in the external walls is in addition to and different from any requirement for fire resistance.

The external wall is a weakness in the compartmentation of a building because even if non-combustible it inevitably involves unprotected areas with zero fire resistance. These unprotected areas may be more than the extent of annealed glass required for daylighting and vision. While protecting the building interior from the weather the external wall includes doors for access, whether at ground level or on balconies and roof terraces, or opens for ventilation, whether in opaque construction or as windows.

The architectural “fenestration” of the external wall is a necessary weakness in compartmentation discussed in BDM01.

External walls shall make no significant contribution to a developing fire but shall meet any requirements specified, such as quantifiable performance for weathertightness, airtightness, condensation risk, thermal and acoustic insulation, daylighting, ventilation, durability in addition to descriptions of architectural qualities. BDM01 A to Z Essential Principles refers to BS EN 13501-1:2018 *Fire classification of construction products and building elements – Classification using data from reaction to fire tests* and addresses why the BS 476 series is no longer to be referred to.

The decision to approve the BS 476 tests and classifications in parallel to BS EN 13501-1 was taken by government in response to the RADAR 2 report of 2000. Which is the acronym derived from Revision of Approved Document And Revision. RADAR 2 was only published in Module 6, Phase 2 of the Grenfell Tower Inquiry in February 2022. The Grenfell Tower Inquiry has criticised the transposition between European testing and classification for reaction to fire and prolonged National approval of BS 476 Part 6 and 7 testing. There may be a specialist technical review of BS EN 13501-1.

BDM01 also addresses the need to agree a fire resisting protected zone of external wall both sides of any internal compartment wall. In multi-storey buildings where compartmentation is horizontal, BDM01 addresses the need to agree a fire resisting protected zone of external wall above and below any internal compartment floor. These protected zones of external walling both vertically and horizontally shall resist fire from inside to outside and from outside to inside.

The fire resistances recommended in this document BDM02 differentiate between floor and wall compartmentation and the structure that provides stability (R). It is necessary to refer to BDM01 to consider how the internal fire resistances in BDM02 Tables by Purpose Group relate to the protected zones in external walls.

### 3.5 Compartment floors

Internal compartment floors provide horizontal barriers to prevent the vertical spread of fire between compartments within a building. They must also support the safe occupation and movement of building occupants and the intervening Fire and Rescue Services in the event of a fire for the duration of a minimum period of fire resistance to ensure life safety.

The Tables in BDM02 are differentiated between compartment floors and walls for loadbearing stability (R) where structural, integrity (E) and insulation (I) through fire resistance testing under BS EN 13501-2:2016 *Fire classification of construction products and building elements – Classification using data from fire resistance tests, excluding ventilation services*. Loadbearing compartment floors will be tested and classified (REI) for a duration of fire resistance in Minutes.

Compartment floors shall be designed to maintain loadbearing capacity in a fire, to assist the Fire and Rescue Services in their operations, which in BDM02 may exceed the time to ensure that escape routes remain accessible to building occupants. Fire resistances of compartment floors shall be tested and classified from above and below, with consideration in BDM01 to non-fire resisting raised floors and suspended ceilings creating cavities through which fire can spread.

## 4 Insurer recognised automatic sprinkler installations

The FPA is one of the leading experts for automatic sprinkler inspections, head testing, pipework testing and water mist testing.

The FPA wrote the LPC Sprinkler Rules and have a purpose-built, dedicated laboratory where specially trained engineers conduct all sprinkler system tests.

<https://www.thefpa.co.uk/sprinkler-services>

LPC Rules for Automatic Sprinkler Installations 2015 incorporating BS EN 12845:2015+A1:2019 Fixed firefighting systems. Automatic sprinkler systems. Design, installation and maintenance provides the two Insurer supported options for augmenting BS EN 12845:2015+A1:2019 for property protection.

<https://www.thefpa.co.uk/shop/lpc-sprinkler-rules>

The LPC Sprinkler Rules are maintained and updated by the Sprinkler Rules Working Group.

<https://www.riscauthority.co.uk/members-area/member-working-groups/sprinkler-rules-working-group>

A draft for public consultation on BS EN 12845-1 Fixed firefighting systems – Automatic sprinkler systems – Part 1: Design, installation and maintenance was published for 8 February 2022, with a proposed Part 2. The draft revision departs from established industry Hazard classification and may not be acceptable.

<https://standardsdevelopment.bsigroup.com/projects/2020-02747#/section>

The LPC Sprinkler Rules include Technical Bulletin TB206:2020 Rev 1 *Passive fire protection of sprinklered buildings*, which replaces BS EN 12845:2015+A1:2019 clauses 5.1, 5.2 and 5.3. This document BDM02 refers to TB 206 Tables T1 and T2 as the two Insurer supported options for property protection.

<https://www.riscauthority.co.uk/member-download/39>

The *LPC Design guide for the fire protection of buildings – A Code of Practice for the Protection of Business* was published jointly by the Association of British Insurers (ABI) and the Fire Protection Association (FPA) in 1999. The LPC Design Guide established advice for property protection, and includes Tables 2.1, 2.2 and 2.3.

<https://www.riscauthority.co.uk/public-resources/documents/resource/lpc-design-guide-for-fire-protection-of-buildings-741>

Table 2.2 refers to BS 5306-2:1990 *Fire extinguishing installations and equipment on premises – Specification for sprinkler systems*, which is withdrawn and replaced by BS EN 12845:2015+A1:2019. This document follows the Light, Ordinary and High Hazard classes in the LPC Sprinkler Rules that originate in BS 5306-2:1990.

The following suppression systems are not recognised as equivalents to a Sprinkler system in accordance with the two options in the *LPC Rules for Automatic Sprinkler Installations 2015 incorporating BS EN 12845:2015+A1:2019*. They tend to be disregarded for compartmentation in building occupancies.

- BS 9251:2021 *Fire sprinkler systems for domestic and residential occupancies. Code of practice*
- BS 8458:2015 *Fixed fire protection systems. Residential and domestic watermist systems. Code of practice for design and installation*

- BS 8489-1:2016 *Fixed fire protection systems. Industrial and commercial watermist systems. Code of practice for design and installation*
- BS EN 14972-1:2020 *Fixed firefighting systems. Water mist systems – Design, installation, inspection and maintenance*

ADB does not recognise Water Mist systems but does recognise BS 9251 Residential Sprinklers. Standards for Water Mist systems may be approved by ADB in future. BS EN 14972 is being developed into a series of Water Mist system standards. The expectation is that BS EN 14972 will replace BS 8458 Residential and Domestic and BS 8489 industrial and Commercial standards for Water Mist systems. These are further considered by RISC Authority in:

- *IQ1 Water Mist Questionnaire – Building Protection* – <https://www.riscauthority.co.uk/resource-download/302>
- *IQ2 Water Mist Questionnaire – Local Application* – <https://www.riscauthority.co.uk/resource-download/303>
- *IQ3 Water Mist Questionnaire – Closed Heads* – <https://www.riscauthority.co.uk/resource-download/304>

For a consideration of aspects of water damage related to suppression systems refer to *RISC Authority Insurer Requirements for enhanced escape of water protection based on Approved Document G*, first edition 2021.

<https://www.riscauthority.co.uk/resource-download/763>

## 5 Purpose Group Tables relating compartmentation to the LPC Sprinkler Rules

The seven Purpose Groups Tables are as follows, showing where advantages are to be gained in the compartment fire resistances for floors and walls, or the size of compartments, with the installation of one of the two approaches to automatic sprinkler installations recognised in the LPC Sprinkler Rules:

**BDM02 Table 1 Residential Dwellings**

**BDM02 Table 2 Residential other than Dwellings**

**BDM02 Table 3 Office**

**BDM02 Table 4 Shop, Commercial and Large Retail**

**BDM02 Table 5 Assembly and Recreation**

**BDM02 Table 6 Industrial**

**BDM02 Table 7 Storage and Car Parking**

The seven Purpose Group Tables are also consolidated into a single chart that can be printed in an A3 portrait format, available on the RISC Authority website.

The Notes to the individual seven tables and the consolidated chart are consistent. The Notes are shown in <sup>[x]</sup> brackets.

BDM02 Table 1 Residential Dwellings

Purpose Group 1 Residential Dwellings		Consider the Location	Use Overall Dimension	Unsprinklered and Systems not to LPC Sprinkler Rules			Sprinklered to LPC Sprinkler Rules with Exceptions			Sprinklered to LPC Sprinkler Rules in Full		
Hazard classes are identified in Annex A of BS EN 12845:  LH – Light Hazard OH – Ordinary Hazard HH – High Hazard, as:  HHP – Process HHS – Storage		Refer to Scope in BDM02 Section 2	Method of Measurement	Insurers tend to disregard:  BS EN 12845 Sprinklers BS 9251 Residential Sprinklers BS 8458 Residential Mist BS 8489 Industrial Mist BS EN 14972-1 Water Mist			Defined TB 206 Table T2  Overall Height to include enclosed Plant Rooms  4.2.1 Permitted exceptions 4.2.2 Necessary exceptions			Defined TB 206 Table T1  Allowance for the alternative suppression systems based on the risk assessment of identified fire Hazards in the building		
				Floor	Wall	Floor	Wall	Floor	Wall			
Residential (Dwellings)  Flat [2, 3, 8] with Car Parking as 7(b)  OH1 [18, 19]	1(a)	Basement <sup>[1]</sup>	>10 m deep	90 <sup>[4, 5]</sup>	90 <sup>[5]</sup>	Each Floor and the Dwelling up to 250 <sup>[6]</sup>	90 <sup>[4, 5]</sup>	90 <sup>[5]</sup>	Each Floor and the Dwelling up to 250 <sup>[6]</sup>	90 <sup>[4, 5]</sup>	90 <sup>[5]</sup>	Each Floor and the Dwelling up to 250 <sup>[6]</sup>
			<10 m deep									
		Ground and above	≤5 m	Not permitted	120	120	120	120				
			≤11 m									
			≤18 m									
	≤30 m											
	>30 m											
Residential (Dwellings)  Dwellinghouse >4.5m [7, 8]  LH [17, 19]	1(b)	Basement <sup>[1]</sup>	>10 m deep	Not covered by ADB			Not recommended <sup>[6]</sup>			Not recommended <sup>[6]</sup>		
			<10 m deep	30	60 <sup>[16]</sup>	Each Dwelling up to 250 <sup>[6]</sup>	30	60 <sup>[16]</sup>	Each Dwelling up to 250 <sup>[6]</sup>	30	60 <sup>[16]</sup>	Each Dwelling up to 250 <sup>[6]</sup>
		Ground and above	≤5 m	60	60	60	60	60				
			≤18 m									
			≤30 m									
	>30 m	Not covered by ADB			Not recommended <sup>[6]</sup>			Not recommended <sup>[6]</sup>				
Residential (Dwellings)  Dwellinghouse <4.5m [7, 8, 9]  LH [17, 19]	1(c)	Basement <sup>[1]</sup>	>10 m deep	Not covered by ADB			Not recommended <sup>[6]</sup>			Not recommended <sup>[6]</sup>		
			<10 m deep	30	60 <sup>[16]</sup>	Each Dwelling up to 250 <sup>[6]</sup>	30	60 <sup>[16]</sup>	Each Dwelling up to 250 <sup>[6]</sup>	30	60 <sup>[16]</sup>	Each Dwelling up to 250 <sup>[6]</sup>
		Ground and above	≤5 m	Not in the Purpose Group	Not in the Purpose Group	Not in the Purpose Group	Not in the Purpose Group	Not in the Purpose Group				
			≤18 m									
			≤30 m									
	>30 m											

BDM02 Table 2 Residential other than Dwellings

Purpose Group 2 Residential other than Dwellings		Consider the Location Refer to Scope in BDM02 Section 2 Basements to be considered separately to Storeys above Ground Level with Mixed Use resolved at each Storey	Use Overall Dimension Method of Measurement ADB adopts Height of Top Storey while LPC Sprinkler Rules adopt the Overall Height (m) of the building	Unsprinklered and Systems not to LPC Sprinkler Rules			Sprinklered to LPC Sprinkler Rules with Exceptions			Sprinklered to LPC Sprinkler Rules in Full		
				Insurers tend to disregard: BS EN 12845 Sprinklers BS 9251 Residential Sprinklers BS 8458 Residential Mist BS 8489 Industrial Mist BS EN 14972-1 Water Mist			Defined TB 206 Table T2 Overall Height to include enclosed Plant Rooms 4.2.1 Permitted exceptions 4.2.2 Necessary exceptions			Defined TB 206 Table T1 Allowance for the alternative suppression systems based on the risk assessment of identified fire Hazards in the building		
				Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )
Floor	Wall	Floor	Wall	Floor	Wall							
Residential (Institutional) OH1 <sup>[18, 19]</sup> except Prisons as LH <sup>[17]</sup>	2(a)	Basement <sup>[1]</sup>	>10 m deep	90	90	Each Floor up to 500	90	90	Each Floor up to 1000	90	90	Each Floor up to 1000
			<10 m deep	60	60		60	60		60	60	
		Ground and above	≤5 m				90	90		90	90	
			≤18 m	90	90		120	120		120	120	
			≤30 m	120	120		180	180		180	180	
>30 m	Not permitted			180	180	180	180					
Residential (Other) OH <sup>[18, 19]</sup>	2(b)	Basement <sup>[1]</sup>	>10 m deep	90	90	Each Floor up to 500	90	90	Each Floor up to 1000	90	90	Each Floor up to 1000
			<10 m deep	60	60		60	60		60	60	
		Ground and above	≤5 m				90	90		90	90	
			≤18 m	90	90		120	120		120	120	
			≤30 m	120	120		180	180		180	180	
>30 m	Not permitted			180	180	180	180					

BDM02 Table 3 Office

Purpose Group 3 Office		Consider the Location	Use Overall Dimension	Unsprinklered and Systems not to LPC Sprinkler Rules			Sprinklered to LPC Sprinkler Rules with Exceptions			Sprinklered to LPC Sprinkler Rules in Full		
				Insurers tend to disregard:			Defined TB 206 Table T2			Defined TB 206 Table T1		
				BS EN 12845 Sprinklers BS 9251 Residential Sprinklers BS 8458 Residential Mist BS 8489 Industrial Mist BS EN 14972-1 Water Mist			Overall Height to include enclosed Plant Rooms 4.2.1 Permitted exceptions 4.2.2 Necessary exceptions			Allowance for the alternative suppression systems based on the risk assessment of identified fire Hazards in the building		
				Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )
				Floor	Wall		Floor	Wall		Floor	Wall	
Office OH1 <sup>[18, 19]</sup> only reduced to LH <sup>[17]</sup> when small <sup>[20]</sup>	3	Basement <sup>[1]</sup>	>10 m deep	120	120	126 when small <sup>[20]</sup> and all other cases	90	90	126 when small <sup>[20]</sup> and all other cases	60	60	126 when small <sup>[20]</sup> and all other cases
			<10 m deep	90	90		60	60		60	60	
		Ground and above	≤5 m	60	60	4000 Multi 4000 Single	90	90	No limit Multi No limit Single	30	60 <sup>[16]</sup>	No limit Multi No limit Single
			≤11 m	90	90					60	60	
			≤18 m	Not recommended <sup>[10]</sup>		120	120	90	90			
			>30 m	Not permitted Fully Sprinklered required		Not permitted Fully Sprinklered required			120 <sup>[15]</sup>	120 <sup>[15]</sup>		

BDM02 Table 4 Shop, Commercial and Large Retail

Purpose Group 4 Shop, Commercial and Large Retail		Consider the Location	Use Overall Dimension	Unsprinklered and Systems not to LPC Sprinkler Rules			Sprinklered to LPC Sprinkler Rules with Exceptions			Sprinklered to LPC Sprinkler Rules in Full			
				Insurers tend to disregard:			Defined TB 206 Table T2			Defined TB 206 Table T1			
				BS EN 12845 Sprinklers BS 9251 Residential Sprinklers BS 8458 Residential Mist BS 8489 Industrial Mist BS EN 14972-1 Water Mist			Overall Height to include enclosed Plant Rooms 4.2.1 Permitted exceptions 4.2.2 Necessary exceptions			Allowance for the alternative suppression systems based on the risk assessment of identified fire Hazards in the building			
Hazard classes are identified in Annex A of BS EN 12845:  LH – Light Hazard OH – Ordinary Hazard HH – High Hazard, as:  HHP – Process HHS – Storage		Basements to be considered separately to Storeys above Ground Level with Mixed Use resolved at each Storey	Method of Measurement	ADB adopts Height of Top Storey while LPC Sprinkler Rules adopt the Overall Height (m) of the building	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )
					Floor	Wall		Floor	Wall		Floor	Wall	
Shop and Commercial other than 4(b)  OH3 <sup>[18]</sup>	4(a)	Basement <sup>[1]</sup>	>10 m deep	120	120	2000 Multi 2000 Single	120	120	4000 Multi 8000 Single	90	90	4000 Multi 8000 Single	
			<10 m deep										
		Ground and above	≤5 m	Not recommended <sup>[10]</sup>	Not permitted Fully Sprinklered required	Not permitted Fully Sprinklered required	120 <sup>[15]</sup>	120 <sup>[15]</sup>	4000 Multi 8000 Single				
			≤18 m										
			>30 m										
Large Retail Warehouse or Superstore in which stock is on display  OH3 <sup>[18]</sup>	4(b)	Basement <sup>[1]</sup>	>10 m deep	120	120	2000 Multi 2000 Single	120	120	4000 Multi 8000 Single	120	120	4000 Multi 8000 Single	
			<10 m deep										
		Ground and above	≤5 m	Not permitted Fully Sprinklered required	Not permitted Fully Sprinklered required	Not permitted Fully Sprinklered required	120 <sup>[15]</sup>	120 <sup>[15]</sup>	4000 Multi 8000 Single				
			≤18 m										
			>30 m										

BDM02 Table 5 Assembly and Recreation

Purpose Group 5 Assembly and Recreation		Consider the Location Refer to Scope in BDM02 Section 2 Basements to be considered separately to Storeys above Ground Level with Mixed Use resolved at each Storey	Use Overall Dimension Method of Measurement ADB adopts Height of Top Storey while LPC Sprinkler Rules adopt the Overall Height (m) of the building	Unsprinklered and Systems not to LPC Sprinkler Rules			Sprinklered to LPC Sprinkler Rules with Exceptions			Sprinklered to LPC Sprinkler Rules in Full		
				Insurers tend to disregard: BS EN 12845 Sprinklers BS 9251 Residential Sprinklers BS 8458 Residential Mist BS 8489 Industrial Mist BS EN 14972-1 Water Mist			Defined TB 206 Table T2 Overall Height to include enclosed Plant Rooms 4.2.1 Permitted exceptions 4.2.2 Necessary exceptions			Defined TB 206 Table T1 Allowance for the alternative suppression systems based on the risk assessment of identified fire Hazards in the building		
				Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )
Floor	Wall	Floor	Wall	Floor	Wall							
Assembly and Recreation OH1 to OH4 as Table A.2 [18, 19] but Schools as LH [17] when small [20]	5	Basement <sup>[1]</sup>	>10 m deep	120	120	126 when small <sup>[20]</sup> and all other cases	90	90	126 when small <sup>[20]</sup> and all other cases	60	60	126 when small <sup>[20]</sup> and all other cases
			<10 m deep	90	90		60	60		60	60	
		Ground and above	≤5 m			2000 Multi 4000 Single	90	90	4000 Multi 8000 Single	30	60 <sup>[16]</sup>	4000 Multi 8000 Single
			≤18 m	120	120		90	90		60	60	
			≤30 m				120	120		60	60	
>30 m	Not permitted Fully Sprinklered required			Not permitted Fully Sprinklered required			120 <sup>[15]</sup>	120 <sup>[15]</sup>				

BDM02 Table 6 Industrial

Purpose Group 6 Industrial		Consider the Location  Refer to Scope in BDM02 Section 2  Basements to be considered separately to Storeys above Ground Level with Mixed Use resolved at each Storey	Use Overall Dimension  Method of Measurement  ADB adopts Height of Top Storey while LPC Sprinkler Rules adopt the Overall Height (m) of the building	Unsprinklered and Systems not to LPC Sprinkler Rules			Sprinklered to LPC Sprinkler Rules with Exceptions			Sprinklered to LPC Sprinkler Rules in Full		
				Insurers tend to disregard:  BS EN 12845 Sprinklers BS 9251 Residential Sprinklers BS 8458 Residential Mist BS 8489 Industrial Mist BS EN 14972-1 Water Mist			Defined TB 206 Table T2  Overall Height to include enclosed Plant Rooms  4.2.1 Permitted exceptions 4.2.2 Necessary exceptions			Defined TB 206 Table T1  Allowance for the alternative suppression systems based on the risk assessment of identified fire Hazards in the building		
				Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )
Floor	Wall	Floor	Wall	Floor	Wall							
Industrial <sup>[11]</sup> OH1 to OH2 as Table A.2 <sup>[18, 19]</sup>	6(a)	Basement <sup>[1]</sup>	>10 m deep	120	120	7000 Multi 7000 Single	120	120	14000 Multi 14000 Single	90	90	14000 Multi 14000 Single
			<10 m deep									
		Ground and above	≤5 m	Not recommended Fully Sprinklered advised	Not recommended Fully Sprinklered advised	180	180	4000 Multi 4000 Single				
			≤18 m									
			≤30 m									
>30 m	Not permitted Fully Sprinklered required	Not permitted Fully Sprinklered required	180	180								
Industrial <sup>[11]</sup> OH3 to OH4 as Table A.2 <sup>[18, 19]</sup> and HHP as Table A.3	6(b)	Basement <sup>[1]</sup>	>10 m deep	240	240	7000 Multi 7000 Single	240	240	14000 Multi 14000 Single	120	120	14000 Multi 14000 Single
			<10 m deep									
		Ground and above	≤5 m	Not recommended Fully Sprinklered advised	Not recommended Fully Sprinklered advised	180	180	4000 Multi 4000 Single				
			≤18 m									
			≤30 m									
>30 m	Not permitted Fully Sprinklered required	Not permitted Fully Sprinklered required	180	180								

BDM02 Table 7 Storage and Car Parking

Purpose Group 7 Storage and Car Parking		Consider the Location	Use Overall Dimension	Unsprinklered and Systems not to LPC Sprinkler Rules			Sprinklered to LPC Sprinkler Rules with Exceptions			Sprinklered to LPC Sprinkler Rules in Full					
				Insurers tend to disregard:			Defined TB 206 Table T2			Defined TB 206 Table T1					
				Method of Measurement			Overall Height to include enclosed Plant Rooms			Allowance for the alternative suppression systems based on the risk assessment of identified fire Hazards in the building					
Hazard classes are identified in Annex A of BS EN 12845:  LH – Light Hazard OH – Ordinary Hazard HH – High Hazard, as:  HHP – Process HHS – Storage		Basements to be considered separately to Storeys above Ground Level with Mixed Use resolved at each Storey	ADB adopts Height of Top Storey while LPC Sprinkler Rules adopt the Overall Height (m) of the building	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )	Minimum (REI) Fire Resistance (Minutes)		Maximum Floor Area of Compartment (m <sup>2</sup> )			
				Floor	Wall		Floor	Wall		Floor	Wall				
Storage <sup>[11, 12]</sup>  Categorised as TB217 <sup>[18, 19]</sup> and HHS subject to storage risk	7(a)	Basement <sup>[1]</sup>	>10 m deep	240	240	4000 Multi 4000 Single	240	240	8000 Multi 8000 Single	120	120	8000 Multi 8000 Single			
			<10 m deep												
		Ground and above	≤5 m	Not recommended Fully Sprinklered advised	Not recommended Fully Sprinklered advised	120 <sup>[15]</sup>	120 <sup>[15]</sup>	8000 Multi 8000 Single							
			≤18 m												
			≤30 m												
>30 m	Not permitted Fully Sprinklered required	Not permitted Fully Sprinklered required	120 <sup>[15]</sup>	120 <sup>[15]</sup>											
Car Parking for light vehicles  HHP as Table A.3 <sup>[18, 21]</sup> to allow for electric light vehicles	7(b)	Ground and above  Open sided	≤5 m	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	No limit Multi No limit Single	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	No limit Multi No limit Single	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	No limit Multi No limit Single			
			≤18 m												
			≤30 m												
		>30 m	60	60	60	60									
		Basement <sup>[1]</sup>	>10 m deep	90	90	90	90								
			<10 m deep	60	60	60	60								
		Ground and above  Closed sided	≤5 m	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	60 <sup>[13, 14]</sup>	No limit Multi No limit Single	
			≤18 m												
			≤30 m												
			90												90
>30 m	120 <sup>[15]</sup>		120 <sup>[15]</sup>												120 <sup>[15]</sup>

### Notes to Table

- 1 The compartment floor over a basement, or if there is more than one basement the floor over the topmost basement, should meet the provisions for the ground floor and upper Storeys if the fire resistance for compartmentation is higher. [This is the same principle as Note \* in ADB Table B4]
- 2 Purpose Group 1(a) Flats includes live/work units that meet the provisions of Paragraph 3.24. [This is the same principle as Note 1 in ADB (2019 as amended 2020) Table 0.1 Purpose Groups]
- 3 Purpose Group 1(a) Flats provided with compartment floors and walls to ADB Volume 1 (2019 as amended 2020) Paragraph 7.1 as follows:
  - a. Any floor and wall separating a Flat from another part of the building.
  - b. Any wall enclosing a refuse storage chamber.
  - c. Any wall common to two or more buildings.
- 4 Purpose Group 1(a) Flats to provide 90 Minutes compartment floors between different tenancies, as an enhancement since Insurer ADB (2015) when ADB (2013) Table A1 provided 60 Minutes or deferred to Table A2. Reduced to 30 Minutes for non-compartment floors that do not contribute to the support of the building within a Flat of single tenancy of more than one Storey. [This is an enhancement on Note + in ADB (2019 as amended 2020) Table B4]
- 5 Purpose Group 1(a) Flats converted from Dwellinghouses in Purpose Groups 1(b) and 1(c) to consider the acceptability of Paragraphs 6.5 to 6.7 for compartment floors or walls of 30 Minutes. Some existing buildings are unsuitable for conversion into Flats when enhanced compartmentation is considered necessary. For all other conversions of buildings to Flats provide compartment floors and walls between different tenancies of 90 Minutes. [This is an enhancement on Note § in ADB (2019 as amended 2020) Table B4]
- 6 Purpose Group 1(a) Flats or Dwellinghouses in Purpose Groups 1(b) and 1(c) with compartments larger than 250 m<sup>2</sup> or other unusual risks are outside the scope of the guidance in this Insurer ADB. A fire engineering approach should be adopted. Assessment of risk should be carried out in early consultation with the Insurer [This is an enhancement on Note 4 in ADB (2019 as amended 2020) Table B4]
- 7 Purpose Groups 1(b) and 1(c) Dwellinghouses include surgeries, consulting rooms, offices or other accommodation that is:
  - a. No more than 50 m<sup>2</sup> internal floor area in total;
  - b. Part of a Dwellinghouse; and
  - c. Used by an occupant of the Dwellinghouse in a professional or business capacity.[This is the same principle as Note 2 in ADB (2019 as amended 2020) Table 0.1 Purpose Groups]
- 8 Purpose Groups 1(b) and 1(c) includes Garages attached to or forming an integral part of Dwellinghouses to be separated as a compartment from the living accommodation by 30 Minute fire resisting construction to meet the provisions of Diagram 5.1. This provision also applies to Flats converted from Dwellinghouses as Note 5 of this Table.
- 9 Purpose Group 1(c) Dwellinghouses with no Storey >4.5m includes the following:
  - a. A detached garage of maximum 40 m<sup>2</sup> in area.
  - b. A detached open carport of maximum 40 m<sup>2</sup> in area.
  - c. A detached building that consists of a garage and open carport, each a maximum of 40 m<sup>2</sup> in area.[This is the same principle as Note 4 in ADB (2019 as amended 2020) Table 0.1 Purpose Groups]
- 10 Purpose Group 3 Offices and Purpose Group 4(a) Shops and Commercial buildings with an Overall Height of more than 18m and less than 30m may be provided with enhanced non-combustibility and fire resistance of construction instead of an installation of Sprinklers to the LPC Sprinkler Rules, but this is not recommended. Assessment of risk should be carried out in early consultation with the Insurer.

- 11 Purpose Groups 6(a) and 6(b) Industrial Process buildings and Purpose Group 7(a) Storage buildings are subject to other legislation where fuels and combustible chemicals or materials are present. They shall have further limitations on floor area and additional sprinkler provisions. Assessment of risk should be carried out in early consultation with the Insurer using the LPC Sprinkler Rules with reference to a minimum Hazard class OH3 as Note 19 of this Table. [This is the same principle as Note 3 in ADB Volume 2 (2019 as amended 2020) Table 8.1]
- 12 Purpose Group 7(a) Storage buildings should not have compartment heights exceeding 18m measured from finished floor level to the underside of the roof or fire resisting ceiling. [This is the same principle as Note 5 in ADB Volume 2 (2019 as amended 2020) Table 8.1]
- 13 Purpose Group 7(b) Open or Closed sided Car Parks for light vehicles to provide 60 Minutes for parking decks and compartment walls protecting the means of escape. [This is an enhancement on Note # in ADB (2019 as amended 2020) Table B4]
- 14 Purpose Group 7(b) Open sided Car Parks for light vehicles are approved by Note 8 in ADB (2019 as amended 2020) Table B4 to be constructed of the following steel elements deemed to have satisfied 15 Minutes when tested to the European test method referred to in BS EN 1993-1-2:2005 *Eurocode 3. Design of steel structures - General rules - Structural fire design*, with National Annex:
- i) Beams supporting concrete floors, maximum  $H_p/A = 230/m$  operating under full design load.
  - ii) Free standing columns, maximum  $H_p/A = 180/m$  operating under full design load.
  - iii) Wind bracing and struts, maximum  $H_p/A = 210/m$  operating under full design load.
- 15 Minutes is insufficient fire resistance for property protection of Open sided Car Parks for light vehicles, whatever the primary structural material. Electric light vehicles involve additional risks, particularly when in proximity to liquid or gas fuelled light vehicles. Assessment of risk in in Open or Closed sided Car Parks for light vehicles as Purpose Group 7(b) should be carried out in early consultation with the Insurer when considering a reduction in fire resistance to 30 Minutes for parking decks and walls not protecting the means of escape as Note 13 of this Table. [This is an enhancement on Note 8 in ADB (2019 as amended 2020) Table B4]
- 15 Reduced to 90 Minutes for non-loadbearing compartment walls not associated with firefighting shafts and any compartment floor that does not contribute to the support of the building. [This is the same principle as Note ‡ in ADB (2019 as amended 2020) Table B4]
- 16 Reduced to 30 Minutes for walls that are not compartment walls separating buildings. [This is the same principle as Note † and 5 in ADB (2019 as amended 2020) Table B4]
- 17 Sprinkler protection in concealed spaces shall be to LH only when the occupancy Hazard class is LH as Paragraph 5.4 in BS EN 12845:2015+A1:2019.
- 18 Sprinkler protection in concealed spaces shall be to OH1 for all OH and HH occupancy Hazard classes as Paragraph 5.4 in BS EN 12845:2015+A1:2019.
- 19 Where a Plant Room or any Storage is integral to the building the Hazard class for the whole building shall be increased to OH3 as Table A.2 of BS EN 12845:2015+A1:2019. LPC Sprinkler Rules for Storage are provided in Technical Bulletin TB217: 2018: Rev 1 – *Categorisation of goods in storage*, which relates to Clause 6 and Annex B and C of BS EN 12845:2015+A1:2019.  
<https://www.riscauthority.co.uk/member-download/48>
- 20 Where none of the compartments in a building exceed a floor area of 126 m<sup>2</sup> and there is a minimum fire resistance for walls and floors of 30 Minutes the Hazard class may be reduced to LH. If Storage or Plant Rooms are present the Hazard class shall instead be increased to OH3 as Note 19 of this Table.
- 21 TB206:2020 Rev 1 *Passive fire protection of sprinklered buildings* stated OH2 but the LPC Sprinkler Rule requirement has been subsequently increased to HH subject to vehicle risk by the RISCAuthority Sprinkler Work Group.



**Fire Protection  
Association**



**Fire Protection Association**

London Road

Moreton in Marsh

Gloucestershire GL56 0RH

Tel: +44 (0)1608 812500

Email: [info@riscauthority.co.uk](mailto:info@riscauthority.co.uk)

Website: [www.riscauthority.co.uk](http://www.riscauthority.co.uk)

2022 © The Fire Protection Association

Administered by the Fire Protection Association

Cover Image of steel sprinkler pipes with threaded ends courtesy of Shawston International Ltd.