

## **Recommended Guidelines**

### ***Building & Construction of Residential Swimming pools*** **[G-0411]**

#### **Pool & Hot Tub Council of Canada**

**April 2012**

These guidelines are provided by the Pool & Hot Tub Council of Canada to be used as reference documents by pool and spa builders, contractors, and service companies in communities across the country. Adherence to these guidelines assures attainment of a base level of quality, durability and performance of the final product for the consumer. In addition, it assures that work is carried out in accordance with existing codes and regulations.

The Pool & Hot Tub Council of Canada is a voluntary, not-for-profit association representing the interests of the pool and hot tub industry. As such it is not considered a harmonized organization, and therefore does not qualify as an accredited national standards-writing body. Notwithstanding the above, the thrust of these guidelines is to ensure high quality residential pools through the adoption of state-of-the-art construction and operating practices. These guidelines are endorsed in principle by the Pool & Hot Tub Council of Canada, and the Council strongly recommends their widespread implementation.

Recommended Guidelines (G-0411) do not circumvent nor supersede existing requirements enshrined under federal, provincial or municipal law. Government codes take precedence over industry guidelines.

## **Introduction**

The rules that govern the installation of residential pools differ greatly from region to region across Canada. In some jurisdictions the industry remains unregulated, with few or no codes specific to the aquatic leisure industry sector in place. Other districts have adopted the standards issued by the American National Standards Institute (ANSI). Yet other parts of the country have enacted their own distinct legislation in this domain.

In an effort to uphold excellence in the building and construction of residential pools, the Pool & Hot Tub Council of Canada (PHTCC) has prepared Recommended Guidelines G-0411. These guidelines expand upon existing regulations, offering supplementary assurance to homeowners that minimum standards of workmanship and safety are to be met or exceeded.

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#### **Industry Recommended Best Practices**

A condition of membership in the Pool & Hot Tub Council of Canada is that all Members must abide by the *Code of Ethics* (Attachment A). In doing so, they are required to maintain the highest standards of quality and professionalism in meeting contractual obligations, and ultimately the expectations of their clients. Moreover, Members of the Council ensure that all applicable rules and regulations within the governing jurisdiction are strictly followed in the design, installation and servicing of pools, spas and water features.

The planning, construction and maintenance of a residential swimming pool requires expertise in a variety of disciplines, including fundamental understandings of water chemistry, electricity, plumbing, hydraulics, filtration, joinery, masonry, and landscaping. A residential swimming pool built to the following qualifications will assure a level of workmanship that will meet the specifications set by regulatory authorities while satisfying the demands of consumers.

#### **Circulation of Water**

- In order to maintain water clarity, the turnover rate for residential pools shall not exceed 8 hours.
- Each pool shall operate a minimum of 16 hours per day so that the pool can achieve two full turnovers of the pool water volume through the filtration system.
- The filtration system installed shall produce sufficient water clarity so that the floor of the deep end of the residential pool is clearly visible and is sharply defined.
- The maximum filter rate shall be 13.6 L/s per square metre (20 US gpm per square foot) for sand filters.
- The maximum filter rate shall be 0.34 L/s per square metre (0.5 US gpm per square foot) for cartridge filters.

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### **Water flow**

- The maximum velocity of water flowing in piping that is after the pump shall not exceed 2.3 metres/second (7.5 ft./s).
- The velocity of water flowing through any piping before a pump shall not exceed 1.5 metres/second (5 ft./s).
- The maximum velocity of water through any grates on a pool or spa shall not exceed 0.5 metres/second (1.5 ft./s).
- Related equipment (i.e., pumps, pipes and filters) are to be sized to meet these requirements. The maximum flow through any equipment shall not exceed the manufacturer's specifications.
- All underground piping shall be backfilled in sand or free flowing granular material.
- The length of straight suction piping installed directly in advance of the pump shall be equivalent to at least five times its diameter. [e.g., If the pump suction piping has a diameter of 6.35 cm (2.5 inches), there must be a minimum of 31.75 cm (12.5 inches) of straight pipe directly in-front of the pump.]

### **Overflow System**

- Automatic skimming devices are to be used as the sole overflow system. Equalizers are not to be installed in connection with skimmers.
- Skimmers are to be installed at a rate of one per every 55.8 square metres (600 square feet) of pool surface area, or portion thereof.
- Maximum flow rate through a skimmer shall be 3.15 L/s (50 US gpm).
- Skimmers shall be installed to handle the total circulation rate of the filtration system plus any additional flow requirements for the pump(s). [i.e., the number of skimmers multiplied by the skimmer's maximum flow rating must be greater than the total flow from the attached pump(s)].



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### **Drain Systems (Outlets)**

Pool drainage systems shall be designed in compliance with the U.S. Virginia Graeme Baker Act. Adherence to this regulation will prevent accidents related to entrapment and entanglement.

If floor drains are used:

- At least two main drains are to be installed no less than 91.4 cm (36 inches) apart, measured edge to edge between covers.
- Each drain is to be sized to accept one hundred percent of the pool flow.
- Each drain system is to be sized to accept one hundred percent of the attached pump's flow, with one additional drain to be installed to neutralize any potential blockage.
- Each drain is to be outfitted with a certified cover meeting the requirements of ASME/ANSI A112.198.2007, and affixed according to the manufacturer's instructions.

### **Return to Pool System (Inlets)**

- All pools shall incorporate a return circulation system that utilizes either floor returns, or wall returns, or a combination of both.
- Pools over 7.32 metres (24 feet) in width shall utilize floor returns.
- All returns shall allow the operator to adjust flow directionally and by volume.
- All returns shall be capable of being capped for testing and winterization.
- The location of returns shall allow maximum circulation of all areas of the pool.
- All returns must inhibit the entrapment of bathers.
- Over-the-wall returns are not permitted.

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### **Water Sanitization**

- According to federal law under the enforcement of Health Canada, chlorine- or bromine-based sanitizers must be utilized in order to rid swimming pools of disease-causing microorganisms.
- While other purification chemicals and systems exist on the market (e.g. algaecides, ozone, ultraviolet radiation), all must be used in combination with the use of chlorine- or bromine-based compounds to effectively prevent microorganisms from multiplying.
- Residential swimming pools shall be equipped to control the amount of sanitizer in the water to thereby create a stable level of free available chlorine (or bromine equivalent) in the range of 1 to 3 parts per million.
- Residential swimming pools shall be equipped to maintain the pH of the water from 7.2 to 7.6.

### **Chemical Storage**

- A secure area is to be set aside for storage of pool chemicals. This area is to be made inaccessible to children.

### **Electrical Components**

- Federal and provincial codes apply to all regions.
- Hook-ups, bonding and grounding of equipment shall be carried out in accordance with applicable Codes.
- Line voltage electrical connections (i.e., greater than 30 volts) and grounding of swimming pools, spas, or water features, shall only be connected, serviced or maintained, by a certified electrician licenced under the authority having jurisdiction.

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##### **Heaters**

- Heaters installed on residential pools shall be properly sized.
- Heaters and all related components, including gas supply piping, regulators, gas cocks, draft hoods, venting, and electrical appliances shall be installed as specified by the manufacturer and in accordance with applicable Codes.
- All heaters shall be installed on a non combustible base.
- Natural Gas or propane-fired appliances, operated in conjunction with a swimming pool, spa or water feature shall only be connected, serviced or maintained, by a certified gasfitter licenced under the authority having jurisdiction.

##### **Entries, Exits and Hand-holds**

- Residential pools shall be equipped with an entry/exit on the shallow side of the first slope change.
- An entry/exit shall be installed in the deep area of a residential pool in which the water depth is 1.5 m (5 ft.) or greater.
- Residential pools exceeding 9 m (29.5 ft.) in width shall be equipped with entries/exits on both sides of the deep area.
- Entries/exits may include ladders, steps, stairs, ramps, beach entries, benches, swim-outs, or mechanical lifts.
- Residential pools exceeding 1.22 m (4 ft.) in depth shall be equipped with hand-holds within 30.5 cm (1 ft.) of the waterline. Hand-holds may include coping, decks, rocks, ladders, stairs, and ropes.
- Foot ledges (or walking platforms) shall not be installed.



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### **Accessories**

The recent enactment of regulations in some parts of Canada (e.g., B.N.Q. 9461-100/2009 in Québec) has led to increased scrutiny over the installation and use of diving boards. Any company contracted to install a diving board, should take the following steps:

- Prior to sale and installation, the homeowner is to be advised of the importance of using the diving board in a safe and responsible manner. The owner is to be presented with a copy of the users' instruction manual and any safety guidelines provided by the manufacturer.
- Diving boards may be installed only on appropriate in-ground swimming pools that are built to meet or exceed all current regulations that apply within the particular jurisdiction. In regions where specific diving board regulations do not exist, the following standards may be consulted in order to determine Pool Type: American National Standard for Residential Inground Swimming Pools (ANSI/NSPI-5 2003); American National Standard for Public Swimming Pools (ANSI/NSPI-1 2003). Once the Pool Type has been determined an appropriate board and stand may be selected. The diving board is to be mounted in strict compliance with the manufacturer's instructions, and in accordance with codes applicable within the given jurisdiction. Diving boards are never to be installed on Above-ground or On-ground pools.
- Prior to the diving board being put into use, the contractor shall confirm to the owner in writing that the assembly specifications supplied by the manufacturer have been met. The homeowner shall sign off that the installation has been done in accordance with the manufacturer's instructions.
- When selling replacement boards, it shall be verified that the new installation meets current manufacturer's requirements and the most up to date regulatory Code. Specifications may have changed since the original diving board was installed. In all cases, the latest rules and requirements take precedence. When replacing diving boards, the contractor will confirm in writing to the owner that the new installation meets all of the manufacturer's requirements. If the requirements cannot be met, no diving board shall be installed.

These same recommendations may prove applicable when installing other pool add-ons such as slides and water toys.

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##### **Building Materials**

- Materials used in the construction and finishing of a residential pool shall be devoid of irregularities (e.g., sharp edges, abrasive surfaces) so as to prevent injury under normal use.
- Surfaces intended to provide footing in and around the residential pool shall be constructed of slip-resistant materials.
- Construction and finishing materials shall be used in accordance with the manufacturer's instructions.

##### **Municipal By-laws and Applicable Building Codes**

- Many municipalities have enacted By-laws that address such local matters as the placement of a pool and/or spa on a lot, fencing requirements, water discharge procedures, etc. Members of the Pool & Hot Tub Council of Canada are committed to understanding relevant rules within their region that affect the design, construction and service of residential swimming pools. This ensures that the final product is in compliance with current By-laws.
- Prior to any construction taking place, all applicable building and installation permits will have been obtained from the local authorities.
- All pools and whirlpools shall be constructed to meet current Electrical and Plumbing codes.

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### **General Safety Measures**

- Upon completion of the installation of a residential swimming pool, the owner shall be briefed on the importance of using the swimming pool and related accessories in a safe manner.
- The contractor will provide the owner with all manufacturer written instructions for all equipment that is supplied.
- Pool owners shall be made aware of supplementary ways to enhance safety related to the pool environment (i.e., the availability of kiddie fencing, door alarms, safety covers, latched windows, wave alarms, etc.)
- Safety information provided by the manufacturers of individual components of the pool shall be passed along to pool owners.
- Pool owners shall be urged to develop a list of pool safety rules, and to enforce them vigilantly. The posting of a safety sign is to be mandatory.

**NOTE:** The Pool & Hot Tub Council of Canada endorses a layered approach to safety. Education of the consumer begins with creating an awareness of the fundamental role of adult supervision. Complementary safeguards shall be explained. The following reference material is available from the Council:

- i) Recommended Guidelines - Suction Avoidance Provisions (G-0109)
- ii) Recommended Guidelines - General Safety Provisions for Pools and Hot Tubs (G-0209)
- iii) Safety Sign - Backyard Pool and Spa Safety Rules
- iv) Safepools.ca Stickers
- v) Recommended Guidelines - Occupational Health and Safety (G-0511)

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Additional information on residential swimming pool safety can be found on the website:  
[www.safepools.ca](http://www.safepools.ca).



The pool and hot tub industry in Canada is required to follow national and provincial codes in the design and construction of swimming pools, spas and water features. A partial list of relevant codes follows:

- The Pest Management Regulatory Agency of Health Canada oversees the treatment and quality of water in pools and spas.
- The National Building Code of Canada, under the aegis of the National Research Council, specifies construction materials and methods. Some provinces publish their own building codes that must be no less stringent than the national code.
- The National Plumbing Code of Canada is issued by the National Research Council. Some provinces have their own plumbing codes in place.
- The Canadian Electrical Code is published by the Canadian Standards Association. Some provinces have their own electrical codes in place.
- The Province of Québec has enacted two regulations that specifically address the construction of residential pools; *Residential Swimming Pool Safety Act* (L.R.Q., c. S-3.1.02,a.1), *Residential Pools Equipped with a Diving Board* [P9461-100-7]

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### **Existing Standards**

In the absence of codes, some jurisdictions enforce standards related to the design and construction of residential swimming pools. A partial list of standards that may apply follows:

- American National Standards Institute ANSI/NSPI-5 2003 - Residential Inground Swimming Pools
- American National Standards Institute ANSI/NSPI-4 2007 - Residential Aboveground/ Onground Residential Swimming Pools

### **Related Organizations**

**ANSI:** American National Standards Institute

**APSP:** Association of Pool and Spa Professionals

**ASME:** American Society of Mechanical Engineers

**BNQ:** Bureau de normalisation du Québec

**NSPI:** National Spa and Pool Institute (succeeded by the Association of Pool and Spa Professionals)

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## ***Appendix A***

### **CODE OF ETHICS**

Extracted from the Member Handbook of the Pool & Hot Tub Council of Canada:

**18.01** All Members shall observe and be dedicated to the following principles and policies:

- (1) To encourage free enterprise and unselfish service to the public and to the Industry.
- (2) To continually strive to promote the image of the Industry at the local community, and on regional and national levels.
- (3) To make the greatest contribution possible to the health, safety and welfare of the public in the installation, maintenance and operation of swimming pools, hot tubs and spas.
- (4) To support all efforts to improve swimming pool, hot tub and spa services and products; and to encourage research and development of new materials, techniques and methods.
- (5) To advertise and sell the merits of the Industry's products and services; and to refrain from attacking competitors or reflecting unfairly on their products, services or methods of doing business.
- (6) To reveal all material facts and to refrain from the use of misleading advertising or innuendo in advertising and selling to ensure that products or services are fully understood by the consuming public.
- (7) To design, build, service and maintain swimming pools, hot tubs and spas in a manner consistent in all ways with the concepts of public health and safety; and to comply at all times with applicable laws, ordinances and regulations.
- (8) To fulfill promptly and completely all contractual obligations; to offer a reasonable warranty, whether explicit or implied, written or oral; and to process justifiable claims without hesitation or delay in accordance with the Standards & Ethics Procedure for Consumer Complaints.

**18.02** Failure to abide by this Code of Ethics may result in a Member having his/her membership revoked or suspended in accordance with Paragraph 5.10 of this By-law.