

# CFS Joinery Specialist

## Building Regulations

**Approved Document K of the Building Regulations 1992:**

The following pages are from The Building Regulations Document K.

Page 2	General notes from Approved Document K of the Building Regulations 1992
Page 3	This is a short introduction to Document K. (Page 4)
Page 4	This page is titled Guidance and covers topics titled Performance, Introduction and Definitions. (Page 5)
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Page 6	This page covers Headroom, Stair Widths and the total length a flight of stairs can go to. (Page 7)
Page 7	This page refers to the areas required to be left when a doorway is near the staircase, and also provides information on the layout of Winder staircases. (Page 8)
Page 8	This page covers the Space Saver staircases otherwise known as Alternating Tread Staircases. Fixed ladders. also Handrails to staircases. (Page 9)
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Please note, Page numbers in brackets refer to the page of the Building Regulations Document K featuring this item, we do not guarantee these to be the latest publication.

## Listed below are some notes from Approved Document K of the Building Regulations 1992:

Stairs, Ramps and Guards gives provisions for stairways in the design and building of stairways, which form part of the structure and guidance on the aspects of geometry and guarding of stairs.

**BS585 Part 1 1989:** Wood stairs covers specifications for stairs with closed risers for domestic use, including straight and winder flights and quarter or half landings.

Appendix A of this standard also details the recommendations for the site fixing of stairs.

**BS5395 Part 1 1977:** Stairs, Ladders and Walkways covers the design of straight stairs.

**BS6180 1982:** Code of practice for protective barriers in and about buildings.

### DEFINITIONS

**Private stairs** intended to be used for only one dwelling with a maximum rise of 220mm and a minimum going of 220mm. A maximum pitch of 42° is stipulated for domestic stairs.

**Institutional and assembly stairs** serving a place where a substantial number of people will gather, with a maximum rise of 150mm and a minimum going of 280mm.

**Other stairs** covers all other types of buildings, with a maximum rise of 190mm and a minimum going of 250mm.

The normal relationship between the dimensions of the rise and going can be expressed as detailed in Approved Document K, which states that twice the rise plus the going ( $2R+G$ ) should be between 550mm and 700mm.

**Pitch** the angle between the pitch line (notional line connecting nosings) and the horizontal. The maximum pitch for domestic stairs is 42°, semi-public stairs, eg factories, offices and common stairs serving more than one dwelling, 38° and public stairs, eg places of public assembly, 33°.

**Height of handrails** Approved Document K states that flights should have a handrail on at least one side if they are less than one metre wide and on both sides if they are wider than one metre. There is no need for handrails beside the bottom two steps of a stairway. Minimum domestic handrail heights of 900mm for both stairs and landings, public handrail heights should be a minimum of 900mm on stairs and 1100mm on landings.

It is also a Building Regulations requirement that no openings in any balustrading should allow the passage of a 100mm sphere.

Please note this is not a full representation of the building regulations on staircases.

# The Requirement K1

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

<i>Requirement</i>	<i>Limits on application</i>
<b>Stairs, ladders and ramps</b> K1. Stairs, ladders and ramps shall be so designed, constructed and installed as to be safe for people moving between different levels in or about the building	Requirement K1 applies only to stairs, ladders and ramps which form part of the building.

Where necessary reference should be made to Approved Document B: Fire Safety, and Approved Document M: Access and facilities for disabled people.

### Note

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

Compliance with Building Regulation requirement K1 and, where appropriate requirement M2 where it relates to stairs and ramps would, in accordance with Section 23(3) of the Health and Safety at Work, etc Act 1974, prevent the service of an improvement notice with regard to the requirements of Regulation 17 of the Workplace (Health, Safety and Welfare) Regulations 1992 which relate to permanent stairs, ladders and ramps on pedestrian traffic routes within the workplace premises, including those used to give access for maintenance to parts of the workplace premises.

# Guidance

## Performance

In the Secretary of State's view the requirement K1 will be met by the use of stairs, ladders and ramps in appropriate circumstances to afford reasonable safety between levels in the following buildings:

- a. dwellings where the difference in level is more than 600mm.
- b. other buildings where the change of level is two or more risers, (or 380mm if not part of a stair).

An acceptable level of safety can be achieved by different standards of provision, 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.

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.

## Introduction

**0.1** This document describes some ways of meeting the requirement.

Section 1 gives guidance on aspects of geometry of stairs, special stairs and guarding of stairs.

Section 2 gives guidance on ramps and guarding of ramps.

**0.2** The requirement does not apply to means of access outside a building unless the access is part of the building; for example, the requirement does not apply to steps on land leading to a building, but does apply to entrance steps which are part of the building.

**0.3** Where access routes:

- a. form part of a means of escape in case of fire, reference should be made to Approved Document B: Fire safety.
- b. are intended as a means of access for disabled people, reference should be made to Approved Documents M: Access and facilities for disabled people.

**0.4** In places where a stair or ramp forms part of the means of access within assembly buildings, such as sports stadia, arenas, theatres, cinemas, etc., it should conform to the guidance in Part K: Protection from falling, collision and impact. However, where steps are part of the gangways serving areas for spectators or there needs to

be special consideration given to guarding in spectator areas then reference should be made to relevant guidance such as:

- a. for new assembly buildings, BS 5588 *Fire precautions in the design, construction and use of buildings* Part 6: 1991: *Code of Practice for places of assembly*.
- b. for work to existing assembly buildings, *Guide to Fire Precautions in Existing Places of Entertainment and Like Premises*, Home Office 1990.
- c. for stands at sports grounds, *Guide to Safety at Sports Grounds*, The Stationery Office 1997.

## Definitions

**0.5** The following meanings apply to terms throughout this Approved Document.

**Alternating tread stair** A stair with paddle shaped treads with the wide portion alternating from one side to the other on consecutive treads. (see paragraphs 1.22 - 1.24)

**Containment** A barrier that prevents people falling from one floor to the storey below (see Diagrams 11 and 12)

**Flight** The part of a stair or ramp between landings that has a continuous series of steps or a continuous slope. (For the widths and lengths of flights see paragraphs 1.11 - 1.14)

**Going** The horizontal dimensions from front to back of a tread less any overlap with the next tread above. (For measurement of the going on tapered treads see paragraphs 1.18 - 1.20)

**Helical stair** A stair that describes a helix round a central void (see paragraph 1.21)

**Ladder** A means of access to another level formed by a series of rungs or narrow treads on which a person normally ascends or descends facing the ladder (see paragraphs 1.25 and 1.26).

**Ramp** A slope steeper than 1 in 20 designed to conduct a pedestrian or wheelchair user from one level to another (see Section 2)

**Rise** The height between consecutive treads. (see paragraphs 1.1 - 1.6)

**Spiral stair** A stair that describes a helix round a central column. (see paragraph 1.21)

**Stair** A succession of steps and landings that makes it possible to pass on foot to other levels.

**Tapered tread** A step in which the nosing is not parallel to the nosing of the step or landing above it. (see paragraphs 1.18 - 1.20)

# 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

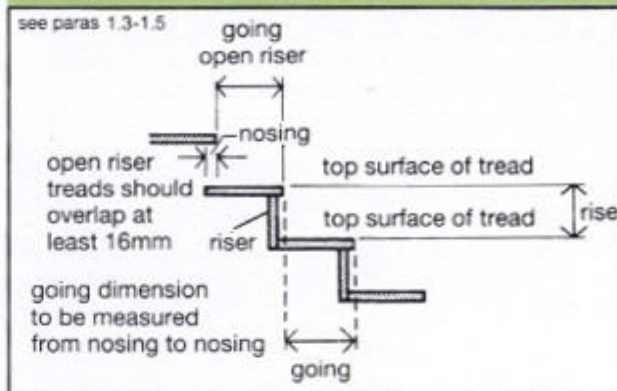
Note:

† The maximum pitch for a private stair is 42°

\* If the area of a floor of the building is less than 100m<sup>2</sup>, 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**

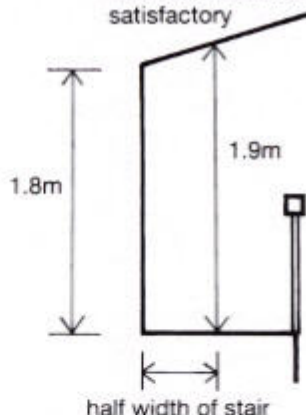
see para 1.10



**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

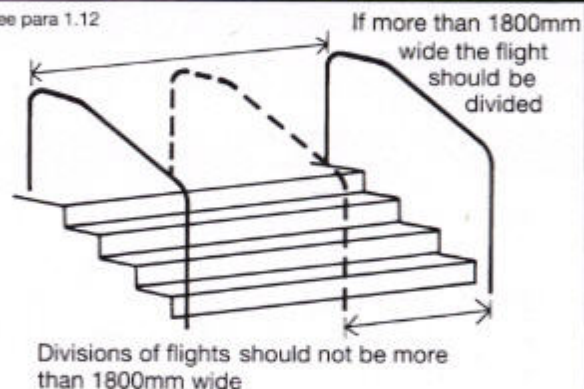
**1.11** No recommendations for minimum stair widths are given. Designers should bear in mind the requirements for stairs which:

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

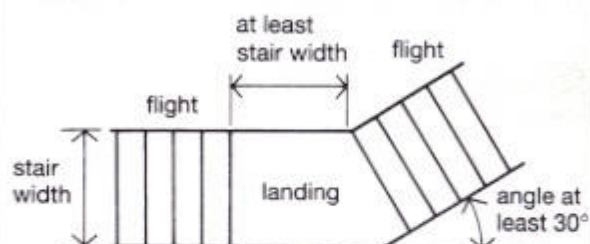
**1.13** The number of risers in a flight should be limited to 16 if a stair serves an area used as a shop or for assembly purposes.

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.

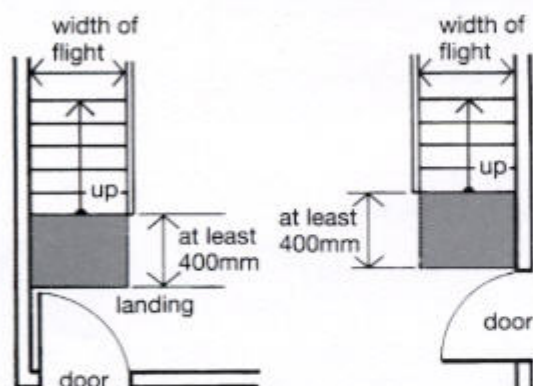
**1.16** To afford safe passage landings should be clear of permanent obstruction. A door may swing across a landing at the bottom of a flight but only if it will leave a clear space of at least 400mm across the full width of the flight (see

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.

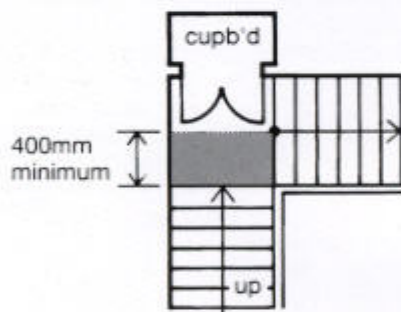
**Diagram 6 Landings next to doors**

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:

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

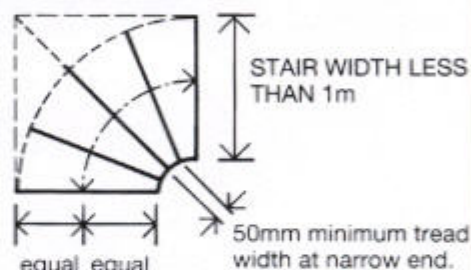
**1.19** Where consecutive tapered treads are used a uniform going should be maintained.

**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.

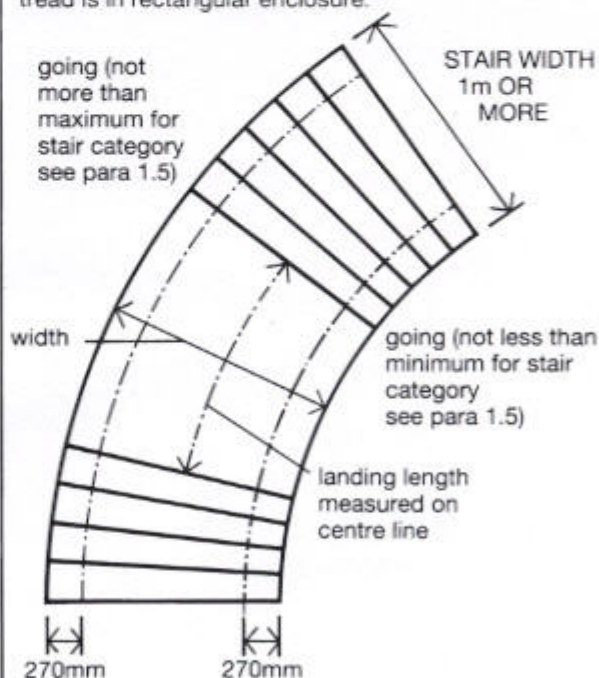
Stairs designed to BS 585: *Wood stairs Part 1: 1989. Specification for stairs with closed risers for domestic use, including straight and winder flights and quarter or half landings*, will offer reasonable safety.

**Diagram 8 Measuring tapered treads**

see para 1.18



measure going at centre of tread.  
measure from curved stair line, even when tread is in rectangular enclosure.



### 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.

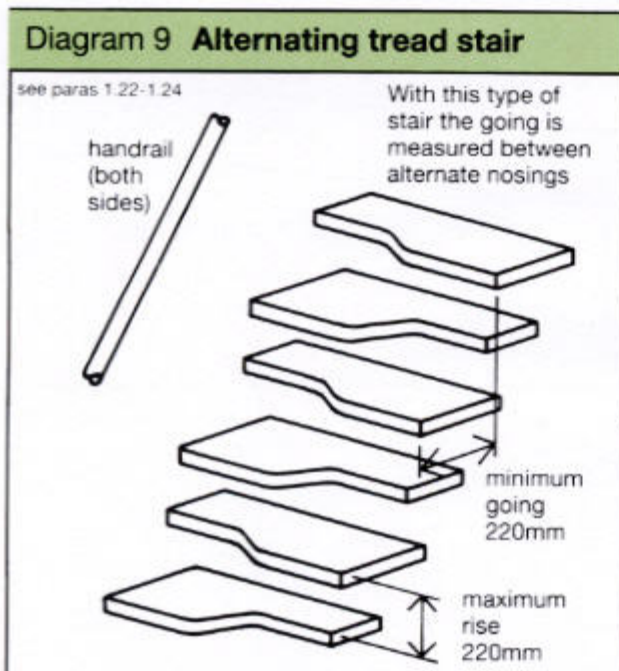
Stairs with goings less than shown in this standard may be considered in conversion work when space is limited and the stair does not serve more than one habitable room.

## 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.



## 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):

- in dwellings - when there is a drop of more than 600mm
- 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 100mm sphere cannot pass through any openings in the guarding and
- 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.

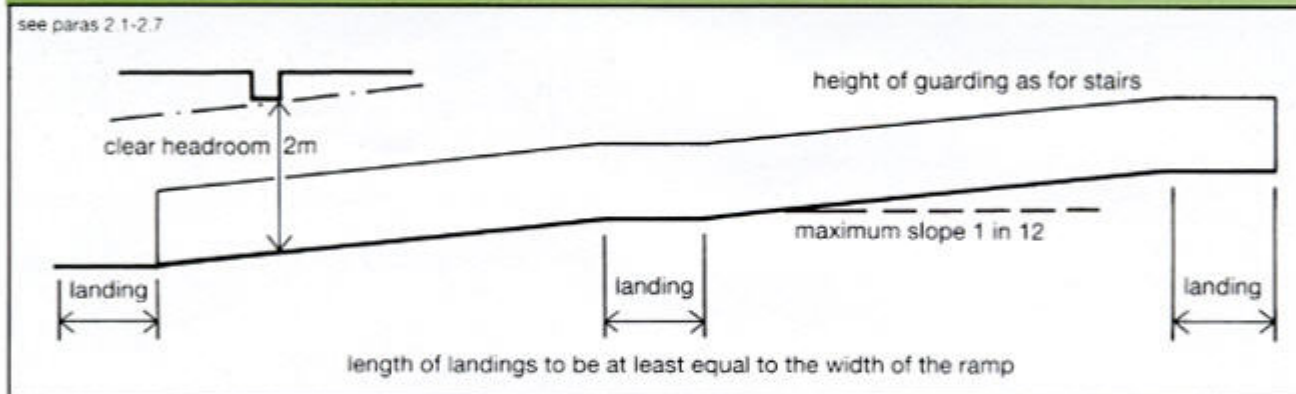
**2.5 Handrails** Ramps that are less than 1m wide should have a handrail on at least one side. They should have a handrail on both sides if they are wider. There is no need to have handrails if the rise of the ramp is 600mm or less.

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

<i>Requirement</i>	<i>Limits on application</i>
<b>Protection from falling</b> <b>K2.</b> (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.
<b>Vehicle barriers and loading bays</b> <b>K3.</b> (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:

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

- 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.

# Section 3

## GUARDS AND BARRIERS

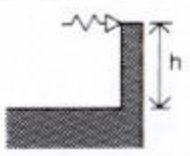
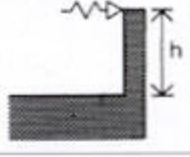
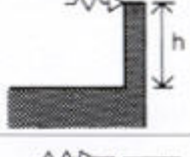

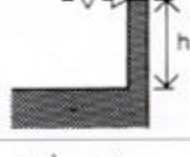
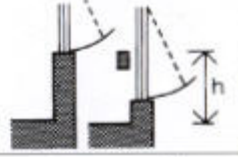

### Pedestrian guarding

**3.1 Siting:** Guarding should be provided where it is reasonably necessary for safety to guard the edges of any part of a floor (including the edge below an opening window) gallery, balcony, roof (including rooflights and other openings), any other place to which people have access and any light well, basement area or similar sunken area next to a building. Guarding should also be provided in vehicle parks, but not on any ramps used only for vehicle access. Guarding need not be provided to such places as loading bays where it would obstruct normal use.

**3.2 Design:** Any wall, parapet, balustrade or similar obstruction may serve as guarding. Guarding should be at least the height shown in Diagram 11. Guarding should be capable of resisting at least the horizontal force given in BS 6399: Part 1: 1996. Where glazing is used in the guarding, reference should be made to Approved Document N: Glazing – safety in relation to impact, opening and cleaning.

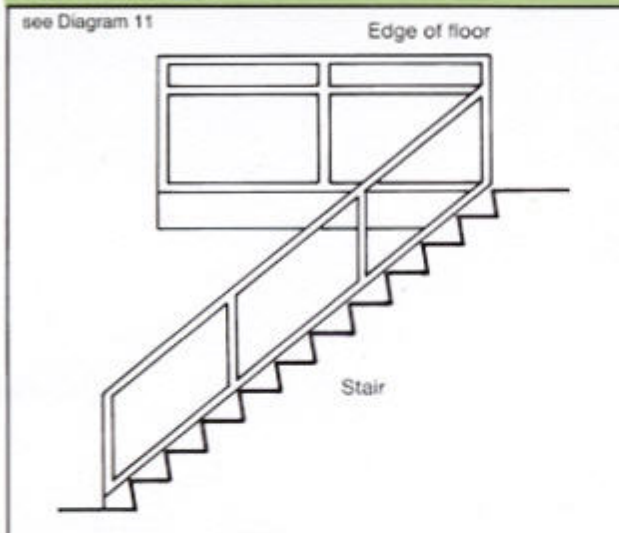
For further guidance on design of barriers and infill panels reference should be made to BS 6180: 1995 *Code of practice for protective barriers in and about buildings*.

Diagram 11 Guarding design

Building Category and location		Height (h)	
Single family dwellings	stairs, landings, ramps, edges of internal floors	900mm for all elements	
	external balconies and edges of roof	1100mm	
Factories & warehouses (light traffic)	stairs, ramps	900mm	
	landings and edges of floor	1100mm	
Residential, institutional, educational, office, and public buildings	all locations	900mm for flights otherwise 1100mm	
Assembly	530mm in front of fixed seating	800mm (h1)	
	all other locations	900mm for flights elsewhere 1100mm (h2)	
Retail	all locations	900mm for flights otherwise 1100mm	
Glazing in all buildings	at opening windows except roof windows in loft extensions, see Approved Document B1	800mm	
	at glazing to changes of level to provide containment (see Diagram 12)	below 800mm	

**3.3** Where buildings are likely to be used by children under 5 years the guarding should prevent children being held fast by the guarding. The construction should be such that a 100mm sphere cannot pass through any opening in the guarding and so that children will not readily be able to climb it. Horizontal rails for such guarding should be avoided.

**Diagram 12 Typical locations for containment**



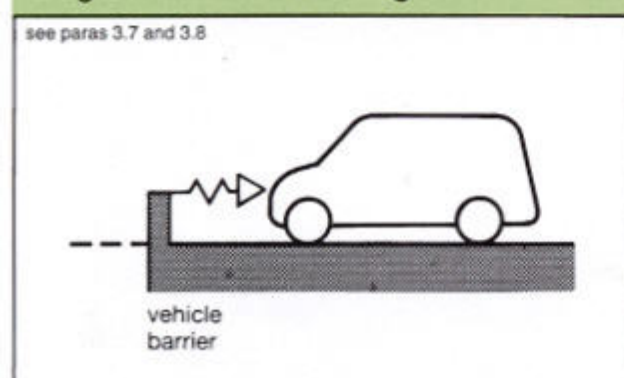
#### Guarding of areas used for maintenance

**3.4** Where frequent access for maintenance will be required (eg at least once per month), provisions such as those suggested for dwellings in this Approved Document (see Diagram 11) will satisfy the requirement.

**3.5** Where access for maintenance will be required less frequently, it may be appropriate to use temporary types of guarding or warning notices. Provisions for such measures are not covered by Building Regulations, but they are covered by the Construction (Design and Management) Regulations 1994.

**3.6** Information on signs is given in the Health and Safety (Signs and Signals) Regulations 1996.

**Diagram 13 Barrier siting**



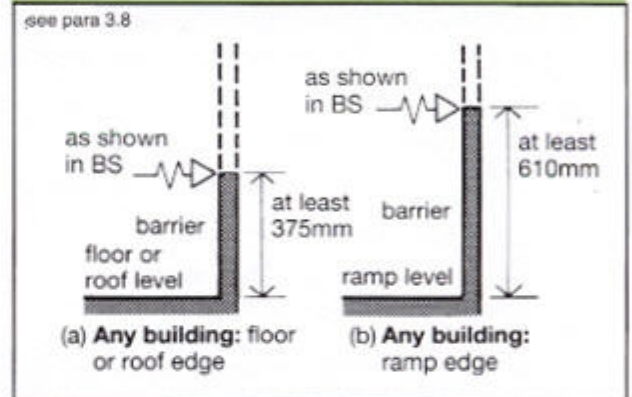
#### Vehicle barriers

**3.7 Siting:** If vehicles have access to a floor, roof or ramp which forms part of a building, barriers should be provided to any edges which are level with or above the adjoining floor or ground or any other route for vehicles (see Diagram 13).

**3.8 Design:** Any wall, parapet, balustrade or similar obstruction may serve as a barrier.

Barriers should be at least the height shown in Diagram 14 and should be capable of resisting forces set out in BS 6399: 1996 *Loading for buildings: Part 1: Code of practice for dead and imposed loads*.

**Diagram 14 Barrier design**



#### Loading bays

**3.9 Design:** Loading bays should be provided with at least one exit point from the lower level (preferably near the centre of the rear wall). Wide loading bays (eg those for three or more vehicles) should be provided with at least two exit points, one being at each side. Alternatively, a refuge should be provided which people can use to avoid being struck or crushed by a vehicle (see Diagram 15).

**Diagram 15 Loading bay**

