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Specification for Parkour equipment

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 36, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 28 February 2013. It was prepared by Sub-committee, SW/65/1, *Parkour*, under the direction of Technical Committee SW/65, *Children's playground equipment*. A list of organizations represented on this committee can be obtained on request to its secretary.

Information about this document

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.

It is not expected that every scenario has been addressed. Where new designs or concepts are delivered that have not been provided for, the principle of risk assessment needs to be utilized on the condition that it is performed by a competent person.

The design and layout of Parkour facilities requires a good understanding of the sport and the interrelationship of equipment and "flow" routes. To ensure the safety of equipment it is recommended that design advice is obtained from a competent person and that appropriate risk assessments are carried out.

NOTE Parkour UK as the National Governing Body can provide advice on suitable competent persons.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

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.

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Section 1: Design of equipment

Introduction

Parkour, also known as "Freerunning" and "Art du Deplacement", is the non-competitive sport of training to move freely over and through any terrain using only the abilities of the body, principally through running, jumping, climbing and quadrupedal movement. In practice it focuses on developing the fundamental attributes required for such movement, which include functional strength and fitness, balance, spatial awareness, agility, coordination, precision, control and creative vision.

It is a sport that encourages self-improvement on all levels, revealing one's physical and mental limits, while simultaneously offering ways to overcome them. It is a method of training one's body and mind in order to be as completely functional, effective and liberated as possible in any environment.

The sport aims to build confidence, determination, self-discipline and self-reliance, and responsibility for one's actions. It encourages humility, respect for others and for one's environment, self-expression and community spirit, and emphasizes the importance of discovery and safety at all times.

The sport, originally termed l'Art du Deplacement, was founded in France in the 1980s by a group of nine young men who called themselves "The Yamakasi". "Yamakasi" is a Lingala word loosely meaning "strong man, strong spirit", and summed up the core aim of the sport: to be a strong individual: physically, mentally and ethically.

The Yamakasi founders are Yann Hnautra, Chau Belle, David Belle, Laurent Piemontesi, Sebastain Foucan, Guylain N'Guba Boyeke, Charles Perriere, Malik Diouf and Williams Belle.

The term "Parkour" was first introduced by David Belle in 1998. "Parkour" derives from the French word "parcours" meaning "route" or "course".

The term "freerunning" was coined by Guillaume Pelletier, a representative of a group of French practitioners involved in the production of the 2003 Channel 4 documentary, *Jump London*, to communicate this new sport to an English-speaking audience.

This British Standard covers the design of equipment for the practice and development of the principle techniques/movements of the sport of Parkour by those new to Parkour and by experienced practitioners, known as traceurs (or freerunners).

Parkour facilities can comprise a combination of items of equipment permitting flowing movement of the user.

The use of facilities as Parkour equipment is connected with sporting risks. Sporting skills and the use of appropriate equipment reduce the risk of accident, but it is important to recognize that traceurs and/or users are not required to wear personal protective equipment.

It is not the intention of this standard to specify every possible shape and construction of facilities for traceurs and/or users. Parkour is a new, developing sport and the standard does not specify requirements that affect the design of the overall Parkour facility.

Because Parkour movements are self-controlled, it is expected that injuries resulting from falls/misjudgement can occur. It is also anticipated that sites might be used by/for non-Parkour activities.

1 Scope

This British Standard specifies requirements for the manufacture of Parkour equipment for use by youths and adults. The standard recognizes that Parkour forms no part of children's play and that movement is personally determined by users, using controlled physical exertion from, to and through equipment elements and structures.

The requirements are intended to protect users from hazards that they might be unable to foresee when using the equipment as intended, or in a manner that can be reasonably anticipated.

The standard also specifies requirements for the installation and maintenance of Parkour equipment, including area, height, flow, location and separation from other facilities, including children's playgrounds and multi-use games areas (free access multi-sports equipment).

2 Normative references

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

BS 7188:1998+A2:2009*, Impact absorbing playground surfacing – Performance requirements and test methods*

BS EN 335-2:2006, *Durability of wood and wood-based products – Definition of use classes – Part 2: Application to solid wood*

BS EN 350-2:1994, *Durability of wood and wood-based products – Natural durability of solid wood – Part 2: Guide to natural durability and treatability of selected wood species of importance in Europe*

BS EN 351-1:2007, *Durability of wood and wood-based products – Preservative-treated solid wood – Part 1: Classification of preservative penetration and retention*

BS EN 636, *Plywood – Specifications*

BS EN 1176-1:2008, *Playground equipment and surfacing – Part 1: General safety requirements and test methods*

BS EN 1177*, Impact attenuating playground surfacing – Determination of critical fall height*

3 Terms and definitions

For the purposes of this British Standard the following terms and definitions apply.

3.1 clearance
dimension that allows the opportunity of free passing from, to and through equipment elements and structures and during a flow of movements

3.2 competent person
individual with sufficient training, experience or knowledge and/or particular qualifications, who is able to contribute to the design and/or layout of Parkour equipment

NOTE The level of competence is dependent upon the task involved.

3.3 entrapment
situation in which the user becomes trapped or is unable to continue movement without risking a serious injury

3.4 falling space
space in, on or around the equipment through which a user can pass or fall from an elevated part of the equipment

3.5 flow
move smoothly with unbroken continuity

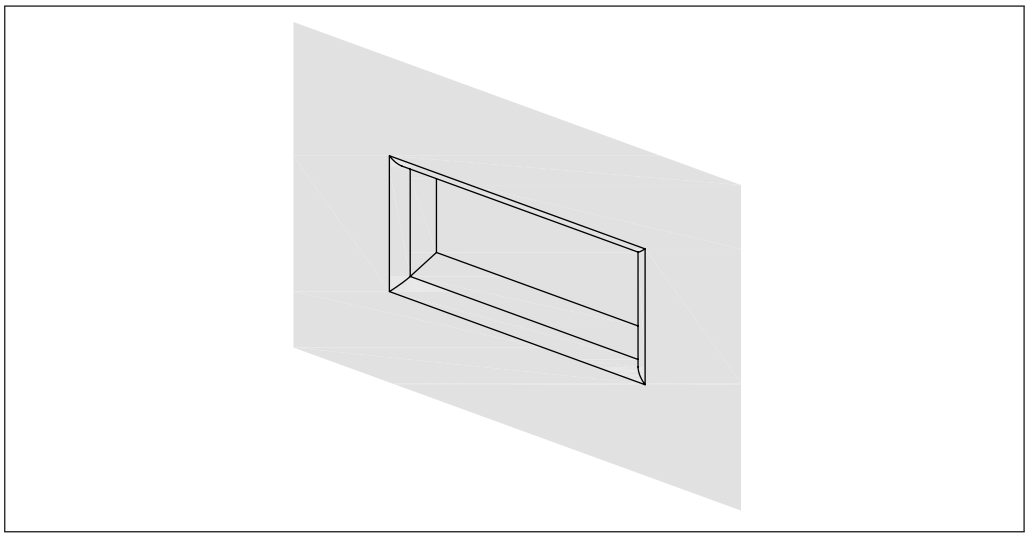
3.6 forced or mechanical movement
movement to which a user is committed by the equipment

3.7 Grooves and openings

3.7.1 groove
gap that does not pass through the material

NOTE See Figure 1 for an example groove.

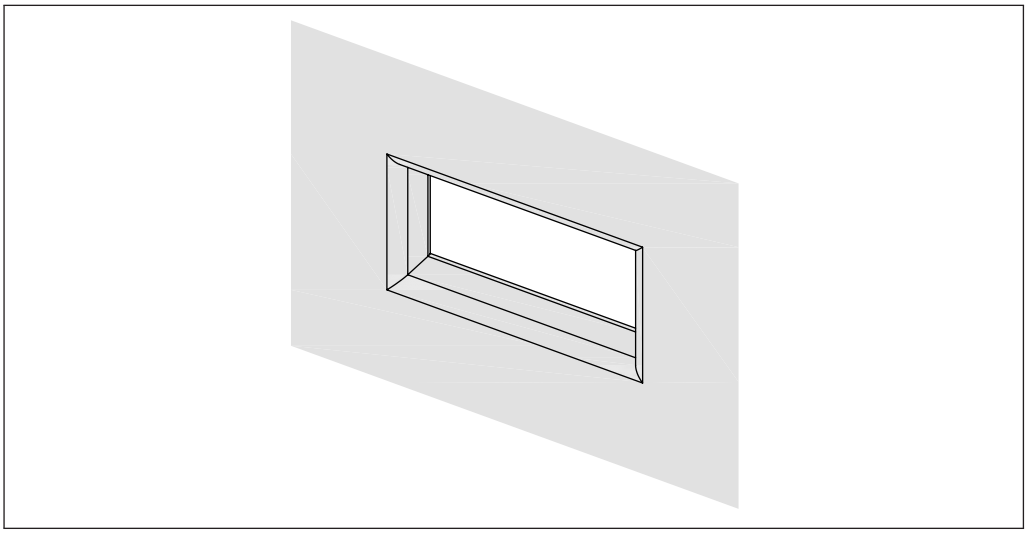
Figure 1 **Example groove**



3.7.2 opening
gap that passes through the material

NOTE See Figure 2 for an example opening.

Figure 2 **Example opening**



3.8 landing
flat (though not necessarily horizontal), regular and inflexible surface in any plane (see Clause **8**)

3.9 movement
method(s) of travelling from and to equipment

*NOTE See **3.5**.*

3.10 Parkour
non-competitive sport of training to move freely over and through any terrain using only the abilities of the body, principally through running, jumping, climbing and quadrupedal movement

NOTE Full definition in Introduction. Movements such as somersaults, flips or tricks are gymnastic/acrobatic movements. Gymnastics/acrobatics is an entirely separate sport in its own right and has been practised much longer than the sport of Parkour. However, traceurs/freerunners (practitioners) sometimes include acrobatics as part of their movement for fun and as a method of improving coordination, flight, balance and spatial awareness.

3.11 traceur
competent practitioner in the sport of Parkour

3.12 user
person who is able to access the equipment, including but not restricted to a traceur

3.13 warm-up/cool-down space
space associated with, but not necessarily part of, the facility that allows users to prepare for activities

4 Materials

4.1 General

Materials shall be selected and protected such that the structural integrity of the equipment is not affected before the next relevant maintenance inspection.

Traditional brick or block structures, with or without cement render or similar face-work, and precast concrete beam/plank constructions, e.g. fencepost and gravel board, shall not be used (due to the potential for repeated impact of Parkour activities to cause failure of the construction). Any other concrete equipment shall conform to CONSTRUCT's *National Structural Concrete Specification for Building Construction* [1].

Parkour equipment reliant on bolted connections shall incorporate a secondary proven system to prevent loosening caused by the vibrations of repeated user impact.

Fibreglass product shall not be used in Parkour equipment (again, because of the potential for damage from repeated user impact and from weather).

4.2 Natural and engineered wood

Wooden parts shall be designed in such a way that precipitation can drain off freely so that water does not accumulate.

In cases of ground contact, one or more of the following methods shall be used:

a) use of species of wood with sufficient natural resistance in accordance with classes 1 and 2 of the natural resistance classification given in BS EN 350-2:1994, **4.2.2**;

b) appropriate construction methods, e.g. post shoe, that protect the wood;

c) use of wood treated with wood preservatives in accordance with BS EN 351-1:2007, Figure A.1, and BS EN 335-2:2006, class 4.

NOTE 1 Consideration should also be given to other issues, such as the potential for splintering or poisoning.

All components made of wood and associated products, other than those species conforming to a) that affect the stability of the structure and are in constant contact with the ground, shall be treated in accordance with c).

NOTE 2 When selecting metal fastenings, consideration should be given to the species of wood and chemical treatments used as some accelerate corrosion of metals if there is contact between them.

NOTE 3 The longevity of wooden components of equipment is a contractual issue.

Any plywood used in construction shall conform to BS EN 636 and shall be weatherproofed.

The materials used for any surface shall be treated such that they do not encourage the growth of moss and algae, and the equipment layout shall encourage as much open aspect to permit ultraviolet penetration as possible to assist in restricting such growth.

4.3 Metals

4.3.1 Toxicity

Metals that produce toxic oxides that scale or flake shall be protected by a durable, non-toxic coating.

4.3.2 Corrosion

Metal parts shall be protected against atmospheric conditions and cathodic corrosion.

4.4 Rubbers and synthetics

An indication of the time period after which a part or item of equipment shall be replaced shall be provided if it could be difficult to determine during maintenance the point at which the material becomes brittle.

All structural plastic components shall have appropriate substances to reduce the influences of ultraviolet radiation and oxygen.

If rubber is used in structural components, deterioration due to ozone should be prevented or reduced either by:

a) using considerably thicker material;

b) leaving rubber parts visible for inspection; or

c) making a notification to product or to maintenance instruction to check their conditions.

5 Structural integrity and loading

When the structural integrity of equipment is verified by the calculations or test method in Annex A, using the appropriate number of users given in Annex B, the equipment shall show no cracks, damage or excessive permanent deformation and no connections shall be loosened.

Due to the dynamic loads applied by Parkour activities, the structural integrity shall be subjected to physical testing. When tested in accordance with Annex A the equipment shall show no signs of cracking, damage or excessive permanent deformation and no connections shall be loosened.

Parkour equipment for standing, walking, jumping or climbing upon, or any flat surface ≥0.1 m wide, and which has less than a 30° angle from the horizontal, shall be able to carry the load caused by at least one user.

NOTE 1 This also applies to rungs or steps for supporting a user's feet.

For equipment for which these specific calculations or tests are not always appropriate, the structural integrity shall be at least equivalent.

When Parkour equipment relies on one post for its stability, the construction shall be carried out such as to:

a) minimize rotting or corrosion in parts contributing to stability;

b) allow for controlling degradation and the need for decommissioning; and

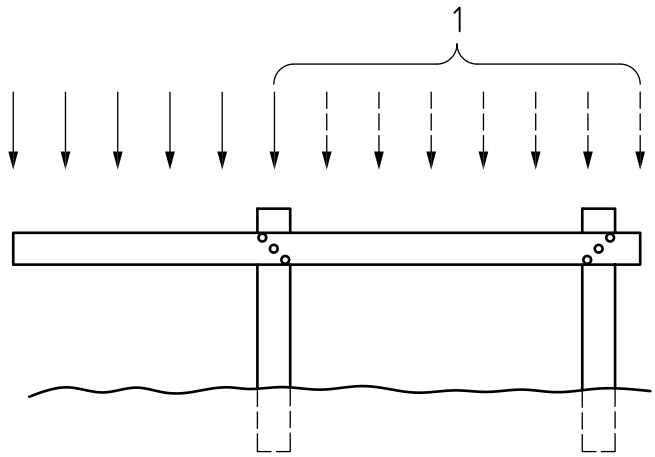
c) be used without collapse within the foreseen inspection period when maintained correctly.

NOTE 2 No allowance for accidental loads, i.e. loads produced by fire, collision by vehicles or earthquake, need be made.

*NOTE 3 The loads associated with fatigue are generally much smaller than the loads in combination with the appropriate load factors when calculated in accordance with **A.2**. Therefore, equipment in general need not be verified for fatigue.*

Structural parts shall resist the worst-case loading condition, as demonstrated by, for example, that part of the user load causing favourable effects, as shown in Figure 3.

Figure 3 **Example of removal of that part of the user load which causes a favourable effect**



Key
1 Part of load to be removed

Landings shall be designed to withstand repeated shock from users, including occasional heavy impacts, as determined by calculations that recognize that impacts might arise from more than one user landing at the same time.

When tested in accordance with Annex C, the surround, including the panel and fixing points, shall show no signs of cracks or deformation, loosening of connecting parts, or any other failure of structural integrity.

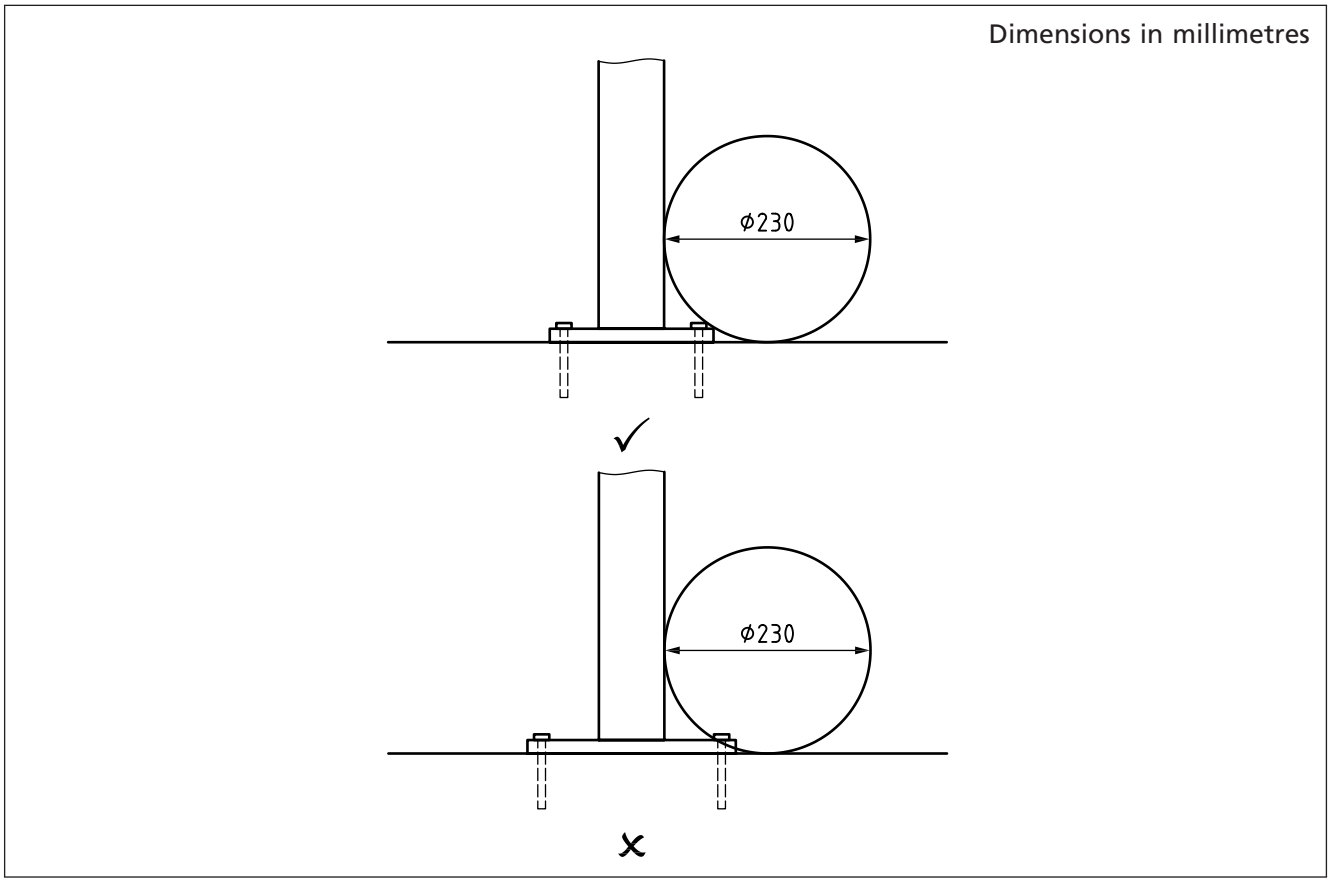
6 Foundations

Foundations shall not protrude beyond the side elements of the BS EN 1176-1:2008, Probe C (see Figure 4).

Additional measures shall be taken for equipment in which the stability depends on only one cross section.

NOTE When components are embedded in concrete there is a risk of corrosion or rotting. The high rate of corrosion or rotting under dynamic loading endangers the stability of the anchorage of units in which the stability depends on only one cross section, or in which the stability is provided by two-legged members or rows of members.

Figure 4 **Protrusion of foundations**



7 Maximum height

7.1 Maximum height of any element or part of equipment

The free height of fall shall not exceed 3 000 mm.

7.2 Maximum fall height

The maximum fall height onto impact absorbing surfaces (IAS) (see **7.3**) shall not exceed 3 000 mm.

The maximum fall height onto surfaces that are not impact absorbing shall not exceed 1 200 mm.

The maximum fall height from one element/item to another shall not exceed 1 200 mm. The minimum opening/clearance shall be 550 mm.

The maximum fall height between landings up to 2 500 mm apart shall not exceed 1 200 mm.

NOTE 1 Items of equipment up to 1 200 mm do not require IAS; items from 1 201 mm up to a maximum height of 3 000 mm require IAS.

The free height of fall shall be determined from the top of the equipment.

NOTE 2 Falling height comes from highest point as every part of the equipment is accessible. Basic examples of how the free height of fall is measured are given in Figure 5. Maximum allowed falling height depends on the situation. The falling heights are:

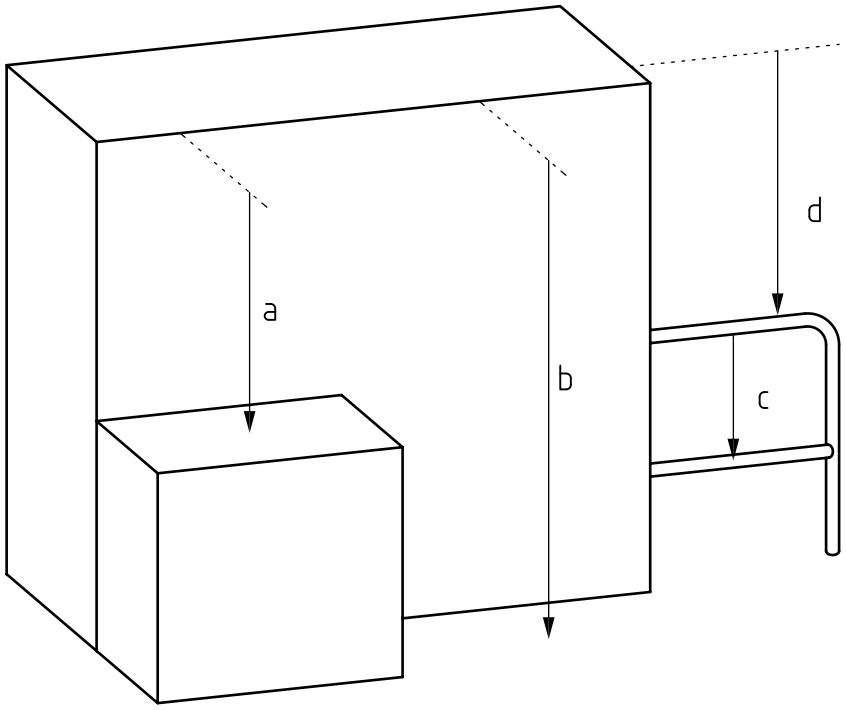
a) 1 200 mm max on hard impact area landing or large object;

b) 3 000 mm max on impact attenuated impact area, landing or large object;

c) 550 mm max on bar or rail below;

d) 1 200 mm max on bar or rail below.

Figure 5 **Examples of determination of falling height**



Key

a From landing on the landing
b From landing on the ground or impact area
c From underside of the bar on the bar below
d From landing to a rail or bar

7.3 Impact absorbing surface (IAS)

Where the maximum height exceeds 1 200 mm IAS shall be provided that meets the equivalent fall heights of BS EN 1177 to a minimum extent of 2 500 mm, measured out from the furthest perimeter of the item.

IAS shall only be provided on the ground.

8 Landings

Landings shall have a surface area with a minimum inscribed circular diameter of 100 mm. When tested in accordance with Annex D, any projection beyond the inscribed circle shall not protrude beyond the end of the test probe appendage offering an insufficient area of surface to land upon.

Landings shall be of a height above the surface ≥100 mm.

IAS shall not be installed on landings.

NOTE The nature of Parkour is such that all components and elements of equipment are deemed accessible and can be used by the user. Therefore, traditional protection against falling in the form of guard rails and barriers is not specified or encouraged by this standard. It needs to be recognized that any underbar/laché (swinging) provision at the perimeter is likely to be used for Parkour activities and should not be considered a barrier or guard rail. IAS is excluded from landings to ensure that users of the equipment have a realistic experience of Parkour, which is essential for gaining an understanding of their environment, e.g. it is imperative that users are able to get a sensation of the edge of a landing and that landings do not desensitize users from their environment.

The potential for access by children to landings shall be risk-assessed.

9 Accessible surfaces, profiles and edge chamfers

The surface finish of any accessible surface shall conform to BS 7188:1998+A2:2009, Clause **5**.

All accessible materials shall be treated to maintain the minimum slip resistance in conditions other than persistent precipitation, frost and snow.

There shall be no protruding nails or pointed or sharp-edged components. Rough surfaces shall not present any risk of injury. Protruding bolt threads within any accessible part of the equipment shall be permanently covered, e.g. by dome-headed nuts.

Finishes shall be free from sharps and galvanizing spru.

The edge profile chamfer of equipment shall be >3 mm radius.

Corners, edges and projecting parts that protrude more than 8 mm, and which are not shielded by adjacent areas that are not more than 25 mm from the end of a projecting part, shall be rounded off. The minimum radius of the curve shall be 3 mm.

NOTE This requirement is intended only to prevent injuries caused by unintended contact with components.

10 Trip points

There shall be no depression or bump/ridge greater than 10 mm beneath a 300 mm straight edge.

11 Equipment providing forced or mechanical movement

No equipment shall provide mechanical advantage or mechanical movement, e.g. swinging ropes.

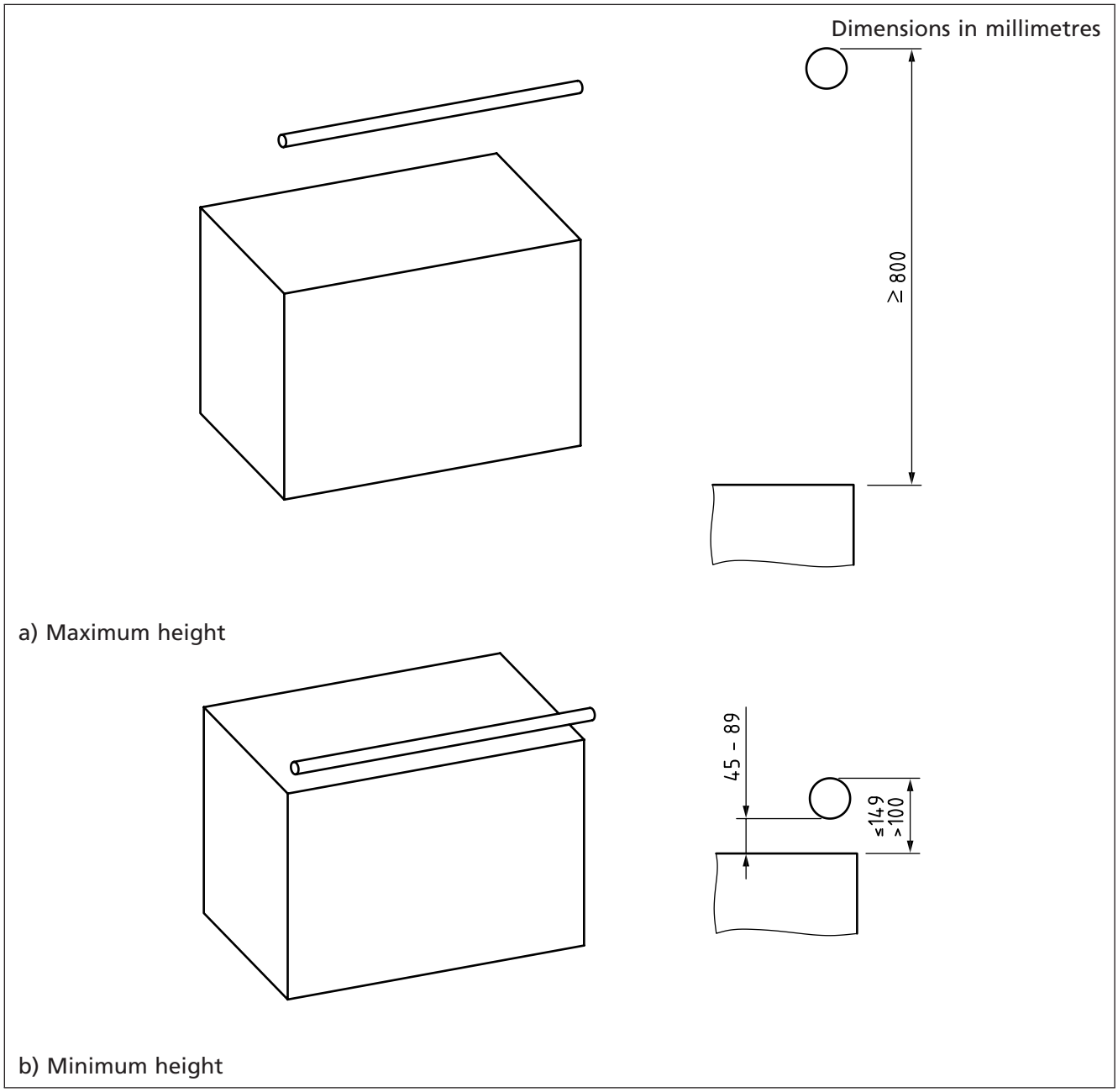
12 Parkour bars and rails

Parkour bars shall conform to Clause **9**. The minimum opening between any two bars shall conform to Clause **14**. The minimum and maximum heights for bars on an elevated landing shall be in accordance with Figure 6.

Rails shall be of a square or rectangular section with dimensions of ≥45 and ≤60 mm.

Bars shall be of a circular or oval section, with a diameter of ≥45 and ≤60 mm.

Figure 6 **Height of bar at edge of landing**



Section 2: Operation and layout

13 Protection against injuries during movement and falling

Objects in the falling space shall be restricted to landings, bars and rails.

14 Clearances

14.1 General

Grooves shall be ≥45 mm in width and depth.

Openings shall be:

a) greater than 550 mm in diameter; or

b) greater than 45 mm in diameter, but not permitting test probes E and C (see Annex E) to enter.

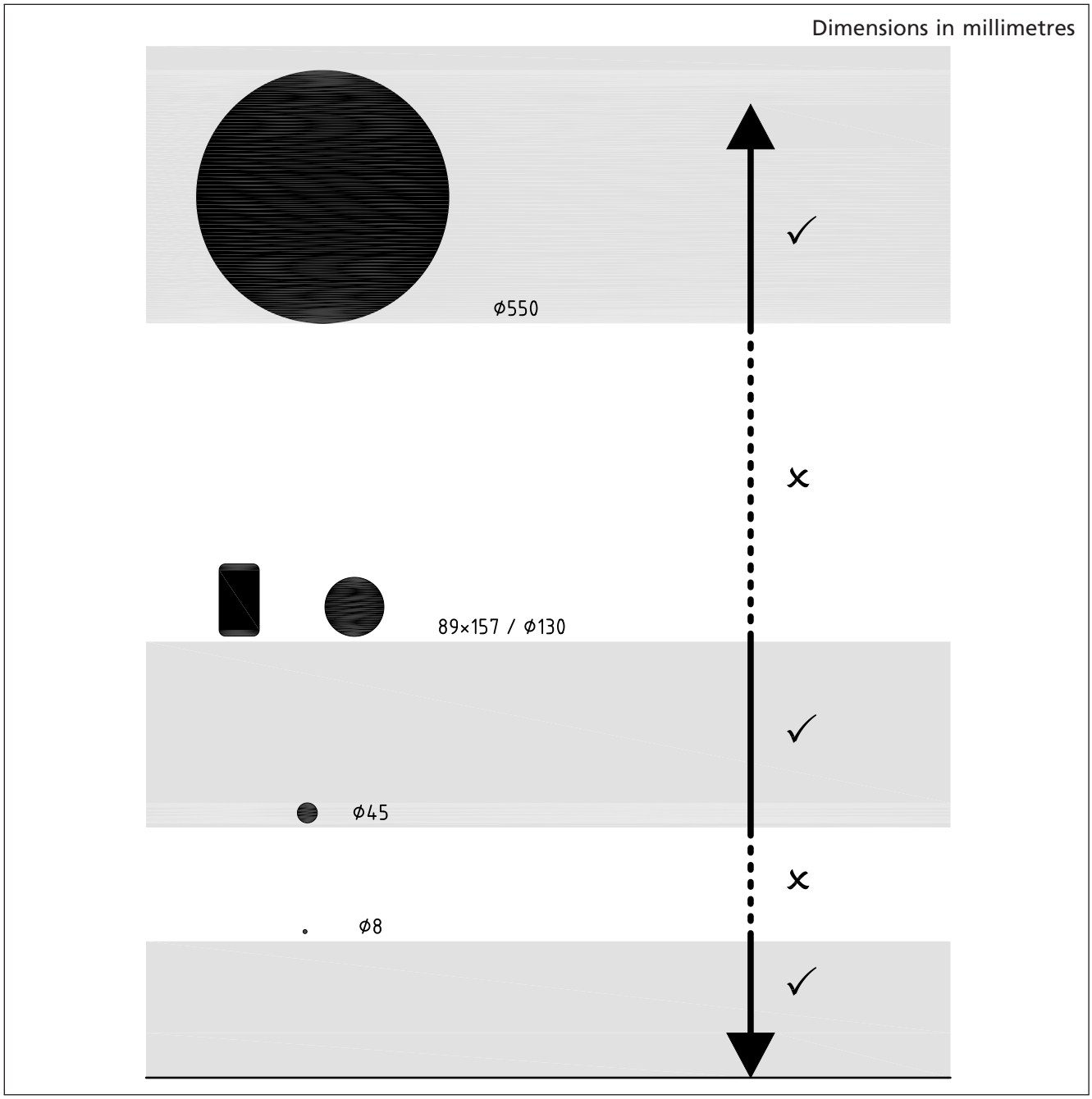
Gaps and holes shall otherwise be <8 mm.

NOTE See Figure 7.

14.2 Entrapment of clothing and hair

Equipment shall be constructed such that, when the test probe of BS EN 1176-1:2008, **D.3**, is applied at any position on any item, it is released under the action of its own weight or otherwise subjected to a maximum force of 50 N in the direction of any potential sliding movement of the user.

Figure 7 **Dimensions of grooves, openings, gaps and holes**



14.3 Wedge entrapment

14.3.1 Entrapment of the head and neck

Equipment shall be constructed so that any openings do not create head and neck entrapment hazards, either by head first or feet first passage.

NOTE Hazardous situations in which this type of entrapment can be encountered include:

- *completely bound openings through which a user may slide feet first or head first (see **14.3.2**);*
- *partially bound or V-shaped openings (see **14.3.3**);*
- *other openings (e.g. shearing or moving openings).*

14.3.2 Completely bound openings

When accessible completely bound openings with a lower edge more than 600 mm above ground are tested in accordance with **E.2.1**, Probe C or E shall not pass through any opening unless it also allows sufficient clearance for the body (Ø550 mm).

14.3.3 Partially bound and V-shaped openings:

Partially bound and V-shaped openings with an entrance at 600 mm or more above the ground shall be constructed so that either:

a) any opening is not accessible when tested in accordance with **E.2.2**; or

b) if accessible at a position of 600 mm or more above ground, when tested in accordance with **E.2.2** the angular orientation range of any opening (see Figure E.4) shall conform to the following.

   1) Range 1 (template centre line ±45° from vertical): when the template apex contacts the base of the opening, the depth of the opening shall be less than the length of the template to the underside of the shoulder section.

   2) Range 2 (template centre line from horizontal to +45°): when the template apex contacts the base of the opening, the depth of the opening shall be less than the "A" portion of the template. If the depth of the opening is greater than the "A" portion of the template all parts of the opening above the "A" portion shall also allow insertion of the shoulder section of the template.

   3) Range 3: No template test requirements.

15 Separation from other facilities and activities

Parkour equipment and the sporting activities that take place are unique and clear separation shall be provided from children's play and other sporting facilities and activities.

NOTE The method of doing this varies according to the site.

16 Access

16.1 Sporting ability

Access to equipment shall be possible only through the user's own sporting ability. Therefore, no means of easy access, such as steps, shall be provided to landings.

NOTE The intention is to allow user's to develop their skills to access equipment. They determine their ability to access the equipment.

16.2 Disability and equality

Disability and equality access shall be provided to a ground access point of every item of Parkour equipment.

NOTE For further information, see PD CEN/TR 16467 (in preparation).

17 Post-installation inspection

On completion of the installation, a post-installation inspection shall be carried out by a competent person who was not physically involved in the installation and is not responsible for possible correction works or expenses.

18 Maintenance

18.1 General

The manufacturer/supplier shall provide instructions for maintenance (marked with the number of this British Standard), including the frequency of inspection and maintenance and a statement that the frequency varies with the type of equipment.

The manufacturer/supplier shall also provide drawings and diagrams necessary for maintenance, inspection and checking of correct operation and, when appropriate, repair of the equipment.

Equipment and its components shall be inspected and maintained in accordance with the manufacturer's instructions at frequency not less than that given by the manufacturer (see also Annex F).

NOTE The level of competence required varies with the task.

18.2 Inspection frequency (see also Annex F)

18.2.1 To prevent accidents, the owner or operator shall ensure that an appropriate inspection schedule is established and maintained for Parkour equipment. This shall take into account local conditions and the manufacturer's instructions that can affect the necessary inspection frequency. The schedule shall list the components to be inspected at the various inspections and the methods of inspection.

18.2.2 If defects that could put safety at risk are discovered during inspection, these shall be corrected without delay. If this is not possible, the equipment shall be secured against use, e.g. immobilization or removal where possible.

18.2.3 Where a piece of equipment is to be removed from the site, for example for maintenance, any anchorages or foundations left in the ground shall be removed or safeguarded and the site made safe.

Section 3: Information to be supplied

19 Labelling/marking

The following information shall be marked legibly and permanently on each item of Parkour equipment, in a position visible from ground level.

a) The name and address of the manufacturer or the authorized representative.

b) The equipment reference and year of manufacture.

c) The number and date of this British Standard, i.e. BS 10075:2013. [1)]

20 Information to be provided by the manufacturer/supplier

20.1 General product information

The manufacturer/supplier shall provide instructions in the appropriate language(s) of the country in which the equipment is to be installed and used. The instructions shall:

a) be printed legibly and in a simple form;

b) contain illustrations wherever possible; and

c) include at least the following information:

1) details of the installation, operation, inspection and maintenance of the equipment;

2) advice to the operator about the need to increase inspection/maintenance if the equipment is subject to heavy use and/or the stability of the equipment relies on one post; and

3) advice to take care in relation to specific hazards to users from incomplete installation or dismantling or during maintenance.

NOTE The manufacturer/supplier should supply copies of test reports to purchasers upon request.

20.2 Pre-information

The manufacturer/supplier shall provide information concerning the safety of the installation prior to the acceptance of the order, e.g. a catalogue data sheet.

This information shall include at least the following, where relevant.

a) Minimum space.

b) Surfacing requirements (including free height of fall and extent of surfacing).

c) Overall dimensions of the largest part(s).

d) Mass of the heaviest part/section in kilograms.

e) Guidance regarding the target user group for the equipment.

[1)] Marking BS 10075:2013 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third-party certification of conformity.

f) If the equipment is intended only for indoor use or under supervised conditions.

g) Availability of spare parts.

h) Any certification of conformity with this standard.

20.3 Installation information

The manufacturer/supplier shall supply an equipment delivery parts list with the equipment.

The manufacturer/supplier shall supply installation instructions for the correct assembly, erection and placing of the equipment.

This information shall include at least the following.

a) Minimum space requirements and safety clearances.

b) Equipment and parts identification.

c) Erection sequence (assembly instruction and installation details).

d) Matching aids where necessary, e.g. signs on parts accompanied by appropriate instructions.

e) The need for any special tools, lifting devices, templates or other assembly aids to be used and any precautionary measures to be taken. Where necessary, torque values should be given.

f) Constructional space required to install the item of equipment.

g) Orientation, where necessary, in relation to sun and wind.

h) Details of the required foundation, under normal conditions, anchorage in the ground and the design and location of the foundation (with a note that care should be taken concerning abnormal conditions).

i) Specific instructions if a particular landscape profile is necessary for safe operation, e.g. falling height.

j) Free height of fall (for impact attenuation surfacing needs).

k) The need for and details of the application of any painting or treatment.

l) Removal of assembly aids before the equipment is used.

Drawings and diagrams shall clearly specify the principal dimensions of the equipment and the relevant space, heights and areas required for installation.

The manufacturer/supplier shall supply the details necessary for inspection of the equipment prior to its first use.

21 Information sign

A sign containing the following information shall be posted at each entrance to a Parkour facility.

a) "This is a Sports Area, designed specifically for Parkour use by youth and adults at [location]".

b) "This is **not** a children's playground".

c) The name of the operator and a contact number.

d) Any desired safety and operational information, preferably through the use of pictograms.

e) "For advice on safe and appropriate usage please contact Parkour UK, the National Governing Body for Parkour/ Freerunning in the UK. www.parkouruk.org info@parkouruk.org".

Annex A (normative) Method of determining structural integrity

A.1 General principle

Calculate the number of users for each structural component in accordance of Annex B.

Calculate the test load using the following formula.

$M \times \gamma_Q + m$

where:

M is the appropriate user load taken from Table A.1;

γ_Q is the applicable safety factor (see **A.3**);

m is the self-weight of the structure.

Table A.1 **User loads *M* by number of users *n* 1 to 100**

n	*M*	*n*	*M*	*n*	*M*	*n*	*M*
	kg		kg		kg		kg
1	227	26	2 240	51	4 231	76	6 213
2	306	27	2 320	52	4 310	77	6 292
3	387	28	2 400	53	4 390	78	6 371
4	468	29	2 480	54	4 469	79	6 450
5	550	30	2 559	55	4 548	80	6 529
6	631	31	2 639	56	4 628	81	6 608
7	712	32	2 719	57	4 707	82	6 687
8	793	33	2 799	58	4 786	83	6 767
9	874	34	2 878	59	4 866	84	6 846
10	955	35	2 958	60	4 945	85	6 925
11	1 036	36	3 038	61	5 024	86	7 004
12	1 117	37	3 118	62	5 104	87	7 083
13	1 197	38	3 197	63	5 183	88	7 162
14	1 278	39	3 277	64	5 262	89	7 241
15	1 358	40	3 356	65	5 341	90	7 320
16	1 439	41	3 436	66	5 421	91	7 399
17	1 519	42	3 515	67	5 500	92	7 478
18	1 599	43	3 595	68	5 579	93	7 557
19	1 680	44	3 675	69	5 658	94	7 637
20	1 760	45	3 754	70	5 737	95	7 716
21	1 840	46	3 834	71	5 817	96	7 795
22	1 920	47	3 913	72	5 896	97	7 874
23	2 000	48	3 992	73	5 975	98	7 953
24	2 080	49	4 072	74	6 054	99	8 032
25	2 160	50	4 151	75	6 133	100	8 111

A.2 User load

User load M is calculated from formula.

$$(n \times 78 + 1.64 \times \sigma \sqrt{n}) \times (1 + 1.3/n)$$

where:

n is a number of users;

78 kg is a mean mass of adult male;

1.64 is a statistical factor;

σ is a standard deviation of adult males;

$1 + 1.3/n$ is a factor that takes into account movement of users.

A.3 Safety factors

Apply the safety factor (γ_Q) of 2.0 for identical series where not every specimen is tested.

Apply the safety factor (γ_Q) of 1.35 where every specimen, including any unique product, is tested.

A.4 Self-weight

Calculate the self-weight m of the structure and assemblies and add this to the test weight when calculations only are carried out.

For physical testing, self-weight m of the structure is the structure itself, so this need not be calculated and added to the test weight.

A.5 Physical testing

Apply the test weights on or under the structure so that the entire weight rests on the component or structure that is tested.

Subject the specimen to the load for 5 min.

Annex B (normative) Number of users on the equipment

B.1 General

Calculate the number of users for each structural element likely to be loaded by users. Round the calculated number up to the next whole number, e.g. 3.13 becomes 4.0.

B.2 Number of users on a point

Unless stated differently elsewhere in this standard, the number of users n on a point is 1 ($n = 1$).

B.3 Number of users on line type elements

NOTE Line type elements are rungs in ladders and in climbing frames, poles and ropes.

Calculate the number of users *n* on a line as follows.

a) Line elements with an inclination up to and including 60°: $n = L_{pr}/0.7$.

b) Line elements with an inclination greater than 60°: $n = L/1.40$.

Where:

L is the length of the element in metres.

L_{pr} is the length of the element projected down to a horizontal plane, in metres.

B.4 Number of users on an area

NOTE Area type elements are platforms, lattice type platforms, ramps and nets. These types of element are not loaded as densely as platforms.

Calculate the number of users *n* on a surface area from the following.

a) Planes with inclination up to and including 60°: $n = A_{pr}/0.49$.

b) Planes with inclination greater than 60°: $n = A/0.98$

Where:

A is the area, in metres squared.

A_{pr} is the area projected down to a horizontal plane, in metres squared.

If the width of the plane is smaller than 0.7 m, treat it as a line type element.

Annex C (normative) Test method for structural integrity

C.1 Principle

The structural integrity of a surround is tested by dropping weights onto the panel.

C.2 Apparatus

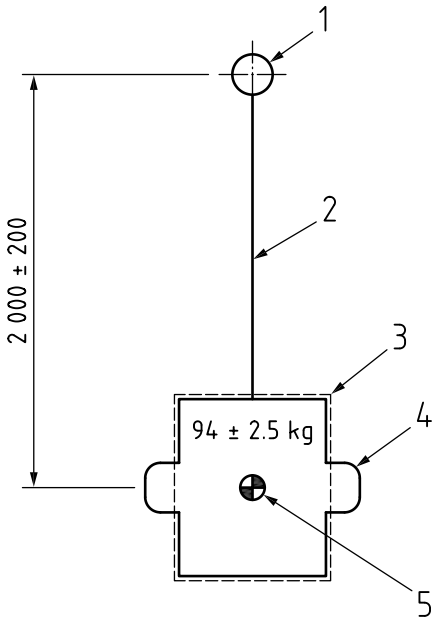
C.2.1 *Panel.*

C.2.2 *Mass, M, of (94 ±2.5) kg.*

C.2.3 *Test apparatus conforming to Figures C.1 and C.2.*

Figure C.1 **Apparatus for testing structural integrity**

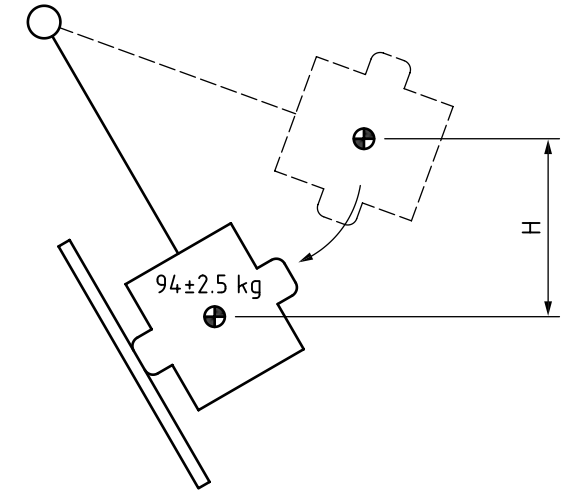
Unless otherwise indicated, dimensions in millimetres



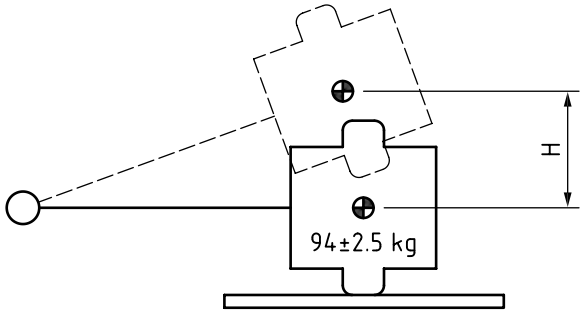
Key

1 Rotating point
2 Stiff arm
3 Mass
4 Car tyre with 2 bar pressure
5 Mass gravity centre point

Figure C.2 **Test apparatus for an inclined surface and a horizontal surface**



a) Testing inclined surface



b) Testing horizontal surface

Key

H Drop height

C.3 Procedure

Suspend the mass *M* (see **C.2.2**) 500 mm above the largest panel, as measured from the mass gravity centre point (see Figure C.1), and drop this onto the panel.

Suspend the mass *M* (see **C.2.2**) 400 mm above the longest edge of the panel, as measured from the mass gravity centre point (see Figure C.2), and drop this onto the edge.

Check panel and edge for visible signs of deterioration as a result of the impact.

Annex D (normative) Assessment of surface area of a landing

D.1 Principle

The assessment method determines whether a landing is large enough (larger than the body section of the test template) (Phase 1) and whether the grip section of the form of the landing has corners that are too sharp to be used for landing (Phase 2).

D.2 Apparatus

Test template, conforming to Figure D.1 and Figure D.2.

Figure D.1 **Dimensions of test template**

Dimensions in millimetres

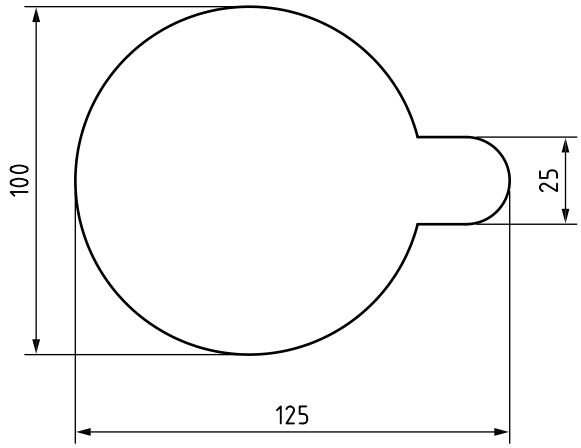
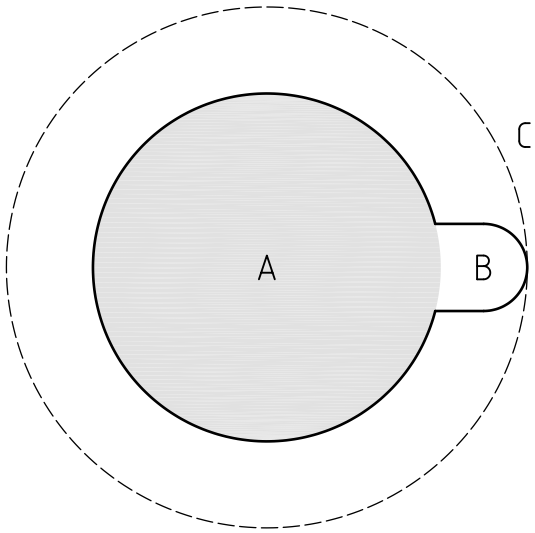


Figure D.2 **Sections of test template**



Key

A Body section

B Grip section

C Imaginary perimeter that is covered by grip section, while body section does not move

D.3 Procedure

D.3.1 Phase 1

Place the test template on the landing.

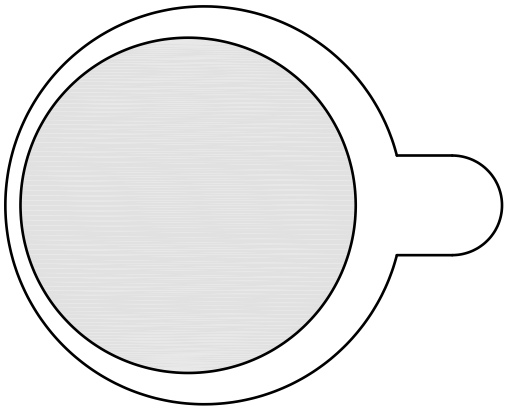
Check if the landing is large enough to support whole surface area of the body section of the template (see Figure D.3 for example test results).

D.3.2 Phase 2

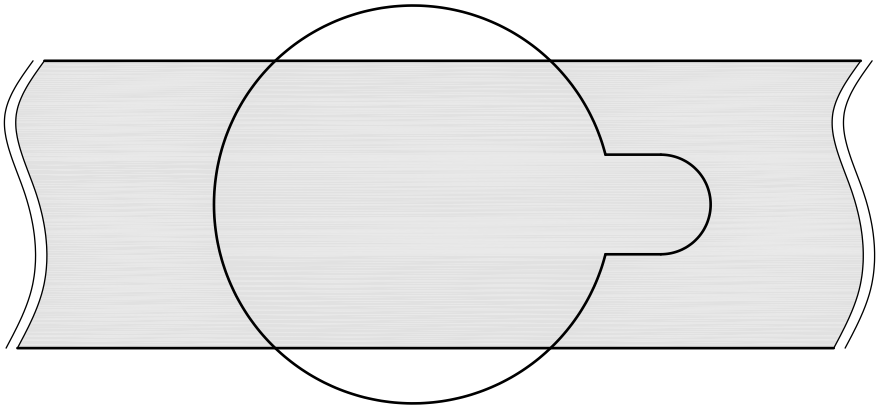
Move the template to extremities of the landing.

Check whether the imaginary perimeter of the grip section covers all corners of the landing (see Figure D.3 for example test results).

Figure D.3 **Example test results** *(1 of 3)*



a) Fail: Body section of the template does not fully fit on the landing

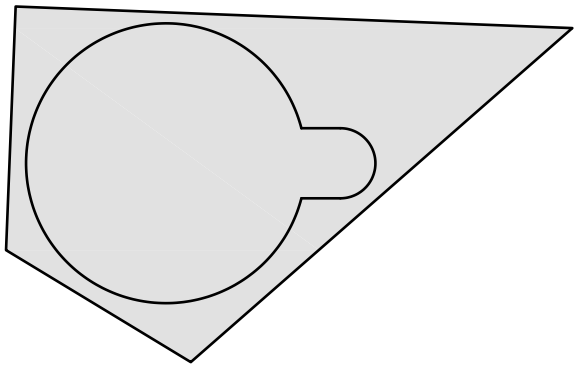


b) Fail: Body section of the template does not fully fit on the landing

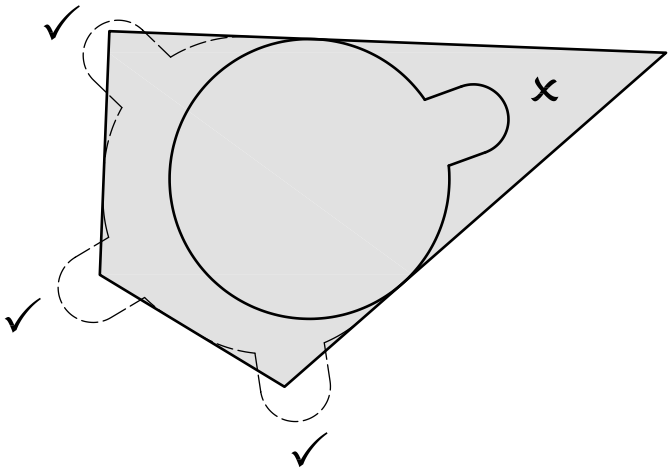
Key

Landing

Figure D.3 **Example test results** *(2 of 3)*



Phase 1: Body section of the template fully fits on the landing. Pass. Proceed to Phase 2.



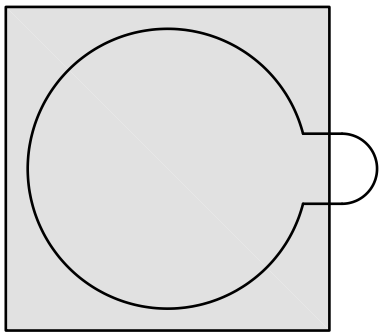
Phase 2: Grip section covers only three of the four corners of the landing. Fail whole test.

c) Fail: Two-phase test of body and grip section

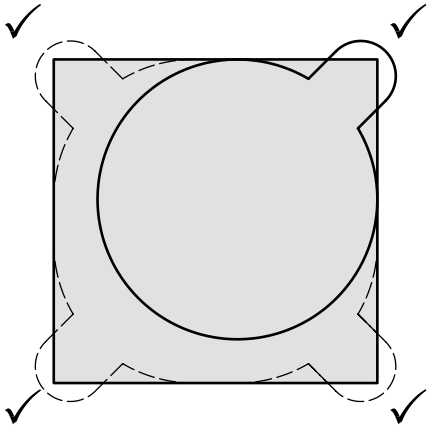
Key

Landing

Figure D.3 **Example test results** *(3 of 3)*



Phase 1: Body section of the template fully fits on the landing. Pass. Proceed to Phase 2.



Phase 2: Grip section covers all four corners of the landing. Pass whole test.

d) Pass: Two-phase test of body and grip section

Key

Landing

Annex E (normative) Test methods for entrapment

E.1 General

Unless stated otherwise, tolerances of the probes in this Annex are:

a) ±1 mm for dimensions; and

b) ±1° for angles.

In situations of doubt about the tolerance, an accurate measurement shall be made to ensure the opening is in accordance with the nominal dimension of the probe.

E.2 Head and neck entrapment

E.2.1 Completely bound openings

NOTE These entrapment tests are taken from BS EN 1176 because it is recognized that, although the equipment is intended primarily for youths and adults, children might choose to use the equipment.

E.2.1.1 Apparatus

E.2.1.1.1 *Probes*, as illustrated in Figure E.1.

E.2.1.2 Procedure

Apply successively the probes as illustrated in Figure E.1 to each relevant opening. Apply each probe with the axis perpendicular to the plane of the opening. Record and report the passage of any probe through the opening. If any of the probes are not freely passing through the opening apply a force of (222 ±5) N to the probe. If the probe passes, the item fails.

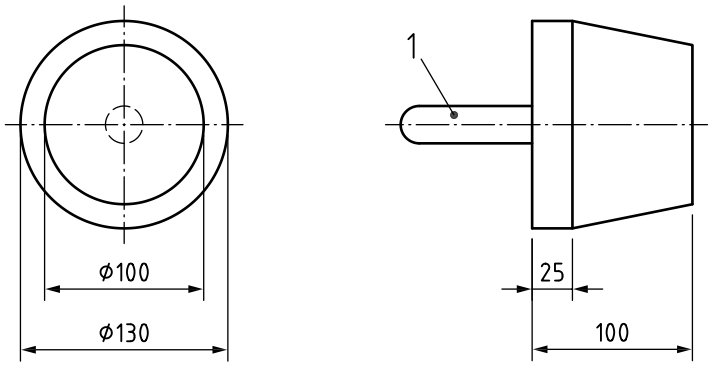
E.2.2 Partially bound and V-shaped openings

E.2.2.1 Apparatus

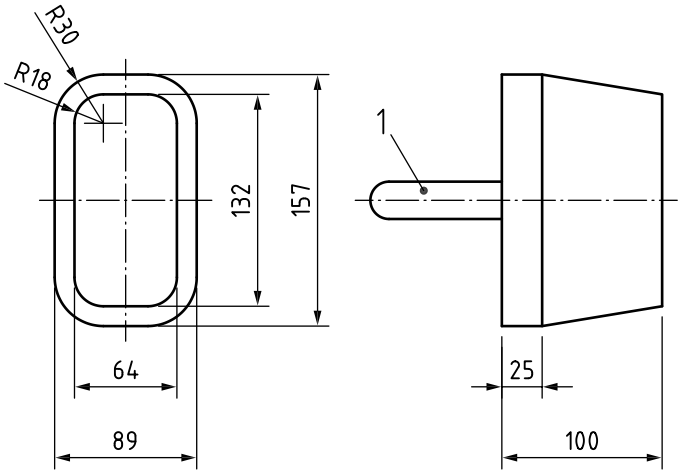
E.2.2.1.1 *Test template*, as illustrated in Figure E.2.

Figure E.1 **Probes for determination of head and neck entrapment in completely bound openings**

Dimensions in millimetres



a) Probe E (small head)



b) Probe C (torso)

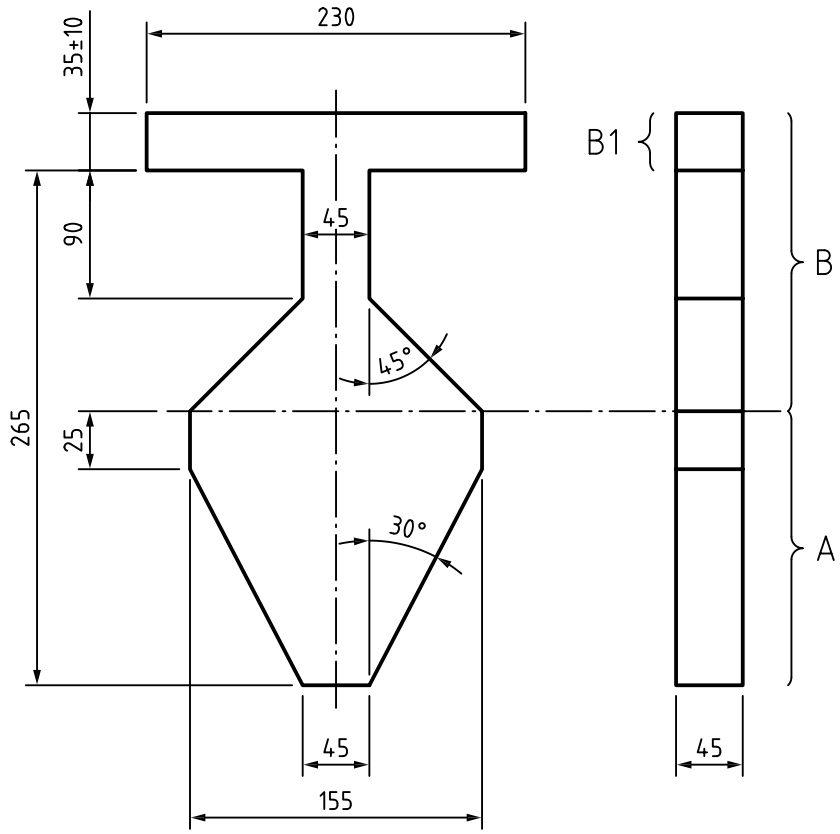
Key

1 Handle

NOTE Probes taken from BS EN 1176-1:2008.

Figure E.2 **Test template for assessment of head and neck entrapment in partially bound and V-shaped openings**

Dimensions in millimetres



Key

A "A" portion of probe
B "B" portion of probe
B1 Shoulder section

E.2.2.2 Procedure

Position the "B" portion of the test template between and perpendicular to the boundaries of the opening, as shown in Figure E.3. Record and report whether the template fits within the boundaries of the opening or if it cannot be inserted to its full thickness.

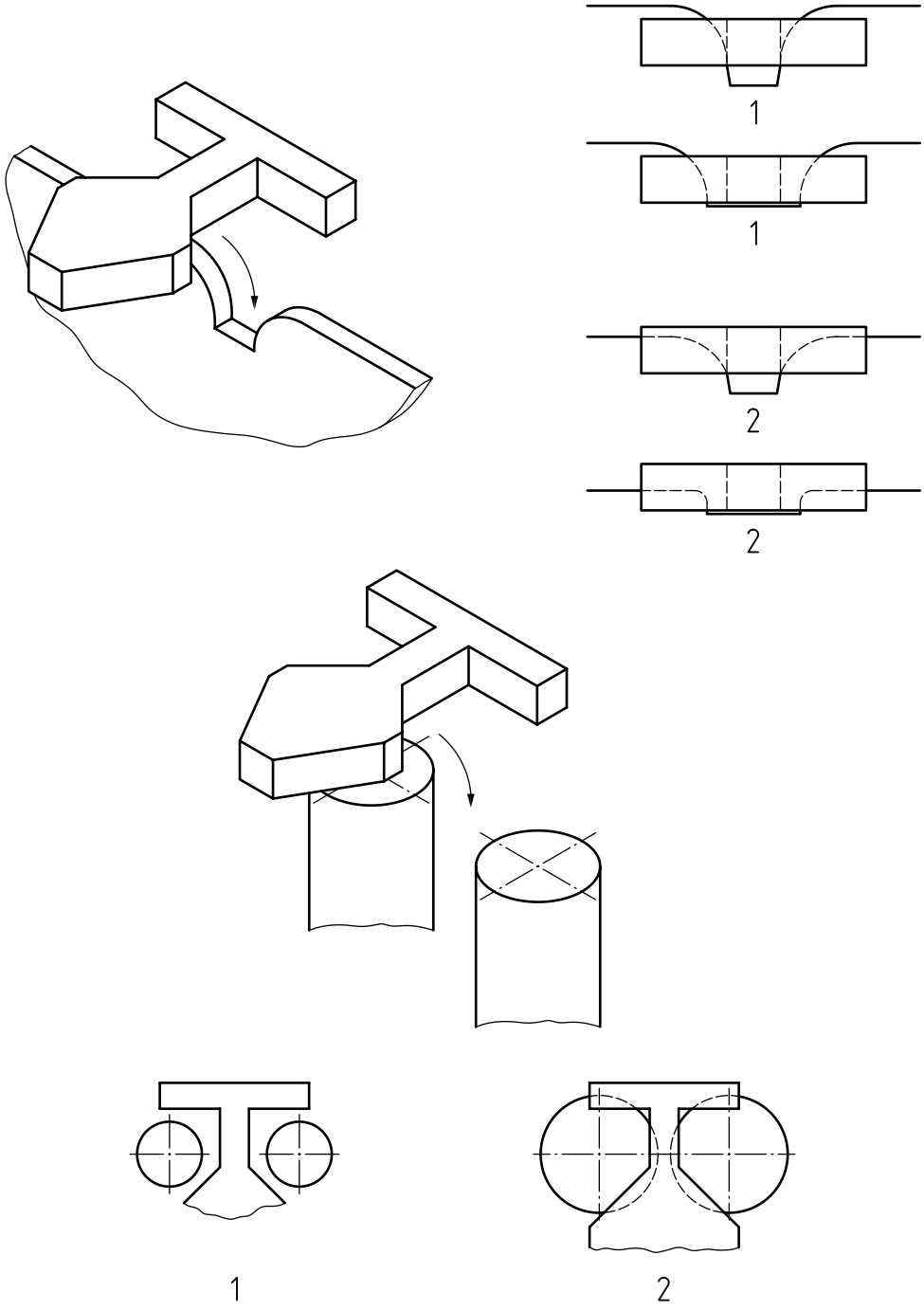
If the test template can be inserted to a depth greater than the thickness of the template (45 mm), apply the "A" portion of the test template so that its centre line is orientated to check the extremities of the opening as well as the centreline.

Ensure that the plane of the test template is parallel and applied in line with the opening, as shown in Figure E.4.

Insert the test template along the opening until its motion is arrested by contact with the boundaries of the opening. Record and report the results, including the angle of the template centreline relative to the vertical and horizontal axes (see Figure E.4) as this determines the pass/fail requirements given in **14.3**.

NOTE See Figure E.5 and Figure E.6 for examples of the assessment for the different angular ranges.

Figure E.3 **Method of insertion of the "B" portion of the test template**

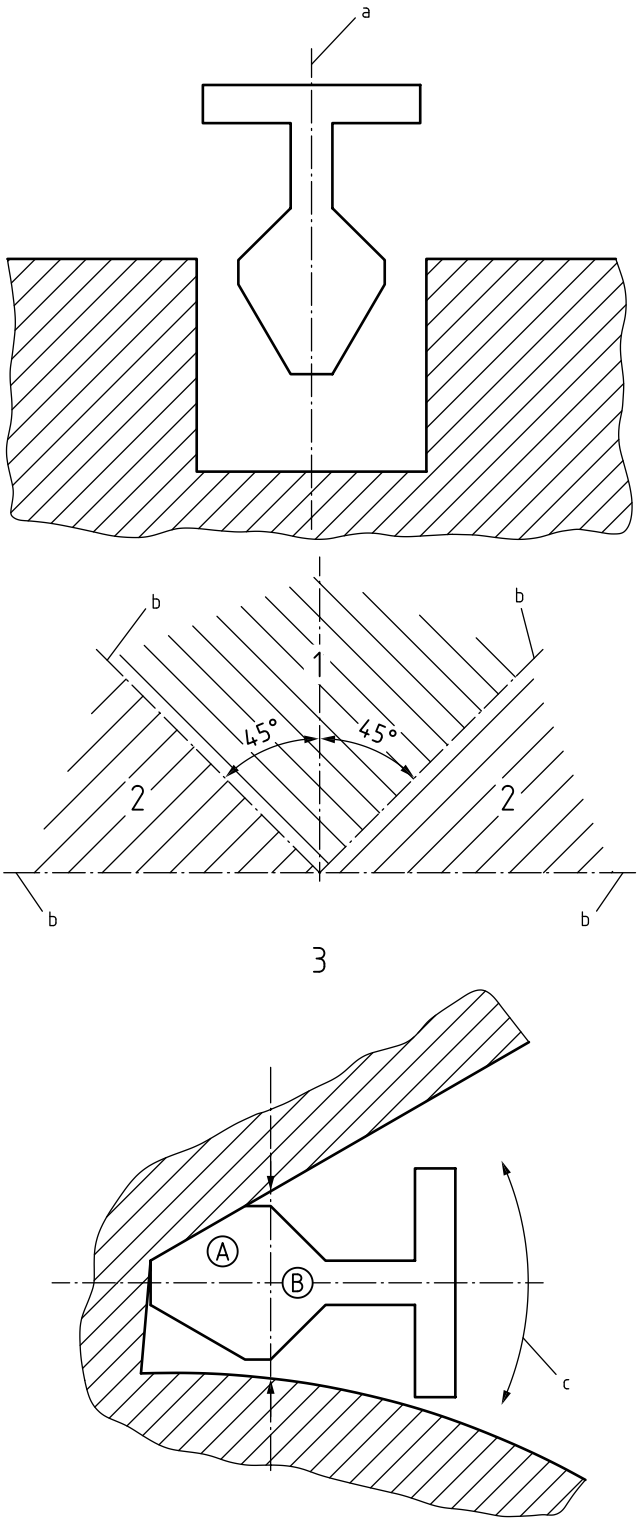


Key

1 Accessible

2 Not accessible

Figure E.4 **Checking all insertion angles to determine range**

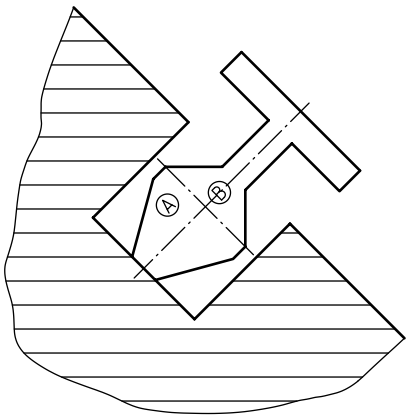


Key

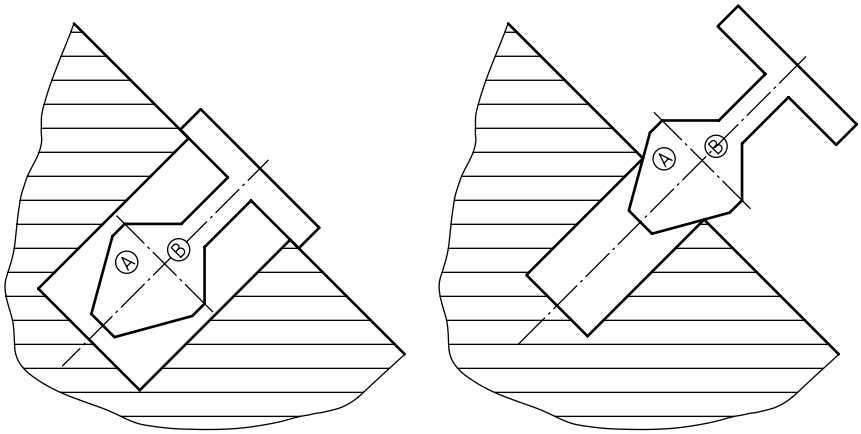
1	Range 1	a	Insertion angle for the range
2	Range 2	b	Template centre line
3	Range 3	c	All insertion angles checked

Figure E.5 **Range 1 method of insertion of the "A" portion of the test template**

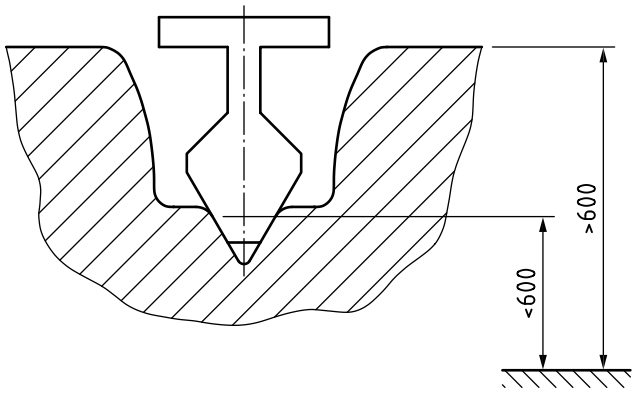
Dimensions in millimetres



a) Pass if front section fully enters aperture to a maximum depth of (template shoulder depth) 265 mm



b) Fail



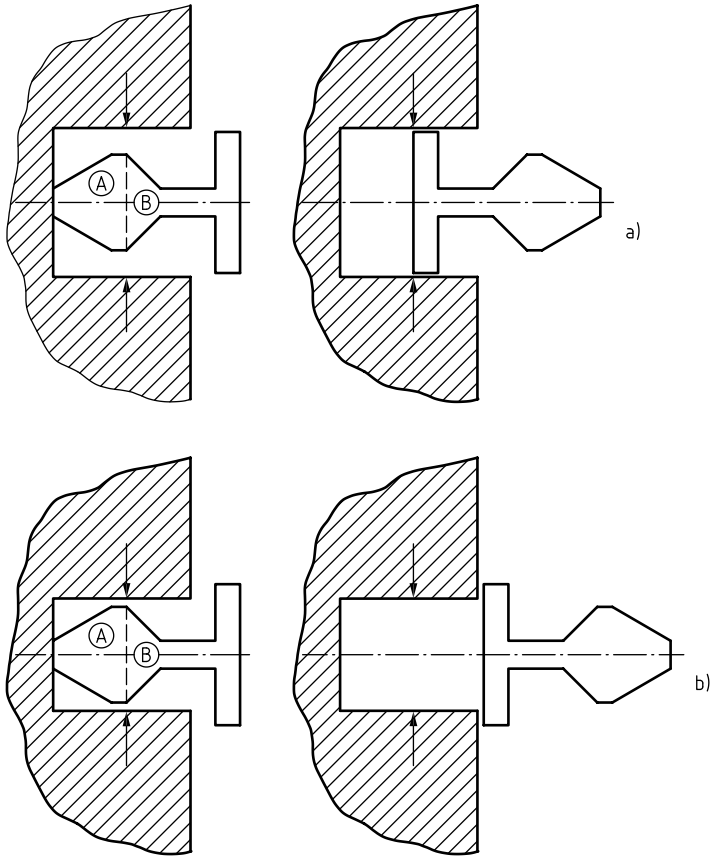
c) Pass

Key

>600 mm More than 600 mm above the playing surface

<600 mm Less than 600 mm above the playing surface

Figure E.6 **Range 2 method of insertion of the "A" portion of the test template followed by insertion of the shoulder of the template**



Key
a) Pass
b) Fail

Annex F (informative)

Frequency of inspections

a) Routine visual inspection

Routine visual inspection enables the identification of obvious hazards that can result from vandalism, use or weather conditions, e.g. broken parts or broken bottles.

For Parkour facilities subject to heavy use, vandalism or severe weather conditions, daily inspection of this type might be necessary.

b) Operational inspection

The operational inspection is a more detailed inspection to check the operation and stability of the equipment, especially for any wear. This inspection should be every one to three months, or as indicated by the manufacturer's instructions.

Special attention should be given to "sealed-for-life" parts.

NOTE Examples of visual and operational inspection points are cleanliness, equipment ground clearances, ground surface finishes, exposed foundations, sharp edges, missing parts, excessive wear and structural integrity.

c) Annual main inspection

The annual main inspection is carried out to establish the overall level of safety of equipment, foundations and surfaces, including any changes made as a result of the assessment of safety measures, effects of weather, presence of rotting or corrosion, and any change in the level of safety of the equipment as a result of repairs made, or of added, or replaced components.

Special attention should be given to "sealed-for-life" parts.

NOTE The annual main inspection may involve excavation or dismantling of certain parts. Additional measures might be necessary to detect other possible deterioration of the structure.

Bibliography

Standards publications

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

PD CEN/TR 16467, *Playground equipment accessible for all children* (in preparation)

Other publications

[1] CONCRETE STRUCTURES GROUP (CONSTRUCT). *National Structural Concrete Specification for Building Construction* (Third edition). Camberley: CONSTRUCT. 2004.

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