SWIMMING POOL / HOT TUB PERMIT APPLICATION

Property Owner _____ Phone # _____

Address _____

Property Location _____

Contractor _____ Phone # _____

Address _____ Contractor License PA # _____

1. Type: In-Ground ___ Above Ground ___ Hot Tub ___ Storable Pool (blow-up or any type pool with side wall less than 42") ___
2. Size: Max Length _____ Max Width _____ Max Depth _____ Volume in gallons _____
3. All pools, except storable require permanent electric service to all components.
   a. Buried depth _____ (circle one) Direct burial / Non-metal conduit / Metallic conduit
   b. Circuit Protector: _____amp type of wire _____ gauge of wire _____
   c. Is there a ground fault circuit-interrupter (GFCI) on the service line? No Yes
   d. Electrical Contractor's name: _____ Phone # _____
4. Submit a detailed schematic of all electric wiring and bonding including the equal potential bonding grid around the perimeter of the pool. (See your electrician for details.)
5. Will there be any overhead wires directly above the pool or within 18ft. of the water surface? No Yes
6. Pool Barrier:
   a. In Ground Pool – Fence - Type _____ Height _____
   b. Above Ground Pool - Removable secured ladder _____ Other _____
7. Does access to the pool comply with the barrier requirement attached to this application? No ___ Yes ___
8. If there is a Hot Tub, does it have a safety cover that complies with ASTM F 1346? No ___ Yes ___
9. IN GROUND POOLS ONLY- Show compliance with ANSI/APSP-7 Standard for Section Entrapment Avoidance
   a. What is the pool (spa) volume in gallons? _____ What is the required (or desired) flow rate in gpm? ____
   b. What is the total dynamic head (TDH), the sum of all resistances in a complete operating system (pipe, fittings, valves, filter, heater, etc.) as measured in "feet of head". _____
   c. Show the selected pump and pump curve to deliver the specified flow rate.
   d. Show the piping schematic used to achieve the specified main drain flow rate.
   e. What is the velocity in the main drain piping in feet/second _____

The information requested on this application is to supplement the review of the construction drawings. All questions must be answered and requested information submitted for the application to be considered complete. See attached information for details.

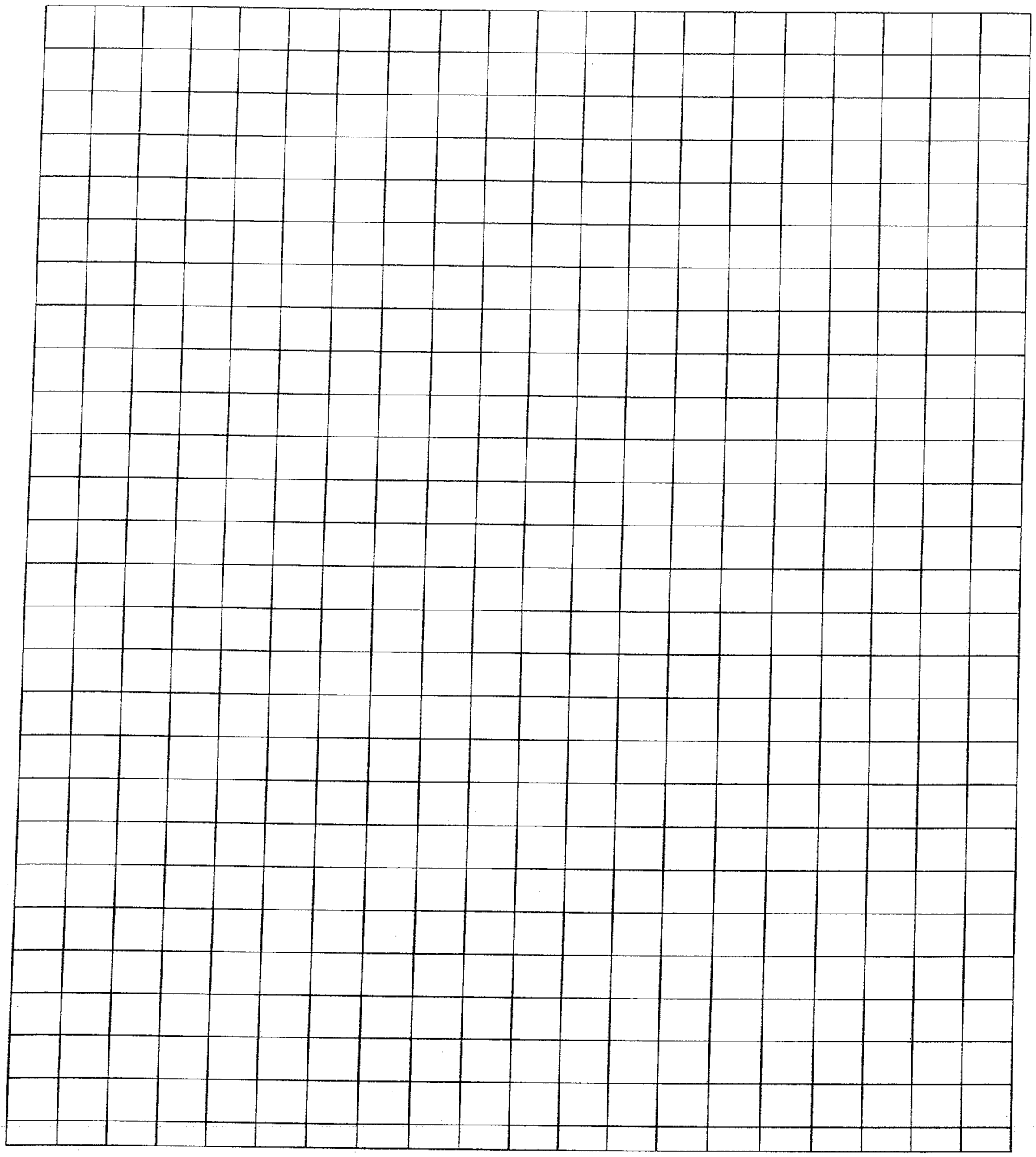
_____ _____ _____

Cost of Improvement | Application Date | Signature of Applicant

Location of Improvements

Submit a plot plan of the boundary of the property, to scale, showing the following improvements:

a. Location of all existing and proposed structures, on-lot septic systems and wells.
b. Driveway
c. Location of the pool, showing distances from property lines and improvements.
d. Location of equipment including any filters, decks, walkways, diving boards, etc.
e. If applicable, show the area that will be utilized when the pool filter is backwashed. (Cannot interfere with public streets or neighboring properties).



OUTDOOR SWIMMING POOL: An outdoor swimming pool, including an in-ground, above ground or on-ground pool, hot tub or spa shall be provided with a barrier which shall comply with the following:

1. The top barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade, such as an aboveground pool, the barrier may be at ground level, such as the pool structure, or mounted on top of the pool structure. Where the barrier is mounted on top of th pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm)

2. Openings in the barrier shall not allow passage of a 4-inch-diamaaater (102 mm) sphere.

3. Solid barriers which do not have openings, such as a masonry or stone wall, shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.

4. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall no exceed 1.75 inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1.75 inches (44 mm) in width.

5. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1.75 inches (44 mm) in width.

6. Maximum mesh size for chain link fences shall be a 1.25-inch (32 mm) square unless the fence is provided with slates fastened at the top or the bottom which reduce the openings to not more than 1.75 inches (44 mm).

7. Where the barrier is composed of diagonal members, such as a lattice fence, the maximum opening formed by the diagonal members shall not be more than 1.75 inches (44 mm).

8. Access gates shall comply with the requirements of Section AG105.2, Items 1 through 7, and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Gates other than pedestrian access gates shall have a self-latching device. Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from the bottom of the gate, the release mechanism and openings shall comply with the following:

   8.1 The release mechanism shall be located on the pool side of the gate at least 3 inches (76 mm) below the top of the gate, and
   8.2 The gate and barrier shall have no opening greater than 0.5 inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

9. Where a wall of a dwelling serves as part of the barrier one of the following conditions shall be met:

   9.1 The pool shall be equipped with a powered safety cover in compliance with ASTM F1346; or
   9.2 All doors with direct access to the pool through that wall shall be equipped with an alarm which produces an audible warning when the door and its screen, if present, are opened. The alarm shall sound continuously for a minimum of 30 seconds immediately after the door is opened and be capable of being heard throughout the house during normal household activities. The alarm shall automatically reset under all conditions. The alarm system shall be equipped with a manual means, such as touchpad or switch, to temporarily deactivate the alarm for a single opening. Such deactivation shall last for not more than 15 seconds. The deactivation switch(es) shall be located at least 54 inches (1372 mm) above the threshold of the door.
   9.3 Other means of protection, such as self-closing doors with self-latching devices, which are approved by the governing body, shall be acceptable so long as the degree of protection afforded is not less than the protection afforded by Item 9.1 or 9.2 described above.

10 Where an aboveground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps, then:

   10.1 The ladder or steps shall be capable of being secured, locked or removed to prevent access, or
   10.2 The ladder or steps shall be surrounded by a barrier which meets the requirements of Section AG105.2, Items 1 through 9. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch diameter (102 mm) sphere.

Chart shows pipe size required per flow rate specified.

PIPE SIZE	6 fps (branch)	8 fps (trunk)	10 fps (return)
Sch. 40 PVC	GPM	GPM	GPM
1 ½ in.	38	51	64
2 in.	63	84	105
2 ½ in.	90	119	149
3 in.	138	184	230
4 in.	238	317	397
6 in.	540	720	900

The standard allows for three ways to calculate flow:

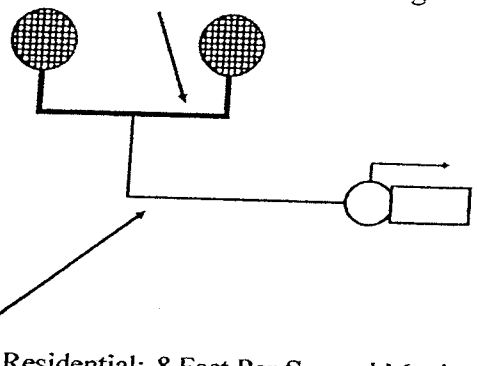
Note: Total dynamic head (TDH) is the sum of all resistances in a complete operating system (pipe, fittings, valves, filter, heater, etc.).

1. TDH calculation for the circulation system of each pump; or
2. Simplified TDH calculation (a method of determining the maximum system flow rate using hydraulic calculations based on the lowest possible TDH for a circulation system); or
3. The maximum flow capacity of the pump from the pump curve.

Water Velocity Requirements

Water velocity (speed of the water flowing through the piping) requirements in all field fabricated piping are based on the maximum system flow rate (see following figure). Maximum system flow for purposes of suction outlet safety is to be calculated and/or measured with all pipes, other than the drain pipes closed (when possible) so maximum flow is through the drain(s). This creates the highest velocity possible through the drain(s) and that is the velocity that must be protected against.

Thick Line = 3 Feet Per Second Maximum
With Both Suction Outlets Flowing

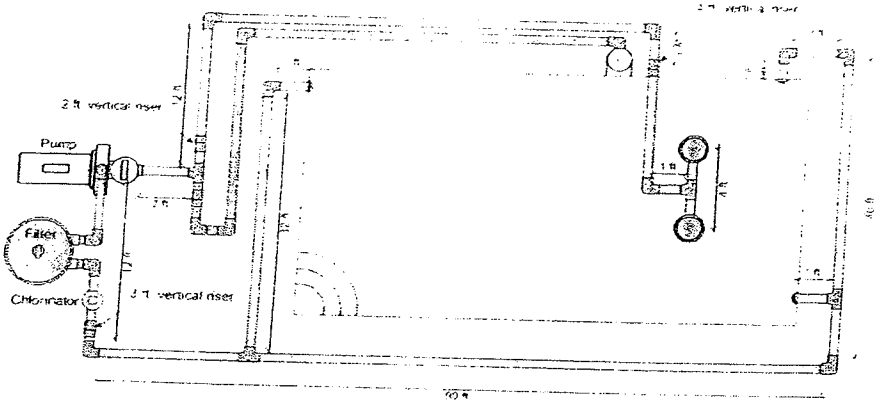


Thin Line = Residential: 8 Feet Per Second Maximum
Public: 6 Feet Per Second Maximum

Velocity in branch suction piping shall be limited to 6 feet per second when one of a pair of drains is blocked so in normal operation with both drains flowing, the velocity is 3 feet per second. 2006 ANSI/APSP-7 Section 4.4.

You can verify velocity with plans submittal (builder can provide flow calculations).

Sample Pool



SUCTION SIDE		
2" pipe		104 ft.
2" 90's	9 ea. @ 5.7 ft. ea.	51 ft.
2" Tee's	2 ea. @ 12 ft.	24 ft.
3 way valve	1 ea. @ 12 ft.	12 ft.
Drains	2 ea. @ 2 ft.	4 ft.
Total equivalent feet of 2 in. pipe		**195 ft.**

RETURN SIDE		
2" pipe		182 ft.
2" 90's	10 ea. @ 5.7 ft. ea.	57 ft.
2" Tee's	2 ea. @ 4 ft.	8 ft.
Total equivalent feet of 2 in. pipe		**247 ft.**

1.95 x 7.76 ft. of head per 100 ft. @ 70 gpm = 15.3 **2.47 x 7.76 ft. of head per 100 ft. @ 70 gpm = 19.2**

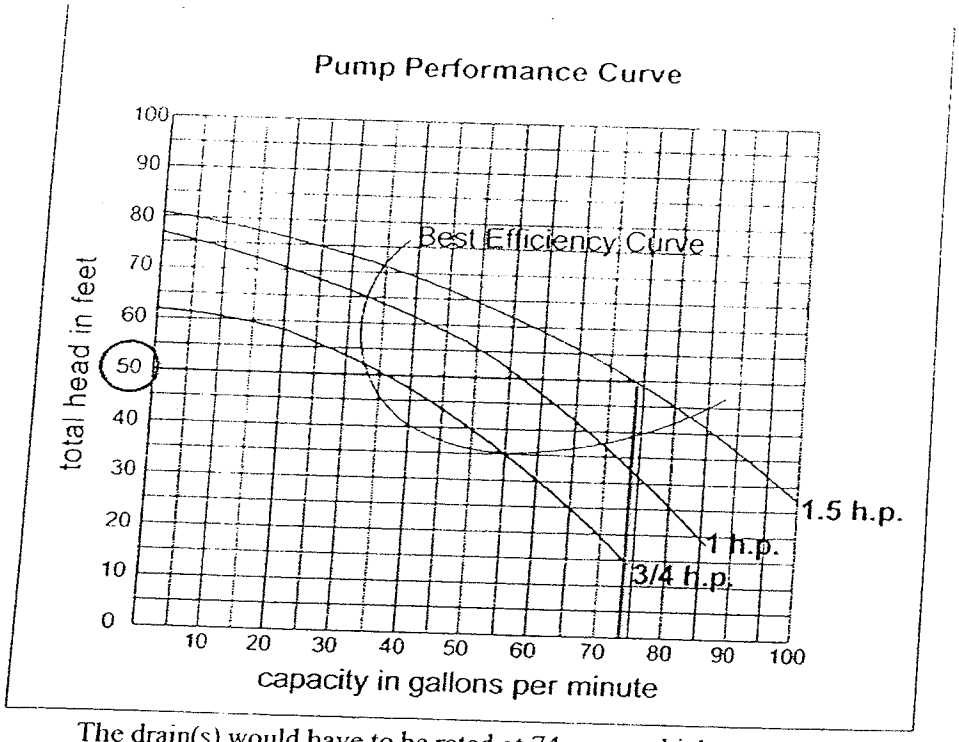
Note that fittings, valves, etc, are listed with their resistance to flow converted to the length of pipe equal to their resistance. The "7.76 feet of head per 100 feet of pipe" comes from a chart that shows resistance listed by pipe size and flow rate. This chart is available from equipment manufacturers.

Suction side loss	15.3
Return side loss	19.2
Filter loss	12.0
Chlorinator loss	2.0
Return fitting loss	1.6
Total Loss =	**50.1**

The Total Dynamic Head (TDH) of this system is 50.1–round to 50 feet of head.

Then Calculate the maximum system flow rate: ANSI/APSP-5 Residential Standard requires a 12 hour minimum filtration cycle. Sixteen gpm would filter 11,520 gallons in 12 hours, but a minimum of 35 gpm is required for adequate skimming. We will use 70 gpm in our example as the maximum system flow rate so the flow can be equally divided between the skimmer and the drains. Two speed pumps, when used, must be calculated at high speed, even if their default setting will be low speed (calculate at the highest possible flow through the drains).

You can see by the pump curve in the figure, if the builder uses a 1 h.p. pump, it will only deliver about 57 gpm and since we need 70 gpm, he would have to go to the 1½ hp. pump, which delivers about 74 gpm at 50 feet of head.



The drain(s) would have to be rated at 74 gpm or higher to comply.

If the builder uses a Simplified TDH calculation:

Simplified TDH calculation: A method of determining the maximum system flow rate using hydraulic calculations based on the lowest possible total dynamic head (TDH) for a circulation system. For example, using the shortest distance between the pool and the pump, omitting the calculations for fittings/valves, and using the best performance ratings for filters and heaters.

Note: A simplified TDH calculation will always lead to a lower resistance value than the actual TDH, insuring a safer system. Lower resistance will lead to higher flow so a pump sized to a lower resistance (Simplified TDH) will always produce a lower flow rate when installed in a system with a higher resistance (TDH as shown above), thereby reducing velocity at the drains.

If the builder uses the **Maximum Flow Capacity** of the pump as shown on the pump curve, the pool will also be much safer because the maximum flow shown on the pump curve is calculated with no resistance at all and when installed, there will always be resistance (TDH) so the flow will drop, but the drain(s) must be rated for the flow shown on the information provided.

Velocity can be verified at plans submittal based on the flow information provided

To comply with the velocity requirements of the new code, when dual drains are used, the builder must specify the branch piping size which will limit velocity between drains to 6 feet per second.