



New Zealand Standard

Safety Barriers and Fences around Swimming Pools, Spas and Hot Tubs

NZS 8500:2006

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NZS 8500:2006

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This Standard was prepared under the supervision of the P 8500 Safety of Swimming Pools Committee for the Standards Council established under the Standards Act 1988.

The committee consisted of representatives of the following:

Nominating Organisation

BRANZ Ltd
Department of Building and Housing
Injury Prevention Network of Aotearoa New Zealand Inc.
Institute of Public Policy
Local Government New Zealand
New Zealand Institute of Architects Inc.
New Zealand Master Pool Builder's Guild
Registered Master Builders Federation
Royal New Zealand Plunket Society
Safekids New Zealand
Water Safety New Zealand
WaterSafe Auckland Inc.

ACKNOWLEDGEMENT

Standards New Zealand gratefully acknowledges the financial support provided by the Accident Compensation Corporation, Department of Building and Housing, and Water Safety New Zealand, and the contribution of time and expertise from all those involved in developing this Standard.

In particular, we wish to thank WaterSafe Auckland Inc., Water Safety New Zealand and Standards Australia for generously supplying material from their organisational resources for use in this Standard.

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REVIEW OF STANDARDS

It is intended that the Standard for *Safety barriers and fences around swimming pools, spas and hot tubs* remains a dynamic and useful document. In order to achieve this, a regular review of the Standard is required to ensure it remains appropriate and applicable.

Suggestions for improvements of this Standard will be welcomed. They should be sent to the Chief Executive, Standards New Zealand, Private Bag 2439, Wellington 6140.

AMENDMENTS

No.	Date of issue	Description	Entered by, and date

NZS 8500:2006

New Zealand Standard

**SAFETY BARRIERS AND
FENCES AROUND
SWIMMING POOLS,
SPAS AND HOT TUBS**

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1-86975-055-1

NOTES

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REFERENCED DOCUMENTS

Reference is made in the document to the following:

NEW ZEALAND STANDARD

NZS 8690:2003 Water safety signage

AMERICAN STANDARDS

ASTM F1346-91 (2003) Standard performance specification for safety covers and labeling requirements for all covers for swimming pools, spas and hot tubs

ASTM F2208-02 Standard specification for pool alarms

UL 2017-2002 UL Standard for safety general-purpose signaling devices and systems

OTHER PUBLICATIONS

Chalmers, D., McNoe, B., Stephenson, S. and Langley, J. Drowning, near-drowning and other water-related injury: literature review and analysis of national injury data. Report to ACC. May 2004. Located at www.acc.co.nz/wcm001/groups/external_ip/documents/internet/wcm2_020857.pdf (on 1 November 2006).

Child and Youth Mortality Review Committee. Circumstances surrounding drowning in those under 25 in New Zealand (1980 – 2002). 2005. Located at www.newhealth.govt.nz/cymrc/publications/watersafetyreport.pdf (on 1 November 2006).

Drownbase™ Drowning statistics. Located at www.watersafety.org.nz/drowning/index.asp

NEW ZEALAND LEGISLATION

Building Act 2004 and the New Zealand Building Code

Fencing Act 1978

Fencing of Swimming Pools Act 1987

Local Government Act 2002

LATEST REVISIONS

The users of this Standard should ensure that their copies of the above mentioned referenced Standards are the latest revisions or include the latest amendments. Amendments to referenced New Zealand and joint Australian/New Zealand Standards can be found on **www.standards.co.nz**

USEFUL WEBSITES

ASTM (American Society for Testing and Materials)	www.astm.org
BRANZ Ltd.	www.branz.co.nz
Department of Building and Housing	www.dbh.govt.nz
Injury Prevention Network of Aotearoa New Zealand Inc.	www.ipn.org.nz
Institute of Public Policy	www.aut.ac.nz
Local Government New Zealand	www.lgnz.co.nz
New Zealand Institute of Architects Inc.	www.nzia.co.nz
New Zealand Legislation	www.legislation.govt.nz
New Zealand Master Pool Builders Guild	www.poolguild.org.nz
Registered Master Builders Federation	www.masterbuilder.org.nz
Royal New Zealand Plunket Society	www.plunket.org.nz
Safekids New Zealand	www.safekids.org.nz
Water Safety New Zealand	www.watersafety.org.nz
WaterSafe Auckland	www.watersafe.org.nz

PREFACE

Drowning is a major cause of the accidental deaths of young children in New Zealand. Many drownings happen in private houses, in unfenced or inadequately fenced swimming pools, spa pools and hot tubs. (For the purposes of this Standard the terms 'spa pools' and 'spas' are interchangeable.)

Concern about these unnecessary deaths and other non-fatal accidents led Parliament to enact the Fencing of Swimming Pools (FOSP) Act in 1987. The Department of Building and Housing took over the administration of this legislation in October 2006. The FOSP Act requires that, in the absence of a specific individual exemption, every residential swimming pool, spa pool and hot tub is properly fenced in accordance with the specific requirements of the Act.

Water Safety New Zealand statistics show that drownings of children under the age of 6 years have steadily decreased since the introduction of the FOSP Act.

However, New Zealand still has the highest rate of youth drownings among OECD countries, at almost twice the rate of our nearest neighbour Australia.¹

A 2005 report from the Child and Youth Mortality Review Committee reported 42 % of all drownings of 1 to 4 year olds were in home pools.² This has led the Accident Compensation Corporation, Department of Building and Housing and Water Safety New Zealand to sponsor the development of this Standard.

The aim of NZS 8500 is to assist New Zealanders to avoid pool-related drowning by providing various options which are designed to deny, delay or detect unsupervised entry to the swimming pool area by young children.

The committee has developed this Standard on the basis that the ultimate responsibility for avoiding fatal and near-fatal outcomes due to drowning as well as maintaining the integrity of all layers of protection lies with the property owner or person in possession of the property, adult supervisor or person in control of the pool.

All existing and future pool owners/users and members of the pool building industry are urged to make use of this Standard as soon as it is published in a bid to reduce drownings among the very youngest New Zealanders.

1 Chalmers, D., McNoe, B., Stephenson, S. and Langley, J. Drowning, near-drowning and other water-related injury: literature review and analysis of national injury data. Report to ACC. May 2004.

2 Child and Youth Mortality Review Committee. Circumstances surrounding drowning in those under 25 in New Zealand (1980 – 2002). 2005.

FOREWORD

Protecting young children from accidental drowning and near-drowning in all water environments, whether natural or constructed, is a primary concern for parents, the aquatic industry, manufacturers of swimming pools, hot tubs and spas, health and water safety organisations, and regulators. Many fatalities and near-fatal drowning incidents involving young children happen in private houses, in unfenced or inadequately fenced swimming pools, spas and hot tubs.

To this end, organisations such as the Accident Compensation Corporation (ACC), Water Safety New Zealand, Royal New Zealand Plunket Society, BRANZ Ltd, territorial authorities, water and child safety organisations, the Department of Building and Housing (DBH) and spa and pool manufacturers, architects and designers, all recognise that restricting unsupervised access to pools coupled with constant adult supervision while in the pool enclosure are the primary elements in an integrated approach to drowning prevention for young children.

Water Safety New Zealand figures show that 34 % of total drownings of children under the age of 6 occurred in home pool/spa/hot tubs, between January 2001 and December 2005, compared to 44 % for the time period January 1980 to July 1987.

The following table compares home drowning with the total drownings of children in this age group after different time periods.

Time period	Home pool/Spa/Hot tub drownings of children under 6 years of age	Total drownings of children under 6 years of age
1 January 1980 to 31 July 1987 (seven years)	77 (Approx. 10 each year)	175 (Approx. 23 each year)
1 August 1987 to 31 December 1995 (nine years)	53 (Approx. 6 each year)	122 (Approx. 15 each year)
1 January 1996 to 31 December 2000 (four years)	26 (Approx. 5 each year)	67 (Approx. 13 each year)
January 2001 to 31 December 2005 (five years)	19 (Approx. 4 each year)	55 (Approx. 11 each year)

Source: Drownbase™

The aim of this Standard is to assist people to avoid a swimming pool-related drowning. The various options are specifically intended to deny, delay, and/or detect unsupervised entry to residential swimming pool areas including areas around spas and hot tubs. While supervision is important in preventing drowning, academic research has consistently and conclusively reported that isolation barriers are the most effective means to prevent young children from drowning in residential pools.

Unless adequate barriers are in place between the pool and areas ordinarily frequented by the child, it is unavoidable that small children will occasionally escape from supervision and be exposed to the risk of drowning. Being caught off guard does not have to mean being unprepared.

For those instances when there may be a lapse in supervision and the unexpected does occur, NZS 8500 *Safety barriers and fences around swimming pools, spas and hot tubs* has been developed to provide for layers of protection to supplement and complement the requirement of adult supervision of young children around residential swimming pools, spas and hot tubs.

The Standard provides options for the location of effective safety barriers to restrict the access of young children to swimming pools, as well as specifying requirements for the design, construction and performance of the fences, gates, retaining walls and doorsets and all structures that are intended to form a barrier to restrict the access of young children to swimming pools.

These requirements have been specified with the intention of providing a degree of flexibility to the pool owner in terms of the choice of fence and cost, while not compromising the safety of young children.

The committee has developed this Standard on the basis that territorial authorities will gradually seek an upgrade of existing pools over a transitional period. It is expected that this transitional phase would be completed within five years of the publication of this Standard.

The intention in developing NZS 8500 is that Government will be able to consider using it as a replacement for the Schedule in the Fencing of Swimming Pools (FOSP) Act. Until an amendment is made to the FOSP Act, the Standard will provide valuable guidance to territorial authorities in enforcing the FOSP Act for both new and existing pools. This Standard is a multi-purpose document. It is intended to become a compliance document under the New Zealand Building Code for new pools in addition to being used by territorial authorities in developing safe solutions for existing pools, once the Standard replaces the Schedule to the FOSP Act.

The ultimate responsibility for avoiding fatal or near fatal outcomes due to drownings and for maintaining the integrity of all layers of protection lies with the property owner or person in possession of the property.

Supervision of all young children in the vicinity of water is vital and this responsibility for avoiding fatal or near fatal outcomes lies with the adult supervisor or person in control of the pool.

NOTES

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Safety Barriers and Fences around Swimming Pools, Spas and Hot Tubs

1 General

1.1 Scope

This section specifies requirements for the location of effective safety barriers that will restrict the access of young children to new and existing swimming pools. These include residential and other pools where persons are not employed and present to provide supervision of the pool whenever the pool is available for use, as defined by the FOSP Act.

NOTE –

- (1) This Standard does not apply to baths, including spa baths within houses.
- (2) The location of the barriers should be related to the need for protection and should take into account all the circumstances of the particular site. Most drowning victims in private pools are under the age of six years and either live at the address or are invited visitors (refer to Drownbase™ 2005 Drowning Statistics).
- (3) Guidance on factors to be considered in selecting the location of barriers is given in section 2.
- (4) The type of barrier and the location of the pool within the property should ideally permit observation through or over the barrier so that the pool area may be directly viewed from commonly used areas of the house or yard.
- (5) Information and guidance for new and existing pools is given in 2.3.

1.2 Definitions

For the purpose of this Standard, the following definitions shall apply.

ARC OF OPERATION. The unaided movement of a gate, covering its operation area for access to or from the pool area.

BARRIER (including SAFETY BARRIER). The assembly of components intended to restrict the access of young children to the pool. The barrier can include items such as posts and panels, fencing, gates and doorsets, constructed or natural walls, sides of houses, child-resistant windows or balustrades on a balcony.

CHILD-RESISTANT DOORSET. Comprises a door, door frame, self-closing device and self-latching device, that are designed to provide an access way to the swimming pool from a house.

CHILD-RESISTANT WINDOW. Comprises a window, window frame and device that limits the window opening to less than 100 mm.

FENCE/FENCING. A barrier comprising a fence and associated gate or gates.

FENCING HEIGHT. The minimum height perpendicular to the finished floor level or ground level at any point along the length of the fencing, measured on the outside of the fencing (see figure 3.2).

FINISHED FLOOR LEVEL (FFL). A permanent stable surface, such as the top of tiles, timber or concrete, not including vinyl covering, carpet or similar.

FINISHED GROUND LEVEL (FGL). A permanent ground/landscaped level, such as lawns, gardens, soil or gravel.

GATE. Any portion of the barrier/fencing other than a child-resistant doorset that is designed to provide an access way through the barrier/fence. A gate is not designed to provide an access way to the swimming pool from a house. Double gates shall either independently self-close and self-latch or one leaf of the gate shall be permanently fixed in a closed position with the second leaf complying with 3.4.

HOUSE. A house or dwelling includes a home unit, apartment building, school, hospital, hotel, motel, and camping ground.

IMMEDIATE POOL AREA. The land in, or on which the pool is situated and so much of the surrounding area as is used for activities or purposes carried on in conjunction with the use of the pool. For further clarification, including examples, see 2.2.

INSIDE OF THE FENCE/FENCING. That side of a barrier/fence or gate which faces the pool area.

ISOLATION BARRIER. A continuous barrier/fence enclosing the immediate pool area.

OUTSIDE OF THE FENCE/FENCING. That side of a barrier/fence or gate which faces away from the pool area.

SWIMMING POOL and POOL. An excavation, structure or product that is used or is capable of being used for the purpose of swimming, wading, paddling or bathing; and includes any such excavation, structure or product that is a spa pool or hot tub. (For the purposes of this Standard the terms 'spa pools' and 'spas' are interchangeable.)

NOTE – For further clarification refer to the FOSP Act (www.legislation.govt.nz).

TERRITORIAL AUTHORITY (TA). Any city or district council.

NOTE – For further clarification refer to the Local Government Act (www.legislation.govt.nz).

YOUNG CHILD. A child under the age of six years.

1.3 Interpretation

For the purposes of this Standard the word 'shall' identifies a mandatory requirement for compliance with the Standard. The word 'should' refers to practices which are advised or recommended.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is for information and guidance and does not form part of the mandatory requirements of the Standard. However, where an informative appendix specifies a prescribed test procedure, the word 'shall' used in it means that if users elect to conduct this test, it shall be undertaken exactly as set out in the appendix.

Clauses prefixed by 'C' and printed in italic type are intended as comments on the corresponding mandatory clauses. They are not to be taken as the only or complete interpretation of the corresponding clause, nor should they be used for determining in any way the mandatory requirements for compliance with a Standard.

The full titles of referenced documents cited in this Standard are given in the list of Referenced Documents immediately preceding the Foreword.

1.4 Legislation

It is intended that this Standard will be cited in the FOSP Act as replacing the Schedule.

1.5 Requirement for building consent applications

The Building Act requires that building consents be obtained for all new swimming pools, spa pools and hot tubs, and for any alterations to existing swimming pools, spa pools and hot tubs and their barriers/fences. It is the responsibility of the Territorial Authority (TA) or Building Consent Authority (BCA) to enforce this requirement.

NOTE – Under the Building Act spa pools and hot tubs are classified as buildings and require a building consent before installation.

C1.1.5

When applicants cannot agree with a TA or BCA about building work, a determination may resolve the matter. A determination is a legally binding decision made by the Department of Building and Housing (DBH) and provides a way of solving disputes or questions about the rules that apply to buildings, building accessibility, and health and safety.

As the Building Act is not retrospective, existing pool fences are required to meet the requirements specified in the FOSP Schedule.

1.6 Inspections

Enforcement of the legislation and the Standard is an integral component of home pool compliance. See Appendix A for the inspection regime.

2 Options for the location of safety barriers and fences for swimming pools, spas and hot tubs

2.1 Introduction

The most effective way to prevent drowning is to isolate the pool from the house with an isolation barrier.

Young children are inquisitive and tend to be attracted to water. This attraction is one reason why the existence of a pool is particularly dangerous to young children. Pool barriers/fences safeguard a child even when a parent/caregiver is not able to constantly supervise them.

This Standard provides alternatives in the form of layers of protection in order to restrict the access of young children to swimming pools, spas and hot tubs.

2.2 General

The definition of 'immediate pool area' is important to understanding the responsibilities of a property owner(s) or person(s) in possession of the property, adult supervisor or person in control of the pool, as it defines the area, along with the pool, which shall be enclosed by the barrier/fence.

The immediate pool area could include the pool, its decking, changing sheds, an ornamental garden or landscaped area and a barbecue and outdoor furniture, but not a vegetable garden, clothes line, children's play areas or equipment, as these are not used in conjunction with the pool.

Tool sheds, garages, children's sand pits, vegetable gardens, clothes lines and other children's play equipment not associated with the use of the pool shall be located outside the pool area to reduce the likelihood of self-closing gates or doors being propped open in order to gain access.

Whenever a young child is inside a pool area, constant adult supervision is essential. Increasing the area and utilities inside the pool area may increase this responsibility. It is essential that a separate outdoor safe play area for children is available directly from the house.

The activities within the immediate pool area must be closely connected or associated with the use of the pool and may, but do not have to be carried out exclusively with use of the pool. It does not matter that the particular activity can be carried out independently of the use of the pool.

The distance of the barrier/fence from the pool should take into consideration a safety margin sufficient to discourage diving and jumping from the barrier/fence into the pool. The barrier/fence should be located within enough distance from the pool to allow visual supervision of the children.

2.3 Requirements for new and existing pools

2.3.1 General

NZS 8500 has been developed on the basis that TAs will gradually seek an upgrade to existing pools over a transitional period. It is expected that this transitional phase would be completed within 5 years of the publication of this Standard.

2.3.2 Specific requirements for pools

For new and existing pools at least one of the following requirements shall be met:

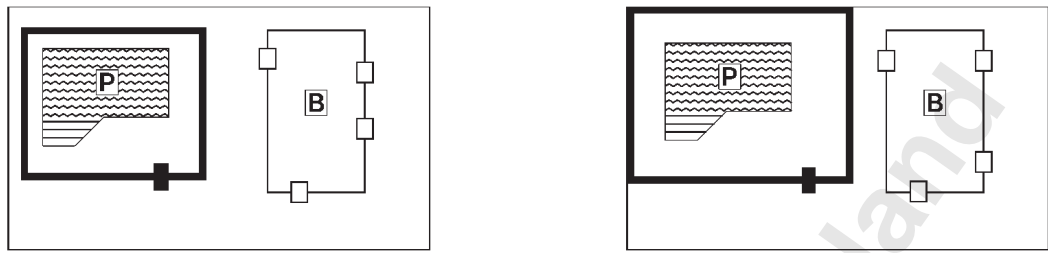
- (a) The pool shall be enclosed by an isolation barrier (see figure 2.1(a));
- (b) The pool shall be enclosed by an isolation barrier which includes boundary fences (see figure 2.1(b));
- (c) The pool shall be enclosed by an isolation barrier, where a wall of a house forms part of the barrier (see figure 2.1(c));
- (d) The pool shall be enclosed by an isolation barrier where a wall of a house contains a child-resistant window (see figure 2.1(d));
- (e) The pool shall be enclosed by an isolation barrier where a wall of a house contains a child-resistant window and/or a child-resistant doorset or doorsets, regardless of the direction of door swing (see figure 2.1(e)); or
- (f) The pool shall be enclosed by an isolation barrier where a wall of a house contains doors opening from the house to the immediate pool area (regardless of direction of door swing). Should the doors not be self-closing and self-latching, then a lockable door latch 1500 mm above finished floor level shall be provided on every opening door-set. In addition there shall also be:
 - (i) An automatic pool cover that complies with ASTM F1346-91, and
 - (ii) An alarm complying with UL 2017 capable of detecting unauthorised access from the house into the immediate pool area, and that when activated emits a sound of 85 decibels or more to be heard from the house.

Where an automatic pool cover is not installed in an existing pool, an alarm that complies with UL 2017 and a pool alarm that complies with ASTM F2208 shall be fitted in addition to lockable door latches at 1500 mm from the finished floor level including safety signage on every doorset.

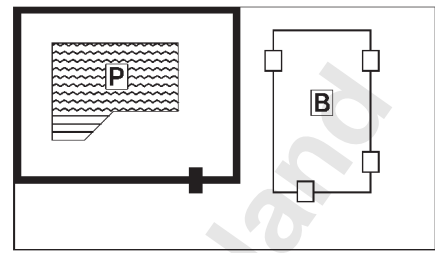
NOTE –

- (1) A pool alarm that complies with ASTM F2208 provides additional protection and may also be used in conjunction with any of the above methods.
- (2) The TA has the authority under the FOSP Act to provide an exemption for a specific pool and the Department of Building and Housing can make determinations on specific pools.

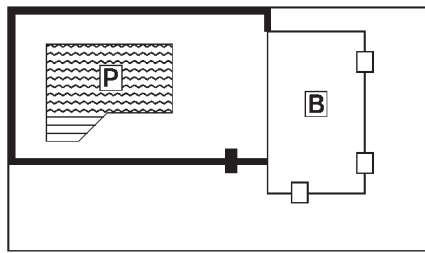
It is the responsibility of the property owner(s) or person(s) in possession of the property on which any pool is situated to ensure that the pool is not filled or partly filled with water at any time when the person(s) knows or could reasonably be expected to know that the pool/fence/barrier does not comply with this Standard. This means that the property owner(s) or person(s) in possession of the property must check that any layers of protection are functioning at all times.



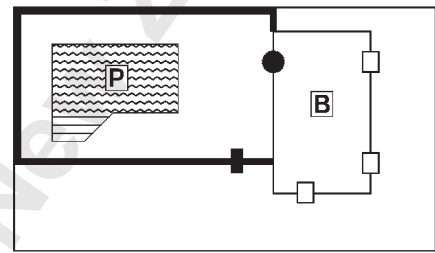
(a) Isolation barrier



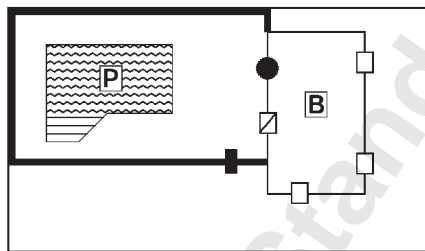
(b) Isolation/boundary



(c) Isolation/boundary/building








(d) Isolation/boundary/building/window



(e) Isolation/boundary/building/window/door

LEGEND

-  Pool
-  Building
-  Window or door
-  Gate complying with 3.4
-  Child-resistant doorset (self-closing and latching) complying with 3.7.1




-  Child-resistant openable portion of window complying with 3.6
-  Property boundary
-  Fence, retaining wall or other such barrier complying with 3.3

Figure 2.1 – Typical examples of outdoor pool barriers (not to scale)

2.4 Requirements of barriers/fences

Fences, gates, retaining walls and other such barriers in figure 2.1 shall comply with 3.2.

2.5 Boundary fences

It is the obligation of the property owner(s), or person(s) in possession of the property to ensure that where the boundary fence forms part of the pool fencing it continues to provide a complying barrier.

The property owner(s), or person(s) in possession of the property shall ensure that neighbours do not permanently place climbable objects adjacent to the fence compromising the barrier/fence. See figure 3.2.

NOTE – The Fencing Act provides recourse for an owner to negotiate fence construction with their neighbour.

2.6 Balcony

A balcony projecting into a pool area shall comply with 3.8.

2.7 Indoor pools

2.7.1 Fully indoor pool

Access to a fully indoor pool shall be via a child-resistant doorset or doorsets that is compliant with this Standard (see 3.7.1). Where windows are present in the pool barrier they shall be made to be child-resistant.

2.7.2 Partly indoor pool

Where the pool is partly in an indoor area that extends directly into an outdoor area, each area shall be treated in the same way as a pool in that exclusive area.

The indoor section of the pool barrier shall only be accessible via a pool gate or child-resistant doorset that complies with 3.4 or 3.7.1.

The outdoor section of the pool barrier shall only be accessible via a pool gate, child-resistant doorset or appropriate pool barrier that complies with 3.4, 3.5 or 3.7.1.

2.8 Ornamental ponds

This Standard does not apply to any excavation, structure or product in which the maximum depth of water does not exceed 400 mm. Refer to www.legislation.govt.nz for the Fencing of Swimming Pools Act definition of swimming pool, including section 5 exemptions for swimming pools.

2.9 Access to the house through the pool area

Access to the house from outside the property shall not be through the pool area.

Where compliance is impossible, unreasonable or in breach of any other Act, regulation or bylaw, then a special exemption or determination may be sought from the TA or the DBH. Considerations may include additional layers of protection incorporating at least one of the following:

- (a) Automatic pool covers that comply with ASTM F1346-91;
- (b) Alarms complying with ASTM F2208, with warning signage required in accordance with section 5; or
- (c) Any barrier/fence approved by the TA or DBH through the special exemption/determination process.

2.10 Pools under construction

Once a pool contains more than 400 mm of water it shall be isolated by a construction fence that complies with this Standard.

3 Design of safety barriers and fences for swimming pools, spas and hot tubs

3.1 General

3.1.1 Scope

This section of the Standard specifies requirements for the design, construction and performance of barriers/fences, gates, retaining walls, windows, doorsets and balconies intended to restrict the access of young children to swimming pools, including residential pools and other pools where persons are not employed and present to provide supervision of the pool whenever the pool is available for use.

NOTE – Appendix B gives a broad guide to some of the key construction criteria which need to be met by some of the more common types of barriers/fences, in order to comply with the requirements of this Standard.

3.2 Design and construction of elements of a barrier/fence

3.2.1 General

A barrier/fence shall be designed and constructed so that at any point the outside of the barrier will restrict access to young children. The barrier/fence shall be a permanent structure.

3.2.2 Materials and finish

Barriers/fences may be constructed from any type of material, provided that the finished barrier/fence complies with the requirements of this Standard. New barriers/fences shall also comply with the New Zealand Building Code, in particular Clause B2 'Durability'.

3.3 Barriers/fencing

3.3.1 Barrier and fence dimensions and proximity requirements

The effective barrier/fencing height shall be not less than 1200 mm (see figure 3.1 and figure 3.2).

There shall be no climbable objects on the outside within 1200 mm of the top of the barrier/fence (see figure 3.2).

The height shall be considered to be effective if a quadrant of radius 1200 mm, located as shown in figure 3.2, provides a clear span of 1200 mm to finished ground or floor level, or to any projections from, or weight bearing objects on, the ground, except for objects non-climbable by a young child which are able to be positioned within the 1200 mm radius.

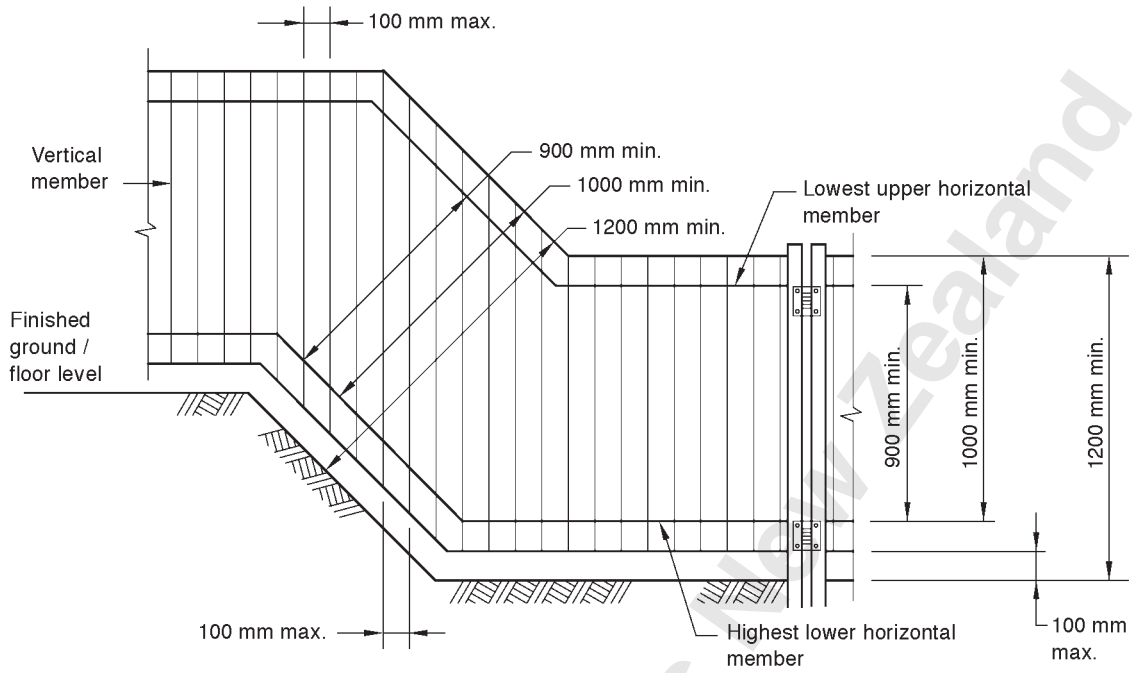


Figure 3.1 – Perpendicular fencing dimensions on sloping ground

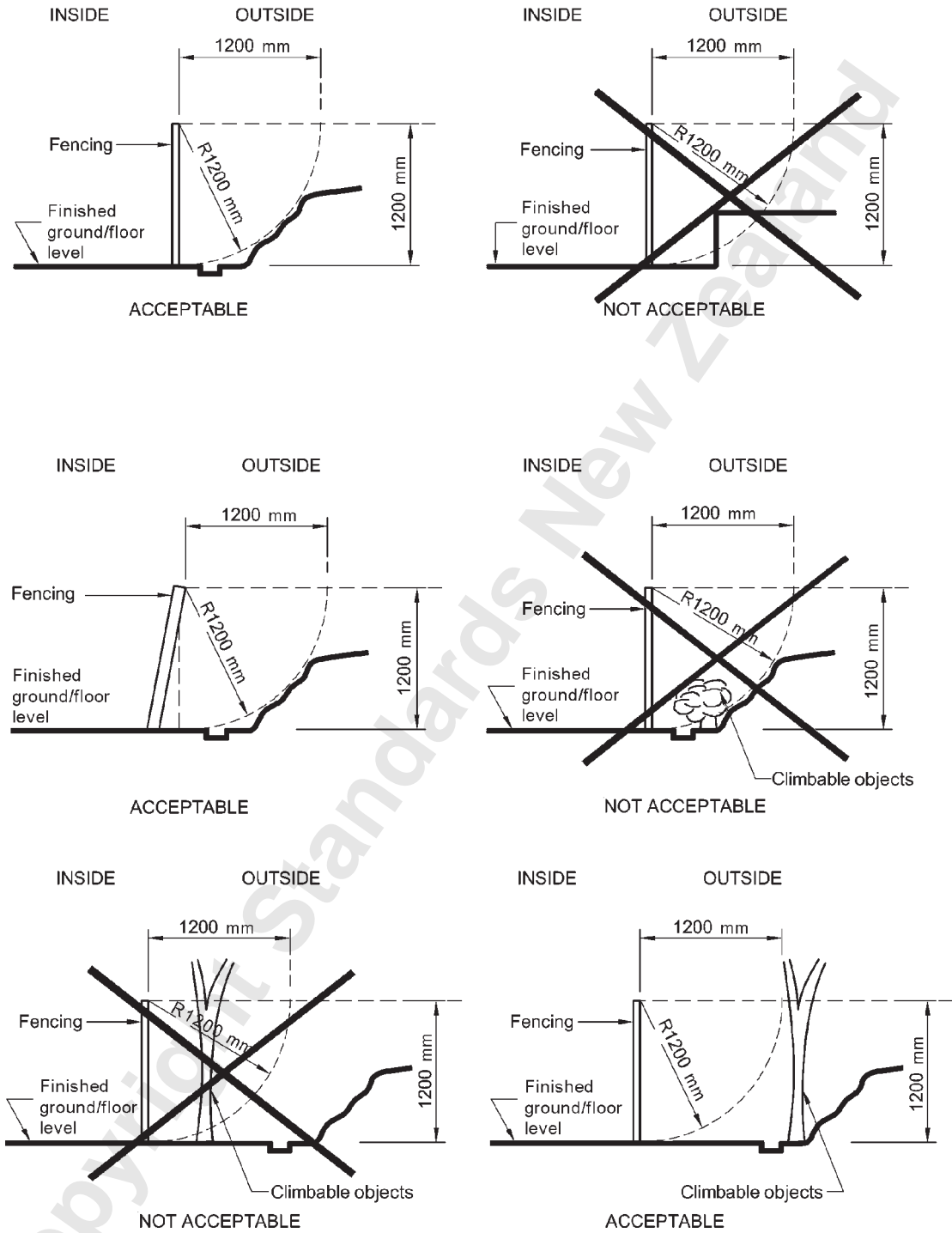


Figure 3.2 – Effective fencing height

3.3.2 Perforated material, mesh or trellis

For barriers/fences 1200 mm and above in total height, the aperture size of the fencing materials shall be no greater than 10 mm diameter (see table 3.1 and figure 3.3).

For barriers/fences 1800 mm and above in total height, the aperture size of the fencing materials shall be no greater than 35 mm diameter.

For barriers/fences 3000 mm and above in total height, the aperture size of the fencing materials shall be no greater than 53 mm diameter.

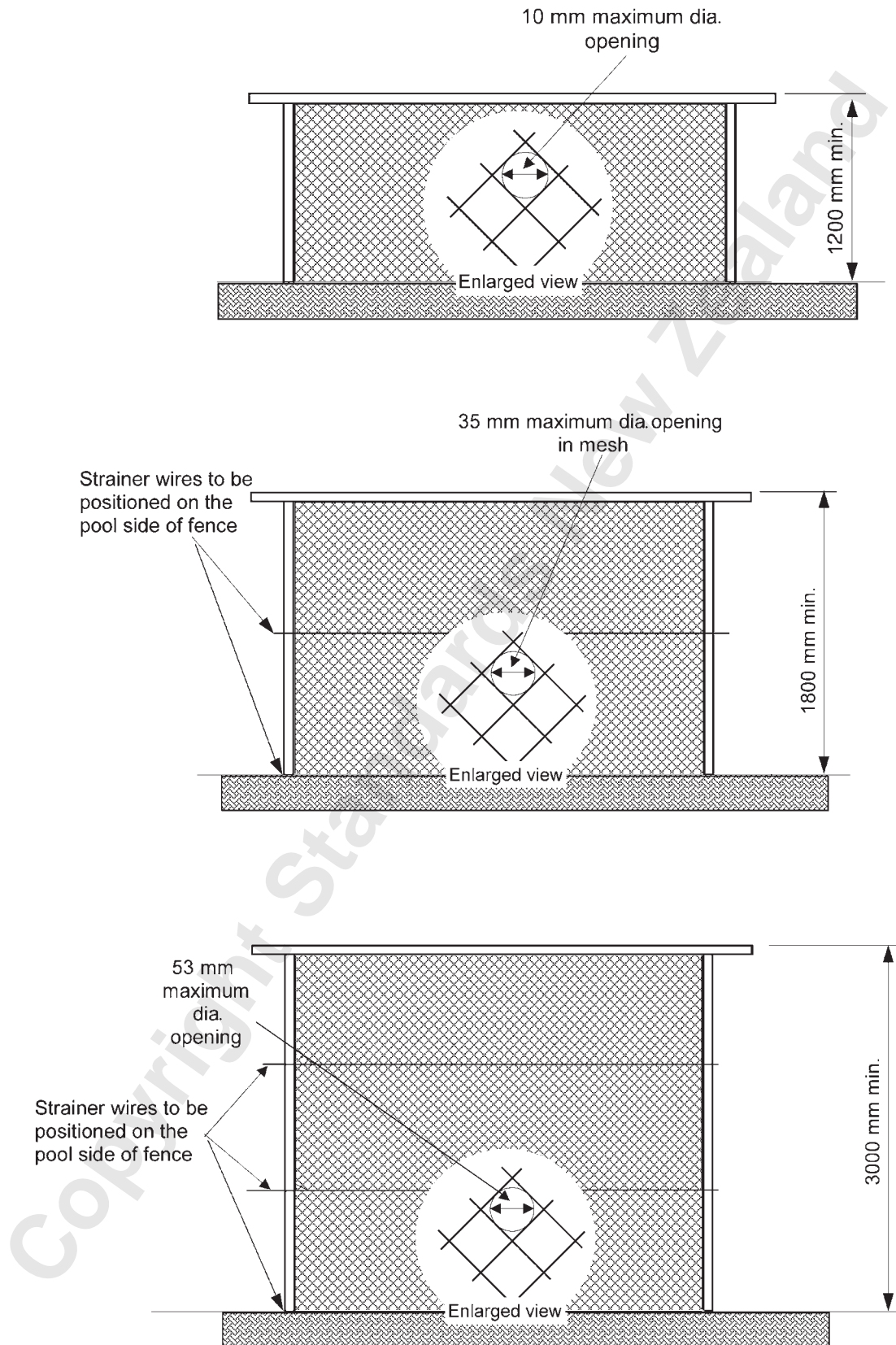
Barriers/fences using link mesh or fabric shall include a strainer wire or rail at the top and the bottom of the barrier.

Barriers/fences that require a strainer wire to be used to maintain their rigidity at finished floor or ground level shall be located at or below finished floor/ground level.

Table 3.1 – Maximum apertures for size of barriers/fencing

Fence height (mm)	Apertures max. diameter (mm)
1200 and above	10
1800 and above	35
3000 and above	53

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NOTE – Consideration is to be given to the climbability of adjoining fences, barriers and other objects.

Figure 3.3 – Maximum aperture size on fencing

3.3.3 Outside surface

Projections from or indentations into the outside surface of the barrier/fencing, or any combination of projections and indentations, shall not form a substantially horizontal surface with a depth greater than 10 mm, unless they are spaced not less than 900 mm vertically apart and provided that the lower projections or indentations are at least 1000 mm below the top of the barrier/fencing (see figure 3.4 and figure 3.5).

The barrier/fence shall be designed to be vertical, or where specifically designed to lean towards the pool, it shall not do so by more than 15° to the vertical (see figure 3.7).

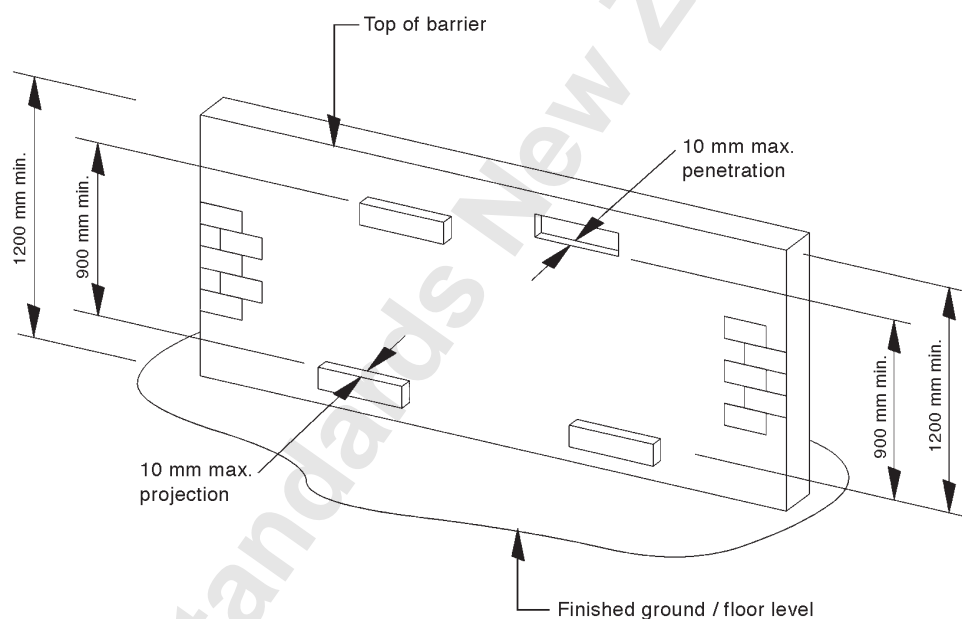


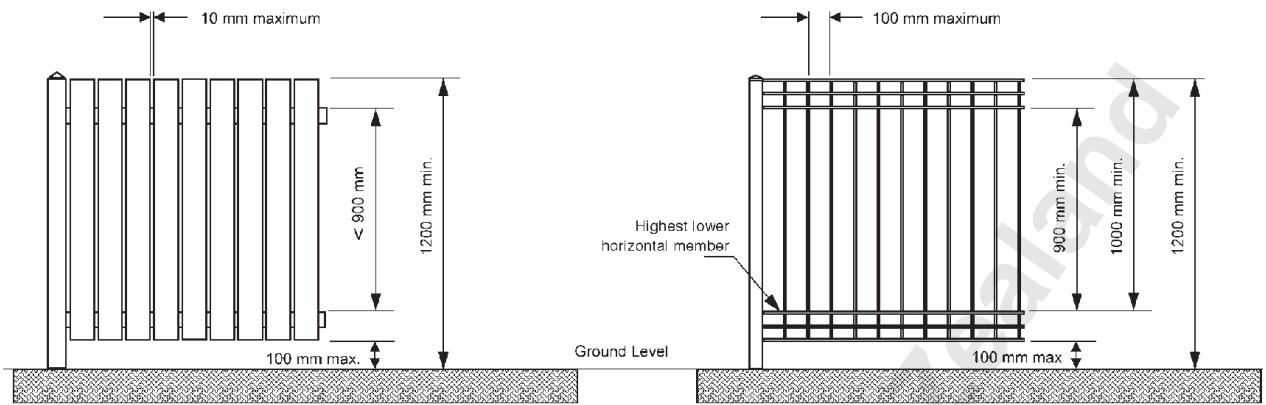
Figure 3.4 – Barriers/fencing with projections such as ornamental brick or stonework

3.3.4 Horizontal climbable members

Where barrier/fencing components provide a substantially horizontal surface, such as rails, rods, wires or bracings, that could be used as holds for climbing and are located on the outside of the barrier/fencing, or where vertical members are spaced such that they provide clear openings of more than 10 mm width, the following requirements shall apply except for gate hinges:

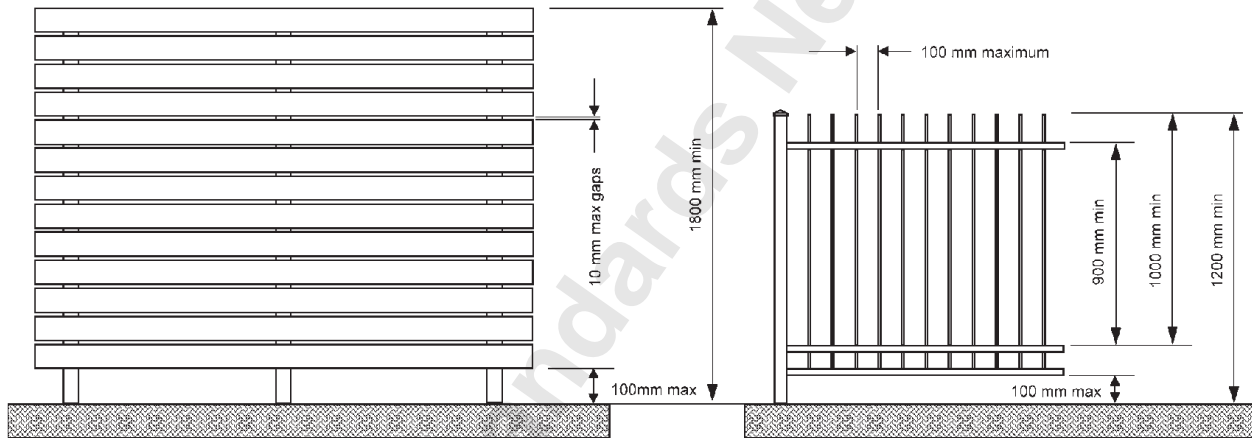
- (a) Horizontal members shall be not less than 900 mm apart and where there are more than two horizontal members, there must be at least one 900 mm unclimbable portion between any two top surfaces of members (see figure 3.1 and figure 3.5);
- (b) The top surface of the highest lower horizontal member shall be at least 1000 mm below the top of the fence (see figure 3.1 and figure 3.5).

Gate hinges with a horizontal dimension greater than 10 mm shall be not less than 900 mm apart. Hinges may be spaced less than 900 mm apart if the total projection of the hinge is less than 10 mm.



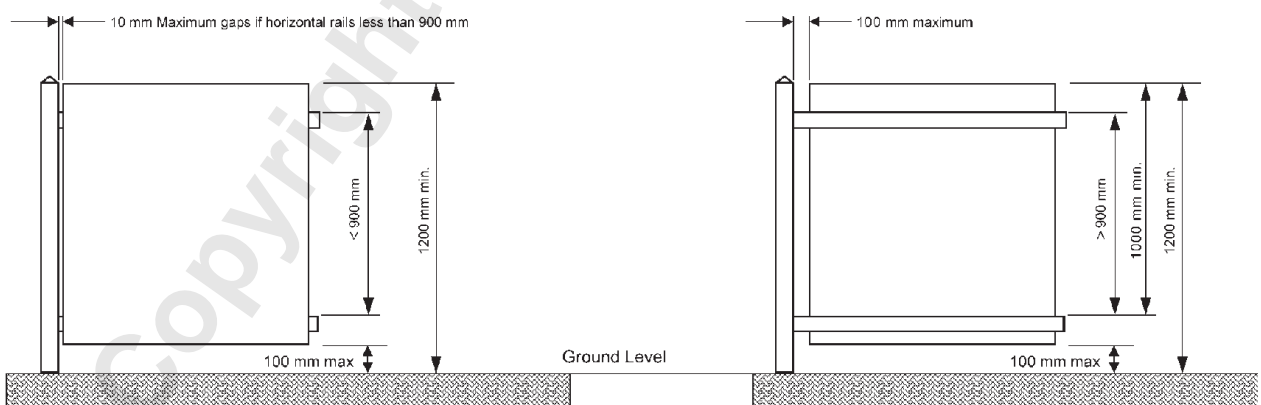
(a) Rails inside, but with uprights spaced not more than 10 mm apart.

(b) Rails on outside, but with uprights spaced not more than 100 mm apart.



(c) Horizontal fencing with spacing of not more than 10 mm.

(d) Fencing with several horizontal members, such as welded construction.



(e) Solid panel type barrier.

(f) Solid panel type barrier with rails on outside.

NOTE – These drawings are of an outside pool barrier view.

Figure 3.5 – Spacing of accessible horizontal members, or projections or indentations

3.3.5 Horizontal non-climbable members

Horizontal members shall be categorised as non-climbable if they comply with figure 3.4 and figure 3.5.

3.3.6 Horizontal surfaces inside the barrier/fencing

Where any nearby horizontal surfaces that could be used as holds for climbing are permanently located near the inside of the fencing and where the spacing between vertical members is greater than 10 mm, such surfaces shall be separated from the fencing by a distance of not less than 300 mm.

3.3.7 Vertical members

The clear space between any adjacent vertical members (figure 3.1), such as palings, rods or wires, shall not exceed 100 mm at any point.

3.3.8 Ground clearance

The height of any opening between the bottom of the barrier/fence and the finished floor/ground level shall not exceed 100 mm, except for the minimum requirements for perforated materials (see 3.3.2).

3.4 Gates and fittings

3.4.1 Direction of opening

Gates shall be hung so that they only swing outwards away from the pool area.

3.4.2 Operation of gate

The gate shall have sufficient clearance to enable it to swing freely and be unobstructed through its arc of operation.

When lifted up or pulled down the gate shall not release the latching device, come off its hinges or provide a ground clearance greater than 100 mm.

3.4.3 Self-closing device

All gates shall be fitted with a device that will return the gate to the closed position and operate the latching device from any position with a stationary start and without the application of a manual force.

The self-closing device shall be capable of complying with these requirements with the gate at any position from resting on the latching mechanism to fully open.

NOTE –

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

3.4.4 Latching device

Gates shall be fitted with a latching device that will automatically operate on the closing of the gate to prevent the gate from being re-opened without being manually released.

Any latching device shall be designed to prevent being inadvertently adjusted during operation (e.g. locked in the open position), and any necessary adjustment shall only be possible with the use of correct tools.

When in the closed position, the latching mechanism shall not be able to be released by the insertion of any implement between the 10 mm gap shown in figure 3.6(a) particularly from below the mechanism.

3.4.4.1 Location of the latching device

Where the release to the latching device or the latch is located at a height less than 1500 mm above the finished floor/ground level or 1400 mm above the top of the highest lower horizontal member and is capable of being released at the latching mechanism, the location of the release of the latching device (see figure 3.6) shall:

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

3.4.4.2 Shielding of latching device

Where the release to either the latching device or the latch is located at a height less than 1500 mm above the finished floor/ground level or 1400 mm above the top of the highest lower horizontal member and is capable of being released at the mechanism, the latch and its release shall be so shielded (see figure 3.6(a) – (c) and (e)) that no opening greater than 10 mm occurs within an area bounded by:

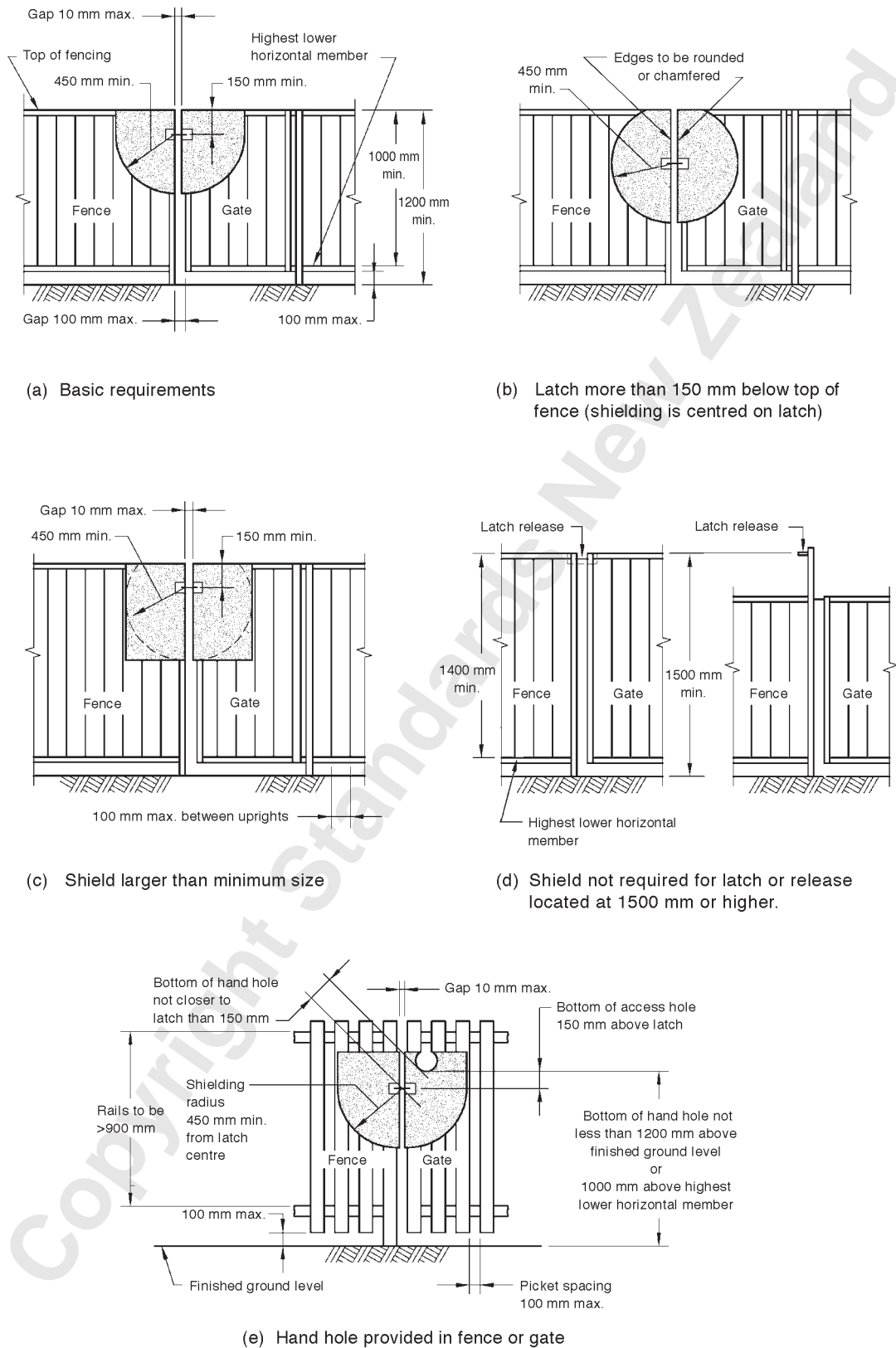
- (a) An effective radius of 450 mm from the operating parts of the latch; and
- (b) The top of the fence, if this intersects the area described in (a).

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 floor level or 1000 mm above the top of the highest lower horizontal member, 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, 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 fence shall be rounded or chamfered to prevent a hazard when the gate closes.

3.4.4.3 Double gates

Double gates shall either independently self-close and self-latch or one leaf of the gate shall be permanently fixed in a closed position with the second leaf complying with 3.4.



NOTE – Main dimensional requirements are also shown. The shields are shaded.

Figure 3.6 – Latch shielding for gates of open construction

3.4.4.4 Maintenance of gates and doors

Any gate or door that is deliberately propped open or faulty, does not comply with this Standard.

A barrier/fence, gate or doorset that is not properly maintained as an effective barrier compromises the safety of young children and is not permitted under this Standard.

3.5 Retaining wall or other such barrier**3.5.1 Retaining wall on the high side of a pool**

A retaining wall or other such barrier on the high side of the pool (see figure 3.7(a)) shall be an effective barrier if it has an effective height of not less than 2400 mm and does not slope away from the pool by more than 15° to the vertical.

NOTE – Refer to F4 of the New Zealand Building Code for appropriate barrier height.

3.5.2 Retaining wall on the low side of a pool

A retaining wall or other such barrier on the low side of the pool (see figure 3.7(b)) shall be an effective barrier if it does not slope towards the pool by more than 15° from the vertical, is non-climbable and complies with 3.3.1 and 3.3.3.

Where a barrier/fence intersects a retaining wall, a barrier/fence shall extend to the outer edge of the retaining wall and return 1200 mm along the retaining wall in either direction.

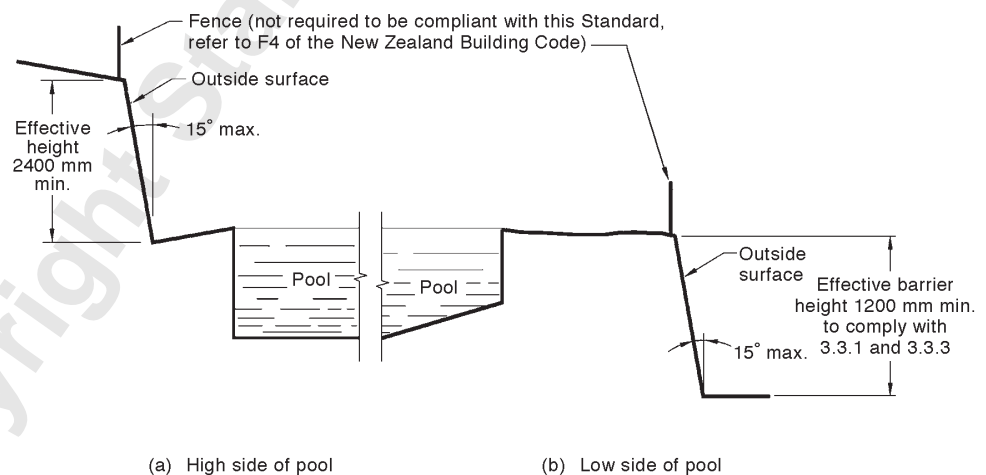


Figure 3.7 – Retaining wall or other such barrier

3.6 Child-resistant operable portion of window

Where the height (h_1) from the sill of the lowest opening portion of the window in the pool barrier is less than 2400 mm (see figure 3.8), the operable portion of the window shall comply with the following requirement:

Where the height (h_2) from the internal sill of the lowest opening panel of a compliant window to the floor inside the house is less than 1200 mm, then:

- (a) The operable portion of the window shall be covered by a safety barrier to a minimum height of 1200 mm (complying with 3.2); or
- (b) Windows shall be fixed in such a way that they will only open to a maximum of 100 mm and comply with the test for strength and rigidity of fencing openings in 4.2.

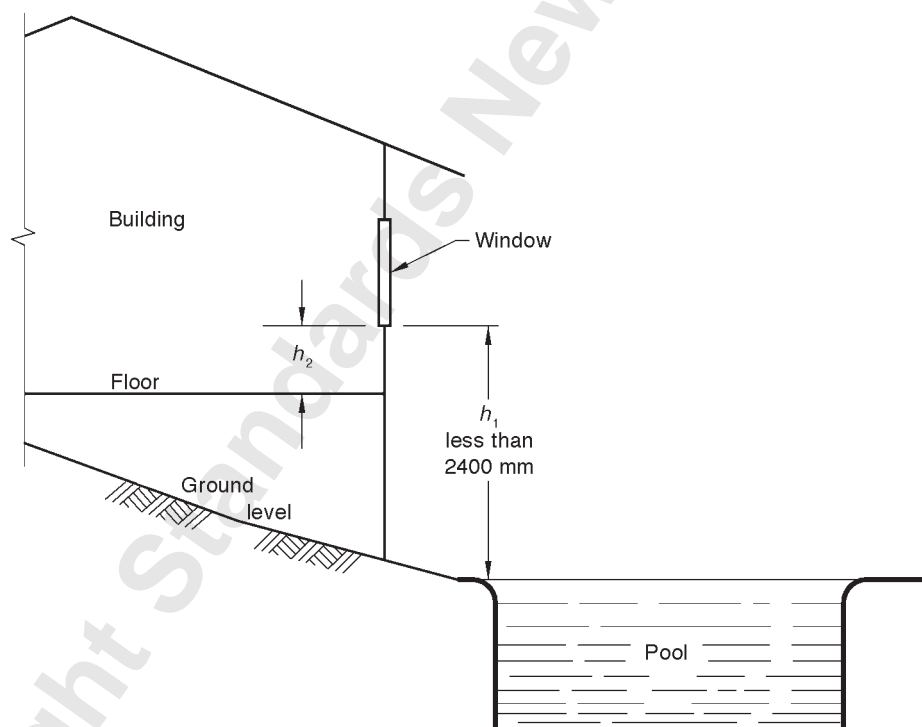


Figure 3.8 – Height limitations on child-resistant windows

3.7 Doors

3.7.1 Child-resistant doorset

Child-resistant doorsets shall comply with all of the following requirements:

- (a) Doors shall be fitted with a self-latching device that will automatically operate on the closing of the door and will prevent the door from being re-opened without manually releasing the device;
- (b) Every door shall be fitted with a device that will automatically return the door to the closed and latched position when the door is stationary and 150 mm from the closed and secured position;
- (c) The release for the latching device on the internal (house) side of the door shall be located not less than 1500 mm above the floor;
- (d) There shall be no footholds wider than 10 mm on the door or its frame between the floor and 1000 mm above the floor;
- (e) The closing and latching of the door shall comply with 4.6;
- (f) Horizontal members, vertical members, perforated materials or mesh, and finish shall comply with this Standard;
- (g) The doorset shall comply with the performance requirements for a gate for strength and rigidity of openings and strength of gate (see 4.2 to 4.4);
- (h) Doors from the house may swing in either direction; and
- (i) Pet doors to the immediate pool area are prohibited.

3.8 Balcony

Where a balcony projects into the immediate pool area (see figure 3.9) the following shall apply:

- (a) Where the distance from the floor of the balcony to the pool finished floor level is less than 2400 mm, and where windows and doors to the balcony do not comply with 3.6 and 3.7, the balcony shall include a pool safety barrier which complies with the requirements for a barrier in this Standard;
- (b) Where the distance from the floor of the balcony to the pool surround is less than 2400 mm, and where windows and doors to the balcony comply with 3.6 and 3.7, the balcony shall include a balustrade which complies with the requirements of the New Zealand Building Code; and
- (c) Where there is a climbable object below and the distance from the floor of the balcony to the pool surround is greater than 2400 mm, and where windows and doors to the balcony do not comply with 3.6 and 3.7, and there is a clear arc of 1200 mm from the floor of the balcony, the balcony shall include a balustrade which complies with the New Zealand Building Code.

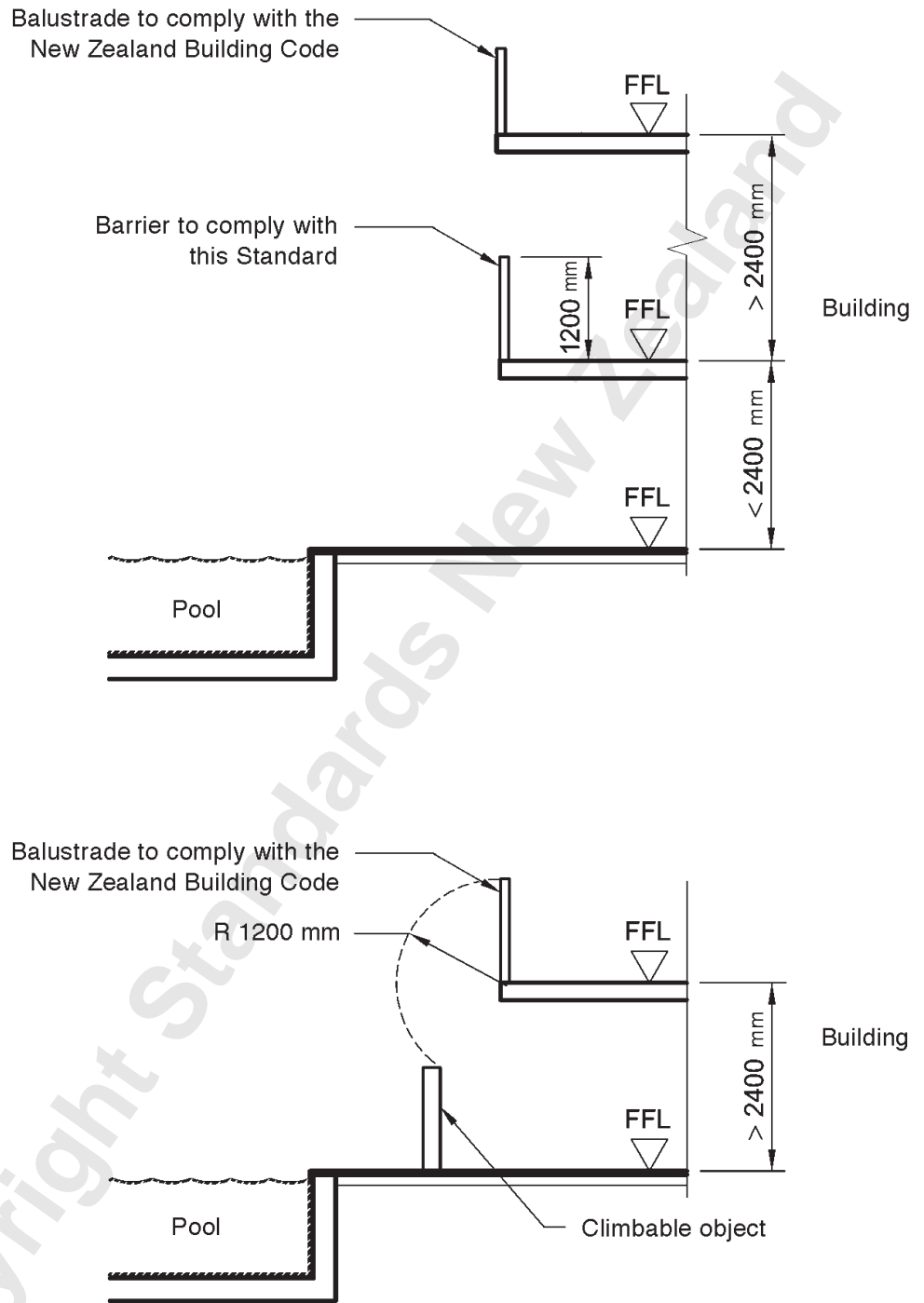


Figure 3.9 – Balcony projecting into immediate pool area

3.9 Above-ground swimming pools

For above-ground pools, as illustrated in figure 3.10, including inflatable pools, (whether temporary, permanent, moveable or removable) the walls of the pool can be an effective barrier if no part of the top of its sidewalls is less than 1200 mm above the adjacent ground level or near any permanent projection from, or objects standing on the ground outside and within 1200 mm of the walls. The outside surface of the side walls shall be constructed so as to inhibit climbing and any ladder or other means of access to the interior of the swimming pool shall be via a safety barrier/fence complying with this Standard and in particular complying with 3.3.

NOTE – Above-ground pools pose a particular hazard because of the tendency to leave climbable objects against the pool that can be used for access into the pool.

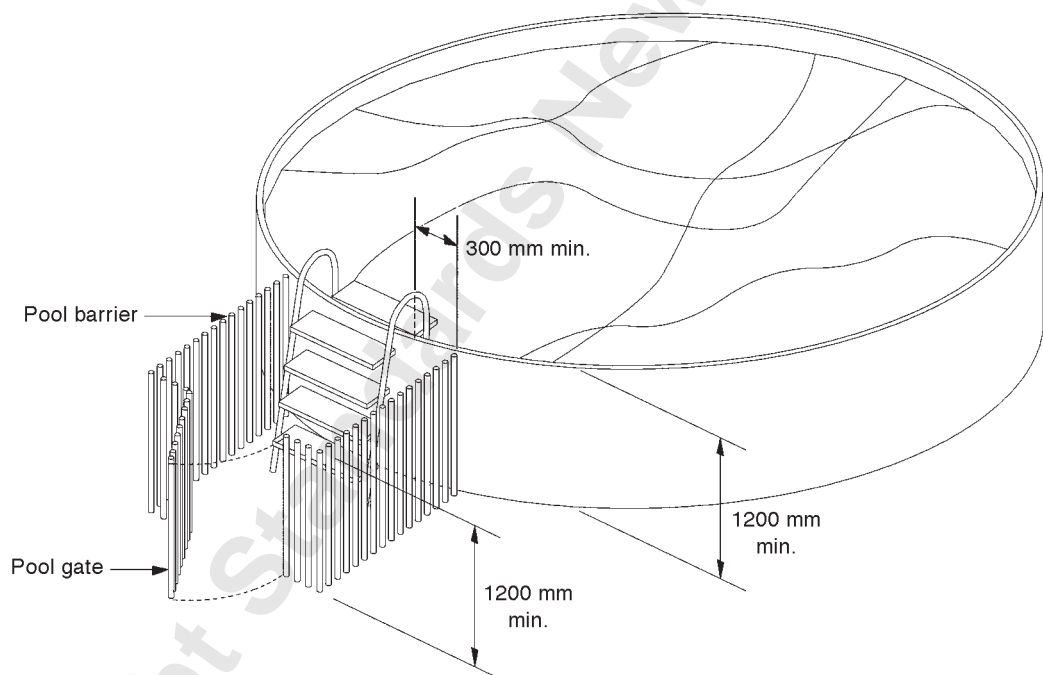


Figure 3.10 – Above-ground pool with barrier

3.10 Above-ground spas and hot tubs

Above-ground spas and hot tubs shall meet all of the following (see figure 3.11):

- (a) The top of the spa pool or hot tub shall be positioned with the entire top surface not less than 760 mm above the surrounding ground or deck;
- (b) The cover shall be lockable and shall be kept locked when the spa pool or hot tub is not being used or supervised. A locking device shall contain a mechanical locking mechanism or a self-locking mechanism in addition to latching shut;
- (c) The locks shall not be able to be readily opened or released by a child of up to the age of six years;
- (d) When locked the cover shall be fitted so that if lifted it does not release the locking device or provide a clearance greater than 100 mm;
- (e) The cover shall be made of a material that if walked on cannot collapse and can withstand the weight of at least 20 kg to ensure that it will more than take the weight of a child up to six years of age;
- (f) The cover shall be constructed of material that meets ASTM F1346-91 to allow easy movement on and off the spa pool or hot tub;
- (g) The cover shall be constructed with a taper from the centre hinge to the outside edge of the cover so that water will not pond on top of it;
- (h) The cover shall have an evenly spaced mechanical locking device as required in (b) which shall be positioned to ensure the cover cannot be lifted more than 100 mm by a child up to six years of age, and ensures that the cover is fixed securely to the spa pool or hot tub;
- (i) The cover and locks shall be maintained at all times in a good state of repair;
- (j) Warning stickers/signs shall be placed on the cover to advise that it shall be locked in place when the spa pool or hot tub is not being used or supervised;
- (k) Removable steps, movable furniture, or other objects that can assist a young child to climb onto the cover, shall be stowed/stored away at least 1200 mm from the side of the spa pool or hot tub.

3.10.1 Non compliant above-ground spa pools and hot tubs

Failure to comply with 3.10 will require a barrier/fence complying with this Standard.

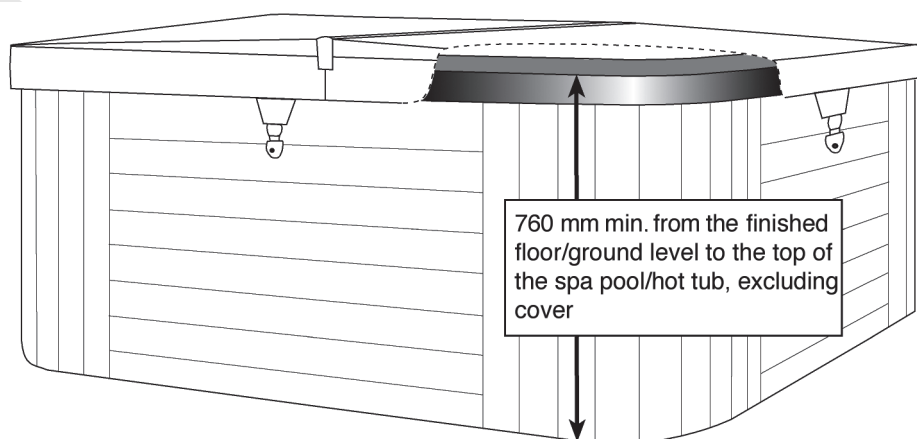


Figure 3.11 – Example of typical spa pool

4 Performance tests for safety barriers/fences and closing latching devices

4.1 General

This section provides practical means for measuring the performance of the safety barriers/fences/gates/doors and latching devices used by pool owner(s) or person(s) in possession of the property.

4.2 Strength and rigidity of openings

When any opening in the barrier/fence is tested in accordance with Appendix C, the test object shall not pass through.

4.3 Strength of posts and footings

When tested in accordance with Appendix D, there shall be no permanent damage to any post. The footings shall not loosen to impair the effectiveness of the barrier and any gate shall meet the requirements of 3.4.

4.4 Strength of barrier/fencing components

4.4.1 Rigid components

When tested in accordance with Appendix E, structural components, such as panel infills, top and bottom rails, rods, palings, pickets and the like, shall be capable of:

- (a) Sustaining a force of 250 N (25 kg) without any component becoming permanently deformed; and
- (b) Sustaining a force of 330 N (33 kg):
 - (i) Without breaking
 - (ii) Without showing signs of fracture, or
 - (iii) Without becoming permanently deformed by more than 10 mm over their length.

4.4.2 Flexible material and components

When tested in accordance with Appendix F, flexible barrier/fencing material and components shall not break or tear or the fixings loosen.

4.5 Closing and latching of gates

Every gate shall be fitted with a device that will automatically return the gate to the closed position and operate the latching device.

In addition to 3.4 each gate shall:

- (a) Close and latch from a stationary point at any position, including resting on the latch, in both of the following conditions:
 - (i) Under the natural weight of the gate
 - (ii) After a mass of 25 kg supported by the top rail is placed at a point 100 mm from the outer edge of the locking stile of a gate.

NOTE – This requirement is intended to show 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) Have the latching device and posts of the barrier/fencing to which the gate is attached capable of retaining the gate in the closed position when tested in accordance with (a).

4.6 Closing and latching of doors

Every door shall be fitted with a device that will automatically return the door to the closed position and operate the latching device.

In addition to 3.7 each door shall:

- (a) Close and latch from a stationary point 150 mm from the closed and secured position under the natural weight of the door; and
- (b) Have the latching device, door jamb and striker plate to which the door is attached capable of retaining a door in the closed position.

5 Water safety warning signage

5.1 General

Water safety signage has an important role to play in the implementation of preventive safety measures by informing owners, visitors and temporary users of the house of their obligations that exist under this Standard.

Warning signage shall be required when doorsets open to the immediate pool area and where pool/spa/hot tub covers are used as a barrier (see 2.3.2(e) and (f) and 3.10).

Appendix G provides examples (drawn to scale) of warning signage that is currently available.

5.2 Wording

A warning sign shall consist of:

- (a) Black lettering on white background, white lettering on black background, or black lettering on yellow background;
- (b) Lettering shall be of a size that enables a person with normal vision, including corrected vision, to read the safety sign or label at a normal viewing distance;
- (c) 'Warning' letter size height shall be at least 50 % greater than the selected height of the message panel;
- (d) Signal words shall be in upper case in a bold sans serif font (e.g. Helvetica or Universe);
- (e) Letter size for 'Warning Signage' shall be in accordance with 5.7; and
- (f) Any branding shall not detract from the message contained on the sign and shall not encroach on the target area.

NOTE – It is recommended that where possible the colours of the surface should conform to Pantone® 123 (yellow) and Pantone® Black, as detailed in NZS 8690 *Water safety signage*.

5.3 Placement

A warning sign shall be:

- (a) Readily visible to the intended viewer;
- (b) Able to alert the viewer to potential hazard/danger;
- (c) Located 1000 to 1500 mm above the inside floor/ground level and within 300 mm of any latching mechanism; and
- (d) Placed on one doorset.

5.4 Life expectancy/materials

A label sign shall:

- (a) Have a reasonable expected life of no less than 5 years with good colour stability and word message legibility when viewed as stated; and
- (b) Be resistant to foreseeable damage, corrosive elements, fading or visual obstruction caused by abrasion, rain or ultraviolet light.

5.5 Attachment

A label sign shall be attached permanently so that it cannot be readily removed.

5.6 Replacement

A label sign shall be replaced when it no longer meets legibility requirements for safe viewing as prescribed in 5.7.

5.7 Weight and sizes of signage

Word message letters' height and size shall be as indicated in table 5.1, or refer to NZS 8690.

Table 5.1 – Weight and sizes of signage

Safe viewing distances (mm)	Minimum letter height for favourable reading conditions	Minimum letter height for unfavourable reading conditions
Less than 600	Height (mm) – $\frac{\text{view distance}}{150}$	Height (mm) – $\frac{\text{view distance}}{75}$
600 – 2500	Height (mm) – $\frac{\text{view distance}}{300}$	Height (mm) – $\frac{\text{view distance}}{150}$
Greater than 2500	Height (mm) – $\frac{\text{view distance}}{400}$	Height (mm) – $\frac{\text{view distance}}{300}$

Appendix A – Inspection regime

(Informative)

A1 General

Inspection and maintenance is an integral component of home pool compliance. While the Fencing of Swimming Pools (FOSP) Act (section 10) requires each Territorial Authority (TA) to take 'all reasonable steps' to ensure that the Act is complied with, the Act is silent on specifying in detail what these reasonable steps are.

The aim of this Appendix is to provide all TAs with guidance in performing their responsibilities in enforcing the safety barriers of some commercial and residential swimming pools, spa pools and hot tubs. Hereafter 'pools' includes spa pools and hot tubs.

It is vital that owner(s) or person(s) in possession of the property, adult supervisor or person in control of the pool know it is illegal to fill, or partly fill the pool deeper than 400 mm, while it does not have safety barriers compliant with this Standard.

Reasonable steps should include:

- (a) Informing property owner(s) or person(s) in possession of the property, adult supervisor or person in control of the pool of the need to:
 - (i) Establish layers of protection to supplement and complement the requirements of adult supervision around water amenities
 - (ii) Advise the TA of the existence of pools
 - (iii) Advise the TA of an intention to build a pool, and
 - (iv) Comply with the FOSP Act.
- (b) Locating all existing pools, within the TA's area;
- (c) Establishing a regular inspection and education regime for existing pools, and:
 - (i) Instructing and educating property owner(s) or person(s) in possession of the property, adult supervisor or person in control of the pool of any changes required to upgrade safety barriers/fencing to meet this Standard
 - (ii) Carrying out periodic inspections to ensure that any instructions are complied with
 - (iii) Carrying out periodic inspections of all pools, to ensure that safety barriers/fences are being maintained and that they continue to meet this Standard
 - (iv) Taking court action against non-complying property owner(s) or person(s) in possession of the property, adult supervisor or person in control of the pool when all other means of obtaining compliance have failed.

A2 Location of existing pools

To be effective, a TA needs to know the location of every pool in its district. If its information is considered inadequate, a first step could be to circulate a general request throughout the district seeking information about the existence of pools, drawing attention to the requirements of the FOSP Act. The subsequent responses of property owners or persons in possession of the property would then be the start of a database. However, further work is likely to be needed to discover all the pools in the district. This should involve, for example:

- (a) Notices in rates newsletters;
- (b) An advertising campaign in local newspapers;
- (c) Aerial surveys;
- (d) Identification of existing pools during a property inspection for some other purpose;
- (e) Amending a Land Information New Zealand request form to include a description of any pool on the property; or
- (f) Checking with Valuation New Zealand for details of properties.

The database could be progressively extended as applications for building consents for new pools and alterations to existing pools are received.

The core set of minimum data to be collected should include:

- (g) The exact number of pools in the district;
- (h) The year of pool construction;
- (i) Whether the pool is exempt under the Act;
- (j) Whether a building permit/building consent has been issued for the construction of the pool AND safety barrier/fence;
- (k) The date and result of Code Compliance inspection. This is then to be transferred to the Pool Safety Database for ongoing inspections;
- (l) Whether an order to comply or notice of intended prosecution has been issued;
- (m) Court action, if any.

A3 Pool inspection

TA inspectors should inspect new safety barriers/fences to ensure that they comply with the FOSP Act and this Standard. If the safety barrier(s)/fence(s) do/does not comply, property owner(s) or person(s) in possession of the property, adult supervisor or person in control of the pool should be informed, and if necessary told how to bring the safety barrier(s)/fence(s) up to this Standard. It is vital that the owner(s) or person(s) in possession of the property, adult supervisor or person in control of the pool know it is illegal to fill, or partly fill a pool while it is not isolated to this Standard.

A further inspection would be required, after a period specified by the inspector, to ensure that the owner(s) or person(s) in possession of the property, adult supervisor or person in control of the pool has made the necessary changes.

A pool compliance certificate under the FOSP Act is to be issued to owner(s) or person(s) in possession of the property, adult supervisor or person in control of the pool who complete work that was subject to a building consent.

A4 Cyclic inspection regime

Three-yearly inspections of barrier(s)/fence(s) should be made, in addition to periodic inspections where the TA suspects that this Standard is not being met.

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Appendix B – Examples of pool barriers/fences

(Informative)

B1 General

The information given in this Appendix is intended to serve as a broad guide to some of the main construction criteria that some of the more common types of barriers/fences will have to meet in order to satisfy this Standard.

The examples are given as a simplified guide to commonly available fencing; they are not a recommendation for any style of barrier/fencing and do not preclude the necessity for the fencing to meet the requirements of this Standard.

B2 Typical barriers/fences

The following examples serve to identify the significant dimensional requirements that need to be met to enable a barrier/fence to comply with this Standard:

- (a) *Post-and-rail construction.* For fences constructed of palings, galvanised steel, fibre cement (fibro), aluminium or similar profiled or flat wall material, the significant dimensions are as follows:
- (i) The rails, if located on the outside of the fencing, are to be not less than 900 mm apart when measured between the top surfaces of the rails
 - (ii) The top surface of the lower rail is to be at least 1000 mm from the top of the barrier/fence.

The effect of these similar requirements in (c), (d) and (e) is that there should be a height of at least 900 mm clear of any potential handholds or footholds, and that any foothold at the bottom of this clear distance should be at least 1000 mm from the top of the barrier/fence.

- (b) *Perforated materials, wire mesh or fabric fences.* For fences of this type, the significant dimensions are as follows:
- (i) Where the material has openings greater than 10 mm, the fence height is to be increased in accordance with 3.3.2
 - (ii) Materials with openings greater than 53 mm are not to be used.

To meet the requirements of this Standard it will generally be necessary for the material to be firmly fastened and tightly strung and meet 3.3.2.

- (c) *Fabricated metal barriers.* For fences fabricated from small section steel, aluminium or other suitable metals, the significant dimensions are as follows:
- (i) Vertical members are to be spaced not more than 100 mm apart
 - (ii) Horizontal members are to be placed a minimum of 900 mm apart vertically.

Horizontal members shall be not less than 900 mm apart and where there are more than two horizontal members, there must be at least one 900 mm unclimbable portion between any two top surfaces of members (see figure 3.1 and figure 3.5).

The top surface of the highest of the lower group of horizontal members is to be at least 1000 mm below the top of the fencing.

(d) *Infill panel barriers.* For fences constructed of glass-fibre reinforced plastics, reinforced glass, safety glass, timber, plywood, exterior grades of hardboard or other sheet products in framed ledge or panel construction, the significant dimensions are as follows:

- (i) Any potential climbing holds are to be at least 900 mm apart vertically
- (ii) The lower of any climbing holds between which the vertical distance of 900 mm is measured is to be at least 1000 mm below the top of the fencing
- (iii) The width of any openings below a height of 1200 mm is not to exceed 100 mm.

In addition, it will be necessary to ensure that the sheet material is sufficiently rigid and adequately fixed to its frame.

(e) *Brickwork or masonry barriers.* For fences constructed of bricks, blocks or masonry, the significant dimensions are as follows:

- (i) Any projections, indentations or combination of these having a depth greater than 10 mm are to be spaced at least 900 mm apart vertically
- (ii) The lower of any such projections or indentations is to be at least 1000 mm below the top of the fencing.

Natural features such as rock faces that form part of the fence would be acceptable provided that they meet the requirements of the Standard.

(f) *Brushwood fences.* For fences constructed of woven brushwood, the significant requirements are:

- (i) Brushwood should be tightly packed so that it will meet the performance requirements in 4.2
- (ii) Wires on the outside of the fence are to be interwoven with the brushwood in order not to provide a foothold for young children.

It may also be necessary to provide some sort of capping on the top of the fence to prevent birds from picking at the brushwood twigs.

NOTE – Brushwood fences are known to deteriorate quickly in comparison to other types of fencing and therefore should be regularly maintained.

(g) *Retaining walls.* Where a vertical or near-vertical retaining wall not less than 1200 mm high supports the pool and the surface of the wall complies with 3.3.4, a fence complying with this Standard is not required on top of the wall. A barrier/fence to provide safety from falling may be required to comply with the requirements of the New Zealand Building Code.

Appendix C – Test for strength and rigidity of barrier/fencing openings

(Informative)

C1 Scope

This Appendix sets out a method for determining that the barrier/fencing is sufficiently strong and rigid to prevent an opening from being forced to a size that would allow a young child to gain entry.

There are simple tests already covered earlier in this Standard for strength and rigidity of barrier/fencing.

The following tests are available if there is doubt, in the case of a failure, whether this barrier/fencing complies with this Standard.

C2 Principle

A force is applied to the test object in an attempt to force it through an opening in the barrier/fencing. This will result in a failed test.

C3 Apparatus

The following apparatus is required:

- (b) A cylindrical solid-faced test object 105 ± 1 mm in diameter with a body length of 300 ± 2 mm, as shown in figure C1. One end shall be conical and may be truncated to a diameter of 20 mm to provide a flat base for the attachment of fittings. The test object shall be made from a rigid material having a smooth surface;
- (c) A means of measuring the force applied, such as a spring balance;
- (d) A means of attaching the force measuring device to the test object.

C4 Procedure

Place the conical end of the test object into the opening under test and steadily apply a force of 150 N (15 kg) in an attempt to force the body of the object through the opening.

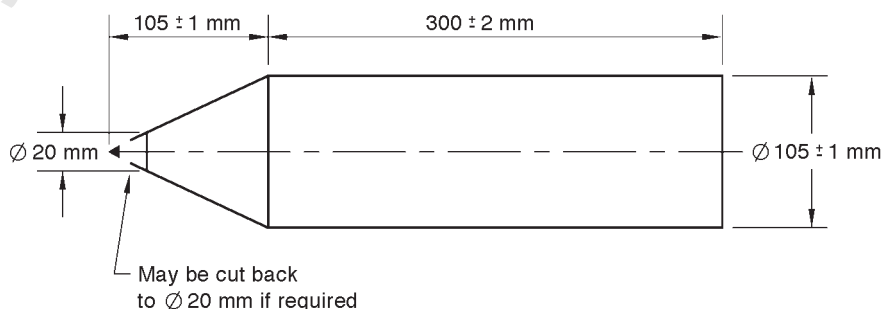


Figure C1 – Test object for testing openings and other components

C5 Report

The report shall include the following information:

- (a) Whether the test object passed through any opening in the fencing.
- (b) Reference to this test method, i.e. NZS 8500, Appendix C.

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Appendix D – Strength test for posts and footings

(Informative)

D1 Scope

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

There are simple tests already covered earlier in this Standard for strength and rigidity of barrier/fencing.

The following tests are available if there is doubt, in the case of a failure, whether this barrier/fencing complies with this Standard.

D2 Principle

A force is applied to the fencing post and it is then inspected for signs of fracture, loosening of footings or any damage to the gate that would prevent it from closing and latching from any position. This would result in a failed test.

D3 Apparatus

The following apparatus is required:

- (a) A cylindrical test object of diameter 105 ± 1 mm (as shown in figure D1), having at least one solid flat-faced end; and
- (b) A means of measuring the force being applied.

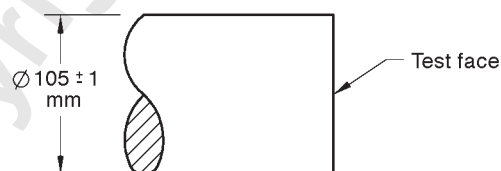


Figure D1 – Test object for barrier/fencing posts

D4 Procedure

The procedure shall be as follows:

- (a) Place the flat end of the test object against the post under test at a height of 1200 mm above finished floor level;
- (b) Apply a horizontal force of 330 N (33 kg), without shock, to the test object so as to load the post in the desired direction;
- (c) Inspect the post for damage or loosening of the footings;
- (d) For gate posts, check that the gate will close and latch when released from various positions including fully open and with the gate resting on the latching mechanism.

D5 Report

The report shall include the following information:

- (a) Breakage or sign of fracture of any post;
- (b) Loosening of any component;
- (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. NZS 8500, Appendix D.

Appendix E – Strength test for rigid barrier/fencing components

(Informative)

E1 Scope

This Appendix sets out a method for testing whether barrier/fencing components have adequate strength.

There are simple tests already covered earlier in this Standard for strength and rigidity of barrier/fencing.

The following tests are available if there is doubt, in the case of a failure, whether this barrier/fencing complies with this Standard.

E2 Principle

A force is applied to the component or components of the fencing and it is then inspected for signs of fracture, permanent deformation or loosening of components which would result in a failed test.

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 D1).
- (b) A means of measuring the force being applied.

E4 Procedure

The procedure shall be as follows:

- (a) Place the flat end of the test object against the component (or several components of such size or spacing (or both) that they will be covered by the 105 mm diameter) under test. The test shall be carried out from either side of the fencing component and at the component's weakest points;
- (b) Apply a force of 250 N (25 kg), without shock, to the test object to load the component in the desired direction;
- (c) Remove the test force and inspect the component for permanent deformation;
- (d) Apply a force of 330 N (33 kg), without shock, to the test object in order to load the component in the desired direction;
- (e) Remove the test force and inspect the component for the following:
 - (i) Breakage or sign of fracture of any component
 - (ii) Loosening of any component;
- (f) Measure and record the amount of deformation of the component, in millimetres.

E5 Report

The report shall include the following information:

- (a) Whether the component permanently deformed under a load of 250 N (25 kg);
- (b) For a load of 330 N (33 kg) whether there was:
 - (i) Breakage or sign of fracture of any component, and
 - (ii) Loosening of any component;
- (c) For a load of 330 N (33 kg) the amount of deformation of any component, in millimetres;
- (d) Whether the component passed or failed the test;
- (e) Reference to this test method, i.e. NZS 8500, Appendix E.

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Appendix F – Strength test for flexible materials and components

(Informative)

F1 Scope

This Appendix sets out a method for testing whether flexible materials and components have adequate strength and whether such materials are adequately fixed to prevent them being penetrated or deformed under dynamic loading.

The following tests are available if there is doubt, in the case of a failure, whether this barrier/fencing complies with this Standard.

F2 Principle

A dynamic force is applied to the component or components of the barrier/fencing and it is then inspected for signs of penetration, breakage, tearing or signs of fracture, or loosening of components. This would result in a failed test.

F3 Apparatus

The following apparatus is required:

- (a) Test object A – a 8.1 kg half spherical solid-faced test object 150 ± 1 mm diameter;
- (b) Test object B – a 9.1 kg half spherical solid-faced test object 50 ± 1 mm diameter;
- (c) A means of swinging the test object through an arc of radii 1400 mm and 1800 mm.

F4 Procedure

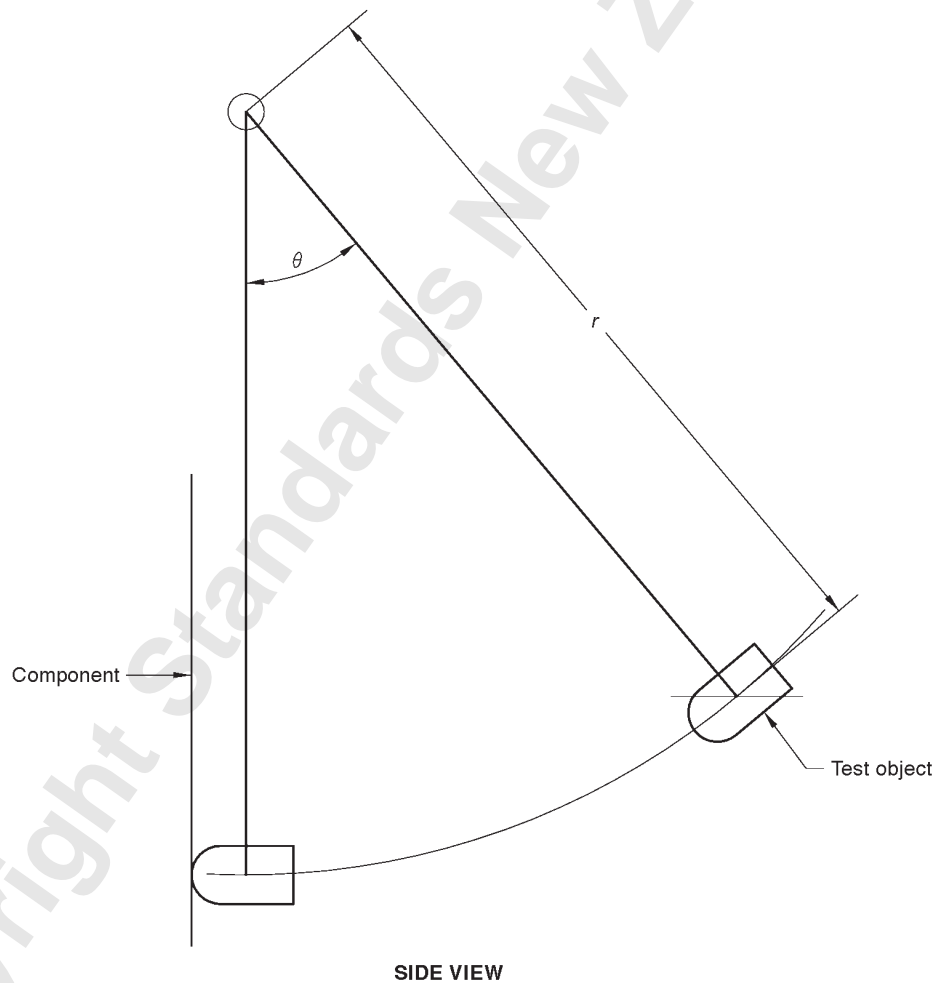
The procedure shall be as follows:

- (a) Suspend test object A the distance of the selected radius below a pivot point to allow pendulum action and place the test object against the component. The test shall be carried out from either side of the fencing component and at the component's weakest points.
- (b) Raise the test object A through the selected angle to the vertical (see figure F1) and release.
- (c) Inspect the component for the following:
 - (i) Breakage, tearing or signs of fracture
 - (ii) Loosening of any component or fixings;
- (d) Repeat step (a) using test object B (see figure F1);
- (e) Raise test object B through the selected angle to the vertical (see figure F1) and release;
- (f) Repeat step (c).

F5 Report

The report shall include the following:

- (a) For test object A and B separately, whether there was:
 - (i) Breakage, tearing or signs of fracture of any component
 - (ii) Loosening of any components or fixings;
- (b) Whether the component passed or failed the test;
- (c) Reference to this test method i.e. NZS 8500 Appendix F.



Test object	Pendulum length (r) (mm)	Angle to the vertical (θ), (degrees)
A	1400	40
B	1400	37
A	1800	35
B	1800	33

Figure F1 – Test object for testing flexible materials and components

Appendix G – Water safety warning signage

(Informative)

G1 General

The information given in this Appendix is intended to serve as a broad guide for swimming pool, spa and hot tub property owner(s) or person(s) in possession of the property, adult supervisor or person in control of the pool to ensure that there is adequate warning signage displayed informing visitors, subsequent owners, and temporary users of the house of the dangers that exist on the property around the immediate pool area.

Warning signage shall be required when doorsets open out to the immediate pool area and where pool/spa/ hot tub covers are used as a barrier (see 2.3.2(e) and (f) and 3.10).

G2 Samples

Figures G1 to G5 (drawn to scale) provide indicative samples of warning signage and are not limited in application.

NOTE – Consult current PANTONE Publications for accurate colour. Pantone® is the property of Pantone, Inc.

G2.1 Pool signage



Figure G1 – Swimming pool warning signage

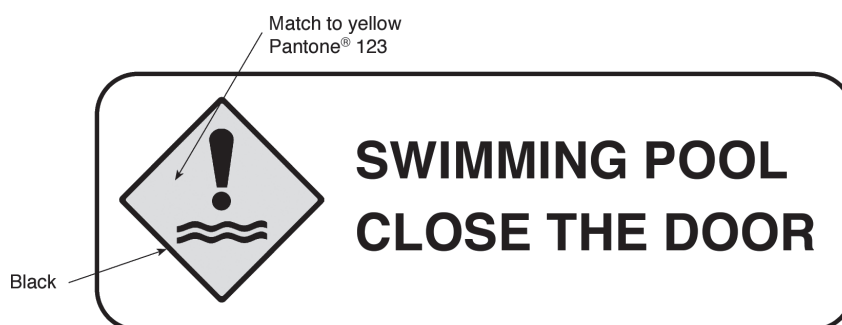


Figure G2 – Water warning signage

G2.2 Spa signage

Match to yellow
Pantone® 123

Black



Figure G3 – Spa cover warning signage

G2.3 Hot tub cover signage

Match to yellow
Pantone® 123

Black

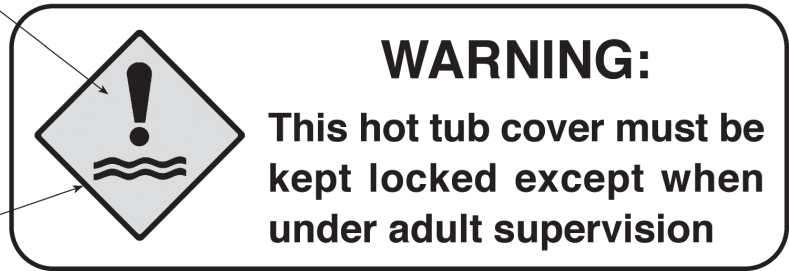


Figure G4 – Hot tub cover warning signage

G2.4 General

Match to yellow
Pantone® 123

Black



Match to yellow
Pantone® 123

Black

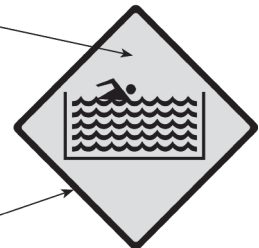


Figure G5 – General signs

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Approved by the Standards Council on 3 November 2006 to be a New Zealand Standard pursuant to the provisions of section 10 of the Standards Act 1988.

First published: 24 November 2006

The following SNZ references relate to this Standard:

Project No. P 8500

Draft for comment No. DZ 8500

Typeset and printed by: Standards New Zealand



Standards
New Zealand

