



Playground equipment and surfacing

Part 0: Development, installation, inspection, maintenance and operation



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- Australian Industry Group
 - Australian Institute of Landscape Architects
 - Early Childhood Australia
 - Education and Early Childhood Services Registration and Standards Board
 - Engineers Australia
 - Institute of Public Works Engineering Australasia
 - Kidsafe
 - National Association of Testing Authorities Australia
 - NSW Fair Trading
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 - Play Australia
 - Royal Children's Hospital
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Australian Standard®

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Part 0: Development, installation, inspection, maintenance and operation

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PREFACE

This Standard was prepared by the Standards Australia Committee CS-005, Playground Equipment, to supersede AS/NZS 4486.1:1997, *Playgrounds and playground equipment, Part 1: Development, installation, inspection, maintenance and operation*. It also incorporates the relevant parts of AS/NZS 4422:1996, *Playground surfacing—Specifications, requirements and test method*, dealing with the specifications and requirements for surfacing. AS/NZS 4422:1996 underwent review concurrently with this Standard and remains current solely to deal with the test method for impact-attenuating surfacing.

The objective of this Standard is to minimize the risk of injury to playground users. It provides requirements for siting, designing and developing playgrounds, for the selection of appropriate equipment and other design elements, for product information requirements, instructions and operating procedures, and for the minimization of operational hazards. This Standard is intended for use by designers and installers of playground equipment, as well as the operators of playgrounds.

This Standard will apply from the date of publication.

This Standard has been designated Part 0 of the AS 4685 series of Standards as it deals with the development, installation, inspection, maintenance and operation of the playground. The other Parts of the series specify equipment requirements and test methods.

The term ‘informative’ has been used in this Standard to define the application of the appendices to which it applies. An ‘informative’ appendix is only intended for information and guidance.

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FOREWORD

Play is a significant aspect of children's lives through which they develop and demonstrate knowledge, skills, concepts and dispositions. It is an important context for all aspects of children's learning and development including problem-solving, social-emotional development, the acquisition and mastery of physical skills, self-awareness, imaginative abilities, exploration of natural environments, and relaxation. Consideration of play provision should not be limited to formally-equipped areas but also extend to natural elements. Provision should also be made to cater for the needs and interests of users of all abilities.

The management of risk in a playground is the responsibility of all involved in the provision of play, including designers, manufacturers and operators.

It should be recognized that risk-taking is an essential feature of play provision and of all environments in which children legitimately spend time playing. Play provision aims to offer children the chance to encounter acceptable risks as part of a stimulating and challenging learning environment. Play provision should aim at managing the balance between the need to offer risk and the need to keep children safe from serious harm.

Designers should consider the likely maintenance regime of equipment intended to be used in unsupervised environments.

Operators of playgrounds need to ensure that adequate and appropriate maintenance is performed in a timely manner. Operators are reminded that they may have legislative requirements to maintain their playgrounds and that these requirements could include funding and maintaining the playgrounds in a sustainable manner both in the short term and the long term in order to retain their functional requirements.

The most effective way to minimize unacceptable risks in a playground is to consider them in the planning and design stage. As maintenance or safety issues arise this Standard provides directions for the operator on the management of such issues.

This Standard covers the design and development of playgrounds, requirements for the manufacturer or supplier to provide relevant documentation, and also provides requirements for the operator in managing the ongoing operation of the playground.

Designers and providers of playground equipment are strongly urged to reduce the potential for foreseeable misuse of their products. Among other appropriate design measures, unintended access to parts of the playground not designed for use (e.g. roofs) should be actively discouraged through the elimination of unnecessary handholds and footholds, the inclusion of physical barriers, and the use of dimensions and profiles that are intrinsically difficult for children to climb.

Designers and providers of playgrounds are strongly urged to minimize the harmful effects of UV exposure to children and other users by incorporating shade structures and natural shade within the design. The committee noted that the provision of shade has the additional benefit of reducing the potential for skin burns from exposed hot surfaces.

STANDARDS AUSTRALIA

Australian Standard

Playground equipment and surfacing

Part 0: Development, installation, inspection, maintenance and operation

1 SCOPE

This Standard specifies requirements for the design, development, installation, inspection, maintenance and operation of playgrounds, including playground equipment and surfacing, to ensure a continuing level of functionality and safety. It also contains requirements for information to be supplied by the manufacturer or supplier and the responsibilities of the operator once the playground is in operation.

This Standard is applicable to all playground equipment (excluding equipment only used for domestic purposes) and is intended to be read in conjunction with, AS 4685 (series) and AS/NZS 4422.

This Standard does not apply to contained play facilities (refer to AS 3533.4.2).

2 OBJECTIVE

This Standard is intended to minimize the risk of injury to playground users. It provides requirements for siting, designing and developing playgrounds, for the selection of appropriate equipment and other design elements, for product information requirements, instructions and operating procedures, and for the minimization of operational hazards. The Standard is intended for use by designers and installers of playground equipment, as well as the operators of playgrounds.

3 APPLICATION

The same hazards may occur from playground equipment and surfacing whether it is produced by a commercial organization (such as a specialist manufacturer), a voluntary group (such as a service group or a parent organization) or a single individual. The requirements of this Standard therefore apply to all playgrounds excluding equipment designed for domestic use.

4 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- | | |
|--------|--|
| 1428 | Design for access and mobility |
| 1428.1 | Part 1: General requirements for access—New building work |
| 2985 | Workplace atmospheres—Method for sampling and gravimetric determination of respirable dust |

4422	Playground surfacing—Specifications, requirements and test method
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4685	Playground equipment and surfacing (series)
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AS/NZS

1170	Structural design actions (series)
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AS/NZS ISO

31000	Risk management—Principles and guidelines
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ISO	
7708	Air quality—Particle size fraction definitions for health-related sampling
SA/SNZ	
HB 436	Risk management guidelines—Companion to AS/NZS ISO 31000:2009

5 DEFINITIONS

For the purpose of this Standard the definitions in AS 4685 (series), AS 4422 and the following apply.

5.1 Competent person

A person who has acquired through training qualifications or experience or a combination of these, the knowledge and skills enabling that person to perform a specified task.

5.2 Critical fall height (h_c)

The maximum free height of fall that meets impact attenuation requirements as defined AS 4685.1 and for the purpose of this Standard is referred to as h_c .

5.3 Free height of fall (h_f)

The potential fall height as defined in AS 4685.1 and for the purpose of this Standard is referred to as h_f .

5.4 Impact-attenuating surfacing (IAS)

A surface, whereby the kinetic energy of an impact is dissipated by localized hysteresis, deformation or displacement such that the maximum acceleration and head injury criteria is reduced and the head injury criteria duration is increased.

5.5 Impact attenuation

Property whereby the kinetic energy of an impact is dissipated by localized hysteresis, deformation or displacement.

5.6 Loose-fill material

Surfacing material supplied for the purpose of impact attenuation in playgrounds, consisting of unbound, granular, chipped or fibrous elements such as sand, wood fibre, bark mulch, wood chips or other materials. These may be organic or inorganic.

5.7 Manufacturer and/or supplier

The party responsible for the design, fabrication and/or supply of playground equipment, components, built elements and surfacing products.

5.8 Nature play

The elements of a playground consisting of natural, non-manufactured items that are incorporated into the playground, including items such as logs, boulders, plant materials and surfaces, changes of level and other landscape elements.

5.9 Operator

The person(s) or organization(s) that own, operate, oversee and/or are responsible for the playground in its entirety.

5.10 Playground

An area designed for children's play, including the site, natural features, built landscape, and any manufactured equipment and surfacing.

NOTES:

- 1 This does not include domestic playgrounds, nor sites and equipment intended for use in formal sport.
- 2 This does not include fitness equipment unless these items are integrated into the playground along with other play equipment.

5.11 Risk assessment

The identification, evaluation, and estimation of the levels of risks involved in a situation and the likelihood of its occurrence, its comparison against benchmarks or standards, and determination of an acceptable level of risk.

NOTES:

- 1 AS/NZS ISO 31000 provides guidance on how risk management should be implemented and integrated into organizations. SA/SNZ HB 436 provides more detailed guidance on the implementation of risk management within organizations such as local government authorities.
- 2 Risk management in playgrounds does not require the automatic removal of all risks and that risk benefit assessment is frequently a more appropriate method of assessment.

5.12 Risk benefit assessment

A tool to aid risk management that explicitly brings together consideration of the benefits as well as the risks of play in a single judgement.

5.13 Safety management system

The procedures set up by the operator of the playground to assess, maintain and document actions aimed at injury prevention in playgrounds.

5.14 Shall

Indicates that a requirement is mandatory.

5.15 Should

Indicates a recommendation.

5.16 Supervised early childhood services (SECS)

A defined play space used by an education and care service or children's services, for children under school age, which is supervised by educators.

NOTE: Refer to AS 4685 (series), Clause 3.32 for more information.

5.17 Trip hazard

An unexpected change in height or level on which a playground user can trip or fall with the potential to cause injury.

5.18 Unitary surfacing

An impact-attenuating surface consisting of one or more material components (such as shredded rubber bound together with urethane) formed into a sheet, tile or other continuous surface where the underlying protective properties of the impact surfacing changes little with consecutive and/or repeated use.

6 PLAYGROUND DEVELOPMENT

6.1 Planning and development considerations

Playgrounds are typically provided in many settings, including—

- (a) public parks, both supervised and unsupervised;
- (b) commercial or community premises, both free access and paid access;
- (c) educational centres including schools;
- (d) SECS, including pre-schools, kindergartens, childcare centres, and family day care; and
- (e) playgroups.

Each of these environments has its own specific requirements and in some cases (such as SECS), its own regulations that also need to be taken into account.

When developing a playground, the design shall take into account the purpose of the play space, the likely ages and abilities of users, the likely level of supervision, and the potential number of users at any given time. Access for people of all abilities to the playground and to play activities is an important consideration.

Other important factors include the types of other play experiences available locally, the demographic context, the physical, social and environmental site conditions, and the provision of regular maintenance.

6.2 Site selection

6.2.1 General considerations

When the need for a playground has been established, the following questions should be considered in the selection and development of a site:

- (a) Does it have natural interest and provide a community focus for families?
- (b) Does it have safe pedestrian access to the play area?
NOTE: Refer to AS 1428 (series).
- (c) Does it have vehicular access (for ongoing maintenance)?
- (d) Is the new play area integrated into an overall open space system or part of a pathway system through a locality?
- (e) Has it been chosen with regard to the local climatic conditions, e.g. sun, shade and proximity to the ocean?
- (f) Can any water hazards, such as rivers, creeks, lakes and ponds, be managed effectively to reduce the risk of harm to children?
- (g) Is the site free from adverse environmental conditions, e.g. air pollution, noise and soil toxicity?
- (h) Is it located a safe distance from hazards that may be present from neighbouring sites, e.g. roads or industrial installations?
- (i) Does it recognize the rights of local residents with regard to their privacy and the possible noise factor?
- (j) Does it have clear lines of sight for supervision?
- (k) Have the principles of crime prevention within the design been considered such as Crime Prevention through Environmental Design (CPTED)?

6.2.2 Site conditions

The following physical properties should be considered to determine the suitability of the site and the approximate site preparation cost:

- (a) Surface levels and gradients.

NOTES:

- 1 Loose-fill impact-attenuating surfacing typically needs to be contained within a space that is approximately level to limit the migration of material.
 - 2 Site slopes will affect how paths need to be located and set out to achieve wheelchair accessible gradients [refer to AS 1428 (series)].
- (b) Proximity of trees and extent of tree protection zones.
 - (c) Soil, subsoil and geotechnical characteristics.
 - (d) Drainage characteristics, water table levels, and susceptibility to flash flooding.

- (e) Location of nearest sewer connection points, water supply and power, if required.
- (f) Location of nearest stormwater drains and discharge points.
- (g) Presence of easements, overhead power lines, covenants, heritage or inundation overlays, or other restrictions on land use.

6.2.3 Services

The need for electricity, water, sewerage and garbage services and telephone and emergency services should be considered. Access for the latter should be clearly defined.

Care should be taken to avoid damage to existing underground services such as power, water, drainage and communications. Supply authorities should be contacted regarding the location of underground services.

Drainage of the site and installation of the required services should conform with the requirements of the appropriate authorities and the particular characteristics of the site.

6.2.4 Regulations and covenants

A close liaison should be maintained with the authority or government department which has jurisdiction over the area regarding any regulations, covenants or restrictions.

NOTE: In some states, playground structures require structural engineering certification, e.g. conformity with AS/NZS 1170 (series).

6.3 Playground design

6.3.1 Purpose

Every playground should be designed to meet the particular needs of its likely users, whether these are young children in a SECS, school students of various ages and abilities, or members of the general community using a public playground.

The design should take into account—

- (a) the needs of the children or community;
- (b) the likely age range, size and ability level of the users;
- (c) the degree of crowding; and
- (d) the level and type of supervision.

6.3.2 Provision of amenities and facilities

The design of public playgrounds needs to take into account the requirements of the space and benchmarks and service levels established by any local authorities, where applicable. These typically take into account the site size, catchments and anticipated intensity of use.

The design should determine the types of amenities and facilities that will be required including—

- (a) paths and levels of accessibility;
- (b) shade and shelter;
- (c) toilets;
- (d) barbeques;
- (e) drinking fountains;
- (f) fencing and gates;
- (g) seating and tables;
- (h) lighting; and
- (i) litter bins.

6.3.3 *Design for access and inclusion*

Playgrounds should be designed so that people with disabilities and those using mobility aids can enter the playground, participate in a choice of play activities, and use the amenities and facilities on the site. Inclusive design makes it easier for all users including carers with prams, the elderly, children with wheeled toys, and staff and maintenance workers.

In particular, where the design of play equipment and surfaces provides access for users such as those with wheelchairs or mobility aids to elevated surfaces, care is needed to ensure that the design protects these users from falls through elevated openings.

NOTE: Refer to AS 1428 (series) for further guidance regarding inclusive environments.

6.3.4 *Selection of play elements*

Playgrounds should offer a diverse range of play activities, experiences and settings to users. They should offer internal variety and should also vary from site to site. Playgrounds should offer varying degrees of challenge and usability, to enable children of varying ages and abilities to participate safely at their own level.

Playgrounds can comprise any combination of playground equipment and natural/landscape features, and should ideally include a variety of textures and materials, spatial characteristics and surfaces. They should offer opportunities for physical movement and challenge; for creative/sensory expression; for cognitive and imaginative play; and for social interaction, role-play and fantasy. The availability of some loose materials for play is important.

The landscape itself provides many valuable play opportunities and adds value to the equipment. Natural features of a site, such as trees, rocks, logs and sloping banks, can be incorporated into the design.

The layout of the space as a whole affects both the play value and the safety of every playground.

The playground should be laid out to avoid conflicts between active areas involving movement and areas for quieter, sedentary activities.

The design of the playground should encourage active supervision by adults, through accessible design and the provision of accessible seating close to the play activities.

6.3.5 *Nature play*

The requirements of AS 4685 (series) shall apply to natural play elements incorporated into a playground. A risk assessment may be required to determine the suitability of such elements within the application.

NOTES:

- 1 For example, it may not be practical or desirable to place barriers or handrails on a log or boulder. Adequate impact-attenuating surfacing should be provided in the impact area corresponding to the h_f . The impact area should be free of obstacles that could cause injury. Hazardous situations that may cause entrapment should be avoided. Consideration should be given to preventing easy access to hazardous situations.
- 2 Where the contents of this Standard do not apply directly to natural elements, a risk benefit assessment may be required to determine the suitability of such elements.

6.3.6 *Placement of moving equipment to minimize injury*

Equipment with components that swing or move vigorously, (such as swings, some overhead rocking/spinning equipment, rotating digging equipment, and cableways), offer important and beneficial play experiences to users but can pose a serious hazard to others (especially young children) crossing their path. These items shall be located out of the main paths of travel within a playground. The items shall be located where they do not conflict with more sedentary activities or users.

NOTE: This is particularly important in confined spaces and in SECS.