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BS 5395-1:2010



BSI Standards Publication

Stairs –

Part 1: Code of practice for the design of stairs with straight flights and winders

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 34, an inside back cover and a back cover.

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Publishing information

This part of BS 5395 is published by BSI and came into effect on 28 February 2010. It was prepared by Technical Committee B/208, *Stairs and walkways*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This part of BS 5395 supersedes BS 5395-1:2000, which is withdrawn.

Relationship with other publications

BS 5395 is published in three parts, as follows:

- *Part 1: Code of practice for the design of straight stairs and winders;*
- *Part 2: Code of practice for the design of helical and spiral stairs;*
- *Part 4: Code of practice for the design for stairs for limited access¹⁾.*

BS 5395-1 offers guidance on straight stairs and winders with nosings with a straight edge, and where the straight stairs have a walking line perpendicular to the nosings.

Information about this document

The standard has been updated to reflect the simplifying of stair criteria to a range of rise and going designed to provide safer stairs of general use. There is no criterion on pitch or comfortable gait ($g+2r$)

Useful information regarding sports grounds can be found in BS EN 13200-1 and in the *Guide to Safety at Sports Grounds* [1].

Use of this document

As a code of practice, this part of BS 5395 takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this part of BS 5395 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.

Where methods of design, materials, components and methods of construction are not covered by this standard, or by any other British Standard, this is not necessarily to be regarded as discouraging their use.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations 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.

¹⁾ In preparation.

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standard. The word "may" is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word "can" is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this standard. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Attention is drawn to the requirements of the Building Regulations for England and Wales, [2] The Building Regulations (Northern Ireland) [3], The Building (Scotland) Regulations [4] and The Workplace (Health, Safety and Welfare) Regulations, 1992 [5].

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In the United Kingdom there are over 500 deaths each year from stair related accidents in the home. It is estimated that a further 250 000 non-fatal accidents take place on stairs in the home each year, which are serious enough to cause the victim to visit their General Practitioner or Hospital Accident and Emergency department. This is equivalent to a domestic accident on stairs occurring every 2.5 minutes. In addition, there are approximately 100 000 accidents on stairs in leisure environments and a further 1 000 plus in the workplace. This is equivalent to a fall on stairs in the UK occurring every 90 seconds. In 2003, there were over twice as many deaths due to falls on or from steps and stairs as there were due to exposure to smoke, fire and flames in England and Wales.

Young children and elderly people are particularly at risk from falls on stairs. Nearly 20% of the non-fatal domestic accidents on stairs happen to children less than 4 years of age, and 70% of the fatal accidents occur to adults over 65 years of age.

The most important aspects of stair design that affects the safety of users are the tread dimensions. If a going is too small to easily place a significant proportion of the foot upon, it increases the likelihood of an overstep. Research suggests that large oversteps, coupled with the type of material on the stair nosing, can lead to a slip in descent. If there are no suitable handrails, or the person cannot reach them in time, this slip can lead to a serious incident.

It is also important that stairs are designed and constructed to enable use by people with as wide range of ability as practical, recognizing that the ability to use steps can vary significantly. There is a correlation between ease of use and safety, with stairs that offer passage without undue effort or exertion further reducing the potential for incidents that might result in injury.

The uniformity of steps is also very important, since even a small decrease in the size of a going can lead to a significant increase in the likelihood of a large overstep. This small difference in the size of goings is particularly important if the going is less than 300 mm.

Under normal walking conditions the placement of feet on successive treads is not completely consistent, but instead there is limited variation within foot placement on a stair tread. Therefore, there is a possibility that a large overstep can occur when descending any stair, although this risk is dramatically reduced by increasing the size of the going, and by limiting the variation between successive treads. The more frequently a stair is used, the greater the probability of a large overstep occurring. For this reason, any stair subject to frequent daily use is designed and built to a different specification to one that is only used occasionally. There are secondary issues which require stair goings used by the general population of a building to be larger than those that are installed in a private dwelling, for example the need for people who have difficulty walking to be able to stop and rest on any of the treads, to catch their breath or wait for dizziness to pass before climbing up. To allow this to occur on any tread, rather than forcing them to ascend until they reach a landing, suggests a minimum going of 300 mm.

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This part of BS 5395 gives recommendations for the design of stairs with straight flights, including landings and winders for all types of building and industrial walkways.

NOTE 1 External walkways are covered in BS 8300.

It does not apply to steps or stairs which are not connected to a building, for example, those which are part of the surrounding landscape or which provide entry to a property. Whilst information within this standard is relevant to external stairs, a range of additional issues such as durability, performance in variable environmental conditions and the inconsistency of natural lighting can mean that application of this standard alone does not address issues of safety and convenience in external situations.

NOTE 2 BS 8300 addresses these issues in more detail.

This standard does not cover spiral or helical stairs, which are addressed within BS 5395-2. Industrial stairs are covered in BS 4592-0.

The standard does not apply to ramps, whether stepped or not, nor to ladders nor to steps within swimming pools.

This standard does not cover limited-use stairs e.g. stairs to be used in loft or basement conversions, which will be addressed within BS 5395-4²⁾.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 1134-1, *Assessment of surface texture – Part 1: Methods and instrumentation*

BS 5266-1, *Emergency lighting – Part 1: Code of practice for the emergency lighting of premises*

BS 5395-2, *Stairs, ladders and walkways – Part 2: Code of practice for the design of helical and spiral stairs*

BS 6180, *Barriers in and about buildings – Code of practice*

BS 6262-4, *Glazing for buildings – Part 4: Code of practice for safety related to human impact*

BS 7976-2, *Pendulum testers – Part 2: Method of operation*

BS 9999, *Code of practice for fire safety in the design, management and use of buildings*

3 Terms and definitions

For the purposes of this part of BS 5395, the terms and definitions given in Annex A and the following apply.

NOTE Some of the terms are illustrated in Figure 1, which is solely for that purpose and has no other significance.

²⁾ In preparation.