Section 1

STAIRS AND LADDERS

Steepness of stairs

Rise and going

1.1 The requirement will be satisfied if, in a flight, the steps all have the same rise and the same going to the dimensions shown in 1.3 or comply with 1.4 and 1.5.

1.2 Three categories of stairs are considered in this Approved Document:

"Private" intended to be used for only one dwelling.

"Institutional and assembly" serving a place where a substantial number of people will gather.

"Other" in all other buildings.

1.3 Indication of the practical limits for rise and going, for each category of stair which satisfies the requirements, is given below.

a. **Private stair:** Any rise between 155mm and 220mm used with any going between 245mm and 260mm, or

Any rise between 165mm and 200mm used with any going between 223mm and 300mm.

b. **Institutional and assembly stair:** Any rise between 135mm** and 180mm** used with any going between 280mm and 340mm.

c. **Other stair:** Any rise between 150mm** and 190mm** used with any going between 250mm and 320mm.

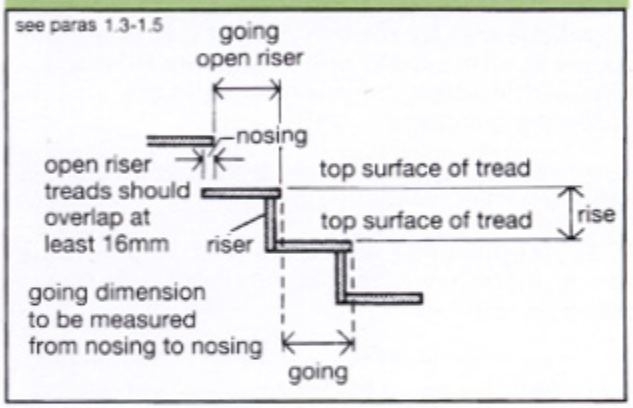
1.4 Table 1 gives the maximum rise and minimum going for the three stair categories.

Table 1 Rise and going

		Maximum Rise (mm)	Minimum Going (mm)
1.	Private stair	220†	220†
2.	Institutional and assembly stair	180**	280*
3.	Other stair	190**	250

Note:
† The maximum pitch for a private stair is 42°
* If the area of a floor of the building is less than 100m², the going may be reduced to 250mm
** For maximum rise for stairs providing the means of access for disabled people reference should be made to Approved Document M: Access and facilities for disabled people.

Diagram 1 Measuring rise and going



1.5 The normal relationship between the dimensions of the rise and going is that twice the rise plus the going (2R + G) should be between 550mm and 700mm.

Diagram 1 shows how to measure the rise and going (for steps with tapered treads, see also paragraphs 1.18 - 1.20).

1.6 In assembly buildings, the gangways may need to be at different pitches to maintain sightlines for spectators and this may affect the main stairs, etc.

The maximum pitch for gangways for seated spectators is 35°.

Alternative approach

1.7 The requirement for steepness of stairs can be met by following the relevant recommendations in BS 5395 *Stairs, ladders and walkways* Part 1: 1977 *Code of practice for the design of straight stairs:*

Construction of steps

1.8 Steps should have level treads. Steps may have open risers, but treads should then overlap each other by at least 16mm. For steps in buildings providing the means of access for disabled people reference should be made to Approved Document M: Access and facilities for disabled people.

1.9 All stairs which have open risers and are likely to be used by children under 5 years should be constructed so that a 100mm diameter sphere cannot pass through the open risers.

Headroom

1.10 A headroom of 2m is adequate on the access between levels (see Diagram 2). For loft conversions where there is not enough space to achieve this height, the headroom will be satisfactory if the height measured at the centre of the stair width is 1.9m reducing to 1.8m at the side of the stair as shown in Diagram 3.

Diagram 2 Measuring headroom

see para 1.10

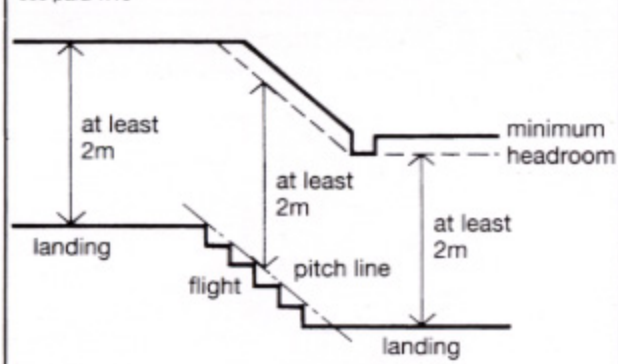
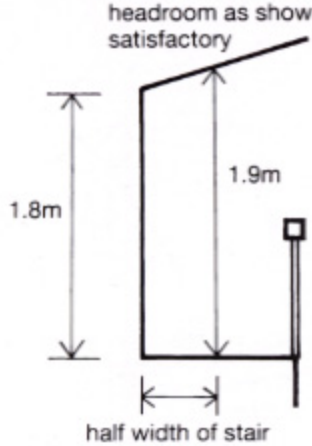


Diagram 3 Reduced headroom for loft conversions

see para 1.10

Where there is not enough space to achieve 2m headroom reduced headroom as shown will be satisfactory



Width of flights

1.11 No recommendations for minimum stair widths are given. Designers should bear in mind the requirements for stairs which:

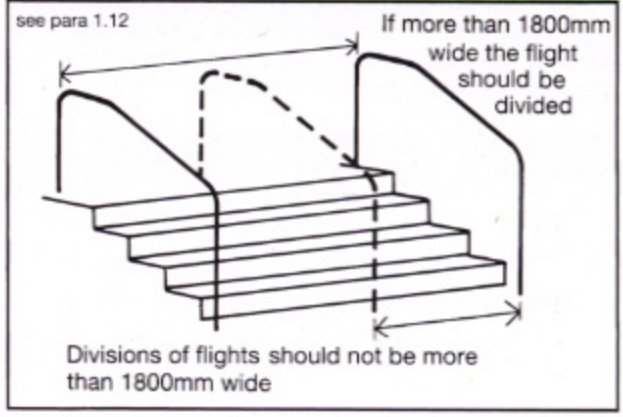
a. form part of means of escape, reference should be made to Approved Document B: Fire safety.

b. provide access for disabled people. reference should be made to Approved Document M: Access and facilities for disabled people.

1.12 A stair in a public building which is wider than 1800mm should be divided into flights which are not wider than 1800mm as shown in diagram 4.

Diagram 4 Dividing flights

see para 1.12



Length of flights

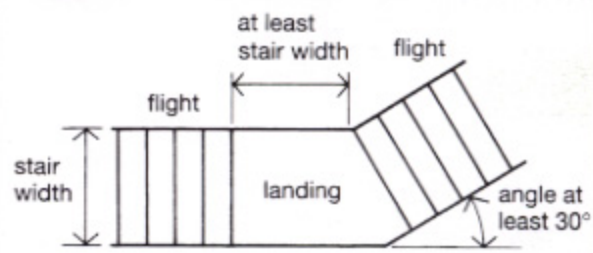
1.13 The number of risers in a flight should be limited to 16 if a stair serves an area used as a shop or for assembly purposes.

For gangways of shallow pitch that are used in assembly buildings reference should be made to BS 5588: Part 6: 1991 and to the *Guide to Safety in Sports Grounds* and *Guide to Fire Precautions in Existing places of Entertainment and Like Premises.*

1.14 Stairs having more than 36 risers in consecutive flights should make at least one change of direction between flights of at least 30° (see Diagram 5).

Diagram 5 Change of direction

see para 1.14



Landings

1.15 Landings should be provided at the top and bottom of every flight. The width and length of every landing should be at least as great as the smallest width of the flight. The landing may include part of the floor of the building.

1.16 To afford safe passage landings should be clear of permanent obstruction. A door may swing across a landing at the bottom of a flight but only if it will leave a clear space of at least 400mm across the full width of the flight (see

Diagram 6). Doors to cupboards and ducts may open in a similar manner over a landing at the top of a flight (see Diagram 7). For means of escape requirements reference should be made to Approved Document B: Fire safety.

1.17 Landings should be level unless they are formed by the ground at the top or bottom of a flight. The maximum slope of this type of landing may be 1 in 20 provided that the ground is paved or otherwise made firm.

Diagram 6 **Landings next to doors**

see para 1.16

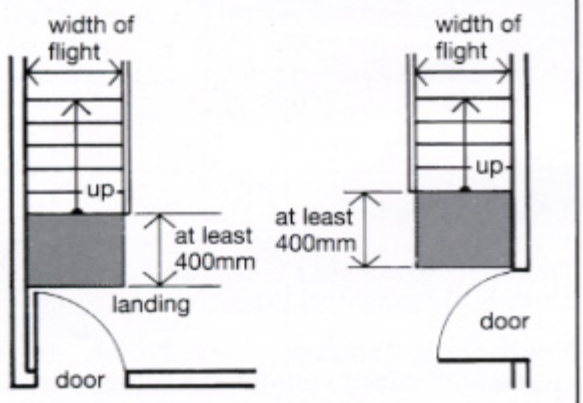
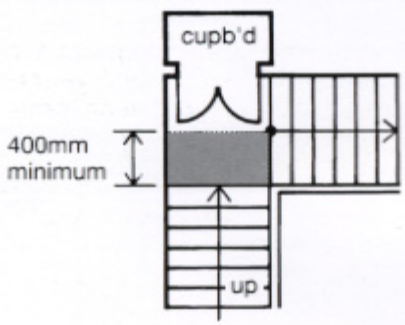


Diagram 7 **Cupboard onto landing**

see para 1.16



Special stairs

Tapered treads

1.18 For steps with tapered treads the going should be measured as follows:

a. if the width of flight is narrower than 1m measure in the middle, and,

b. if the width of flight is 1m or wider measure 270mm from each side.

The requirement will be satisfied if the rise and going complies with advice in paragraphs 1.1 to 1.5.

The going of tapered treads should measure at least 50mm at the narrow end. (see Diagram 8).

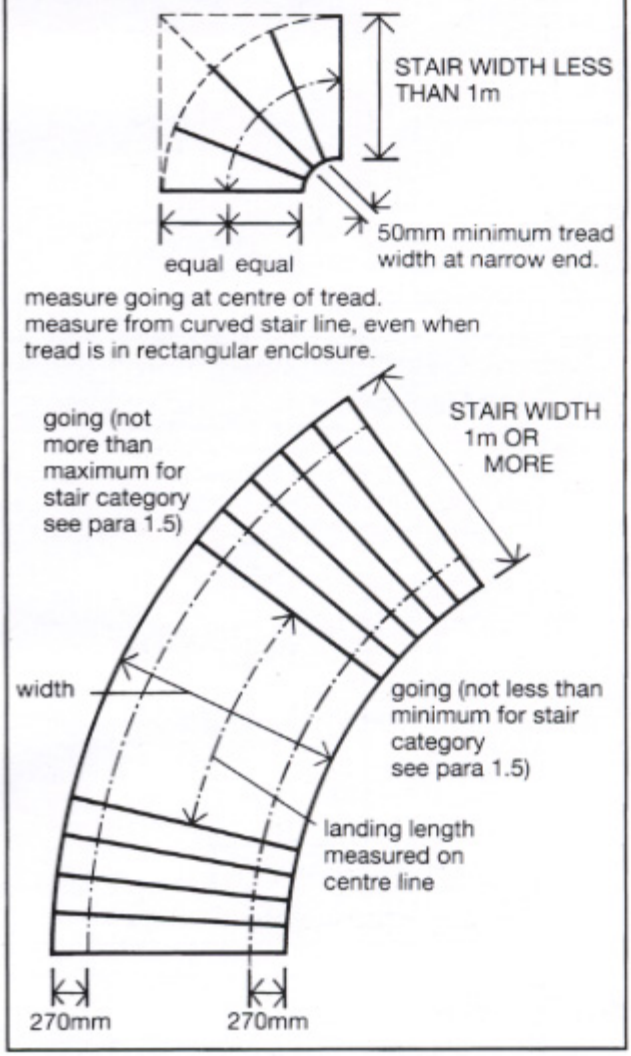
1.19 Where consecutive tapered treads are used a uniform going should be maintained.

1.20 Where a stair consists of straight and tapered treads the going of the tapered treads should not be less than the going of the straight flight - these treads should satisfy paragraphs 1.1 to 1.5.

Stairs designed to BS 585: *Wood stairs* Part 1: 1989. *Specification for stairs with closed risers for domestic use, including straight and winder flights and quarter or half landings,* will offer reasonable safety.

Diagram 8 **Measuring tapered treads**

see para 1.18



Spiral and helical stairs

1.21 Stairs designed in accordance with BS 5395 *Stairs, ladders and walkways.* Part 2: 1984 *Code of Practice for the design of helical and spiral stairs,* will be adequate.

Stairs with goings less than shown in this standard may be considered in conversion work when space is limited and the stair does not serve more than one habitable room.

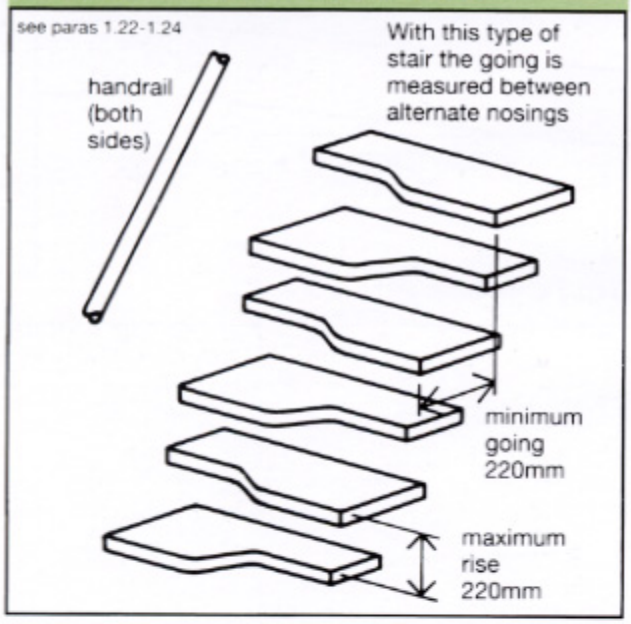
Alternating tread stairs

1.22 This type of stair is one of a number of stair types designed to save space. The general pattern of steps has alternate handed steps with part of the tread cut away; the user relies on familiarity and regular use for reasonable safety (see Diagram 9).

1.23 Alternating tread stairs should only be installed in one or more straight flights for a loft conversion and then only when there is not enough space to accommodate a stair satisfying paras 1.1 to 1.17 above. It should only be used for access to one habitable room, together if desired with a bathroom and/or a WC. This WC must not be the only WC in the dwelling.

1.24 Steps should be uniform with parallel nosings. The stair should have handrails on both sides and the treads should have slip resistant surfaces. The tread sizes over the wider part of the step should be in line with dimensions shown in Table 1 with a maximum rise of 220mm and a minimum going of 220mm. The provisions stated in paragraph 1.9 will apply.

Diagram 9 **Alternating tread stair**



Fixed ladders

1.25 A fixed ladder should have fixed handrails on both sides and should only be installed for access in a loft conversion, and then only when there is not enough space without alteration to the existing space to accommodate a stair which satisfies paragraphs 1.1 to 1.17. It should be used for access to only one habitable room. Retractable ladders are not acceptable for means of escape. For reference see Approved Document B: Fire safety.

1.26 Stairs, ladders and walkways in industrial buildings should, as appropriate, be designed and constructed in accordance with BS 5395 *Stairs, ladders and walkways*. Part 3: 1985 *Code of practice for the design of industrial stairs, permanent ladders and walkways*, or BS 4211: 1987 *Specification for ladders for permanent access to chimneys, other high structures, silos and bins.*

Handrails for stairs

1.27 Stairs should have a handrail on at least one side if they are less than 1m wide. They should have a handrail on both sides if they are wider. Handrails should be provided beside the two bottom steps in public buildings and where stairs are intended to be used by people with disabilities. See Approved Document M: Access and facilities for disabled people. Elsewhere handrails need not be provided beside the two bottom steps.

In all buildings handrail height should be between 900mm and 1000mm measured to the top of the handrail from the pitch line or floor.

Handrails can form the top of a guarding if the heights can be matched.

Guarding of stairs

1.28 Flights and landings should be guarded at the sides (see Diagram 11):

a. in dwellings - when there is a drop of more than 600mm

b. in other buildings - when there are two or more risers.

1.29 Except on stairs in a building which is not likely to be used by children under 5 years the guarding to a flight should prevent children being held fast by the guarding. The construction should be such that:

a. a 100mm sphere cannot pass through any openings in the guarding and

b. children will not readily be able to climb the guarding.

1.30 The height of the guarding itself should be as shown in Diagram 11.

Access for maintenance purposes

1.31 Where frequent access for maintenance will be required (eg at least once per month), provisions such as those suggested for private stairs in dwellings in this Approved Document, or the guidance in BS 5395: Part 3 on industrial stairs and ladders, will satisfy the requirement.

1.32 Where access will be required less frequently it may be appropriate to use portable ladders etc. Provisions for safe use of such temporary means of access are not covered by Building Regulations, but they are covered by the Construction (Design and Management) Regulations 1994.

Section 2

RAMPS

2.1 Steepness To permit safe passage the steepest slope of ramp that should be used is 1:12

2.2 Headroom All ramps and landings should have a clear headroom throughout of at least 2m (see Diagram 10).

2.3 Width There is no recommendation for minimum ramp widths, except for ramps which form means of escape, for reference see Approved Document B: Fire safety. For ramps providing access for disabled people see Approved Document M: Access and facilities for disabled people.

2.4 Obstruction of ramps Ramps should be clear of permanent obstructions.

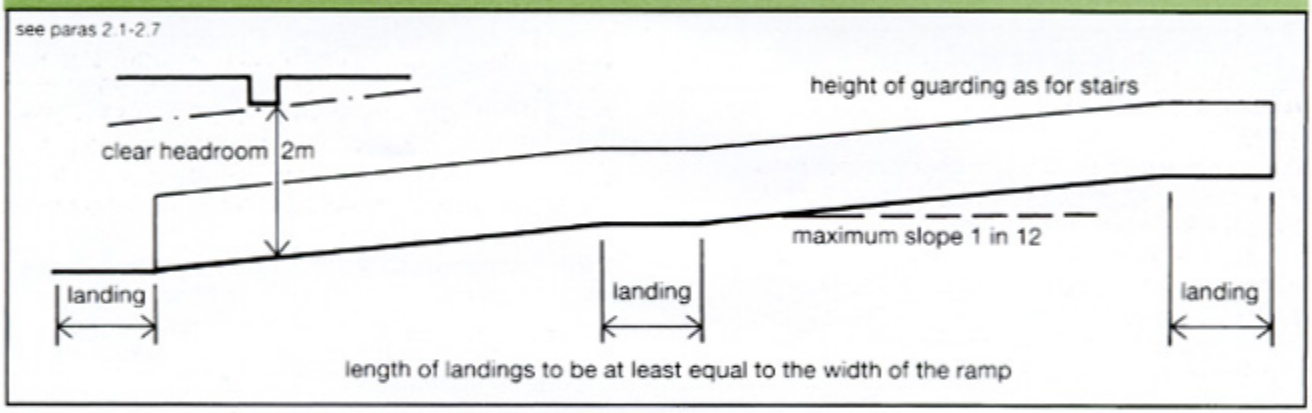
2.5 Handrails Ramps that are less than 1m wide should have a handrail on at least one side. They should have a handrail on both sides if they are wider. There is no need to have handrails if the rise of the ramp is 600mm or less.

Handrails should be at a height of between 900mm and 1000mm. They should give firm support and allow a firm grip. Handrails can form the top of the guarding if the heights can be matched. For handrails on ramps providing access for disabled people see Approved Document M: Access and facilities for disabled people.

2.6 Landings Ramps should be provided with landings (see paragraphs 1.15 - 1.17).

2.7 Guarding Ramps and their landings should be guarded at their sides in the same way as stairs (see paragraphs 1.28 - 1.30).

Diagram 10 **Ramp design**



The Requirements K2 and K3

This Approved Document, which takes effect on 1 January 1998, deals with the following requirements from part K of Schedule 1 to the Building Regulations 1991 as amended by the Building Regulations (Amendment) Regulations 1997

Requirement	*Limits on application*
Protection from falling **K2.** (a) Any stairs, ramps, floors and balconies and any roof to which people have access, and (b) any light well, basement area or similar sunken area connected to a building, shall be provided with barriers where it is necessary to protect people in or about the building from falling.	Requirement K2(a) applies only to stairs and ramps which form part of the building.
Vehicle barriers and loading bays **K3.** (1) Vehicle ramps and any levels in a building to which vehicles have access, shall be provided with barriers where it is necessary to protect people in or about the building. (2) Vehicle loading bays shall be constructed in such a way, or be provided with such features, as may be necessary to protect people in them from collision with vehicles	

Note

Attention is drawn to the Workplace (Health, Safety and Welfare) Regulations 1992

Compliance with Building Regulation requirement K2 would, in accordance with Section 23(3) of the Health and Safety at Work, etc Act 1974, prevent the service of an improvement notice relating to guarding with regard to the requirements for protection from the risk of falling a distance likely to cause personal injury in Regulation 13 of the Workplace (Health, Safety and Welfare) Regulations 1992.

Compliance with Building Regulation requirement K3 (b) would, in accordance with Section 23(3) of the Health and Safety at Work, etc Act 1974 prevent the service of an improvement notice relating to the design of loading bays under Regulation 17 of the Workplace (Health, Safety and Welfare) Regulations 1992.

Guidance

Performance

In the Secretary of State's view the requirements of K2 and K3 will be met if, in order to reduce the risk to the safety of people in and about buildings:

a. pedestrian guarding is provided in dwellings which is capable of preventing people from being injured by falling from a height of more than 600mm, and

b. pedestrian guarding is provided in other buildings which is capable of preventing people from falling more than the height of two risers (or 380mm, if not part of a stair).

c. vehicle barriers are provided which are capable of resisting or deflecting the impact of vehicles.

d. loading bays are provided with an adequate number of exits or refuges which enable people to avoid being struck or crushed by vehicles.

An acceptable level of safety can be achieved by different standards of provision for guarding, depending on the circumstances; for example in a public building the standard of provision may be higher than in a dwelling, to reflect the lesser familiarity and greater number of users.

For areas where access is required only for the purpose of maintenance, greater care can be expected from those gaining access, and it would be reasonable that less demanding provisions could satisfy the requirement.