Australian Standard®

Swimming pool safety

Part 1: Safety barriers for swimming pools
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- NSW Office of Fair Trading
- Planning South Australia
- Royal Life Saving Society Australia
- Swimming Pool and Spa Association of NSW
- Swimming Pool and Spa Association of Western Australia
- Swimming Pool and Spa Association of Victoria

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Australian Standard®

Swimming pool safety

Part 1: Safety barriers for swimming pools

Revised, amalgamated and redesignated as AS 1926.1—2012.

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PREFACE

This Standard was prepared by the Standards Australia Committee CS-034, Safety of Private Swimming Pools, to supersede AS 1926.1—2007, Swimming pool safety, Part 1: Safety barriers for swimming pools, and AS 2820—1993, Gate units for private swimming pools.

The objective of this Standard is to assist pool owners/users in avoiding pool-related drowning by providing design, construction and performance of various barrier options, which are designed to restrict entry to the swimming pool area by young children.

This Standard is part of a series dealing with barriers, location of barriers and water recirculation and filtration systems for swimming pools, as follows.

AS
1926 Swimming pool safety
1926.1 Part 1: Safety barriers for swimming pools (this Standard)
1926.2 Part 2: Location of safety barriers for swimming pools
1926.3 Part 3: Water recirculation systems

This revision incorporates changes to the previous edition to correct and clarify many inconsistencies and areas of ambiguity. Technical and diagrammatic errors have been corrected to clarify particular safety issues. Glass barriers have been included for the first time.

This revision also incorporates the requirements for the design, construction and performance of gate units installed as part of a barrier from AS 2820, Gate units for private swimming pools.

Statistical evidence shows that the majority of drowning deaths in private swimming pools involve children under five years of age. For this reason, the requirements established by this Standard are directed at achieving a barrier that will make it difficult for a young child to gain access to a pool area, whether under, over or through the barrier.

It should be noted that the provisions of this Standard relate to barriers that are intended to be child resistant but not childproof, as effectiveness of the barrier is very much dependent on its location, installation and maintenance.

The requirements are established with the intention of leaving a high degree of flexibility to the consumer in the choice of barrier, desirable aesthetics and cost.

Requirements for the effective use of barriers in protecting children from pool hazards are given in AS 1926.2, Swimming pool safety, Part 2: Location of safety barriers for swimming pools.

In the development of this Standard reference was made to the Queensland Development Code (QDC).

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of the Standard, whereas in an ‘informative’ appendix is only for information and guidance.

Notes to the text contain information and guidance. They are not an integral part of the Standard.
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Swimming pool safety  

Part 1: Safety barriers for swimming pools

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE
This Standard specifies requirements for the design, construction and performance of barriers that will restrict the access of young children to swimming pools.

NOTE: Public swimming pools have different human dynamics, such as access for people with disabilities, increased gate usage, crowd behaviour and supervision, and the duplication of the requirements of this Standard may not always be appropriate.

1.2 NORMATIVE REFERENCES
The following are the normative documents referred to in this Standard:

NOTE: Documents referenced for informative purposes are listed in the Bibliography.

AS 1288 Glass in buildings—Selection and installation

1.3 DEFINITIONS
For the purpose of this Standard, the definitions below apply.

1.3.1 Barrier
The assembly of components, natural or otherwise, that restricts access to the pool. The barrier includes items such as fences, posts and panels, gate units, gates and doorsets, constructed or natural walls retaining or otherwise, sides of buildings, and balustrades on a balcony, where they form part of the intended barrier.

1.3.2 Barrier height
The height of the barrier perpendicular to the finished ground level.

1.3.3 Boundary barrier
A dividing barrier between two adjoining properties.

1.3.4 Child-resistant doorset
A barrier installed in a residential building that comprises a door, door frame, self-closing device and latch.

1.3.5 Child-resistant windows
The opening part of a window that is protected in accordance with Clause 2.6.

1.3.6 Finished ground level (FGL)
Ground level or other permanent stable surface.
1.3.7 Flexible components
Flexible components are those parts of a barrier or materials used in a barrier made with
chain link wire mesh, perforated materials, fabric, brushwood and the like.

1.3.8 Foothold
A component of, or feature in, an NCZ that can be used by a young child as an aid to
climbing a barrier.

1.3.9 Gate
A portion of a barrier, other than a child-resistant doorset that is designed to provide access
through the barrier.

1.3.10 Gate unit
An assembly comprising a gate, a hinge post, a latch post, a latching device, hinges and a
self-closing device.

1.3.11 Handhold
A component of, or feature in, an NCZ that can be used by a young child as an aid to
climbing a barrier.

1.3.12 Indoor pool
A pool that is fully enclosed within a residential building or by a separate building.

1.3.13 Indoor/outdoor pool
A pool that is partly enclosed by a building and partly an outdoor pool.

1.3.14 Latch
A self-latching mechanism that prevents the opening of a closed gate or door without
activation of its release device.

1.3.15 Non-climbable
A part of a barrier in which there are no handholds or footholds or other aids for climbing.

1.3.16 Non-climbable zone (NCZ)
A zone on a barrier and in the space adjacent to a barrier, running the full length of a barrier
including a gate, that is intended to restrict climbing of the barrier by young children.

1.3.17 Outdoor pool
A pool that is not fully or partly enclosed by a building.

1.3.18 Outside of the barrier
That side of a barrier facing away from the pool area.

1.3.19 Permanent structure
A barrier, or part of a barrier which cannot be removed without the use of tools.

1.3.20 Pool area
The area that contains the pool and is enclosed by a barrier.

1.3.21 Rigid components
Rigid components of a barrier are those made of steel, aluminium, wood, glass, acrylic,
masonry and the like.

1.3.22 Swimming pool (referred to as ‘pool’ in this Standard)
Any structure containing water to a depth greater than 300 mm and used primarily for
swimming, wading, paddling or the like, including a bathing or wading pool, or spa pool.
1.3.23 Tool (tools)
Screwdriver, spanner, wrench, shovel, cutting implement or the like.

1.3.24 Within the property
On a property other than on a property boundary.

1.3.25 Young child
A child under the age of five years.
SECTION 2 DESIGN AND CONSTRUCTION OF ELEMENTS OF A BARRIER

2.1 GENERAL

A barrier shall be designed and constructed so that it will restrict access by young children. The barrier shall be a permanent structure.

The height of a barrier within the property shall be not less than 1200 mm on the outside of the barrier.

Barriers may be constructed from any durable material, provided the barrier complies with the requirements of this Standard.

A barrier other than a retaining wall, shall be vertical or lean away from the pool by not more than 15°.

NOTE: A barrier should be free of sharp edges, sharp projections, and similar hazards.

2.2 NON-CLIMBABLE ZONE (NCZ)

2.2.1 General

The height and radius of the arc of all NCZs (other than NCZ 4) shall be not less than 900 mm. Within an NCZ there shall be no handholds or footholds, objects or plants that will facilitate climbing.

Where NCZs are required they shall apply to the entire length of a barrier.

2.2.2 Barriers less than 1800 mm in height

The following NCZs shall be present on all barriers with a height less than 1800 mm:

(a) NCZ 1 is a 900 mm vertical plane on the outside face of a barrier. This NCZ may be located anywhere within the perpendicular height of a barrier or, where present, anywhere between horizontal components or handholds and footholds on a barrier (see Figures 2.1, 2.3, 2.5 to 2.8, and 2.10 (b) and (c)).

(b) NCZ 2 is a quadrant on the outside of a barrier created by a 900 mm radius down from the top of NCZ 1 above (see Figures 2.1, 2.3, 2.6 and 2.10 (b) and (c)).

NOTE: NCZ 2 is always immediately adjacent to NCZ 1 on all barriers.

(c) NCZ 3 is a quadrant on the outside of a barrier created by a 900 mm radius up from the top of the barrier. When the top of NCZ 1 is below the top of a barrier then NCZ 3 shall extend vertically down to the top of NCZ 1 (see Figures 2.1 and 2.11). NCZ 3 is applicable only to the space created by the quadrant and does not apply to any item or component on, or that is part of, the barrier.

(d) NCZ 4 is required on all barriers with vertical openings 10–100 mm in width and is a 900 mm high by 300 mm deep rectangular space on the inside of the barrier and shall align with NCZ 1 (see Figures 2.1 and 2.6).

A barrier component or an item or object on a barrier that would otherwise be climbable is non-climbable if its top surface is sloped at more than 60° to the horizontal plane (see Figure 2.6).
NOTE: The lower radius point of NCZ 2 may be located anywhere on the barrier provided there are no aids for climbing within the arc.

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FIGURE 2.1 (in part) EXAMPLES OF NON-CLIMBABLE ZONES (NCZs)
2.2.3 Barriers not less than 1800 mm in height

Barriers not less than 1800 mm in height shall not require an NCZ and may be climbable on either or both sides.

2.2.4 Boundary barriers

Where a boundary fence acts as a barrier to a pool, it shall have a height not less than 1800 mm on the inside and NCZ 5 formed as a quadrant of 900 mm radius down from the top of the inside of the barrier. See Figure 2.2(a). The following also apply:

(a) NCZ 5 is not invalidated by the intersection of a compliant internal fence provided the width of the top rail or surface of the intersecting barrier is not more than 50 mm wide at any point within the non-climbable zone and intersects at an angle of between 45 and 135 degrees to the 1800 mm boundary barrier (see Figure 2.2(b)).

(b) Where the top rail or surface of the internal barrier is greater than 50 mm and is located within the NCZ 5, the height of the lower barrier shall extend to a height not less than 1800 mm and extend not less than 900 mm from the intersection (see Figure 2.2(c)).
(a) Boundary barrier 1800 mm min.

(b) Intersecting barrier with top less than 50 mm in width

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FIGURE 2.2 (in part) BOUNDARY BARRIERS
2.2.5 Intersecting barriers

Where a barrier with a height less than 1800 mm intersects with a barrier with a height not less than 1800 mm at an angle greater than 90° then NCZs 1 and 2 on the lower barrier shall extend 900 mm beyond that intersection (see Figure 2.3).
2.3 BARRIERS

2.3.1 Features and objects near a barrier
In addition to the provisions of Clause 2.2, steps, retaining walls, objects or level changes that would otherwise reduce the height of a barrier within a property shall not be located within 500 mm of the barrier (see Figure 2.1(a)).

2.3.2 Perforated material or mesh
Barriers using perforated and mesh materials shall comply with the following:

(a) Barriers within the property using materials with apertures not greater than 13 mm shall have a height not less than 1200 mm and comply with the relevant provisions of Clauses 2.1 and 2.2.

(b) Barriers using material with apertures greater than 13 mm but not greater than 100 mm shall have a height of not less than 1800 mm.

(c) Material with apertures greater than 100 mm shall not be used.

(d) Apertures shall be measured horizontally across their widest part.

(c) Barriers within the property shall be installed in such a manner and with sufficient height so that—

(i) when a 25 kg weight is supported at any point along on the top of the barrier, it shall not reduce the barrier height to less than 1200 mm; and

(ii) when a vertical lift force of 100 N is applied at any point along the bottom of the barrier, it shall not result in a gap between the bottom of the barrier and the surface beneath, of more than 100 mm.

(f) Perforated materials or mesh shall be durable and shall comply with the requirements of Clause 3.3.2.
2.3.3 Glass barriers

Glass used in barriers shall comply with the provisions of AS 1288.

Glass gates using top and bottom pivot style hinges shall comply with dimensions of Figure 2.4.

![Diagram of glass gate with pivot hinges]

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**FIGURE 2.4 GLASS GATE WITH PIVOT HINGES**

2.3.4 Surface projections and indentations

Projections and indentations, or any combination thereof, within the NCZ 1, shall not form a horizontal surface with a depth greater than 10 mm (see Figure 2.5).

For a barrier having random projections and/or indentations with horizontal surfaces of a depth greater than 10 mm the following requirements shall apply:

(a) All such lower surfaces shall be not less than 900 mm from the top of the barrier.

(b) All such higher surfaces shall be not less than 900 mm above the finished ground level.

(c) High and low surfaces shall be not less than 900 mm apart.

The relevant surface for projections shall be the top horizontal surface and for indentations shall be the bottom horizontal surface.

NOTE: On such barriers the location of NCZ 1 may vary along the length of a barrier (see Figure 2.5).
2.3.5 Horizontal components

In addition to the relevant requirements of Clause 2.2, barriers less than 1800 mm in height shall comply with the following:

(a) No barrier shall incorporate a horizontal component within NCZs 1 and 2, with a top surface depth greater than 10 mm nor any component, that can be used as a handhold or foothold, unless such top surface is sloped at not less than 60° from the horizontal plane (see Figure 2.6).

(b) Where a barrier is sloping, NCZs shall be parallel to the top of the barrier (see Figure 2.8(a)).

(c) Where a barrier is stepped at a ground level change or installed with steps on a gentle slope the integrity of all applicable NCZs shall be maintained (see Figure 2.8 (b) and (c)).

(d) Rails or other components or items on the inside of barriers shall not constitute holds for climbing where the opening between vertical components is not greater than 10 mm (see Figure 2.7).

2.3.6 Vertical components

The clear opening between any vertical components shall not exceed 100 mm at any point in a barrier (see Figures 2.7 and 2.8).

2.3.7 Ground clearance

The height of any opening between the bottom of the barrier and the finished ground level shall not exceed 100 mm.

The surface beneath the barrier shall be permanent and not easily removed or eroded by a young child, animals or weather.
FIGURE 2.6 HORIZONTAL COMPONENTS NOT ACTING AS A HOLD FOR CLIMBING

(a) Vertical openings not more than 10 mm with horizontal components less than 900 mm apart on inside barrier.

(b) Vertical components spaced not more than 100 mm apart

(c) Barrier with several horizontal components, such as welded steel construction

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FIGURE 2.7 HORIZONTAL COMPONENTS

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FIGURE 2.8 (in part) PERPENDICULAR BARRIER DIMENSIONS
2.4 GATES, GATE UNITS AND LATCH FITTINGS

2.4.1 Gates

2.4.1.1 Operation of gates

Gates shall be hung so that they only swing outwards, i.e. away from the pool area.
Gates shall be located so that the arc of operation is clear of any building or doorway.
Gates shall have sufficient clearance to swing freely through the arc of operation.
The opening under a closed gate shall not exceed 100 mm at any point.

2.4.1.2 Self-closing device

Gates shall be fitted with a self-closing device that will close the gate from any position, with a stationary start, without the application of a manual force and operate the latch.
The self-closing device shall be capable of complying with these requirements with the gate at any position from fully open to resting on the latch.

NOTES:
1. The self-closing device may require a cushioned back-checking operation to prevent shock when the gate is closing.
2. Gates subject to wind loading (which may prevent their closing) may require special consideration.

2.4.1.3 Security of closure

Gates shall be hung so that when a gate is closed and latched, and is lifted upwards or pulled downwards with a force of 250 N, movement of the gate does not—

(a) release the latch;
(b) unhinge the gate; or
(c) increase the opening between the bottom of the gate and the finished ground level to more than 100 mm.
2.4.2 Latch

2.4.2.1 General

Gates shall be fitted with a latch that will automatically operate on the closing of the gate and will prevent the gate from being re-opened without being manually released. The latch shall not be able to be—

(a) inadvertently adjusted during operation;
(b) locked in the ‘open’ position; or
(c) adjusted without the use of tools.

A latch shall not be able to be released by the insertion of any implement in the 10 mm opening shown in Figure 2.9.

2.4.2.2 Location of the latch (see Figure 2.9)

Where the release point of the latch is located at a height less than 1500 mm above the finished ground level, the location of the latch shall—

(a) not be on the outside of the barrier;
(b) be in such a position that to release the latch from the outside it will be necessary to reach over or through the barrier at a height of not less than 1200 mm above the finished ground level or not less than 1000 mm above the highest lower horizontal member; and
(c) be at least 150 mm below the top of the barrier if a hand-hole is not provided, or at least 150 mm below the edge of any hand-hole if provided.

2.4.2.3 Shielding of latch (see Figure 2.9)

In a gate with vertical openings greater than 10 mm, where the latch release is located at a height less than 1500 mm above the finished ground level, the latch release shall be shielded so that no opening greater than 10 mm occurs within an area bounded by—

(a) an effective radius of 450 mm from the latch release; and
(b) the top of the barrier, if this intersects the area described in Item (a).

Where it is necessary to have a hand-hole in a gate, the bottom of the opening shall be not less than 1200 mm above the finished ground level, and the shielding shall be extended up to a horizontal line through the top of the hand-hole, or 150 mm above the top of the latch release, whichever is the higher.

The shield shall be free of sharp edges and the edges of the adjacent parts of the shield on the gate and the barrier shall be rounded or chamfered to prevent a hazard when the gate closes.

2.4.3 Gate hinges

Gate hinges that protrude out from the barrier with a horizontal top surface depth greater than 10 mm and those that create an opening between the gate post and the gate stile of more than 10 mm shall not be permitted in NCZs 1 and 2.

Hinges with a top surface sloped at 60° to the horizontal or more may be located within NCZs 1 and 2.

2.4.4 Gate units

2.4.4.1 General

This Clause (2.4.4) sets out requirements for manufacturers for the design, construction, performance and sale of gate units to be installed as part of a barrier.
2.4.4.2 Supply of gate units

Gate units shall be supplied as complete sets of components with all parts necessary for correct installation.

NOTE: Gate units may be supplied fully assembled or with some assembly required.

Gate units shall be of a permanent nature.

Gate units shall be supplied with a set of written instructions as follows:

(a) Installation instructions which include all necessary information including foundation requirements to allow erection of the gate unit as part of a barrier complying with this Standard.

(b) Parts list and exploded diagram showing all of the components supplied.

(c) Maintenance instructions including any special requirements for maintaining the latching mechanism and hinges.

(d) A statement explaining the need to keep the automatic closing device properly adjusted.

(e) A statement that the gate is required to swing outwards, away from the pool area.

2.4.4.3 Types of materials

Gate units may be constructed from any type of material, provided that the finished components comply with the requirements of this Standard.

NOTE: Components of gate units should be effectively protected against corrosion, UV degradation and other effects of exposure to weather, sunlight, pool chemicals and water.

2.4.4.4 Marking of gate units

Each gate unit shall be clearly and permanently marked on at least one of the gate posts or on the gate or on some other component of the gate unit with the registered trademark or the name and address of the manufacturer.

The following methods of marking are acceptable:

(a) Self-adhesive metalized label which cannot be removed without the use of a tool such as a scraper.

(b) Metal plate secured by rivets.

(c) Stamping or moulding of the information into a component.

NOTE: Manufacturers making a statement of compliance with this Australian Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.

2.4.4.5 Testing

Test requirements for gate units are set out in Clauses 3.5 and 3.6.
FIGURE 2.9 ALTERNATIVE LATCH SHIELDING OPTIONS FOR GATES WITH VERTICAL OPENINGS 10–100 mm

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2.5 OTHER BARRIERS

2.5.1 Retaining wall above the pool level

A retaining wall (or similar feature) that acts as a barrier above the pool level shall comply with the following:

(a) It shall not slope away from the pool by more than 15° (see Figure 2.10 (a)(i) and (b)(i)).

(b) When less than 1800 mm in height, it shall comply with Clauses 2.1, 2.2.1, 2.2.2, 2.3.4 and 2.3.5(a) (see Figure 2.10 (b)(i) and (c)(i)).

2.5.2 Retaining wall below the pool level

A retaining wall (or similar feature) that acts as a barrier below the pool level shall comply with the following:

(a) It shall not slope towards the pool by more than 15° (see Figure 2.10 (a)(ii) and (b)(ii)).

(b) When less than 1800 mm in height, it shall comply with Clauses 2.1, 2.2.1, 2.2.2, 2.3.4 and 2.3.5(a) (see Figure 2.10 (b)(ii) and (c)(ii)).

Where a barrier intersects a retaining wall that is below the pool level, as shown in Figure 2.10(d), that barrier shall extend to the outer edge of the retaining wall and either overhang the retaining wall by 900 mm (shown as option C), or return 900 mm along the retaining wall in either direction (shown as options A and B).

Barriers using option A or B shall be affixed, as close as practicable, to the outside face of the retaining wall.
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FIGURE 2.10 (in part) RETAINING WALL OR OTHER SUCH BARRIER
2.5.3 Out-of-ground pool walls

Out-of-ground walls of pools that comply with the requirements of a barrier in this Standard shall be considered an effective barrier. (For above-ground pools, see Clause 2.9.)

2.5.4 Permanent bodies of water

Permanent bodies of water of a width greater than 1800 mm shall be considered as an effective barrier where a pool owner is able to provide evidence showing that the body of water is permanent and the water at the edge of the pool area is not less than 300 mm deep at any time.

NOTE: Refer to relevant authorities for the minimum water depths of a waterway.

2.6 CHILD-RESISTANT OPENABLE PORTION OF WINDOW

Where a window opens directly into the pool area and the height from the sill of the lowest opening panel of the window to the finished ground level in the pool area is less than 1800 mm, the openable portion of the window shall comply with one of the following:

(a) Be totally covered by bars or a metal screen, that are fixed to the building with fasteners that can only be removed by the use of a tool. The opening between bars and the horizontal dimension of openings in a metal screen shall not be greater than 100 mm.

(b) Be fixed to the building with fasteners that can only be removed by the use of a tool so that it will remain closed or will open to a maximum of 100 mm.
2.7 CHILD RESISTANT DOORSETS

Child-resistant doorsets shall only be installed for access to indoor pools and the indoor part of an indoor/outdoor pool and shall comply with the following:

(a) Doors shall be fitted with a self-closing device that will close the door from any position, with a stationary start, without the application of a manual force and operate the latch.

(b) The self-closing device shall be capable of complying with these requirements with the door at any position fully open to resting on the latch.

(c) Doors shall be fitted with a latch that complies with Clause 2.4.2 and which will automatically operate on the closing of the door and prevent the door from being re-opened without being manually released.

(d) The release for the latch shall be located on the outside of the door and not less than 1500 mm above the floor.

(e) NCZ 1 shall apply to the outside of a door and the top of NCZ 1 shall be 1200 mm or less above the floor. See Clause 2.2.2(a).

(f) Perforated materials or mesh shall comply with the requirements of Clause 2.3.2.

(g) Pet doors shall not be placed in a child-resistant doorset.

(h) Door shall not open towards the pool.

NOTE: For examples of locations for use of doorsets see AS 1926.2.
2.8 BALCONY BALUSTRADES

A balcony that protrudes into an NCZ shall be fitted with a balustrade that complies with Clauses 2.1, 2.2.1 and 2.2.2. See Figure 2.11.

![Diagram of balcony and NCZ with dimensions in millimetres]

**FIGURE 2.11  BALCONY INTRUDING INTO NCZ**

2.9 ABOVE-GROUND POOLS

For above-ground pools that are factory fabricated and designed for assembly and installation on site, including inflatable pools, the walls of the pool shall be considered an effective barrier provided they comply with the relevant provisions of Clauses 2.1 to 2.3.

A barrier complying with Clauses 2.1 to 2.4 shall be placed around permanently fixed access ladders and around a designated access point to above-ground pools with removable ladders.

NOTE: Above-ground pools pose a particular hazard because of the tendency to leave climbable objects against or near the pool, which may be used for access into the pool.
SECTION 3  LOADING REQUIREMENTS

3.1 STRENGTH AND RIGIDITY OF OPENINGS

A barrier with vertical openings wider than 10 mm shall have vertical components with sufficient strength and rigidity such that a 105 +0, -0.5 mm diameter metal cone cannot pass through the opening under the application of a force of 150 N.

When tested in accordance with Appendix A the test object shall not pass through the openings.

3.2 STRENGTH OF POSTS AND FOOTINGS

Each post and footing shall withstand a horizontal force of 330 N at 1200 mm above finished ground level. After loading, there shall be no permanent damage to any post, the footings shall not loosen to impair the effectiveness of the barrier.

NOTES:
1. A method that may be used to test posts and footings is provided in Appendix B.
2. 330 N is approximately 33 kg. This test can be conducted in the field by fastening one end of a calibrated force measuring device to the post 1200 mm above ground level and pulling on the other end of the balance until a load of 33 kg is achieved. After application of the load, inspect the post and footing for any looseness or damage.

3.3 STRENGTH OF BARRIER COMPONENTS

3.3.1 Rigid components

Structural components, such as panel infills, top and bottom rails, rods, palings, pickets, and the like, shall be capable of sustaining a force of 330 N without any component—

(a) breaking;
(b) showing signs of fracture;
(c) loosening so the effectiveness of the panel is impaired; or
(d) becoming permanently deformed by more than a factor of 1/200 over its length.

Testing of barrier panels shall be in accordance with Appendix C.

3.3.2 Flexible material and components

Flexible barrier components and materials, and the manner in which they are installed, shall be capable of withstanding the dynamic forces imparted with no permanent deformation when tested in accordance with Appendix D.

3.4 CLOSING AND LATCHING OF GATES

In addition to the requirements of Clauses 2.4.1 to 2.4.3 each gate shall comply with the following:

(a) The gate shall close and latch from fully open to resting on the latch, under both of the following conditions:
(i) Under the natural weight of the gate.
(ii) With the gate open and after a weight of 25 kg has been placed on the top rail or component at a point 100 mm from the outer edge of the locking stile of the gate for 30 seconds and then removed.

NOTE: This requirement is intended to indicate whether the automatic closing and latching mechanism is likely to remain effective after the gate has been subject to deflection, either under its own weight or as a result of children swinging on it.
(b) With the gate closed, the latch and posts of the barrier to which the gate is attached shall be capable of retaining the gate in a closed position when the weight in Item (a)(ii) is placed at the same location and remains on the gate.

3.5 STRENGTH AND RIGIDITY OF A GATE UNIT

When tested in accordance with Appendix E, no component of gate units shall fracture, break or loosen so the effectiveness of the gate unit is impaired or permanently deformed by a factor of more than 1/200 over its length. The latch shall not unintentionally release and the gate shall still comply with Clause 2.4 at the end of the test.

3.6 DURABILITY OF A GATE UNIT

When a gate unit is tested in accordance with Appendix F, it shall—

(a) be capable of complying with the requirements of Clauses 2.4.1 to 2.4.3 after 10 000 operations; and

(b) the force required to release the latch shall not be greater than 50 N both before and after the test.
APPENDIX A

TEST FOR STRENGTH AND RIGIDITY OF BARRIER OPENINGS

(Normative)

A1 SCOPE

This Appendix sets out a method for determining whether a barrier is sufficiently strong and rigid to prevent an opening from being forced to a size that would allow a young child to gain entry. This Appendix is to be used by manufacturers to gain certification for their barrier. It is not designed for in-field testing.

WARNING: THIS TEST SHALL NOT BE USED ON A GLASS BARRIER.

A2 PRINCIPLE

A horizontal force is applied to the test object in an attempt to force it through the openings in the barrier panel.

A3 APPARATUS

The following apparatus is required:

(a) A cylindrical solid-faced test object 105 +0, -0.5 mm in diameter with a body length of 300–400 mm, as shown in Figure A1.

One end shall be conical and shall be truncated to a nominal diameter of 20 mm to provide a flat base for the attachment of fittings, as shown in Figure A1.

The test object shall be mild steel and have a smooth machined finish.

(b) A calibrated force-measuring device with an accuracy of 2% of the test loads and a resolution of 1 N or less.

(c) A stable supporting structure to suspend the conical test object from and to hold the barrier panel in a vertical position, as shown in Figure A1.

(d) A means of attaching the force-measuring device to the conical test object, as shown in Figure A1.

(e) A force activating device.

A4 PROCEDURE

The procedure shall be as follows:

(a) Secure the panel into the supporting structure (jig) in the vertical position.

(b) Hang the test object from the supporting structure. The test object shall be suspended horizontally at two points by using a suspension method that minimizes the effects of friction and allows free movement, as shown in Figure A1.

(c) Attach the force measuring device to the conical end of the test object, as shown in Figure A1. Connect the other end of the force measuring device to the force activating device.

(d) Each panel shall be tested in three locations, across the width of the panel at the middle of each third of the panel.

(e) Place the conical end of the test object into the opening being tested and steadily apply a force up to 150 N, in an attempt to force the object through the opening. Should the test object oscillate during the test it shall be stabilized.
(f) Record the force at which the test object pulled through the panel or that it failed to pull through the panel.

A5 REPORT

The report shall include the information shown in Figure A2 and clearly show the following:

(a) The pull-through force at which the conical test object passed through the panel openings or that it failed to pass through the panel when tested in the three locations specified in Paragraph A4(d).

(b) Reference to this test method, i.e. AS 1926.1, Appendix A.

(c) The conclusion of whether the panel has passed or failed the test in accordance with the criteria in Clause 3.1.
NOTE:
$X = L/2$ where $L$ is the distance between the lower top and the higher bottom horizontal members.

FIGURE A1 APPARATUS FOR TESTING OPENINGS AND OTHER COMPONENTS
Date: ..................................................
Test Report No.: ..................................................
Product: Name of product
Material: Specify product material
Source: Name of manufacturer/supplier/consumer
Specifications: AS 1926.1, Swimming pool safety—Part 1: Safety barriers for swimming pools,
Appendix A, Test for strength and rigidity of barrier openings

**Wire-based panel**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Product</th>
<th>Wire size (mm)</th>
<th>Horizontal wire spacings (mm)</th>
<th>Upright wire openings CC (mm)</th>
<th>Results—Pull-through force (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Product name</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Tubular panel**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Product</th>
<th>Tube size (mm)</th>
<th>Horizontal rail spacings (mm)</th>
<th>Upright tube openings CC (mm)</th>
<th>Results—Pull-through force (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Product name</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusion and comments: .................................................................................................................................
 .................................................................................................................................

Name of individual conducting the test: ...................................................................................................................

Individual’s title: ...................................................................................................................................................

Authorized signatory: .............................................................................................................................................

Name and location of testing facility: .......................................................................................................................

.................................................................................................................................................................

**FIGURE A2  EXAMPLE TEST REPORT—BARRIER PANEL**
APPENDIX B

STRENGTH TEST FOR POSTS AND FOOTINGS

(Informative)

B1 SCOPE

This Appendix sets out a method for testing whether barrier posts have adequate strength and have been correctly installed.

WARNING: THIS TEST IS NOT TO BE APPLIED TO A GLASS BARRIER.

B2 PRINCIPLE

A force is applied to the barrier post and it is then inspected for signs of fracture, loosening of footings or any damage or deformation of the post or if to a gate post any damage or deformation that would prevent the gate from closing and latching from any position.

B3 APPARATUS

The following apparatus is required:

(a) A cylindrical test object of diameter 105 ±1 mm, having at least one solid flat-faced end.

(b) A calibrated force-measuring device with an accuracy of 2% of the test load and a resolution of 1 N or less.

(c) A means of applying and measuring the applied force being applied.

![Figure B1 Test Object]

FIGURE B1 TEST OBJECT

B4 PROCEDURE

The procedure is as follows:

(a) Place the flat end of the test object against the post under test at a height of 1.2 m above finished ground level at 90° to the barrier.

(b) Apply a horizontal force of 330 N, without shock, to the test component.

(c) Apply the test force for a minimum of 30 seconds.

(d) Remove the force and inspect the post for damage or loosening of the footings.

(e) For gate posts, the test is to be carried out with the gate held or chocked in a partly open position. After testing check that the gate will close and latch when released from various positions from a 90° opening to resting on the latch.
B5 REPORT

The report is to include the following information:

(a) Breakage or sign of fracture of any post.
(b) Loosening of any part of the barrier that will impair its effectiveness.
(c) Any damage to the gate that would prevent it from closing and latching from any position.
(d) Whether the post or gate passed or failed the test.
(e) Reference to this test method, i.e. AS 1926.1, Appendix B.
APPENDIX C

STRENGTH TEST FOR RIGID BARRIER COMPONENTS
(Normative)

C1 SCOPE
This Appendix sets out a method for testing whether barrier components have adequate strength.

WARNING: THIS TEST SHALL NOT BE APPLIED TO A GLASS BARRIER.

C2 PRINCIPLE
A force is applied to the component or components of the barrier and it is then inspected for signs of fracture, permanent deformation or loosening of components.

Measurements shall be accurate to ±0.5 mm.

C3 APPARATUS
The following apparatus is required:

(a) A cylindrical test object of diameter 105 ±1 mm, having at least one solid flat-faced end (see Figure C1).

(b) A calibrated force-measuring device with an accuracy of 2% of the test load and a resolution of 1 N or less.

(c) A means of applying the force.

![Test Object Diagram]

FIGURE C1 TEST OBJECT

C4 PROCEDURE
The procedure shall be as follows:

(a) Connect the force measuring device to test object.

(b) Place the flat end of the test object against the test component at its most flexible point.

(c) Using the force measuring device, apply a pre-load force of 50 N for a minimum of 30 seconds. Remove the force and measure the zero load displacement.

(d) Using the force measuring device apply a force of 330 N, without shock, for a minimum of 30 seconds.

(e) Remove the test force and measure and record the amount of permanent deformation of the component relative to the zero load displacement.
(f) Inspect the component for—
   (i) breakage or sign of fracture of any component; and
   (ii) loosening of any component that will impair the effectiveness of the panel.

C5 REPORT
The report shall include the following information:
(a) The amount of permanent deformation recorded in C4(e).
(b) Whether the barrier panel conforms to the requirements of Clause 3.3.2 after testing.
(c) Reference to this test method, i.e. AS 1926.1, Appendix C.
APPENDIX D

STRENGTH TEST FOR FLEXIBLE MATERIALS AND COMPONENTS
(Normative)

D1 SCOPE
The Appendix sets out a method for testing whether flexible materials and components have adequate strength and whether such materials are adequately fixed to ensure they comprise a suitable barrier.

D2 PRINCIPLE
A dynamic force is applied to the material or component and it is then inspected for signs of penetration, breakage, tearing or signs of fracture or loosening of components.

D3 APPARATUS
The following apparatus is required:
(a) Test object—a 9.1 kg half spherical solid-faced test object 50 ±1 mm diameter.
(b) A means of swinging the test object through an arc of radius 1400 mm.

D4 PROCEDURE
The procedure shall be as follows:
(a) Suspend test object A at the distance of 1400 mm below a pivot point to allow a pendulum action and place the test object against the material or component.
(b) Raise the test object to a 40° angle to the vertical (see Figure D1) and release.
(c) The test shall be carried out from both sides of the component and at the weakest points.
(d) Inspect for the following:
   (i) Breakage, tearing or signs of fracture.
   (ii) Loosening of any component or fixings.

D5 REPORT
The report shall include the following:
(c) Whether there was—
   (i) breakage, tearing or signs of fracture of any material and component; or
   (ii) loosening of any components or fixings that impaired the effectiveness of the barrier.
(d) Whether the material and component passed or failed the test.
(e) Reference to this test method, i.e. AS 1926.1, Appendix D.
FIGURE D1 TEST OBJECT
APPENDIX E

STRENGTH TEST FOR RIGID COMPONENTS OF GATE UNITS
(Normative)

E1 SCOPE

This Appendix sets out a method for testing whether the strength of structural components of gate units are sufficiently robust to provide an effective barrier throughout the life of the barriers. This test is only for use by manufacturers of gate units.

WARNING: THIS TEST SHALL NOT BE APPLIED TO A GLASS GATE UNIT.

E2 PRINCIPLE

A force is applied at a number of locations on the gate unit and it is then inspected for signs of fracture, permanent deformation and any faulty operation of the latching device.

E3 APPARATUS

The following apparatus is required:

(a) A cylindrical test object of diameter 105 ±1 mm, having at least one solid flat-faced end (see Figure B1).

(b) A calibrated force-measuring device with an accuracy of 2% of the test load and a resolution of 1 N or less.

(c) A means of applying the force.

E4 PROCEDURE

The procedure shall be as follows:

(a) Close and latch the gate.

(b) Using the test object, apply a force of 330 N in a horizontal direction to the centre of the gate panel.

(c) Using the test object, apply a force of 330 N in a horizontal direction to each of the four corners of the gate.

(d) Repeat Steps (b) and (c) from the other side of the gate unit.

(e) Using the test object, apply a force of 330 N in a horizontal direction to any part of the gate at, or below, 1200 mm above finished ground level, which is a point of potential weakness.

(f) Inspect the gate unit for any breakage, fracture or permanent deformation.

(g) Record whether the latch was released during the test.

(h) Open the gate and hold it in a position so that it is just ajar with the components of the latch on the gate post and the latching stile disengaged and clear of each other.

(i) Using the test object, apply a force of 250 N in a vertical direction to the top rail of the gate at a point 100 mm from the outer edge of the latching stile. Where the design of the gate precludes access to the top rail at that point, the force may be applied closer to the latching stile of the gate.

(j) Remove the test force and check that the gate automatically closes and the latch operates.
(k) Inspect the gate unit for any breakage, fracture or permanent deformation.
(l) All required forces shall be applied and held for 30 seconds.

E5 REPORT

The report shall include the following information:

(a) Whether there was any breakage or fracture of any part.
(b) The distance that any part deformed, in millimetres.
(c) Whether the latch was unintentionally released during the tests.
(d) Whether the gate still complied with Clause 2.4 at the end of the test.
(e) Reference to this test method, i.e. AS 1926.1, Appendix E.
APPENDIX F
TEST OF DURABILITY OF GATE UNITS
(Normative)

F1 SCOPE
This Appendix sets out a method of assessing the ability of a gate, including its hinges and latch, to withstand repeated closing. This test is only for use by manufacturers of gate units.

F2 PRINCIPLE
The gate unit is subject to a number of repeated opening and closings, and then inspected for compliance with the design requirements.

F3 APPARATUS
The following apparatus is required:
(a) A means of releasing the latch and opening the gate to the 90-degree position.
(b) A means of measuring the force applied to release the latch.

F4 PROCEDURE
The procedure shall be as follows:
(a) Install the gate unit in accordance with the manufacturer’s instructions on a site which simulates the in situ condition with the gate posts securely anchored into the ground.
(b) Ensure that the gate and its latch comply with Clause 2.4.
(c) Measure and record the force (to the nearest 5 N) required to release the latch.
(d) Release the latch and open the gate to the 90-degree position.
(e) Release the gate and allow it to close under the action of the self-closing device.
(f) Repeat Steps (d) and (e) for a total of 10 000 operations or until the latch fails to operate, whichever occurs first. The latch shall not be lubricated or adjusted during this test.
(g) Inspect the gate to see whether it still complies with Clause 2.4.
(h) Measure and record the force (to the nearest 5 N) required to release the latch.
(i) Inspect the gate, including the hinges and latch together with the gate posts, for any damage which would affect the ability of the gate to comply with the requirements of Section 2.

F5 REPORT
The report shall include the following information:
(a) The number of operations of the gate that were completed.
(b) Whether the gate still complied with Clause 2.4 at the end of the test.
(c) The force required to release the latch at the start and at the end of the test.
(d) Any damage to the gate, hinges, latching device or gate posts at end of the test.
(e) The number of this test method, i.e. AS 1926.1, Appendix F.
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