

Swimming pool and spa safety barriers

This updates the previous Practice Note 2006-05 issued June 2006

GENERAL REGULATORY REQUIREMENTS

(1) SUMMARY

All swimming pools and spas with a depth of water more than 300mm associated with Class 1, 2 and 3 buildings and a Class 4 part of a building or a children's service must have safety barriers to restrict access of children under the age of five to the pool or spa area.

It is the responsibility of owners and occupiers of a property to ensure that the pool, spa and associated barriers to restrict access to the pool or spa area are maintained and in good working order.

From 1 May 2010 the *Building Code of Australia (BCA)* Volume Two referenced AS1926.1-2007, AS1926.2-2007 and AS1926.3-2003. Parts 1 and 2 introduce requirements for swimming pool and spa barriers while Part 3 relates to water recirculation and filtration systems. AS1926.1-2007 has been amended by the BCA, which prohibits the use of child-resistant doorsets in barriers for an outdoor swimming pool or spa. BCA 2011 references AS1926.3-2010.

Volume One of the BCA contains a Victorian variation that retains the previous editions AS1926.1-1993 and AS1926.2-1995. These editions will be applicable to children's services, Class 2 and 3 buildings and a Class 4 part of a building until the Victorian variation is removed with the introduction of BCA 2011 on 1 May 2011 as part of the National Construction Code.

Designers, building surveyors and other industry practitioners should obtain a copy of AS1926 as this Practice Note does not replace the Standard. Rather this Practice Note is a companion to the Standard and clarifies some issues with swimming pools and spas and their associated barriers. It does not cover all scenarios in complying with the *Building Act 1993* (the Act), *Building Regulations 2006* (the Regulations), BCA and associated Australian Standards.

(2) KEY DEFINITIONS

The introduction of AS1926.1-2007 brought with it some new key definitions as outlined below:

Fencing height

The height perpendicular to the finished ground level at any point along the length of the fencing, measured on the outside of the fencing.

Designers will need to consider any step, landing, finished ground level, retaining wall or other climbable objects, abutting (or adjacent to) a fence, so that the effective height of 1200 mm is not reduced when measured from the outside of the pool area.

Pool area

The area that surrounds the pool that is separated from the rest of the allotment by a safety barrier.

Young child

A child under the age of five years.

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Non-climbable zone (NCZ)

A zone consisting of a barrier as well as the associated space within 900 mm of the barrier, intended to inhibit climbing of the barrier by children. This includes any point along the length of the barrier and its associated space.

The definition of swimming pool has also been further clarified in the Standard as:

Swimming pool

Any excavation or 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.

(3) WHEN IS A SAFETY barrier required

Generally safety barriers are required for:

- In-ground swimming pools and spa pools
- Above-ground swimming pools, including inflatable pools holding more than 300 mm of water
- Indoor swimming pools and spa pools
- Bathing and wading pools
- Spas and swim spas
- Jacuzzis
- Hot tubs.

Safety barriers are not required for structures not used principally for swimming, paddling or wading, such as:

- Bird baths
- Fountains
- Water supply/storage tanks
- Fish ponds
- Dams
- Baths used for personal hygiene and emptied after each use
- Swimming pools or spas not containing a depth of water greater than 300 mm
- Inflatable swimming pools (typically toddler or wading pools) not containing a depth of water greater than 300 mm
- Spas inside a building used for personal hygiene, such as a spa bath in a bathroom or ensuite.

(4) BUILDING A SWIMMING POOL AND BARRIER REQUIRES A BUILDING PERMIT

The Act and the Regulations require that a building permit be obtained when proposing to build or alter a swimming pool or spa, and barrier.

There has been some confusion about the application of the building permit process when issuing building permits for pools and spas. The Relevant Building Surveyor (RBS) must not issue a building permit for a pool or spa without including adequate details of safety barriers as part of the one permit. Once building work has commenced the swimming pool, spa and safety barrier must be completed within six months.

If the pool / spa and the safety barrier are associated with a dwelling, and if the value of the work for the swimming pool and / or barrier is greater than \$5,000 (including GST, labour and materials), the builder must be a registered building practitioner with the Building Practitioners Board (BPB). They must also enter into a major domestic contract with the owner. When the cost of building work is greater than \$12,000, Domestic Building Insurance will also need to be provided.

(5) REQUIREMENTS FOR NEW SWIMMING POOLS AND SPAS

Swimming pools and spas associated with a Class 1 building must be provided with barriers that meet Performance Requirement P2.5.3 of the BCA Volume Two. This can be achieved by constructing safety barriers in accordance with the Acceptable Construction Manuals.

The requirements calling up the Acceptable Construction Manuals are set out in clause 3.9.3.0. Clause 3.9.3.0 provides that, for a Class 1 building, compliance with AS1926 Parts 1 and 2, subject to two exceptions, will satisfy Performance Requirement P2.5.3. The first exception is that a child-resistant doorset must not be used in a barrier for an outdoor swimming pool. Walls of a dwelling or other building and child-resistant openable portions of windows may still be used.

The second exception is that a side hung door forming part of the barrier for an indoor swimming pool must be hung so that, when opening, it only swings away from the pool area. AS1926.1-2007 also provides that doors must be self-closing and self-latching. Self closing sliding doors may still be used.

Swimming pools and spas associated with a Class 2 or 3 building or a Class 4 part of a building or a children's service must have safety barriers that meet Performance Requirement GP1.2 of the BCA Volume One. Performance Requirement GP1.2 can be met by complying with clause G1.1 and providing safety barriers in accordance with AS1926 Parts 1 & 2.

For Class 2 or 3 buildings or a Class 4 part of a building, where an Alternative Solution is proposed, BCA Performance Requirement GP1.2 must be complied with.

(6) BUILDING PERMIT DOCUMENTATION FOR SAFETY BARRIERS

When applying for a building permit, the designers of the pool or spa will need to include detailed plans and specifications of the proposed pool and safety barrier in accordance with Part 3 of the *Regulations*. Applications must include relevant details of the type and location of all barriers, fences, gates, windows, latches, catches, and self-closing gates and fly screens. Plans must also clearly show the location of all existing and proposed fixed objects on the property, such as BBQs, clothes lines, retaining walls and planter boxes that may impact the effectiveness of the safety barrier.

It is not appropriate that designers only use general notes, such as: "Pool barrier to be constructed in accordance with AS1926.1-2007". Statements like these do not provide sufficient detail for the RBS to issue a building permit or for the builder to construct the safety barrier correctly. Designers should not rely on the RBS or the builder to "guess" the compliance level they are trying to achieve.

Designers, builders, building inspectors and building surveyors also need to be aware that AS1926.1-2007 requires certain elements of the pool barrier to be tested to meet structural and operational criteria. The loading and testing criteria are outlined in Section 3 of AS1926.1-2007 and it is important that when applying for a building permit, the test data or certificates from the fence manufacturer are supplied as part of the application.

(7) KEY DOCUMENTATION TO SHOW COMPLIANCE WITH AS1926.3 - 2010

AS1926.3-2010 Water recirculation and filtration systems is to be introduced into the BCA 2011 on 1 May 2011. As with the introduction of AS1926.3-2003, the design requirements of the recirculation and filtration system need to be provided as part of the application for a building permit. To comply with Performance Requirements GP1.2 (b) this Standard was introduced to minimise the risk of entrapment or injury of people using the pool or spa and to provide for the safe operation of skimmer boxes and outlet systems.

Building surveyors need to familiarise themselves with the requirements of the Standard and ensure they get sufficient documentation from the applicant to show compliance. This may include, but is not limited to:

- Schematics of the recirculation and filtration system showing connection of common lines
- Detailed drawings of active main drain / suction point covers
- Section through the skimmer box
- For spas, drawings showing the location of suction points to ensure they are not less than 600mm apart
- Details of the design water velocities
- Details of the pump system must be included.

Ultimately, designers of pool and spa recirculation and filtration systems will need to ensure that sufficient documentation is provided as part of a building permit application. As this issue relates to ensuring people are not at risk of entrapment when using the pool or spa, the RBS may refuse to issue a building permit if not enough information is provided to ensure their safe use.

(8) SITE SAFETY BEFORE AND DURING CONSTRUCTION

Three aspects of public safety need to be considered when constructing a swimming pool or spa:

- Prior to the issue of the building permit; and
- After excavation work; and
- When the pool or spa is filled with water.

Prior to the issue of the building permit the RBS must consider the requirements of regulation 604 to determine any proposed precautions required to protect the safety of the public during the construction of the swimming pool or spa.

In the event that a pool or spa is constructed against a boundary adjacent to an adjoining allotment, the RBS, pursuant to regulation 602, will need to consider whether protection work is required in respect of the adjoining property. This is particularly important for in-ground pools or spas as the nature of construction usually requires excavation work. Excavations could cause the adjoining property to be at risk of damage from the building work and the RBS will need to ensure that regulation 602 is applied appropriately.

The RBS will need to carefully consider a building permit application where the applicant provides "dual certification" in accordance with regulation 603. If the application is accompanied by dual certification that the structural design complies with the Act and the Regulations, the RBS must still be satisfied that the work will not adversely affect the stability of, or cause damage to, the adjoining property (reg.603(c)). In this instance, where the excavation for the pool is on the boundary, and subject to the particular circumstances, the RBS must be satisfied that the building work would have no adverse affect on the stability of, or cause damage to, the adjoining property.

Once construction has commenced the excavation and the pool being filled with water can potentially be dangerous, especially for young children. If the pool excavation is left incomplete it can become partly filled with ground water or rainwater, creating a potential drowning hazard. An unfenced pool excavation can also be dangerous.

Where such excavations are inadequately protected and are accessible from a street or public reserve, the RBS may, consider using the power provided under regulation 604 (3) to require safety precautions to ensure the safety of the public and prevent them from gaining access. The RBS could do this by issuing a direction as to work pursuant to section 37 of the Act or a building order for minor work if the RBS considers that the work required is of a minor nature.

In instances where the pool may be filled with water prior to providing permanent safety barriers, the RBS must consider appropriate safety precautions. The RBS should require plans showing safety precautions during construction and include a permit condition to provide temporary construction barriers. This will be important should the owner elect to engage separate pool and fencing contractors. Should temporary fencing be removed before a compliant and permanent safety barrier is erected, the RBS or the Municipal Building Surveyor (MBS) can utilise the enforcement process through the use of notices and orders.

(9) APPLYING THE BUILDING CODE OF AUSTRALIA AND AS1926.1-2007 TO NEW POOLS AND BARRIERS

(9.1) Child-resistant door sets must not be used in barriers for outdoor pools

Based on the results of research over a number of years, the BCA prohibits the use of child-resistant doorsets as part of the pool barrier to an outdoor pool area.

Therefore, doors from a building must not be used to allow access to the pool area directly - a separate barrier between the building and the pool area will be required. The effect of this change in the BCA, which applies to swimming pools in both domestic and commercial buildings, is that a number of options for compliance with AS1926.1-2007 are removed or amended by the BCA.

However, walls of buildings and child-resistant windows can still be used as part of the safety barrier.

Designers of pool and spa safety barriers need to ensure that safety barrier location details are included as part of the design documentation to accompany the application for the building permit. Such details need to be closely checked by the RBS.

If the RBS cannot be satisfied that the pool and safety barrier will comply with the Act and Regulations (including the BCA) then the RBS may ask the applicant for further information. If the information and details are not provided, the RBS may have to decide upon the application by refusing to issue the building permit.

(9.2) Indoor pools

Designers need to be aware that for indoor swimming pools the BCA also provides that any side-hung doors forming part of the barrier must swing away from the indoor pool area. The design will need to clearly show details of the pool barrier, child-resistant doorsets and the swing direction of doors as part of the building permit application.

Swimming pools and spas are considered to be indoors when they are fully enclosed by walls on all sides and roofed, and access to the pool is within the building.

For indoor swimming pools a side-hung door within the dwelling may be used. The door forming part of a safety barrier for the indoor swimming pool must only swing away from the pool area when opening. It must also be self-closing and self-latching in accordance with the requirements of AS1926.1-2007. Self-closing and self-latching sliding doors may also be used.

Pools and spas under verandahs or within an enclosure that is open to the elements on any side (not including windows in walls) are considered to be outdoor pools, and child-resistant doorsets must not be used for access.

(9.3) Non-climbable zones (NCZ)

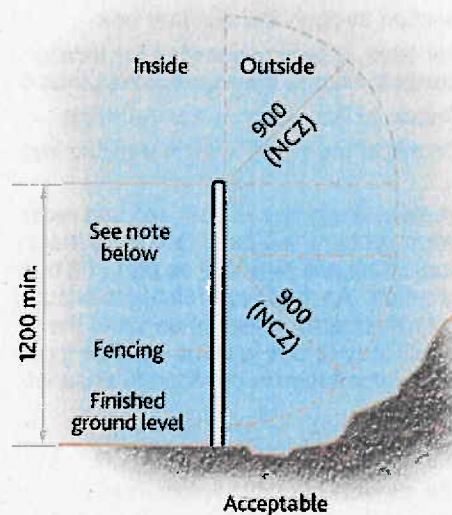
AS1926.1-2007 has introduced the concept of "non-climbable zones" (NCZ), the definition of which is provided at the beginning of this Practice Note. Diagrams have been included as a quick reference guide.

Designers and building surveyors will need to be aware that AS1926.1-2007 does not specify the location of NCZ's. Clause 2.1 of AS 1926.1 provides that the NCZ may be located anywhere on the vertical face of the outside of the barrier. A NCZ should be measured from the top of the fence. Clause 2.3.1 of AS 1926.1 allows the NCZ to be located on the inside of a 1.8m high boundary fence and measured from the top of the fence. The NCZ does not preclude the requirement that the fence height must be a minimum of 1.2m and for boundary fencing a minimum of 1.8m. Refer to Diagrams 1 through to 7.

(9.4) Steps abutting fencing

An issue has arisen that in certain circumstances a step may be adjacent to fencing and may still be outside the NCZ. For instance, as a NCZ can be taken from the top of the pool barrier at a height of 1200 mm in a 900mm arc on the outside of the barrier, there is effectively 300 mm left outside the climbable zone. It is important to interpret this correctly. The 1.2m barrier height is measured from any point from the top of the fence to the finished ground level on the outside of the barrier. A step that abuts the fence is considered to be the finished ground level and therefore the 1.2m must be measured to this point. Although not detailed in the Standard, steps should be setback from a barrier to provide adequate access around the barrier, so as not to decrease the barrier height and so as not to impinge on the NCZ.

Diagram 1



Note: The lower radius point may be anywhere on the fence at least 900mm above the ground or the highest lower rail or foothold.

Diagram 2

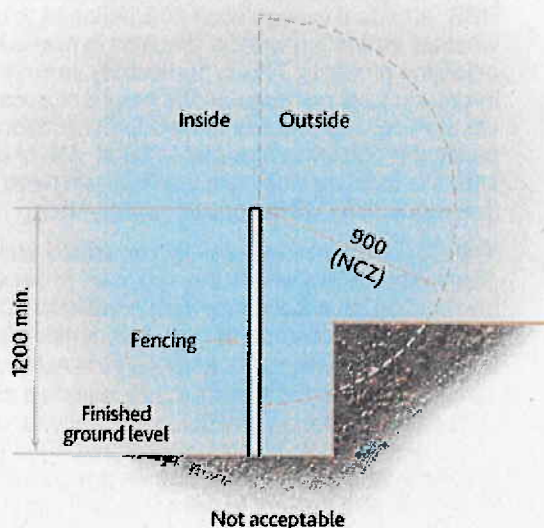


Diagram 3

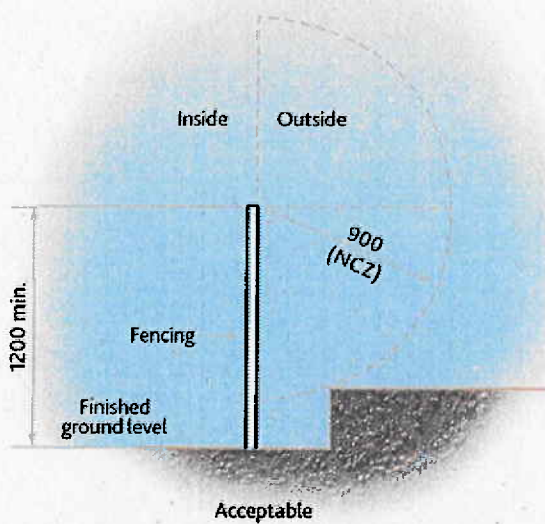
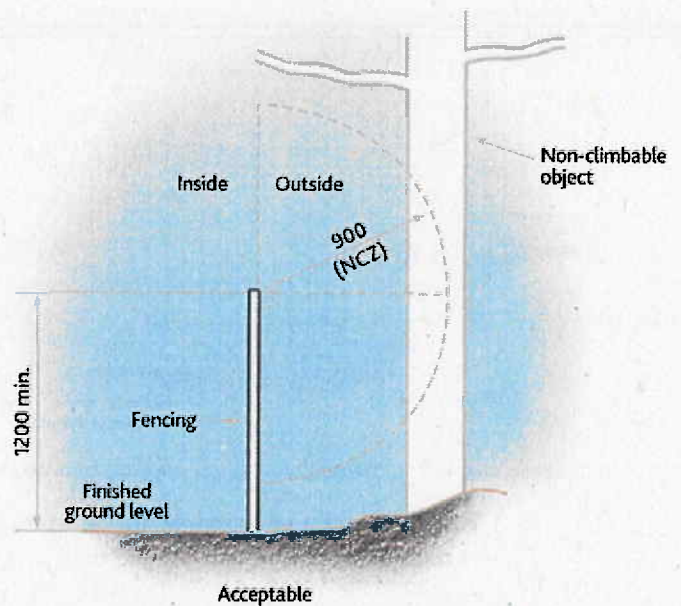


Diagram 5



Note: The minimum height of a safety barrier is 1200mm and is measured on the outside of the barrier. The above acceptable projection must not reduce the effective height of the fence less than 1200mm.

Diagram 4

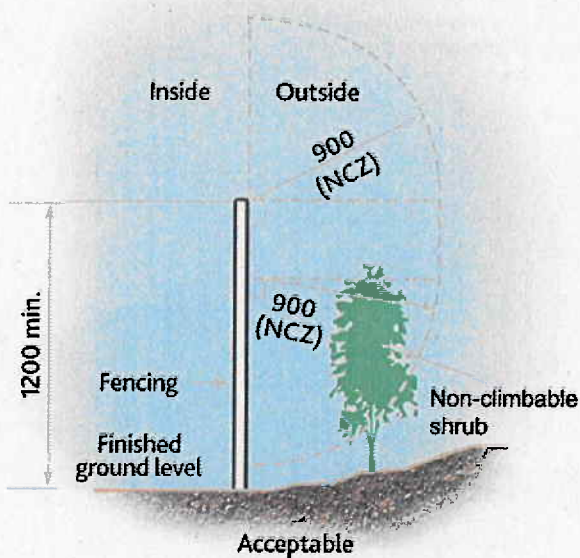


Diagram 6

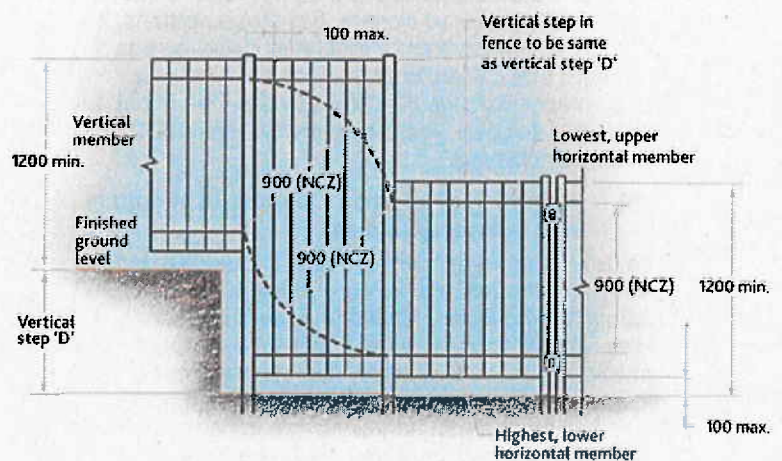
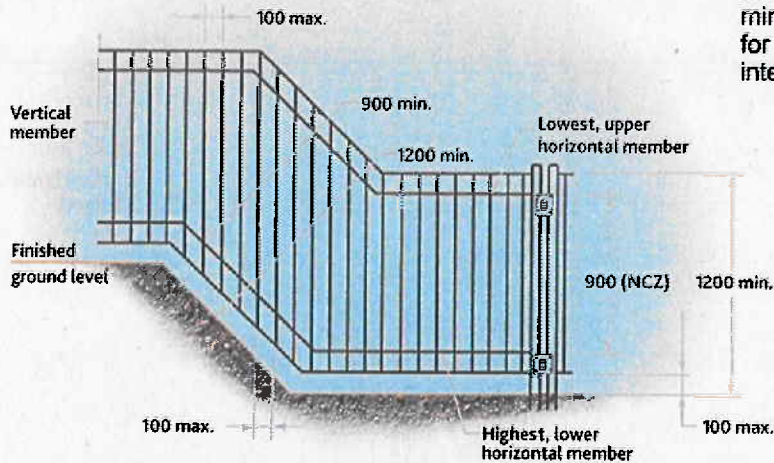


Diagram 7



Note: On sloping sites, the fence height is to be measured perpendicular to the ground line.

(9.5) Total enclosure of property not permitted

Designers and building surveyors need to be aware of the definition of pool area. AS 1926.1-2007 defines pool area as: "The area that surrounds the pool that is separated from the rest of the allotment by a safety barrier". Therefore, the whole allotment cannot be a pool area. Accordingly, it is not acceptable that the safety barrier consists of only the boundary fencing. This approach results with the Class 1 dwelling being within the pool area and is inconsistent with the definition. The pool area must be a separate area on the allotment and access to it must not be directly available from any other building, including any dwelling and habitable outbuilding on the allotment.

Secondly, there is difficulty in ensuring that a front gate, car driveway access, gates or even roller doors that are part of a garage access are self-closing. Self-closing means that the door or gates close under their own weight or via a mechanism and do not require the use of electrically powered closers. For these reasons, it would be difficult to ensure that large gates across driveways that close using an electrical sensor or similar mechanism would always close. This is not an acceptable solution where compliance with AS1926.1 cannot be achieved.

(9.6) Adjoining properties - climbable elements and boundary fences

The development of AS1926 Parts 1 & 2-2007 include changes to the use of boundary fencing. A broad approach to boundary fencing in previous editions of the Standard, such as the application of non-climbable rails to the outside, has been removed. The requirements for boundary fencing include that the fence has the 900mm non-climbable zone measured from inside the pool area and the fence must be a minimum height of 1.8m above finished ground level. Refer to Diagram 8.

Attention also needs to be made to the intersection of a 1.2m high barrier with a boundary fence. The top of the 1.2m barrier will become a climbable object within the 900mm NCZ. In this instance, the height of the boundary fence NCZ must be increased to be a minimum of 900mm above the top of the 1.2m barrier for a horizontal distance of 900mm either side of the intersection. Refer to Diagram 9.

Diagram 8

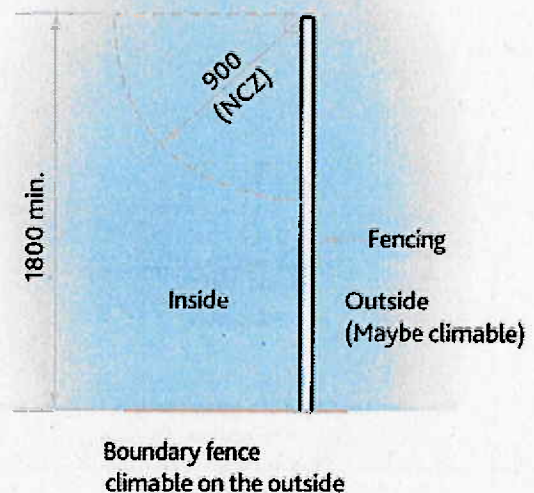
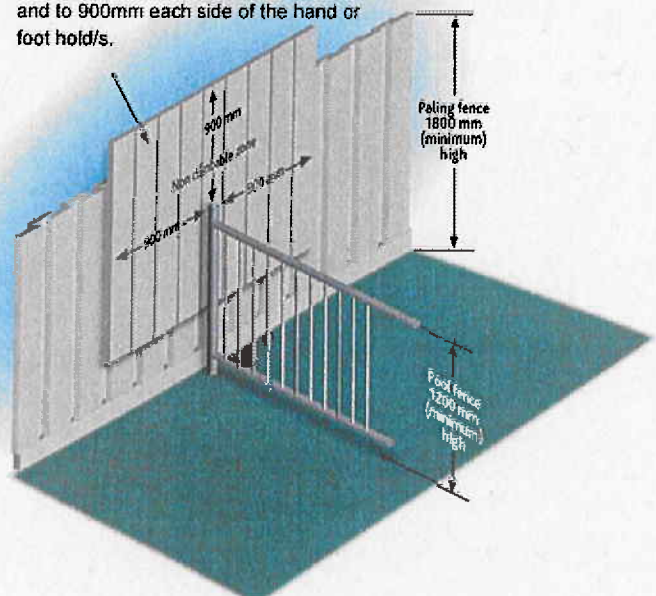


Diagram 9

Where a pool fence, or another object or structure provides a hand or foot hold/s within 900mm of the top of the paling fence, the additional palings are to extend this existing fence height to 900mm above and to 900mm each side of the hand or foot hold/s.



(9.7) Boundary fencing separating adjoining pool area

An issue has arisen that an interpretation of pool area includes pool areas on adjoining allotments. Some have interpreted that the boundary fencing separating two pool areas does not need to comply as the fence itself is in a pool area. This is an incorrect interpretation, and the boundary fence between the two pools is required to comply for both pool areas.

(9.8) Garages and other Class 10 Buildings forming part of a pool barrier

The Building Appeals Board (BAB) has received a number of applications where garages form part of the pool barrier, with applicants requesting that the roller door be considered as forming part of the barrier. Generally the BAB has refused these requests. The use of automatic closing roller doors where compliance with AS1926.1 cannot be achieved or the consideration by building surveyors requesting that rollers doors are "bolted" closed is not an appropriate solution.

The temptation for owners to "unbolt" the roller door is too great and is therefore an unacceptable risk. The door needs to be permanently fixed in the closed position through the appropriate use of fasteners that can only be removed by the use of a tool, such as a screwdriver or spanner.

The BCA Volume Two contains explanatory information regarding Class 1 and 10 buildings, stating: "A door must not be installed between a Class 1 or Class 10a building and an outdoor swimming pool enclosure if the door forms part of the swimming pool safety barrier".

Therefore, in the example above where the garage roller door could not be used, the side-hung door that would typically allow access to the garage from the yard must also not be used as part of the barrier. A separate barrier must be installed around a garage or shed door.

(9.9) Gazebos, pool houses, and parts of Class 1 structures within the pool area or forming part of the barrier

Owners, designers and building surveyors will need to carefully consider the location of these structures. The risk is that a child may be hidden by or within a structure. Where a structure is totally enclosed by the pool barrier, consideration of the use and design of the structure needs to be undertaken to determine compliance with the requirements of AS1926.1.

An important distinction needs to be made: open sided gazebos or other open shade structures that form part of the use of the pool area are considered non-habitable. However, pool buildings that contain kitchens, playrooms, change rooms, or entertainment rooms are habitable, and therefore, part of a Class 1a, a satellite building to the main dwelling.

The BCA Volume Two, prohibits the use of a child-resistant doorset as part of a Class 1 building. A separate barrier must be provided that separates the part of the Class 1 building from the pool area.

Having parts of a Class 1 building totally enclosed within the pool area is no longer acceptable without additional safety barriers.

(10) DESIGN AND CONSTRUCTION CONSIDERATIONS

(10.1) Single footing for fence posts to maintain the gate and latch operation

One of the major problems identified with pool barriers is the effective operation of the gates and self-latching requirements.

SPASA Victoria has advised that a common problem is that the posts supporting the gate and the latches tend to spread over time. This has the effect of not allowing the gate to latch properly and in some circumstances, causes it to swing freely between the posts.

SPASA Victoria has recommended to its members that the footings for fence posts supporting the gate and latches are poured "monolithically", or as one footing across the opening. This ensures that the posts are "connected". As the ground moves, the posts should move together, reducing the likelihood of them "spreading", and ensuring that the gate will self-latch.

(10.2) Main drain / suction design - using alternatives to AS1926.3 for pools and spas

Part 3.9.4 of the BCA 2010 references AS1926.3-2010 Water recirculation systems published on 1 September 2010 and adopted by the BCA 2011 on 1 May 2011.

Designers and builders of pools and spas should be aware of the changes to AS1926.3-2010 that require performance-based testing of system elements to eliminate the risk of entrapment.

In using AS1926.3-2010, pool or spa designers need to provide the RBS with the design and test data from the manufacturer of the main drain cover and the RBS will need to ensure that the main drain cover has been installed in accordance with the building permit documentation and AS1926-2010 where appropriate.

(10.3) Testing and inspection prior to sign off

The RBS will need to satisfy themselves the pool or spa has been built in accordance with the documentation approved as part of the building permit.

The RBS may also ask for the pool or spa to be tested to ensure that no pipes have been blocked during construction. This is particularly important where pools are to be "pebblecreted".

Pool and spa builders must satisfy themselves that no blockages have occurred in the suction pipes prior to handover to the client and operation of the pool or spa.

(10.4) Connection of pool or spa pipework - not plumbing work

Although the designs of the recirculation and filtration systems are required to be provided to the RBS as part of the building permit application, the work to connect the circulation and filtration system to pump systems and filters etc is not plumbing work.

The *Plumbing Regulations 2008* do not define the connection of recirculation and filtration system pipe work as plumbing work and therefore the work is not required to be undertaken by a licensed plumber.

However, where drain pipes are connected to the sewer, or in certain circumstances where allowed by water authorities to be connected to stormwater drains, the connection point is plumbing work to be done by a licensed plumber.

Building surveyors are not required to seek plumbing certificates for the pool / spa pipe work connections and only need a compliance certificate to be provided if the cost of the connection to the main sewer is more than \$750.

(11) TESTING REQUIREMENTS IN-SITU AND ENSURING POOLS ARE CONSTRUCTED IN ACCORDANCE WITH THE BUILDING PERMIT DOCUMENTATION

Pool barrier builders, building surveyors and building inspectors should familiarise themselves with test requirements that can be undertaken while the fence is being constructed. These are specifically for the strength of posts and footings and the operation of gates, and help to ensure that the barrier and the gate will provide an effective barrier.

(11.1) Strength of posts and footings

Each post and footing shall withstand a horizontal force of 330N at 1.2m above finished ground level. After loading, there shall be no permanent damage to any post, the footings shall not loosen to impair the barrier's effectiveness and any gate shall meet the requirements of Clauses 2.5.3, 2.5.4 and 3.4 in AS1926.1-2007.

330 N is approximately 34 kg. This test can be conducted in the field by fastening one end of a calibrated spring balance to the post 1200 mm above ground level and pulling on the other end until a load of 33 kg is achieved. The post and footing should then be checked for any looseness or damage.

(11.2) Operation of gates and doors

The gate or door shall close and latch from any position from resting on the latching mechanism to fully open, under both of the following conditions:

- (i) The natural weight of the gate or door, and
- (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 the gate or door.

NOTE: This requirement is intended to indicate whether the automatic closing and latching mechanism is likely to remain effective after the gate or door has been subject to deflection, either under its own weight or as a result of children swinging on it.

The latching device and posts of the fencing to which the gate or door is attached shall be capable of retaining the gate in a closed position when tested.

When making final inspections of pool barriers, the RBS may request evidence of the in-situ testing or may require to be present at the testing to ensure the construction of the barrier meets the structural adequacy criteria and that the gate or door operates correctly.

(12) ENERGY EFFICIENCY FOR SWIMMING POOLS AND SPAS

BCA 2011 Volume One J7.3 and J7.4 along with BCA 2011 Volume Two 3.12.5.7 contain energy efficiency requirements for swimming pools and spas. ABCB has issued a corrigendum to J7.4 and 3.12.5.7 clarifying its application to spas. Therefore only spas sharing a water recirculation system with a swimming pool must comply. A copy of the corrigendum is available from the [ABCB website](#). These requirements remain unchanged where swimming pools are provided with a heater.

The BCA 2011 also requires heating of swimming pools must be by a solar heater and cannot be boosted by electric resistance heating. Therefore boosting of the swimming pool solar heater may be by a gas heater or heat pump or both. Should solar heating not be able to be provided to a proposed swimming pool an Alternative Solution may be formulated to meet the performance requirement P2.6.2 or an application may be made to the Building Appeals Board to modify the regulations.



If you have a technical enquiry please email technicalenquiry@buildingcommission.com.au or phone 1300 815 127

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733 Bourke Street
Docklands VIC 3008

Note: The drawings in this practice note have been prepared by the Building Commission and are a visual representation of various clauses in AS1926.1-2007.