



NEW PUBLIC SPA DESIGN CHECKLIST

Instructions: A Maine Licensed Professional Engineer may use this checklist to ensure that a new public spa meets all of the design criteria required by the Maine Rules Relating to Public Pools and Spas, 10-144 CMR, Chapter 202, Section 2.B.

Reference: ANSI/NSPI-2 1999: American National Standard for Public Spas

For questions, please contact the DHHS Environmental and Occupational Health Program, Engineering, at 207-287-2070.

NEW SPA DESIGN CHECKLIST

SCOPE

This standard is intended to cover public spas that are used for bathing and are operated by an owner, licensee, or concessionaire, regardless of whether a fee is charged for use.

The provisions of this specification are not intended to prevent the use of other designs provided that any variation from the specifications in this standard provide the required quality, strength, durability and safety for the intended use and are approved by the authority having jurisdiction.

This standard is not meant to cover portable spas, permanently installed residential spas, or other spas, such as those operated for medical treatment, physical therapy, or other purposes.

Other standards are referenced in this standard for items not covered.

MATERIALS OF MANUFACTURE

_____ The materials of manufacture shall be capable of fulfilling the design, installation, and intended use requirements in this standard. The materials of manufacture, components and accessories used in public spas shall comply with following:

Plastic Spa Shells: ANSI Z124.7-97, Pre-fabricated Plastic Spa Shells

Tile: IAPMO IS-2-90, Tile Lined Roman Bathtubs

Stainless Steel: ASTM-A240, Type 316 Stainless Steel

Piping Copper Tubing:

ASTM B 88-96: Specification for Seamless Copper Water Tube

ASTM B 88 447-84: Specification for Welded Copper Tube

PVC: ASTM D 1785-95, Specification for Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120

PVC Hose: IAPMO PS-33-93, Specification for Flexible Hose for Pools, Hot Tubs, Spas, and Jetted Bathtubs

CPVC: ASTM D 2846-95A, Specification for Chlorinated Poly Vinyl Chloride (CPVC) Plastic Hot and Cold Water Distribution Systems

PB: ASTM D3309-95-A, Specification for Polybutylene (PB) Plastic Hot Water Distribution Systems

Steel Pipe Galvanized: ASTM A53-96a, Specification for Pipe, Steel Black and Hot- Dipped, Zinc-Coated, Welded and Seamless

Plastic Fittings: ABS ASTM D 2235-95, Specification for Solvent Cements for Acrylonitrile Butadiene Styrene (ABS) Plastic Pipe and Fittings

PVC: ASTM D 2564-95, Specification for Solvent Cements for Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe and Fittings

CPVC: ASTM F493-95, Specification for Solvent Cements for Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe and Fittings

Soldered Joints:

IAPMO: IS 3-93, Installation Standard for Copper Plumbing Tube & Fittings

IAPMO: IS 21-89, Installation Standard for Copper and Copper Alloy Welded Water Tube
Copper Tube Handbook, CDA

Threaded Joints: ANSI/ASME B1.20.1, Pipe Threads, General Purpose (inch)

Accessories and Components;

Suction Fittings: ANSI/ASME AI 12.19.8- M-1987 Suction Fittings for Use in Swimming pools, Wading pools, Spas, Hot Tubs and Whirlpool Bathtub Appliances.

Couplings or Hose: ASTM C 564-95-A, or equivalent SAEJ20e Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings

Pumps/Motors:

NEMA MG1, Motors and Generators

ANSI/UL I 081 Swimming pool Pumps, Filters and Chlorinators

Spa Heaters:

ANSI/UL 1261, Electric Water Heaters for Pools and Tubs

ANSI Z21 .56a- I 996, Gas Fired Pool Heaters

ANSI/UL 1563 Electric Hot Tubs, Spas and Associated Equipment 1995

ANSI Z21 .56a-I 996, Gas Fired Pool Heaters (supplement)

Circulation Systems:

Components: ANSI/NSF 50 Circulation System Components and Related Materials for Swimming Pools, Spas/Hot Tubs

Equipment: ANSI/UL 1563, Electric Hot Tubs, Spas, and Associated Equipment

Water Supply: ANSI A 112. I.2 (R1991), Air Gaps in Plumbing Systems

Foam: ANSI/UL 94-96, Test for Flammability of Plastic Materials for Parts in Devices and Appliances

Air Induction Systems: ANSI/UL 1563 - Electric Hot Tubs, Spas and Associated Equipment 1995

Safety Signs: ANSI 2535 Series of Standards for Safety Signs and Colors

_____ **Material Surfaces:** All material surfaces that come in contact with the user shall be finished, so that they do not constitute a cutting, pinching, puncturing or abrasion hazard under casual contact and intended use.

Product shall be maintained in accordance with the manufacturer's specifications.

_____ **Compatibility:** Assemblies of different materials shall be chemically and mechanically compatible for their intended use and environment.

PLANS AND PERMITS

_____ **Plans:** Prior to construction, rehabilitation or alteration of a public spa, plans and specifications shall be submitted to the authority having jurisdiction for review, approval and issuance of a permit to construct or rehabilitate as may be required. Changes in the spa shall be approved by the authority having jurisdiction.

_____ **Third Party Inspection:** In areas where the authority having jurisdiction cannot provide the plan review or inspections and where local government does not require building inspections, the owner or his agent shall be required to hire a third party inspector with the approval of the authority having jurisdiction to make the required plan review and inspections.

_____ **Inspection:** The spa owner or builder shall notify the authority having jurisdiction at specific, predetermined stages of construction and at the time of completion of the spa to permit inspections as may be required.

STRUCTURE AND DESIGN

_____ **Structural Design:** The structural design and materials used shall be in accordance with generally accepted structural engineering practices and methods.

_____ **Installation:** Spa equipment shall be supported to prevent damage from misalignment, settling, etc., and located in such a manner to allow access for inspection, servicing, removal and repair of component parts.

_____ **Sand or Earth:** Sand or earth shall not be used as an interior finish in a public spa.

_____ **Freezing:** A means shall be provided to protect the spa shell and appurtenances, piping, filter system, pump and motor and other components from damage due to freezing.

_____ Manufacturer's specifications shall be followed for providing a means to protect the spa when not in use from direct sunlight exposure.

_____ **Slip-Resisting Surface:** The surfaces within the spa intended to provide footing for users shall be slip-resisting surfaces. The texture of such surfaces shall not cause injury or discomfort during normal use.

_____ **Colors, Patterns or Finishes:** The colors, patterns or finishes of the spa interior shall not obscure the existence or presence of objects or surfaces within the spa.

_____ **Roof or Canopies:** Roofs or canopies over spas shall be constructed so that water run-off does not drain into the spa.

DIMENSIONAL DESIGN

_____ **Shape:** This standard is not intended to regulate the shape of the spa other than to take into account the effect a given shape will have on the safety of the occupants and that the minimum required level of circulation will be maintained to ensure sanitation.

_____ There shall be no protrusions, extensions, means of entanglement or other obstructions in the bathing area which can cause the entrapment or injury of the user.

_____ The designed waterline shall have a maximum construction tolerance at the time of completion of the work of plus or minus one-fourth inch ($\pm 1/4"$) [± 6.35 mm] for spas with adjustable weir surface skimming systems, and a plus or minus one-eighth inch ($\pm 1/8"$) [± 3.175 mm] for spas with nonadjustable surface skimming systems.

_____ There shall be a construction tolerance on all other dimensional designs. The overall length, width and depth in the deep end shall be limited to a tolerance of plus or minus two inches ($\pm 2"$) [± 5.08 cm].

_____ **Water Depth:** The maximum water depth shall be four feet (4') [1.2192 m] measured from the waterline except for spas that are designed for special purposes and approved by the authority having jurisdiction.

_____ **Multi-Level Seating:** Multi-level seating may be provided, but the maximum water depth of any seat or sitting bench shall be twenty-eight inches (28") [71.12 cm] measured from the waterline.

_____ **Handholds:** The spa shall be provided with a suitable handhold around its perimeter in areas where water depths exceed three feet six inches (3'6") [1.0668 m]. Handholds shall be provided no further apart than four feet (4') [1.2192 m] and shall consist of any one or a combination of the options listed below.

_____ Suitable handholds shall consist of coping, ladders, steps, secured rope or railing, ledges, seat ledges, radiused flanges or decks located along the immediate top edge of the spa. A handhold shall have a slip-resisting surface and be located at a maximum of twelve inches (12") [30.48 cm] above the waterline.

_____ **Floor Slope:** The slope of the floor shall not exceed one foot in twelve feet (1':12') [1 m: 12 m].

Steps, Seats, Recessed Steps, Ladders and Recessed Treads

_____ **Exit/Entry:** Steps, seats, ladders or recessed treads shall be provided for entry and exit where water depths are greater than twenty- four inches (24") [60.96 cm].

_____ Spas shall be equipped with at least one handrail (or ladder) for each fifty feet (50') [15.24 m] of perimeter or a portion thereof, to designate the point of entry and exit.

_____ **Design and Construction:** The design and construction of spa steps, recessed steps and seat benches, where used, shall conform to the following:

_____ Step treads shall have a minimum unobstructed horizontal depth of ten inches (10") [25.4 cm] and a minimum unobstructed surface area of two hundred and forty square inches (240 sq. in.) [1548.384 sq. cm].

_____ Riser heights at the centerline of treads shall have a maximum uniform height of 12 inches (12") [30.48 cm], with the bottom riser height allowed to vary plus or minus 2 inches (2") [5.08 cm] from the uniform riser height.

_____ The first and last risers are not required to be uniform but shall comply with riser height requirements as noted above. The first (top) riser is measured from the finished deck.

_____ Intermediate risers, those between the first and last risers, shall be uniform in height.

_____ Each set of steps shall be provided with at least one (1) handrail to serve all treads and risers.

_____ Handrails shall be installed in such a way that they cannot be removed without the use of tools.

_____ The leading edge of a handrail in the spa shall be no more than eighteen inches (18") [45.72 cm] plus or minus three inches (± 3 ") [7.62 cm] horizontally from the vertical plane of the bottom riser (where applicable.)

_____ Seats or benches are not prohibited from being a part of the steps.

_____ **Ladders:** The design and construction of spa ladder(s), where used, shall conform to the following:

_____ Spa Ladder(s) shall be made entirely of corrosion-resisting materials.

_____ Ladder treads shall have a slip-resisting surfaces.

_____ Ladder(s) shall be provided with two (2) handholds/handrails.

_____ The outside diameter of a ladder rail shall be between a minimum of one inch (1") [2.54 cm] and a maximum of one and nine-tenths inches (1.9") [4.826 cm].

_____ Below the water level, there shall be a clearance of not more than six inches (6") [15.24 cm] nor less than three inches (3") [7.62 cm] between any ladder tread edge, measured from the spa wall side of the tread and the spa wall.

_____ The clear spread between ladder handrails shall be a minimum of seventeen inches (17") [43.18 cm] and a maximum of twenty-four inches (24") [60.96 cm].

_____ **Recessed Treads:** The design and construction of recessed treads, where provided, shall conform to the following:

_____ Recessed treads at the centerline shall have a uniform vertical spacing of twelve inches (12") [30.48 cm] maximum and seven inches (7") [17.78 cm] minimum.

_____ Vertical distances between the spa coping edge, deck or step surface and the uppermost recessed tread shall be a maximum of twelve inches (12") [30.48 cm].

_____ Recessed treads shall have a minimum depth of five inches (5") [12.7 cm] and a minimum width of twelve inches (12") [30.48 cm].

_____ Recessed treads shall drain into the spa to prevent the accumulation of dirt, and shall be slip-resisting.

_____ Each set of recessed treads shall be provided with a set of handrails/grabrails/handrails to serve all treads and risers.

DECKS

____ New Construction Areas: These requirements shall apply to new construction areas immediately around the spa.

____ Work for concrete deck(s) shall be performed in accordance with local construction practices and the recommendations of the latest American Concrete Institute (ACI) Standard 302. IR-80, "Guide for Concrete Floor and Slab Construction".

____ Slip-Resisting: Decks, ramps, coping and similar step surfaces shall be slip-resisting materials and easy to clean.

____ Special Features: Special features in or on decks such as markers, brand insignias or similar items shall conform to this article.

____ Riser Dimensions: Risers for deck steps shall be uniform and have a maximum height of seven and one-half inches (7-1/2") [19.05 cm]. The minimum tread depth shall be ten inches (10") (25.4 cm).

____ Subgrade: The subgrade for decks shall be prepared and/or installed in accordance with engineering practices required in the area of installation or methods required by the authority having jurisdiction.

____ Unobstructed Deck: A minimum four foot (4') [1.2192 m], continuous, unobstructed deck, including the coping, shall be provided around at least fifty percent (50%) of the spa.

____ Slope: Decks shall be sloped to effectively drain towards the perimeter areas or to deck drains.

____ Typical slopes for immediate spa decking are:

____ a) 1/8 inch per 1 foot (1.04166 cm per 1 meter) shall be provided for textured, hand- finished concrete decks;

____ b) 1/4 inch per 1 foot (2.08333 cm per 1 meter) for exposed aggregate concrete decks;

____ c) 1/2 inch per 1 foot [4.1666 cm per 1 meter] for indoor/outdoor carpeted concrete decks, unless an alternate drainage method is provided.

____ The maximum slope for wood decks shall be one-eighth inch per 1 foot (1/8":1') (1.04166 cm : 1 meter). Gaps shall be based on good engineering practices with respect to the type of wood used.

____ Expansion joints: The maximum voids between adjoining concrete slabs and/or between concrete slabs and expansion joint materials shall be one- sixteenth inch (1/16") (1.5875) of horizontal clearance with a maximum difference in vertical elevation of one-fourth inch (1/4") [6.35 mm].

____ Construction joints where concrete deck(s) meets the spa coping shall be watertight and shall not allow water to pass to the ground beneath.

____ Decks shall be installed so as to protect the coping and its mortar bed from damages as a result of deck movement.

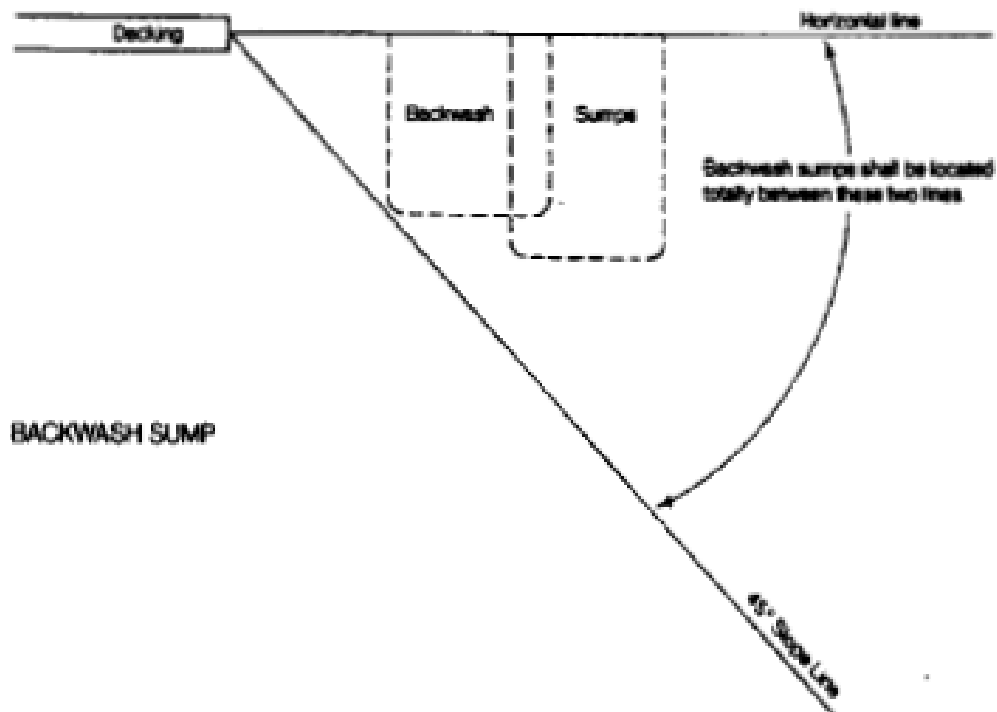
____ Expansion or control joints shall be provided to help control cracks due to expansion, contraction and movement of the slab.

____ The areas where deck(s) join concrete work shall be protected by expansion joints, if necessary, to protect the spa adequately from the pressures of relative movements.

____ Sharp Corners: Decks shall be chamfered or otherwise relieved to eliminate sharp comers.

____ Drainage: Site drainage shall direct all deck drainage as well as general site and roof drainage away from the spa. Where required, yard drains shall be installed to prevent the accumulation or puddling of site water in the general area of the deck(s) and related improvements.

____ Backwash Sump: If used, a backwash sump shall be located so that it falls completely below adjacent deck(s) and fully outside a line projected 45° downward and away from the deck(s) or shall be designed to accommodate local soil conditions and the volume of backwash.



____ Circulation System Piping: Circulation system piping, other than that integrally included in the manufacture of the spa, shall be subject to an induced static hydraulic pressure test (sealed system) at twenty-five pounds per square inch (25 lbs/psi) (1.7577035 kg/sq. cm) for

30 minutes. This test shall be performed before the deck is poured, and the pressure shall be maintained throughout the deck pour.

_____ Valves installed in or under any deck(s) shall provide a minimum of nine inches (9") [22.86 cm] diameter access cover and valve pit to facilitate servicing.

_____ Hose Bibb: A hose bibb with a vacuum breaker shall be provided for washing down the entire deck area.

CIRCULATION SYSTEMS

_____ Compliance: Circulation systems, components and equipment shall comply with the latest revision of ANSI/NSF 50, "Circulation System Components and Related Materials for Swimming Pools, Spas/Hot Tubs."

_____ Complete Circulation: A circulation system consisting of pumps, piping, return inlets, suction outlets, filters and other necessary equipment shall be provided for circulation of water throughout the spa and shall be located as to prevent their being used as a means of access to the spa by young children.

_____ The system shall be designed to turn over the entire spa water capacity at a minimum of once every thirty minutes, based on the manufacturer's specified rate of the filter, in a clean media condition of the filter. Water clarity shall be maintained. (See Appendix A.) When standing at the spa's edge, the deepest portion of the spa floor shall be visible when the water is in an undisturbed condition.

NOTE: Clarity is a function of proper filtration and maintenance of proper chemical operation parameters.

_____ Circulation System Components: Components which require servicing shall be accessible for inspection and repair, and shall be installed in accordance to the manufacturer's specifications.

_____ Spa equipment shall be properly supported to prevent damage from misalignment, settlement, operational movement, etc. The equipment shall be mounted so as to minimize the potential for the accumulation of debris and moisture, following manufacturer's specifications.

_____ Water Velocity: The water velocity in the piping shall not exceed ten feet (10') [3.048 meters] per second for discharge piping, except for copper pipe where the velocity for piping shall not exceed eight feet (8') [2.4384 meters] per second, and six feet (6') [1.8288 meters] per second for suction piping, unless summary calculations are provided to show that the greater velocity is possible with the pump and piping provided.

_____ A pump motor shall be provided for circulation of the spa water. Performance of all pumps shall meet or exceed the conditions of flow required for filtering and cleaning (if applicable) the filters against the total dynamic head developed by the complete system.

_____ Piping and Fittings: The circulation system piping and fittings shall be of material able to withstand operating pressures and operating conditions.

_____ Equipment shall be designed and fabricated to drain the spa water from the equipment, together with the exposed face piping, by removal of drain plugs and by manipulating valves or by other methods. The system shall be drained in accordance with the manufacturer's specifications on draining the system.

_____ Pressure or Vacuum Gauge: A pressure gauge (located downstream from the pump on a pressure system), a vacuum gauge (located after the filter and before the pump on a vacuum system) or other means of indicating system condition shall be provided in the circulation system in an easily readable location.

_____ The spa shall be provided with an indicator measuring the rate of flow through the filter system with an appropriate range, readable in gallons per minute (gpm) and accurate within ten percent (10%) of actual flow.

_____ Water Clarity: The circulation system shall be capable of maintaining water clarity and water chemistry requirements. Time clocks may be used to set the operating period. When time clocks are used, they shall also govern the operating time of appurtenant devices such as chemical/sanitizing feeders, heaters, etc. that are dependent upon circulation pump flow.

In addition to programmed filtration times, recirculation equipment shall be in operation during the hours the spa is accessible for use.

_____ Maintenance Instructions: Written operation and maintenance instructions shall be provided for the circulation system.

FILTERS

_____ Compliance: Filtration systems, components and equipment shall comply with the latest revision of ANSI/NSF 50 "Circulation System Components and Related Materials for Swimming Pools, Spas/Hot Tubs."

_____ Design Performance: Filters shall be designed so that after cleaning per manufacturer's specifications, the system can provide the water clarity noted below "Complete Circulation" under circulation systems.

_____ All filter elements, media and other components which require servicing shall be accessible for inspection, removal and repair, and shall be installed in accordance with the filter manufacturer's instructions.

_____ Pressure-Type Filters: On pressure-type filters, a means shall be provided to permit the release of internal pressure.

_____ Internal Pressure: Pressure-type filters shall provide an automatic internal and manual external means to relieve accumulated air pressure inside the tank. Filter tanks composed of upper and lower tank lids that are held in place by a perimeter clamp shall provide a slow and safe release of air pressure before the clamp disengages the lids.

_____ Any separation tank used in conjunction with any filter tank shall have an air release or a manual means which provides a slow and safe release of pressure as it is opened as part of its design.

____ Maintenance and Instructions: Pressure filters and separation tanks shall have operation and maintenance instructions permanently installed and clearly visible on the filter or separation tank. It shall include a precautionary warning statement not to start the system after maintenance without first opening the air release and properly reassembling the filter and separation tank.

____ Piping: Piping, furnished with the filter, shall be of suitable material capable of withstanding one and one-half (1-1/2) times the working pressure. The suction piping shall not collapse when there is a complete shutoff of flow on the suction side of the pump.

PUMPS AND MOTORS

____ Sizing: Swimming spa pumps shall be tested and approved by a nationally recognized testing laboratory. Pumps rated three (3) horsepower or less shall comply with ANSI/UL I 081, "Standard for Swimming Pool Pumps, Filters and Chlorinators." Centrifugal pumps shall comply with the latest revision of ANSI/NSF-50 Circulation System Components and Related Materials for Swimming Pools, Spas/Hot Tubs.

____ Rating: Pump horsepower rating and labeling shall not exceed the brake horsepower of the motor.

____ Strainer or Screen: With all pressure filter systems, a cleanable strainer or screen shall be provided upstream (inlet suction side) of the circulation pump(s) to remove solids, debris, hair, lint, etc.

____ Safe Operation: The design and construction of the pump(s) and component parts shall provide operation that is not hazardous to the operator or maintenance personnel.

____ Capability: Motor(s) shall be capable of operating the pump(s) under full load with a voltage variation of plus or minus ten percent ($\pm 10\%$) from the nameplate rating. If the maximum service factor of the motor is exceeded (at full voltage), the manufacturer shall indicate this on the pump curve.

____ Overload Protection: All motors shall have thermal or current overload protection, either built in or in the line starter, to provide locked rotor and running protection.

____ Pumps Below the Waterline: Where the pump is below the waterline, shut-off valves shall be installed on suction and discharge lines. Valves shall be readily accessible for maintenance.

RETURN INLETS AND SUCTION OUTLETS

____ Location: Return inlet(s) and suction outlet(s) shall be provided and arranged to produce a uniform circulation of water and maintain a uniform sanitizer residual throughout the entire spa.

____ Testing and Certification: Spa suction outlets shall be provided with a cover that has been tested and accepted by a nationally recognized testing laboratory and comply with

ANSI/ASME A112.19.8M 1987 "Suction Fittings for Use in Swimming pools, Wading Pools, Spas, Hot Tubs, and Whirlpool Bathtub Appliances."

____ Installation: Spa suction outlets shall be sized and installed in accordance with manufacturer's specifications.

____ IMPORTANT SAFETY NOTE: Do not use or operate spa if the suction outlet cover is missing, damaged, broken or loose.

____ Entrapment Avoidance: Vacuum systems shall have access fitting mounted outside the spa. The access fittings shall not be accessible to the spa user.

____ Outlets Per Pump: A minimum of two (2) suction outlets shall be provided for each pump in the suction outlet system, separated by a minimum of three feet (3') [91.44 cm] or located on two (2) different planes; i.e. one (1) on the bottom and one (1) on the vertical wall, or one (1) each on two (2) separate vertical walls. These suction outlets shall be plumbed such that water is drawn through them simultaneously through a common line to the pump.

____ Cleaner Fittings: Where provided, the vacuum or pressure cleaner fitting(s) shall be located in an accessible position(s) at least six inches (6") [15.24 cm] and not greater than eighteen inches (18") [45.72 cm] below the minimum operating water level or as an attachment to the skimmer(s).

SURFACE SKIMMER SYSTEMS

____ Skimming devices shall comply with the latest revision of ANSI/NSF-50 "Circulation System Components and Related Materials for Swimming Pools, Spas/Hot Tubs".

____ Design and Construction: Skimming devices shall be provided on all public spas, and shall be designed and constructed to skim the spa surface when the water level is maintained within the operational parameters of the system's rim or weir device.

____ Safe Operation: Skimming devices shall be designed and installed so as not to constitute a hazard to the user.

____ Automatic Surface Skimmers: Where automatic surface skimmers are used as the sole overflow system, at least one (1) surface skimmer shall be installed for each one hundred fifty square feet (150 sq. ft.) [13.935 sq. meter] or fraction thereof of water surface area. When skimmers are used, they shall be located to optimize skimming action over the surface of the spa.

____ Perimeter Surface Skimmers: Where perimeter surface skimmer systems are used, they shall be connected to the circulation system with a system surge capacity of not less than two and one half gallons per square foot (2-1/2 gal/sq. ft.) [10.18676 liters/sq. meter] of spa surface.

____ The hydraulic capacity of the overflow system shall be capable of handling one hundred percent (100%) of the circulation flow.

ELECTRICAL REQUIREMENTS

_____ Testing and Certification: Electrical components used in a public spa shall be evaluated for the application and accepted by a nationally recognized testing laboratory.

_____ Compliance: All electrical components installed in and/or adjacent to a public spa shall comply with the requirements of Article 680 of the National Electrical Code (NEC)® and the authority having jurisdiction.

_____ Grounding and Bonding: Grounding and bonding required in a public spa shall comply with the requirements of the National Electrical Code (NEC)®, ANSI/UL 1563 "Standard for Electric Hot Tubs, Spas and Associated Equipment" and the authority having jurisdiction.

IMPORTANT NOTE: Requirements for grounding and bonding are particularly important and shall be adhered to to reduce the hazard of electrical shock.

_____ Disconnect Switch: Disconnecting means shall be accessible, located within sight of the spa and shall be located at least 5 feet (5') [1.524 m] horizontally from the inside walls of the spa.

AIR BLOWER AND AIR INDUCTION SYSTEMS

_____ Air Intake: This section pertains to all devices and systems which induce or allow air to enter the spa either by means of a power pump or passive design.

_____ Electrical: Any component requiring electrical connection shall be evaluated for the application and accepted by a nationally recognized testing laboratory.

_____ Backflow/Shock: To prevent electrical shock hazards, all air blower systems shall have backflow protection as specified in ANSI/UL 1563 "Standard for Electric Hot Tubs, Spas and Associated Equipment."

_____ Air Intake Source: Air intake sources shall not induce water from outside the spa unit, dirt or contaminants, into the spa.

_____ Sizing: The air induction system shall be properly sized. Refer to the manufacturer's sizing specifications.

_____ Make Up Air: When installing an air blower within an enclosure or indoors, adequate ventilation is required. The air induction system shall be installed in accordance with the manufacturer's specifications or the authority having jurisdiction.

_____ Electrical Supply: Air blowers shall be installed in accordance with the National Electrical Code (NEC)® and the authority having jurisdiction.

IMPORTANT NOTE: Requirements for grounding and bonding are particularly important and shall be adhered to to reduce the hazard of electrical shock.

Accessibility: The air blower shall be accessible for inspection and service.

____ Air Passages: Integral air passages shall be pressure tested at time of manufacture to provide structural integrity to a value of one and one-half (1-1/2) times the intended working pressure.

HEATER AND TEMPERATURE REQUIREMENTS

____ Source: This section pertains to appliances using either fossil fuels such as natural gas, propane, (LPG) and #2 Fuel Oil, or electric heating equipment for heating spa water.

____ Testing and Certification: Heaters shall be tested and shall comply with the requirements of ANSI Z21 .56a- I 996 for gas applications or UL 1261 for electrical applications. Heat pumps shall comply with UL 559 specifications and be evaluated for the application and accepted by a nationally recognized testing laboratory.

____ Water Temperature Controls: Components provided for water temperature controls shall be evaluated for suitability for its intended application.

____ Water Temperature Regulating Controls: Water temperature regulating controls shall comply with ANSI/UL 1563 "Standard for Electric Hot Tubs, Spas, and Associated Equipment" and UL 372 "Primary Safety Controls for Gas and Oil-Fired Appliances." Owner/operator shall routinely check the in- spa water temperature to ensure that the temperature does not exceed 104°F [40 °C]. Any adjustment, if required, shall be performed in accordance with manufacturer's specifications.

____ Water Temperature Limiting Controls: Water temperature limiting controls shall comply with ANSI/UL 1563 "Standard for Electric Hot Tubs, Spas and Associated Equipment" and UL 372 Primary Safety Controls for Gas and Oil-Fired Appliances." Water temperature at the heater return outlet shall not exceed 122° F [50 °C].

____ Sizing: Heaters shall be sized based on the volume of spa water in gallons and in accordance with the heater manufacturer's specifications.

____ Installation: Heaters shall be installed in accordance with the authority having jurisdiction and in accordance with the manufacturer's specifications.

____ Support: Heaters shall be installed on a surface with sufficient structural strength to support the heater when it is full of water and operating. The heater shall be stable and not able to move after plumbing, gas and/or electrical connections are completed.

____ Combustible Surfaces: If the heater requires a non-combustible mounting surface per the manufacturer's specification, it shall be placed on a concrete or other accepted surface and comply with ANSI Z21 .56a- I 996 or with the authority having jurisdiction.

____ Clearances: All heaters shall be installed and maintained with the minimum clearances to combustibles for which the heater has been tested as specified by the manufacturer's specification.

____ Ventilation: The heater shall have adequate ventilation in order to assure proper operation.

____ Make Up Air: When installing a fossil fuel heater indoors, proper openings to the room are required. The heater shall be installed in accordance with the authority having jurisdiction and the manufacturer's specifications for properly sized and located air openings to the enclosure.

____ Heating Energy Source

____ Natural Gas Energy Supply: The heater gas supply piping shall comply with manufacturer's specifications and ANSI/NFPA 54 "National Fuel Gas Code."

____ IMPORTANT SAFETY NOTE: Install a gas cock, properly sized and readily accessible outside the jacket, to stop the flow of natural gas at the heater for service or emergency shutdown.

____ Propane Energy Supply: Whenever a propane (LPG) appliance is installed, special attention shall be given to insure that the storage tank, supply piping and regulator shall be adequately sized to ensure operating fuel pressures as specified by the appliance manufacturer. Consult the fuel supply company and ensure that the system is installed in accordance with the National Fuel Gas Code (ANSI 2223.1/NFPA 58-1989), or equivalent.

____ IMPORTANT SAFETY NOTE: Propane gas is heavier than air and therefore can create an extreme hazard of explosion or suffocation if the heater is installed in a pit or enclosed area. NFPA 58 contains provision for installing valves and other controls in pits and similar areas.

____ IMPORTANT SAFETY NOTE: Install a gas cock, properly sized and readily accessible outside the jacket to stop the flow of propane (LPG) at the heater for service or emergency shutdown.

____ Electrical Supply: Electric heating appliances shall be installed in accordance with the National Electrical Code (NEC)® and with the requirements of the authority having jurisdiction.

IMPORTANT SAFETY NOTE: The requirements for grounding and bonding are particularly important and shall be adhered to to reduce the hazard of electrical shock.

____ Heater Circulation System

____ Water flow through the heater, any bypass plumbing installed, any back siphoning protection and the use of heat sinks shall be done in accordance with the manufacturer's specifications and the requirements of the authority having jurisdiction.

SPECIAL CONSIDERATION:

____ Mechanisms such as a "fireman's switch" adapted to the time clock will turn the heater off long enough for it to cool down before the time clock turns the pump off.

____ NOTE: The "fireman's switch" does not protect against a manual override or a system shut down in the event of power failure.

WATER SUPPLY

_____ Treatment: The spa water shall be tested and treated to meet the requirements of Appendix A before the bather uses the spa.

_____ Backflow: No direct mechanical connection shall be made between the potable water supply and spa, sanitizing equipment or the system of piping for the spa, unless it is protected against backflow and back-siphonage in a manner approved by the authority having jurisdiction or through an air gap, meeting the latest ANSI A112.1.2 (R1991) Standard.

_____ Over-The-Rim Spout: An over-the-rim spout, if used for fresh water makeup, shall be properly shielded so as not to create a hazard. Its open end shall have no sharp edges and shall not protrude more than two inches (2") [5.08 cm] beyond the edge of the spa.

_____ Water Temperature: Temperature of the incoming make-up water should not exceed 104°F (40°C) as recommended in ANSI/UL 1563 "Standard for Electric Hot Tubs, Spas and Associated Equipment."

WASTE WATER DISPOSAL

_____ Backwash water is permitted to be discharged into a sanitary sewer through an approved air gap into an approved subsurface disposal system or by other means approved by the authority having jurisdiction.

SANITIZING, OXIDATION EQUIPMENT AND CHEMICAL FEEDERS

_____ Compliance: Sanitizing equipment, oxidation equipment and chemical feeders, shall comply with the latest revision of ANSI/NSF-50 "Circulation System Components and Related Materials for Swimming Pools, Spas/Hot Tubs." The sanitizing equipment and the chemical feeders shall be capable of introducing a sufficient quantity of an approved sanitizing agent or other chemical to maintain the provisions as outlined in Appendix A.

_____ Chemical Feeders: Manufacturer's specifications shall be used in installing and maintaining chemical feeders. The installation and use of chemical feeders shall conform to Articles below:

_____ Chemical feeders, if used, shall be installed downstream from the filter and heater unless the equipment is designed to feed to the suction side of the pump, e.g., slurry or coagulant feeders, etc.

_____ If the chemical feeder is equipped with its own pump, it shall be installed so it introduces the sanitizer or oxidizer downstream from the heater and at a position lower than the heater outlet fitting.

_____ Chemical feed pumps shall be wired so they cannot operate unless the filter pump is running. If the device has an independent timer, the filter and chemical feed pump timers shall be interlocked.

____ Training: Personnel responsible for the operation of the sanitizing agent equipment shall be properly trained in the operation of that equipment, the procedure for performing and interpreting the required onsite chemical tests, and the appropriate emergency procedures. (See Article XVIII)

____ Test Kits: Every public spa shall be supplied with a chemical test kit(s) for the determination of pH, sanitizer, cyanuric acid (if used), total alkalinity, and calcium hardness.

____ The method used in determining free chlorine shall be such that any chloramine present in the spa do not affect the determination as referenced in Maine Rules Relating to Public Pools and Spas (10-144 CMR Chapter 202) for chemical operational parameters .

____ Low Output Ozone Generating Equipment: The installation of ozone generating equipment shall be limited to low output ozone generating equipment. The installation and use of ozone generating equipment shall conform to all requirements of the authority having jurisdiction, as well as below:

____ Installation of ozone generating equipment shall allow for indications of operation or malfunction to be easily observed. The equipment shall be installed in a manner such that a malfunction shall not endanger operators or spa users.

____ Ozone generating equipment shall be used in conjunction with other chemical treatments to meet the chemical operating parameters in Appendix A. Normal maintenance and monitoring of water chemistry shall be followed.

____ If the equipment is capable of exposing maintenance or service personnel to ozone concentrations exceeding federal, state, or local air standards, a self-contained breathing apparatus approved for ozone usage shall be provided. If a distinct, pungent odor is smelled when the ozone generating equipment is operating, the equipment shall be shut down and the area shall be ventilated. The equipment shall be inspected and repaired as required per the manufacturer's specifications.

____ Manufacturer's specifications shall be used to determine where and how ozone shall be introduced.

SAFETY FEATURES

____ Obstructions and Entrapment Avoidance: There shall be no obstructions that can cause the user to be entrapped or injured. Types of entrapment can include but not be limited to such things as wedge or pinch-type openings and rigid, nongiving cantilevered protrusions.

____ Unauthorized Access: The spa shall be secured to protect against unauthorized access. Consult the authority having jurisdiction for barrier requirements. (ANSI/NSPI-8 Model Barrier Code for Residential Swimming Pools, Spas and Hot Tubs).

____ Disconnect Switch: Disconnecting means shall be accessible, located within sight of the spa and shall be located at least 5 feet (5') [1.524 m] horizontally from the inside walls of the spa.

_____ The disconnect switch shall be clearly labeled as a safety disconnect switch use only. It is not used for emergency.

_____ Safety Literature: The spa owner shall be advised of the available publications related to spa safety. These documents include NSPI booklets entitled: "Children Aren't Waterproof", "Pool and Spa Emergency Procedures For Infants", "Layers of Protection" and "The Sensible Way to Enjoy Your Spa."

_____ Instructions/Safety Signs: The installing agent shall provide instructions to inform the owner to post signage in a prominent location which states the safety, emergency and operational aspects of the spa. As a guide for language and layout of the safety signs reference ANSI Z 535 series of standards for "Safety Signs and Colors" and ANSI/UL 1563 "Standard for Electric Hot Tubs and Associated Equipment."

_____ Spa Use Sign: The spa instructions shall inform the operator to post the spa use parameters sign in a prominent location adjacent to the entrance of the spa.

_____ Emergency Telephone Signs: A sign shall be posted in the immediate vicinity of the spa, stating the spa's address, the location of the nearest telephone with references that emergency telephone numbers are posted at the location. Those emergency telephone numbers shall include the name and phone number of the nearest available police, fire, ambulance service, and/or rescue unit, and/or "911", if available.

_____ Depth Markers: Public spas shall have permanent depth markers with numbers a minimum of four inches (4") [10.16 cm] high plainly and conspicuously visible from all obvious points of entry and in conformance with Articles 18.7.1 through 18.7.6.

_____ There shall be a minimum of (2) two depth markers per spa, regardless of spa size or shape.

_____ Depth markers, in accordance with 18.7.1 above, shall be spaced at no more than twenty-five feet (25') [7.62 m] intervals and shall be uniformly located around the perimeter of the spa.

_____ Spas shall have the maximum water depth clearly marked on the required surfaces.

_____ Depth markers shall be positioned on the deck within eighteen inches (18") [45.72 cm] of the water line.

_____ Depth markers shall be positioned to be read while standing on the deck facing the water.

_____ Depth markers in or on the deck surfaces shall be slip-resisting.

_____ Clock: All public facilities shall have a clock which is visible to spa user.

_____ Water Temperature: The maximum temperature in the spa should not exceed 104°F [40°C].

_____ The spa operator shall be provided with an accurate thermometer (± 1 °F) [± 0.56 °C] tolerance and shall periodically check to ensure that the maximum temperature does not exceed 104°F [40°].

_____ A means to determine the spa temperature with ± 1 °F [± 0.56 °C] tolerance shall be provided to the user.

DRESSING FACILITIES FOR PUBLIC SPAS

_____ The minimum criteria for dressing and sanitary facilities shall be based upon the anticipated maximum attendance of users and their gender.

NSPI GLOSSARY OF INDUSTRY TERMS

The following is a list of definitions used by the swimming pool and spa industry as referenced in the National Spa and Pool Institute standards.

ABRASION HAZARD - A surface that presents an unreasonable risk of irritation to the skin upon contact.

ACCESSIBLE - Methods providing access to physically challenged users.

ACID - A liquid or dry chemical used to lower the pH and/or alkalinity of pool or spa water.

ACIDIC - Having a pH below 7.0 on the pH scale. Opposite of basic.

ACID WASH - A procedure using an acid solution to clean an interior surface of a pool with subsequent neutralization of the acid.

ACRYLIC - An thermoplastic material which can be extruded, injection molded, or vacuum formed into usable shapes and surfaces.

ACTION POOL - A wave pool in which standing waves are generated in an assortment of patterns.

ACTIVATED CARBON - A charcoal like material used to remove colors, odors, and/or oxidizer from water.

ACTIVITY POOL - Any pool designed primarily for play activity which uses constructed features and devices including lily pad walks, flotation devices, small slide features and similar attractions.

ADULT SUPERVISION - Supervision of a person of reasonable intelligence and ability, at least eighteen (18) years of age, or, if less than eighteen (18) years old, with training in supervision such as Red Cross Life Guard.

AGGREGATE - Marble dust, sand, rocks, pebbles, colored quartz, dolomite, and other similar materials used as components of concrete or plaster.

AGGRESSIVE WATER - Water which is corrosive because it is low in pH, and/or calcium hardness, and/or alkalinity.

AIR BLOWER - A device that produces a continuous flow of air.

AIR CHANNEL - A system whereby a volume of air is introduced into hollow ducting built into a spa floor, bench or other location. The air channel is activated by a separate air power unit (blower).

AIR CONTROL - A means for spas and hot tubs to regulate air flow in the air induction system, increasing or decreasing hydrotherapy action.

AIR INDUCTION SYSTEM - A plumbing system which provides the source of air for the air/water mixture to a hydrotherapy jet.

AIR SWITCH SYSTEM - An isolated device which utilizes a pulse of air sent down a tube to remotely operate electrical equipment.

ALGAE - Microscopic plant-like organisms that contain chlorophyll. Algae are nourished by sunlight (carrying out photosynthesis). They are introduced by rain or wind and grow in colonies producing nuisance masses. These organisms include green, blue-green or black, brown, and yellow-green (mustard) algae. Pink/red colored algae-like organisms exist but are bacteria and not algae. There are 21,000 known species of algae.

ALGAECIDE (Also spelled ALGICIDE) - Any chemical or material which kills algae.

ALGISTAT-Able to inhibit the growth of algae.

ALKALI - A term applied to bases, usually carbonates and hydroxides, which raise the pH and alkalinity when added to water.

ALKALINE - Having a pH above 7.0. Opposite of acidic.

ALKALINITY - A measure of the pH buffering capacity of water. Alkalinity is generally expressed in terms of the equivalent concentration of calcium carbonate in mg/L (or ppm).

ALUM (aluminum sulfates) - A compound used to cause suspended solids in the water to form filterable masses (floculate).

AMMONIA (NH) - A chemical compound of hydrogen and nitrogen that combines with free chlorine in pools to form chloramines, or combined chlorine. It also combines with free bromine to form bromamines.

AMP (AMPERE) - A unit of electric current that is equivalent to a flow of one coulomb per second or to the steady current produced by one volt applied across a resistance of one ohm.

AMPERAGE - The strength of a current of electricity expressed in amperes.

AMPHOTERIC - Having the ability to serve as either an acid or a base.

ANCILLARY FACILITY - Area used in conjunction with, or operation of, a pool such as public dressing, locker, shower, or bathroom area, equipment room, pool deck area or building space intended to be used by pool users.

ANTIVORTEX DRAIN COVER (ANTIVORTEX PLATE OR COVER) - A plate or cover that is affixed to the main outlet of a swimming pool or spa that prevents a vortex from forming as water passes through to the main outlet.

AVAILABLE CHLORINE - A rating of a chemical's total chlorine content based on a comparison to elemental (gaseous) chlorine having 100% available chlorine.

BACKBOARD - Device for immobilizing a person with a suspected injuries to the spinal column.

BACK PRESSURE - Resistance to flow, normally expressed in pounds per square inch (kilograms per square centimeter).

BACKWASH - The process of cleansing the filter medium and/or elements by the reverse flow of water through the filter.

BACKWASH CYCLE - The time required to backwash the filter medium and/or elements and to remove debris in the filter vessel.

BACKWASH RATE - The rate of flow water through the filter media per unit of area (U.S. gallons/minute/sq. feet).

BACTERIA - Single-celled microorganisms of various forms, some of which cause infections or disease.

BACTERICIDE - Any chemical or material which kills bacteria.

BALANCE - In pools and spas, used to refer to a condition of the water that is neither scaling nor corrosive.

BALL VALVE - A device that can partially or totally obstruct the flow of water, using a ball-shaped diverter.

BARRIER - A means to limit, delay, or restrict access to a pool, spa, or hot tub. (Refer to ANSI/NSPI-8 1996 Model Barrier Code for Residential Swimming Pools, Spas, and Hot Tubs.)

BASE • A chemical used to raise pH and/or total alkalinity of pool or spa water.

BASE DEMAND - A measure of the amount of alkaline material required to raise pH to a predetermined level. This can be accomplished by use of a base demand test, whereby a standard base is added dropwise to the pH test solution until the desired pH is reached.

BASIC - Having a pH above 7.0. Opposite of acidic.

BATHER - Any person using a pool, spa, or hot tub and adjoining deck area for the purpose of water sports, recreation, therapy or related activities. Also USER.

BATHER LOAD - The number of persons in the pool/spa at any given moment, or during any stated period of time. Also USER LOAD.

BEACH ENTRY OR ZERO (0) ENTRY - Sloping entry starting above water line at deck level and ending below water line. (Does not refer to sand only).

BEGINNER'S AREA - Those water areas in pools which are three feet (3') or less in water depth.

BLEACH (NaOCl) - Sodium hypochlorite, also called liquid chlorine. A chlorine source that typically has between 5 and 16% available chlorine.

BLEEDER VALVE - A device that allows air to be vented from a system.

BLISTER - An area of raised surface detached from the structural matrix of a material.

BODY COAT - A layer of diatomaceous earth or similar materials on a filter element which acts as the filtering media.

BODY FEED - A controlled amount of diatomaceous earth that is continuously added to the filter element during the course of a filter run to help maintain filter porosity.

BONDING (electrical) - The joining of metallic parts to form an electrically conductive path which will assure electrical continuity.

BOND FAILURE (delamination) - Failure of plaster or other surfaces to adhere to the underlying subsurface.

BOOSTER PUMP SYSTEM - A pump which is completely independent of the filtration and heating system. Used to provide support for hydrotherapy jets, cleaning systems and gas chlorinators or special water features.

BOTTOM RAIL - The lower portion of an above ground pool frame used as a structural retainer for aboveground pool wall.

BREAK IN GRADE - Occurs when the slope of the pool floor changes to a greater slope.

BREAKPOINT CHLORINATION - The addition of a sufficient amount of chlorine to water to destroy the combined inorganic chlorine present. Normally, the amount added is ten times the combined chlorine concentration.

BRIDGING - Build-up of a body coat on diatomaceous earth filter elements to the point where the body coats of two adjacent elements touch.

BROADCAST - A method of applying chemicals into a pool or spa by spreading them uniformly over the water surface.

BROMAMINES - Bromine-ammonia compounds exhibiting sanitizing properties similar to hypobromous acid.

BROMIDE - A salt that contains a bromide (Br⁻) ion. Bromide becomes hypobromous acid when reacted with oxidizers such chlorine, ozone, or mono persulfates.

BROMINE (Br₂) - One of several chemicals that yield hypobromous acid when added to water.

BROMINE FEEDER - A device to add or deliver bromine sanitizer at a controlled rate.

BTU - British thermal unit. A unit of measurement used to define the capabilities of heaters. One BTU is capable of raising the temperature of one pound of water by one degree Fahrenheit.

BUFFER - Chemicals which when dissolved in water, will resist pH change. Also a chemical solution used to calibrate pH instrument.

BURNER - The component of the heater where the combustion of fossil fuel takes place.

BYPASS VALVE - A valve used to limit or adjust the amount of water flowing through a device in a bypass loop to divert flow to an alternate plumbing path.

CALCIFICATION - Formation of calcium salts on walls of pools or pipes, or in a filter or heater, due to low solubility of calcium salts.

CALCIUM CARBONATE - An insoluble calcium compound which is the major component of scale. CaCO₃ occurs naturally in limestone, marble, various eggshells, seashells, etc.

CALCIUM CHLORIDE (CaCl₂) - A soluble white salt used to raise the calcium hardness of pool or spa water.

CALCIUM HARDNESS - A measure of the amount of calcium dissolved in water and expressed in parts per million (ppm) or milligrams per liter (mg/L) as calcium carbonate.

CALCIUM HYPOCHLORITE (Ca(OCl)₂) - A solid white form of chlorine found in both granular and tablet forms (65-75% available chlorine).

CARBON DIOXIDE (CO₂) - A common gas found in air. Can be used to lower pH in a pool.

CARDIOPULMONARY RESUSCITATION (CPR) - A lifesaving technique involving both chest compressions to circulate blood and mouth-to-mouth breathing, to restart a non-beating heart.

CARTRIDGE - A replaceable porous element designed to retain suspended particles from water.

CARTRIDGE FILTER - A filter that utilizes a porous element that acts as a filter medium.

CASUAL CONTACT- Contact of any body part occurring by normal use modes.

CATCH POOL - A pool or designated section of a pool used as a terminus for waterslide flumes.

CAUSTIC SODA (NaOH) - Sometimes called caustic, sodium hydroxide or lye. A highly alkaline substance sometimes used to raise pH.

signal word **CAUTION** - Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices. (Reference ANSI Z535 Series of Standards for Safety Signs and Colors.)

CAVITATION - Formation of partial vacuums when the pump capacity exceeds water replacement supply.

CEMENT - A powdered substance of lime and clay generally mixed with water and aggregate to make concrete.

CENTRIFUGAL FORCE - The outward force exhibited by a circular motion.

CENTRIFUGAL PUMP - A pump to circulate water using a shaft-mounted impeller, powered by an electric motor or gasoline engine. The centrifugal force of the spinning impeller creates the flow through the pump.

CFM - Cubic feet per minute (of air).

CHANNELIZATION - The undesirable process whereby filter sand is permeated by tubes or channels of calcified or oily material allowing water to pass freely, without filtration.

CHECK VALVE - A valve allowing flow in one direction and obstructing flow in the other direction.

CHECKS (surface) - Spider webbing pattern in a surface. Not all the way through, not an open crack.

CHEMICAL FEEDER - A device (floating or mechanical) for applying chemicals to pool or spa water.

CHEMICAL FEEDER OUTPUT RATE- Amount of chemical or active ingredient delivered by a feeder per unit time (for example, pounds of chlorine per hour).

CHILDREN'S POOL/RIDE - Ride, flume ride, or other slide attraction, at a water theme park, designed primarily for the use of small children.

CHINE - That portion of the stave of a hot tub below the bottom of the croze.

CHINE JOIST - A brace that provides support to the floor of a hot tub.

CHLORAMINES - (also called combined chlorine) Are formed when free chlorine combines with nitrogen- containing compounds (for example, perspiration, ammonia). These compounds can cause eye and skin irritation, have strong chlorine-like odors, and low sanitizing capability.

CHLORINATOR - A device used to add or deliver a chlorine sanitizer at a controllable rate.

CHLORINE DEMAND - The amount of chlorine that will be consumed by oxidizable impurities in pool or spa water.

CHLORINE GAS - A gaseous form of chlorine used to sanitize pool and spas. (See chlorine compounds - calcium hypochlorite, chlorine gas, sodium dichlor, sodium hypochlorite, trichloro, liquid chlorine)

CHLORINE GENERATOR-An electrolytic device used to generate free available chlorine or total bromine from either chloride or bromide salts. See ELECTROLYTIC CHLORINE/BROMINE GENERATOR.

CHLORINE NEUTRALIZER - A chemical used to reduce chlorine residuals.

CHLORINE RESIDUAL - See RESIDUAL.

CIRCUIT - The complete path of an electric current.

CIRCUIT BREAKER - A device designed to open and close an electrical circuit manually, and to open a circuit automatically at a predetermined over current level, thus providing protection to the wiring and electrical components.

CIRCULATION EQUIPMENT - The components of a circulation system.

CIRCULATION SYSTEM - An arrangement of mechanical equipment and/or components designed to ensure even distribution of heat, chemicals and filtration of water throughout the pool. Includes filters, heaters, pumps, chlorinators, piping, inlets, drains, skimmers and other appurtenances.

CLARIFIER - A chemical that causes fine suspended solids in water to combine into filterable clusters. See FLOCCULANT.

COLIFORM BACTERIA - Bacteria found in the intestines and fecal matter of warm blooded animals. The detection of coliforms is used to indicate the possible presence of disease-causing bacteria.

COMBINED CHLORINE - The difference between the total available chlorine and free available chlorine measurement. See CHLORAMINE.

CONCRETE SHELL - Various forms of concrete that together with the steel form the structure.

CONTACT CONCENTRATION - The concentration of a chemical in a flow of water. This concentration depends on the rate of addition, the flow rate of the water, and the efficiency of the mixing. It is calculated using the equation (assumes complete mixing): Amount of Chemical (grams/hour)/Water Flow Rate (gpm) X 4.41=Contact Concentration (mg/L).

COPING - The cap on the wall that provides a finishing edge around the pool/spa. Can be formed, cast in place, precast, brick, stone, or pre-fabricated from metal or plastic materials. It may be used as part of the system that secures a vinyl liner to the top of the pool wall.

COVE - The radius that joins the floor and wall of a pool/spa.

COVER - Something that covers, protects, or shelters a pool, spa, or hot tub. Types of covers are:

Safety cover - As defined by ASTM F1346-91, Emergency Standard Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs, a barrier (intended to be completely removed before entry of users), for swimming pools, spas, hot tubs or wading pools, attendant appurtenances and/or anchoring mechanisms which will when properly labeled, installed, used and maintained in accordance with the manufacturer's published instructions reduce the risk of drowning of children under five years of age, by inhibiting their access to the contained body of water, and by providing for the removal of any substantially hazardous level of collected surface water. (These covers may be power or manual).

Solar cover - A cover that when placed on a pool or spa surface, increases the water temperature by solar activity, and reduces evaporation.

Thermal cover - An insulating cover used to prevent evaporation and heat loss from pools or spas.

CRACK (surface) - A repairable break in the surface, not major, not self-curing.

CRACK (structural) - A break or split which weakens the structural integrity of the pool.

CRAZE - See CHECKS.

CROSS CONNECTION - An unprotected connection between a domestic water supply and pool water, or other non-potable water, where a contamination of the domestic system could occur.

CYANURIC ACID - Also called stabilizer, isocyanuric acid, conditioner, or triazinetrione. A chemical that reduces the loss of chlorine in water due to ultraviolet rays of the sun.

signal word **DANGER** - A visual alerting device in the form of a decal or label placard or other marking such as an embossing, stamping, etching, or other process which advises the observer of the nature and degree of the potential hazard(s) which can cause property damage, injury, or death. It can also provide safety precautions or evasive actions to take, or provide other directions to eliminate or reduce the hazard. Aquatic safety signage shall conform to ANSI Z535 specifications.

Signal word: to convey the gravity of the risk.

Consequences: what are likely to happen if the warning is not heeded.

Instructions: appropriate behavior to reduce or eliminate the hazard.

DANGER - Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING - Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION - Caution indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

DEAD LOAD - The weight of all permanent structural and nonstructural components of a building, such as walls, floors, roofs, ceilings, stairways, and fixed service equipment.

DECKS - Those areas immediately adjacent to or attached to a pool or spa that are specifically constructed or installed for sitting, standing, or walking. Generally made of concrete, wood, or masonry.

DECK DIVE - A dive performed from the deck area of a pool into five (5) feet or more of water depth.

DEEP AREA - Water depth areas exceeding five feet (5').

DESIGN RATE OF FLOW - The rate of flow used for design calculations in a system.

DIATOMACEOUS EARTH FILTER (DE) - A white powder used as a filtering medium composed of microscopic fossil skeletons.

DIFFUSER - A component of pump whose function is to reduce the velocity and increase static pressure of a fluid passing through a system.

DISINFECTANT - See **SANITIZER**.

DIVE - A free fall entry into water from a planned acrobatic maneuver into a designated diving area of a pool.

DIVING AREA - The area of a swimming pool that is designed to be used for diving.

DIVING BOARD - A flexible board secured at one end used for diving.

DIVING EQUIPMENT, COMPETITIVE -Competitive diving equipment includes competitive diving boards and adjustable fulcrum-setting diving stands intended for competitive diving.

DIVING PLATFORM - Stationary platform designed for diving.

DIVING STAND - Any supporting device for a springboard or diving board.

DPD (DIETHYL PHENYLENE DIAMINE) - A chemical retesting reagent used to measure oxidizers in water. DPD is most commonly used in kits to measure free chlorine, total chlorine and total bromine.

DRY ACID - See ACID.

EDGE GUARDS - Shields designed to cover sharp edges in aboveground pools.

EFFECTIVE FILTER AREA - Total surface area through which designed flow rate will be maintained during filtration.

Permanent Medium Type - The effective filter area is the filter surface that is perpendicular to the flow direction.

Cartridge Type - The total effective filter area is the cartridge area that is exposed to the direct flow of water, figured in square footage of fabric. This excludes cartridge ends, seals, supports and other areas where flow is impaired.

Diatomaceous Earth (DE) Type - The actual area of the element is the total effective area of the porous fabric septum, less any area of a septum support member greater than one-fourth (1/4") wide contacting the septum during filtration.

Sand Filtration Type - The top surface area of the filter medium within the filter, calculated in square inches or square feet.

EFFLUENT - The outflow of water from a filter, pump, or pool.

EGRESS - Means of exit.

ELECTROLYSIS - Flow of electric current intentional or unintentional which corrodes metals.

ELECTROLYTIC CHLORINATOR - A device that converts dissolved chloride salt (sodium chloride) into chlorine and its reaction products.

ELECTROLYTIC CHLORINE/BROMINE GENERATOR - See CHLORINE GENERATOR.

ELECTRON - A minute particle of negatively charged electricity.

ENTRY POOL - Pool at a water theme park that is provided at the entrance of a water slide or inner tube ride.

EQUIPMENT AREA - Area used to house recirculation and sanitizing equipment and related appurtenances.

EROSION - Act of destroying or dissolving by slow disintegration or wearing away. In an erosion feeder, it is the way water dissolves the chemical being fed.

EROSION FEEDER - A device that dispenses a sanitizer by directing a flow of water past tablets, briquettes or pellets.

ETCHING - Corrosion on the surface; the pitting or eating away of a material such as the surface of plaster (marcite).

EVAPORATION - Conversion of liquid molecules into vapor.

EXERCISE BAR - A tubular device installed in the wall as a handhold.

EXPANSIVE SOIL - Heavy clay soils that absorb moisture and swell, creating the potential for structure damage.

FACTOR OF SAFETY - The ultimate load divided by the safe load or the ultimate strength divided by the allowable stress.

FEET OF HEAD - The resistance in a hydraulic system based on the equivalent to the height of a column of water that causes the same resistance (100 feet of head equals 4.3 pounds per square inch). The total dynamic head is the sum of all resistances in a complete operating system.

FERRIC IRON - Iron (III), which is generally insoluble in water, commonly precipitating as rust.

FERROUS IRON - Iron (II), which is soluble in water and will generally impart a pale green color in ground water. In the presence of oxidizers will convert to Iron (III).

FIBERGLASS - Fine spun filaments of glass, which are available in a rope or mat form. When used in a process with polyester resins and hardeners, can be formed and molded into pools, spas and related equipment.

The Total Dynamic Head is the sum of all resistances in a complete operating system.

FILTER - A vessel that removes undissolved particles from water by recirculating the water through a porous substance (a filter medium or element).

Permanent Medium Filter - A filter that utilizes a filter medium (sand).

Diatomaceous Earth Filter - A filter that utilizes a thin coating of diatomaceous earth (D.E.) over a porous fabric as its filter medium.

Cartridge Filter - A filter that utilizes a porous element that acts as a filter medium.

FILTER AGITATION - The mechanical or manual movement to dislodge the filter aid and dirt from the filter element.

FILTER AID - A powder-like substances such as diatomaceous earth or volcanic ash used to coat septum type filter.

FILTER CARTRIDGE - A filtering element, usually of fibrous material.

FILTER CYCLE -The operating time between cleaning or backwash cycles.

FILTER ELEMENT - A device within a filter tank designed to entrap solids and conduct water to a manifold, collection header, pipe, or similar conduit and return it to the pool or spa, or hot tub. A filter element usually consists of a septum and a septum support, or a cartridge.

FILTER MEDIUM - A finely graded material (such as sand, diatomaceous earth, polyester fabric, anthracite, etc.) that removes solid particles from the water.

FILTER SAND - A hard silica-like material free of carbonates or other foreign material used in sand filters as the media.

FILTRATION FLOW - The design rate of flow, in volume per time (gpm, gph), through the filter system installed per manufacturer's instructions with a new, clean filter medium.

FILTRATION RATE - The rate of water flowing through a filter during a given period of time, expressed in U.S. gallons per minute per square foot of effective filter area. Also known as filtration flow rate.

FIREBOX - A chamber in the pool/spa heater where combustion takes place.

FIREBRICK - A refractory brick capable of sustaining high temperatures.

FIREMAN'S SWITCH - A mechanism adapted to the time clock which will tum the heater off long enough for it to cool down before the time clock turns the pump off.

FLOAT VALVE - A valve controlled by the level of a fluid.

FLOCCULANT - A chemical that causes fine suspended solids in water to combine into large clusters that settle out.

FLOOR - The interior bottom surface of a pool or spa.

FLOW - The rate of the movement of water, typically in gallons per minute.

FLOW METER - A device that measures the rate of flow of water or other liquid through piping.

FLOW RATE - The volume of liquid flowing past a given point in a specified time period. Usually expressed as US gallons per minute (GPM) or gallons per hour (GPH).

FLOW RIDER - Pool at a water park that uses wave sheet technology for body boarding or body surfing activity.

FLOW SWITCH - A safety device that prevents the heater from firing if there is no adequate water flow through the system.

FLUME - A trough-like or tubular structure generally recognized as a water slide which directs the path of travel and the rate of descent by the rider.

FLUME SLIDE - Slides of various configurations which are characterized by having deep riding channels, vertical and lateral curves, high water flows, and accommodate riders using or not using mats, tubes, rafts, and other transport vehicles. Included but not limited to family raft rides, inner-tube rides, body slides, speed slides, etc.

FRAME - The structure that defines and/or supports the outline or shape of the aboveground pool wall.

FREE AVAILABLE CHLORINE - That portion of the total chlorine that is not combined chlorine and is available as a sanitizer.

FREEZE-THAW CYCLE - Seasonal weather and temperature changes that can cause stress to a surface.

FRICTION - Resistance created by the liquid passing the inner surface of the conductor pipe and fittings.

FRICTION HEAD - Head specifically caused by friction or drag.

GALLONAGE - A specific quantity of fluid in terms of gallons.

GALVANIC ACTION - The creation of electrical current by the process of electro-chemical action of dissimilar metals in a liquid.

GALVANIC CORROSION - The deterioration of metal produced when two dissimilar metals are exposed to the electrical current produced by electro-chemical action.

GATE VALVE - A device in a pipe that can partially or totally obstruct the flow of water, using an internal "gate" that moves in and out as the valve is operated.

GELCOAT - A colored polyester-resin material applied in liquid form which hardens to a smooth, durable form when applied over a mold.

GPD - Gallons per day. **GPH** - Gallons per hour. **GPM** - Gallons per minute.

GRAB RAIL - Rails used to enter or leave a pool or spa.

GROUNDING - Connecting to earth or to some conducting body that serves in place of earth.

GUNITE - A pneumatically applied (sprayed) concrete that is a dry mixture of cement, aggregate, and/or sand. Water is applied to the mix at the hose nozzle.

GUTTER - Overflow trough in the perimeter wall of a pool which is a component of the circulation system.

HANDHOLD/HANDRAIL - A device that is intended to be gripped by a user for the purpose of resting and/or steadying him/herself. It is typically located within or without the pool or spa or as part of a set of steps or deck- installed equipment.

HARDNESS - The amount of calcium and magnesium dissolved in water; measured by a test kit and expressed as parts per million (ppm) of equivalent calcium carbonate.

HEATER - A fossil-fueled, electric or solar device to heat the water of a pool or spa.

Fossil-fueled heaters use natural, propane gas or fuel oil and utilize an open-flame to heat a heat exchanger.

Electric heaters utilize a heating element immersed in water.

Solar heaters utilize ultraviolet rays of the sun to heat the water.

Other ways to categorize heaters include:

Direct heaters heat the tubes in which water circulates.

Indirect heaters circulate steam or hot water inside a heat exchanger through which water flows.

HEAT EXCHANGER - A device with coils, tubes or plates that takes heat from any fluid, liquid or air, and transfers that heat to another fluid without intermixing the fluids.

HEAT PUMP - A refrigeration compressor usually electrically driven, that is operated in reverse. To obtain heat, the evaporator side (cooling coil) is exposed to water, air or ground. The coil takes the heat from this source and transfers it to the condenser coil where it discharges the heat to the pool or spa to be heated.

HOOP - A circumferential constraint that prohibits the staves of a hot tub from separating. Also, device used to secure two halves of a filter together.

HOOP CONNECTOR - A tightening and connecting device.

HOT TUB - A spa constructed of wood with sides and bottoms formed separately; and the whole shaped to join together by pressure from the surrounding hoops, bands, or rods; as distinct from spa units formed of plastic, concrete, metal, or other materials.

HYDROCHLORIC ACID (HCl) - Also called muriatic acid when diluted. A very strong acid used in pools or spas for pH control and for certain specific cleaning needs. A by- product of the addition of chlorine gas to water. Use extreme caution in handling. See also MURIATIC ACID.

HYDROTHERAPY JETS - A fitting that blends air and water creating a high-velocity, turbulent stream of air- enriched water.

HYDROTHERAPY SPA - A unit that may have a therapeutic use but which is not drained, cleaned or refilled for each individual. It may include, but not be limited to, hydrotherapy jet circulation, hot water, cold water mineral baths, air induction bubbles, or any combination thereof. Industry terminology for a spa includes, but is not limited to, "therapeutic pool,"

"hydrotherapy pool," "whirlpool," "hot spa," etc. NSPI Standards exclude facilities used or under the direct supervision and control of licensed medical personnel.

HYPOBROMOUS ACID (HOBr) - The most powerful sanitizing form of bromine in water.

HYPOCHLORITE - A family of chemical compounds including CALCIUM HYPOCHLORITE, LITHIUM HYPOCHLORITE, SODIUM HYPOCHLORITE, etc., found in various forms for use as a chlorine carrier in pool and spa water.

HYPOCHLOROUS ACID - The most powerful sanitizing form of chlorine in water.

IMPELLER - The rotating vanes of a centrifugal pump; its action creates the flow of the water.

INFLUENT - The water entering a filter or other device.

INLET, RETURN - See RETURN INLET.

IODINE - A chemical element that exists as a grayish- black granule in its normal state, or as a part of a chemical compound, which is a biocidal agent used to sanitize pool and spa water.

The spa sanitizer is in the form of liquid iodine and in iodide compounds. Chlorine used with iodides releases elemental iodine.

IRON - See FERRIC/FERROUS.

ISOCYANURATES (Also ISOs) - Families of pool sanitizer products that are self stabilizing by containing cyanuric acid. Also called STABILIZED CHLORINES.

JETS - See HYDROTHERAPY JETS. **JOIST** - See CHINE JOIST.

LADDERS –

"A-Frame" Ladder - An entry ladder that straddles an aboveground/onground pool wall and is either removable (Type A) or has a built-in entry limiting feature (Type B).

Double Access Ladder (Type A) - An "A- Frame" ladder that straddles the pool wall of an aboveground pool and provides pool ingress and egress, and is intended to be removed when not in use.

Limited Access Ladder (Type B) - An "A- Frame" ladder that straddles an aboveground/ onground pool wall and is removable with a built- in entry limiting provision for making entry inaccessible when a pool or spa is not in use (i.e., swing-up, slide-up, "pick off" or equivalent).

Staircase Ladder (Type C) - A "ground to deck" staircase ladder that allows access to an aboveground pool deck and has a built-in entry limiting feature. A Type E "in-pool" staircase ladder is located in the pool to provide a means of ingress and egress from the pool to the deck.

In-Pool or Spa Ladder (Type D) - An "in-pool" ladder located in a pool or spa to provide ingress and egress from the deck.

Staircase Ladder (Type E) - An "in-pool" staircase ladder located in the pool to provide a means of ingress and egress from the pool to the deck.

LINER - See VINYL LINER.

LITHIUM HYPOCHLORITE - A solid white granular form of inorganic chlorine that has a pH of approximately 9 and contains an Available Chlorine Content (ACC) of 35%.

LOWER DISTRIBUTION SYSTEM (Underdrain) - Those devices used in the bottom of a permanent medium filter to collect the water during filtering and distribute the water during backwashing.

MAKE-UP WATER - Fresh water used to fill or refill the pool or spa. See also SOURCE WATER.

MANUFACTURED DIVING EQUIPMENT - See DIVING EQUIPMENT, MANUFACTURED.

MARCITE - See PLASTER.

MULTIPLE FILTER-CONTROL VALVE - A multiport valve having a number of control positions for various filter operations that combines in one unit the function of two or more single valves.

MURIATIC ACID (Hydrochloric acid) - Used to lower pH and/or total alkalinity in pool and spa water.

NEW POOL AND/OR SPA CONSTRUCTION – The activity of building or installing a pool and/or spa structure, and its component parts, where no such structure has previously existed.

NON-SWIMMING AREA - Any portion of a pool where water depth, offset ledges, or similar irregularities would prevent normal swimming activities.

NON-TOXIC - Meaning that a given substance has no adverse physiological effect on human beings or other living organisms.

ORGANIC MATTER- Perspiration, urine, saliva, suntan oil, cosmetics, lotions, dead skin, and similar debris introduced to water by users and the environment.

ORP (Also called REDOX) - The OXIDATION REDUCTION POTENTIAL produced by strong oxidizing agents in a water solution. It is measured of the oxidation level measured in millivolts by an ORP METER.

ORTHOTOLIDINE (OTO) - A colorless reagent that reacts with chlorine or bromine to produce a series of yellow-to-orange colors which indicate the amount of chlorine or bromine in water. Effectively measures total chlorine.

OUTLET, SUCTION - See SUCTION OUTLET.

OVERFLOW SYSTEM - Refers to removal of pool/spa surface water through the use of overflows, surface skimmers, and surface water collection systems of various design and manufacture.

OZONE (O₃) - A gaseous molecule composed of three (3) atoms of oxygen that is generated on site and used for oxidation of water contaminants.

OZONE, LOW OUTPUT GENERATING EQUIPMENT (OZONATOR) - Refers to units which will produce ozone in air at a concentration less than 500 ppm. Usually this term will refer to ultraviolet (UV) generators.

PASS THROUGH - Referring to opening between vertical pickets of a fence.

pH - A value expressing the relative acidity or basicity of a substance, such as water, as indicated by the hydrogen ion concentration. pH is expressed as a number on the scale of 0 to 14, 0 being most acidic, 1 to 7 being acidic, 7 being neutral, 7 to 14 being basic and 14 being most basic.

PHENOL RED - A dye that is used to measure pH.

PINCHING HAZARD - Any configuration of components that would pinch or entrap the user.

PLASTER - A type of interior finish (a mixture of white cement and aggregate, which can be tinted or colored) which is also applied to a concrete pool or spa. Also called Marcite or Marblite.

POINT OF THE FIRST SLOPE CHANGE - The point of the first slope change shall be at a minimum water depth of two feet and nine inches (2'9") and be at least six feet from the shallow end, except as stated in Article 6.3.

POOLS -

Permanently Installed Swimming Pool - A pool that is constructed in the ground or in a building in such a manner that it cannot be readily disassembled for storage (refer to ANSI/NSPI-1 1991 Standard for Public Swimming Pools or ANSI/NSPI-5 1995 Standard for Residential Inground Swimming Pools as applicable).

Aboveground Pool-Type O - A removable pool of any shape that has a minimum water depth of thirty-six inches (36") and maximum water depth of forty-eight inches (48") at the wall. The wall is located on the surrounding earth and may be, readily disassembled or stored and reassembled to its original integrity. Diving and the use of a water slide are prohibited (Refer to ANSI/NSPI-4 1992 Standard for Aboveground/Onground Residential Swimming Pools).

On-Ground Residential Swimming Pool-Type O - A removable pool package whose walls rest fully on the surrounding earth and has an excavated area below the ground level where diving and the use of a water slide are prohibited. (Refer to NSPI-4 1992 Standard for Aboveground/Onground Swimming Pools.) The slope adjacent to the shallow area shall have a maximum slope of 3:1, and the slope adjacent to the side walls shall have a maximum slope of 1:1.

Inground Swimming Pool - Any pool whose sides rest in partial or full contact with the earth. (Refer to ANSI/NSPI-5 1995 Standard for Residential Swimming Pools or ANSI/NSPI-1 1991 Standard for Public Swimming Pools, as applicable.)

Residential Pool - A residential pool shall be defined as any constructed pool, permanent or non-portable, that is intended for non-commercial use as a swimming pool by not more than three (3) owner families and their guests and that is over twenty-four inches (24") in water depth, and has a surface area exceeding 250 square feet and/or a volume over 3,250 gallons. (Refer to ANSI/NSPI- 5 1995 Standard for Residential Swimming Pools.)

Residential pools shall be further classified into types as indication of the suitability of a pool for use with diving equipment.

Type O - Any residential pool where the installation of diving equipment is prohibited.

Type I-V - Residential pools suitable for the installation of diving equipment by type. Diving equipment classified at a higher type may not be used on a pool of lesser type (i.e., Type III equipment on a Type II pool).

Commercial/Public Pool - Any pool, other than a residential pool, which is intended to be used for swimming or bathing and is operated by an owner, lessee, operator, licensee or concessionaire, regardless of whether a fee is charged for use. References within the standard to various types of public pools (Refer to ANSI/NSPI-1 1991

Standard for Public Swimming Pools) are defined by the following categories:

Class A: Competition Pool - Any pool intended for use for accredited competitive aquatic events such as Federation Internationale De Natation Amateur (FINA), U.S. Swimming, U.S. Diving, National Collegiate Athletic Association (NCAA), National Federation of State High School Associations (NFSHSA), etc. The pool may be used for recreation.

Class B: Public Pool - Any pool intended for public recreational use.

Class C: Semi-Public Pool - Any pool operated solely for and in conjunction with lodgings such as hotels, motels, apartments, condominiums, etc.

Class D: Other Pool - Any pool operated for medical treatment, therapy, exercise, lap swimming, recreational play, and other special purposes, including, but not limited to, wave or surf action pools, activity pools, splash pools, kiddie pools and play areas. These pools are not intended to be covered within the scope of NSPI standards.

Public pools may be diving or non-diving - If diving, they shall be further classified into types as an indication of the suitability of a pool for use with diving equipment.

Type VI-XI: Public pools suitable for the installation of diving equipment by type. Diving equipment classified at a higher type may not be used on a pool of lesser type (i.e., Type VIII equipment on a Type VI pool).

Type N: A non-diving public pool (no diving allowed).

SPLASHER (WADER) POOLS - A splasher pool shall have a minimum water depth of twenty four inches (24") and a maximum water depth of thirty-six inches (36").

WADING POOL - A pool that has a shallow depth used for wading. There are no requirements for residential wading pools. (Refer to NSPI-1 Standard for Public Swimming Pools for public wading pools.)

POOL UPRIGHT SUPPORT-That portion of the frame that is adjacent to the aboveground pool in a vertical position which supports the top rail and braces the wall.

POTABLE WATER - Any water, such as an approved domestic water supply, which is bacteriologically safe and otherwise suitable for drinking.

PPM - An abbreviation for PARTS PER MILLION. The unit of measurement used in chemical testing which indicates the parts by weight in relation to one million parts by weight of water. It is essentially identical to the term milligrams per liter (mg/L).

PRECIPITATE - A solid material which is forced out of a solution by some chemical reaction and which may settle out or remain as a haze in suspension (turbidity).

PRE-COAT - The coating of filter aid on the septum of a diatomaceous earth type filter at the beginning of each filter cycle.

PRE-COAT FEEDER - A chemical feeder designed to inject a diatomaceous earth into a filter in sufficient quantity to coat the filter septum at the start of a filter run.

PRESSURE CHECK - A test for the rate of water flow; also a test for leaks in a system.

PRESSURE DIFFERENTIAL - The difference in pressure between two parts of a hydraulic system, such as the influent and effluent of a filter.

PRIMARY STRUCTURAL MEMBERS -Any part of the aboveground pool structure that carries or retains any static load or stress caused by water pressure, surge and/or natural forces and for reasonable foreseeable use.

PSI - An abbreviation for pounds per square inch.

PUMP - A mechanical device, usually powered by an electric motor, which causes hydraulic flow and pressure for the purpose of filtration, heating, and circulation of pool and spa water. Typically, a centrifugal pump design is used for pools and spas.

PUNCTURE HAZARD - Any surface or protrusion that would puncture a user's skin under casual contact.

QUATERNARY AMMONIUM (also QUATS)- Organic compounds of ammonia used as algaestat and germicide.

RATED PRESSURE - That pressure that is equal to or less than the designed pressure and appears on the data plate of the equipment.

RATE OF FLOW - See FLOW RATE.

REHABILITATION - The activity of restoring all or part of a pool or spa structure and its component parts back into good condition, including the rebuilding and/or replacing of worn and broken parts or components.

REMOVABLE - Capable of being disassembled with the use of only simple tools such as a screwdriver, pliers, or wrench.

RETURN INLET - The aperture or fitting through which the water under positive pressure returns into a pool or spa.

RETURN PIPING - That piping which is referred to as effluent.

RING BUOY - A ring-shaped floating buoy capable of supporting a user.

ROPE AND FLOAT LINE - A continuous line not less than one-fourth inch (1/4") in diameter, which is supported by buoys and attached to opposite sides of a pool to separate the deep and shallow ends.

SANITIZER - Is an agent which reduces the level of micro-organism present by significant numbers or to safe levels, as established by federal or regional health authorities. Sanitation is then, the science of obtaining such a safe environment.

SCALE - The precipitate that forms on surfaces in contact with water when the calcium hardness, pH, or total alkalinity levels are too high.

SECONDARY STRUCTURAL MEMBERS - Any part of the aboveground pool structure that is not subject to load caused by water pressure.

SEPTUM - That part of the filter element consisting of cloth, wire screen or other porous material on which the filter medium or aid is deposited.

SEQUESTERING AGENT – Synonymous with CHELATING or METAL COMPLEXATION AGENT, a sequestering agent reacts with potential stain-producing metal ions (i.e., copper, iron, etc.) to reduce staining of pool/spa surfaces and associated colored water.

SHALLOW AREAS - Portions of a pool or spa with water depths less than five feet (5').

SHOCK TREATMENT- The practice of adding significant amounts of an oxidizing chemical to water to destroy ammonia and nitrogenous and organic contaminants in water.

SHOTCRETE - A mixture of cement and sand, applied onto contoured and supported surfaces to build a pool or spa. Shotcrete is premixed and pumped wet to the construction site.

SIGHT BARRIER - Available opening space in any given or total fence area.

SKIMMER - See SURFACE SKIMMING SYSTEM.

Thru-wall - A device installed in the wall of an inground pool or spa or aboveground/onground pool that permits the continuous removal of floating debris and surface water to the filter.

Over-the-wall - A device installed over the wall of an aboveground/onground pool that allows for continuous removal of debris and surface water to the filter.

SKIMMER WEIR - Part of a skimmer which adjusts automatically to small changes in water level to assure a continuous flow of water to the skimmer. See WEIR.

SLIP RESISTING - A surface that has been so treated or constructed as to significantly reduce the chance of a user slipping. The surface shall not be an abrasion hazard.

SLOPE - An inclined surface.

SODA ASH (also SODIUM CARBONATE) – A white powder used to raise pH of the water.

SODIUM BICARBONATE (also BAKING SODA) (NaHCO_3) - A white powder used to raise total alkalinity in water.

SODIUM BISULFATE (also DRY ACID) (NaHSO_4) -A granule used to lower pH and/or the total alkalinity in water.

SODIUM CARBONATE - See SODA ASH.

SODIUM DICHLORO-ISOCYANURATE - Also known as SODIUM ICHLORO-S-TRIAZINETRIONE. An organic chlorine, granular in form, approximately 62% chlorine; in the dihydrate form, approximately 56% chlorine. It contains 58.7% stabilizer by weight and has a pH of 6.0. See also ORGANIC CHLORINE.

SODIUM HYPOCHLORITE (NaOCl) - A clear liquid form of an inorganic chlorine compound obtainable in concentrations of 5 to 16% available chlorine.

SOURCE WATER - Water used to fill or refill the pool or spa. See MAKE UP WATER.

SPA-(See also HYDROTHERAPY SPA) A hydrotherapy unit of irregular or geometric design.

Permanent Residential Spa - A spa in which the water heating and water circulating equipment is not an integral part of the product. The spa shall be intended as a permanent plumbing fixture and shall not be intended to be moved. (Refer to ANSI/NSPI-3 1998 Standard For Permanently Installed Residential Spas.)

Public Spa - Any spa other than a permanent residential spa or residential portable spa which is intended to be used for bathing and is operated by an owner, licensee, concessionaire, regardless of whether a fee is charged for use. (Refer to ANSJ/NSPI-2 1998 Standard for Public Spas.)

Residential Portable Spa - Either Self-Contained or Non-Self-Contained:

Self Contained Spa - A spa in which all control, water heating and water circulating equipment is an integral part of the product. Self-contained spas may be permanently wired or cord connected.

Non-Self-Contained Spa - A spa in which the water heating and circulating equipment is not an integral part of the product. Non-self-contained spas may employ separate components such as an individual filter, pump, heater and controls, or they may employ

assembled combinations of various components. (Refer to ANSI/NSPI-6 1998 Standard For Residential Portable Spas.)

STABILIZER - See CYANURIC ACID.

STEPS, RECESSED STEPS, LADDERS AND RECESSED TREADS- Means of pool and spa ingress and egress that may be used in conjunction with one another.

Steps - A riser/tread or series of risers/treads extending down from the deck and terminating at the pool or spa floor. May be recessed so that all risers are located outside of user areas.

Ladders - A series of vertically separated treads or rungs connected by vertical rail members or independently fastened to an adjacent vertical pool wall (see LADDERS for definitions of particular ladder types).

Deck Ladder - A ladder for deck access from outside the pool or spa.

Recessed Treads - A series of vertically spaced cavities in the pool or spa wall creating tread areas for stepholes.

SUCTION OUTLET - The aperture or fitting through which the water under negative pressure is drawn from the pool or spa.

SUCTION PIPING - That piping which is referred to as influent.

SUPERCHLORINATION - The practice of adding a sufficient amount of chlorinating compound to water to destroy chlorine demand compounds and any combined chlorine which may be present. Generally, the level of chlorine added is 10 times the level of combined chlorine in the water. See BREAKPOINT CHLORINATION.

SURFACE SKIMMING SYSTEM – This term encompasses perimeter-type overflows, surface skimmers, and surface water collection systems of various design and manufacture. See SKIMMER.

TAMPER PROOF - Meaning that tools are required to alter or remove portions of the equipment.

TEST KIT - A device used to monitor specific chemical residual or demands in pool or spa water.

TIME CLOCK - A mechanical device that automatically controls the periods that a pump, filter, heater, blower and other electrical devices are on.

TOP RAIL - That frame part located on top or adjacent to the outer edges of the aboveground pool wall.

TOTAL ALKALINITY - The ability or capacity of water to resist change in pH; also known as the buffering capacity of water. Measured with a test kit and expressed as ppm.

TOTAL CHLORINE - The sum of both the free available and combined chlorines.

TOTAL DISSOLVED SOLIDS (TDS) - A measure of the total amount of dissolved matter in water, e.g. calcium, magnesium, carbonates, bicarbonates, metallic compounds, etc.

TOTAL DYNAMIC HEAD - See FEET OF HEAD.

TOXIC - Meaning that a given substance has an adverse physiological effect on human beings or other living organisms.

TREAD CONTACT SURFACE - Foot contact surfaces of a ladder, step, stair, or ramp.

TRICHLORO-ISO-CYANURATE (Also known as TRICHLORO-S-TRIAZINETRIONE. A form of organic chlorine, most common in compressed form (tablets or sticks), with 90% or more available chlorine, approximately 55.5% stabilizer by weight, and with an approximate pH of 2.9. See also ORGANIC CHLORINE and SODIUM DICHLORO-ISO-CYANURATE.

TURBIDITY - Cloudy condition of water due to the presence of extremely fine particulate materials in suspension that interfere with the passage of light.

TURNOVER RATE-The period of time required (usually in hours) to circulate volume of water equal to the pool or spa capacity.

UNDERWATER LIGHT - A fixture designed to illuminate a pool or spa from beneath the water surface. Types:

Wet Niche Light - A watertight and water-cooled light unit placed in a submerged, wet niche in the pool or spa wall and accessible only from the pool or spa.

Dry Niche Light - A light unit placed behind a watertight window in the pool or spa wall.

UPPER DISTRIBUTION SYSTEM - Those devices designed to distribute the water entering a permanent medium filter in a manner so as to prevent movement or migration of the filter medium. This system shall also properly collect water during filter backwashing unless other means are provided.

UPRIGHT SUPPORT - That portion of the frame that is adjacent to the aboveground wall in a vertical position which supports the top rail and braces the wall.

USER - Any person using a pool or spa and adjoining deck area for the purpose of water sports, recreation, therapy or related activities.

USER LOAD-The number of persons in the pool/spa area at any given moment, or during any stated period of time.

VACUUM - The reduction of atmospheric pressure within a pipe, tank, pump, or other vessel. Vacuum is measured in inches of mercury. One inch of mercury is equivalent to 1.13 feet of head. The practical maximum vacuum is 30 inches of mercury, or 33.9 feet of head.

VALVE - Any device in a pipe that can partially or totally obstruct the flow of water (as in a ball, gate or globe valve) or permit flow in one direction only (as in a check or foot valve).

Bleeder valve - A device that allows air to be vented from a system

Multi-port valve - A device that allows for the multi-directional control of the passage or flow of water through a system.

Push-pull valve - A device that allows for the dual directional control or flow of water through a system.

VELOCITY - The speed at which a liquid flows between two specified points, expressed in feet per second.

VERTICAL WALL - Shall refer to the wall up to a positive 110° angle towards the pool's interior from plumb.

VENTURI JET - See HYDROTHERAPY JET.

VINYL LINER - That plastic membrane constructed of vinyl or vinyl compounds that acts as a container for the water.

Expandable Liner - A liner that is constructed of a material that has the capability of stretching into a shape other than the original construction dimensions.

Hopper Liner - The liner that is used to obtain greater depth by geometrical pattern construction on the liner bottom or floor to fit a predetermined size and shape.

WALL CLOSURE - The fastening device(s) that connect the aboveground wall ends together.

WALLS - The interior pool or spa wall surfaces consisting of surfaces from the plumb to a 45° slope.

WASTE WATER DISPOSAL SYSTEM - All water disposal systems approved by (state or local) authority, such as a storm sewer, sanitary sewer, open pit, leach field, or irrigation system.

WATERLINE - The waterline shall be defined in one of the following ways:

Skimmer System - The waterline shall be at the midpoint of the operating range of the skimmers when there are no users in the pool or spa.

Overflow System - The waterline shall be at the top of the overflow rim.

WEIR - The device included with a through-the-wall and over-the-wall skimmer that controls the amount of surface water (flow) drawn into the skimmer and filtration system. See SKIMMER WEIR.

WET NICHE - See UNDERWATER LIGHT.

WINTERIZED LINER - A plastic liner that is manufactured with sufficient plasticizers to withstand exposure to its rated lowest temperature of -20°F.

WINTERIZING - The procedure of preparing pools and spas for freezing weather. Includes chemical treatment of the standing water, plus physical and chemical protection of the pool or spa and its equipment against freezing.