

BS 5395-4:2011



BSI Standards Publication

Code of practice for the design of stairs for limited access

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Summary of pages

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Foreword

Publishing information

This part of BS 5395 is published by BSI and came into effect on 30 September 2011. 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.

Relationship with other publications

BS 5395 is published in three parts, as follows:

- *Part 1: Code of practice for the design of stairs with straight flights and winders;*
- *Part 2: Code of practice for the design of helical and spiral stairs;*
- *Part 3: Code of practice for the design of industrial type stairs, permanent ladders and walkways (declared obsolescent);*
- *Part 4: Code of practice for the design for stairs for limited access.*

Information about this document

BSI committee, B/208, takes collective responsibility for its preparation. The committee wishes to acknowledge the contribution of the Building Research Establishment (BRE), whose report 202591 [1] was used as the basis for this standard.

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.

The word "should" is used to express recommendations of this 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] and *The Building (Scotland) Regulations* [4].

Introduction

In the United Kingdom there are over 500 deaths each year¹⁾ from stair related accidents in the home. It is estimated that a further 250 000 non-fatal accidents²⁾ 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. From 2003 onwards, 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.

The uniformity of steps is also very important, because 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.

1 Scope

This part of BS 5395 gives recommendations for the design of stairs suitable for use in limited access situations for dwellings only. Such stairs include straight, spiral and alternating tread stair designs.

Limited access for industrial settings is covered in BS EN ISO 14122, BS 5395-3³⁾ and BS 4211. These standards apply to all limited access situations for non-domestic buildings.

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 5395-1:2010, *Stairs, ladders and walkways – Part 1: Code of practice for the design, construction and maintenance of straight stairs and winders*

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

¹⁾ ONS Mortality database (Twentieth Century Mortality ICD-10 code W10).

²⁾ 24th (Final) report of the home and leisure accident surveillance system (HASS).

³⁾ Declared obsolescent.

BS EN 1930, *Child care articles – Safety barriers – Safety requirements and test methods*

3 Terms and definitions

For the purposes of this part of BS 5395, the terms and definitions given in BS 5395-1 and BS 5395-2 and the following apply.

3.1 private stair

stair within a dwelling, intended for use only by occupants and visitors

NOTE A private stair is commonly steeper and narrower than a normal-use stair, saving space at the expense of both safety and amenity.

3.2 stair for limited access

stair suitable for use in stair enclosures that are too small for a private stair

3.3 alternating tread stair

stair constructed of alternate handed steps with part of the tread cut away, forming a paddle-shape tread

4 Safety

4.1 Handrails

COMMENTARY ON 4.1

Use of a suitably designed handrail can prevent users from losing their balance when on the stair and can also assist users to ascend by pulling themselves up the stairs. A handrail can also help users to regain balance in the event of a fall, reducing the severity of the injuries that might result.

The need for a handrail on both sides of the stair comes from two sources. Firstly, to allow users a choice of support when ascending and descending stairs, it is preferable to have a handrail on both sides. This can be essential for people using a walking stick or cane, or who might be weaker on one side. The other reason is that having two handrails reduces the chances of a serious incident happening on a stair.

Stairs for limited access should have two handrails, one on each side of the stair, with a minimum distance between the handrails of 600 mm. Where space allows, the width should be increased, ideally to more than 800 mm (this allows both handrails to be used at the same time). Size and shape of handrails should be designed in accordance with BS 5395-1.

The height of the handrails above the pitch line should be between 900 mm and 1 000 mm, so that the handrails provide support in descent and can be used to assist users in climbing the stairs.

The handrail height on both sides of the flight should be identical.

4.2 Guarding

4.2.1 General

The height of guarding should be as recommended in BS 5395-1.

4.2.2 Safety for children

NOTE 1 Stairs for limited access are unsuitable for use by children under two years of age.