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The Building Regulations 2010

**Approved
Document**
Infrastructure for
electronic communications

R

**Volume 2: Physical infrastructure for high-speed
electronic communications networks**

**Requirement R1: High-speed-ready in-building physical
infrastructure**

2023 edition - For use in Wales*

2023 edition

Draft consultation version – December 2022

This approved document supports Part R of Schedule 1 to the Building Regulations 2010.

This approved document R takes effect on ?? 2023 for use in Wales. It does not apply to work subject to a building notice, full plans application or initial notice submitted before that date, provided the work for each building is started before ?? 2023. Full detail of the transitional arrangements can be found in Circular Letter 0??/2023.

DRAFT

This approved document gives guidance for compliance with the Building Regulations for building work carried out in Wales.

Contents

The approved documents	1
The Building Regulations.....	3
Section 0 – Introduction	5
Section R1: High-speed-ready in-building physical infrastructure	6
Performance	6
Section 1: In-building physical infrastructure	7
Introduction	7
Application	7
Ductwork for copper and fibre-optic cables	8
Satellite and wireless communications	10
Further information	11
Appendix A:.....	12
Appendix B: Documents referred to	13

DRAFT

The approved documents

What is an approved document?

This Approved Document, which takes effect on ?? 2023, has been approved and issued by the Welsh Ministers to provide practical guidance on ways of complying with the **requirements of Part R** of the Building Regulations 2010 for Wales, as amended, which are referred to throughout the remainder of this document as ‘the Building Regulations’.

These approved documents give guidance on each of the technical parts of the regulations and on regulation 7 (see the back of this document). The approved documents provide guidance for common building situations.

It is the responsibility of those carrying out building work to meet the requirements of the Building Regulations 2010. Although it is ultimately for the courts to determine whether those requirements have been met, the approved documents provide practical guidance on potential ways to achieve compliance with the requirements of the regulations in Wales.

Although approved documents cover common building situations, compliance with the guidance set out in the approved documents does not provide a guarantee of compliance with the requirements of the regulations because the approved documents cannot cater for all circumstances, variations and innovations. Those with responsibility for meeting the requirements of the regulations will need to consider for themselves whether following the guidance in the approved documents is likely to meet those requirements in the particular circumstances of their case.

Note that there may be other ways to comply with the requirements than the method described in an approved document. If you prefer to meet a relevant requirement in some other way than described in an approved document, you should seek to agree this with the relevant Building control body at an early stage.

Where the guidance in the approved document has been followed, a court or inspector will tend to find that there is no breach of the regulations. However, where the guidance in the approved document has not been followed, this may be relied upon as tending to establish breach of the regulations and, in such circumstances, the person carrying out building works should demonstrate that the requirements of the regulations have been complied with by some other acceptable means or method.

In addition to guidance, some approved documents include provisions that must be followed exactly, as required by regulations or where methods of test or calculation have been prescribed by the Welsh Ministers.

Each approved document relates only to the particular requirements of the Building Regulations 2010 that the document addresses. However, building work must also comply with all other applicable requirements of the Building Regulations 2010 and all other applicable legislation.

How to use this approved document

This document uses the following conventions.

- a. Text against a grey background is an extract from the Building Regulations 2010 or the Building (Approved Inspectors etc.) Regulations 2010 (both as amended). These extracts set out the legal requirements of the regulations.
- b. **Key terms, printed in blue**, are defined in Appendix A.
- c. References are made to appropriate standards or other documents, which can provide further useful guidance. When this approved document refers to a named standard or other reference document, the standard or reference has been clearly identified in this document. Standards are highlighted in **bold** throughout. The full name and version of the document referred to is listed in Appendix B (standards) or Appendix C (Documents). However, if the issuing body has revised or updated the listed version of the standard or document, you may use the new version as guidance if it continues to address the relevant requirements of the Building Regulations.
- d. Standards and technical approvals also address aspects of performance or matters that are not covered by the Building Regulations and may recommend higher standards than required by the Building Regulations. Nothing in this approved document precludes you from adopting higher standards.
- e. Additional *commentary in italic* text appears after some numbered paragraphs. This commentary is intended to assist understanding of the immediately preceding paragraph or sub-paragraph, or to direct readers to sources of additional information, but is not part of the technical guidance itself.

User requirements

The approved documents provide technical guidance. Users of the approved documents should have adequate knowledge and skills to understand and apply the guidance correctly to the building work being undertaken.

Where you can get further help

If you are not confident that you possess adequate knowledge and skills to apply the guidance correctly or if you do not understand the technical guidance or other information in this approved document or the additional detailed technical references to which it directs you, you should seek further help. Help can be obtained through a number of routes, some of which are listed below.

- a. If you are the person undertaking the building work: either from your local authority building control service or from an approved inspector
- b. If you are registered with a competent person scheme: from the scheme operator
- c. If your query is highly technical: from a specialist or an industry technical body for the relevant subject.

The Building Regulations

The following is a high-level summary of the Building Regulations relevant to most types of building work. Where there is any doubt you should consult the full text of the regulations, available at www.legislation.gov.uk.

Building work

Regulation 3 of the Building Regulations defines 'building work'. Building work includes among other things:

- a. the erection or extension of a building
- b. the provision or extension of a controlled service or fitting in or in connection with a building
- c. the material alteration of a building or a controlled service or fitting.

Regulation 4 states that building work should be carried out in such a way that, when work is complete:

- a. For new buildings or work on a building that complied with the applicable requirements of the Building Regulations: the building complies with the applicable requirements of the Building Regulations.
- b. For work on an existing building that did not comply with the applicable requirements of the Building Regulations:
 - (i) the work itself must comply with the applicable requirements of the Building Regulations and
 - (ii) the building must be no more unsatisfactory in relation to the requirements than before the work was carried out.

Material change of use

Regulation 5 defines a 'material change of use' in which a building or part of a building that was previously used for one purpose will be used for another.

The Building Regulations set out requirements that must be met before a building can be used for a new purpose. To meet the requirements, the building may need to be upgraded in some way.

Materials and workmanship

In accordance with regulation 7, building work must be carried out in a workmanlike manner using adequate and proper materials. Guidance on materials and workmanship is given in Approved Document 7.

Independent third-party certification and accreditation

Independent schemes of certification and accreditation of installers can provide confidence that the required level of performance for a system, product, component or structure can be achieved.

Building control bodies may accept certification under such schemes as evidence of

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compliance with a relevant standard. However, a Building control body should establish before the start of the building work that a scheme is adequate for the purposes of the Building Regulations.

Notification of work

Most building work and material changes of use must be notified to a Building control body unless one of the following applies.

- a. It is work that will be self-certified by a registered competent person or certified by a registered third party.
- b. It is work exempted from the need to notify by regulation 12(6A) of, or Schedule 4 to, the Building Regulations.

Responsibility for compliance

People who are responsible for building work (e.g., agent, designer, builder, installers and the building owner) must ensure that the work complies with all applicable requirements of the Building Regulations. The Building Regulations can be contravened by not following the correct procedures or not meeting the technical performance requirements. If the building owner or those responsible for the works contravene the Building Regulations, the local authority may prosecute them in the magistrates' court.

Section 0 – Introduction

0.1 This approved document, Approved Document R, Volume 2, contains the following sections:

Section 1: High-speed-ready in-building physical infrastructure

Appendix A: Key terms

Appendix B: Documents referred to

0.2 This approved document provides guidance on how to comply with the requirements for [in-building physical infrastructure for high-speed electronic communication networks](#) when new buildings are erected or when existing buildings are subject to [major renovation works](#) (but requirement R1 does not apply where requirement RA1 applies, e.g. when new dwellings are erected).

0.3 A separate approved document, Approved Document R Volume 1, provides guidance on how to comply with the requirement to install gigabit-ready physical infrastructure and a connection to a gigabit-capable public electronic communications network when new dwellings or a building containing one or more dwellings are erected.

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Section R1: High-speed-ready in-building physical infrastructure

This section deals with requirement R1 from Part R of Schedule 1 to the Building Regulations 2010.

Requirement	
<i>Requirement</i>	<i>Limits on application</i>
Regulations to be amended as necessary post consultation.	

Performance

In the Welsh Ministers' view, a building will meet requirement R1 if it is designed and constructed so that high-speed electronic communications networks can be installed in the future.

Section 1: In-building physical infrastructure

Introduction

1.1 Requirement R1 applies to new buildings and to existing buildings that are subject to [major renovation works](#), including existing dwellings subject to such works. See paragraph 1.5 for types of building and building work that are exempt. Requirement R1 does not apply where requirement RA1 applies, e.g., when a new dwelling or a building containing one or more dwellings is erected.

1.2 Requirement R1 is to provide the [in-building physical infrastructure](#) so that, in future, copper or fibre-optic cables or wireless devices capable of delivering broadband speeds greater than 30 Mbps can be installed.

Note: A standard copper telephone cable, when connected to a service provider's fibre network, can deliver broadband speeds up to 70 Mbps.

1.3 The requirement is to provide only the [in-building physical infrastructure](#), from the service provider's [Access point](#) to the occupier's [network termination point](#). Multi-dwelling buildings that are subject to [major renovation works](#) must be equipped with a common [Access point](#) capable of serving all the dwellings within the building.

1.4 It is not a requirement to provide any network cabling or equipment, or any [in-building physical infrastructure](#) that extends internally beyond the [network termination point](#). Nor is it a requirement to provide any external or site-wide infrastructure beyond the [Access point](#) or common [access point](#). The developer and broadband service provider should agree who will install such external infrastructure.

Application

1.5 Requirement R1 does not apply to the following types of building or building work.

- a. The erection of a new dwelling described in requirements RA1 and RA2 for gigabit-ready physical infrastructure and gigabit-capable connections (see Approved Document R Volume 1: Physical infrastructure and network connection for new dwellings). A new dwelling may be a dwelling- house or a flat in a building that contains one or more dwellings.

Dwellings include the following:

- i. new housing developments
 - ii. self-build new dwellings
 - iii. new dwellings in mixed-use developments (including live/work units, e.g., a flat (dwelling) that is a workplace for people who live there, and for people who do not live there).
- b. Buildings and work described in Classes 2 to 7 of Schedule 2 (Exempt buildings and work) to the Building Regulations – for example, sheds, domestic greenhouses, garages, conservatories and other small detached buildings with no sleeping accommodation.

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- c. Buildings included in the schedule of monuments maintained under section 1 of the Ancient Monuments and Archaeological Areas Act 1979.
- d. Buildings for which compliance with requirement R1 would unacceptably alter their character or appearance and that are either of the following:
 - i. listed in accordance with section 1 of the Planning (Listed Buildings and Conservation Areas) Act 1990
 - ii. in a conservation area designated in accordance with section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990.
- e. Buildings occupied by the Ministry of Defence or the armed forces of the Crown, or otherwise occupied for purposes connected to national security.
- f. Buildings in isolated areas where the prospect of a high-speed connection is considered too remote to justify equipping the building with [high-speed-ready in-building physical infrastructure](#) or an [Access point](#) or common [Access point](#). For example, areas that are so isolated that no duty is placed on a communications provider (under the Electronic Communications (Universal Service) Order 2003) to meet the full cost of installing a telephone line to the building.
- g. [Major renovation works](#) if the cost of compliance with requirement R1 would be disproportionate to the benefit gained. A person wishing to take advantage of this exemption would need to demonstrate to a building control body that in the particular case the cost of compliance would be unreasonable, taking into account the work required and the available alternative means of high-speed broadband delivery.

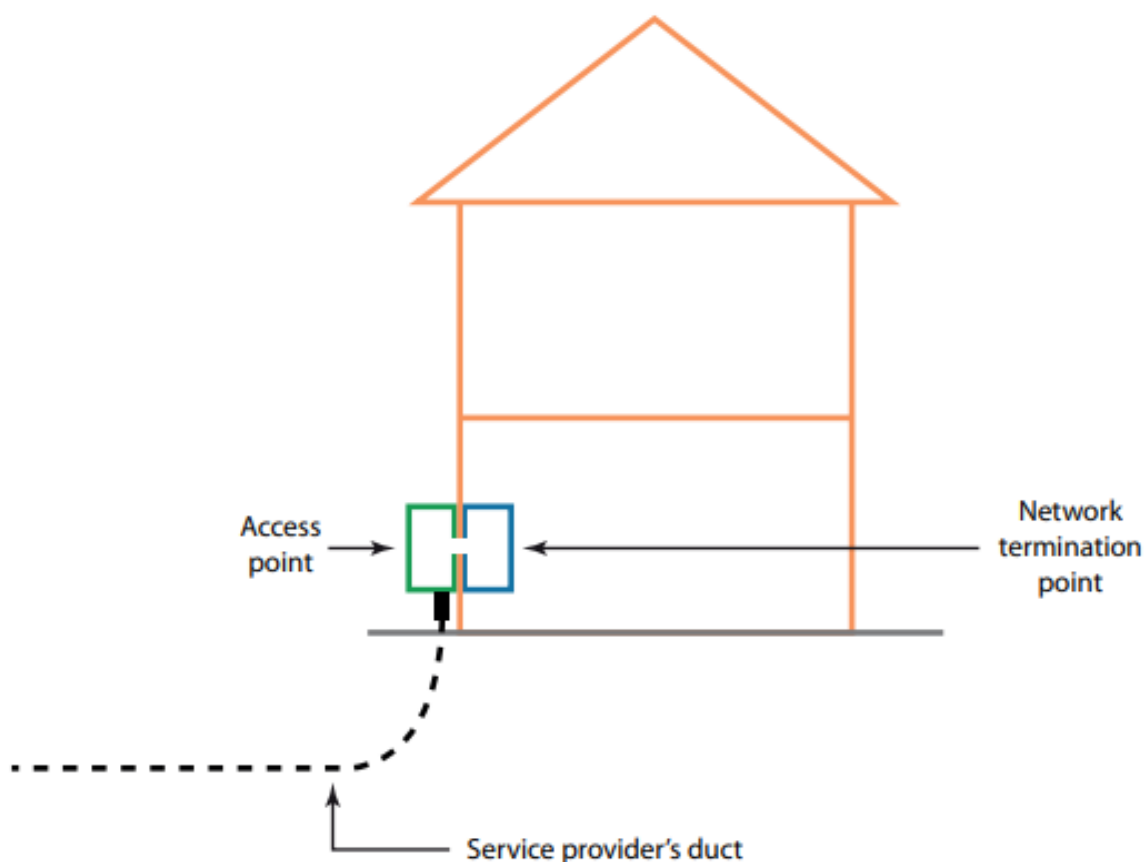
Ductwork for copper and fibre-optic cables

- 1.6** A suitable position for at least one [network termination point](#) should be identified for the erection of a new building other than a dwelling, for an existing building (including an existing individual dwelling) that is subject to [major renovation works](#), and for each dwelling in an existing multi-dwelling building that is subject to [major renovation works](#). Suitable ducting should be provided to connect all such [network termination points](#) to an appropriate [Access point](#) or common [Access point](#).
- 1.7** Diagram 1¹ shows a possible arrangement for the physical infrastructure for a single-occupancy building. The [Access point](#) is on an outside wall and is connected by a through-wall duct² to a [network termination point](#).

¹ The diagrams show underground ducts for network cables outside the building, but this does not preclude the use of overhead lines.

² For copper cables, the duct may simply be a hole drilled in the wall. Note the downwards slope to the outside to prevent rainwater ingress.

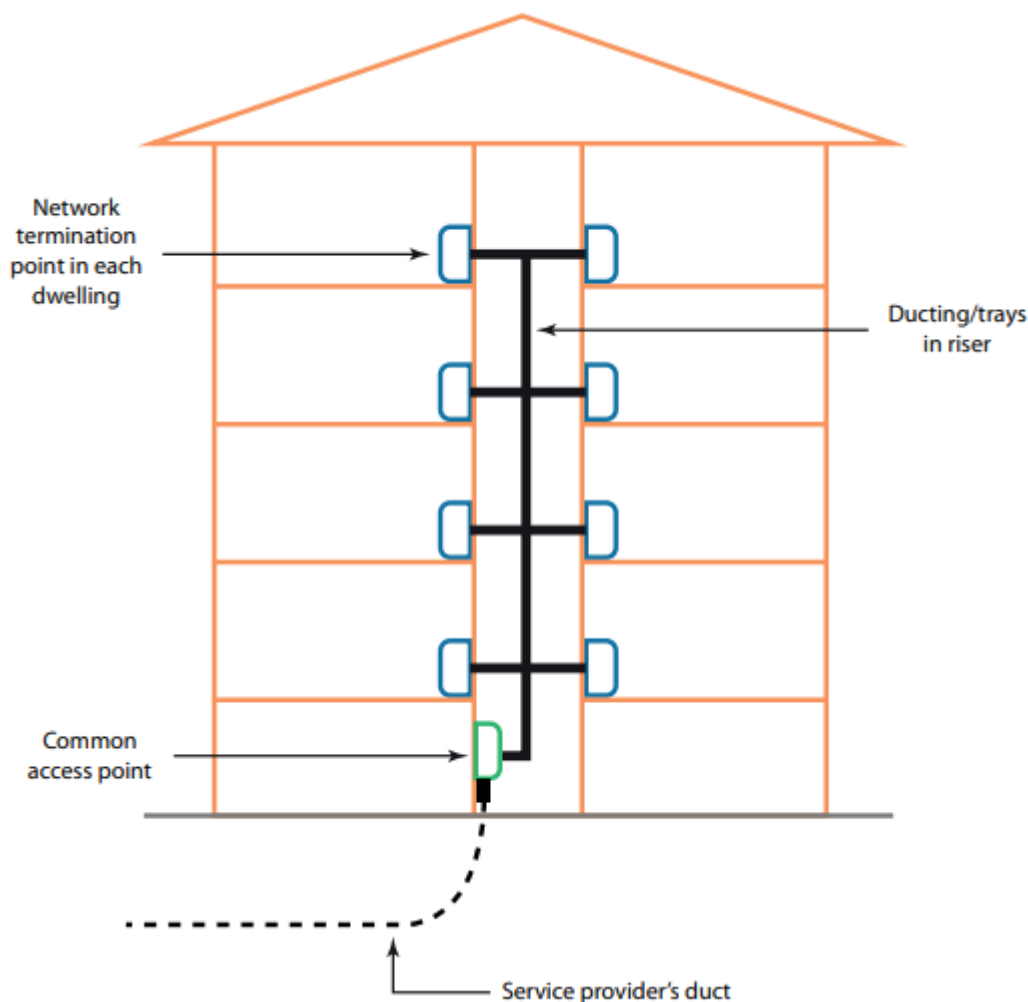
Diagram 1: Schematic example of the in-building physical infrastructure for a single-occupancy building



Note: The diagram shows future connectivity by underground ducts for network cables outside the building. However, it should be noted that alternative forms of connectivity may be used.

- 1.8 A multi-dwelling building subject to [major renovation works](#) should have a common [Access point](#) and dedicated vertical and horizontal service routes so that service providers can connect from the common [Access point](#) to the [network termination point](#) in each dwelling. Diagram 2 shows a possible arrangement for the physical infrastructure for a multi-dwelling building.
- 1.9 The [in-building physical infrastructure](#) should comply with all relevant requirements of the Building Regulations. These include the requirements of Part B of Schedule 1 to the Building Regulations (Fire safety), including the need for fire stopping at penetrations through compartment walls, floors and ceilings, and the ban on combustible materials in the external walls of relevant buildings (regulation 7 of the Building Regulations).

Diagram 2: Schematic example of the in-building physical infrastructure for a multi-dwelling building that is subject to major renovation works



Note: The diagram shows future connectivity by underground ducts for network cables outside the building. However, it should be noted that alternative forms of connectivity may be used.

1.10 This guidance (Approved Document R, Volume 2: Physical infrastructure for high-speed electronic communications networks) applies also to dwellings subject to [major renovation works](#) in mixed-use multi-unit buildings. The requirement is for the common [Access point](#) to serve each of the dwellings within the building. Other units may also use the common [Access point](#), or they may have an entirely separate [in-building physical infrastructure](#).

Satellite and wireless communications

1.11 The design of the [in-building physical infrastructure](#) should take account of satellite

and wireless technologies where there is evidence that the required network speeds could be met.

Further information

1.12 Publicly Available Specification (PAS) 2016, *Next generation access for new build homes – Guide*, provides best practice guidance on infrastructure and cabling for broadband networks in new homes.

Note: Developers should refer to PAS 2016 and manufacturers' specifications for guidance on the duct dimensions, bending radii etc. required to allow copper and fibre optic cables to be installed in the future.

1.13 The NHBC Foundation's *The Connected Home* guide covers the benefits of current and future smart technologies. The guide recommends that housebuilders 'future proof' new homes by including additional hard wiring.

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Appendix A:

Key terms

The following are key terms used in this document and defined in regulation xxx of the Building Regulations 2010 (as amended):

Access point A physical point, located inside or outside the building, accessible to undertakings providing or authorised to provide public communications networks, where connection to the high-speed-ready in-building physical infrastructure, or as the case requires the gigabit- ready physical infrastructure, is made available.

High-speed electronic communications network An electronic communications network which is capable of delivering broadband access services at speeds of at least 30 Mbps.

High-speed-ready In-building physical infrastructure In-building physical infrastructure intended to host elements, or enable delivery, of high-speed electronic communications networks.

In-building physical infrastructure Physical infrastructure or installations at the end-user's location, including elements under joint ownership, intended to host wired or wireless access networks, where such access networks are capable of delivering electronic communications services and connecting the building **Access point** with the network termination point.

Major renovation works Works at the end-user's location encompassing structural modifications of the entire in-building physical infrastructure, or of a significant part of it.

Network termination point A physical point at which an occupier is provided with access to high- speed electronic communications networks.

Note: The 'occupier' is the subscriber to the broadband service. The termination point is typically inside the building but may be outside the building for wireless connections.

Appendix B: Documents referred to

Legislation

(available via www.legislation.gov.uk)

Ancient Monuments and Archaeological Areas Act 1979, c. 46

Building Regulations 2010, SI 2010/2214

Planning (Listed Buildings and Conservation Areas) Act 1990, c. 9

Standards

PAS 2016 Next generation access for new build homes – Guide [2010]. Publicly Available Specification produced by BIS (as was, now BEIS) and the British Standards Institution (BSI). Available at <https://www.gov.uk/government/publications/pas-2016-2010-next-generation-access-for-new-build-homes-guide>

Other documents

NHBC Foundation

(www.nhbcfoundation.org)

NF67 *The Connected Home: Designing and Building Technology into Today's New Homes* [2016]. Available at <https://www.nhbcfoundation.org/publication/the-connected-home/>

List of Approved Documents

This approved document is one of a suite of approved documents that have been published to give guidance on how to meet the Building Regulations. You can find the date of the edition approved by Welsh Ministers at <https://gov.wales/building-regulations-approved-document>

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