SLOVENSKI STANDARD
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Prostori za gledalce ï 3. del: Loļ ilni elementi ï Zahteve

Spectator facilities - Part 3: Separating elements - Requirements

Zuschaueranlagen - Teil 3: Abschrankungen - Anforderungen

Installations pour spectateurs - Partie 3: Eléments de séparation - Exigences

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91.040.10	Javne stavbe	Public buildings
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English Version

Spectator facilities - Part 3: Separating elements - Requirements

Installations pour spectateurs - Partie 3: Eléments de séparation - Exigences

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This European Standard was approved by CEN on 7 October 2005.

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Foreword

This European Standard (EN 13200-3:2005) has been prepared by Technical Committee CEN/TC 315 “Spectator facilities”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2006, and conflicting national standards shall be withdrawn at the latest by May 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This European Standard has been prepared in order to specify the general design criteria for spectator facilities (permanent, movable, demountable and telescopic), with the purpose of enabling their functionality.

Within this European Standard minimum and recommended values for dimensions and loadings are occasionally presented. It should be recognised that these values are to be considered as values that in part recognise different national requirements as a basic provision.

Attention is drawn to the fact that in certain countries additional/different requirements may be applicable due to existing national regulations or equivalent.

This European Standard is divided among six parts:

EN 13200-1, *Spectator facilities - Part 1: Layout criteria for spectator viewing area - Specification*

prCEN/TR 13200-2, *Spectator facilities - Layout criteria of service area –Part 2: Characteristics and national situations*

EN 13200-3, *Spectator facilities - Part 3: Separating elements - Requirements*

prEN 13200-4 *Spectator facilities - Part 4: Seats - product characteristics*

prEN 13200-5 *Spectator facilities - Part 5: Telescopic stands*

prEN 13200-6, *Spectator facilities – Part 6: Demountable (temporary) stands*

IMPORTANT NOTES

NOTE 1 The proposed values for barrier loadings contained in Tables A1, A2 and A3 may be justified from experimentally determined values appropriate to the barrier provision.

NOTE 2 Separating elements for demountable and retractable stands are included within this European Standard.

NOTE 3 Safety management does not form part of this European Standard.

1 Scope

This European Standard specifies design requirements for layout and product characteristics for separating elements within spectator accommodation at permanent or temporary entertainment venues including sport stadia, sport halls, indoor and outdoor facilities for the purpose of enabling their functionality.

Other permanent venues such as theatres, cinemas, opera houses, lecture halls and similar are excluded from this standard.

Elements and barriers included in this standard are:

a) external perimeter barriers (5.2)

b) activity area barriers (5.3)

c) segregation elements (5.4)

d) crush barriers (5.5)

e) barriers in front of and behind seating (5.6)

f) barriers in spectator galleries (5.7)

g) ingress and turnstiles (5.8)

h) exit doors and gates (see 5.9)

i) temporary barriers (5.10)

j) front of stage barriers (5.11)

2 Normative references

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

EN 13200-1:2003, *Spectator facilities - Part 1: Layout criteria for spectator viewing area - Specification*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions in EN 13200-1:2003 and the following apply.

3.1
separating element or barrier
protective barrier, which is any element of building or structure, permanent or temporary, intended to prevent persons from falling or to retain, stop or guide persons

3.2
external perimeter barriers
barrier which separates the external area from the spectator's service area (see EN 13200-1:2003, Figure A.1)

3.3
activity area barriers
barrier which separates spectator viewing area from the activity area

3.4
segregation element
any barrier which serves to separate areas of standing or seated accommodation from adjoining areas of standing or seated accommodation

3.5
crush barrier
barrier which, combined with appropriate spacing, protects spectators from crushing, positioned in areas of standing accommodation

3.6
barriers in front of and behind seating
barriers specifically positioned immediately in front of or behind seating (see Figure A.1)

3.7
spectator gallery
limited space, usually attached to a hospitality area, from which standing spectators can view the event

3.8
turnstile
gate for admission with revolving arms which allows persons to pass through singly

3.9
temporary barrier
barrier lasting or meant to last for a limited time and that will normally be removed after the event

3.10
datum
finished level of the floor, roof, foundation slab, balcony, ramp, stage or pitch line of stairs, etc.

3.11
design level
level at which the horizontal force on the barrier is assumed to act for the purposes of design

3.12
handrail
rail normally grasped by hand for guidance or support

3.13
infill panel
element of the barrier designed to prevent the risk of person falling

4 General requirements

4.1 Preliminary considerations

4.1.1 In the assessment of the need for a barrier and the type of barrier to be provided, the designer and ground management shall consider the building use and the risks to building users.

Where, in a building more than one use is anticipated, either the barrier design shall be chosen to suit the worst case or more than one type of barrier shall be provided as appropriate to the location.

Where there is a difference in level exceeding 500 mm consideration shall be given to the necessary provision of a barrier to restrict or control the movement of spectators: however barriers may be required in certain circumstances where the difference in levels is less than 500 mm.

4.1.2 Where walls, glazing or other elements of buildings or structures perform the functions of barriers, the designer shall either:

a) ensure that these separating elements satisfy the criteria given in this standard, or

b) provide additional barriers designed in accordance with this standard.

4.1.3 The design of barrier adopted shall be such as to reduce the risk of persons falling, rolling, sliding or slipping through gaps in the barrier to an acceptable level. Except in areas not likely to be used by children, barriers shall be designed so that the widest gap in the barrier does not permit a sphere of diameter of 120 mm (maximum) to pass through, making due allowance for deflection under load. The recommended diameter of the sphere is 100 mm. Barriers shall be non climbable.

4.2 Barrier design and loading

Barriers shall be designed to resist safely the minimum horizontal imposed loads specified in Tables A.1, A.2 or A.3.

Regardless of the height of the barrier (4.4), the horizontal imposed load shall be considered to act at a height of 1,1 m above the datum, when applied as a static load at right angles to the longitudinal axis.

Designers shall ensure that any construction or structure acting as a support for barriers is of adequate strength and stability to resist safely all applied loads, without excessive stress, deflection or distortion.

Where values are given for minimum and recommended levels of loading, the adoption of a value shall be substantiated by documented risk assessment, taking into account the purpose and position of that barrier during its lifecycle.

NOTE Recommended values suit all applications. In applying Table A.1 due accord should be given to National Regulation regarding safety

4.3 Design procedures

For barriers limit state design procedures shall be used, according to the recommended procedure given in the Eurocode appropriate for the material to be used, treating the loads given as characteristic loads, for limit state design.

When using limit state design, the partial safety factors for loads and materials shall be those recommended by the appropriate material's code of practice. The strength of the barrier shall be designed as Ultimate Limit State and the deflection as Serviceability Limit State.

4.4 Barrier heights

Barriers used in standing accommodation, seated accommodation and on stairways and ramps shall be designed to a height of not less than 1,1 m, measured from the datum, unless they fall into one of the following two categories:

a) barriers within 530 mm in front of fixed seating can be a minimum height of 800 mm above the datum (see Figure A.1).

NOTE 1 See E specified Figures 3 and 4 in EN 13200-1:2003.

In such cases consideration shall be given to the horizontal width of the barrier to prevent falling over, i.e. in certain instances a lower height can be acceptable with a wide barrier (see Figure A.1).

b) barriers immediately behind a row of seats should be a minimum height of 1,1m above the datum, which in this case is the level of the seat (Figure A.2).

In all cases, as stated in 4.2, regardless of the height, the horizontal imposed load shall still be considered to act at a height of 1,1 m above the datum.

NOTE 2 Further guidance on the height of crush barriers is provided in 5.4.

4.5 Deflection

A barrier for the protection of people that is structurally safe shall not possess sufficient flexibility to alarm the building users when subjected to normal service.

NOTE This recommendation is in addition to any recommendations for limiting deflection under full load given in the appropriate structural codes for the material to be used, in which event the most onerous limit is to be applied.

4.6 Fixings

Care shall be taken to ensure that the strength of the fixing is adequate for the loading to which the barrier will be subjected. All joints shall be designed to provide the full strength of the members being joined.

Wherever a single fixing or support is essential to prevent the collapse or failure of a barrier, or of a critical part of a barrier, the design shall avoid reliance wholly on the pull-out strength of the fixing. Fixing design shall take particular account of the material into which the fixing is placed, the spacing between fixings, the edge distance, and the position of any reinforcement.

4.7 Safety details

The finished barrier shall have no sharp edges or projections that may cause injury to persons or damage to clothing or other objects.

Infill panels and balusters are intended to provide support and protection to the user, and shall be designed to restrain people without causing additional injury from sharp edges, thin sections, projecting details, etc. (see A.1).

4.8 Support from adjacent construction

Designers shall ensure that any construction or structure acting as support for barriers is of adequate strength and stability to sustain all applied loads safely without excessive stress, deflection or distortion.

4.9 Maintenance

The design shall provide the safe maintenance of barriers. Consideration shall be given to the possibility of tampering or vandalism.

4.10 Barriers and sightline considerations

All spectators viewing areas shall have a clear, unobstructed view of the whole activity area, as defined in EN 13200-1.

NOTE It is recognised that even barriers meeting the height requirements listed in 4.4 may obstruct sightlines.

5 Specific requirements

5.1 General

The requirements for design and loading for all barriers is given in Table A.1, A.2 and A.3. This section is additionally concerned with barriers in the following locations:

5.2 External perimeter barriers

External perimeter barriers subjected to crowd loading at sports ground may include walls, fences, turnstiles, ingress exit doors and gates. The relevant loadings are specified in Table A.1.

Allowance shall also be made for forces simultaneously and independently induced by other factors, for example, wind forces or attached installations.

NOTE 1 Dangerous overcrowding may be caused if spectators are able to force their way into a ground already full or nearly full by scaling or breaking through boundary walls or fences or the gates in them. To avoid this danger such walls, fences and gates should be of appropriate height and strength and should not provide the opportunity for hand or footholds which might assist climbing.

NOTE 2 Consideration should also be given to the security aspects of external fencing particularly the ease with which undesirable objects i.e. flares, canisters, tickets etc may be passed into or out of the venue.

5.3 Activity area barriers

5.3.1 Such barriers can take the form of crush barriers, walls or rails.

The type, height and horizontal imposed load of an activity area barrier will vary according to its location and required function.

NOTE See also Table A.1.

The characteristics of the activity area perimeter barrier and the distance of the barrier from the activity area shall be established by the spectator facilities management in consultation with the relevant authorities and legislation, sports federation and the organiser of the event to ensure safety of spectators, management personnel and participants in the activity area as required.

If spectators can lean on, or gather immediately behind the perimeter barrier, it shall be deemed a crush barrier and therefore meet the horizontal imposed load and height requirements as specified in 5.5.

5.3.2 Emergency access to the activity area

In certain cases forward evacuation onto the activity area may form part of the emergency evacuation plan, provided that the activity area leads directly to an exit which itself leads to a place of safety.

However, regardless of whether the activity area forms part of the emergency evacuation plan, any activity area barrier or fence placed in front of the spectator viewing area shall be provided with gates or openings which allow spectators access to the of activity area.

5.3.3 Requirements dependent upon sports or activities

Individual requirements for specific sports or activities shall be required.

Requirements for the protection of the playing field can be either (or a combination of):

a) police/security;

b) moat;

c) high seating configuration;

d) insurmountable fences (either permanently fixed or removable).

In all instances the agreed and specific requirements set out in Clauses 4 and 5 shall be maintained.