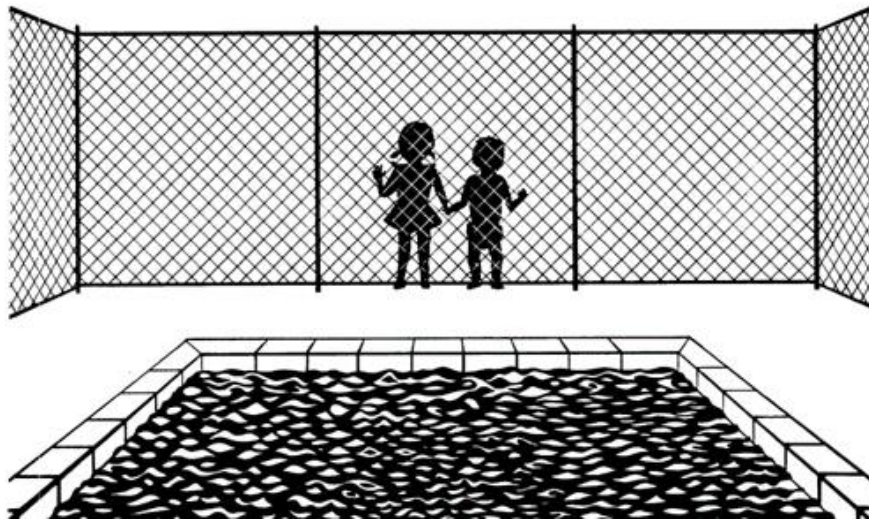




# Town of Duck

## *Pools, Spas and Hot Tub Barrier Guide*



This image is from US Consumer Product Safety Commission  
Publication # 363

18 August 2004  
**Appendix G**

## SWIMMING POOLS, SPAS AND HOT TUBS

### SECTION AG101 GENERAL

**AG101.1 General.** The provisions of this appendix shall control the design and construction of swimming pools, spas and hot tubs installed in or on the lot of a one- and two-family dwelling.

### SECTION AG102 DEFINITIONS

**AG102.1 General.** For the purposes of these requirements, the terms used shall be defined as follows and as set forth in Chapter 2.

**ABOVE-GROUND/ON-GROUND POOL.** See “Swimming Pool”.

**BARRIER.** A fence, wall, building wall or combination thereof which completely surrounds the swimming pool and obstructs access to the swimming pool.

**HOT TUB.** See “Swimming Pool”.

**IN-GROUND POOL.** See “Swimming Pool”.

**RESIDENTIAL.** That which is situated on the premises of a detached one- or two-family dwelling or a one-family townhouse not more than three stories in height.

**SPA, NONPORTABLE.** See “Swimming Pool”.

**SPA, PORTABLE.** A nonpermanent structure intended for recreational bathing, in which all controls, water-heating and water-circulating equipment are an integral part of the product.

**SWIMMING POOL.** Any structure intended for swimming or recreational bathing that contains water over 24 inches (610 mm) deep. This includes in-ground, aboveground, and on-ground swimming pools, hot tubs and spas.

**SWIMMING POOL, INDOOR.** A swimming pool which is totally contained within a structure and surrounded on all four sides by walls of said structure.

**SWIMMING POOL, OUTDOOR.** A swimming pool which is not an indoor pool.

### SECTION AG103 SWIMMING POOLS

**AG103.1 In-ground pools.** In-ground pools shall be designed and constructed in conformance with ANSI/NSPI-5 as listed in Section AG107.

**AG103.2. Above-ground and on-ground pools.** Above-ground and on-ground pools shall be designed and constructed in conformance with ANSI/NSPI-4 as listed in Section AG107.

### SECTION AG104 SPAS AND HOT TUBS

**AG104.1 Permanently installed spas and hot tubs.** Permanently installed spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-3 as listed in Section AG107.

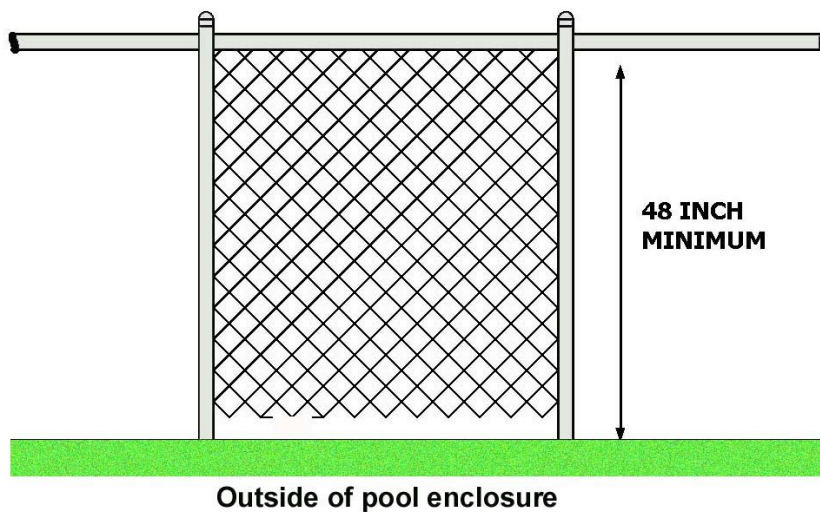
**AG104.2 Portable spas and hot tubs.** Portable spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-6 as listed in Section AG107.

## **SECTION AG105 BARRIER REQUIREMENTS**

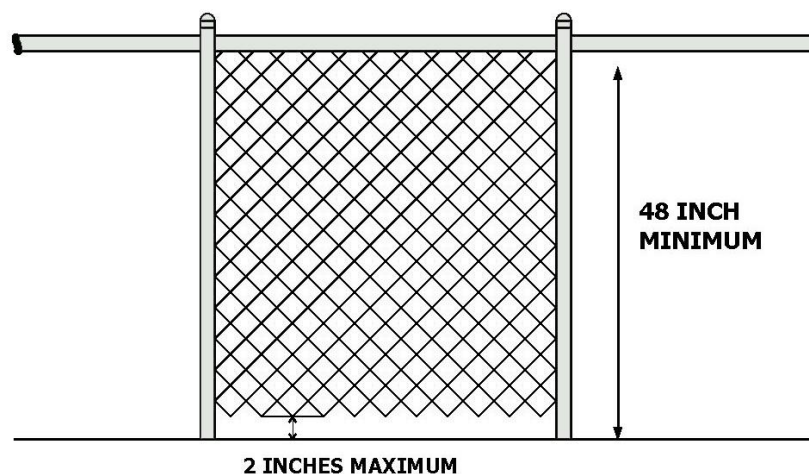
**AG105.1 Application.** The provisions of this chapter shall control the design of barriers for residential swimming pools, spas and hot tubs. These design controls are intended to provide protection against potential drownings and near-drownings by restricting access to swimming pools, spas and hot tubs.

**AG105.2 Outdoor swimming pool.** An outdoor swimming pool, including an in-ground, aboveground or on-ground pool, hot tub or spa shall be provided with a barrier which shall comply with the following:

1. The top of the 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.

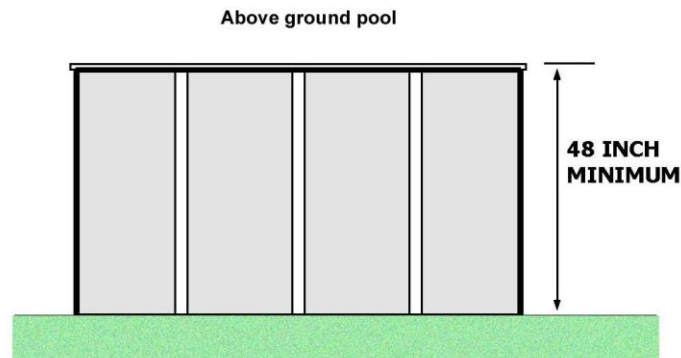


The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool.

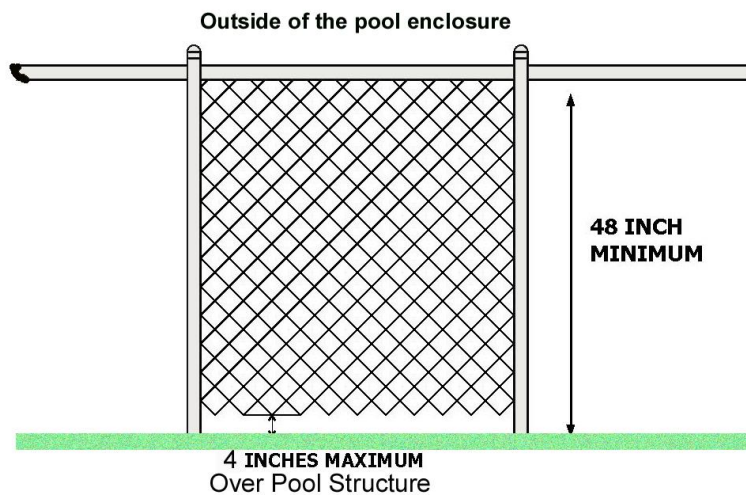


Where the top of the pool structure is above grade, such as an aboveground pool, the barrier may be at ground level, such as the pool structure, or mounted on top of the pool structure.

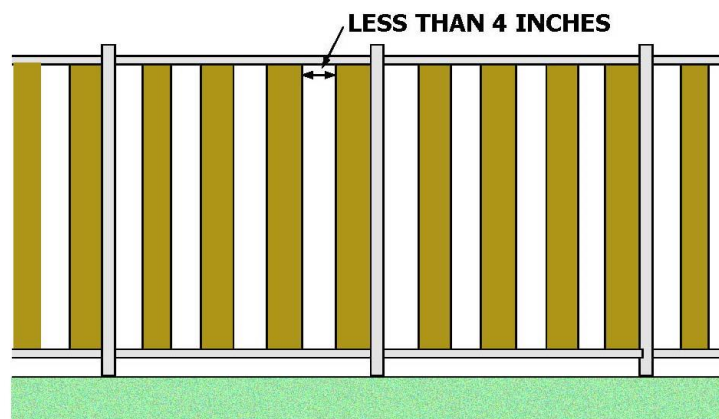
**THE ABOVE GROUND SWIMMING POOL STRUCTURE  
COULD BE THE BARRIER IF:**



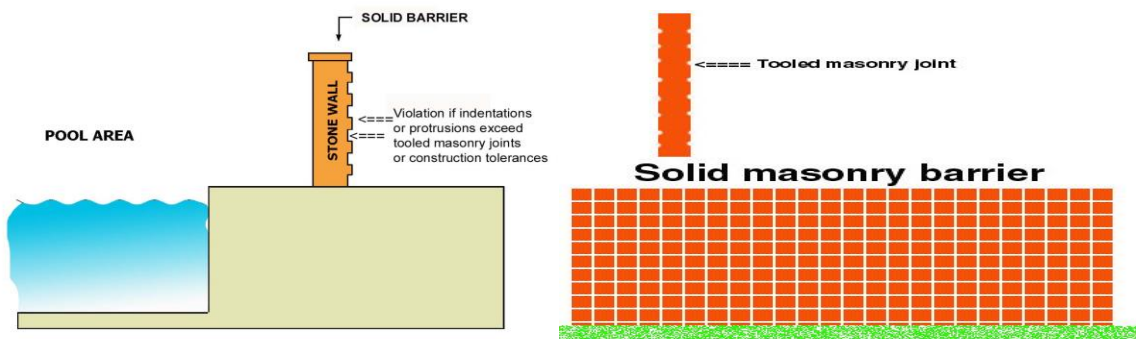
Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).



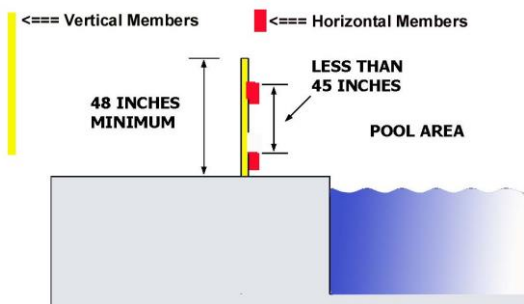
2. Openings in the barrier shall not allow passage of a 4-inch diameter (102 mm) sphere.



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.



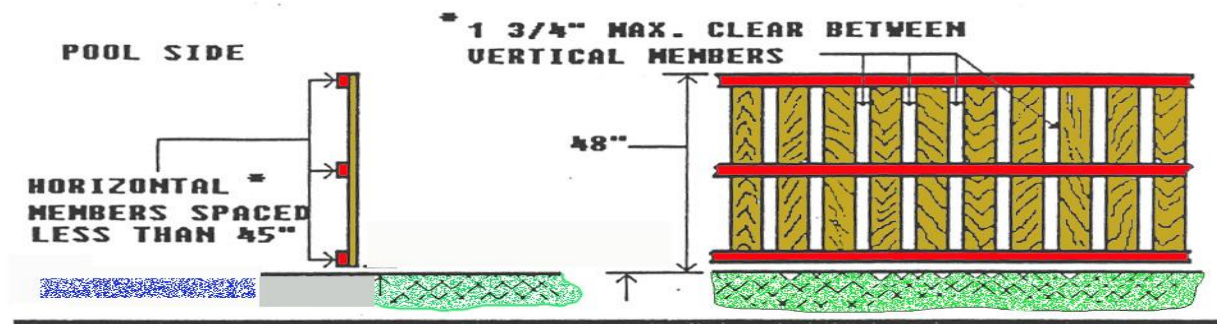
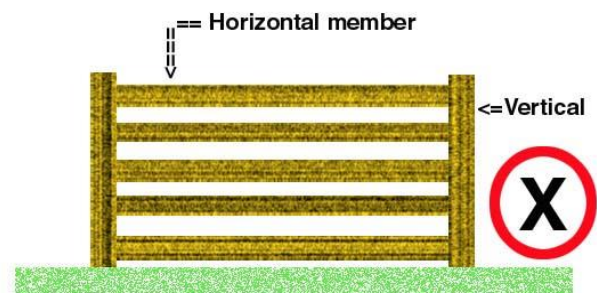
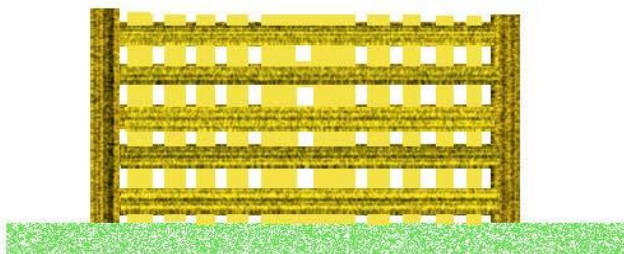
4. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence.



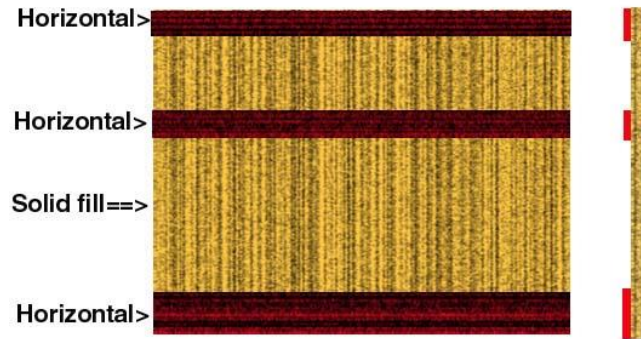
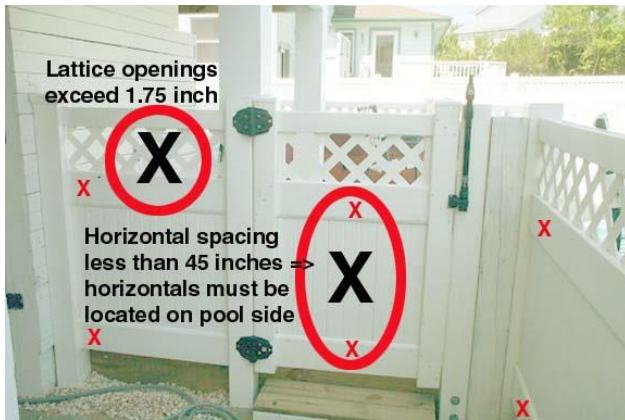
- \* Horizontals must be located on pool side.
- \* Verticals spaced no more than 1.75 " apart
- \* Decorative cut-outs no more than 1.75"



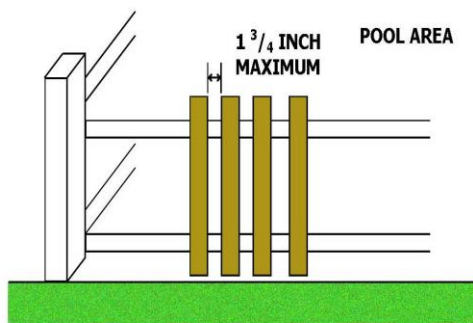
Horizontals must be located on pool side



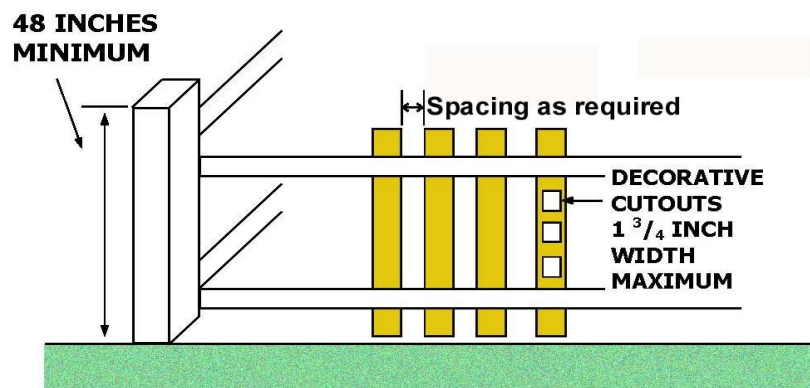




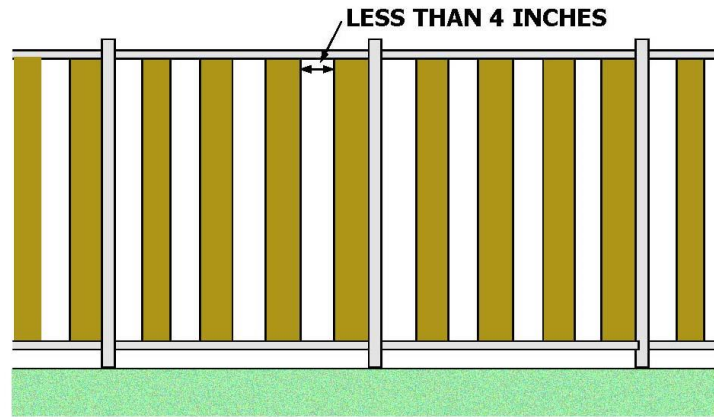
Spacing between vertical members shall no exceed 1.75 inches (44 mm) in width.



Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1.75 inches (44 mm) in width.

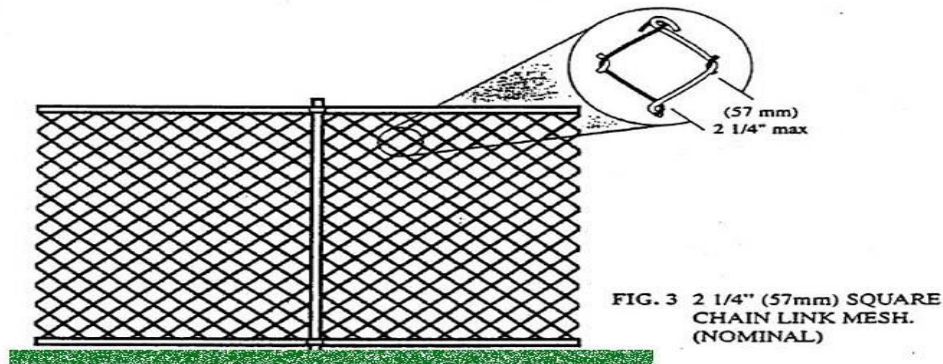


5. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between the vertical members shall not exceed 4 inches (102 mm).

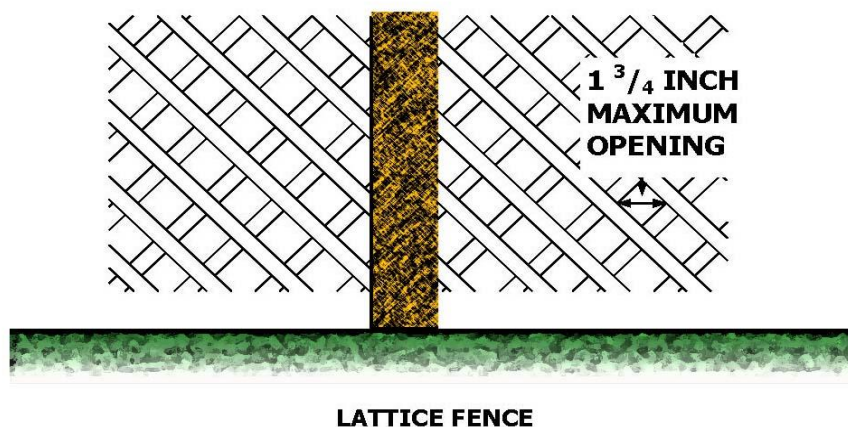


Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1.75 inches (44 mm) in width.

6. Maximum mesh size for chain link fences shall be a 2.25 inch (5/.57 mm) square. A larger mesh size is allowed, when the fence is provided with slats fastened at the top or the bottom which leave a clear opening of no more than 1.75 inches (44 mm).

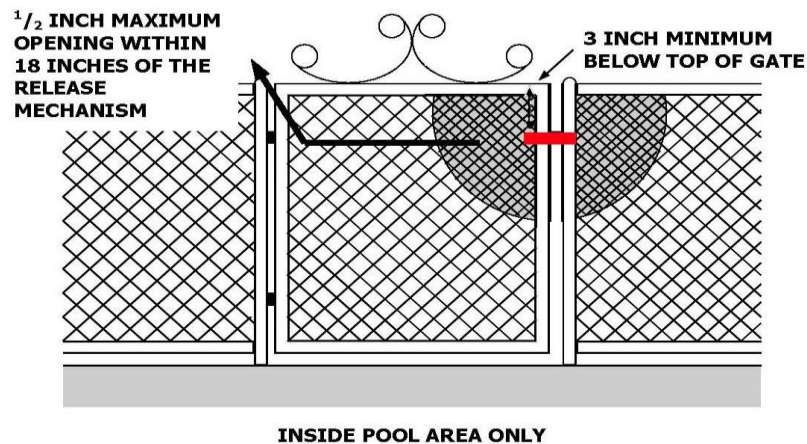


7. Where the barrier is composed of diagonal members, such as a lattice fence, the maximum opening formed by the diagonal members shall not be more than 1.75 inches (44 mm).



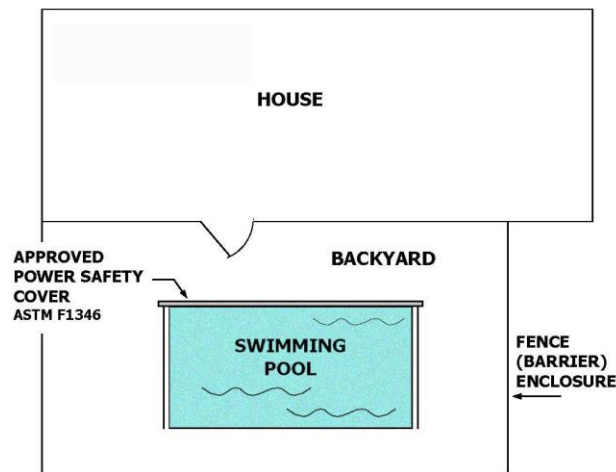
8. Access gates shall comply with the requirements of Section AG105.2, Items 1 through 7, and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Gates other than pedestrian access 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.



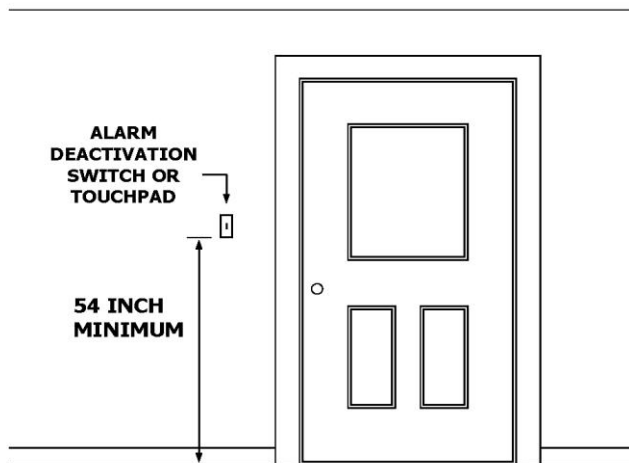
9. Where a wall of a dwelling serves as part of the barrier one of the following conditions shall be met:

- 9.1 The pool shall be equipped with a powered safety cover in compliance with ASTM F1346; or



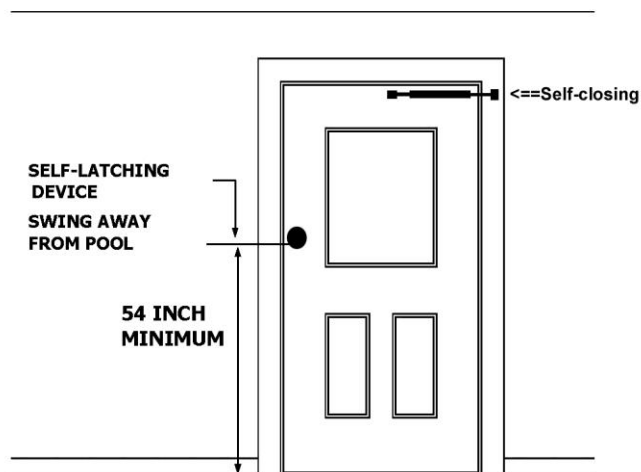
- 9.2 All doors with direct access to the pool through that wall shall be equipped with an alarm which produces an audible warning when the door and its screen, if present, are opened. The alarm shall sound continuously for a minimum of 30 seconds immediately after the door is opened and be capable of 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 a 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;





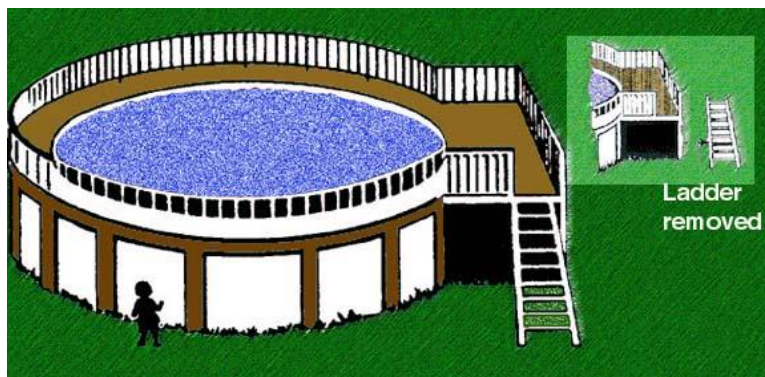
or

- 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.



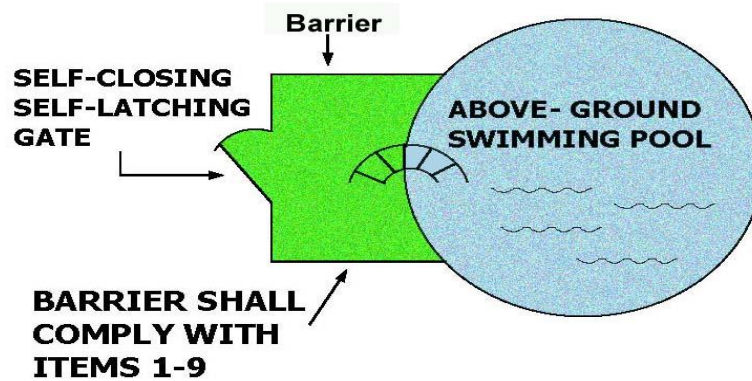
10. Where an aboveground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps, then:

- 10.1 The ladder or steps shall be capable of being secured, locked or removed to prevent access,

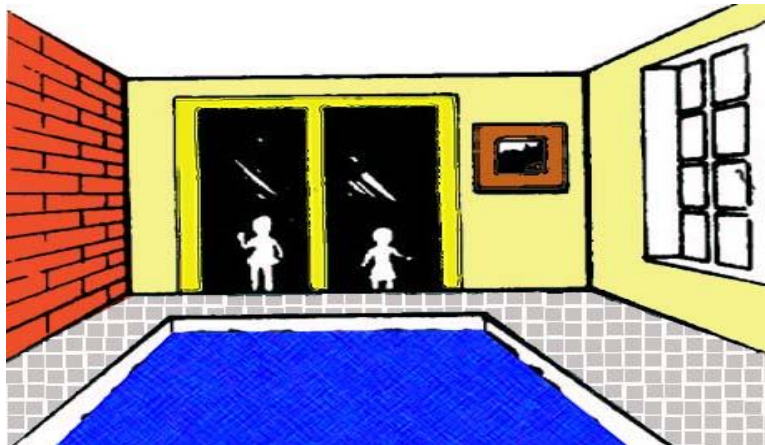


or

- 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.

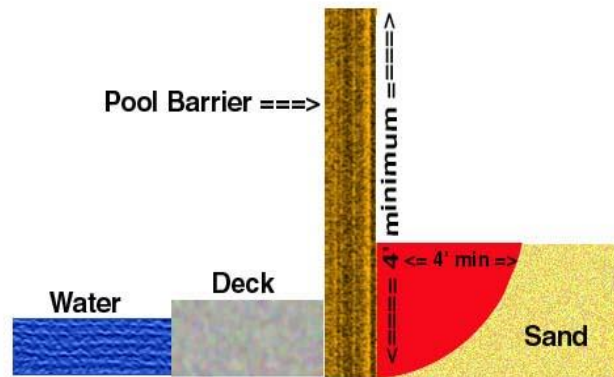
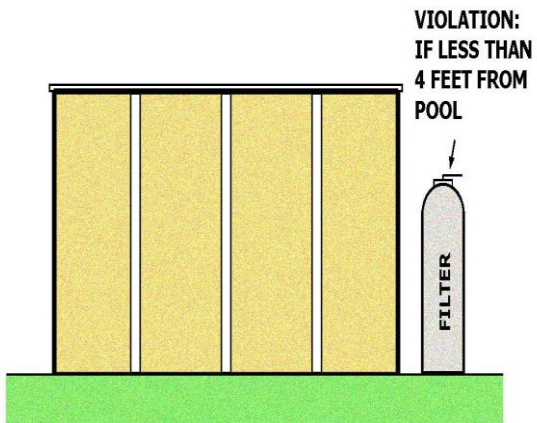


AG105.3 Indoor swimming pool. All walls surrounding an indoor swimming pool shall comply with Section AG105.2, Item 9.

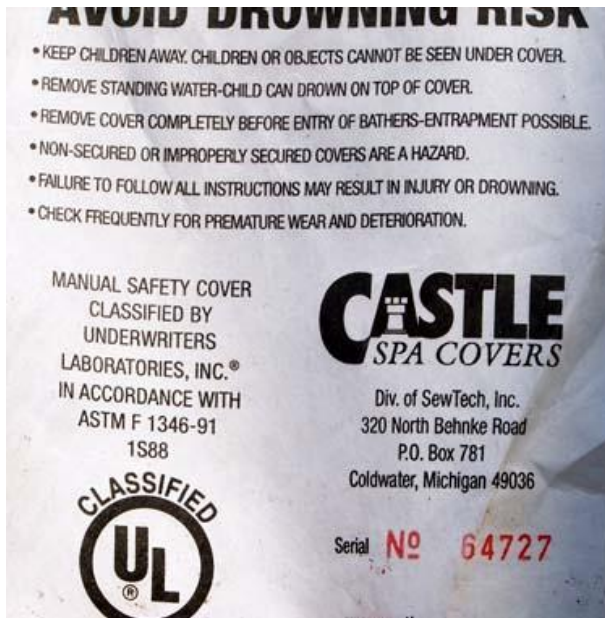


AG105.4 Prohibited locations. Barriers shall be located so as to prohibit permanent structures, equipment or similar objects from being used to climb the barriers.





**AG105.5 Barrier exceptions.** Spas or hot tubs with a safety cover which complies with ASTM F1346, as listed in Section AG107, shall be exempt from the provisions of this appendix.



# QUICK SUMMARY

- Barrier minimum height is 4 feet (including gates).
- Barriers shall be located so as to prohibit permanent structures, equipment or similar objects from being used to climb the barriers.
- House used, as a part of the pool barrier must meet all barrier requirements including openings to the pool area.
- Solid barriers, *which do not have openings*, such as masonry or stonewall, shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.
- Clearance between the barrier bottom and ground is a maximum of 2 inches and a maximum of 4 inches if over solid pool structure (such as wood or cement deck).
- Decorative cutouts - maximum opening size is 1 ¾ inch.
- Vertical spacing up to 4 inches if horizontals are 45 inches or more apart.
- Horizontal spacing less than 45 inches must be located on the poolside of barrier and vertical spacing cannot exceed 1¾ inch.
- Gates must swing away from the pool.
- Gate release mechanisms located 54 inches or more above grade may be located on either side of the gate.
- Gate release mechanisms located less than 54 inches above grade must be located on the poolside of gate, at least 3 inches below the gate top and no openings more than ½ inch within 18 inches of the release.
- Hot tubs and Spas must meet the pool barrier requirements unless a approved cover is used.

## **SPECIAL NOTE!**

Most pool barriers that fail use horizontal and vertical construction.

*AG105.2 (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.*

The current code, as written, makes no allowance for any horizontals spaced less than 45 inches (regardless of their width or depth) to be installed on the outside of the barrier.

*Acknowledgements:*

*Some of the images used in this guide were downloaded from the Internet*

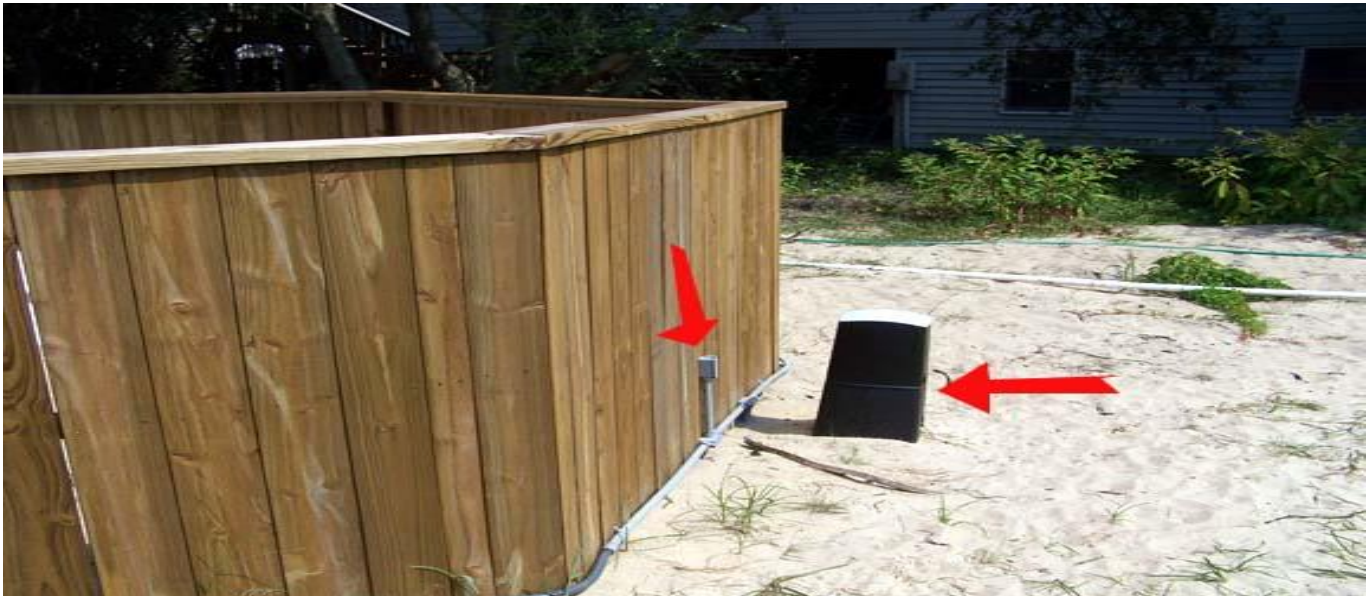


## Addendum - Images

27 August 2004



This barrier is 4 feet high and would meet barrier requirements if not for the electrical conduit. The conduit becomes a horizontal member and the location causes the horizontals to be less than 45 inches apart. This requires the conduit to be placed on the poolside, or on the top or bottom of the barrier to meet code.



This barrier meets the minimum 4 feet height and barrier wall construction requirements but the location of the optical lighting equipment and the electrical device box provide assistance in climbing the barrier thus violating the provisions of **Section AG105.4 Prohibited Locations**



The above picture illustrates violations of **Section AG105.4 – Prohibited Locations**. The placement of this pool equipment and supporting electrical wiring help aid in climbing the barrier.



This barrier is 5 feet high and the lowest part of the pool equipment shed is 4 feet high. The horizontal members are spaced less than 45 inches apart so the verticals are spaced no more than 1 ¾ inches and the electrical conduit is OK. Problems: the optical lighting unit and the plumbing pipe location assist in climbing the barrier.





This barrier overall is 4 feet high. **(A)** The horizontals are less than 45 inches apart so they must be located on the poolside. **(B)** The required vertical spacing for verticals is a maximum of 1  $\frac{3}{4}$  inches when horizontals are spaced less than 45 inches apart. These verticals exceed the maximum spacing. **(C)** The decorative openings exceed the maximum 1  $\frac{3}{4}$  inches square allowed by code. **(D)** The lattice by the pool barrier violates Section **AG105.4** in that the lattice spacing exceeds 1  $\frac{3}{4}$  inches there by providing a means to climb beside the barrier.

**AG105.4 Prohibited locations.** Barriers shall be located so as to prohibit permanent structures, equipment or similar objects from being used to climb the barriers. (Also see pages 10 and 11 of this guide.)

**NOTE: Locating the pool barrier or locating structures, equipment or similar objects near the barrier may violate the provisions of AG105.4. Some equipment or materials such as electrical conduit, outlet boxes, plumbing, etc. that are attached to the pool barrier exterior may also be considered a part of the barrier construction itself and found non-compliant.**

Addendum – Department of Insurance Interpretation  
13 March 2006

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PAGE 82

*Rec'd 6-23-98 AR*



DEPARTMENT OF INSURANCE  
State of North Carolina

P.O. BOX 26287

RALPH, N.C. 27611

June 18, 1998

JIM LONG  
COMMISSIONER OF INSURANCE

ENGINEERING DIVISION  
(919) 733-3801

Mr. Alvin T. Rountree  
Outer Banks Satellite Office  
County of Currituck  
P.O. Box 73  
Corolla, NC 27927-0073

RE: PLACEMENT OF SWIMMING POOLS

Dear Mr. Rountree:

This letter is in response to your letter, dated June 3, 1998, asking for a ruling that Code Section (3103.7) applies to structures near piling.

Section 3103.7 deals with piping below the bottom of footings or bearing walls. Though the problem of the affect of construction near a footing or foundation is similar to a pool near piling, it is not exactly the same, and I do not believe this section applies.

I believe Section 301.1 applies to pile foundations and pools. There are at least two areas of concern.

1. When the soil adjacent to a pile is removed, the pile does not have lateral support. This means it has a reduced ability to resist horizontal forces such as wind or flood. If the pile develops its vertical capacity based on friction with the adjacent soil, removing the adjacent soil close to the pile (even if it is later replaced) reduces the vertical capacity of the pile.
2. The second area of significant concern is when the pile is resisting a horizontal force and places a concentrated load on the side of the pool. Most pools are not designed to resist a horizontal concentrated load.

The above areas of concern may be eliminated if the piles and pool are built to accommodate the lack of support and special forces. Unless a special design of the piles and pool are done by a registered structural engineer and/or geotechnical engineer, I recommend you require that pools be horizontally separated from piles by a distance equal to the embedment of the pile.  
If you have any questions, please call me.

Sincerely,

*William W. Murchison*

William W. Murchison, P.E.  
Building Code Consultant

WWM/gm