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Protection of below ground structures against water ingress — Code of practice

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Summary of pages
This document comprises a front cover, an inside front cover, pages I to IV, pages 1 to 53, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 March 2022. It was prepared by Technical Committee B/526, *Geotechnics*. A list of organizations represented on this committee can be obtained on request to its committee manager.

Supersession

This British Standard supersedes BS 8102:2009, which is withdrawn.

Information about this document

This British Standard was originally published in 1990, superseding the earlier CP102 (1973). This is a full revision of the standard, and introduces the following principal changes:

a) a number of recent developments are addressed, which are important when specifying, designing and constructing below ground structures, including:

   1) more deep construction in congested urban areas;

   2) an increase in the provision of residential basements;

   3) development and use of new materials for waterproofing;

b) a more detailed assessment is provided of the risks inherent in below ground construction and how these might best be addressed.

It is noted that the figures used in this document are only representative of different installation methods, and are not to be translated directly into practice without first checking all the parameters specific to the installation.

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As a code of practice, this British Standard takes the form of recommendations and guidance. It is not to be quoted as if it were a specification. Users are expected to ensure that claims of compliance are not misleading.

Users may substitute any of the recommendations in this British Standard with practices of equivalent or better outcome. Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

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1 Scope

This British Standard gives recommendations and provides guidance on methods of dealing with and preventing the entry of water from external sources into structures that are partly or wholly below ground.

It covers the use of:

a) waterproofing barrier materials applied to the structure;

b) structurally integral watertight construction; and

c) drained cavity construction.

It refers to the evaluation of groundwater conditions and consideration of harmful ground gases, risk assessment and how to manage these risks in below ground structures.

This British Standard includes guidance on the drainage outside the structure and recognizes the risk of water entering a structure through openings.

NOTE 1 Structures that are partly or wholly below ground can include occupied rooms, tunnels, plantrooms, car parks, residential or commercial spaces, and service ducts. These structures can consist of any combination of solid masonry, concrete and steel as the primary ground retaining structures. This British Standard is relevant to structures below buildings or that are fully underground and covered by buried roofs, podium decks, or tunnel roofs.

Structures are generally characterized as "deep" if they have more than one storey below ground level, or "shallow" if they have only a single storey below ground. This British Standard is applicable to both.

NOTE 2 The principles for achieving waterproof underground spaces in this standard are relevant to most forms of underground space. However, it is recognized that deep tunnels, rock caverns, mines, pipelines and some water containment structures might follow design principles that are different to the approach set out in this British Standard. In these types of structures, the acceptable levels of water ingress can be very different to those defined in this standard.

NOTE 3 Standards and guidance for the protection of buildings against flooding by means of property level flood resistance and resilience measures are given in BS 85500.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document[1)]. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 5930, *Code of practice for ground investigations*

BS 6100-3, *Building and civil engineering — Vocabulary — Part 3: Civil engineering — General*

BS 8000-2 (all sections), *Workmanship on building sites — Part 2: Code of practice for concrete work*

BS 8204-1, *Screeds, bases and in situ floorings — Part 1: Concrete bases and cement sand levelling screeds to receive floorings — Code of practice*

BS EN 1504 (all parts), *Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality control and evaluation of conformity*

BS EN 1542, *Products and systems for the protection and repair of concrete structures — Test methods — Measurement of bond strength by pull-off*

1) Documents that are referred to solely in an informative manner are listed in the Bibliography.

