

Building Regulations, Codes and Standards

**A guide for safe, sustainable and
healthy development**

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Chapter 1

Introduction

1.1. The importance of building regulations, codes and standards

Rules setting out standards to which buildings should be constructed have existed in one form or another for thousands of years. The earliest known standards applied to the built environment are contained in the Code of Hammurabi, written around 1754 BC – Hammurabi was the sixth king of the first Babylonian dynasty (centred around modern-day Iraq). The Code contained 282 laws inscribed on 12 stone tablets, which were placed in public view. Six of the laws covered the built environment.

Over recent centuries, regulations, codes and standards have been developed around the world to varying degrees as legal instruments, the initial intention being to ensure that buildings provided socially acceptable levels of health, safety and welfare for building occupants and the surrounding community. As society has continued to modernise and grow, building standards have incrementally broadened in scope to cover an array of technical areas, including structural safety, fire safety, acoustics/noise control, ventilation, access/facilities for disabled people and fuel/power conservation.

Since the latter half of the 20th century, and to differing levels on a country-by-country basis, protection of the environment has become an additional policy objective, with rapid population growth, rising energy needs, global warming and the depletion of natural resources emerging as large-scale and complex challenges. In the 21st century, regulations, codes and standards have never been more important as blueprints for safe, sustainable and healthy development. Accordingly, it has never been more important for those charged with procuring, designing, constructing and regulating buildings to have a good grasp of the principles that lie behind regulations, codes and standards, together with a clear understanding of their role in meeting a vast array of technical requirements.

1.2. Global challenges

The global population was comparatively small until relatively recently, with the one billion mark not being passed until the early 1800s. Currently, the world's population is more than 7.5 billion, with the United Nations (2020a) predicting that it could reach more than 11 billion by 2100. People are living longer – global average life expectancy increased by 5.5 years between 2000 and 2016 alone, the fastest increase since the 1960s (World Health Organization, 2020). Correlated with this continuing population boom and increase in life expectancy, by 2060, global building stock floor area is expected to double. This rate of development is equivalent to building the current building stock floor area of Japan every year from now until 2060 – it is important that such high levels of new development minimise the use of finite natural resources (Global Alliance for Buildings and Construction, 2019).

With the exception of 1998, 19 of the 20 warmest years on record have occurred since 2001 and the recent increase in extreme weather events around the world has demonstrated the devastating effects of global warming. The United Nations (UN) predicts that global temperatures will have risen by up to 5°C by 2100 (Miles, 2020). In 2020, following a record-breaking heatwave in Siberia, an international team of climate scientists found that the record average temperatures now being experienced were likely to

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Chapter 3

The Building Regulations 2010: legislative and procedural issues

3.1. Introduction

Since being introduced on 1 February 1966, building regulations in England have incrementally evolved through six subsequent versions (1972, 1976, 1985, 1991, 2000 and 2010). This evolution has seen regulations move away from containing a few hundred pages of self-contained prescriptive building standards towards the thousands of pages now contained in performance-based standards associated with approved documents and second-tier standards (developed by the BRE (Building Research Establishment), the BSI (British Standards Institution), the ISO (International Organization for Standardization), etc). Accordingly, building regulations have become a user of, rather than a repository for, building standards.

The Building Regulations 2010 are Statutory Instrument 2010 No. 2214. They are secondary legislation made by the Secretary of State under specific sections of primary legislation – the Building Act 1984, which is referred to within the regulations as '*the Act*'. Compliance must be shown with the minimum standards set out through the technical requirements (in functional terms) of the building regulations and not necessarily with the deemed approved solutions contained in approved documents. The regulations are split into ten parts and six schedules. The ten parts, each containing a number of regulations, essentially deal with terminology and procedural issues:

- Part 1 – General
- Part 2 – Control of Building Work
- Part 3 – Notices, Plans and Certificates
- Part 4 – Supervision of Building Work Otherwise than by Local Authorities
- Part 5 – Self-certification Schemes
- Part 6 – Energy Efficiency Requirements
- Part 7 – Water Efficiency
- Part 8 – Information to be Provided by the Person Carrying Out Work
- Part 9 – Testing and Commissioning
- Part 10 – Miscellaneous.

The six schedules describe the standards that must be met by building work and set out exemptions and amendments to the regulations:

- Schedule 1 – Requirements
- Schedule 2 – Exempt Buildings and Work
- Schedule 3 – Self-certification Schemes and Exemptions from Requirements to Give Building Notice or Deposit Full Plans
- Schedule 4 – Descriptions of Work where No Building Notice or Deposit of Full Plans Required
- Schedule 5 – Revocation of Regulations
- Schedule 6 – Consequential Amendments.

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Chapter 4

The Building Regulations 2010: functional requirements and technical solutions

4.1. Introduction

As discussed in Chapters 2 and 3, Schedule 1 of the Building Regulations 2010 sets out the technical requirements for building work to new and existing buildings in functional terms. Each set of technical requirements relevant to building work corresponds to a letter (e.g. Part A to Structure, Part B to Fire Safety, etc.) and each requirement is given a number (e.g. in Part A, A1 is Loading, A2 is Ground Movement, etc.). Functional requirements are often expressed in terms of *reasonable provision* rather than clear instruction (or prescription) against which to assess the suitability of a building design. Accordingly, approved documents are published to offer guidance on how to comply with each set of functional requirements relevant to a building project.

Guidance pertaining to which functional requirements are linked to different types of building work has been provided in Chapter 3. Concentrating on issues linked to full plans submissions for larger projects, Chapter 4 expands on the functional requirements contained in Schedule 1 of the Building Regulations 2010 and covers the technical guidance offered in approved documents. The chapter provides a brief overview of the functional requirements attributable to each part of Schedule 1, together with the structure and overriding objectives of each associated approved document. Chapter 4 is supplemented by digital checklists containing hyperlinks to the approved documents, regulations and second-tier standards referenced in the documents. Hyperlinks are also provided to useful websites not referenced in approved documents. In comparison to the extensive narrative contained in approved documents, the checklists offer a shortened one-stop reference to compliance with all relevant requirements of Schedule 1. They also serve as an indicator of the breadth and depth of the technical requirements/solutions of a performance-based system that has often served as a benchmark for other countries developing/introducing similar systems, and as a useful benchmark against which building standards examined in subsequent chapters can be compared.

Checklists (design, sustainability, compliance, etc.) have been used by different built environment disciplines for many years, enabling a word/term search facility across a single source of guidance and negating the need to constantly flick between dozens of separate documents. Although approved documents are now available as a collective volume, checklists can serve to strip out repeated/supporting narrative and expand on essential guidance in areas that regularly present problems/challenges. As users become more familiar with the technical issues covered in approved documents, checklists can be simplified (i.e. listing technical issues only, with a space to write notes if necessary as each is covered) and columns can be added in a work environment to tick off issues when they have been addressed. Where required, hyperlinks can be inserted to link users to a particular website or electronic copies of approved documents and second-tier references. Figure 4.1 shows an example excerpt from the type of checklist that might be used to tick off technical issues as they are addressed as part of a design.

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Chapter 5

International regulations, codes and standards

5.1. Introduction

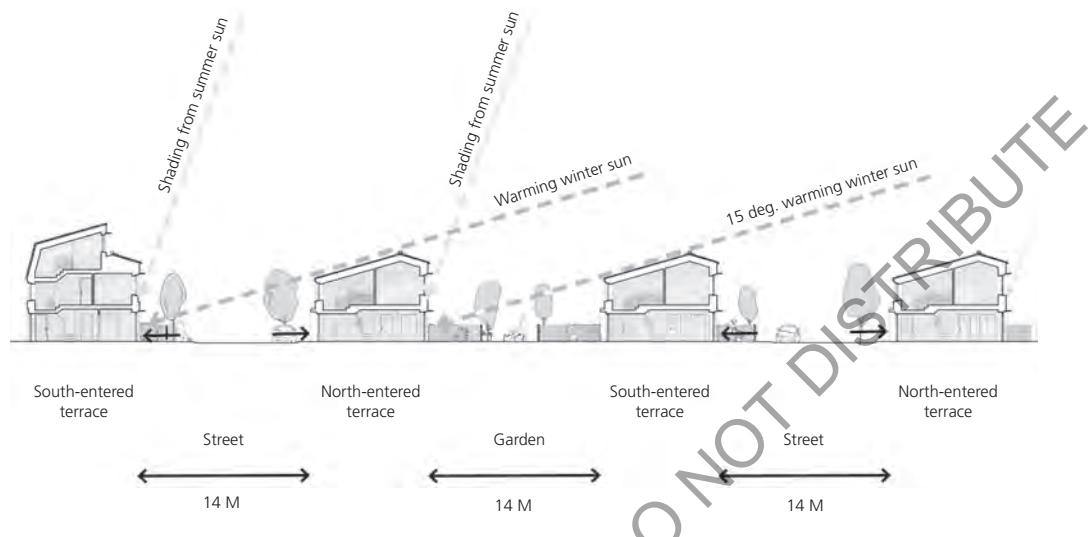
Chapters 2 to 4 have demonstrated how building regulations and standards have evolved throughout the centuries in England, and have set out their current scope. Despite the breadth and complexity of the building standards covered in Chapter 4 and its supplementary digital checklists, standards are clearly deficient in areas linked with sustainability, resource depletion, climate change and occupant well-being. Other developed countries around the world have similar stories to tell, their current performance-based building standards having evolved over many years for similar and/or differing reasons. As discussed in Chapter 1 (see section 1.4), many of the rationales for regulating can be described as instances of market failure – in England, if ever it were needed, reinforcement of the need to regulate the built environment has been provided through the fallout from the Grenfell Tower tragedy in 2017.

Globally, climate change is a clear and present rationale for regulation of the built environment, having been described by Nicholas Stern, one of the world's leading economists, as the greatest market failure the world has ever seen (Stern, 2006). In recent decades, natural disasters have affected 4.4 billion people, claimed 1.3 million lives, and caused \$2 trillion in economic losses, with building standards playing a crucial role in disaster risk reduction. Developed countries with mature building control systems have experienced 47 per cent of disasters globally, but have accounted for only 7 per cent of disaster fatalities, demonstrating the value of such systems internationally. But in addition to clear arguments to regulate internationally, economic arguments to dilute regulation would appear to be weakened by the fact that in member countries of the Organisation for Economic Co-operation and Development (OECD), obtaining planning and building consents has been shown to account for only 1.7 per cent of total construction cost on average (and as low as 0.6 per cent in Japan and 0.7 per cent in New Zealand). This contrasts with around 46 per cent in developing countries such as India (World Bank Group, 2016).

To demonstrate the lessons that might be learnt from the successes and failures of international regulatory frameworks for the built environment, this chapter looks at the experiences of eight OECD countries which, like England, are also members of the Inter-jurisdictional Regulatory Collaboration Committee (IRCC): the Netherlands, Scotland, Sweden, Canada, the United States, Australia, New Zealand and Japan.

In light of the range of government structures among the eight countries, there is diversity in the administration, development and structure of building regulations, codes and standards, which varies between governments, organisations working for governments and the private sector. Although performance-based building regulations are in use or under development in a growing number of countries around the world, it is difficult to gather reliable data to enable conclusions to be drawn on the overall value of building standards in terms of the success/failure of completed buildings (Conlon, 2019).

Figure 7.3 Section through Norwich City Council's Goldsmith Street development, which utilises passive solar design



statutory building regulations and codes will need to undergo radical change if beneficial innovations such as passive solar design are to become mainstream, as they will surely need to become if the built environment is to decarbonise and meet the needs of current and future communities.

7.6. SDG 11 – Sustainable cities and communities

Buildings are the foundations of cities and communities and are key to their long-term sustainability but, as touched upon in Chapter 6, voluntary rating schemes have moved beyond the certification of single buildings, developing standards that facilitate the formation of sustainable neighbourhoods and districts. As a result, voluntary building standards cross the boundaries between those associated with statutory building regulations and codes (which normally cover buildings only) and planning policies/frameworks (which cover development sites as a whole).

SDG 11 involves making human settlements inclusive, safe and resilient, each of which play an important part in sustainable development as a whole – each of these three requirements is now considered in turn.

7.6.1 Inclusivity

The 2030 Agenda for Sustainable Development is built on the overriding principle of leaving no one behind, implicitly promoting the inclusion of people with disabilities. Disability is defined as a limitation in a functional domain that arises from the interaction between a person's intrinsic capacity, and environmental and personal factors (Department of Economic and Social Affairs of the UN Secretariat, 2018). To make cities and other human settlements inclusive, all people will need to have support to enable them to live in and be part of cities and communities.

Fifteen per cent of the world's population is made up of people with a wide range of disabilities, who are regularly denied access to basic services such as housing, public spaces, transportation, sanitation/water, health, education and disaster response/assistance. Policy commitments made by UN member states in