



**Saskatchewan
Ministry of
Health**

SWIMMING POOL DESIGN AND OPERATIONAL STANDARDS

July 2012

SWIMMING POOL DESIGN AND OPERATIONAL STANDARDS

Table of Contents

PREAMBLE.....	1
DEFINITIONS	2
SECTION 1 – GENERAL	3
1.1 Introduction	3
1.2 Plan Approval.....	3
1.3 Operating Information	4
1.4 Licence Required	4
1.5 Chemical Handler Certification.....	4
1.6 Lifeguard Certification	4
SECTION 2 - POOL CONSTRUCTION	4
2.1 General	4
2.1.1 Application of Standard	4
2.1.2 Materials.....	5
2.1.3 Basin Design	5
2.1.4 Handhold	5
2.1.5 Play Equipment	6
2.1.6 Pool Slides	6
2.1.6.1 General	6
2.1.6.2 Children Activity Slides.....	6
2.1.6.3 Drop Slides.....	7
2.1.6.4 Flume Water Slides	8
2.1.7 Stairs and Ladders	8
2.1.8 Deck Areas.....	9
2.1.9 Lighting.....	10
2.1.10 Drinking Fountains.....	11
2.1.11 Equipment Room	11
2.1.12 Dressing Room Facilities	11
2.1.13 Washroom Facilities.....	13
2.1.14 Shower Facilities.....	13
2.1.15 Pool Area	14
2.1.16 Gallery	14
2.1.17 Food Concessions	15
2.1.18 Ventilation	15
2.1.19 Fencing/Walls	15
2.2 Swimming Pool	15
2.2.1 Application of Standard	15
2.2.2 Basin Design	15
2.2.3 Diving Boards and Platforms	15
2.2.4 Stairs and Ladders	16
2.2.5 Depth Markings	16
2.3 Paddling Pool.....	17
2.3.1 Application of Standard	17
2.3.2 Basin Design	17
2.3.3 Depth Markings	17

2.4	Water Flume Slide	17
2.4.1	Application of Standard	17
2.4.2	General.....	17
2.4.3	Depth Markings	18
2.4.4	Flume Exit	18
2.4.5	Plunge Pools	19
2.4.6	General Safety	19
2.4.7	Walkways & Steps.....	20
2.5	Wave Pool.....	20
2.5.1	Application of Standard	20
2.5.2	Depth Markings	20
2.5.3	Handholds	21
2.5.4	Stairs and Ladders	21
2.5.5	Safety Line	21
SECTION 3 – POOL RECIRCULATION SYSTEM.....		21
3.1	General	21
3.1.1	Application of Standard	21
3.1.2	Continuous Operation	21
3.1.3	Piping System	22
3.1.4	Outlets.....	22
3.1.5	Anti Entrapment.....	23
3.1.6	Overflow Structures.....	23
3.1.7	Skimmers	23
3.1.8	Perimeter Overflow Channels.....	24
3.1.9	Strainer.....	24
3.1.10	Gauges	24
3.1.11	Filtration.....	24
3.1.12	Rate of Flow Indicators	25
3.1.13	Pool Heat.....	25
3.1.14	Chemical Feeders.....	25
3.1.15	Disinfection Equipment	25
3.1.16	Cross-Connections	26
3.1.17	Vacuum Cleaning Equipment	26
3.1.18	Inlets	26
3.2	Swimming Pool	27
3.2.1	Application of Standard	27
3.2.2	Circulation Capacity	27
3.2.3	Skimmers	27
3.3	Paddling Pool.....	27
3.3.1	Application of Standard	27
3.3.2	Circulation Capacity	27
3.4	Water Flume Slide	27
3.4.1	Application of Standard	27
3.4.2	Circulation Capacity	28
3.4.3	Flume Pumps	28
3.4.4	Skimmers	28
3.4.5	Surge-Free System	28
3.5	Wave Pool.....	29
3.5.1	Application of Standard	29

3.5.2	Circulation Capacity	29
SECTION 4	–POOL OPERATIONAL STANDARDS	29
4.1	General	29
4.1.1	Application of Standard	29
4.1.2	Water Quality Control	29
4.1.2.1	Bacteriological Water Quality	29
4.1.2.2	Combined Chlorine Residual.....	29
4.1.2.3	pH Concentration	30
4.1.2.4	Alkalinity	30
4.1.2.5	Calcium Hardness.....	30
4.1.2.6	Cyanuric Acid	30
4.1.2.7	Testing and Records	30
4.2	Swimming Pools	30
4.2.1	Application of Standard	30
4.2.2	Turnover Rate	30
4.3	Paddling Pools	31
4.3.1	Application of Standard	31
4.3.2	Turnover Rate	31
4.3.3	Fill and Drain Paddling Pools	31
4.4	Water Flume Slides.....	31
4.4.1	Application of Standard	31
4.4.2	Turnover Rate	32
4.5	Wave Pools.....	32
4.5.1	Application of Standard	32
4.5.2	Turnover Rate	32
SECTION 5	– POOL SAFETY	32
5.1	General	32
5.1.1	Application of Standard	32
5.1.2	Maintenance.....	32
5.1.3	Emergency Procedures.....	32
5.1.4	Emergency Telephone and Sign	33
5.1.5	Incident Report Forms.....	33
5.1.6	Safety Rules.....	33
5.2	Swimming Pools	33
5.2.1	Application of Standard	33
5.2.2	Maximum Swimmer Load.....	34
5.3	Water Flume Slides.....	34
5.3.1	Application of Standard	34
5.3.2	Safety Rules	34
5.3.3	Inspection of Flumes	34
5.3.4	Maintenance.....	34
5.4	Wave Pools.....	34
5.4.1	Application of Standard	34
5.4.2	Maximum Swimmer Load.....	35
5.4.3	Warning Buzzer.....	35
APPENDIX A	36
APPENDIX B	37
APPENDIX C	39

PREAMBLE

These standards should be read in conjunction with *The Swimming Pool Regulations, 1999*.

The Saskatchewan Ministry of Health with the assistance of the local health authorities has developed design/operational standards to assist operator/owners of aquatic facilities in meeting the requirements of *The Swimming Pool Regulations, 1999*. While the design/operational standards in themselves should not be considered law, provisions of the standards become legally binding when they are attached as a condition or term of a licence to operate. Consequently, it is expected that all aquatic facilities will be constructed and operated in accordance with the design/operational standards.

The format of the standards is such that all pools covered by the regulations are expected to comply with the applicable pool design/operational standards (Pool Standards, or Whirlpool Standards). Existing swimming pools, water theme facilities and whirlpools which do not meet the design/operational standards may continue to operate provided that the pool is operated in compliance with *The Swimming Pool Regulations, 1999* and that a health hazard does not exist. Alterations to existing pools and equipment are to be carried out in accordance with the standards. It may be necessary for pools intended for competition purposes to be designed to more stringent standards.

When applying this standard, all general sections apply to all type of swimming pools (swimming, wave, water flume slide, and paddling pools) excluding whirlpools. There are also sections specific to a type of pool. Where contradictory requirements result from situations such as a multi-use pool, the most stringent requirement should be applied unless a solution is otherwise specifically mentioned in the standard.

There are several appendixes contained in this standard that are either normative or informative. Normative appendixes form part of the standard, while informative appendixes are only for information. Normative appendixes provide additional detail that explains requirements in the standards. An informative appendixes is intended to provide examples and additional explanation of specific requirements but the details contained are not specifically required.

Judicious use of these standards should result in the provision of bacteriologically and physically safe swimming pools, water theme facilities and whirlpools in this province.

Note: Anyone considering establishing or renovating a public swimming pool should be aware that in addition to the requirements of *The Swimming Pool Regulations, 1999* and accompanying standards, approvals from other ministries, agencies and/or local municipalities may also be required. These approvals may include, but are not limited to building, fire, accessibility, plumbing and sewage disposal.

DEFINITIONS

“Dressing room” means a dressing area that may include washroom facilities and shower facilities.

“Multiple drain” means a minimum of two hydraulically balanced outlets per pump that are inserted into the system so that no outlet can be cut out of the suction line by a valve or other means and with the outermost outlet centers at least 920 cm apart or on different planes.

“Operational time” means the time that the pool is open to the public.

“Public health officer” means an person who is:

- a. certified by the minister pursuant to section 9 of *The Public Health Act, 1994*; or
- b. a member of a class of persons prescribed as public health officers.

“Unblockable drain” includes a suction outlet defined as all components, including the sump and/or body, cover/grate, and hardware such that its perforated (open) area cannot be shadowed by the area of the 18”x23” Body Blocking Element of ASME/ANSI A112.19.8-2007 and that the rated flow the remaining open area (beyond the shadowed portion) cannot create a suction force in excess of the removal force values in Table 1 of that Standard.

Further definitions can be found in *The Swimming Pool Regulations, 1999*.

SECTION 1 – GENERAL

1.1 Introduction

1. In addition to *The Swimming Pool Regulations, 1999*, this design/operational standard applies to any swimming pool governed by the regulations that is not a whirlpool.
2. The standards specify minimum prescriptive standards to be followed when establishing, constructing, extending, renovating, or altering a public swimming pool. However, where supported by sufficient evidence submitted by the proponent, a public health officer may deem an alternative solution as equivalent to the prescriptive requirements provided that:
 - (a) the alternative solution is capable of performing at least as well as the prescribed standard; and,
 - (b) the proponent clearly demonstrates and supports how their proposed alternative will achieve the same outcome(s) as the prescribed standard. An appropriate level of evidence, which may include verification of performance by a qualified professional, is required.

1.2 Plan Approval

1. An application for a licence shall include a site plan and structural, mechanical, and electrical drawings showing complete construction details and, where applicable, shall include the following:
 - (a) the street location, the name of the swimming pool facility and the name and address of the owner;
 - (b) the swimming pool deck elevation relative to the surrounding area;
 - (c) the location of outlets, drains, overflows, inlets, steps and ladders, diving boards, walk areas, lighting fixtures, equipment, dressing room areas and utilities service lines;
 - (d) the source of water supply and the method of waste water disposal;
 - (e) a statement of:
 - i. pool volumes;
 - ii. turnover rate;
 - iii. filtration rate; and,
 - iv. maximum design load.
 - (f) the complete detailed specifications and drawing for the construction of the swimming pool, dressing/shower areas, recirculation system, filtration facilities, disinfection equipment and all appurtenances; and,
 - (g) the type of backflow prevention used on the make up water to avoid cross connection with the public water supply.
2. All plans and specifications for a proposed pool shall be prepared by a professional engineer or architect registered to practice and each drawing is to be duly signed and sealed.

3. The owner shall ensure that the pool and all appurtenances are built in accordance with the plans that were submitted, reviewed by and approved by the public health officer. Any deviation from the approved drawings requires the approval of the public health officer.

1.3 Operating Information

1. Any person who constructs or alters a pool, or dressing room or building used in conjunction with a pool, or who installs any equipment in a pool, dressing room or building shall:
 - (a) furnish the operator with complete operating instructions and drawings; and,
 - (b) in the case of the pool equipment, attach a tag to every drain, valve or other fitting to indicate its function.

1.4 Licence Required

1. A pool is subject to inspection prior to the issuance of a licence and at any other time that a public health officer considers necessary or desirable.

1.5 Chemical Handler Certification

2. No person shall handle, store or use pool chemicals
 - (a) without successfully completing a swimming pool operator's course that is recognized by the public health officer; or,
 - (b) unless they are acting under the direct supervision of a person who has successfully completing a swimming pool operator's course that is recognized by the public health officer.

1.6 Lifeguard Certification

1. Where lifeguards or supervisors are required in the safety plan, pool operators shall maintain proof of certification of all lifeguard and supervisory staff employed at the pool and make these records available to a public health officer upon request.

SECTION 2 - POOL CONSTRUCTION

2.1 General

2.1.1 Application of Standard

1. This section (2.1) applies to wave pools, paddling pools, water flume slide facilities and other swimming pools but not to whirlpools.

2.1.2 Materials

1. Components which come into contact with the water intended for use in swimming pools shall be of a material type that is non-toxic to humans, impervious and enduring.
2. The materials to be used in and around a water theme facility (paddling pool, wave pool or water slide facility) or swimming pool shall be of a type such that the operational strength of the entire assembly and each of its components are not adversely affected by exposure to rain, snow, ice, sunlight, local normal temperature extremes, local wind pressures, expected local air pollution products and the mechanical, electrical and chemical environment in and around the water theme facility or pool.
3. Materials selected for components and accessories used in and around the facilities shall be of a type that all parts with external surfaces and edges, that may come in contact with the user, are assembled, arranged, and finished so that they will not constitute a cutting, pinching, puncturing, or abrasion hazard in casual contact and intended use.

2.1.3 Basin Design

1. The pool basin shall be a watertight structure that has a smooth and easily cleanable surface (excluding structural joints).
2. The sides and bottom of the pool basin shall be light in colour.
3. The radius of curvature between the pool wall and the pool floor shall not exceed 150 millimetres where the water depth is less than 1.5 metres.
4. All side and end walls shall be vertical.
5. The floor of the pool basin shall have a slope towards the main drain(s).
6. The slope of the bottom of the pool where the water is less than 1.5 metres deep shall not be greater than 1:15. This slope shall be uniform.

2.1.4 Handhold

1. Handholds shall be provided:
 - (a) along the length of each wall of the pool; and,
 - (b) placed not more than 230 millimetres above the normal water line.
2. Where an overflow channel is installed in a pool, it may be designed to serve as a handhold.
3. No handhold shall be extended above the top of the wall of the pool on which it is installed.

2.1.5 Play Equipment

1. Before any play equipment is installed, constructed or used in any swimming pool, approval of design and location shall be obtained from a public health officer.
2. Wherever play equipment is installed, specific safety instructions shall be given to all users through the means of posted instructions placed on the equipment.

2.1.6 Pool Slides

2.1.6.1 General

1. All children's activity, drop and other slides used at pools shall be specifically designed and intended for use with a pool, and for the specific application. Slides shall be permitted only where supervision of the slide is incorporated into the safety plan.
2. The construction, dimensions and mechanical attachments of the components of a water slide shall ensure that the surface of the water slide is continuous and smooth throughout its length.
3. Wall thickness of a water slide shall be designed so that the continuous and combined action of hydrostatic, dynamic, and static loads and normal environmental deterioration do not cause structural failure which could result in injury, or continually require repair which would weaken the strength of the original structure.
4. Water slides shall only be installed where the public health officer is satisfied that joints, materials, tunnels, turns, ladders, exit areas, the receiving pool and other associated items of a water slide shall provide a safe environment for the swimmer.
5. The public health officer may approve deviations from the standard with respect to slides when:
 - (a) the standard does not adequately address the specific designs;
 - (b) sufficient information, in the opinion of the public health officer, for evaluating the proposal is submitted; and,
 - (c) in the opinion of the public health officer, the operation of the proposed slide is safe.

2.1.6.2 Children Activity Slides

1. Children's activity slides are small slides with a low exit velocity designed by the manufacturer for use by small children at pools. They shall be designated by the manufacturer for use in 61 cm (24 inches) or less of water and installed accordingly.

2.1.6.3 Drop Slides

1. Drop slides are slides which discharge into a pool with a drop of more than 5 centimeters (2 inches) to the water surface:
 - (a) Slide entry areas shall be designated so the rider is able to properly enter and position him or her self before sliding down the chute. This area shall be a small platform or a less sloped portion of the chute with well placed assist bars.
 - (b) Drop slides shall have handrails on both sides of the ladder and steps. Platforms and landings shall have a 110 centimetres (42 inches) high guard rails, with at least one intermediate-height rail.
 - (c) There shall be a drop slide landing area extending 1.5 metres (5 feet) on either side on the center line of the slide and from the backwall to 6.1 metres (20 feet) in front of the slide terminus. This area shall not infringe on the required landing areas for other drop slides, water flume slides, or diving equipment.
 - (d) The drop slide landing area shall be separated from the rest of the pool in a manner approved by the public health officer. A slide mounted in a separate diving area may be allowed to use the diving area separation as long as access to the diving well is restricted to patrons using slide and diving equipment.
 - (e) The terminus of the chute shall extend beyond the pool wall, and be so oriented that the safety area in front of the slide does not interfere with the safety area of another slide or other pool equipment.
 - (f) The maximum angle of the slide runway at the exit shall be between zero degrees and 11 degrees, measured downward from horizontal.
 - (g) The area in front of the slide terminus outward to 1.8 metres (6 feet) in front of the slide terminus shall have a depth as established from the table below. The slide shall be constructed so that the rider enters the water in this 1.8 metres (6 feet) area. If the depth is 1.5 metres (5 feet) or less, the bottom in this area shall have a maximum slope of 1:12 and the slide shall be located at least 1.5 metres (5 feet) from any change to steeper slope of the pool bottom.

Water depth from the slide terminus to 1.8 m in front of the terminus	Corresponding maximum exit height above the water
1.2 m to 1.5 m (4 to 5 feet)	30 cm (12 inches)
2.4 m (8 feet) minimum	110 cm (42 inches)

- (h) The maximum drop height at the terminus of the slide shall not exceed 110 centimetres (42 inches).
- (i) If water is pumped from a swimming pool to the slide, the pump intake shall be constructed according to the anti-entrapment requirements.
- (j) Slides shall be located and constructed to allow easy supervision. When a slide is not open for use, it shall be secured to prevent access.

- (k) The slide shall have a posted set of rules that include the following:
 - (i.) One rider at a time. Wait until the landing area is clear before entering the slide;
 - (ii.) Slide in a sitting position or on the back only;
 - (iii.) Do not attempt to stop in the slide;
 - (iv.) Leave plunge area immediately;
 - (v.) Warning Water Depth is _____ metres (_____ feet); and,
 - (vi.) Non-swimmers not permitted (if over 1.5 metres deep).

2.1.6.4 Flume Water Slides

1. A water flume slide consists of one or more flumes entering a plunge pool or dedicated plunge area of a multiple use pool at or near the water level. The requirements for water flume slides are listed separately in this standard under the heading of "Water Flume Slide".

2.1.7 Stairs and Ladders

1. Stairs or ladders shall be installed:
 - (a) at the shallow portion of the pool where the vertical distance from the bottom of the pool to the deck or top of the wall is more than 600 millimetres; and,
 - (b) where a pool is more than 9 metres wide, at each side of the pool.
2. A ramp or step shall be continuous in nature and without spaces or gaps between the edge or side, of this ramp or step and the wall of the pool.
3. Recessed steps with grab-rails may be used in place of ladders.
4. Stairs shall be sloped towards the pool to prevent an accumulation of settleable solids.

<i>Recommendation</i>

<i>The stairs should be finished in a manner that will contrast with the pool.</i>
--

5. Treads on steps of ladders and stairs shall not be less than 76 millimetres deep over their full width and have non-slip surfaces. Ladders shall be corrosion-resistant and are to be rigidly installed.
6. There shall be a clearance of not more than 150 millimetres between a ladder and the wall of the pool on which the ladder is installed.
7. All ladders shall be removable.

2.1.8 Deck Areas

1. A deck area shall surround the entire pool.
2. The deck area shall not be less than 1.8 metres in width and provide not less than 0.9 metre of clear passage behind a diving board or any slide or other piece of play equipment and its supporting structure.
3. In pools where the pool floor forms part of the deck (e.g., zero depth or zero beach type pools), the deck shall have a slope away from the pool for a distance of at least 0.6 metre with positive drainage to the recirculation drains. In this area the width of the deck drained to the recirculation drains shall not be greater than 1.8 metres.
4. For pools where recessed gutters or skimmers are used, the deck shall be sloped away from the pool and drained to waste.

Recommendation

A slope of 1:40 is recommended for the deck.

5. All walks, decks and terraces surrounding pools shall be uniformly sloped to drains or points at which the water will have a free unobstructed flow to points of collection.

Recommendation

Deck drains shall be free from obstruction (e.g., benches, lockers) to permit ease of cleaning.

6. The number of deck drains shall be calculated at a rate of 20 square metres of deck surface per drain.
7. Deck surfaces shall be non-slip when wet, sufficiently smooth to facilitate disinfection and shall not create discomfort to bare feet.
8. Where brushed concrete finishes on deck surfaces are used, brushing shall be done toward the drains.
9. Deck surfaces shall not be painted.

Recommendation

The colour and finish of deck surfaces should be selected so as to minimize glare from overhead lighting.

10. Hot water shall be available from the hose bibs for deck cleaning and disinfection.

Recommendation

Hose bibs of not less than 19 millimetres diameter should be located in such a manner that all parts of the pool deck area may be reached with a 30 metre hose.

2.1.9 Lighting

1. General Design Considerations:
 - (a) The impact of glare from artificial and natural light sources on supervisors and lifeguards shall be considered during the design of swimming pool and water theme facilities.
 - (b) Lights shall be located so that bulbs can be replaced when the pool is in use.
 - (c) Lights shall be shielded or shatter-proof.
 - (d) Light shields shall be shatter-proof.
2. Underwater Lighting:

Where underwater lighting is to be used in a swimming pool or water theme facility, the total lamp lumens shall be not less than:

 - (a) 650 multiplied by the area in square metres of the water surface for an outdoor swimming pool or water theme facility; or,
 - (b) 1100 multiplied by the area in square metres of the water surface for an indoor swimming pool or water theme facility.
3. Pool Area Lighting:

An indoor pool or an outdoor pool where night swimming is permitted shall:

 - (a) Where underwater lighting complying to section 2 is used, provide area lighting designed to ensure a minimum of 215 lux at the deck level for all the deck areas that is directed towards the deck areas and away from the pool surface; or,
 - (b) Where underwater lighting complying to section 2 is not used, provide area lighting designed to ensure a minimum of 215 lux at the deck level for all the deck areas and at the pool water surface.
4. General Area Lighting:
 - (a) Lighting with a minimum of 215 lux at floor level shall be provided in pool dressing rooms and any other area of the facility used by swimmers.
5. Emergency Lighting:
 - (a) All indoor pools and outdoor pools, with lighting for night use, shall have independent emergency lighting systems designed to provide a minimum of 10 lux at deck level that automatically operate whenever the main lighting system fails.

- (b) The system shall be constructed and arranged to ensure that the pool, deck, dressing rooms, washroom facilities and exit passages are safely lit to facilitate prompt evacuation.

2.1.10 Drinking Fountains

1. At least one drinking fountain shall be provided.

Recommendation

Drinking fountains should be recessed; accessible to all swimmers and located away from the deep end of the swimming pool.

2.1.11 Equipment Room

1. Doors to the equipment and mechanical room shall be locked to prevent unauthorized entry.
2. The equipment and mechanical room or rooms shall be adequately lighted, heated and ventilated.
3. The equipment and mechanical room shall have a floor drain and the floor should be sloped to create positive drainage.
4. Chemicals shall not be stored in an area that provides access to other areas or that is near heating equipment.

Recommendation

Chemicals should be stored on platforms raised sufficiently off the floor to prevent damage by water.

2.1.12 Dressing Room Facilities

1. Dressing rooms shall be well-lighted, drained, ventilated and of good construction with impervious materials, finished in light colours and so developed and planned that good sanitation can be maintained throughout the building at all times.
2. Unless otherwise approved by the Public Health Officer, the size of the dressing room area shall be based on:
 - (a) maximum swimmer load with 0.5 square metres of floor space for each swimmer; or,
 - (b) where swimmer load is determined to be 50 swimmers or less, dressing rooms for each sex shall have a minimum floor space of not less than 12.5 square metres.

3. No steps shall be installed in the interior of the dressing room areas nor between the shower area and adjoining pool deck areas. Should it be necessary that the shower area be at a different elevation from the pool deck, a ramp shall be provided, constructed with a non-slip surface and a slope not exceeding 1:12.
4. All partitions and walls in the dressing room areas shall be of durable material and shall be so designed that a space of at least 150 millimetres is provided between the partitions and floor to permit thorough cleaning of the walls and floor areas with hoses and brooms.
5. Floors shall be of a smooth but non-slip finish, impervious to moisture with no open cracks or joints. All corners should be rounded and have coving of wall to floor for ease of cleaning.
6. Floors shall be so drained as to prevent pooling of water. A slope of not less than 1:40 towards the closest drain shall be provided.
7. If lockers are provided, they shall be constructed of a durable rust resistant material.
8. At least one 19 millimetre hose bib per dressing room shall be provided for flushing down and disinfecting the dressing room and shower interior. The hose bibs shall be supplied with hot water.
9. Separate dressing rooms for male and female patrons shall be provided where the pool will be used simultaneously by both sexes.
10. Where a pool is not used simultaneously by male and female patrons, at least one dressing room shall be provided.
11. In the case of an operator who has not complied with subsection (9) or (10), the requirements may be waived if a public health officer is satisfied that:
 - (a) a dressing room provided for the use of persons engaged in some recreational activity, other than swimming, is conveniently located and available for use by persons using the pool; or,
 - (b) the use of the pool is restricted to the owner or occupant and the family and guests of the owner or occupant of a building that contains more than two dwelling units; or a dwelling unit that is located in an apartment block, hotel, motel, trailer court or institutional camp.
12. Dressing rooms shall be equipped with garbage receptacles.
13. The doorway to a dressing room shall be:
 - (a) separated from a doorway to any other dressing room; and,
 - (b) located at the shallow end of a swimming pool, except where a barricade of a type approved by a public health officer is provided and is designed so that traffic to the pool is directed to the shallow end.

2.1.13 Washroom Facilities

1. Unless otherwise approved by the public health officer, washroom facilities for each sex shall be provided at all pools.
2. The number of required fixtures shall be calculated on the basis that 50% of the occupants will be male and 50% of the occupants female, or as determined from experience or proposed use.
3. The minimum number of water closets for each sex shall be based on maximum swimmer load. (**Note:** Gallery spectator area washroom requirements are governed by *The Uniform Building Accessibility Standards Act and Regulations* – National Building Code)
4. For each 50 males or fraction thereof, there shall be 1 water closet or 1 urinal and 1 handbasin. As a minimum, there shall be 1 water closet, 1 urinal and 1 handbasin.
5. Where more than 2 water closets are required, urinals may be substituted for 2/3 of the required number of water closets and may be counted as water closets.
6. For each 50 females or fraction thereof, there shall be 1 water closet and 1 handbasin.
7. Access to the washroom for gallery spectators shall not require a spectator to pass through the dressing rooms.
8. The lower 1.5 metres of the wall in the water closet and hand basin area shall be impervious.
9. Toilet tissue in suitable dispensers shall be provided at each water closet.
10. Soap dispensers with either liquid or powdered soap shall be provided at each hand basin. Dispensers shall be all-metal or plastic type and contain no glass.
11. Paper or equivalent towels in suitable dispensers or hot air dryers shall be provided near the hand basins.
12. Each washroom shall be equipped with garbage receptacles. In addition, individual garbage receptacles shall be located in female water closets.

2.1.14 Shower Facilities

1. The number of showers provided in both male and female dressing rooms shall be one for each 40 users or part thereof calculated on the maximum swimmer load, except that the minimum number of showers in each dressing room shall be two.

2. Each shower facility shall be equipped with a thermostatic mixing valve that is capable of providing a sufficient supply of hot water to each shower head at a temperature of not more than 40°C.
3. Floor drains shall be so designed that waste water from shower heads will not pass over the floor area of another shower.

Recommendation

One drain per shower head is recommended.

4. Soap dispensers with either liquid or powdered soap shall be provided between each pair of shower heads. Dispensers shall be all-metal or plastic type and contain no glass.
5. All showers shall be located in such a manner that the swimmer shall pass by or through the shower area before entering the pool areas
6. Except for the purpose of lighting, no person is to install or bring any glass into the portion of the dressing room which contains shower heads.

2.1.15 Pool Area

1. Except where grassed areas are provided, the pool area is not considered to form part of the deck shall be finished with a hard, impervious, non-slip material.

Recommendation

Facilities should be provided for proper cleansing of swimmers before re-entering the pool from these grassed areas.

Recommendation

Access to the pool deck should be located at the shallow end of the pool.

2. Garbage receptacles shall be provided in the pool area.

2.1.16 Gallery

1. Where a gallery for spectators is provided at a pool, the owner shall ensure that the entrance to and exit from the gallery does not require a spectator to pass through the dressing room or across the deck of the pool.
2. No gallery shall overhang any portion of the water area in the pool.

3. The vertical distance between the deck of the pool and the lowest portion of a gallery or overhead obstruction that overhangs the deck shall be at least 2.5 metres, unless otherwise approved by a public health officer.

2.1.17 Food Concessions

1. Food and/or beverages shall only be consumed in an area set aside for that purpose.
2. No glass containers or any other materials, which may constitute a hazard to swimmers, shall be used.

2.1.18 Ventilation

1. All indoor pool facilities shall be provided with an adequate ventilation system.

2.1.19 Fencing/Walls

1. The pool shall be completely surrounded by a fence or wall that:
 - (a) is at least 1.8 metres in height;
 - (b) is designed and constructed to discourage unauthorized entry; and,
 - (c) has a gate or door equipped with panic hardware, for use in the event of an emergency, that is located away from both the chlorine room, if present, and the deep end of the pool.

2.2 Swimming Pool

2.2.1 Application of Standard

1. This section (2.2) applies only to all swimming pools that are not wave pools, paddling pools, whirlpools or water flume slide facilities.

2.2.2 Basin Design

1. The area of the pool designated as a deep area shall extend vertically downward for a minimum distance of 1680 millimetres; and the shallow area of the pool shall extend vertically downward for a minimum distance of 790 millimetres.

2.2.3 Diving Boards and Platforms

1. Diving boards or platforms provided shall be rigidly constructed and properly anchored at the base with sufficient bracing to ensure stability under the heaviest possible load. Manufacturer's specifications regarding installation and usage of diving boards or platforms shall be adhered to.
2. Design of diving boards and platforms and their corresponding depths and clearances shall conform with Appendix B.

3. Diving boards and platforms in excess of 3 metres in height shall comply with technical specifications for diving facilities found within the most current Federation Internationale de Natation Amateur (FINA) - Standard.

2.2.4 Stairs and Ladders

1. In addition to the general requirements, stairs or ladders shall be installed at the deep portion of the pool.
2. The stairs or ladders in the deep end of the swimming pool shall be placed to direct the swimmer away from the diving boards and diving area.

2.2.5 Depth Markings

1. The depth of water shall be plainly marked at the point of minimum depth; 1.2 metres depth; and at the points of break between gentle and steep bottom slopes. The words "deep area" and "shallow area" shall be clearly marked in letters at least 100 millimetres high of a colour contrasting with the background at appropriate locations.
2. Depth markings shall indicate the depth on the deck in legible numerals at least 100 millimetres high of a colour contrasting with the background.

Recommendation

Wherever possible, depth markings should also be located on the wall of the pool basin above the operating water level.

3. Depth markings shall be placed on both sides and both ends of a swimming pool. The distance between markings is not to exceed 7.6 metres.
4. At the 1.2 metre mark and at any point in the pool where the slope is greater than 1:12, the pool shall be equipped with apparatus to house a safety line with a minimum diameter of 19 millimetres. This safety line shall be equipped with floats.

Recommendation

All lane divider ropes used in swimming pools should be removed when the swimming pool is not in use for more than 1 hour, to permit proper circulation.

5. The position of every safety line or life line shall be marked by coloured buoys attached to the safety line or lifeline at intervals of not more than 1.5 metres.

2.3 Paddling Pool

2.3.1 Application of Standard

1. This section (2.3) applies only to all paddling pools but not wave pools, whirlpools, water flume slide facilities or other non-paddling pool swimming pools.

2.3.2 Basin Design

1. Paddling pools shall:
 - (a) be completely free of obstructions which may be hazardous to children; and,
 - (b) have a floor with a maximum slope of 1:15 and a minimum of 1:50, unless otherwise approved by a public health officer.

2.3.3 Depth Markings

1. Depth of water markings shall be plainly marked and conspicuously posted at a minimum of two locations and shall:
 - (a) indicate the maximum depth of water;
 - (b) be positioned to be read by persons using the pool;
 - (c) be on the deck within 460 millimetres of the water edge in legible numerals/letters 100 millimetres high of a colour contrasting with the background; and,
 - (d) not create a hazard.

2.4 Water Flume Slide

2.4.1 Application of Standard

1. This section (2.4) applies only to all water flume slides but not wave pools, paddling pools, or whirlpools.

2.4.2 General

1. Water flume slides require special consultation with the public health officer for consideration of design variations and areas where potential problems may exist.
2. Water flume slides often make use of a multi-use pool. If a multi-use pool is proposed, Section 2.2, 3.2, 4.2 and 5.2 should apply. Requirements for swimming pools may be modified or waived for water flume slides at the discretion of the public health officer.
3. All water flume slides used at pools shall be specifically designed and intended for use with a pool, and for the specific application. Slides shall be permitted only where supervision of the slide is considered in the safety plan.

4. The construction, dimensions and mechanical attachments of the components of a water flume slide shall ensure that the surface of the water slide flume is continuous and smooth throughout its length.
5. Wall thickness of a water slide flume shall be designed so that the continuous and combined action of hydrostatic, dynamic, and static loads and normal environmental deterioration do not cause structural failure which could result in injury, or continually require repair which would weaken the strength of the original structure.
6. Water flume slides shall only be installed where the public health officer is satisfied that joints, materials, tunnels, turns, ladders, exit areas, the receiving pool and other associated items of a water slide shall provide a safe environment for the swimmer.
7. The public health officer may approve deviations from the standard with respect to slides when:
 - (a) the standard does not adequately address the specific designs;
 - (b) sufficient information, in the opinion of the public health officer, for evaluating the proposal is submitted; and,
 - (c) in the opinion of the public health officer, the operation of the proposed slide is safe.

2.4.3 Depth Markings

1. Depth of water markings shall be plainly marked and conspicuously posted at a minimum of two locations and shall:
 - (a) indicate the maximum depth of water;
 - (b) be positioned to be read by persons using the slide;
 - (c) be on the deck within 460 millimetres of the water edge in legible numerals/letters 100 millimetres high of a colour contrasting with the background; and,
 - (d) not create a hazard.

2.4.4 Flume Exit

1. Flume exit sections shall be designed to assure safe exit speeds, angles, and stopping distances.
2. A flume shall be perpendicular to the plunge pool wall for a distance of at least 3 metres (10 feet) from the exit of the flume.
3. The distance between the side of a flume exit and a receiving poolside wall shall be at least 1.5 metres.
4. The distance between sides of adjacent flume terminuses shall be at least 2 metres.

5. The unobstructed distance between a flume exit and the opposite side of the receiving pool shall be at least 6 metres.
6. In the case of high-speed slides, special provisions shall be made in flume exit design, pool depth, and pool width (measured from flume exit) to safely accommodate slides specifically designed with greater slopes or other special features which allow an unusually rapid descent.
7. Multiple-exit slides shall have parallel exits or be constructed so that their centre lines do not intersect for a distance of at least 6 metres from the exits of each flume. If slides with nonparallel exits discharge swimmers at a high speed, the centre lines shall not intersect for at least 9 metres.
8. Unless otherwise approved by a public health officer, flumes shall terminate either at a depth of at least 150 millimetres below the receiving pool's operating water level or no more than 50 millimetres above the water surface. The flume shall not exceed a 1:10 slope for a distance of at least 3 metres from its exit end.

2.4.5 Plunge Pools

1. Unless otherwise approved by a public health officer, the receiving pool water depth at the end of the flume shall be between 1 meter and 1.2 meters.

Recommendation

This depth should be maintained in front of the flume for a distance of at least 6 meters, from which point the receiving pool floor may have a constant slope upward to the minimum water depth. These slopes should be no more than 1:10. The maximum depth within 1.5 meters of the slide flume median is to be no more than 1.2 meters.

2. If special exit systems that assure safe exit from the flume and safe entry to the receiving pool are used, the 1 meter minimum depth and minimum maintenance distance for this depth may be modified or waived by the public health officer.
3. The plunge area in a multi-use pool shall be designated by float ropes, and each area shall have ladders, steps, or stairs for egress.

2.4.6 General Safety

1. All curves, turns, and tunnels within the slide flume shall be designed so that body impact with the walls of the flume or ceiling of a tunnel does not present a hazard and users do not become airborne.
2. The slide flume shall be banked to keep the slider's body safely inside the flume or curve.

3. In sections of the elevated flumes where, contrary to intended use, a slider may stop, there shall be safety walls or other provisions to keep the slider from falling out of the flume.

2.4.7 Walkways & Steps

1. Walkways and steps shall be:
 - (a) well drained;
 - (b) non-slippery;
 - (c) separated from the flume by a physical barrier; and,
 - (d) set back far enough from the operating flume so that users cannot contact it on the way down.
2. A 1.2 metre minimum width walkway or steps shall be provided between the plunge pool deck and the steps leading to the top of the flume.

2.5 Wave Pool

2.5.1 Application of Standard

1. This section (2.5) applies only to all wave pools but not paddling pools, whirlpools, water flume slide facilities or other non-wave pool swimming pools.

2.5.2 Depth Markings

1. Depth of water markings shall be plainly marked:
 - (a) at a point of minimum depth, 1.2 metres depth, and at the points of break between gentle and steep bottom slopes. The words "deep area" and "shallow area" are to be clearly marked in letters at least 100 millimetres high of a colour contrasting with the background at appropriate locations; and,
 - (b) on the deck within 460 millimetres of the water edge and are to indicate the depth of water in legible numerals at least 100 millimetres high of a colour contrasting with the background.

Recommendation

Whenever possible, depth markings should also be located on the wall of the pool basin above the operating water level.

2. Depth of water markings shall be placed on both sides and both ends of a wave pool, the distance between markings is not to exceed 7.6 metres.
3. All depth of water markings shall be placed in a manner that will not create a hazard.

2.5.3 Handholds

1. In the case of pools designed to be operated as both a wave pool and swimming pool, handholds shall be provided along the length of each wall of the pool and installed so that they are not more than 230 millimetres above the water line when the wave pool is not in operation.
2. If installed, handhold railings shall be mounted to the pool basin wall in a fashion that will not cause swimmer entrapment problems.

2.5.4 Stairs and Ladders

1. In addition to the general requirements, stairs or ladders shall be installed at the deep portion of the pool.
2. The stairs or ladders in the deep end of the swimming pool shall be placed to direct the swimmer away from the diving boards and diving area.

2.5.5 Safety Line

1. In the case of pools designed to be used as both a wave pool and swimming pool, safety line anchors shall be installed in the pool basin walls at the 1.2 metre depth of water mark and at the start point of where the pool basin slope is greater than 1:12.
2. Where a wave pool is used as a swimming pool, a safety line (minimum diameter of 19 millimetres) with floats shall be attached to the anchors stated in sentence (1) during the operation of the swimming pool.

SECTION 3 – POOL RECIRCULATION SYSTEM

3.1 General

3.1.1 Application of Standard

1. This section (3.1) applies to wave pools, paddling pools, water flume slide facilities and other swimming pools but not to whirlpools.

3.1.2 Continuous Operation

1. Except for stoppage for maintenance, repairs or backwashing of filters or as authorized by the regulations, the recirculation systems and chemical feeders shall operate continuously, regardless of the duration of actual use of the pool each day.

3.1.3 Piping System

1. The piping system shall be designed to:
 - (a) circulate the pool water through the treatment equipment;
 - (b) allow each filter to be individually backwashed;
 - (c) drain backwashed water to waste;
 - (d) empty the pool;
 - (e) drain or blow out the entire system;
 - (f) permit circulation of water in a closed system between a diatomaceous earth filter and pump during the precoat operation to avoid diatomaceous earth entering the pool;
 - (g) allow for adequate, accessible and easily serviceable valves that permit flexible operation of the filtration equipment;
 - (h) allow for the determination and isolation of leaks in buried lines; and,
 - (i) provide for chemical treatment and heating of the water.
2. The recirculation piping and fittings shall be of a non-toxic material, resistant to corrosion, and able to withstand operating pressures.

3.1.4 Outlets

1. Water outlets shall be designed so that each pumping system in the pool (filter system(s) or jet system(s) if so equipped) complies with section 4.1.5 Anti Entrapment.
2. One or more drain outlets shall be provided at the lowest point of the pool floor. The total orifice area of all the pool drain outlets shall be at least four times the cross-sectional area of the main pool drain line and be sized to accommodate the main drain recirculation rate.
3. The main drain piping shall be sized to accommodate 100% of the recirculated water.
4. All suction drain covers shall:
 - (a) conform to ASME A112.19.8;
 - (b) have a flow through the drain grate which does not exceed 0.45 m/s (1.5 fps); and,
 - (c) a minimum sump depth which is 1.5 times the diameter of the inlet pipe.
5. The drain covers shall present no sharp edges to the adjacent surfaces. Each drain cover shall be so secured that the removal requires the use of a tool.

3.1.5 Anti Entrapment

1. New swimming pools and water theme facilities shall be designed to include one of the following in order to prevent the entrapment of patrons in the drains and recirculation equipment:
 - (a) a minimum of two hydraulically balanced outlets per pump that are inserted into the system so that no outlet can be cut out of the suction line by a valve or other means and with the outermost outlet centers at least 920 cm apart;
 - (b) one or more unblockable drain;
 - (c) no main drain; or,
 - (d) another solution acceptable to the public health officer.

Recommendation:

Additional Barriers recommended such as an unblockable drain, a suction limiting vent system, a gravity drainage system that utilizes a vented collector tank or an automatic pump shut-off are recommended.

Existing pools, when renovated, should consider upgrading to mitigate the risks associated with a single main drain.

2. If a drain cover or grate is cracked, broken or missing, the pumps shall be immediately shut down and the pool closed until the grate or cover replaced.
3. For the purposes of accessing the effectiveness of an anti-entrapment device, the public health officer may require an engineer's report.
4. The owner/operator shall ensure that all anti-entrapment devices are properly installed and in good working order and be able to demonstrate that no entrapment or entrapment risk is present.
5. The on/off switch for all circulation pumps shall be clearly marked, and labelled as well as accessible and known to pool staff.

3.1.6 Overflow Structures

1. Overflow structures may be either perimeter overflow channels or skimmers or both.

3.1.7 Skimmers

1. Skimmers shall be:
 - (a) constructed of corrosion resistant materials and be fully recessed behind the face of the pool wall;
 - (b) accessible through the deck;
 - (c) conform to NSF 50 Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities;

- (d) equipped with an easily removable and cleanable basket or screen through which all the overflow water shall pass and which is capable of trapping solids larger than 3 millimetres in dimension;
- (e) equipped with a valve or other device for regulating flow so that uniform skimming action can be achieved; and,
- (f) designed to handle a minimum flow of 2.3 litres per second.

3.1.8 Perimeter Overflow Channels

1. Where overflow channels are provided, the channel shall:
 - (a) extend completely around the pool;
 - (b) be adequately sized to prevent water entering the channel from washing back into the pool;
 - (c) be designed so that the dimensions minimize the danger of swimmer entrapment;
 - (d) be adequately sized and sloped to provide rapid drainage to drains which are not less than 50 millimetres in diameter and spaced not more than 4.5 metres apart; and,
 - (e) be of a capacity sufficient to carry 125% of the designed recirculation rate.

3.1.9 Strainer

1. The circulation system, when receiving water directly from the pool, shall include a strainer to prevent hair, lint and other materials from reaching the pump and/or filters.

Recommendation:

Two corrosion-resistant strainer baskets should be provided.

3.1.10 Gauges

1. Gauges shall be installed in all piping systems to measure the pressure drop across pressure type filter systems, suction pressure on vacuum filter systems and on both sides of circulation pumps for checking their operational performance.

3.1.11 Filtration

1. Unless otherwise approved by a public health officer, a filter system shall be of a sand, anthracite, diatomaceous earth or cartridge type.
2. A filter system shall operate continuously at the designed rate of flow for that filter system.

3.1.12 Rate of Flow Indicators

1. A rate of flow indicator shall be provided in the piping system to indicate the rate of pool water circulation.
2. Where a single treatment plant serves two or more separate pools, provision shall be made for measuring the flow into or from each pool.

3.1.13 Pool Heat

1. Valved piping shall be provided for regulating flow through the heater and for bypassing or isolating the heater.
2. One or more approved thermometer(s) shall be in use for determining water temperature.
3. The water in any swimming pool shall not be artificially heated to a temperature above 30°C unless permission to do so has been granted by a public health officer.

3.1.14 Chemical Feeders

1. Adjustable output rate chemical feeding equipment shall conform to the Joint National Swimming Pool Institute - National Sanitation Foundation Standard relating to adjustable output rate chemical feeding equipment for pools, or as required by a public health officer.

3.1.15 Disinfection Equipment

1. All pools shall be equipped with equipment to provide continuous disinfection when in use, at a dosage necessary to meet minimum residual requirements outlined in *The Swimming Pool Regulations, 1999* and to maintain the pool water in a bacteriologically safe condition at all times.
2. The disinfection equipment shall be maintained in satisfactory working order, and spare parts essential to immediate safety should be on hand for immediate use.
3. The disinfection equipment shall include some positive feature to prevent siphoning when installed above the pool.
4. Where gaseous chlorine equipment is used, requirements are outlined in the Occupational Health and Safety Regulations. Contact the Ministry of Labour Relations and Workplace Safety for details.

3.1.16 Cross-Connections

1. No piping arrangement under any condition shall permit sewage or waste water to enter the recirculation system, or permit water from the recirculation system or pool to enter a potable water supply.

3.1.17 Vacuum Cleaning Equipment

1. All pools shall be provided with vacuum cleaning equipment which will remove sediment in the pool basin.

Recommendation:

Fixed pipe connections from the vacuum cleaning equipment fittings to the pump should be free of air pockets and slope downwards from the pool to the pump.

2. Skimmer systems or portable pump vacuum cleaning equipment are permissible alternatives.

3.1.18 Inlets

1. Inlets shall be constructed of non-corrosive material, and sized to prevent an entrapment hazard.
2. The minimum number of adjustable inlets, providing uniform circulation of water and uniform distribution of disinfectant, shall be:
 - (a) based on either one inlet per 55 square metres (600 square feet) or portion thereof pool area, or one inlet per 57,000 litres (15,000 gallons), whichever is greater. In any case a minimum of four inlets are required;
 - (b) placed not more than 6 metres (20 feet) apart around the entire perimeter, with one inlet within 1.5 metres (5 feet) of each corner of the pool and one in each recessed step area;
 - (c) submerged not less than 0.6 metres (2 feet). If the pool water depth is less than 0.6 metres (2 feet), the inlet fittings shall be placed as near to the pool floor as possible. In water greater than 1.5 metres (5 feet) deep they shall alternate between one third of the depth from the top of the water and a depth of one third from the bottom;
 - (d) supplied with bottom inlets for pools over 18 metres (60 feet) in width. Bottom inlets shall be uniformly spaced with a separation distance of no greater than 6 metres (20 feet) and with rows of inlets within 4.5 metres (15 feet) of each side wall. The floor inlets shall be flush with the floor; and,
 - (e) subject to having a dye test (crystal violet or equivalent) performed to determine and adjust the recirculation pattern.

3.2 Swimming Pool

3.2.1 Application of Standard

1. This section (3.2) applies only to all swimming pools that are not wave pools, paddling pools, whirlpools or water flume slide facilities.

3.2.2 Circulation Capacity

1. The pool circulation and filtration equipment shall be of adequate size to turnover the entire system's water at least once every six hours or less.

3.2.3 Skimmers

1. Swimming pools may be provided with suitable skimming devices which will accomplish the purpose of an overflow channel.
2. Where skimmers are used, the minimum number of such shall be determined by providing one device per 40 square metres of pool area or one device per 3 litres per second, based on the recirculation rate for the pool, whichever is greater.
3. The collection piping for skimmers shall be designed to carry 100% of the designed recirculation rate.
4. Skimming devices shall be capable of handling at least 75% of total filter rate.

3.3 Paddling Pool

3.3.1 Application of Standard

1. This section (3.3) applies only to all paddling pools but not wave pools, whirlpools, water flume slide facilities or other non-paddling pool swimming pools.

3.3.2 Circulation Capacity

1. In the case of a paddling pool that is constructed after the coming into force of *The Swimming Pool Regulations, 1999*, the circulation and filtration equipment shall be of adequate size to turnover the entire system's water at least once every two hours.

3.4 Water Flume Slide

3.4.1 Application of Standard

1. This section (3.4) applies only to all water flume slides but not wave pools, paddling pools, or whirlpools.

3.4.2 Circulation Capacity

1. The circulation and filtration equipment shall be of adequate size to turnover the entire system's water at least once every one hour or less.
2. In the case where the water slide's receiving pool is used both as a receiving pool and a swimming pool, this multiple use pool shall have a recirculation rate and chemical treatment capability that:
 - (a) is equal to or greater than that of a swimming pool; and,
 - (b) recirculates water and applies chemicals as often as necessary in order to maintain the water quality.

Recommendation:

Designers should consider increasing the recirculation rate and chemical treatment capability of a multi-use pool to be equivalent to that of a water flume receiving pool.

3.4.3 Flume Pumps

1. Unless otherwise approved by a public health officer, the intake for the water slide piping shall be located at least 6 metres away from a flume exit and designed and meet the anti-entrapment requirements of this standard.
2. The suction fitting covers shall present no sharp edges to the adjacent surfaces.
3. Each flume pump discharge shall have a check valve.
4. If a separate pump reservoir is provided, it shall have a main drain and a surface skimmer, both connected to the recirculation system. Pump reservoirs shall only be accessible to authorized personnel.

3.4.4 Skimmers

1. When surface skimmers are used as the sole overflow system, they shall be sufficient in number to facilitate at least 50% of the designed recirculation rate.

3.4.5 Surge-Free System

Recommendation:

A surge-free automatic water make-up system should be installed to ensure that the water in the receiving pool is maintained at the proper level.

3.5 Wave Pool

3.5.1 Application of Standard

1. This section (3.5) applies only to all wave pools but not paddling pools, whirlpools, water flume slide facilities or other non-wave pool swimming pools.

3.5.2 Circulation Capacity

1. The circulation and filtration equipment shall be of adequate size to turnover the entire system's water at least every six hours.

Recommendation:

Designers should consider decreasing the turnover period to two hours.

SECTION 4 – POOL OPERATIONAL STANDARDS

4.1 General

4.1.1 Application of Standard

1. This section (4.1) applies to wave pools, paddling pools, water flume slide facilities and other swimming pools but not to whirlpools.
2. This section (4.1) applies during the pool's operational time.

4.1.2 Water Quality Control

4.1.2.1 Bacteriological Water Quality

1. Where bacteriological analyses indicate the presence of coliforms or other organisms, as may be determined by a public health officer, resampling, investigation of disinfection procedures and remedial action shall be carried out by the operator as required by a public health officer.

4.1.2.2 Combined Chlorine Residual

1. The combined chlorine residual shall not be more than 50% of the total chlorine residual

Recommendation:

It is recommended that that combined chlorine residual not exceed 1 milligram per litre.

4.1.2.3 pH Concentration

1. The operator shall control the pH within a range of 7.2 and 7.8.

4.1.2.4 Alkalinity

1. Alkalinity should be maintained within the range of 80-120 mg/L.

4.1.2.5 Calcium Hardness

1. Calcium hardness should be maintained within the range of 125-275 mg/L.

4.1.2.6 Cyanuric Acid

1. Cyanuric acid should be maintained within the range of 25-50 mg/L.
2. Cyanuric acid shall not be used in indoor pools.

4.1.2.7 Testing and Records

1. Testing and recording for levels of alkalinity, hardness, cyanuric acid if used and any other parameter a public health officer considers appropriate shall be conducted and recorded as directed by a public health officer.
2. Each operator shall test the pool water and record the disinfection and pH levels as well as the oxidation reduction potential level, if in use:
 - (a) prior to swimmers being admitted to the pool; and,
 - (b) thereafter at three hour maximum time intervals during the hours of operation, or as directed by a public health officer.

4.2 Swimming Pools

4.2.1 Application of Standard

1. This section (4.2) applies only to all swimming pools that are not wave pools, paddling pools, whirlpools or water flume slide facilities.
2. This section (4.2) applies during a swimming pool's operational time.

4.2.2 Turnover Rate

1. The entire volume of water used at a swimming pool shall be recirculated through the filter and disinfecting equipment at least once every 6 hours.

4.3 Paddling Pools

4.3.1 Application of Standard

1. This section (4.3) applies only to all paddling pools but not wave pools, whirlpools, water flume slide facilities or other non-paddling pool swimming pools.
2. This section (4.3) applies during a paddling pool's operational time.

4.3.2 Turnover Rate

1. In the case of a paddling pools that is constructed after the coming into force of *The Swimming Pool Regulations, 1999*, the entire volume of paddling pool water shall be completely circulated through the filter and disinfecting equipment at least once every two hours.

4.3.3 Fill and Drain Paddling Pools

1. Where a paddling pool was constructed prior to the coming into force of *The Swimming Pool Regulations, 1999* and not equipped with recirculation equipment, the pool shall be operated as follows:
 - (a) The pool shall be completely drained after the last period of use each day. The main drain valve for the pool is to remain open until such time that the pool is ready to be refilled;
 - (b) All debris or other materials that could pollute the water or that could be hazardous to the pool users shall be removed from the pool bottom and deck areas and properly disposed of;
 - (c) Before being refilled, the pool and the pool deck shall be scrubbed thoroughly and hosed down with disinfectant;
 - (d) The pool shall be filled with water from a supply approved by a public health officer;
 - (e) A disinfectant shall be added to the pool water in sufficient quantity to maintain a disinfecting residual as outlined in subsection 4.1.2.2;
 - (f) In a case where mechanical equipment is not provided for the addition of the disinfectant, the disinfectant may be added to the pool water manually; and,
 - (g) The pH range shall be maintained as per subsection 4.1.2.3.

4.4 Water Flume Slides

4.4.1 Application of Standard

1. This section (4.4) applies only to all water flume slides but not wave pools, paddling pools, or whirlpools.
2. This section (4.4) applies during a water flume slide's operational time.

4.4.2 Turnover Rate

1. The entire volume of water used at a water slide shall be circulated through the filter and disinfecting equipment at least once every hour or less.
2. In the case where the water slide's receiving pool is used both as a receiving pool and a swimming pool, the turnover rate may comply with the turnover rate specified in the swimming pool design/operational standards.

4.5 Wave Pools

4.5.1 Application of Standard

1. This section (4.5) applies only to all wave pools but not paddling pools, whirlpools, water flume slide facilities or other non-wave pool swimming pools.
2. This section (4.5) applies during a wave pool's operational time.

4.5.2 Turnover Rate

1. The entire volume of wave pool water shall be completely circulated through the filter and disinfecting equipment at least once every six hours or less.

SECTION 5 – POOL SAFETY

5.1 General

5.1.1 Application of Standard

1. This section (5.1) applies to wave pools, paddling pools, water flume slide facilities and other swimming pools but not to whirlpools.

5.1.2 Maintenance

1. The pool, walkways, dressing rooms and all facilities, furnishings and equipment shall be maintained in good repair and in a sanitary condition.

5.1.3 Emergency Procedures

1. A written plan for emergencies shall be carefully devised and kept up-to-date in the safety plan.

Recommendation:

The emergency plan should contain procedures to deal with crowd control and safe evacuation, drownings, electrical shock, heat prostration, fractures, poisonings, cuts and burns, neck and back or spinal injuries, and exposure to chlorine gas.

All employees should be trained and drilled periodically in the execution of the plan.

5.1.4 Emergency Telephone and Sign

1. An emergency telephone shall be provided and identified as such.
2. At or near an emergency telephone, a sign shall be posted that lists the names and telephone numbers of persons available to render emergency aid, including: ambulance, fire, police, chlorine/emergency maintenance and pool manager.

5.1.5 Incident Report Forms

1. The pool operator shall have incident report forms similar to that of Appendix A available at all times.
2. Incident report forms shall be properly completed when injuries occur.
3. All incident report forms are subject to review by a public health officer.
4. In the event that a fatality occurs as a result of use of the facility, the pool operator shall:
 - a. immediately notify the public health officer and;
 - b. within 48 hours submit a completed incident report form.

5.1.6 Safety Rules

1. Rules and information for swimmers that are described in the safety plan shall be posted.

5.2 Swimming Pools

5.2.1 Application of Standard

1. This section (5.2) applies only to all swimming pools that are not wave pools, paddling pools, whirlpools or water flume slide facilities.

5.2.2 Maximum Swimmer Load

1. The total number of swimmers permitted at any one time on the pool deck and in the pool shall not exceed the maximum swimmer load as determined by the following:
 - (a) one person for each 0.9 square metres of the surface area of water in that part of the pool where the water depth is less than 1.5 metres;
 - (b) one person for each 2.32 square metres of the surface area of water in that part of the pool where the water depth is greater than 1.5 metres; but, where a diving board is provided in part of a pool, the available surface area of water for that part is reduced 27.8 square metres for each diving board or tower; and,
 - (c) Swimmer load may be set at a limit lower than that determined by the above calculations, providing that dressing rooms are sized appropriately.

5.3 Water Flume Slides

5.3.1 Application of Standard

1. This section (5.3) applies only to all water flume slides but not wave pools, paddling pools, or whirlpools.

5.3.2 Safety Rules

1. Rules and information for swimmers that are described in the safety plan shall be posted.

5.3.3 Inspection of Flumes

1. The inspection of flumes shall include checking for:
 - (a) loose railings;
 - (b) leaking seals at butt-joints;
 - (c) rough patching of cracks or joints;
 - (d) absence of or loose guards on the turns;
 - (e) unusual movement of the flume bed when walked on;
 - (f) the growth of algae on flume support structures;
 - (g) sharp edges on the flume safety rails;
 - (h) the projection of any structure or vegetation into the flume; and,
 - (i) a smooth clear view of the receiving pool at the exit of the flume.

5.3.4 Maintenance

1. A daily inspection of the facility operation and maintenance shall be carried out.

5.4 Wave Pools

5.4.1 Application of Standard

1. This section (5.4) applies only to all wave pools but not paddling pools, whirlpools, water flume slide facilities or other non-wave pool swimming pools.

5.4.2 Maximum Swimmer Load

1. The total number of swimmers permitted at any one time on the pool deck and in the pool shall not exceed the maximum swimmer load as determined by the following:
 - (a) one person for each 0.9 square metres of the surface area of water in that part of the pool where the water depth is less than 1.5 metres;
 - (b) one person for each 2.32 square metres of the surface area of water in that part of the pool where the water depth is greater than 1.5 metres; but, where a diving board is provided in part of a pool, the available surface area of water for that part is reduced 27.8 square metres for each diving board or tower; and,
 - (c) Swimmer load may be set at a limit lower than that determined by the above calculations, providing that dressing rooms are sized appropriately.

5.4.3 Warning Buzzer

1. Every wave pool shall be equipped with a warning buzzer that is to be sounded to alert swimmers of the commencement of operation of the wave generator.

**APPENDIX A
NORMATIVE INCIDENT REPORT FORM**

NAME: (Surname) _____ FIRST: _____

ADDRESS: _____

PHONE: _____ AGE: _____ SEX: _____

DATE AND TIME OF INCIDENT: _____

LOCATION OF INCIDENT:

DESCRIBE WHERE AND WHAT OCCURRED

- | | |
|-------------------------|-------|
| 1) Outside Pool Grounds | _____ |
| 2) Dressing Rooms | _____ |
| 3) Pool Deck/Walkways | _____ |
| 4) Open Lawn | _____ |
| 5) Among Trees | _____ |
| 6) Fence | _____ |
| 7) Pool | _____ |
| 8) Shallow End | _____ |
| 9) Deep End | _____ |
| 10) Diving Boards | _____ |
| 11) Paddling Pool | _____ |
| 12) Whirlpool | _____ |
| 13) Water Slide | _____ |

NOTE ENVIRONMENTAL FACTORS:
(weather, structural, etc.)

ACTION IMMEDIATELY TAKEN: (Include equipment used)

SITE AND NATURE OF INJURY: (Include condition of subject and first aid used)

FOLLOW-UP ACTION:

NAMES & ADDRESSES OF WITNESSES:

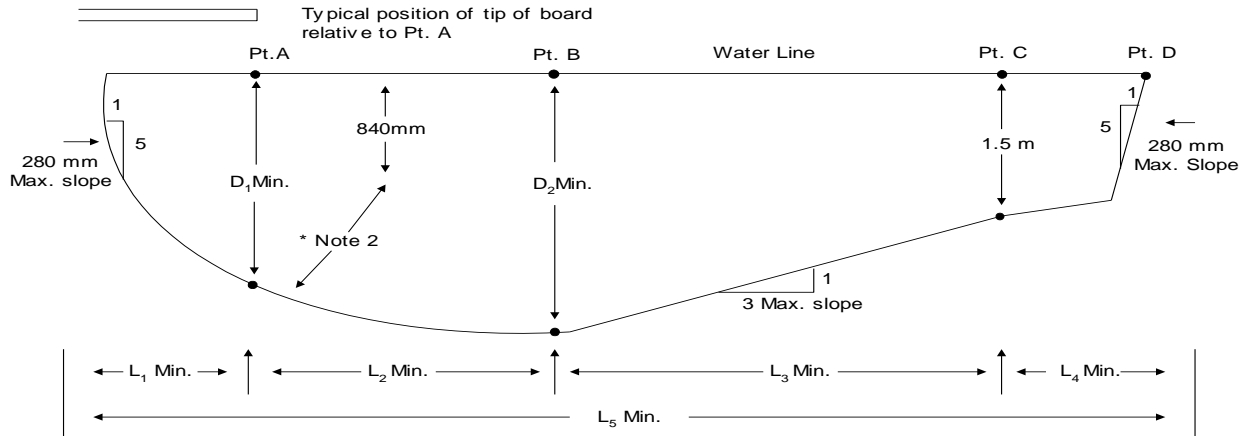
OTHER STAFF ON DUTY FOR THAT ACTIVITY OR TIME PERIOD:

NAME AND POSITION OF PERSON MAKING REPORT:

The owner or operator of a swimming pool or spa pool shall report any death, near drowning or serious injury to the Public health officer within 48 hours of the incident. An investigation will be completed for each incident.

APPENDIX B

NORMATIVE SWIMMING POOL DESIGN/OPERATIONAL STANDARDS DIVING BOARDS AND PLATFORMS MINIMUM REQUIREMENTS



- NOTE:**
1. L_4 is a minimum dimension to allow sufficient length opposite the board. This may of course be lengthened to form the shallow portion of the pool.
 - 2.(1) The transitional radius from wall to floor where floor slopes join the wall shall:
 - (a) have its centre no less than 838 millimetre below the water line in deep areas or .75 metres in the shallow area;
 - (b) have a radius that is at least equal to, or greater than, the depth of the pool minus the vertical wall depth measured from the water line (or tolerance allowed in (2) minus 76 millimetre to allow draining to the main drain).
 - (2) Pool walls shall not be greater than 11 degrees from plumb for a minimum depth of 838 mm from the water line in deep areas, or 686 millimetre in the shallow areas. Below these depths, the wall may be radiused to join the floor.

RELATED DIVING EQUIPMENT		MINIMUM DIMENSIONS								MINIMUM WIDTH OF POOL AT:		
DIVING BOARD LENGTH	MAX. BOARD HEIGHT OVER WATER	D_1	D_2	R	L_1	L_2	L_3	L_4	L_5	PT.A	PT.B	PT.C
3 m	2/3 meter	2.1 m	2.6 m	1.7 m	.8 m	2.4 m	3.2 m	2.1 m	8.5 m	4.6 m	5.5 m	5.5 m
3.6 m	3/4 meter	2.3 m	2.7 m	1.8 m	.9 m	2.7 m	3.6 m	1.2 m	8.5 m	5.5 m	6.1 m	6.1 m
4.9 m	1 Meter	2.6 m	3.0 m	2.1 m	1.2 m	3.0 m	4.6 m	.6 m	9.4 m	6.1 m	6.7 m	6.7 m
4.9 m	3 Meter	3.3 m	3.6 m	2.6 m	1.8 m	3.2 m	6.4 m	0 m	11.4 m	6.7 m	7.3 m	7.3 m

L_2 , L_3 and L_4 combined represent the minimum distance from the tip of board to pool wall opposite diving equipment.

***NOTE:** Placement of boards shall observe the following minimum dimensions. With multiple board installations minimum pool widths shall be increased accordingly.

Deck Level Board to Pool Side	2.4 m
1 Meter Board to Pool Side	3 m
3 Meter Board to Pool Side	3.3 m
1 Meter or Deck Level Board to 3 Meter Board	3 m
1 Meter or Deck Level Board to another 1 Meter or Deck Level Board	2.4 m
3 Meter to another 3 Meter Board	3 m

APPENDIX C

INFORMATIVE INFORMATION REGARDING SWIMMING POOL SAFETY PLANS

Swimming pool operators are required to submit to the local health regions details on:

- (a) procedures to be followed in the event of a serious injury, emergency or incident;
- (b) the qualifications of a lifeguard;
- (c) the qualifications of a supervisor;
- (d) the type of lifesaving, lifeguarding and first aid equipment to be kept within the immediate vicinity of the swimming pool;
- (e) a description of the space provided for the administration of first aid;
- (f) the number of lifeguards and other employees who are to be on duty while the swimming pool is in use in order to ensure adequate supervision of swimmers;
- (g) a description of the supervision of swimmers during regular operation;
- (h) operating procedures for the swimming pool including rules, pool water chemistry testing, filter operation, chemical handling, equipment lockout, play equipment inspection, and other pool system operating procedures; and
- (i) the program of cleaning and maintenance of the swimming pool, including the nature and frequency of the cleaning and maintenance.

A written pool safety plan is required in order to ensure the health and safety of pool patrons and must be reviewed and updated at least once each year. Each pool employee must be trained in the procedures and in the use of the equipment described in the plan, and must have the plan readily available to them.

Information on the following topics is provided to assist pool operators in developing a pool safety plan.

Topic: Safety and Supervision

The safety plan shall outline, where applicable, at a minimum:

- a pool admission standard including young swimmer supervision requirements,
- the rules for use and supervision of pool mats, inflatable toys and life jackets,
- the facility-appropriate lifesaving equipment that will be provided on-site,
- the required emergency equipment and procedures including crowd control and safe evacuation, telephone access and emergency telephone numbers,
- a facility safety check process,
- supervision protocols including the number and positioning of lifeguards and supervisors including scanning and supervision,
 - This should involve an assessment of sightlines, swimmer loads, tanks, layout, and play equipment to ensure appropriate lifeguarding and lifesaving equipment.
- monitoring of users of special areas such as the steam room and sauna room,
- procedures to respond to medical emergencies such as:

- entrapped swimmers, electrical shock, heat prostration, fractures, poisonings, cuts and burns, neck and back or spinal injuries, and, where applicable, exposure to chlorine gas, and
- supervision of special uses. The *Swimming Pool Regulations* allow for the instructor of swimming and aquatic exercise classes to supervise swimmers, if they possess lifeguarding qualifications. Whereas, non-traditional pool uses such as S.C.U.B.A. or diving classes require a separate lifeguard.

Topic: Lifeguards

The qualifications of lifeguards are no longer referenced in *The Swimming Pool Regulations, 1999*. Lifeguard qualifications and requirements must be matched to the risks and hazards at a specific pool. For example, the hazards for designated mineral spas may be less than a typical pool due to the nature of the water. Owners/operators of public swimming pools and spas should ensure that the number of lifeguards is adequate for their facility and that individuals performing lifeguarding for their facility should be adequately trained in order to ensure swimmer safety. Guidance on the type of skills required by a lifeguard is given below. However, additional training may be necessary to address swimmer safety due to pool specific hazards.

- Resuscitation techniques;
- Lifeguarding techniques (i.e. effective supervision of an aquatic facility)
- Lifeguarding skills (e.g. management of a distressed non-swimmer, submerged victim, spinal-injured victim, missing person and/or a public relations situation)
- First aid skills (i.e. assessment and treatment of an injured victim)
- Physical fitness appropriate to a type of facility (e.g. satisfactory level of fitness)
- Use of equipment (i.e. competence with all lifeguarding and first aid equipment)
- Lifeguarding situations (e.g. responding to emergency situations)
- Pool analysis (e.g. impacts of pool features on lifeguarding, pool systems, etc)
- Pool entries and removals
- Specialized rescues (e.g. rescue techniques based on pool features)
- Skin diving
- Deep water rescue of a non-breathing victim
- Water park analysis, supervision and patrol
- Waterslide rescue
- Water park search

Operator's of licenced pools are responsible to ensure that the numbers and training of lifeguards is adequate for their particular pool and that lifeguards are of an age that enables them to fully understand the responsibilities associated with the position of lifeguard and are capable of supervising swimmer safety.

Topic: Lifeguard Towers

The use of lifeguard towers should be considered in the safety plan. It is recommended that:

1. At least one lifeguard tower should be provided for every 150 swimmers up to the maximum swimmer load.
2. Lifeguard towers should be elevated between 1.2 metres and 2 metres above the deck and should be sufficiently anchored and stable enough to permit the lifeguard to ascend or descend from the tower quickly and easily.
3. Portable lifeguard towers are acceptable.

Topic: Suggested Signage

The following is a suggested list of safety rules that are to be posted at the facility entrance:

- (a) Swimmers shall take a cleansing shower before and after using this pool;
- (b) No swimmer infected with a communicable disease or having open sores shall enter this pool;
- (c) Do not use this pool in place of toilet facilities;
- (d) No glass containers, food or drink is allowed near this pool;
- (e) No running;
- (f) No boisterous play;
- (g) No pushing or horseplay;
- (h) This pool is supervised/ unsupervised;
- (i) Lifeguard on duty/no lifeguard on duty;
- (j) Maximum swimmer load is _____;
- (k) First aid kit available at _____; and
- (l) Emergency telephone _____.

Topic: Paddling Pools

Unless a supervisor or the minimum number of lifeguards set out the safety plan is on duty, no operator of a paddling pool shall allow a child who is under the age of 12 years to enter the area of the paddling pool unless the child is accompanied by and is under the care of a person who:

1. is at least 12 years old and understands the responsibilities associated with the required level of supervision and is capable of providing that level of supervision; and,
2. continuously supervises the child while the child is in the swimming pool or the swimming pool area.

Topic: Water Flume Slides

Water flume slides require additional supervision. At a minimum, the following should be considered:

1. In addition to the lifeguard numbers, supervisors should be located at areas at the upper and lower portions of the slide. Where more than one slide can be entered from a common area, individual slide supervisors would not be necessary.
2. A lower slide supervisor should be responsible for supervising swimmer safety in the receiving pool and for ensuring that sliders exit the receiving pool as quickly and as orderly as possible.
3. An upper slide supervisor should be responsible for controlling sliders starting from the

upper flume area; controlling the spacing between the last slider and next slider entering the flume; and for supervising portions of the flume visible from that position.

4. Where a water slide flume exits into a pool area where a lifeguard is present, points 2 and 3 may be incorporated into the safety and supervision plan as lifeguarding duties.

Topic: First-Aid Kits & Safety Equipment

A first aid kit containing the following items should be supplied at all swimming pools. splinter tweezers;

- bandage scissors;
- sterile gauze compresses;
- sterile bandage compresses;
- sterile adhesive dressings;
- sterile pads;
- adhesive bandage strip and hypoallergenic adhesive tape;
- a triangular bandage and safety pins;
- gauze roller, various sizes;
- sterile and wrapped gauze pads and compresses, various sizes, including an abdominal pad size;
- self-adherent roller for dressing (various sizes);
- pad with shield or tape for eye;
- disposable latex or vinyl gloves;
- pocket mask with disposable one-way rebreathe valves;
- one or more electrically insulated or non-conducting reaching poles; and,
- two or more buoyant throwing aids, each having a suitable rope that is at least one-half the width of the pool plus 1.5 metres wide.

In addition to the above items, the following items should be supplied at swimming pools where lifeguards or supervisors are required.

- a current edition of the first-aid manual;
- a first aid record book and pencil;
- a small flashlight;
- pairs of splints (various lengths);
- cold packs;
- tensor bandages;
- rolls adhesive tape;
- elastic crepe;
- a card of assorted safety pins;
- plastic bags; and,
- a spine board equipped with a device capable of preventing movement of the head and having adjustable fastening straps at shoulder, waist and feet areas.