

SINGAPORE STANDARD

Code of practice for the design and management of aquatic facilities



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aquatic facilities**

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National Water Safety Council
Singapore Institute of Architects
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Nanyang Technological University

National Environment Agency

National University Hospital

National University of Singapore

Contents

	Page
Foreword _____	8

CLAUSES

Section One – General

1	Scope and normative references _____	9
2	Classification of aquatic facilities _____	10
3	Definitions _____	11

Section Two – Design and construction requirements

4	General structural requirements _____	15
5	Other pools _____	16
6	Construction materials _____	16
7	Surface finishes – Water bodies _____	16
8	Use of sand and earth material _____	16
9	Obstruction and entrapment _____	16
10	Wall slopes _____	17
11	Radius of wall and floor junctions _____	17
12	Floor gradients _____	19
13	Minimum water depths _____	19
14	Depth markings _____	19
15	Access and egress _____	20
16	Ventilation _____	22
17	Lighting _____	22
18	Concourses and walkways _____	23
19	Fencing and security _____	23
20	Separation distances _____	23
21	Sanitary amenities _____	24
22	Backwash water _____	24
23	First aid facilities _____	24
24	First aid equipment _____	25
25	Rescue equipment _____	25
26	Signage _____	25
27	Spectator stands and seating amenities _____	26
28	Shade protection _____	26
29	Electrical safety _____	26
30	Lightning protection _____	26

	Page
Section Three – Circulation and water treatment systems	
31 General requirements _____	27
32 Circulation – Suction and return points _____	28
33 Water treatment _____	30
34 Disinfection _____	32
Section Four – Chemical safety	
35 Chlorine-containing chemicals storage and handling _____	33
36 Safety and security measures _____	33
Section Five – Water quality	
37 Physico-chemical and microbiological parameters _____	36
Section Six – General sanitation and operational requirements	
38 Cleaning and maintenance requirements _____	38
39 Automatic electric cleaner safety _____	39
40 Electrical safety _____	39
41 Hand dosing of chemicals _____	39
42 Prohibition of entry into water body _____	39
43 Prohibition of animals _____	39
44 Operations manuals and emergency action plans _____	40
45 Maximum bather numbers _____	40
46 Aquatic facility operators and staff and safety audits _____	40
Section Seven – Requirements for special features	
47 Diving facilities _____	41
48 Child amusement devices – Leisure pools _____	41
49 Wave pools _____	42
50 River rides _____	42
Section Eight – Public spa pools	
51 Application _____	42
Section Nine – Special requirements for waterslides	
52 Structural adequacy _____	43
53 Flume (slide) design and construction _____	43
54 Flume exit to landing pool _____	44
55 Landing pool _____	45
Section Ten – Hydrotherapy pools	
56 Application _____	46

ANNEXES

A	Slip resistance test and performance _____	47
B	Recommended safety signage for special facilities _____	49
C	Safety audit checklist and recommendations _____	51
D	Requirements for diving facilities – Stairways, ladders and platforms _____	53

TABLES

1	Classification of aquatic facilities _____	11
2	First aid facilities _____	24
3	First aid equipment _____	25
4	Water body loading category chart _____	27
5	Physico-chemical parameter guidelines _____	37
6	Microbiological parameter guidelines _____	37
7	Maximum bather numbers _____	40
A.1	Aquatic facility surface – Slip resistance performance guide _____	47

FIGURES

1	Radius of curvature _____	13
2	Example of protrusion ≤ 10 mm _____	17
3	Example of protrusion ≥ 10 mm _____	17
4	Wall slope for prefabricated pool _____	18
5	Wall slope for non-prefabricated pool _____	19
D.1	Risers in any staircase flight _____	53

Foreword

This Singapore Standard was prepared by the Technical Committee on Architectural Works under the purview of the Building and Construction Standards Committee.

The Code represents a standard of good practice for aquatic facilities with emphasis on the design and management of aquatic facilities.

It aims 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 risks associated with the use of these facilities.

The Code helps to establish a broad standard for engineers, architects, contractors and owners of aquatic facilities, to comply with matters relating to design and management of aquatic facilities. However, due attention shall be given to the requirements of relevant statutory regulations or by-laws of the regulatory authorities or other government bodies.

This standard is based on the Western Australia Code of Practice for the Design, Construction, Operation, Management and Maintenance of Aquatic Facilities (Department of Health 2007).

In preparing this standard, reference was also made to the standards listed in Clause 1.2 – Normative references.

Acknowledgement is made to the Department of Health, Western Australia for the use of information from the Australian Code and to the Singapore Water Safety Council and Council Chairman Dr Teo Ho Pin for their invaluable assistance and support.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions.*
2. *An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR.*
3. *Compliance with a SS or TR does not exempt users from any legal obligations.*

Code of practice for the design and management of aquatic facilities

Section One – General

Aquatic facilities were simply used for activities such as diving, swimming instruction, training or competitions. However, modern aquatic facilities have been established that incorporate a variety of specialised features such as spa pools, river rides, waterslides and hydrotherapy pools. These have contributed to a growth in the popularity of swimming and other water activities for sports, fitness, rehabilitation and recreation.

As such, 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 facility users, as well as provide a high degree of patron comfort in areas of hygiene and aesthetics.

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

These pollutants provide a habitat for 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 capable of quickly and effectively killing disease-causing micro-organisms, to prevent transmission of diseases to other facility users. Also, 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.

1 Scope and normative references

1.1 Scope

This standard specifies the general requirements for the design and construction, installation of equipment, operation, management and maintenance of all aquatic facilities in Singapore. It is intended to ensure the safety, well-being and recreational benefits of facility users, as well as personnel who may become involved in the aforementioned aspects of design, construction, operation, management and maintenance of the aquatic facilities.

However, this general standard should not be used alone. Rather, it should be exercised with good judgment and personal responsibility.

Special care is required in applying this general standard alone to equipment for which no product specific standard has yet been published.

1.2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ANSI/APSP-7, *Suction entrapment avoidance in swimming pools, wading pools, spas, hot tubs and catch basins*

ANSI/ASME A112.19.17, *Manufactured safety vacuum release systems for residential and commercial swimming pool, spas, hot tub and wading pool suction systems*

ASTM F2376-06, *Standard practice for classification, design, manufacture, construction, and operation of water slide systems*

AS 2610.1 : 2007, *Spa pools, Part 1: Public spas*

AS 3760 : 2003, *In-service safety inspection and testing of electrical equipment*

AS 3979 : 1993, *Section 2: Design requirements and recommendations*

BS EN 13451-1:2001, *Swimming pool equipment. General safety requirements and test methods*

CP 5 : 1998, *Code of practice for electrical installations*

CP 33 : 1996, *Code of practice for lightning protection*

CP 84 : 2000, *Code of practice for entry into and safe working in confined spaces*

SS 457 : 2007, *Specification for playground equipment for public use*

SS 485 : 2001, *Slip resistance classification of public pedestrian surface materials*

SS 508 : Part 3 : 2004, *Specification for graphical symbols – Safety colours and safety signs – Safety signs used in workplaces and public areas*

SS 531, *Code of practice for lighting of work places*

SS 538 : 2008, *Code of practice for maintenance of electrical equipment of electrical installations*

Building Control Act (Chapter 29) and Building Control Regulations 2003

National Environment Agency Code of practice on environmental health