Government of **Western Australia**
Department of **Health**

Code of practice

for the design, construction, operation, management and maintenance of aquatic facilities

Contents

Foreword

This code of practice has been prepared to ensure public aquatic facilities are operated to consistently high health and safety standards, by minimising the occurrence of disease, injury and other health-related complaints associated with the use of these facilities.

The code is divided into 12 sections, which include administrative provisions, design and construction requirements, water treatment, chemical safety, water quality, management and supervision, operational and sanitary requirements, plus requirements for special facilities such as spas, hydrotherapy pools, waterslides and water spray grounds/interactive water features.

The code is aimed primarily at designers, builders and operators of aquatic facilities, together with the agencies responsible for administration of the *Health (Miscellaneous Provisions) Act 1911* (WA), such as State and local government, Authorised Officers and associated practitioners.

The code is published by the Chief Health Officer (CHO) under the provisions of section 344A(2) of the *Health (Miscellaneous Provisions) Act*, and is to be read in conjunction with the Health (Aquatic Facilities) Regulations 2007. It replaces the previous Health (Swimming Pools) Regulations 1964.

Premises classified as aquatic facilities by the Health (Aquatic Facilities) Regulations 2007 are required to comply with these provisions.

Please note that although this code of practice is intended to be a comprehensive document, pool applicants need to be aware that they may need approval from other regulatory mechanisms not documented in this code of practice.

Section 344A(2) of the *Health (Miscellaneous Provisions) Act*, also enables the CHO to amend the code from time to time and thus it is intended that the Code is a living document, which will maintain high industry and workplace standards, cater for emerging technologies and innovations and promote best practice within Australia and internationally.

In accordance with Section 344A (2) of the *Health (Miscellaneous Provisions) Act*, I endorse this code of practice.

Dr Andrew Robertson
Chief Health Officer
Public and Aboriginal Health Division

Introduction

In the past, aquatic facilities consisted of relatively simple outdoor rectangular swimming pools, designed primarily for diving and swimming teaching, training or competition.

In more recent times, aquatic facilities have been established that incorporate a variety of special-use features such as spa pools, river rides, water slides, hydrotherapy pools and water spray grounds/interactive water features. These have contributed to a growth in popularity of swimming and other water activities for sport, fitness, rehabilitation and recreation.

Owners and operators of aquatic facilities need to ensure their premises are attractive, hygienic and provide a high degree of bather comfort. There is a public expectation that facilities will be designed, operated and maintained in such a manner that they will pose no risk to the safety or health of their patrons.

Improper design, maintenance or operation can result in aquatic facilities becoming a source of infection and injury. Aquatic facilities may be used by people who are of varying ages, states of health and standards of hygiene. These people introduce a range of pollutants to the water, including saliva, urine and other body secretions, skin, hair, and sunscreen lotions. Other sources of pollutants include dust, bird droppings, tree leaves, lawn clippings, make-up water, soil and untreated reticulation water.

All of these pollutants can be accompanied by a variety of micro-organisms, some of which have the ability to survive, and even multiply, in recreational water.

A number of the micro-organisms have the ability to cause infections in various parts of the body, such as the eye, ear and skin, gastrointestinal and nervous systems.

Consequently, aquatic facilities need to be equipped with water treatment processes that provide continuous disinfection that is capable of quickly and effectively killing disease-causing micro-organisms, to prevent diseases being transmitted to other patrons. Proper design and operation of facilities can enhance the action of the disinfection process.

Special care needs to be taken with spa pools, hydrotherapy pools and other facilities that operate with elevated water temperatures, as they provide environments that are even more conducive to the survival and growth of disease-causing micro-organisms.

Correct use of chemicals employed to disinfect the water is required, as inappropriate use can cause patrons to suffer irritation of the eyes, and skin conditions such as dermatitis. Approved methods of water treatment and disinfection are set out in this code of practice.

Appropriate design of facilities has also been found to assist in prevention of drowning and other injuries. The provisions of this code of practice do not remove the need to comply with other laws of the State.

Section 1 – administrative provisions

1.1 Definitions

Approved process of cleaning

A process where bathing costumes and towels for loan or hire are thoroughly washed in water with soap or detergent, or by a process of dry cleaning.

Aquatic facility

A man-made body of water used for sport, recreation or educational water activities, as defined in the aquatic facilities regulations.

Aquatic facility concourse

That part of an aquatic facility that is directly adjacent to an aquatic facility water body.

Aquatic facility water body

That part of an aquatic facility used for aquatic activities.

Authorised Officer

A person designated as an Authorised Officer under the *Public Health Act 2016* (WA) Section 24(1).

Baja shelf

A submerged, extended step, seat or ledge which projects greater than 600mm into the main water body, forming a shallow toddler/wading area.

Bed and breakfast establishment

An owner-occupied dwelling providing accommodation and breakfast for transient, paying guests.

Chief Health Officer

Chief Health Officer, Department of Health, Western Australia

Deep water

An aquatic facility water body with a water depth at any location greater than, or equal to 1.8m.

Disinfection

The destruction of all disease-causing micro-organisms.

Diving pool

A man-made body of water used for competitive or recreational diving, including springboard or platform diving.

FINA

Federation Internationale De Natation.

Hydrotherapy pool

A pool containing heated water, designed to meet the therapeutic needs of people of any age with impairments due to illness, injury, disease, intellectual handicap, congenital defects, or for fitness exercising, recreational and educational purposes.

Landing pool

A body of water located at the exit of a waterslide, used to break the fall of waterslide users.

Leisure pool

A swimming pool used for recreational purposes.

Lifeguard

A person who is appropriately qualified and experienced, with primary responsibility for observation of water areas to anticipate problems, control behaviours and hazards, identify emergencies, carry out rescues, give immediate first aid, communicate with swimmers and recreational water users, enforce regulations where appropriate, promote awareness of specific and general hazards, and report incidents.

Multi-zone waterbody

A water body with a shared treatment system which incorporates 2 or more zones which align to different water body loading categories (e.g. learn to swim integrated with a 25m lap pool)

Off-season period

The time of year during which an aquatic facility is not available for use.

Operator

A person who is the occupier of the land or premises on or in which the aquatic facility is located and any other person concerned with the operation of the facility other than as an employee.

Guidelines of Safe Pool Operation

Guidelines of Safe Pool Operation (GSPO) published by the Royal Life Saving Society Australia.

Radius of curvature

The radius arc that denotes the curved surface from the point of departure from the vertical side wall of the pool to the bottom of the pool.

River ride

An aquatic facility that is designed to simulate the effects of a natural river, and incorporates a system to produce an artificial current of water, created to propel patrons along with, or without the use of a floating vessel.

Slip resistant

A surface is slip resistant, if the available friction is sufficient to enable a person to move on the surface without an unreasonable risk of slipping.

Small pool establishment

A small pool establishment is one in which a domestic sized swimming pool, catering for 1 to 20 swimmers, is utilised for physiotherapy, sports therapy or as a learn to swim centre, with (usually) 5 people involved in each training or learning session.

Spa pool

A man-made pool or other water-retaining structure designed for human use, which has a capacity of not less than 680 litres, which may or may not be heated. It incorporates, or is connected to, equipment for heating the water contained in it and injecting air bubbles or jets of water under pressure to cause general turbulence in the water.

Starting platforms

An elevated structure located on the side of a swimming pool, designed for use by swimmers in competitive lap-swimming events.

Supervision

Adequate and constant surveillance of people in the water by a person appropriately qualified to anticipate problems, identify emergencies quickly and provide an appropriate and timely response.

Swimming pool

A man-made structure capable of being filled with water, and intended to be used for swimming, diving, wading or paddling that cannot be emptied by a simple overturning of the structure. The definition does not include individual therapeutic tubs or baths used for cleaning of the body.

Technical operator

A person who holds a current technical operations qualification obtained from an approved training program and who engages in the operation and maintenance of an aquatic facility.

Wading pool

A swimming pool designed for wading, where the water depth is less than 300mm.

Wall-to-floor junction radius

The wall-to-floor junction radius is determined by using the following formula:

Junction radius = water depth - vertical wall depth (measured from the water line).

Walkway

Any surface of an aquatic facility, other than the aquatic facility water body, where staff or patrons walk.

Water spray grounds and interactive water features

Water spray grounds and interactive water features are aquatic facilities where patrons (primarily children) become wetted from interaction and exposure to water features which may include: slides, sprays, tippers, fountains, jets, channels, pools, pumps, water screws or other such structures where the water is drained and collected for reuse.

Waterslide

A device incorporating an inclined sliding surface, where a patron’s body comes into direct contact with a water medium that is used to propel, or decelerate a body within a water flume, which terminates in a landing pool and/or watershed area.

Wave pool

An aquatic facility designed to simulate the effects of a beach, and which incorporates a system to produce artificial wave motion.

1.2 Classification of aquatic facilities

For the purposes of this code, aquatic facilities shall be classified in accordance with Table 1

Table 1 – classification of aquatic facilities

Patron access limitations	Activity	Technical operator requirements	Patron supervision and emergency care personnel	Classification
Public access with limited restrictions e.g. child <10 yrs accompanied by a person ≥16 yrs	Non-structured Typical examples: leisure/free play and lap swimming	On-site at all times.	All patrons directly supervised. Emergency care personnel on-site at all times.	Group 1 Facilities typically available to the general public for payment of an entry fee. Examples include: aquatic centres, waterslides and waterparks.
Restricted to discrete users and user groups	Structured Qualified activity, leader present Typical examples: infant aquatics, learn-to-swim, swimming and lifesaving classes, and aqua exercise (See Sect 7.12, Table 9)	Not on-site at all times.	All patrons directly supervised. Emergency care personnel on-site at all times.	Group 2 Facilities generally include: schools, learn-to-swim centres, learn-to-dive pools, nursing homes, hospitals and hydrotherapy/ physiotherapy use pools.
Restricted to discrete users and user groups Typical examples: club members, commercial guests and residents, and their guests	Non-structured No qualified activity leader present Typical examples: leisure/free play and lap swimming	Not on-site at all times.	No direct supervision. Emergency care personnel able to respond within a reasonable period of time (See Sect 6.2.5)	Group 3 Facilities generally include: discrete user access of group 1, 2, or 4 aquatic facilities (AF) by community/swimming groups, or commercial developments for guests such as hotels, motels, resorts, serviced apartments, caravan parks, health clubs, mine sites, recreational camp-sites, lodging houses, staff/student accommodation complexes and places restricted to adult only access.
Restricted to owner/occupier residents and guests	Non-structured No qualified activity leader present. Typical examples: leisure/ free play and lap swimming	Not on-site at all times.	No direct supervision No emergency care personnel on-site.	Group 4 Facilities include: small temporary accommodation developments such as bed and breakfast, farm-stay facilities, permanent/semi-permanent residential developments with 30 or more dwelling units/apartments, retirement/lifestyle villages that do not allow non-residential based club/member access to AF.

Section 2 – design and construction requirements

Aquatic facilities are complicated structures that need to be designed to provide patrons with maximum levels of safety. Aquatic facilities can be subject to relatively large forces, from a range of sources.

Fibre-reinforced plastic pools are mainly used for smaller aquatic facilities, due to the speed of installation, and the variety of designs now available. This type of structure is normally manufactured at industrial premises and transported to the site for installation.

Aquatic facilities can become harsh environments that impose unique requirements upon materials used for construction. Correct selection of materials is essential to ensure the longevity of a facility and can assist with ongoing maintenance and care of a facility.

Designing and constructing aquatic facilities with appropriate surface finishes can contribute to the safe and hygienic operation of the premises. A suitable finish will assist staff to carry out effective maintenance, by enabling dirt and visible contaminants to be detected, and assist in safety by allowing submerged patrons to be seen easily. The use of non-slip floor materials will reduce the risk of slip and fall injuries to patrons and staff.

Ensuring aquatic facility water bodies are designed with appropriate wall slopes, wall and floor junctions, access and egress points, and separation distances between shallow and deep facilities ensures patrons can safely enter and exit facilities. Appropriate floor gradients ensure patrons do not inadvertently move from shallow sections of a facility to deep sections, where they may not be able to swim.

Eliminating entrapment zones in aquatic leisure equipment and ensuring adequate water depths are provided for certain aquatic activities, can reduce the potential for serious injuries.

A given depth of water may appear to be deeper or shallower when viewed from the concourse. Depth markings and signage assists patrons to make informed decisions about their ability to swim in a facility, and whether it is safe to perform activities such as diving.

The concourse directly surrounding aquatic facilities may need to accommodate considerable amounts of water from a variety of sources. Depressions in the concourse can result in pooling of water, providing an environment conducive to the survival and growth of micro-organisms. Inadequate drainage can allow contaminated water to run back into the water body. Irregularities in the concourse surface may create slip and trip hazards.

Adequate ventilation is required in indoor facilities to maintain air quality. Ventilation systems must be able to adequately dilute the concentration of water vapour and by-products of the water treatment processes.

All wastewater produced from aquatic centres needs to be disposed of in an appropriate manner to prevent the creation of health hazards.

Displaying safety signage and behaviour rules informs patrons of the hazards in facilities and may improve patron conduct.

Some larger aquatic facilities are used for competitive events that are attended by a significant number of spectators. These facilities require spectator seating areas and stands that are designed and constructed to support patrons safely.

Adequate lighting ensures aquatic facilities used after the hours of darkness are provided with sufficient illumination levels, which assists patrons to engage in safe activities and allows supervisors to see people in the water.

Providing aquatic facilities with adequate fencing and security has been found to be effective in minimising drowning incidents, especially those involving young children.

Community exposure to ultraviolet radiation can be reduced by creating shaded recreational spaces.

Aquatic facilities create harsh environments that produce special electrical hazards. It is essential for electrical equipment to be correctly installed, maintained in a safe condition and tested regularly.

2.1 General structural requirements

Aquatic facilities shall be structurally sound and engineered to withstand all forces imposed by the design of the facility and its anticipated use.

2.2 Fibre-reinforced plastic pools

Pre-moulded fibre-reinforced plastic pools shall be designed, fabricated and installed in accordance with the following Australia New Zealand Standards:

- AS/NZS 1838:2021 – design and fabrication.
- AS/NZS 1839:2021 – installation.

2.3 Other pools

2.3.1 Spa pools

Spa pools shall comply with the provisions in Section 9 of this code.

2.3.2 Hydrotherapy pools

In addition to the requirements of this section, hydrotherapy pools shall comply with the provisions in Section 11 of this code.

2.4 Construction materials

Aquatic facilities shall be constructed of materials that are non-toxic to humans under normal conditions of use, impervious, enduring, capable of withstanding design stresses, and provide a watertight structure.

2.5 Surface finishes – water bodies

Aquatic facility water bodies shall be provided with surface finishes that comply with the requirements of this section.

The walls and floors shall be smooth, impervious, durable, easily cleanable and continuous, with no cracks, joints or protrusions other than structural joints. Floor surfaces shall be slip resistant in accordance with Appendix 6 – slip resistance performance and testing.

Pools shall be designed in such a way as to prevent pool users from sitting or standing on infinity edges.

The colour of wall and floor finishes shall be no darker than the colours listed in Appendix 1, as defined by AS 2700 – 2011: Colour standards for general purposes. This requirement does not apply to:

- lane markings
- safety markings
- hand holds

- copings
- step edges.

The walls and floors shall not incorporate designs that are shaped in a form that may be reasonably mistaken for a human form, or that may inhibit detection of submerged persons.

The colour requirements of this section do not apply to:

- Spa pools with a surface area of less than 10m².
- Spa pools with a surface area greater than 10m², which have a maximum water depth of 800mm and providing that access, will be restricted to adult use only.
  or
- Water spray grounds and interactive water features.

2.6 Use of sand and earth material

Clean sand, or similar material, if used in a beach pool, shall only be used over an impervious surface. The sand shall be specifically produced for use in such an environment and used in such a manner as to not adversely affect the proper filtration, water treatment, maintenance, safety, sanitation, water clarity and operation of the overall aquatic facility. Positive up-flow circulation of water through the sand shall be provided at all times.

2.7 Obstruction and entrapment

Aquatic facility water bodies shall not be designed or constructed with obstructions that can cause patrons to become trapped or injured. Examples include wedge or pinch-type openings and rigid, cantilevered protrusions.

All protruding edges and corners of facilities shall be rounded. Fixtures and fittings in the walls and floors of the water body shall be fitted flush and have no sharp and protruding edges.

2.8 Wall slopes

2.8.1 Prefabricated pools

Prefabricated pool walls shall not slope towards the pool by more than 7 degrees above and below any projections into the pool.

Any projections such as steps, seats, benches, lounges and swim outs shall not project outwards into the pool by more than 600mm.

Any projections into the pool away from the pool wall greater than 100mm shall require an edge marking strip 25mm wide applied to the edge of the protrusion and to be significantly varying in colour to clearly identify the edge of the protrusion from above the water.

Step ledges may not protrude into the pool away from the pool wall by more than 150mm.

Safety hand grip rails and ledges for automated pool covers may not protrude into the pool by more than 100mm.

2.8.2 Non-prefabricated pools

Non-prefabricated pool walls shall be vertical for at least 75 per cent of the depth of the pool, at any point along its perimeter. Any projections such as safety ledges shall be confined within the 11º angle from the top of the pool wall and shall not project outwards greater than 600mm.

2.8.3 Diving bowls

The wall slopes for diving pools, or diving bowls, shall comply with World Aquatics (formerly known as FINA) design requirements.

2.9 Radius of wall and floor junctions

Where a radius is required, the wall-to-floor junction radius in aquatic facility water bodies shall be coved and easily able to be cleaned.

2.10 Floor gradients

An aquatic facility water body of less than 12.5 metres in length shall have a pool floor with an even gradient so that there is no sudden increase in depth.

An aquatic facility water body of 12.5 metres or more in length shall have pool floor slopes that do not exceed 1:15, where the water depth is less than 1.75 metres.

Changes within the floor gradient at a water depth greater than 1.8m shall be highlighted with a contrasting colour, such as contrast tiles or painted lines.

2.11 Minimum water depths

Aquatic facilities shall be designed and constructed so water depths are appropriate for the expected usage of the facility.

Facilities should comply with Guideline FD1.01 – Design of Pool Tank -1996 of the Guidelines of Safe Pool Operation. The depth of spa pools shall comply with the requirements of Section 9 of this code.

Water depths in areas surrounding starting platforms shall comply with the requirements of Section 2.14 –starting platforms of this code.

2.12 Depth markings

2.12.1 General requirements

Depth markings of a permanent nature, and colour contrasting to the background, shall be installed around aquatic facilities water bodies at intervals not exceeding 7.5 metres. They need to be readily visible to people entering the water body.

2.12.2 Location

Depth markings shall indicate maximum and minimum water depths and designate water depths at all major deviations in shape for irregularly shaped water bodies. All bodies of water, where there is a change in floor gradient shall have a pictorial sign displayed to indicate a change in the floor depth.

Depth markings shall be located as close as practicable to the corners of all square/rectangular shaped water bodies, near to all designated entry points and shall not be located directly over stair/step entries.

Depth markings shall be displayed around all horizontal or outside vertical aquatic facility water body surfaces, which may enable patron access, comprising of one, or a combination of the concourse, coping deck, pool hob or header.

Depth markings shall also be displayed on the inside vertical water body surface clearly above the water line in corresponding locations to horizontal depth markers where possible. Markings are not required on the inside vertical face of the water body, where the water level is < 125mm below the concourse, coping deck or header.

2.12.3 Dimensions

Depth marking dimensions shall be:

- at least 90mm high when positioned in the horizontal plane
- at least 90mm high, when positioned in the vertical plane.

The height-to-width ratio of each numeral/letter contained within a depth marking shall be 3:1.

2.12.4 Spa pools

Depth markings for spa pools shall comply with the provisions of Section 9 of this code.

2.13 Access and egress

2.13.1 General requirements

Access into or egress from an aquatic facility water body shall consist of one or a combination of the following:

- stairs or steps
- ladders
- swim outs
- pool-seats
- landings
- ramps
- beach entries.

Aquatic facility water bodies shall have a means of access/egress at the shallowest point if the water depth exceeds 600mm. A means of egress shall be provided in the deepest point of the water body, if the water depth is 1.8m or greater. Where the water body is greater than 9 meters wide, a means of egress shall be provided on both sides of the water body at the deepest point.

At least one handrail shall be provided to service:

a) the full length of entry ramps and

b) all treads and risers of each set of steps or stairs.

Where the total perimeter of a swimming pool/water body exceeds 40m, a means of accessible water entry/egress for people with a disability is required to be constructed/installed in accordance with Section D3.10 of the Building Code of Australia.

All surfaces for access or egress shall be slip resistant in accordance with Appendix 6 – slip resistance performance and testing.

2.13.2 Dimensions

Swim outs, pool seats and landings shall extend a maximum width of 600mm from the vertical pool wall at any given perpendicular point along the pool wall and shall be located at a maximum height of 500mm below the water level. The outer 50mm edge of the swim out, pool seat, or landing tread shall be finished in a contrasting colour in accordance with colours listed in Appendix 1.2 – approved colours for outer edges of treads.

Stairs or steps for water bodies less than 12.5m in length shall have a minimum horizontal tread depth of 200mm, and a maximum rise of 300mm, except for the bottom riser height to the floor, which may vary. The outer 25mm edge of the stair/step tread shall be finished in a contrasting colour in accordance with colours listed in Appendix 1.2 – approved colours for outer edges of treads.

Stairs or steps for water bodies 12.5m or greater in length shall have a minimum horizontal tread depth of 300mm, and a maximum rise of 250mm. The outer 50mm edge of the stair tread shall be finished in a contrasting colour in accordance with colours listed in Appendix 1.2 – approved colours for outer edges of treads.

2.13.3 Spa and hydrotherapy pools

Spas with a surface area of 10m^2 or greater shall have means of access and egress which comply with AS2610.1: 2007, Section 2.5.

Spas with surface areas of less than 10m^2 shall have means of access and egress which comply with AS2610.1: 2007, Section 2.19.2.

Hydrotherapy pools shall have means of access and egress as referenced in Section 11 of this Code to AS 3979:2006.

2.13.4 Baja shelves

Baja shelves shall be designed and constructed in accordance with the following:

- There shall be no sudden drop off from baja shelf into the main water body. Baja shelves shall be designed with either:
    - a stepped entry (in accordance with Section 2.13.2) to the full length of the shelf into the main water body
      and/or
    - a suitable barrier between baja shelf and main water body.
- The circulation system shall be designed to ensure effective mixing and maintenance of the required disinfectant residual to both the baja shelf and main pool water body.

2.14 Starting platforms

Starting platforms shall be designed and constructed in accordance with Clause 5.1 of Guideline FD 24 Design of Starting Blocks (Starting Platforms) – 2007 of the Guidelines of Safe Pool Operation for the purposes of this code, provisions of the guidelines incorporating the word ‘should’ shall be construed as mandatory requirements.

2.15 Ventilation

Indoor aquatic facilities shall be provided with mechanical ventilation systems. The systems shall have a minimum ventilation capacity as required by this section. The capacity of the systems shall be calculated based on the following:

Occupancy:

- deck and pool 3.5 m2 per person
- spectator areas: 1.5 m2 per person.

Ventilation requirements:

- 10 litres per second of outdoor air per person
  or
- 10 litres per second per m2 of total floor area including pools as determined by the design engineer.

2.16 Lighting

While in use, aquatic facilities shall be provided with sufficient lighting to enable every part of the facility, including the underwater area, to be observed without interference from direct or reflected glare from the lighting sources.

Lighting requirements do not apply within fully enclosed waterslide flume sections.

The water surface of water bodies located within Group 1 and Group 2 facilities used after sunset shall be illuminated by overhead lighting to a minimum level of 80 lux, and to a level that will allow a Secchi disc placed on the floor of the water body to be seen from the concourse. Refer to AS 3550.7-1993, (Waters) Part 7: The construction and use of the Secchi disc.

The water surface of water bodies located within Group 3 and Group 4 facilities used after sunset shall be illuminated by overhead lighting to a minimum level of 30 lux, and to a level that will allow a Secchi disc placed on the floor of the water body to be seen from the concourse.

Aquatic facility concourses shall be illuminated in compliance with the above requirements to a distance of 3 metres from the water body.

Indoor facilities shall be provided with lighting systems that can achieve the above illumination levels. All areas of waterslide facilities that are available to the public shall also comply with these requirements.

Lighting fixtures must be of a type and located so they shall not cause glare to supervisory staff or patrons using the facility.

Diving pools and areas of combined facilities used for diving must be provided with lighting installations that comply with AS 2560.2 – 2021: Sports lighting.

Aquatic facilities not provided with lighting, or where lighting intensity does not comply with this code, shall be provided with signage in a prominent position that is easily seen by pool users at all access points into the facility. This should incorporate the statement “NO USE OF FACILITY ALLOWED AFTER DARK” or similar in accordance with Section 2.25.1.

2.17 Concourses and walkways

Aquatic facility concourses shall be at least 1.0 metre wide and of sufficient width to ensure the safety of patrons around the water body.

All concourses and walkways shall be provided with surfaces that are smooth, free of protrusions that may constitute a trip hazard, impervious, durable, easily cleanable and continuous, with no cracks or joints other than structural joints.

All installed surfaces shall be slip-resistant and maintained so the available friction is sufficient to enable a person to traverse the surface without unreasonable risk of slipping.

Refer to Appendix 6 for guidelines on the measure of slip resistance that should be maintained within certain areas of an aquatic facility.

Adequate drainage shall be provided in all areas that may become wet. The concourse shall be graded to drain away from the water body, to prevent water from accumulating on the concourse or draining back into water bodies. All general site and roof drainage shall be directed away from water bodies.

Garden areas adjacent to aquatic facilities shall be designed to prevent soil from falling or draining onto the concourse, or into the water body.

The layout of the concourse shall enable supervising staff to move around freely, without losing visual contact with water areas.

Garden boxes and other features on the concourse shall not interfere with sightlines for supervision.

The concourse of facilities constructed above ground level shall be constructed with a balustrade, fence or other means that will prevent persons falling to lower levels.

Herbicides and pesticides should not be applied to the concourse or pool surrounds.

2.18 Fencing and security

Whenever the facility is not in use, Group 1 and Group 2 facilities shall be provided with security measures that deter the unauthorised entry of persons.

Group 3 and Group 4 facilities shall be provided with fencing and security measures that comply with Australian Standard AS 1926.1-2012: Swimming pool safety – Safety barriers for swimming pools. For this code a door that provides access into the pool area shall comply with clause 2.7 Child resistant door sets of this standard.

Group 3 and Group 4 facilities may be provided with alternative fencing and security measures provided they afford an equivalent or greater degree of safety to AS 1926.1-2012: Swimming pool safety – Safety barriers for swimming pools.

Alternative measures for Group 3 and 4 facilities may include provision of no fencing, when it is an adult only aquatic facility and no scope exists for access by children or other people requiring protection. Acceptance of such alternative measures by regulators will still require the operator take on full responsibility for managing all risks associated with having these alternative measures for their aquatic facility and that they demonstrate precisely how risks will be managed and access controlled.

2.19 Separation distances

Toddler pools and learner pools shall be situated away from the deep areas of other pools, and away from diving pools.

Where this is not possible, effective transparent barriers and appropriate signage shall be provided.

2.20 Sanitary amenities

Aquatic facilities shall be provided with toilets, hand-wash basins, showers and change rooms.

Toilets must be provided for spectators in Group 1, Group 2 and Group 3 facilities in accordance with the requirements of parts F 2.3 and 2.4 of the Building Code of Australia.

Facilities shall be provided for persons using the aquatic facilities in accordance with the following requirements:

- One water closet for every 40 female patrons.
- One water closet plus one urinal for every 60 male patrons.
- One shower for every 40 patrons.
- One hand basin for every 60 patrons.

Sanitary facilities shall not be located further than 90m from the water body on the horizontal plane and as close as practicable on the vertical plane in the case of high-rise complexes.

The number of patrons in waterslide facilities shall be designated by the maximum number of persons permitted to use the waterslide at any one time.

The number of patrons for all other aquatic facilities is to be calculated by allowing one person for each 2.3m^2 of water body surface area and allocating the final number as 50 per cent male and 50 per cent female.

Floor surfaces for toilets, showers and change rooms shall be impervious, slip-resistant when wet and drained to floor waste or other drainage areas.

Sanitary facilities are not required in Group 4 aquatic amenities, where provision is made for bathers in their accommodation quarters.

The CHO may approve combined use of sanitary conveniences located in an adjacent building.

An aquatic facility that is deemed to be a small pool establishment may have a lesser number of sanitary facilities as follows:

- Where the number of swimmers does not exceed 10 persons, a unisex toilet containing a change room, shower, WC and a hand basin, shall be provided.
- Where the number of persons exceeds 10 swimmers (but not 20 swimmers), a toilet including a change room, WC, shower and a hand basin shall be provided for each gender.

2.21 Backwash water

The onsite discharge of backwash water from an aquatic facility water body shall be disposed of in a manner that has been approved by the local government.

2.22 First aid facilities

Aquatic facilities shall be provided with minimum first aid facilities as detailed in Table 2.

Table 2 – First aid facilities

Type of facility	Mandatory first aid facilities
Group 1	A separate room or area containing all of the following items: 1. Resuscitation notice. 2. Examination couch. 3. Hand wash basin with reticulated potable water. 4. Communication System (ready access to a telephone with emergency number posted close by) 5. One GPO outlet. 6. Work bench for the preparation or the cleaning and sterilisation of items used in first aid treatment. 7. Storage for first aid supplies and equipment. 8. Washable flooring.
Group 2 and Group 3	A separate room or area containing all of the following items: 1. Resuscitation notice. 2. Hand wash basin with running water. 3. One GPO outlet. 4. Storage for first aid supplies and equipment. 5. Washable flooring.
Group 4	Resuscitation notice displayed in a prominent position in the aquatic facility area.

2.22.1 Dimensions of first aid area

The design and construction of first aid areas shall ensure these places can accommodate the items listed in the Table 2 above.

2.22.2 Signage

Signage shall be provided at the pool area that clearly identifies the location of the first aid room. The design and installation of first aid signs shall follow the formats outlined in AS 1319 – 1994: Safety signs for the occupational environment.

2.23 First aid equipment

Aquatic facilities shall be provided with first aid equipment as detailed in Table 3.

Table 3 – First aid equipment

Type of facility	Mandatory first aid equipment
Group 1	1. Resuscitation equipment (capable of delivering oxygen therapy and oxygen supplementation for expired air resuscitation) for children and adults. 2. First aid kit. 3. Spinal board and extrication collars. 4. Pillows and blankets. 5. Pocket mask and disposable gloves. 6. Stretcher.
Group 2 and Group 3	1. First aid kit. 2. Two pillows and blankets. 3. Pocket mask and disposable gloves. 4. Stretcher.
Group 4	First aid equipment is not required to be maintained onsite.

2.24 Rescue equipment

Group 1, Group 2 and Group 3 aquatic facilities, excluding waterslide landing pools or watershed areas, unless otherwise required by the CHO, shall be provided with appropriate rescue equipment, which shall be stored in a readily accessible location.

Examples of appropriate rescue equipment include reaching poles, rescue tubes, lifejackets and throwing ropes or throwing bags, as detailed in Guideline GO 3 – Rescue Equipment – 2010 of the Guidelines of Safe Pool Operation.

2.25 Safety signage

The purpose of safety signage in aquatic facilities is to give user guidance about the rules of expected behaviour when using the facility (as determined by the operator), specific facility features which might impact on their safety, particular restrictions on facility use and basic issues related to emergency response. Signage requirements for aquatic facilities are either mandatory or recommended as detailed below:

2.25.1 Mandatory signage

2.25.1.1 All aquatic facilities intended or restricted to only daylight use because overhead lighting intensity has not been confirmed or provided shall have at least one sign which states: “NO USE OF FACILITY ALLOWED AFTER DARK” or similar so users are aware of that

restriction. That sign shall have minimum lettering size of 100mm and be located in a prominent position that is easily seen by pool users at all access points.

2.25.1.2 All Group 3 and Group 4 aquatic facilities (except spas) shall have at least one sign which states “NO LIFEGUARD ON DUTY”. That sign shall have minimum lettering size of 100mm and be located in a prominent position that is easily seen by pool users.

2.25.1.3 All aquatic facility water bodies shall be provided with depth markings per Section 2.12 of this code.

2.25.1.4 All aquatic facilities shall have one or more resuscitation notice installed in a prominent position that is easily seen by pool users and adjacent to the first aid area (in accordance with Section 2.22 of the Code). Operators must ensure their resuscitation notices are kept up to date with the recommended procedure of the Resuscitation Council of Australia for Cardiopulmonary Resuscitation.

2.25.1.5 All spa pools shall have a spa pool safety rules sign which contains at least those items detailed in the spa pool safety rules sign example in Appendix 2 (adapted from AS 2610.1:2007). That sign shall be installed adjacent to the spa pool in a prominent position that is easily seen by pool users.

2.25.1.6 All spa pools shall have signage on the emergency spa stop switch, detailing the purpose and be located adjacent to the switch/button.

2.25.1.7 All water spray grounds/interactive water features shall have a safety rules sign which contains at least those items detailed in the Water Spray Ground and Interactive Water Features Safety Rules sign example in Appendix 2. That sign shall have minimum lettering size of 50mm sign and be installed in a prominent position that is easily seen by pool users.

2.25.2 Recommended signage

2.25.2.1 A list of recommended and additional recommended statements for signage is provided in Appendix 2 of this code.

2.25.2.2 For Group 1 aquatic facilities a list of suggested signage can be found in Guideline FD 1.04: Advisory Signage – 1995 of the Guidelines of Safe Pool Operation.

2.25.2.3 Recommended formats and symbols specific to water safety signage are contained in AS2416-2010 (Parts 1 - 3) Water safety signs and beach safety flags.

2.26 Spectator stands and seating amenities

Spectator facilities need to be designed and constructed to support patrons in a safe manner. Poorly designed and constructed spectator structures may fail when under load, resulting in mass injuries and casualties.

Aquatic facilities which are used for organised events such as swimming competitions, swimming tuition, and water aerobics, are classified as Public Buildings under the *Health (Miscellaneous Provisions) Act*.

The Act requires facilities to comply with the safety requirements of the Health (Public Buildings) Regulations 1992. The regulation stipulate a number of spectator safety requirements such as the need to provide exits.

Although the regulations do not contain specific requirements for spectator stands, they require all public buildings to be approved by the local government.

In approving public buildings, the local government may require a proponent to demonstrate the spectator facilities, in this case the stands and seating facilities, are safe.

All spectator stands and seating facilities, whether permanent or temporary, should be certified by a practising structural engineer as being safe for the proposed use.

The Department of Health's Guidelines on the Application of the Health (Public Buildings) Regulations 1992 – 2002 is a useful reference in approving large temporary structures.

2.27 Shade protection

The provision of shade is recommended for all outdoor aquatic facilities and, where provided, shall comply with the requirements stipulated in Shade for the Public Swimming Pools Information Sheet included in The Shade Handbook: A practical guide for shade development in Western Australia published by the Cancer Foundation of Western Australia 2020. Group 4 facilities are not required to comply with this requirement.

Where facilities choose to erect shade structures, they shall be carefully positioned to ensure that they do not obscure overhead lighting towers.

2.28 Electrical safety

All electrical installations, including (but not limited to) the installation of residual current devices and equipotential bonding of all metallic/conductive structures/items within the pool/water body electrical zones shall comply with AS/NZS 3000:2018 – Electrical installations (Wiring Rules).

All final sub-circuits supplying electrical equipment shall be protected by correctly rated residual current devices (RCDs) in accordance with Australian Standard AS/NZS 3000:2018.

Periodic verification of electrical installations shall be conducted in accordance with AS/NZS 3019-2022 Electrical installations.

Additional requirements for electrical installations in spa pools are detailed in Section 9 of this code.

2.29 Lightning protection

Group 1 and Group 2 aquatic facilities shall be provided with lightning protection systems in accordance with AS/NZS 1768:2021 – Lighting protection.

Operations manuals and emergency action plans developed in accordance with clause 7.8 of Section 7 of this code should contain lightning protection provisions in accordance with Section 3 of AS/NZS 1768:2021.

Section 3 – circulation and water treatment systems

Aquatic facility water may be contaminated by a variety of pollutants from a number of sources. There are many factors that contribute to the contaminant loading on a water body including (but not limited to) bather load, water depth, temperature and the activities for which the facility is used.

The pollutants may be accompanied by a range of micro-organisms, some of which have the ability to survive and multiply in the water and produce infections in patrons. Pollutants can also produce high levels of turbidity in the water. This can make the water aesthetically unappealing to patrons, interfere with the disinfection process and make detection of submerged patrons difficult.

Aquatic facilities require water treatment systems that can effectively remove pollutants and micro-organisms from the water. The treatment systems need the capacity to draw an adequate volume of contaminated water from the water body, efficiently remove pollutants, dose the water with the required level of disinfectant and distribute the filtered and disinfected water back through the water body.

The more heavily loaded a body of water, the more rapidly this water must be treated to remove contaminants. The water body loading category chart (Table 4) is designed to establish the parameters of different levels of contaminant loading, and specifies a maximum permissible turnover time for each category of facility.

3.1 General requirements

The design of the aquatic facility and water treatment system shall be in accordance with the intended use of the facility and the anticipated bather loadings. At the time of application for approval, proponents of facilities shall nominate the required bather loading and proposed classification for each water body in the facility, in accordance with Table 4.

Table 5 – water body parameters by category chart, specifies the water treatment requirements for each water body in a facility. The water treatment plant for every aquatic facility shall be designed and operated in accordance with the approved classification of the water bodies in the facility, and the requirements of Table 5.

Every aquatic facility shall be provided with a circulation system consisting of one or more pumps, piping, suction outlets, return inlets, filters, disinfectant feeders, automatic water chemistry controls and other equipment necessary to maintain the specified water quality.

The circulation system shall be designed in accordance with the following requirements:

- The capacity shall accommodate 100 per cent of the design flow rate (under clean filter conditions).
- The system shall be capable of providing effective mixing of water in the water body and uniform water quality.
- The system shall be capable of maintaining the specified disinfectant residual throughout all parts of the aquatic facility.

Aquatic facility water treatment systems shall be in continuous operation whenever a facility is available for use, and at such additional times and periods as may be necessary e.g. when an aquatic facility is closed during off season to maintain the water in a clean and disinfected condition.

This requirement applies to pumps, filters, disinfectant and chemical feeders, flow indicators, gauges and all related parts of the water treatment system.

Table 4 – water body loading category chart

Category	Loading classification	Parameters	Water depths	Examples	Maximum permissible turnover times
1	Spas	Spa pools		Spa pools, leisure bubble pools	**20 mins**
2	Extreme	Very high bather load, very shallow water	Very shallow 0m – 0.3m	Toddlers pool, water slide splash down pool	**30 mins**
3	Very high	Very high bather load, heated water, shallow water	Shallow 0.3m - 0.80m	Shallow leisure pool	**1 hour**
4	High	High bather load, heated water, moderately shallow water		Medium depth, leisure pool, learn to swim, wave pool	**1 ½ hours**
5	Moderate	High bather load, heated water, medium depth water	Medium 0.80m -1.40m	Full depth heated leisure pool, lazy river, medium depth unheated outdoor leisure pool, hydrotherapy pool	**2 hours**
6	Light	Medium bather load, heated water, medium depth water		Heated school pool, health club pool, body corporate, caravan park, motel pools full depth unheated outdoor leisure pool	**2 ½ hours**
7	Low	Low bather load, deep water	Deep 1.40m – 2m	50m competition pool, unheated municipal/ school/ motel, etc pool	**3 ½ hours**
8	Very low	Very low bather load, very deep water	Very deep >2m	Diving pool, water polo pool	**5 hours**

Example:

For unheated outdoor pools, the category/loading classification may be increased by one when compared to an indoor heated pool with the same bather load. So, a Category 4 pool (heated indoor with a high bather load and moderately shallow water) could become a Category 5 pool if it was outdoors unheated with the same bather load and depth.

3.2 Circulation – suction and return points

3.2.1 General requirements

Aquatic facilities shall be provided with a surface skimmer or perimeter overflow gutter system, which shall be designed and constructed to provide effective removal of soiled surface waters.

Facilities shall be provided with return inlets and suction outlets, which are arranged to produce a uniform circulation of water throughout the facility. Where applicable, circulation equipment and controls may be installed to allow additional circulation to heavily loaded parts of a water body (e.g. a beach area).

A minimum of two return inlets shall be provided for every pool. These shall be sized and installed to accommodate the flow rate required by Section 3.3.2 filtration rates and turnover times. The flow rates through a single return inlet shall not exceed manufacturer's recommendations.

Where a facility is greater than 12 metres wide, or more than 280m^2 in surface area – floor inlets, or a combination of floor and wall inlets, shall be used.

Where skimmer boxes are used, the return inlets shall be of a directional design and be located to assist in bringing floating particles within range of the skimmers. Return inlets shall be installed no further than 13 metres from the nearest skimmer.

3.2.2 Wall inlets

Wall inlets shall be rounded and smooth, tamper-proof and of a design to prevent entrapment. They shall not extend further than 2.5cm from the wall.

3.2.3 Floor inlets

Floor inlets shall be installed flush with the surface of the bottom of the facility, be tamper-proof and of a design to prevent entrapment.

3.2.4 Surface skimmers

Surface skimmers may be used in aquatic facilities where the water surface area does not exceed 450m^2.

Surface skimmers shall be located in an appropriate position to the inlets to maintain effective skimming action throughout the facility.

The flow rate through surface skimmers shall not be less than 5 litres per minute, per centimetre of skimmer weir. The flow rate through each individual skimmer shall not exceed the manufacturer's maximum specified flow rate.

Skimmer covers located on a walking surface shall be securely seated, slip-resistant, of sufficient strength to withstand normal deck use, and not constitute a tripping hazard.

At least one skimmer shall be provided for every water body. More skimmers and suction outlets shall be installed as required, to ensure adequate circulation of the water body in

accordance with Table 4 – water body loading category chart. Flow rates through skimmers and suction outlets shall not exceed the manufacturer's recommendations.

3.2.5 Perimeter overflow systems (fixed rim skimming device)

Perimeter overflow systems shall be used in aquatic facilities where the water surface area for an individual water body or a series of water bodies connected by the same filtration and circulation system exceeds 450m^2.

Perimeter overflow systems shall be continuous around the water body and achieve 50 per cent minimum perimeter coverage, given the following areas are exempt from perimeter overflow system installation:

- at stairs
- at recessed ladders
- directly under slide flumes
- along weir features
- at raised ends
- along planter boxes and
- walls of river rides/turbo channels.

They shall be designed with sufficient capacity to accommodate the volume of water to achieve the required turnover rate, together with any surge produced from patron activities, so water is not permitted to flow onto the aquatic facility concourse.

All grates shall be neat fitting with no gaps between adjoining grate sections. They should also be flush fitting with no raised or buckled area.

3.2.6 Entrapment prevention

Surface skimmers and perimeter overflow gutter systems shall be designed and installed to not constitute a hazard to the user, and to prevent entrance or entrapment of a patron's limb, body or hair.

The requirements of AS 1926.3-2010 Swimming pool safety, water recirculation and filtration systems shall apply to all suction outlet systems. The following items shall also apply:

- Main drain outlets less than 300mm wide shall be covered with an anti-vortex grate.
- Suction outlets shall not be able to be isolated, such that one outlet serves as the sole source of water to a pump.
- The circulation systems of pools, spas or water recreation attractions shall not be operated if the main drain grates, or any suction outlet cover or grate is missing, broken, or insecurely fitted.

3.2.7 Variable speed drives

Where it is intended to install a variable speed drive on a water body filtration system or at the completion of works undertaken retrospectively to those requirements, the trained technical operator shall complete a form described in Appendix 11 and forward that form to the Department of Health (DoH).

The trained technical operator shall ensure the flow rate of the circulation system shall meet the requirements of Section 3.1 – general requirements or be superior in performance to ensure that the pool water can recover after use by the law of consecutive dilutions. The filtration systems shall continuously operate at the full designed flow rate.

Only variable speed drives that have been designed for commercial (and public pool) usage may be installed. Replacement filters with less capacity than the original (DoH approved) capacity are not permitted to be used in conjunction with variable speed drive pumps.

It is the responsibility of the trained technical operator to maintain plant and equipment and to ensure that all replacement filters and pumps comply with the code of practice.

3.3 Water treatment

Effective water treatment requires a combination of processes working together to provide water that is safe to swim in and of optimum quality. Among these, filtration and disinfection are critical processes with specific requirements.

3.3.1 Filtration

Filtration is used to remove contaminants that are present in the water, either as colloidal solutions or suspended as particulate material.

The filtration system pumps soiled water through a filtration medium, which captures and retains the contaminants. The filtration medium may consist of sand, diatomaceous earth or other approved material. The captured contaminants are subsequently removed from the filter medium during a cleaning process such as backwashing.

Efficient filtration will remove a high proportion of contaminants from the water, enhancing the effectiveness of the disinfection process.

An additional role of the circulation system is to provide a continuous flow of water through the water body, to mix and evenly distribute the disinfectant chemicals throughout the water.

Filtration systems shall be designed to consider the level of contaminants in the water. This is determined by factors such as the type of facility, the expected bather loading, water depth, the size of the facility, the water volume and operating water temperature.

3.3.2 Filtration rates and turnover times

Aquatic facilities shall be provided with filtration systems appropriate to the category approved by the CHO. Each body of water shall be equipped with a filtration system that has the capacity to achieve the turnover times set out in Table 4 – water body loading category chart.

All filtration rates shall comply with the requirements as set out in Table 5 – water body parameters by category chart.

Multi-zoned water bodies shall be configured so that each zone achieves a turnover rate that aligns with the applicable water body loading category for that zone.

Clause 3.9 at the end of this section contains an example on the use of data from Table 4 and Table 5 to determine filtration system requirements.

Table 5 – water body parameters by category chart

Category	Maximum peak bather loading (persons/ m^2)	Minimum water allowance per t/over (m^3/person/turn over)	Maximum daily bather load (persons/ m^3)	Maximum sand filter flow rate (L/min/m^2)	Maximum D.E filter flow rate (L/min/m^2)	Maximum cartridge filter flow rate (L/min/m^2)
1	1 person/ 1.0m2	10.0	9.6	400	60	12
2	1 person/ 2.0m2	8.0	6.0	400	60	12
3	1 person/ 2.0m2	7.0	3.4	400	60	12
4	1 person/ 2.5m2	6.0	3.0	600	80	15
5	1 person/ 2.5m2	5.4	2.2	600	80	15
6	1 person/ 2.5m2	5.0	1.9	600	80	15
7	1 person/ 3.5m2	4.8	1.4	600	80	15
8	1 person/ 3.5m2	4.8	1.0	600	80	15

3.3.3 Requirements for filtration vessels

Filtration vessels shall be designed and constructed in accordance with the following requirements:

- To achieve a uniform flow of water through the filter bed.
- To be capable of withstanding normal and continuous use without deterioration that could affect the filter or filter operation.
- To permit regular inspection and maintenance.
- To permit adequate and effective cleaning or replacement of the media, to achieve design flow rates in filter and backwash mode.
- To have corrosion-resistant components.
- Where filter vessels permit the accumulation of air in the top of the vessel housing, the filter vessel shall be equipped with an air release system which evacuates the air automatically.
- To be installed with all necessary pressure gauges and instrumentation.
- To be clearly labelled with model, make, filter area, pressure rating and flow rates (in filter and backwash mode).

3.3.4 Other requirements

Facilities shall comply with the following requirements:

- Water velocity in pipe work shall not exceed 3 metres per second in discharge piping, and 1.8 metres per second in suction piping.
- Systems incorporating manifolding shall comply with the requirements of AS 1345-1995 Identification of the contents of pipes, conduits and ducts.
- Filtration equipment shall be protected from tampering by unauthorised persons.

- Filtration equipment shall be mounted level on concrete or another surface, which is easily cleanable and non-absorbent.
- Plant room floors shall drain to floor waste.
- Each filter vessel shall be installed so that it can be isolated from the recirculation system for repairs and backwashing.
- All water treatment plant shall be installed with sufficient access, to enable them to be inspected and serviced in accordance with manufacturer's specifications and safe working practices.
- Filters cleaned by backwashing shall be provided with a readily observable sight glass and sampling point installed on the waste discharge line. Sight glasses shall be of full line diameter and readily removable for cleaning.
- Facilities using cartridge filters shall be provided with a wash-down area, to enable filtration media cleaning, without creating a nuisance and whereby, the onsite disposal of wastewater is undertaken in a manner that has been approved by the local government.

3.3.5 Balance tank capacities and personnel accessibility

Balance tanks form an integral part of the hydraulic performance of the water treatment system. Balance tanks shall be sized, to allow for:

- Bather displacement based on the maximum instantaneous load rating for the facility.
- Volume of water available to backwash primary filters.
- A reserve for start-up after backwash, freeboard and wave displacement of not less than 20% above the sum of 1 and 2.

Where entry is possible into a balance tank, it shall be designed in accordance with the requirements of the Work Health and Safety (General) Regulations 2022 (Part 4.3 – Confined Spaces).

3.3.6 Requirements for water supply

The water treatment/recirculation system shall be designed in a way where all additional water is filtered before it enters a water body where patrons may have contact through interaction or use e.g. swimming, leisure or free-play. This requirement does not apply to balance or holding tanks that patrons do not have general access or contact with.

The water supply for all water features shall consist of filtered, disinfected water obtained from the return side of the filtration system. This requirement applies to water features such as waterfalls, fountains, mushrooms, or other design features through which water enters an aquatic facility.

It is recommended that high volume water features (water slides, rivers etc) draw their water from a filtered and chlorinated supply. However, if any water is drawn from the balance tank directly into a water feature, then the make-up water entering the balance tank shall be located in a position away from the water feature suction, within the balance tank, and the balance tank water must be maintained at 2 milligrams per litre of free chlorine. The free chlorine levels must be tested every 4 hours, in accordance with Group 1 manual water chemistry sampling requirements.

3.4 Disinfection

The disinfection process involves adding a chemical to the water to destroy micro-organisms and oxidise chemical pollutants. To prevent transmission of infectious diseases, it is essential this process achieves rapid destruction of micro-organisms in the water, without harming the

bathers. It is also necessary to maintain a sufficient residual disinfectant in the water to rapidly destroy any micro-organisms introduced by patrons or other sources.

Chemical disinfection processes are generally centred on a chlorine or bromine compound, as they are the most effective chemicals that can safely be used in an aquatic facility. They may be used in conjunction with a number of other chemicals or processes (such as U.V. or ozone) to improve their efficiency and reduce the creation of disinfection by-products.

3.4.1 General requirements

Aquatic facilities shall be equipped with automatic disinfectant equipment that is capable of maintaining continuous and effective disinfection of the water under all conditions of use.

The equipment shall be capable of maintaining the water chemistry in compliance with the requirements of this Code.

3.4.2 Design and installation requirements

Chemical dosing equipment shall be designed and installed to comply with the following requirements:

- Dosing pumps shall be regulated to accommodate varying supply or back pressures and ensure the feed rate remains constant.
- Control systems with graduated and clearly marked dosage adjustments shall be provided, which are capable of providing flows from full capacity to 10% of such capacity.
- Chemicals shall not feed into the water if the pumping equipment or power supply fails.
- Operation of the system shall cease if there is inadequate flow of water through the filtration system that would prevent the chemicals from being properly dispersed throughout the aquatic facility water body.
- Water shall not be permitted to siphon from the recirculation system to the water treatment solution container. Water treatment chemicals shall not be permitted to siphon from the solution container into the water body.
- Make-up water supply lines installed on chemical solution feeder tanks shall have an air gap or other back- flow prevention device.

3.5 Positioning of injection points

Uncovered gravity sand filters shall have the disinfectant injection point located prior to the filter.

All other filtration systems may have the disinfectant injection point located either prior to, or after, the filters.

3.6 Special requirements for electrolytic salt chlorinators

A by-product of this process is the production of hydrogen gas (which could accumulate in a pressure filter). Electrolytic salt chlorinators shall only be installed downstream of pressure filters.

Electrolytic salt chlorinators shall be electrically linked to the main circulating pump to prevent the chlorinator operating when the main circulating pump is switched off.

Where the electrolytic salt cells are not designed to be located above the filter vessel, gas detectors shall be fitted that will terminate the operation of the chlorinator in the event of a hydrogen gas build-up.

As an electrolytic salt chlorinator may not respond to instantaneous chlorine demand, a back-up automatic chlorine system should be installed using gas, liquid or granular chlorine.

3.7 Specific requirements for ozone disinfection systems

Facilities equipped with ozone water treatment systems shall comply with the requirements in Appendix 4 of this code.

3.8 Water heating systems

All water heating systems shall comply with the provisions detailed in Appendix 3 of this code.

3.9 Explanatory notes to section 3

From Table 5 – water body parameters by category chart

Category	Maximum peak bather loading (persons/m^2)	Minimum water allowance per t/over (m^3/person/turnover)	Maximum daily bather load (persons/m^3)	Maximum sand filter flow rate (L/min/m^2)	Maximum D.E filter flow rate (L/min/m^2)	Maximum cartridge filter flow rate (L/min/m^2)
1	1 person/ 1.0m2	10.0	9.6	400	60	12
2	1 person/ 2.0m2	8.0	6.0	400	60	12
3	1 person/ 2.0m2	7.0	3.4	400	60	12
4	1 person/ 2.5m2	6.0	3.0	600	80	15
5	1 person/ 2.5m2	5.4	2.2	600	80	15
6	1 person/ 2.5m2	5.0	1.9	600	80	15
7	1 person/ 3.5m2	4.8	1.4	600	80	15
8	1 person/ 3.5m2	4.8	1.0	600	80	15

The above chart specifies maximum filter flow rates for aquatic facility water treatment systems. It is the maximum rate where the water can flow through the filtration medium. Higher bather loadings (number of patrons in the water) produce higher levels of contamination in the water, such as fats, oils and other bodily wastes. To effectively remove these contaminants the water must pass through the filtration medium at a slower rate.

The chart prescribes eight levels of filter flow rates, for varying bather loading levels. The bather loadings are linked to the facility classifications prescribed in the Table 4 – water body loading category chart.

Bather loading levels are prescribed using a maximum peak bather loading and a maximum daily bather loading.

The maximum peak bather loading is prescribed in column 2 of the table, expressed as persons per m^2 of the surface of the water body. This can also be described as the instantaneous bather load and represents the maximum number of people who may use the aquatic facility water body at any one time. The ratios alter according to the category of facility (as defined by table 4) and the usual water body depths.

Column 3 is the minimum water allowance per turnover and corresponds to the maximum number of people permitted in the water body in a 24-hour period. This loading is calculated from the volume of treated water per day, divided by a volumetric allowance per bather. The volumetric allowance varies with the Category selection and a depth factor. This is expressed in volume (m^3) of treated water per turnover, per person, per day.

Column 4 translates this concept into a maximum daily bather load. This value is the maximum number of patrons allowed in the water body per m^3 of water per day.

Columns 5-7 provide the maximum permissible filtration rate for each category of facility, for the three commonly used filter technologies. The value is expressed in litres per minute, per m^2 of filter bed surface area.

It should be noted that these are the maximum rates permissible. Lower filter flow rates may be stipulated by the aquatic engineer, as determined by the anticipated bather loading and water quality requirements. The turnover rates stipulated in Table 4 must be maintained at all times.

Example 1

Water body dimensions:

Area: 250m^2 depth: 1.0m volume: 250m^3

Scenario A: Heated water, indoor pool, medium bather load, fairly shallow water

Category 5*:* maximum permissible turnover time 2 hr = 125m^3/hr

Instant bather load 250m^2 @ 2.5 m^2 per person = 100 persons instantaneous load

Maximum daily bather load:

- turnover = 125m^3/hr x 24 = 3000m^3/24hr
- allowance = 5.4m^3/person/24hrs. 555 persons per day

Scenario B: The facility proponent requires capacity to deal with a higher daily bather load (650 Persons/day)

Instant bather remains at: 100 persons instantaneous load

Maximum daily bather load: 650 persons per day

Turnover required = 650 x 5.4 = 3510m^3/24hrs
= 146m^3/hr 1.17hr turnover required (1hr 10mins)

This must be allowed for in design and application. A Category 4 with a turnover of 1.5hrs would allow 667 persons per day applies in this situation.

Scenario C*:* The facility is designed and built for an instantaneous load of 100 persons, and a daily bather load of 555 persons per day, but regularly has bather loads of 650 persons per day.

The facility owner will be required to decrease the turnover time as in Scenario B or limit the number of patrons to 555 per day.

Note: In all cases, the instantaneous bather load remains sacrosanct in design and operation.

Example 2

Water body dimensions:

Area: 500m^2 depth: 0.6m volume: 300m^3

Scenario A: Heated water, indoor pool, heavy bather load, shallow water

Category 3: Maximum permissible turnover time 1 hr = 300m^3/hr

Instant bather load 500m^2 @ 2.0m^2 per person = 250 persons instantaneous load

Maximum daily bather load

- Turnover = 300m^3/hr x 24 = 7200m^3/24hr
- Allowance = 7.0m^3/persons/24hrs: 1028 persons per day

Scenario B: Same pool size but unheated outdoor pool, heavy bather load, shallow water

Category 4: Maximum permissible turnover time 1.5 hr = 200m^3/hr

Instant bather load 500m^2 @ 2.5m^2 per person = 200 persons instantaneous load

Maximum daily bather load

- Turnover = 200m^3/hr x 24 = 4800m^3/24hr
- Allowance = 6.0m^3/persons/24hrs 800 persons per day

Scenario C: Same pool size but unheated outdoor pool, light bather load, shallow water

Category 5: Maximum permissible turnover time 2.0 hr = 150m^3/hr

Instant bather load 500m^2 @ 2.5m^2 per person = 200 persons instantaneous load

Maximum daily bather load

- Turnover = 150m^3/hr x 24 = 3600m^3/24hr
- Allowance = 5.0m^3/persons/24hrs 667 persons per day

Note: For Scenario A (Category 3) the flow rate through the filter(s) must also be slower.

Section 4 – chemical safety

All chemicals used to treat aquatic facility water can be hazardous, if not handled and stored properly.

Disinfectants are designed to kill micro-organisms, and in concentrated form they can be hazardous to staff and patrons.

A number of the chemicals are incompatible and can react if mixed together. The manufacturers' safety data sheet is a useful source of information on the storage, handling and use of chemicals.

Personnel involved in the purchasing, storage and/or handling of chlorine gas shall be authorised by the legal occupier of the installation and be appropriately trained, in the specific tasks to be performed in accordance with AS 2927:2019.

4.1 Chlorine gas and chemical storage

Aquatic facilities are advised of the need to comply with the *Dangerous Goods Safety Act 2004* (WA), and the Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007 (WA), which are administered by the Department of Mines, Industry Regulation and Safety.

Section 5 – water quality and testing

Maintaining water quality is a fundamental role in operating an aquatic facility. The objectives of an operator should be to:

- Ensure the water is properly disinfected at all times, to prevent transmission of infectious diseases.
- Achieve maximum patron comfort.
- Maximise longevity of the facility structure.

Whenever an aquatic facility is available for use, the water needs to contain an adequate level of a chemical that can destroy micro-organisms. By far the most common chemical used for disinfection is chlorine. This material has the advantages of being a relatively low cost, highly effective disinfectant that is readily available.

However, chlorine is also a highly reactive chemical, which non-selectively combines with nitrogen-rich pollutants in the water to produce unwanted chemicals known as chloramines. These give the water a characteristic pungent chlorine-like smell, and irritate the eyes and skin of patrons.

Chloramines are also known to be less effective disinfectants than free chlorine. High concentrations of chloramines reduce the overall effectiveness of the chlorination process.

The chloramine problem is generally worse in heavily patronised facilities, where patrons add large amounts of urea and other nitrogen-rich bodily wastes to the water.

A number of technologies are now available to reduce the levels of chloramines in water. Examples include the use of ozone gas, ultraviolet light irradiation, and the addition of non-chlorine oxidising chemicals to the water. The use of these technologies should be considered for indoor aquatic facilities with significant bather numbers.

Chlorine also undergoes significant degradation when exposed to sunlight. The degradation is caused by the ultraviolet light component of sunlight, and can be reduced by adding cyanuric acid to the water. This chemical binds to chlorine and shields it from the ultraviolet light.

A number of studies have been performed on cyanuric acid. Some suggest the chemical decreases the effectiveness of chlorine, and therefore increases the disinfection time. To compensate for this effect, cyanuric acid needs to be maintained within a specific concentration range and used in conjunction with higher levels of chlorine.

Techniques for measuring chlorine levels in water are well established. A variety of colorimetric techniques are available, which use reagents and a comparator or photometer.

However, chlorine and pH levels alone are an insufficient measure of the efficacy of the disinfection process. The efficacy is determined by the activity level of the chlorine, which can be affected by a number of other factors.

The activity level of chlorine is measured by its oxidative capacity, otherwise known as the oxidation reduction potential. This parameter indicates the combined effect of all oxidising materials in the water, and is expressed in millivolts.

Systems which monitor the oxidation reduction potential and pH are becoming widespread in the aquatic industry as they provide operators with the ability to automatically control the water chemistry.

Some indoor facilities choose to use bromine disinfectants in place of chlorine. Bromine compounds possess a number of desirable properties, including:

- Reduced breakdown of the disinfectant at higher water temperatures (heated facilities).
- Increased effectiveness of the sanitiser in water with high levels of organic contamination (produced by high bather loadings).
- Reduced patron irritation from sanitiser by-products (bromamines are less irritating than chloramines).

Bromine is most commonly used in solid form as the chemical Bromo-chloro-dimethylhydantoin (BCDMH). The bromine and chlorine components of this substance eventually degrade to inactive bromide and chloride however, the dimethylhydantoin (DMH) component does not break down and accumulates in the water. Elevated levels of DMH are believed to produce skin irritation problems in patrons and can only be reduced by dilution with fresh water on a volume by volume basis.

Bromine is not suitable for use in outdoor facilities as it cannot be stabilised against ultraviolet light degradation.

The effectiveness of chlorine and other disinfectants is largely influenced by the pH of the water. Both chlorine and bromine lose their disinfection and oxidation capacity at higher pH levels. To ensure disinfectants achieve maximum effectiveness, it is critical that the pH of the water is maintained within a defined range.

The addition of disinfectants, which can be strongly acidic or strongly alkaline, changes the pH. Fluctuations in the pH levels can be minimised if correct alkalinity levels are maintained. The alkalinity is a measure of the ability of the water to resist changes in pH.

The appropriate alkalinity level will depend upon the type of disinfection system used and the material used to construct the water body.

The chemicals used to disinfect the water and adjust the pH ultimately break down to produce salt. Unless the salt level is diluted, by emptying a sufficient volume and refilling with fresh water, the salinity level will gradually rise.

The total dissolved solids level (TDS) is a measure of the total quantity of salts dissolved in the water. It is advisable to prevent excessively high TDS levels from accumulating as they may result in accelerated corrosion of metal components within the water bodies.

In addition to water chemistry, it is important to ensure physical water quality parameters are maintained.

Water clarity is often the first feature patrons notice when entering an aquatic facility. Apart from its effect on aesthetic quality, water clarity is also an important factor in providing a safe environment. Excessive levels of turbidity in water can reduce the ability of lifeguards to detect submerged patrons. The particles that produce turbidity also reduce the efficiency of the water disinfection process, by shielding micro-organisms from direct contact with disinfectants. A variety of methods are available to control turbidity levels.

Many aquatic facilities use water heating systems to facilitate patron comfort and enable the facility to be used throughout the colder months. The most appropriate operating temperature will depend on the type of facility.

Warmer temperatures are generally appropriate for facilities used for less strenuous activities such as hydrotherapy pools and spa pools, whilst lower temperatures are generally appropriate for facilities used for vigorous exercise, such as swimming training.

Higher water temperatures can cause patron discomfort, increasing perspiration and elevating levels of contamination in the water. If an aquatic facility is operated with excessively high water

temperatures, and patrons stay in the water for long periods, they may suffer an elevation in body temperature. This can have serious consequences. As it is difficult to control the time patrons spend in the water, it is important to ensure water temperatures do not exceed certain limits.

It is important to regularly check the chemical and physical properties of aquatic facility water and make adjustments where necessary. This will ensure the filtration and disinfection system is functioning correctly and patrons are provided with maximum levels of hygiene and comfort.

5.1 Chemical water standards

The water chemistry shall be maintained in accordance with the requirements of Table 6.

5.1.1 Free chlorine levels

Table 6 - minimum free chlorine levels

	Minimum free chlorine levels (milligrams per litre)	
	Water temperature less than 26°C.	**Water temperature greater than 26°C.**
Unstabilised pools where cyanuric acid is not used.	1.0	2.0
Stabilised pools where cyanuric acid is used.	2.0	3.0
Hydrotherapy pools, spa pools and wading pools.	3.0	

As an alternative to complying with this requirement, indoor facilities may comply with the free bromine levels specified in Section 5.1.4 – free bromine levels of this section.

5.1.2 Combined chlorine levels

It is recommended that facilities be operated with combined chlorine levels no greater than 30 per cent of the free chlorine levels.

5.1.3 Maximum chlorine levels

Total chlorine levels shall be no greater than 8 milligrams per litre whilst a facility is in use.

5.1.4 Free bromine levels

Facilities electing to use bromine sanitisers shall ensure the water complies with the requirements of Table 7.

Table 7 – minimum free bromine levels

	Minimum free bromine levels (milligrams per litre)	
Type of facility	**Water temperature less than 26°C.**	**Water temperature greater than 26°C.**
Swimming pools, wave pools, water slide receiving pools	2.0	4.0
Hydrotherapy pools, spa pools and wading pools	4.0	6.0

Facilities using bromine as a sanitiser shall keep the DMH levels no greater than 200 milligrams per litre.

5.1.5 pH

The pH shall be maintained within the range 7.2 – 7.8, except where bromine is used as a sanitiser wherein, the pH shall be maintained within the range 7.2 – 8.0.

5.1.6 Cyanuric acid

Where cyanuric acid is used, it is recommended to be maintained between 20 and 50 milligrams per litre and no more than 100 milligrams per litre. Trained technical operators should seek industry advice to manage the level of cyanuric acid in swimming pool water.

5.1.7 Alkalinity

The alkalinity shall be maintained within the range 60 – 200 milligrams per litre.

5.1.8 Calcium hardness

The calcium hardness shall be maintained within the range 50 – 400 milligrams per litre.

5.1.9 Total dissolved solids

It is recommended that the total dissolved solids (TDS) level be maintained at no more than 1000 milligrams per litre above the TDS level of the supply water, to an absolute maximum of 3000 milligrams per litre.

Facilities using saltwater chlorination units shall be maintained with the TDS level in the range specified by the chlorination unit manufacturer.

5.1.10 Water balance

It is recommended that operators ensure water is balanced in accordance with the Langelier Saturation Index, Taylor Index or other appropriate saturation index. Information on water balance is contained in Appendix 7 of this code.

5.2 Physical water standards

Aquatic facility water needs to be maintained to appropriate physical standards, to provide patrons with a comfortable and safe environment, and to ensure the disinfection process works efficiently.

5.2.1 Water clarity

Aquatic facility water shall be maintained to a level of clarity that will allow a Secchi disk 150mm in diameter to be placed on the bottom of the deepest part of the water body and be visible when viewed from the concourse at a distance of 9 metres.

Whenever a facility is open for use the water shall have sufficient clarity to enable lifeguards to see a submerged patron on the bottom of the water body.

This requirement shall be applied to measurements conducted on waterslide landing pools without the flume water flow operating.

5.2.2 Maximum water temperatures

Aquatic facility water bodies shall not be heated above 38°C.

5.3 Microbiological water standards

All aquatic facility water shall be maintained in accordance with the microbiological requirements of Table 8.

All make-up water used in aquatic facilities shall also comply with this requirement.

Table 8 – microbiological water standards

Control strategies for the presence of microbiological contamination of aquatic water bodies

Type of organism	Maximum count allowable	Required control strategy
Escherichia coli (E. coli) (All aquatic water bodies) (Presence of *E. coli* indicates faecal contamination of human	< 1 cfu/100mL	• Maintain code chemical requirements and continue monthly monitoring.
	≥ 1 cfu/100mL	• Close water body to patrons. • Super-chlorinate to 10mg/L for 8 hours. • Return chlorine to compliant operational range and then water body may be reopened. • Repeat microbiological testing.
Presumptive Pseudomonas aeruginosa (All aquatic water bodies with an operational temperature of 32°C or greater)	< 1 cfu/100mL	• Maintain code chemical requirements and continue monthly monitoring.
	≥ 1 cfu/100mL	• Close water body to patrons. • Gently clean internal water body walls and super-chlorinate to 10mg/L for 8 hours. • Return chlorine to compliant operational range and then water body may be reopened. • Repeat microbiological testing.
Thermophilic Naegleria (All aquatic water bodies) (Where thermophilic Naegleria is detected, the aquatic water body should immediately be closed and begin remediation actions).	Not detected	• Maintain code chemical requirements and continue monthly monitoring.
	Detected	• Close water body to patrons. • Super-chlorinate to 10mg/L for 8 hours. • Collect and submit follow-up water body samples to the laboratory. • When results are available and have been endorsed as satisfactory by the Local Government Authorised Officer, the water body may be reopened.

Notes to Table 8

Water samples from backwash, source water, balance tank/s and more than one sampling point in a single water body are no longer required unless an investigation is underway.

Chemical parameters for all water body testing shall include chlorine (or bromine), pH and temperature and shall be read in decimal e.g. 2.00, 2.05. Do not use symbols > or < with numbers or decimals.

Where new and existing water bodies (e.g. water spray grounds/interactive water features, pools, spas etc) are tested and have satisfactory results in accordance with Table 8, the water body may open with the approval of the Local Government Authorised Officer following the written approval of the CHO (new facilities only).

In the event of detection of any pathogenic micro-organism in an aquatic facility water body, remedial action must be undertaken.

Where thermophilic *Naegleria* is detected, the water body is to remain closed until all laboratory results comply with the code. An Environmental Health Officer and trained technical operator shall investigate the problem and review the water treatment program.

Remedial action is not mandatory when thermophilic amoeba (but not *Naegleria*) is detected. However, the presence of thermophilic amoeba may indicate that conditions are conducive to the growth of *Naegleria.* Super-chlorination may be conducted at the discretion of the technical operator.

Ongoing detection of *Escherichia coli,* Presumptive *Pseudomonas aeruginosa* or any detection of Thermophilic *Naegleria* warrants investigation by the facilities nominated technical operator.

Spa pools should be replenished by 100 per cent water volume every 4 weeks or 25 per cent of water by volume each week.

A refilled spa pool may be used providing it is within the code's chemical requirements.

5.4 Chemical water testing

Whenever an aquatic facility is open for use, the water chemistry shall be manually tested prior to opening and then on a regular basis, as specified below.

Operators shall undertake manual collection and testing of the aquatic facility's water chemistry at the required daily frequency using the approved manual water chemistry test kit. Under no circumstances are readings taken from automatic chemical controller gauges an acceptable substitute to manual testing.

The water testing shall include measurement of the following parameters:

- free chlorine/free bromine
- pH.

The testing shall be performed in accordance with the following minimum frequencies:

- Group 1 facilities – at least once every four hours
- Group 2 facilities – at least three times per day
- Group 3 facilities – at least twice per day
- Group 4 facilities – at least once per day
- Spas shall, in addition to the prescribed aquatic facility minimum frequencies, also include one additional daily test.

All facilities using isocyanuric acid shall perform water tests to measure the concentration of the chemical at least once per week.

Results of all water testing and maintenance procedures shall be recorded, and records kept by the facility for at least two years. The occupier of a facility shall produce the records for examination at the request of an Authorised Officer.

All chemical water tests are to be performed using water testing kits approved by the CHO. Approved testing kits are listed below:

- palintest comparators
- palintest photometers
- lovibond comparators

- lovibond photometers
- laMotte water link spin photometer.

Test kits shall be operated, maintained, and routinely calibrated in accordance with manufacturer's directions/user manual.

Test kit reagents shall be stored in accordance with manufacturers' directions and discarded upon reaching their expiry date.

Chemical water testing – dilution ratios

The dilution ratios to determine 20mg/L of free chlorine using water chemistry testing kits, assuming that the range of measurement for water chemistry testing kits facilitates up to 5mg/L, can be determined by using the following procedure:

Water testing method

1. Using a clean plastic bucket or jug (recommend rinse with distilled water before use) collect approximately 1– 2L of water from the pool.
2. Pour 250mL of the collected pool water into a second clean 1– 1.5L measuring container.
3. Pour 750mL of distilled water into the 250mL container of pool water.

Note: This dilution ratio will enable the measurement of free and total chlorine levels up to **20mg/L** to be obtained.

4. Mix water gently with a clean stirring implement for approximately 30 seconds – 1 minute.
5. Using pool water chemistry test kit sample vials, collect 10mL from the 1L mixture of pool-distilled water.
6. Add reagents and obtain measurements/readings as required.
7. Multiply the measured value by four to get the actual total and free chlorine levels.
8. If measurements do not register, it is likely measurements/readings are off the scale. Repeat the procedure again using either reduced (1:2), or increased (1:4) dilution rations to determine actual free and total chlorine levels.

Note: Alternative quantities of water and/or ratios can be used when mixing pool water with distilled water. Please refer to the table below for suggested ratios and quantities.

Ratios/ measurement range	Volume of pool water (mL)	Volume of distilled water (mL)
1:4 Measures up to 25mg/L	200	800
	250	1000
1:3 Measures up to 20m/L	200	600
	250	750
1:2 Measures up to 15mg/L	200	400
	250	500

1:1 Measures up to 10mg/L	200	200
	250	250

5.5 Off-season periods – water quality maintenance

During the off-season, whilst an aquatic facility is not in use, operators shall ensure water clarity is maintained and algal growth prevented.

Signage must be displayed at all entry points into aquatic facilities, clearly stating that the facility is closed for the winter, or words to similar effect regarding off-season closure.

Aquatic facilities shall receive sufficient maintenance to ensure they do not give off objectionable odours, become a breeding ground for insects, or create any other nuisance or safety hazards.

Maintenance of other water quality parameters is not required during the off-season.

At the end of an off-season period, occupiers shall seek approval from the environmental health service of the local government where the aquatic facility is located, prior to a facility being re-opened for use.

Section 6 – qualification requirements for aquatic facility operators, supervisors and emergency care personnel

This section defines management requirements for operation, supervision and emergency care using the aquatic facility classification defined in Section 1.

Aquatic facilities vary in their size, design, and patron characteristics. It is essential that aquatic facility management and staff possess qualifications and skills that enable them to effectively operate the facility, supervise and control users and provide adequate emergency care.

Management is expected to be able to carry out all required tasks, including operation of the filtration plant and equipment, maintaining water quality, general upkeep and maintenance of the facility.

Management is responsible for ensuring the facility implements adequate measures to supervise all patrons. A lifeguard service providing effective supervision of patrons, can prevent drowning, and is essential in higher-risk facilities. It is important that lifeguards hold suitable, current qualifications and skills. Lifeguards must be able to provide supervision at all times, and not be allocated duties that could interfere with their ability to respond immediately to an emergency.

It is also important for higher-risk facilities to have qualified personnel on the premises, who are able to carry out emergency care until the casualty recovers or is transferred to the care of a paramedical or medical professional.

To reduce the risk to bathers, Group 3 and Group 4 facilities that do not provide a lifeguard service are required to implement other measures. This could include providing qualified instructors, controlling patron usage, or informing patrons of the need to arrange their own supervision.

In circumstances where a facility is operated and supervised by one person, that person will need to comply with all the qualification requirements that apply to that facility. In circumstances where a facility is operated and supervised by a team of personnel, the qualification requirements may be satisfied by the collective qualifications held by individual team members.

6.1 Interpretation

All units of competence listed in this section are sourced from the SIS – Sport, Fitness and Recreation Training Package.

References to “approved” shall be construed as meaning “approved by the Chief Health Officer”.

For the purposes of this section of the code, provisions in the Guidelines of Safe Pool Operation incorporating the word “should” shall be construed as mandatory requirements.

6.2 Qualification requirements

6.2.1 Group 1 facilities

The operator of a Group 1 facility shall ensure whenever the facility is open or available for use by the public, personnel are on the premises that hold qualifications in technical operations, patron supervision and emergency care as detailed below.

6.2.1.1 Technical operations

Each technical operator of a Group 1 facility shall have completed an approved training program. An approved training program shall consist of the following units of competency or equivalent:

SISXFAC009	Coordinate facility maintenance
SISCAQU015	Test pool water quality
SISCAQU016	Manage pool water quality
SISCAQU017	Monitor and maintain aquatic facility plant and equipment
BSBWHS308	Participate in WHS hazard identification, risk assessment and risk control processes

Currency of practice will be demonstrated by maintaining accreditation with the Leisure Institute of Western Australia (Aquatics) or an approved equivalent. The accreditation certificate is to remain at the aquatic facility and be made available when requested by an Authorised Officer. The accreditation process will require individuals to meet the following criteria every three years and hold the following:

1. Evidence of successful completion of a recognised pool operators' training course.
2. A current Senior First Aid Certificate or equivalent.
3. A current Pool Lifeguard Award or equivalent.
4. Details of current and past employment in the aquatic industry.
5. Evidence of attendance at two professional development seminars over the three year period.

6.2.1.2 Patron supervision

Group 1 facilities shall be provided with lifeguards who have completed an approved training program. The training program shall consist of the following units of competency or equivalent:

SISCAQU019	Supervise patron safety in aquatic locations
SISCAQU020	Perform water rescues
SISCAQU021	Perform complex water rescues
SISCAQU022	Provide oxygen resuscitation and therapy in an aquatic environment
HLTAID011	Provide First Aid

Currency of practice shall be demonstrated by holding a valid Royal Life Saving Society Australia Pool Lifeguard Award or approved equivalent. This award shall be updated every 12 months.

6.2.1.3 Emergency care

Group 1 facilities shall be provided with emergency care personnel who have completed an approved training program. The training program shall consist of the following unit of competency or equivalent:

HLTAID011	Provide First Aid

Currency of practice shall be demonstrated by holding a valid Senior First Aid Certificate or approved equivalent. This certificate shall be updated every 3 years.

6.2.2 Alternative compliance provisions – Group 1 facilities

6.2.2.1 Existing qualifications

Each technical operator of Group 1 facility who holds qualifications approved prior to the introduction of this code shall be deemed to satisfy the requirements of this Section for the 3 years following the commencement of the code. Such persons shall be required to obtain Leisure Institute of Western Australia (Aquatics) Accreditation or an approved equivalent within 3 years of the commencement of this code.

6.2.2.2 Collective use of staff qualifications

A Group 1 facility operated and supervised by a team of personnel may satisfy the qualification requirements by the collective qualifications held by individual team members.

The operator of such a facility shall ensure sufficient staff members who collectively hold qualifications that satisfy the requirements of this section are on the premises whenever the facility is open or available for use.

6.2.3 Special requirements for waterslides

Waterslide landing pools and flume exits should be supervised by personnel holding emergency care qualifications as listed in 6.2.1.3 above. A competent person should supervise the flume entrance of the waterslide.

6.2.4 Group 2 facilities

The operator of a Group 2 facility shall ensure the facility is operated and maintained by personnel who hold qualifications as detailed in:

- 6.2.4.1 – participant supervision
- 6.4 – alternate supervision arrangements
- 6.2.4.2 – emergency care
- 6.2.7 – technical operations requirements for Group 2, 3 and 4 facilities.

The operator shall ensure that personnel holding qualifications in participant supervision and emergency care are on the premises whenever the facility is open or available for use.

6.2.4.1 Participant supervision

Group 2 facilities shall be provided with program supervisors who have completed an approved training program. The training program shall consist of the following unit of competency or equivalent:

SISCAQU020 Perform water rescues

Currency of practice shall be demonstrated by holding a valid Royal Life Saving Society Australia Aquatic Rescue Award, Swimming Teacher Rescue Award, or approved equivalents or higher qualification. This qualification shall be re-assessed annually.

6.2.4.2 Emergency care

Group 2 facilities shall be provided with emergency care personnel who have completed an approved training program. The training program shall consist of the following unit of competency or equivalent:

HLTAID011 Provide First Aid

Currency of practice shall be demonstrated by holding a valid Senior First Aid Certificate or approved equivalent or higher qualification. This certificate shall be updated every 3 years.

6.2.5 Group 3 facilities

The operator of a Group 3 facility shall ensure the facility is operated and maintained by personnel who hold qualifications as detailed in:

- 6.2.5.1 – patron rescue
- 6.2.5.2 – emergency care
- 6.2.7 – technical operations requirements for Group 2, 3 and 4 facilities

As an alternative to qualifications in patron rescue and emergency care, the operator of a Group 3 facility may manage their risk and duty of care to patrons by documenting in their operations manual how they are providing the same, or better, health and safety protection to patrons (e.g. only permitting competent swimmers, having personnel with adequate safety or first aid qualifications, placing restrictions on use or behaviour, adult supervision of children who are not competent swimmers, having adequate signage in place such as safety precautions, pool depth and first aid information).

Group 3 qualified rescue and emergency care personnel are not required to provide supervision of patrons at all times.

6.2.5.1 Patron rescue

The operator of a Group 3 facility shall ensure there are personnel who have completed and hold a current approved patron rescue training program. These personnel are not required to be on the premises at all times.

The approved training program shall comprise of any of the following:

1. SISCAQU020 Perform water rescues award or equivalent.
2. National unit of competency or equivalent.
3. Bronze Medallion Award.

Patron rescue requirements shall not apply to Group 3 spa pools.

6.2.5.2 Emergency care

The operator of a Group 3 facility shall ensure there are personnel who hold a current first aid qualification incorporating a national unit of competency:

- HLTAID010 – provide basic emergency life support or equivalent. A higher competency standard is also acceptable.

These personnel are not required to be on the premises at all times.

6.2.6 Group 4 facilities

The operator of a Group 4 facility shall ensure that the facility is operated and maintained by personnel who hold qualifications, as detailed in Section 6.2.7 Technical operator requirements for Group 2, 3 and 4 facilities.

6.2.7 Technical operator requirements for Group 2, 3 and 4 facilities

Operators of Group 2, 3 and 4 facilities are required to ensure the ongoing operation of aquatic facility water quality, plant, and equipment service and maintenance, is completed by, or done under the direction of, a technical operator who has completed an approved training program.

The approved training program shall consist of the following units of competency or equivalent:

SISXFAC009	Coordinate facility maintenance
SISCAQU015	Test pool water quality
SISCAQU016	Manage pool water quality
SISCAQU017	Monitor and maintain aquatic facility plant and equipment
BSBWHS308	Participate in WHS hazard identification, risk assessment and risk control processes

A person other than a technical operator may undertake the required daily manual water chemistry testing of an aquatic facility water body – provided the technical operator, Authorised Officer of the local government of the district, or other equivalently competent person has instructed and shown them how to undertake prescribed manual water chemistry tests.

If a person who is not a technical operator identifies water chemistry levels outside the prescribed parameters, it is recommended that they contact the designated technical operator to obtain relevant instruction necessary to remediate water chemistry parameters as appropriate, or alternatively await remedial technical operator intervention.

It is recommended that as a temporary response aquatic facility personnel display a sign and restrict patrons from entering the aquatic facility or water body if the technical operator is not able to immediately remediate water chemistry problems. This ensures the health of a person who uses the aquatic facility water body is not adversely impacted.

Operators shall record the name and contact details of the nominated technical operator and the nominated person/s to undertake daily water chemistry testing into their facility operations manual and/or log book.

6.3 Evidence of qualifications

Operators of aquatic facilities that are required by this section to provide qualified technical operators or supervisors shall ensure copies of the personnel's qualifications are kept on-site at the aquatic facility. They must be made available when requested by an Authorised Officer.

6.4 Alternative supervision arrangements

This section requires certain aquatic facilities to provide qualified supervisors.

These facilities shall be deemed to comply with these requirements where patrons are taking part in specific aquatic activities, and are supervised by coaches or instructional staff holding qualifications in accordance with provision 12 of Section 7 of this code.

Section 7 – general sanitation and operational requirements

Aquatic facilities are continuously subjected to contamination.

The main source of contamination is material brought into the water by patrons. This includes bodily fluids and solids, urine, nasal mucus, saliva, sweat, hair, skin and faecal matter. Other contaminants include dirt collected on the body before bathing, dirt on patrons' feet from the concourse, unclean bathing costumes, cosmetics, oils, hairspray, lotions and sunscreen.

A variety of contaminants may also be found in the replacement (make-up) water, and in run-off from rainwater and the environment.

Although these materials are pollutants in themselves, they may also be accompanied by a variety of micro-organisms. Some of these micro-organisms may be transmitted to patrons, where they can produce a range of infections. Strategies need to be implemented to minimise the risk of infections from these micro-organisms.

Many pollutants can be removed or inactivated by effective operation of the filtration system, and maintaining appropriate water chemistry and clarity standards.

Implementing patron hygiene and behaviour rules, including exclusion of persons who are unclean or carrying obvious infectious diseases, reduces the amount of contaminants entering the facility.

Regular servicing and maintenance of the water treatment system, along with other equipment and structures, will ensure all equipment is functioning at maximum efficiency.

Structured cleaning programs assist in preventing the build-up of micro-organisms.

Operations manuals provide a useful tool for ensuring aquatic facility operators have access to information required to run a facility. Emergency action plans allow operators to access important information without delay when emergencies arise.

Animals can be a significant source of contamination and are not permitted to enter water bodies.

Automatic cleaners are used to improve cleaning efficiency. Inappropriate use of this equipment can create a number of hazards to aquatic facility patrons.

Exposure of patrons to excessive chemical levels can be prevented by ensuring chemicals are not added directly to water bodies whilst facilities are in use. All chemicals must be added prior to or post-filtration.

Controls need to be developed for the conduct of specific activities, and only staff with appropriate qualifications shall be involved in instruction or coaching to facilitate that activity. Young children are not allowed to enter an aquatic facility unless accompanied by an adult.

Towels and bathing costumes pick up a variety of micro-organisms and other contaminants when used by patrons. Some facilities operate hire services, resulting in towels and bathers being used by a number of patrons. This practice can result in infectious micro-organisms being transferred between patrons. An approved process of cleaning must be implemented to prevent incidences of cross-infection that can result from this practice.

7.1 Cleaning and maintenance requirements

All parts of an aquatic facility shall be maintained in good repair and in a sound working condition. All parts of an aquatic facility shall be maintained in a clean and sanitary condition, free of litter and vermin, to prevent the transmission of infectious disease.

These requirements apply to all parts of an aquatic facility, including associated plant, fixtures and equipment.

7.2 Automatic electric cleaner safety

Automatic electric cleaners shall not be used, or be left in the water, whilst an aquatic facility is open for use.

7.3 Heat blanket safety

Aquatic facilities that use heat blankets shall use them in accordance with the requirements of Guideline GO 1.05 – Pool Covers - 1996 of the Guidelines of Safe Pool Operation. For the purposes of this clause, provisions incorporating the word “should” shall be construed as mandatory requirements.

7.4 Electrical safety

General power outlets installed around the concourse shall not be used to power equipment whilst people are in the water. Electrical equipment powered by mains supply shall only be used on dry surfaces.

Residual current devices, cord extension sets and any portable or mobile electrical equipment shall be tested at six month intervals by an appropriately licensed electrical worker, in accordance with the tests prescribed by AS 3760 – 2022: In-service safety inspection and testing of electrical equipment and RCDs. Where facilities operate on a seasonal basis, only one test is required prior to the start of each season.

Faulty electrical equipment shall be immediately withdrawn from use, or isolated for repair.

7.5 Hand dosing of chemicals

Hand dosing, or the introduction of chemicals directly into the water body, shall not occur when the water body is occupied by patrons/bathers.

7.6 Prohibition of entry into water body

The following people are not to be permitted to enter a water body of an aquatic facility. This includes a person who is:

a) Suffering from any gastrointestinal disease, skin infection or other disease that is communicable in an aquatic environment.
b) In an unclean condition.
c) Wearing unclean clothes.
d) Under the apparent influence of alcohol, drugs or alcohol and drugs.
or
e) A baby or young child who ordinarily wears a nappy – not wearing an aqua nappy.

Subclause (a) does not apply to a person who has a written statement by a medical practitioner to the effect that the person will not be a health hazard to other users of the water body.

7.7 Prohibition of animals

Any animal belonging to a person, under his or her control, is not to be permitted to enter or remain in an aquatic facility. The following exceptions apply:

a) A guide dog.
b) A dog trained to assist the person in activities where hearing is required.
   or
c) Any other animal trained to assist the person to alleviate the effect of a disability the person has.

However, no animal is to be permitted to enter the water body.

7.8 Operations manuals and emergency action plans

7.8.1 Group 1 facilities

Group 1 aquatic facilities shall establish an operations manual and an emergency action plan. The operations manual shall be prepared in accordance with Guideline G01.01- Operation Manuals – 1996, of the Guidelines of Safe Pool Operation.

The emergency action plan shall be prepared in accordance with Guideline G01.02 – Emergency Action Plans – 1996 of the Guidelines of Safe Pool Operation. For the purposes of this section of the code, provisions of the guidelines incorporating the word “should” shall be construed as code requirements.

7.8.2 Group 2, 3 and 4 aquatic facilities

Group 2, 3 and 4 aquatic facilities shall establish an aquatic facility operation manual. The manual shall use a similar format and contain the information as detailed within the example manual in Appendix 10 of this code.

7.9 Minimum entry age

The operator of an aquatic facility shall ensure that children under 10 years of age are not permitted to enter the facility unless under the supervision of a person 16 years or older, in accordance with Guideline SU 1.11 – Parental Supervision - 1996 of the Guidelines of Safe Pool Operation. Waterslides are exempted from complying with 4.2 of this guideline. For the purposes of this clause, provisions incorporating the word “should” shall be construed as mandatory requirements.

7.10 Supervision requirements

For Group 1 facilities, the minimum ratio of supervision shall be 1 lifeguard for up to 100 patrons in the water in accordance with Section 4.4 Ratios contained within Guideline SU 1.01 – Bather Supervision - 1996 of the Guidelines of Safe Pool Operation.

Supervisors of Group 1 and Group 2 facilities shall be located in a position to maintain supervision of the water. Supervisors shall not be assigned duties that would unduly distract them from supervising patrons or program participants at all times, or unduly inhibit their ability to provide immediate assistance to patrons or program participants in distress.

Group 3 and Group 4 facilities are not required to ensure patrons engaging in aquatic activities are supervised.

7.11 Operation of diving facilities and starting platforms

Diving facilities shall be operated in accordance with Guideline SU 1.13 – Supervision of Diving Towers and Springboards - 1996 of the Guidelines of Safe Pool Operation.

Starting platforms shall be operated in accordance with clauses 5.2 and 5.3 of Guideline SU 1.23 Safe Diving for Competitions - 2002 of the Guidelines of Safe Pool Operation.

For the purposes of this clause, provisions incorporating the word “should” shall be construed as mandatory requirements.

7.11.1 Recreational use of starting blocks

Starting blocks located where the water depth is between 1.2m and 2.0m should be removed or isolated for recreational swimming. Isolation should be a physical barrier designed to prevent climbing or misuse of the starting block.

7.12 Qualifications of coaching and instructional staff

The operator of an aquatic facility shall ensure that personnel providing instruction in specific aquatic activities hold an appropriate and approved qualification, as detailed in Table 9.

Table 9 – qualifications of coaching and instructional staff

Aquatic activity	Approved industry standard or approved equivalent
Swimming and water safety instruction	An approved training program consisting of the following units of competency or equivalent: • SISCAQU020 Perform water rescues • SISCAQU023 Plan swimming lessons • SISCAQU024 Teach water familiarisation, buoyancy and mobility skills • SISCAQU025 Teach water safety and survival skills • SISCAQU026 Teach swimming strokes. Or holds a: • Royal Life Saving Instructor of Swimming and Water Safety Certificate. • AUSTSWIM Teacher of Swimming and Water Safety Certificate. or • World Aquatics Certificate.
Competitive swimming coaching	Australian swimming coaching qualification
Platform and springboard diving	Australian diving association coaching qualification
SCUBA diving	Dive instructor qualification from a recreational scuba training organisation
Aqua-exercise	Australian Fitness Association Council Aqua-Exercise Leaders Certification
Hydrotherapy	Registered physiotherapist

7.13 Towel and bathing costume hire

Loan or hire of bathing costumes shall comply with the requirements of the Health (Cloth Materials) Regulations 1985 (WA). These regulations require the items to be subject to an approved process of cleaning between each hire or loan to the public.

Under this code, similar requirements apply to the hire and loan of towels. Towels which are hired or loaned to members of the public shall be subjected to an approved process of cleaning, before each hire or loan to the public.

7.14 Maximum bather numbers

The operator of an aquatic facility shall ensure that the number of patrons in an aquatic facility water body does not exceed the following levels as detailed in Table 10.

Table 10 – maximum bather numbers

Type of facility	Maximum bather numbers at any time (persons/m^2 of water)
Spa pool	1 person/ 1.0m^2
Toddler pool, waterslide splash down pool, leisure pool, hydrotherapy pool	1 person/ 2.0m^2
Learn to swim pool, wave pool, lazy river, school pool, health club pool, strata titled pool, caravan park pool, motel and hotel pool	1 person/ 2.5m^2
50m competition pool, 25m lap pool, diving pool, water polo pool	1 person/ 3.5m^2

Section 8 – requirements for special features

Diving is an inherently dangerous activity that can produce serious injuries if not performed under safe conditions.

Forces sufficient to crush the cervical spine are generated at a water impact speed of only 1.22m/s. Studies have shown that people diving from a 1 metre board can reach water entry velocities of 6.1 to 6.71m/s.

The majority of spinal and head injuries have been found to occur as a result of divers impacting with the bottom of the pool. Therefore, it is important that diving facilities are designed to provide a sufficient depth of water, together with adequate clearance around the diving boards, diving platforms and the water entry zone.

Inexperienced people using unsafe diving techniques have also been associated with a significant number of injuries. Management and supervision play a crucial role in preventing diving injuries.

Moveable booms are used in the aquatic industry as dividing barriers to enable larger pools to be operated as two or more smaller pools. The booms are most commonly used to divide 50 metre pools into two, 25 metre facilities. The devices can present special hazards if improperly designed or constructed.

A number of modern aquatic facilities are being designed with child amusement devices to increase their appeal to families with younger children. Although the devices increase the recreational value of facilities, they can present a number of hazards if not properly designed and constructed. Hazards include possible entrapment and injury to young children, harbouring of micro-organisms, and interference with water circulation systems.

Wave pools are specialised, complex facilities, designed to imitate the wave action found on natural beaches. To provide a safe environment, these facilities need to be designed, constructed and operated under special conditions.

8.1 Diving facilities

Diving pools shall provide a sufficient depth of water to safely break the fall of a diver. The facility shall allow divers to reduce their velocity in a safe manner, to prevent injuries created by excessive deceleration forces.

Diving boards, diving platforms and diving pools shall be designed and constructed in accordance with the requirements in the FINA Facilities Rules 2021-2025.

Access stairways and ladders shall be designed and constructed in accordance with Appendix 5 of this code.

8.2 Moveable booms

Moveable booms shall be designed and constructed in accordance with Guideline FD 7 – Moveable Booms (Bulk Heads) – 2007 of the Guidelines of Safe Pool Operation. For the purposes of this clause of the code, provisions of the guidelines incorporating the word “should” shall be construed as mandatory requirements.

8.3 Child amusement devices – leisure pools

Child amusement devices shall be designed and maintained with smooth, non-toxic, easily cleanable surfaces, and not pose a safety or health hazard to bathers.

The devices shall not interfere with water circulation or disinfection, or obscure supervision of patrons in the water.

8.4 Wave pools

The generation of waves more than 900mm in height shall not continue for more than 15 minutes at a time.

An emergency shut-off system shall be provided for control of the wave action.

An audible warning system shall be provided to alert bathers of the beginning of wave generation.

The facility shall only be used if the main drain is clearly visible from the deck, with the wave generating equipment in operation.

Bathers shall obtain access to the wave pool at the shallow or beach end. Side entry to the wave pool shall be prevented by the use of a fence or other barrier.

Handholds shall be provided at the static water level. These handholds shall be self-draining and installed so their outer edge is flush with the pool wall. The design of the handholds shall ensure that body extremities will not become entangled during wave action.

Step holds and handrails shall be provided at one or more locations along the wall of the wave pool.

The step holds and handrails shall extend down the wall so they will be accessible during wave generation at the lowest water level.

The distance between the handrail and the wall shall not exceed 15mm.

8.5 River rides

River rides are designed to imitate the flow of water found in natural rivers. To provide a safe environment, these facilities need to be designed, constructed and operated under the following conditions:

- Handrails, steps, stairs and booster inlets for river rides shall not protrude into the river feature.
- An approved method of exit shall be provided not less than every 60 metres along the river.
- The design velocity of the water in a river ride shall not exceed 3.2 kilometres per hour.

Section 9 – public spa pools

Public spa pools shall comply with design, construction and operation requirements of AS2610.1: 2007 except where they are otherwise required to comply with this code, as itemised below:

9.1 Applications for construction and final approval

9.1.1 All applications for construction of a spa must be made with a completed application form and contain the required covering letter, schematic, site and other plans with specifications as detailed on the application form cover sheet.

9.1.2 Covering letters must confirm compliance with each item within Section 9.

9.1.3 All applications for construction, and the final approval to use spas, must be accompanied by written certifications from the spa supplier, manufacturer or installer. This must confirm the proposed spa will be, and the finished spa has been, assembled or installed using only compliant components. It must also be constructed to comply with the minimum design and construction requirements of AS2610.1: 2007, except where otherwise required by this code of practice.

9.1.4 Written certifications (where appropriate) are also required before final approval from the electrician, ventilation designer/installer and gas installer.

9.2 Location: when installed indoors

9.2.1 AS2610.1:2007 Section 2.1.3 – the room surfaces shall be of a moisture-impervious finish. Code Section 2.15 – mechanical ventilation shall comply with minimum air change requirements.

9.3 Materials

9.3.1 AS2610.1:2007 Section 2.2 – materials used to comply with.

9.4 Structural design

9.4.1 AS2610.1:2007 Section 2.3 – structural design and installation to comply with.

9.5 Dimensional design

9.5.1 AS2610.1:2007 Section 2.4 – maximum floor depth from waterline 1.1 metres, maximum seat depth 0.6 metre and floor slope max 1:12.

9.5.2 AS2610.1:2007 Section 2.4.3 – hand holds required if wall depth >0.6 metre and no coping edge within 0.3 metre of waterline.

9.5.3 Code Section 2.13.2 – no seats/benches to project >0.6 metre off wall.

9.6 Entry and egress

9.6.1 Code Section 2.13.3 – surface area >10m^2 must have steps, ladders or recessed steps per Section 2.5 of AS2610.1:2007.

9.6.2 Code Section 2.13.3 – If surface area is <10m^2, Section 2.5 of AS2610.1:2007 does not apply, but the entry must be clearly indicated by the presence of handrails per Section 2.19.2 of AS2610.1: 2007.

9.7 Surface finishes

9.7.1 Code Section 2.5 – surface area >10m^2 must have compliant colour finish except when maximum depth <0.8 metre and exclusively for adult use.

9.7.2 Code Section 2.5 – must have smooth, impervious, durable, easily cleanable and non-slip surface and without protrusions.

9.7.3 AS2610.1:2007 Section 2.19.3 – all parts that may be contacted by users are to be finished so as to not provide any physical injury or entanglement hazard.

9.8 Concourse or walkways

9.8.1 AS2610.1:2007 Section 2.6 – a walkway is required for minimum 25 per cent of spa perimeter and not be higher than top of spa or more than 0.6 metre below top of spa. Must have minimum width of 0.6 metre.

9.8.2 AS2610.1:2007 Section 2.6.3 – steps associated with walkways shall have compliant dimensions.

9.8.3 Code Section 2.17 – if the walkway is above ground level, then it must be fitted with balustrade, fence or other to prevent persons falling to lower levels.

9.8.4 Code Section 2.17 – walkways/concourses shall have compliant surfaces and be drained.

9.9 Heating

9.9.1 Code Appendix 3 – all water heating appliances must comply with.

9.9.2 Code Appendix 3 – whole of the gas installation is to comply with the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999.

9.9.3 AS2610.1:2007 Section 2.7.2 – the temperature of spa water must be controlled by use of primary and secondary thermostats to ensure users cannot be exposed to water higher than 38^{o}C and 45^{o}C respectively.

9.10 Electrics and lighting

9.10.1 AS2610.1:2007 Section 2.8.1 – all electrical equipment used in the installation shall comply with AS/NZS 3000 – 2018 for installation and AS/NZS 60335.2.60:2006 for equipment.

9.10.2 AS2610.1:2007 Section 2.8.2 – an emergency stop switch controlling all spa pool pumps, blowers and heaters, shall be provided within 3.0 metres of the spa pool, visible at all times and clearly identified.

9.10.3 Code Section 2.28 – all electrical works to comply with.

9.10.4 Code Section 2.16 – minimum overhead lighting intensity or signage required.

9.10.5 AS2610.1:2007 Section 2.16.2 – air injection systems shall prevent any water backup that could cause electrical shock hazards.

9.11 Water supply

9.11.1 Code Section 3.3.6 – all water must be filtered before entering the spa.

9.12 Outlets, inlets and piping

9.12.1 AS2610.1:2007 Section 2.10 – compliance required.

9.12.2 AS2610.1:2007 Section 2.12(c) – where a skimmer box is used its design shall comply with AS1926.3-2010.

9.12.3 Code Section 3.2.6 – all suction outlet systems to comply with AS1926.3-2010.

9.12.4 AS1926.3-2010: Section 5.1 – each pump connected to minimum of 2 outlets, pipe diameter of all outlets connected to a common line are to be of equal diameter to the common line.

9.12.5 AS2610.1:2007 Section 2.10.2 – pump suction points must be a minimum 0.6 metre apart.

9.13 Circulation, filtration and chemical treatment systems

9.13.1 Code Sections 3.3, 3.4 and 3.5 – must comply with all requirements, including achieving water turnover time of ≤20 minutes and incorporating an automatic chemical controller/disinfection system.

9.13.2 AS2610.1:2007 Section 2.11(c) – shall be designed to allow water to drain from the spa, equipment and piping by removal of plugs, operation of drain valves or by other means.

9.13.3 AS2610.1:2007 Section 2.15 – if pumping/ filter equipment is lower than water level, isolation valves are required.

9.13.4 Code Section 5.4 – must have an approved manual water test kit onsite at all times for daily water chemistry testing.

9.14 Accessibility

9.14.1 Code Section 3.3.4 – equipment to be housed and protected from tampering by unauthorised persons, installed with sufficient access to be regularly inspected and serviced with plant room floors to be graded, non- absorbent and easily cleanable.

9.15 Wastewater disposal

9.15.1 AS 2610.1:2007 Section 2.18 – where filter backwash is required, approval of the backwash disposal method is required from the regulating authority (e.g. local government or Water Corporation).

9.15.2 Code Section 3.34 – where cartridge filters are used, a nominated onsite wash down point is required and must be acceptable/approved of by the regulating authority.

9.15.3 AS2610.1.2007 Section 2.18 – spas require a means for the disposal of 100 per cent water contained within them.

9.15.4 AS2610:2007 Section 2.18.3 – each week they are required to dump/dispose not less than 25 per cent of their total water volume, or more frequently if total dissolved solids (TDS) concentration water rises 1500 mg/L greater than supply water of 3000 mg/L total.

Approval of the spa-dump disposal method is required from the regulating authority (e.g. local Government if onsite or Water Corporation if to sewer).

9.16 Safety equipment

9.16.1 Code Section 2.18 – isolation fencing required per this code and AS1926.1.

9.16.2 AS2610.1:2007 Section 2.19.1 – minimum of 2 depth markings required within 0.4 metre of water edge.

9.16.3 AS2610.1:2007 Section 2.19.4 – spas to be provided with prominent signage notices including spa pool safety rules sign and emergency stop switch sign.

9.16.4 Code Sections 2.22 to 2.25 – required first aid location, equipment and signage.

9.17 Operating procedures

9.17.1 Code Section 7.8 – there is a requirement to establish an aquatic facility operational manual for the facility. Example given at Appendix 10 of code.

9.17.2 Code Sections 5, 6 and 7 – aquatic facilities (including spas) shall be operated in accordance with these sections. These sections detail the ongoing requirements and necessary qualifications for operation of a spa dependant on the facility class/grouping being either 1, 2, 3, or 4. However, in addition to those requirements of the code, the following additional requirement listed below also apply.

9.17.3 AS2610.1:2007 Appendix C (a) – spa equipment shall be kept operating at all times whenever a spa is open for use and shall commence operating a minimum of 1 hour before the first use and continue operating 2 hours after the last use.

Section 10 – special requirements for waterslides

Application

Water slides are amusement devices as defined in Australian Standard AS 3533 – 2009 Amusement rides and devices.

10.1 Structural adequacy

The design of waterslides and all materials used shall comply with structural engineering practices and requirements. Structural engineering certification shall be provided for both the design phase, prior to approval to construct, and also the installation prior to issuing the certificate of compliance.

Waterslides shall be constructed with a durable structure and be capable of carrying loads in excess of the number of persons that would normally be in the flume. The structure shall be capable of sustaining the most adverse combination of loads.

10.2 Flume (slide) design and construction

10.2.1 General considerations

Waterslides shall be designed to ensure maximum safety.

All materials used for construction shall be durable, water resistant, easily cleaned and maintained.

The flume shall be designed to take into account human size, weight and movement to ensure the rider stays within the pre-determined design path of the flume and cannot be thrown out of the flume.

All ‘user contact’ surfaces shall be assembled, arranged and finished smooth to prevent bodily injury or abrasion to the riders.

Flume path design shall have a configuration to ensure that under normal use, rider speeds will be maintained within the intended design range.

The flume exit configuration shall provide the rider with a safe deceleration from the ride speed to zero velocity in the landing area.

All water should be contained within the flume and landing pool area. Where water leakage and ‘splash out’ from the flume and landing pool occurs, suitable drainage and protection from under structure erosion is required.

10.2.2 Curves and turns

The manufacturer shall demonstrate, or provide evidence to illustrate/certify that, the angle of curves and turns has been considered with respect to public health and safety.

Sharp turns in quick succession shall be avoided, especially in conjunction with accelerator drops.

Attention shall be given to location and radius of bends and drops in areas of high speed.

Flumes shall be designed to minimise rider impact with the walls.

Curved portions of the flume shall be banked, so that riders are retained safely inside the flume under all foreseeable circumstances of operation.

All undulations, turns, drops and other configurations shall be provided with smooth transitions to minimise impacts.

10.2.3 Angle of descent

Optimal descent rates shall be in accordance with slide specifications. The manufacturer shall demonstrate, or provide evidence to certify, the angle of descent has been considered with respect to public health and safety.

10.2.4 Speed

The manufacturer shall demonstrate, or provide evidence to certify, the slide speed has been considered with respect to public health and safety.

10.2.5 Tube diameter

The diameter of the tube shall be in accordance with the design criteria of the slide.

The manufacturer shall demonstrate, or provide evidence to r certify, the tube diameter has been considered with respect to public health and safety.

10.2.6 Point of entry

All waterslides shall be equipped with a system to regulate entry of patrons into the flume. Handrails or grip rails shall be designed to reduce risk to the rider, especially to hands or other body parts.

10.2.7 Fibreglass

Where a flume is constructed of fibreglass, it shall be manufactured with a UV stabilised gel coat on the outer tube layer, and an acid-resistant ‘sanitary grade’ gel coat on the inner tube layer.

The gel coat should be an ‘iso NPG’ (pool grade) gel coat.

10.2.8 Drainage

Adequate drainage shall be provided at the base of the structure to ensure that any spillages over the sides of the flume are quickly drained to grass areas or floor drains.

10.3 Flume exit to landing pool

10.3.1 General design

The flume discharge section shall be graded in such a manner to reduce risk to the rider on discharge into the landing pool.

The flume exit shall be designed to minimise risk of injury from riders falling back onto the flume on discharge (e.g. bull nosed lip, rubber compounds, covers etc.).

10.3.2 Point of exit

All flume sections shall be constructed to meet the design performance criteria. The designer shall specify or certify to the approving authority the flume exit section has been considered with respect to public health and safety.

10.3.3 Clearance

The flume shall have adequate clearance from obstructions on each side to prevent rider collisions. Multiple flumes shall have an adequate clearance between flumes.

10.4 Landing pool

10.4.1 General design

The landing pool should be:

- Either a designated or marked-off area (that will reduce risk to the rider or pool user), or preferably, a dedicated pool for water slide use only, whilst the slide is in use.
- Clear of obstructions over the adequate stopping distance of a rider. The stopping distance is to be designated in the slide parameters.
- Free from any pool grates or drains within the landing area.

Exit points from the landing pool shall be clearly marked or labelled.

The internal surfaces of the landing pool shall be smooth, free of sharp edges and slip resistant. Wall and floor junctions shall be rounded to a radius of 150 – 300mm.

Pool coping shall be rounded, and constructed from non-slip materials, enabling them to be used as a hand-hold by riders in the pool.

10.4.2 Wall and floor colour

The colour of wall and floor finishes shall be no darker than the colours listed in Appendix 1, as defined by AS 2700.

Prior to construction commencing, samples of the proposed landing pool colour/s shall be submitted to the appropriate authority for approval.

10.5 Access ladders and stairways

All flume access ladders and stairways shall comply with Appendix 5 of this code.

10.6 Waterslide operation – safe rider speeds

Qualified, competent and other responsible personnel who supervise, or have overall responsibility for a waterslides operation, shall have in place policies and procedures that demonstrate they have considered the following factors influencing rider descent speeds, when supervising, or operating waterslides to ensure their safe operation.

10.6.1 The angle of the flume descent

Increased flume descent angles increase rider speeds.

10.6.2 The quantity of water flow on the flume

Increasing the water flow rate tends to slow larger and heavier riders down, but can have the opposite effect on small children of lesser body weight, thus providing a moderating effect on sliding speed.

10.6.3 Body weight

Body weight has a direct bearing on rider speeds.

- Heavier riders tend to travel faster than lighter riders.
- This factor must be taken into account when determining time intervals between riders entering and exiting the flumes.

10.6.4 The coefficient of friction

The coefficient of friction between the rider and the flume varies with costume types and skin condition.

- Nylon costumes slide well, but baggy cotton shorts can increase friction, slowing the rider down.
- Skin condition has less influence however, the application of excessive sun-tanning oils or similar preparations can decrease the coefficient of friction, increasing rider speeds.
- Children of small build with cotton tee-shirts and shorts may have difficulty in sliding, whereas a large rider of solid build and wearing copious amounts of tanning oil (and nylon costume) can expect a quick ride.

Section 11 – hydrotherapy pools

Application

A pool that is to be constructed or installed for the predominant purpose of physiotherapy or hydrotherapy shall comply with AS 3979 – 2006, Section 2 Design requirements and recommendations. This excludes the following clauses listed below, where the code Section 2 design and construction requirements shall apply.

- 2.1.7 – lighting
- 2.2.4.4 – indicators
- 2.2.6 – concourse drainage and finish
- 3.1.2 – water circulation
- 2.3 – electrical equipment
- 2.4 – pool cleaning equipment
- 2.5 – storage areas.

Section 12 – water spray grounds and interactive water features

Application

Water spray grounds and interactive water features are aquatic facilities and must be issued regulatory approval by the CHO before being constructed and opened for use.

Design, construction and operation requirements of water spray grounds shall comply with the Department of Health (WA) Aquatic Facilities Water Spray Grounds and Interactive Water Features Application, Design and Operating Requirements Environmental Health Guide.

Appendix 1 – approved colours for aquatic facilities

Aquatic facility water body interior surfaces are required to be finished in materials that are no darker than the following colours, as defined in Australian Standard 2700 – Colour standards for general purposes.

Approved colours for water body interiors

N – Grey or Neutral Group

N11	Pearl Grey
N12	Pastel Grey
N14	White

B – Blue Group

B32	Powder Blue
B33	Mist Blue
B35	Pale Blue
B45	Sky Blue

X – Yellow-Red Group

X31	Raffia
X32	Magnolia
X33	Warm White
X34	Driftwood

R – Red Group

R32	Apple Blossom
R33	Ghost Gum
R34	Mushroom Pink
R41	Shell Pink

G – Green Group

G32	Opaline
G42	Glacier
G43	Surf Green
G 45	Chartreuse
G47	Crystal Green

P – Purple Group

P21	Sunset Pink
P31	Dusty Pink
P33	Ribbon Pink

Y – Yellow Group

Y31	Lily Green
Y32	Flummery
Y33	Pale Primrose
Y34	Cream
Y35	Off White
Y45	Manilla

T – Blue-Green Group

No approved colours in this group

Approved colours for contrast strips on step edging

Contrast colours – against background colours approved in Appendix 1 and in accordance with Section 2.13.2 of the code of practice)

1	Y13	Vivid Yellow	46	R62	Venetian Red
2	Y14	Golden Yellow	47	R63	Red Oxide
3	Y15	Sunflower	48	R64	Deep Indian Red
4	Y16	Inca Gold	49	R65	Maroon
5	Y26	Homebush Yellow	50	P11	Magenta
6	Y41	Olive Yellow	51	P12	Purple
7	Y42	Mustard	52	P13	Violet
8	Y51	Bronze Olive	53	P14	Blueberry
9	Y61	Black Olive	54	P22	Cyclamen
10	Y63	Khaki	55	P24	Jacaranda
11	Y66	Mudstone	56	P41	Erica Pink
12	X11	Butterscotch	57	P42	Mulberry
13	X12	Pumpkin	58	P43	Wisteria
14	X13	Marigold	59	P52	Plum
15	X14	Mandarin	60	B11	Rich Blue
16	X15	Orange	61	B12	Royal Blue
17	X24	Rock Melon	62	B13	Navy Blue
18	X41	Buff	63	B14	Sapphire
19	X45	Cinnamon	64	B15	Mid Blue
20	X51	Tan	65	B21	Ultramarine
21	X52	Coffee	66	B22	Homebush Blue
22	X53	Golden Tan	67	B23	Bright Blue
23	X54	Brown	68	B24	Harbour Blue
24	X55	Nut Brown	69	B34	Paradise Blue
25	X61	Wombat	70	B41	Bluebell
26	X62	Dark Earth	71	B42	Purple Blue
27	X63	Iron Bark	72	B43	Grey Blue
28	X64	Chocolate	73	B51	Periwinkle
29	X65	Dark Brown	74	B53	Dark Grey Blue
30	R11	International Orange	75	B55	Storm Blue
31	R12	Scarlet	76	B61	Coral Sea
32	R12	Signal Red	77	B62	Midnight Blue
33	R14	Waratah	78	B64	Charcoal
34	R15	Crimson	79	T11	Tropical Blue
35	R21	Tangerine	80	T12	Diamantia
36	R22	Homebush Red	81	T14	Malachite
37	R23	Lollipop	82	T15	Turquoise

38	R24	Strawberry	83	T22	Oriental Blue
39	R35	Deep Rose	84	T24	Blue Jade
40	R43	Red Dust	85	T44	Blue Gum
41	R45	Ruby	86	T51	Mountain Blue
42	R52	Terracotta	87	T53	Peacock Blue
43	R53	Red Hum	88	T63	Teal
44	R54	Raspberry	89	G11	Bottle Green
45	R55	Claret	90	G12	Holly
91	G13	Emerald	92	G14	Moss Green
93	G15	Rainforest Green	94	G16	Traffic Green
95	G17	Mint Green	96	G21	Jade
97	G23	Shamrock	98	G24	Fern Green
99	G25	Olive	100	G26	Apple Green
101	G27	Homebush Green	102	G31	Verdigris
103	G33	Lettuce	104	G34	Avocado
105	G35	Lime Green	106	G37	Beanstalk
107	G41	Lawn Green	108	G51	Spruce
109	G52	Eucalyptus	110	G54	Mist Green
111	G56	Sage Green	112	G61	Dark Green
113	G62	Rivergum	114	G63	Deep Bronze Green
115	G64	Slate	116	G65	Ti-Tree
117	G66	Environment Green	118	G67	Zucchini
119	N32	Green Grey	120	N42	Storm Grey
121	N43	Pipeline Grey	122	N44	Bridge Grey
123	N45	Koala Grey	124	N52	Mid Grey
125	N53	Blue Grey	126	N54	Basalt
127	N55	Lead Grey	128	N61	Black
129	N63	Pewter	130	N64	Dark Grey
131	N65	Graphite Grey			

The CHO may approve the use of other colours as they are presented to the CHO as part of an aquatic facility approvals application.

Appendix 2 – safety rules signage

Spa pool safety rules

- This spa pool is a heated water environment and if you are concerned that it may adversely affect you it is your responsibility to seek medical advice.
- Children must be supervised in the spa pool area.
- Never put head under water.
- Do not use the spa pool area while under the influence of drugs or alcohol (certain medications may produce adverse effects).
- It is safer not to use the spa pool alone.
- It is recommended that you use the spa pool for no longer than 15 minutes at a time.

Notes:

- Rule 3 should be in red lettering to give it prominence.
- Operators of spa pools should ensure that the notices provided by the supplier are displayed.

Water spray ground and interactive water features safety rules

- Children must be supervised by an adult.
- Surfaces may be hot – please check the surfaces before use.
- Please note: This facility does not operate with drinking water and water is not suitable for drinking.
- Do not climb spray/water feature equipment.
- Pets, smoking and food/beverages not allowed in the spray park.
- Babies and young children who ordinarily wear nappies must wear an aqua-nappy.
- Please clear the area during thunder/lighting storms.
- Spray Park hours: ?:00am – ?:00pm daily

Waterslide safety rules

- Each rider is to immediately leave the waterslide pool on discharge from the flume.
- Tandem riding is only permitted in accordance with the manufacturer's recommendations.
- No person is to cause, suffer or permit rough behaviour or harassment of other persons in the waterslide pool, on the flume, walkways or platforms.
- Glass bottles or other articles containing glass and sharp objects are not to be carried or used within the flume, waterslide pool and its surrounds or the walkways.
- Waterslide riders are not to wear any personal effects such as jewellery, watches or spectacles, which are likely to result in personal injury to the rider, other riders, or cause damage to the waterslide.
- Persons are not to use the waterslide in a manner which will cause bodily injury to other slide riders.
- Persons under the influence of alcohol or drugs are not permitted to use the waterslide.
- Do not ride this waterslide unless your physical health is sound.
- Health authorities warn that it is considered unsafe to use a waterslide:
    - if you are pregnant
    - if you have a limb or back weakness/disability
    - if you suffer from heart ailments
      or
    - if you have any condition which could predispose you to further aggravation of your pre-existing condition or injury.

Management reserves the right to refuse entry to any person at all times, i.e. where the person is under the influence of alcohol, drugs or for any other reason considered to create a potential hazard for that rider or other persons.

Non-compliance with these rules will result in the rider being directed to leave the premises.

Swimming pool and other general safety rules

- Do not enter the facility if suffering from any skin problem, illness or disease that is contagious. Exception (provide a medical certificate – stating not a risk to other patrons)
- Do not enter the water if you have diarrhoea or had gastroenteritis within the last 14 days.
- Children under 10 years of age must be supervised by a person 16 years of age or older at all times.
- Children under the age of 5 must be within reach of their carer at all times.
- Parents or guardians with children under 10 years shall be dressed to enter the water if required.
- Animals under a person's control are not permitted to enter the facility. Exception (guide-dogs etc, however must not enter water)
- Do not enter water if in an unclean condition, or wearing unclean clothes
- Do not enter water if under the influence of alcohol and/or drugs.
- Babies, children and persons suffering incontinence and who ordinarily wear nappies must wear an aqua-nappy when in the waterbody.
- The maximum number of persons permitted in this pool/spa/waterslide at any one time is **.....**
- Use the toilet before entering the pool.
- Do not deposit rubbish, or offensive material e.g. bodily wastes into the water.
- Do not enter water if you have any bleeding or oozing.
- No dive-bombing, running or rough play in the pool.
- No disorderly behaviour.
- No alcohol in the pool area.
- No smoking in the pool area.
- No food or drink allowed in the pool area.
- No glass objects to be taken into the pool area.
- Surfboards, boogie boards or similar, are not allowed in the pool.
- All floating toys and objects are to be removed from the pool after use.
- Do not use soap, detergent or any other substance in the water.
- Remove all rubbish from the pool area.
- Do not climb up, or onto any fence or partition or roof within the pool area.
- For accidents or emergencies CONTACT**.....** PHONE (landline and mobile) **.....**

Appendix 3 – requirements for aquatic water heating systems

All water heating appliances and their installation including electric, gas, heat exchange, heat pump and geothermal types must comply with the relevant standards.

Water heating appliances are to incorporate thermostatic controls to ensure users cannot be exposed to water above 38ºC and they shall be of the type which cannot be adjusted without use of tools.

Water heating installations must not allow unfiltered top-up water to bypass the filtration system before it enters the waterbody.

For gas heating systems, the whole of the gas installation is to comply with the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999. At the completion of the gasfitting work the registered gas fitter is to submit a notice of completion to the gas supplier and to the person for whom the gasfitting work was done.

Solar water heating installations shall incorporate a drainage system and back-flow prevention valves or other arrangement so when solar heating is not in use stagnant water may be drained from the heating system without contaminating the water body.

Warning: The first flush of solar water heaters may exceed 38ºC and therefore has potential to scald water users.

Appendix 4 – requirements for ozone water treatment systems

1. General requirements

Ozone generating equipment shall only be used in conjunction with a free halogen residual, which shall be maintained in the water at all times.

The ozone concentration in the aquatic facility water body shall not exceed 0.1 milligrams per litre.

The operation and maintenance of the ozone generating equipment shall be detailed in the premise's operations manual.

All employees involved in the operation of ozone generating equipment shall be trained in the operation and maintenance of the equipment. Refresher training of ozone equipment operation and maintenance procedures shall be conducted a minimum of once every six months.

2. Design requirements

Ozone generating equipment shall incorporate an approved ozone removal system such as granular activated carbon or thermal decomposition – to reduce the concentration of ozone in the water below 0.1 milligrams per litre, prior to it re-entering the water body.

The water shall be monitored with an ORP meter – which has the capacity to shut-off the ozonator if the ORP reading exceeds 900 millivolts.

The ORP system shall have an operational range of 650 millivolts to 900 millivolts.

The ozone generation system shall be provided with an airflow meter and a device to control the airflow.

The ozone injection system shall operate on a vacuum principle, so that a loss of water flow will interrupt the injection of ozone into the water.

A check valve shall be installed between the ozone generator and the injection point.

The ozone injection point shall be located in the return line after the filtration and heating equipment, prior to the disinfectant injection point. The injection point shall be a minimum of 3 metres from the nearest return inlet.

Ozone mixes, diffusers, or contact chambers shall provide efficient mixing of ozone with the recirculation water.

3. Requirements for ozone plant rooms

The plant room exit doors shall open outwards.

A ventilation system shall be provided, capable of achieving a minimum of three air changes per hour and have a separate automatic emergency ventilation system, with the capacity to provide a minimum of 30 air changes per hour.

Clearly labelled on/off switches shall be located directly outside the plant room, which indicate and control the following:

- emergency ventilation systems
- lighting
- ozone generator.

An audible and visible ozone detection and alarm system shall be located in the room containing the ozone generation equipment that complies with the following requirements:

- The alarm system shall consist of an audible alarm that is capable of producing at least 85 decibels and a visible alarm consisting of a flashing light mounted in plain view of the entrance to the ozone equipment room.
- The ozone sensor shall be located at a height of 1.5 metres above floor level and be capable of measuring ozone in the range of 0.0125 parts per million.
- The system shall activate when the ozone concentration reaches 0.1ppm in the plant room.
- Activation of the alarm system shall shut off the ozone generating equipment and turn on the emergency ventilation system.

A sign shall be posted on the exterior of the entry door, stating “DANGER – GASEOUS OXIDISER – OZONE” in lettering not less than 100mm high.

The ozone equipment room shall not be used for storage of chemicals, solvents or any combustible materials other than those required for the operation of the re-circulation and ozone generating equipment.

Appendix 5 – stairways, ladders and platforms

Requirements for features constructed above ground level (e.g. diving facilities, waterslides)

1. General requirements

The structure is to be designed and constructed to be easily capable of withstanding maximum loadings.

Surfaces of stairways, ladders and platforms which are likely to become wet shall be self-draining and slip resistive.

Surfaces shall be non-abrasive, and suitable for patrons with bare feet.

Guard-railing or balustrades shall be provided as appropriate, to reduce the possibility of falls.

Access to diving boards and platforms higher than 1.0m shall not be provided by vertical ladders. Access to these facilities shall be provided by stairways.

2. Requirements for stairways

Stairways shall have steps with treads at least 280mm wide, and risers not exceeding 180mm in height.

Stairways shall be wide enough to allow easy passage of two riders, with handrails on either side.

Variation between tread dimensions in any flight is not to exceed 5mm.

A tread surface shall be slip resistive.

Surface of every tread shall extend across the full width of stairway.

Gradient of steps shall provide sufficient drainage.

Number of risers shall not exceed 18 in any flight.

A maximum of 36 risers is permitted without a change in direction.

2.1 Landings

Length and width of landings shall be no less than the stairways.

Their minimum vertical clearance shall be 2 metres.

Landings shall be provided with adequate drainage.

They shall be provided with guard-railing and balustrades, to prevent falls.

2.2 Guard-railing and balustrades

Guard-railing and balustrades where provided, shall be to a minimum height of 1.2m.

All guard-railing and balustrades shall be of such design that they will not permit the passage of a 125mm sphere.

Any horizontal or near-horizontal elements between 150mm and 760mm above the floor shall not facilitate climbing.

2.3 Handrails

Stairways shall be provided with handrails on both sides.

Handrails shall have a smooth, continuous top surface.

They shall be parallel to the angle of the slope of the stairway or ladder.

They shall extend at least 900mm above the landing, or alternatively, handgrips shall be provided above the level of the opening.

3. Requirements for ladders

3.1 General requirements

Ladders shall be not less than 450mm wide.

They shall be provided with metal handrails on both sides.

The handrails shall be at least 30mm in diameter.

3.2 Treads

Treads shall have uniform dimensions, such that variations are less than 5mm.

Treads shall be not less than 100mm wide.

They shall be equally spaced, 200 – 250 mm apart.

The top tread shall be level with, and integral with the landing.

Treads shall be slip resistant.

Appendix 6 – slip resistance testing and performance

Aquatic facility surfaces

Table 11 has been adapted from *HB 198 – 2014: Guide to the specification and testing of slip resistance of pedestrian surfaces*.

Column 1 details the range of surfaces commonly associated with aquatic facilities. Surfaces are required to meet the applicable slip resistance category as detailed in column 2 and/or 3.

Surface products should be tested by an accredited laboratory or service provider in accordance with the wet barefoot inclining platform test method detailed in Appendix C of AS 4586:2013 – Slip resistance classification of new pedestrian surface materials.

For in-situ testing, products should be tested by an accredited laboratory or service provider in accordance with the *wet pendulum test method* as detailed in Appendix A of AS 4586.

Table 11 - Aquatic facility surface - Slip resistance performance guide

Aquatic facility surfaces	AS 4586 – slip resistance category	
	Wet barefoot ramp test	Wet pendulum test
▪ Passages that are normally maintained in a dry condition, used by barefoot staff or patrons. ▪ Individual and communal changing and locker rooms. ▪ Water body floors where the water depth is greater than 1.0 metre.	A	P3
▪ Pool surrounds concourse and bulkheads. ▪ Passages that are normally maintained in a wet condition, used by barefoot staff or patrons. ▪ Shower rooms. ▪ Waterside shower facilities. ▪ Water body floors where the water depth is less than 1.0 metre. ▪ Non-swimmer sections of wave-action pools. Lifting platforms. ▪ Toddlers' paddling pools. ▪ Ladders leading into water bodies. ▪ Stairs leading into the water with a maximum width of 1m and handrails on both sides. ▪ Ladders and stairs outside the pool area. Seating and resting steps and benches.	B	P4
▪ Stairs leading into the water, if not classified in Group A or Group B. ▪ Starting platform top surfaces. ▪ Sloping pool edges.	C	P5

Appendix 7 – water balancing

Section 5 of this code recommends that aquatic facility water be correctly balanced.

The concept of water balancing is important, as correctly balanced water will prolong the life of aquatic facility water bodies and their fittings, assist in preventing staining and improve bather comfort.

Unbalanced water can produce a range of problems. These include etching or eroding of water body surfaces and fittings, or alternatively the formation of calcium salt precipitates, also known as scale.

Water balance factors

Water balancing ensures the water in an aquatic facility contains the correct level of dissolved calcium.

The correct level of calcium for a given facility depends upon the level of other materials in the water. Therefore, there is no optimum level of calcium that can be universally applied to all facilities.

The three major factors that affect water balance are calcium hardness, pH and total alkalinity. Temperature also affects the water balance, but to a lesser extent.

The calcium hardness is a measure of the amount of calcium salts present in the water, expressed in milligrams per litre.

The pH is a measure of the relative acid/alkali content of the water. It is measured on a scale from 1 to 14, with 7.0 being neutral. Acid solutions have a pH less than 7.0 whilst alkali solutions have a pH greater than 7.0.

Total alkalinity is a measure of the amount of alkaline salts present in the water, also expressed in milligrams per litre. These salts act to keep the water slightly alkaline, and reduce pH fluctuations when acids are added to the water.

The effect of calcium solubility

Calcium is different to many other materials, as its solubility decreases at higher water temperatures. Calcium solubility also decreases at higher pH and total alkalinity levels.

In general, lower calcium hardness levels are required at higher pH, higher total alkalinity and higher water temperature levels.

Calculating the water balance

The water balance can be calculated using a number of tables or indexes. The following method is known as the Langelier Saturation Index (“SI”).

The formula for the SI is:

$$\mathbf{SI = pH + TF + AF + CF - 12.1}$$

Where:

TF = Temperature Factor **AF** = Alkalinity Factor **CF** = Calcium Factor

The above three factors are obtained by reading off the values from Table 12:

Table 12 – Saturation Index factors

Temp (^{0}C)	TF	Total alkalinity	AF	Calcium hardness	CF
0	0	5	0.7	5	0.3
3	0.1	25	1.4	25	1.0
8	0.2	50	1.7	50	1.3
12	0.3	75	1.9	75	1.5
16	0.4	100	2.0	100	1.6
19	0.5	150	2.2	150	1.8
24	0.6	200	2.3	200	1.9
29	0.7	300	2.5	300	2.1
34	0.8	400	2.6	400	2.3
41	0.9	800	2.9	800	2.5
51	1.0	1000	3.0	1000	2.6

Example

Consider a pool with the following water chemistry levels:

pH: 7.7 **Temperature**: 29ºC **Alkalinity**: 100 mg/L **Calcium hardness**: 200 mg/L

Using Table 12, the following values would be obtained:

- Temperature factor: 0.7
- Alkalinity factor: 2.0
- Calcium Hardness: 1.9

The SI is calculated as:

SI = pH + TF + AF + CF – 12.1

= 7.7 + 0.7 + 2.0 + 1.9 – 12.1

= 0.2

Interpreting the Saturation Index value

The SI value should be maintained between -0.5 and 0.5.

When the SI value is less than -0.5, the water contains insufficient calcium, in relation to the levels of other materials. This may produce corrosion or etching of the facility.

When the SI value is more than 0.5, the water contains excess calcium, in relation to the levels of other materials. This may produce calcium deposits or scaling of the facility.

Adjusting water balance values

The water balance may be adjusted by altering any of the four variables in the above equation. However, as the water temperature is often dictated by patron requirements it is not generally altered to achieve balanced water.

The desired SI value is achieved by adjusting one or more of the pH, alkalinity or calcium hardness values. These parameters may be adjusted using the following methods:

pH

Adding acids to the water either in dry form (sodium bisulphate) or liquid form (hydrochloric/ sulphuric acid) decreases the pH. These materials also decrease the total alkalinity.

Carbon dioxide gas can also be used to decrease the pH, but is a much weaker acid than the above two materials.

Adding alkalis such as sodium bicarbonate or sodium carbonate increases the pH. Sodium carbonate is a much stronger alkali than sodium bicarbonate, and should be used carefully.

Total alkalinity

The total alkalinity is generally increased by adding sodium bicarbonate to the water. Adding acids (as above), decreases the total alkalinity.

Calcium hardness

Calcium hardness is increased by adding calcium chloride to the water. Using calcium-based chlorine disinfectants such as calcium hypochlorite also adds calcium to the water.

The only practical way of lowering calcium hardness is to dilute the material by adding fresh (top-up) water containing a lower level of calcium. Facilities using calcium-based chlorine disinfectants that experience excessive calcium hardness levels can also switch to using non-calcium-based disinfectants.

Appendix 8 – references

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Appendix 9 – acknowledgements

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Appendix 10 – suggested example of aquatic facility operation manual and other risk and emergency management arrangements

Group 2, 3 and 4 aquatic facilities

<table>
<tr><th colspan="7">Water body and operational matters</th></tr>
<tr><td>Aquatic facility
Title and address
(Certificate of compliance and permit to operate must be stored onsite and be available for inspection)</td><td colspan="6">e.g. Group 4 aquatic facility</td></tr>
<tr><td>Local government
contact details</td><td colspan="6">Phone:</td></tr>
<tr><td>Development manager
Name and contact details of person overseeing management of this property and aquatic facility</td><td colspan="6">Name: e.g. Acme Strata Mangement

Contact: e.g.: Phone, fax. email</td></tr>
<tr><td>Water testing persons
Name and contact detail of person/s responsible or nominated for doing the daily water testing/pool cleaning and maintenance and recording of results</td><td colspan="6">Name: Mrs Doreen Jones
Contact details: Unit 28, Sunshine Apartment
Mobile Phone xxxxxxxxxx
Name: Gardener Jack
Contact details: Mobile Phone xxxxxxxxx</td></tr>
<tr><td>Technical operator
Contact details of the qualified technical operator who can be contacted in the event of any water chemistry or other aquatic facility faults</td><td colspan="6">Name: e.g. Robins Pool and Spa Service (Keep copy of their Qualifications onsite)

Contact: e.g.: Phone, Fax. Email</td></tr>
<tr><td rowspan="2">Waterbody id/vol and target parameters
Operating parameter and target water chemical levels e.g.

<u>Outdoor pool</u> <u>74000 ltrs</u>
<u>Indoor pool</u> <u>35000 ltrs</u>
<u>Spa 1 (green)</u> <u>5000 ltrs</u>
<u>Spa 2 (blue)</u> <u>5000</u></td><td>Water tests per day</td><td>Required range free Cl+ ppm</td><td>Required range pH</td><td>Is water heated Y/N</td><td>Stabilizer max. ppm</td><td>Frequency of filter backwash</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Water quality contingencies
Actions in the event water testing reveals the operational parameters are not met</td><td colspan="6">e.g. Water tester will place sign on the water body entrance advising “Closed for use. DO NOT USE” and make immediate contact with the technical operator about the fault for direction on correction procedures necessary.</td></tr>
<tr><td>Opening controls
Opening hours and seasonal use controls</td><td colspan="6">Daylight only, signage identifies hours of operation as “DAYLIGHT USE ONLY”

Pool closed from 1 April – 1 October with “POOL CLOSED” signage placed on all entrances and all entrances locked</td></tr>
<tr><td>Record keeping</td><td colspan="6">Logbook is completed each time water is tested and when filters have been backwashed.
Logbook is stored with the water test kit in the locked storeroom cupboard</td></tr>
</table>

Qualified persons detail As prescribed by Section 6 in the code *(Code of practice for the design, construction, operation, management and maintenance of aquatic facilities)*	
Group 2, 3 and 4 facilities Required technical operator qualifications	*Who is the nominated technical operator for this aquatic facility as prescribed under section 6.2.7 of the code?* *A copy of this person's qualifications must be permanently stored onsite and be available for inspection by an environmental health officer*
Group 2 facilities Required patron supervision, aquatic rescue and emergency care qualifications	*Who holds the qualifications as detailed under section 6.2.4 of the code?* *A copy of this person/s qualifications must be permanently stored onsite and be available for inspection by an environmental health officer*
Group 3 facilities Required aquatic rescue and emergency care qualifications	*Who holds the qualifications as detailed under section 6.2.5 of the code?* *A copy of this person/s qualifications must be permanently stored onsite and be available for inspection by an environmental health officer*
Group 3 **Risk self-management** Alternative to having qualifications	*As an alternative to having personnel qualified in emergency care and aquatic rescue, the code of practice allows an operator of a Class 3 aquatic facility scope to manage their own risk and duty of care to patrons.* *Where the operator of a Class 3 aquatic facility chooses this option, they must detail in their operation manual precisely how risk to patrons and the aquatic facility operator duty of care to patrons is otherwise managed, (e.g. only permitting competent swimmers, having persons with alternative qualifications, placing restrictions on behaviour, adult supervision at all times, having a shallow facility, signage, electronic supervision etc.*
Other risk/emergency management arrangements	
Type of disinfection pH control agent used	e.g. Liquid or gas chlorine, liquid acid, CO_2 gas, soda ash
Material safety data sheets (MSDS) **DOCEP licence qualifications**	Keep copy of MSDS sheets for all chemicals and/or gas onsite at all times. Is staff qualified/trained in accordance with any DOCEP dangerous goods licence?
Likely risk events and responses	Drowning, chemical spillage/escape, mishandling of chemicals, storage faults.
Emergency contacts	

Note: a copy of the operations manual (completed for each aquatic facility) must be permanently stored onsite and be available for inspection on request by an environmental health officer.

Appendix 11 – basic water body filtration and system design performance table

Health (Aquatic Facilities) Regulations 2007

Basic water body filtration and system design performance information (To be completed for each independent plumbing system)	
Location	
Description (swim, spa, etc.)	
Water body volume (m^3)	
Pump make and model	
Number of pumps in use simultaneously	
Filter make and model	
Number of filters in use simultaneously	

Total system performance data		Filters (Clean Condition)	
		Figure	**Units**
Filter resistance - *see note 2*			Meters ☐ / kPa ☐
Plumbing resistance (resistance in pipes)	**+**		Meters ☐ / kPa ☐
Head (kPa or Metres) - *see note 5*	**±**		Meters ☐ / kPa ☐
Total system resistance (combined total of above at total system flow rate) - *see note 3*	**=**		Meters ☐ / kPa ☐
Flow rate (per pump)			L/min
Total system flow rate - *see notes 1 and 2*	=		L/min
Total pool volume			L ☐ / m^3 ☐
Pool turnover rate	=		Mins ☐ / Hrs ☐

Notes:	
1.	Pump manufacturers performance curves with the duty points under clean filter conditions clearly marked thereon must accompany this statement.
2.	Data from the filter manufacturer stating filter area and maximum allowable flow rate must accompany this statement.
3.	The total system flow rate is the flow to be circulated to and from the water body with all pumps operating simultaneously. It must not count stand-by pumps.
4.	System schematic diagram showing the point of chlorination and distances between water body inlets and outlets must accompany this statement
5.	Pressure loss or gain due to vertical separation of pump and water level

Name: _____ Qualifications: _____

Signature: _____ Date: _____

Produced by Environmental Health Directorate

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