



States of Jersey
Planning and Environment Committee

The Building Bye-Laws (Jersey) 1997. Code of Practice

TECHNICAL GUIDANCE DOCUMENT

Part 7 Stairs, Ramps and Protective Barriers

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Use of Guidance

THE TECHNICAL GUIDANCE DOCUMENTS

The Building Bye-Laws (Jersey) 1997, which come into operation on the twentieth day of February 1997, replace the Building Bye-Laws (Jersey) 1960 and consolidate all subsequent revisions to those Bye-Laws. This document is one of a series that has been approved by the Committee as practical guidance on meeting the requirements of the second schedule and Bye-Law 7 of the Building Bye-Laws (Jersey) 1997.

At the back of this document is a list of those documents currently published which have been approved for the purpose of the Building Bye-Laws.

The detailed provisions contained in the Technical Guidance Documents are intended to provide guidance for some of the more common building situations. In other circumstances, alternative ways of demonstrating compliance with the requirements may be appropriate.

Evidence supporting compliance

There is no obligation to adopt any particular solution contained in a Technical Guidance Document if you prefer to meet the relevant requirement in some other way. However, should a contravention of a requirement be alleged then, if you have followed the guidance in the relevant Technical Guidance Documents, that will be evidence tending to show that you have complied with the Bye-Laws. If you have not followed the guidance then that will be evidence tending to show that you have not complied. It will then be for you to demonstrate by other means that you have satisfied the requirement.

Other requirements

The guidance contained in a Technical Guidance Documents relates only to the particular requirements of the Bye-Laws which that document addresses. The building work will also have to comply with the requirements of any other relevant paragraphs in the second schedule to the Bye-Laws. There are Technical Guidance Documents which give guidance on each of the other requirements in the second schedule and on Bye-Law 7.

LIMITATION ON REQUIREMENTS

In accordance with Bye-Law 8, the requirements in parts 1, 2, 3, 4, 5, 6, 7, 9 and 10 of the second schedule to the Building Bye-Laws do not require anything to be done except for the purpose of securing reasonable standards of health and safety for persons in or about the building.

MATERIALS AND WORKMANSHIP

Any building work which is subject to requirements imposed by the second schedule to the Building Bye-Laws should, in accordance with Bye-Law 7, be carried out with proper materials and in a workmanlike manner.

You may show that you have complied with Bye-Law 7 in a number of ways, for example by the appropriate use of a product bearing an EC mark in accordance with the Construction Products Directive (89/106/EEC), or by following an appropriate technical specification (as defined in that Directive), a British Standard, a British Board of Agrément Certificate, or an alternative national technical specification of any member state of the European Community which, in use, is equivalent. You will find further guidance in the Technical Guidance Document supporting Bye-Law 7 on materials and workmanship.

Technical specifications

Building Bye-Laws are made for specific purposes; health and safety, energy conservation and the welfare and convenience of disabled people. Standards and technical approvals are relevant guidance to the extent that they relate to these considerations. However, they may also address other aspects of performance such as serviceability or aspects which although they relate to health and safety are not covered by the Bye-Laws.

When a Technical Guidance Document makes reference to a named standard, the relevant version of the standard is the one listed at the end of the publication. However, if this version of the standard has been revised or updated by the issuing standards body, the new version may be used as a source of guidance provided it continues to address the relevant requirements of the Bye-Laws.

The Requirement

This Technical Guidance Document which takes effect on 20 February 1997, deals with the following requirements from Part 7 of the second schedule to the Building Bye-Laws (Jersey) 1997.

<i>Requirement</i>	<i>Limits on application</i>
Stairs and Ramps (23) Stairs, ladders and ramps shall be so installed and equipped as to enable persons to move safely between levels of the building.	The requirements of this part apply only to stairs, ladders and ramps which form part of the building.
Protective Barriers (24) Stairs, ramps, floors and balconies, and any roof to which persons normally have access, shall be guarded with barriers where they are necessary to protect users from the risk of falling.	Requirement (23) does not apply to stairs, ladders and ramps which provide access to levels used only for the purpose of maintenance.
Vehicle Barriers (25) Vehicle ramps and any floor and roof to which vehicles have access, shall be guarded with barriers where they are necessary to provide protection for people in or about the building.	

Performance

In the view of the Committee requirements (23) 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 number of users.

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 the Technical Guidance Document for fire safety.
- b. are intended as a means of access for disabled people, reference should be made to Technical Guidance Document for access and facilities for disabled people.

0.4 In places where a stair or a 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 this document for: Stairs, ramps and protective barriers. 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*, Home Office 1990.

Definitions

0.5 The following meanings apply to terms throughout this 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

Steepness of stairs

Rise and going

1.1 Requirement 23 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 Technical Guidance 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

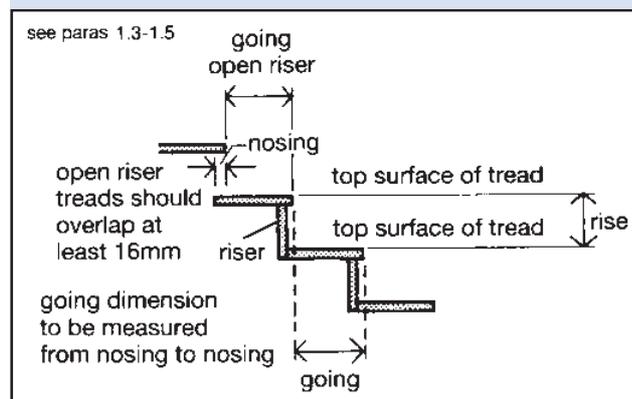
Note:

† 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 the Technical Guidance Document for Access and facilities for disabled persons.

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 the Technical Guidance Document for Access and facilities for disabled person.

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

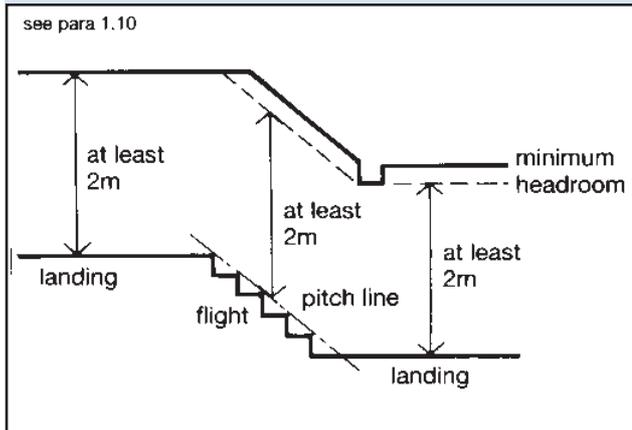
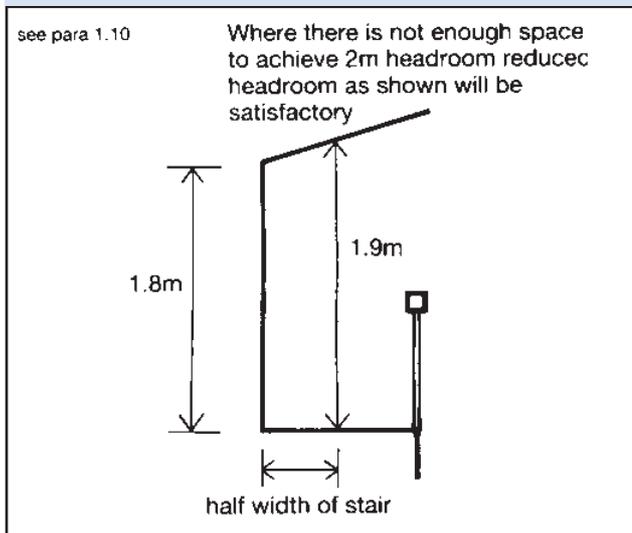


Diagram 3 Reduced headroom for loft conversions



Width of flights

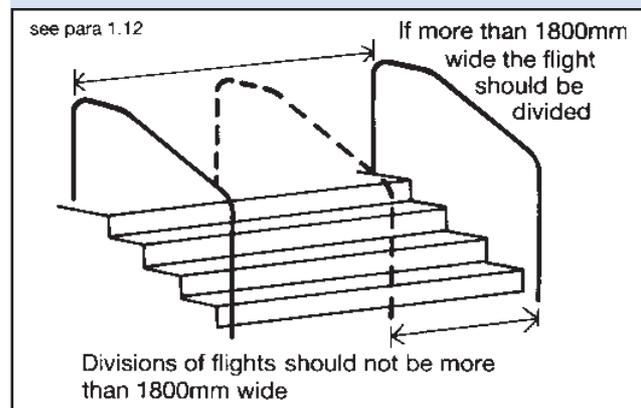
1.11 No recommendations for minimum stair widths are given. Designers should bear in mind the requirements for stairs which:

- form part of means of escape,
- provide access for disabled people.

Reference should be made to the relevant Technical Guidance Documents.

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



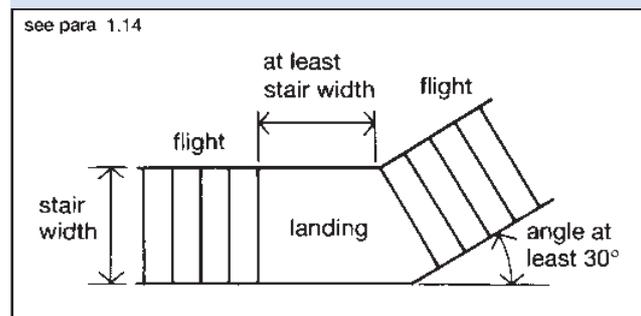
Length of flights

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 Home Office *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



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 the Technical Guidance Document for 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

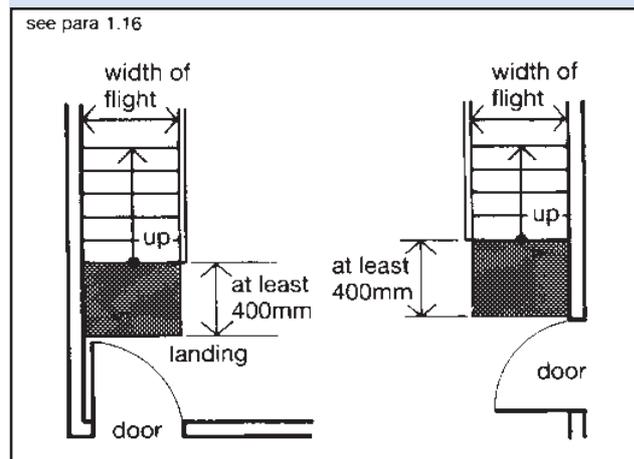
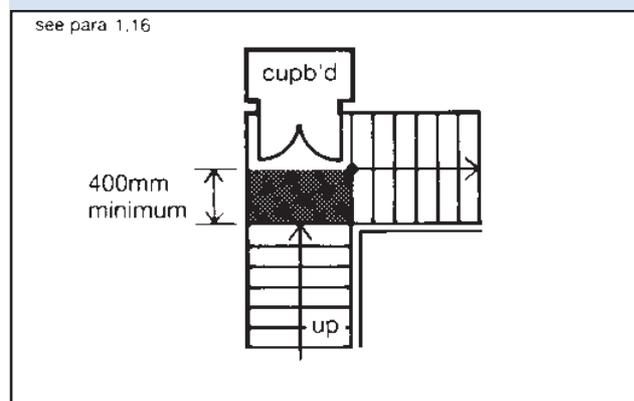


Diagram 7 Cupboard onto landing



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.

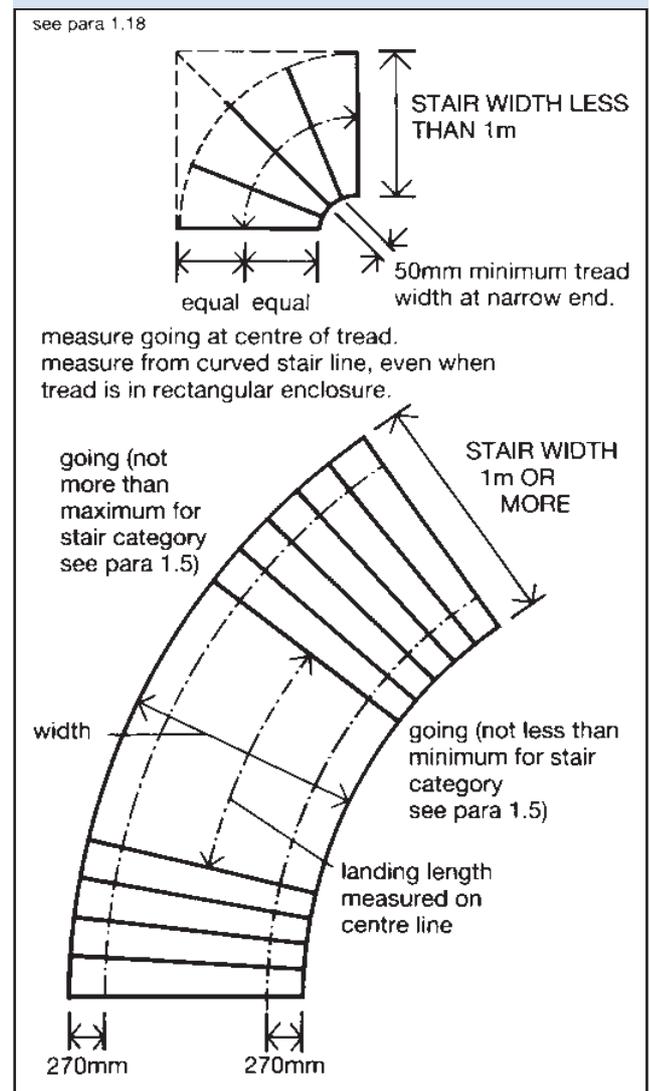
The going of tapered treads should measure at least 50mm at the narrow end. (see Diagram 8).

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



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. The guidance given in paragraphs 1.1, 1.2, 1.4 and 1.5 will apply.

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.

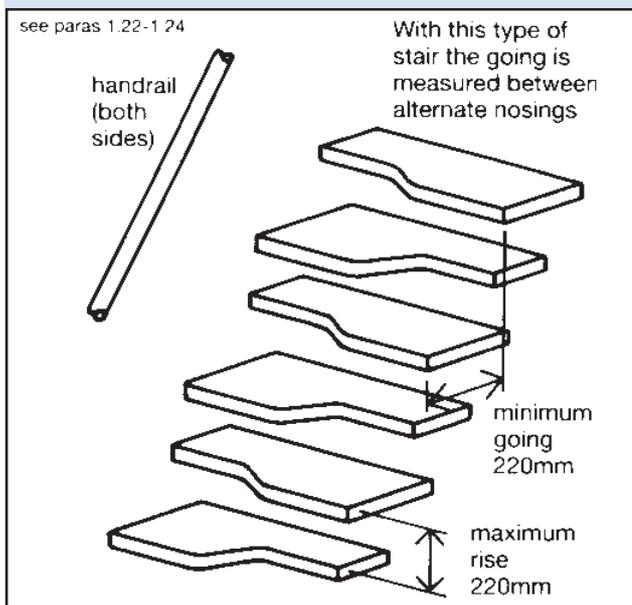
Alternating tread stairs

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 used 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 be used with 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 used 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.

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. 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 not likely to be used by children under 5 years (for example in accommodation for old people) 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.

The guarding should be able to resist a horizontal force, at the height given in Diagram 11 of 0.36 kN for each metre of length if it guards a private stair or as shown in the Diagram if it guards any other stair.

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 Technical Guidance Document Fire Safety. For ramps providing access for disabled people see Technical Guidance Documents Access and facilities for disabled persons.

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

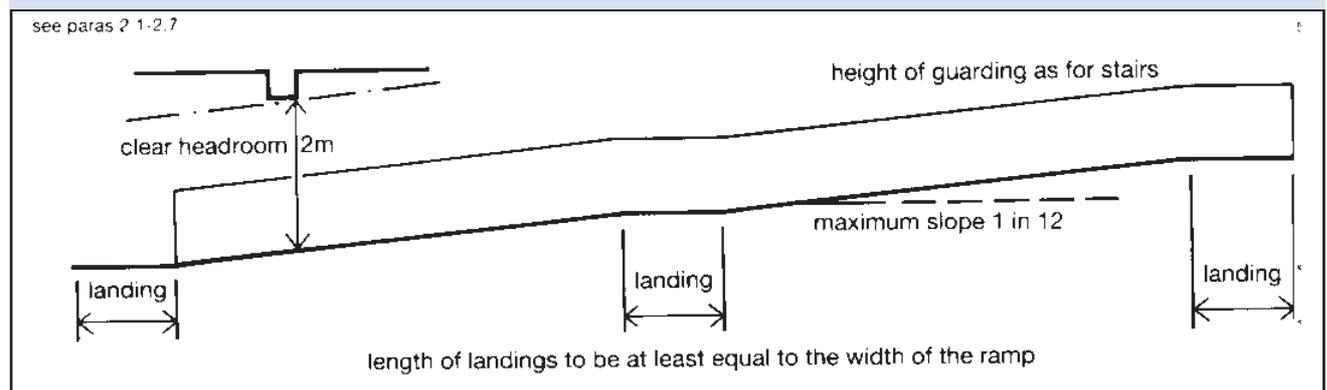
2.5 Handrails Ramps that are less than 1m wide should have a handrail on at least one side. They should have a handrail on both sides if they are wider. There is no need to have handrails if the rise of the ramp is 600mm or less.

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 Technical Document 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



Performance

In the view of the Committee requirements (24) and (25) 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.

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 an opening window) gallery, balcony, roof (including rooflights and other openings), any other place to which people have access (unless it is only for the purpose of maintenance or repair) 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 to 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 Diagram 11 applied at the height shown. Where glazing is used in the guarding, reference should be made to the Technical Guidance Document: Glazing – safety and protection.

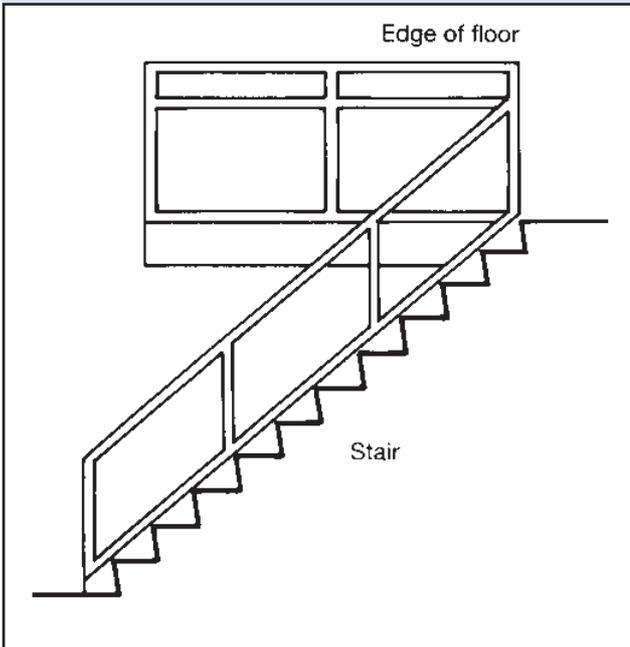
For further guidance on appropriate loads on infill panels reference should be made to BS 6180: 1982: *Code of practice for protective barriers in and about buildings*.

Diagram 11 Guarding design

Building Category and location	Strength	Height (h)	
Single family dwellings	stairs, landings, ramps edges of internal floors	0.36kN/m	900mm for all elements
	external balconies and edges of roof	0.74kN/m	1100mm
Factories & warehouses (light traffic)	stairs, ramps	0.36kN/m	900mm
	landings and edges of floor	0.36kN/m	1100mm
Residential, institutional, educational, office, and public buildings	all locations	0.74kN/m	900mm for flights otherwise 1100mm
Assembly	530mm in front of fixed seating	Refer to BS6399 Part 1	800mm (h1)
	all other locations		900mm for flights elsewhere 1100mm (h2)
Retail	all locations	1.5kN/m	900mm for flights otherwise 1100mm
All buildings	at opening windows except roof windows in loft extensions, see Technical Guidance Document, Fire Safety, Diagram 4		800mm
	at glazing to changes of level	to provide containment	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.

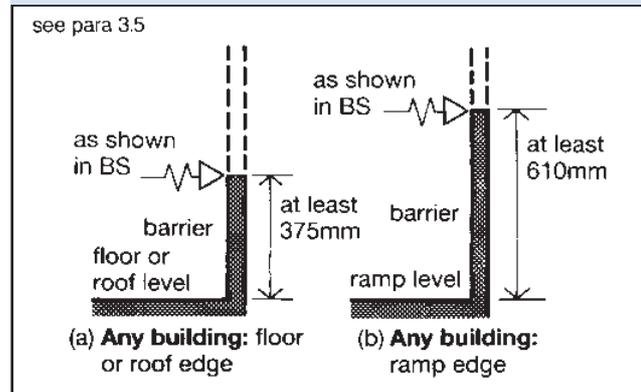
Diagram 12 Typical locations for containment



3.5 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 *Loading for buildings: Part 1: 1984 Code of practice for dead and imposed loads*.

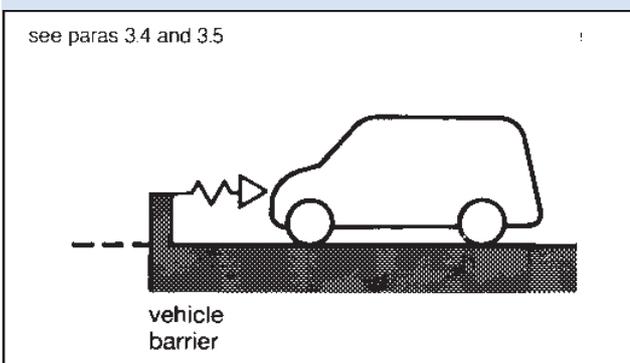
Diagram 14 Barrier design



Vehicle barriers

3.4 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 floor or ground or any other route for vehicles (see Diagram 13).

Diagram 13 Barrier siting



Standards referred to

BS 585: *Wood stairs:*

Part 1: 1989 *Specification for stairs with closed risers for domestic use, including straight and winder flights and quarter and half landings.*

BS 4211: 1987 *Specification for ladders for permanent access to chimneys, other high structures, silos and bins.*

BS 5395: *Stairs, ladders and walkways:*

Part 1: 1977 *Code of practice for stairs*

Amendment slips

1: AMD 3355,

2: AMD 4450

Part 2: 1984 *Code of practice for the design of helical and spiral stairs.*

Part 3: 1985 *Code of practice for the design of industrial type stairs, permanent ladders and walkways.*

BS 5588: *Fire precautions in the design construction and use of buildings:*

Part 6: 1991 *Code of practice for places of assembly.*

BS 6180: 1932 *Code of practice for protective barriers in and about buildings.*

BS 6399: *Loading for buildings:*

Part 1: 1984 *Code of practice for dead and imposed loads*

Amendment slips

1: AMD 4949

2: AMD 5511

3: AMD 6031

Lists of codes of practice currently issued or approved by the Planning and Environment Committee for the purpose of showing compliance with the Building Bye-Laws (Jersey) 1997.

Technical Guidance Document. Part 1 Structure
Technical Guidance Document. Part 2 Fire Safety
Technical Guidance Document. Part 3 Heat Producing Appliances and Storage of Fuels
Technical Guidance Document. Part 4 Site Preparation and Resistance to Moisture
Technical Guidance Document. Part 5 Ventilation
Technical Guidance Document. Part 6 Drainage, Hygiene and Water Storage
Technical Guidance Document. Part 7 Stairs, Ramps and Protective Barriers
Technical Guidance Document. Part 8 Access and Facilities for Disabled People
Technical Guidance Document. Part 9 Resistance to the Transmission of Sound
Technical Guidance Document. Part 10 Glazing—Safety and Protection
Technical Guidance Document. Part 11 Conservation of Fuel and Power
Technical Guidance Document. Supporting Bye-Law 7. Materials and Workmanship