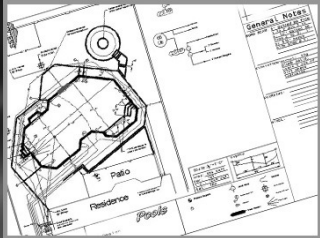


SWIMMING POOLS: How Do We Make Sure You Swim Safely?



Presented by
Milton Gregory Grew, AIA
Architect – Building Official

D.E.S.I.G.N
and
TRADES
CONFERENCE
2016 • 15TH ANNUAL



2005 Connecticut State Building Code

2014 Amendment (pending – February 28, 2014)

- 2003 International Building Code
- 2009 International Residential Code**
- 2003 International Existing Building Code
- 2003 International Mechanical Code
- 2003 International Plumbing Code
- 2009 International Energy Conservation Code (*adopted with changes-effective Oct 1, 2011*)
- ICC/ANSI A117.1-2003 Accessible and Usable Buildings and Facilities
- 2011 National Electrical Code (NFPA-70)**



2016 State Building Code?

2012 International Swimming Pool
& Spa Code
won't be adopted

2012 IBC
2012 IRC
2014 NEC
“aquatic vessels”



Pool
SAFETY

2009 IRC - Appendix G Swimming Pools, Spas and Hot Tubs

- AG 101 - General
- AG 102 - Definitions
- AG 103 - Swimming Pools
- AG 104 - Spas and Hot Tubs
- AG 105 - Barrier Requirements
- AG 106 - Entrapment Protection for Swimming Pool and Spa Suction Outlets
- AG 107 - Abbreviations
- AG 108 - Standards

Pool
SAFETY

2009 IRC - Appendix G

AG101 – General

Design & construction...on the lot of 1 & 2-family dwellings



2009 IRC - Appendix G

AG101.2 Pools in Flood Hazard Areas

AG101.2.1 Designated floodways

-Documentation must be submitted which demonstrates construction will not increase flood elevation

AG101.2.2 Pools located where floodways have not been designated. Must provide a floodway analysis.....will not increase flood elevation more than 1 foot...



Pool in flood hazard area



2009 IRC - Appendix G

AG 102 – Definitions

Swimming Pool

Any structure ***intended*** for swimming or recreational bathing that contains water ***over 24 inches*** deep. This includes in-ground, above-ground, and on-ground swimming pools, hot tubs and spas.



2009 IRC - Appendix G

AG 102 – Definitions

Residential (*amended*)

Situated on the premises of a detached one- or two-family dwelling or which is accessory to an individual one-family townhouse for the exclusive use of its residents and invited guests.



Townhouse swimming pool



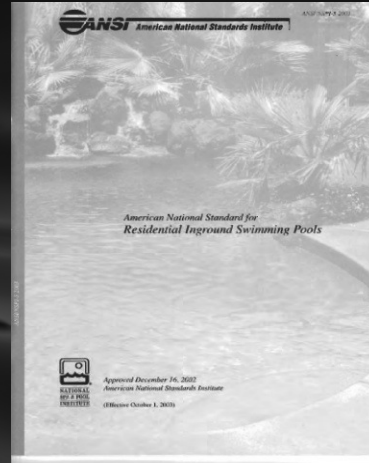
2009 IRC - Appendix G

AG103 – Swimming Pools

AG 103.1 – In-ground Pools

Designed and constructed in
conformance with
ANSI/NSPI-5
(or ANSI/APSP-5)

*Standard for Residential
In-Ground Swimming Pools*



ANSI/APSP-5 In-Ground Pools

4 Structural Design

4.1 The structural design and materials used shall be in accordance with generally accepted engineering practices and methods.

Compare to:

2003 IBC 3109.9 – Pool structure

“The pool structure shall be engineered and designed to withstand the expected forces to which the pool will be subjected.”



2012 ISPSC

802.1 Materials of components and accessories.

The materials of components and accessories used for permanent inground residential swimming pools shall be suitable for the environment in which they are installed. The materials shall be capable of fulfilling the design, installation and the intended use requirements in the International Residential Code.

802.2 Structural design. The structural design and materials shall be in accordance with the International Residential Code.



ANSI/APSP-5 In-Ground Pools

5 Pool Dimensions and Tolerances

- Maximum slope of walls
- Floor slopes
- Diving equipment and minimum water envelope
- Diving platforms



ANSI/APSP-5 In-Ground Pools

6 Entry / Exit

6.1 Required at shallow end if water deeper than 24".

6.1.1 Required at deep end if water depth 5 ft or more.

6.2.1 Treads 10" min., 240 sq in min.

6.2.1.1 If handrail provided, tread can be 8"

6.2.1.1.1 Bottom riser height can vary



ANSI/APSP-5

6 Entry / Exit

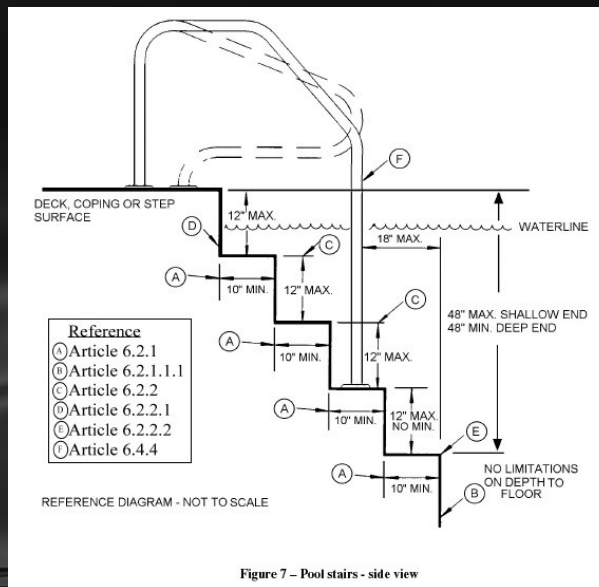
6.2 Riser heights can vary but no exceed 12".

6.2.2.1 Coping to top tread not to exceed 12".

6.2.2.2 When stairs in over 48" deep water, bottom tread must be min. 48" below deck, visually set apart, located outside wall of pool.



ANSI/APSP-5



Pool
SAFETY

Entry / Exit



Pool
SAFETY

Entry / Exit



Pool
SAFETY



Pool
SAFETY

ANSI/APSP-5

6.3 Shallow end detail for beach & sloping entries



Pool
SAFETY

ANSI/APSP-5 In-Ground Pools

6.4 Handrails

6.5 Pool ladder design & construction

6.6 Recessed treads

6.7 Underwater seats, benches & swimouts

Pool
SAFETY

ANSI/APSP-5

7 Decks

- 7.1 General requirements
- 7.2 Drainage
- 7.3 Concrete decks
- 7.4 Wood decks
- 7.5 Stone, brick, brick pavers, concrete pavers and tile decks
- 7.6 Deck steps



ANSI/APSP-5

- 8 Materials of construction & finishes**
- 9 Circulations systems components & related equipment**
- 10 Water supply**
- 11 Waste water disposal**
- 12 Chemical feeders & ozone generators**
- 13 Electrical rqmts (adopted NEC)**



ANSI/APSP-5

14 Instructions for the circulation system, pressure filters & separation tanks

15 Safety features

Appendix I Entrapment avoidance

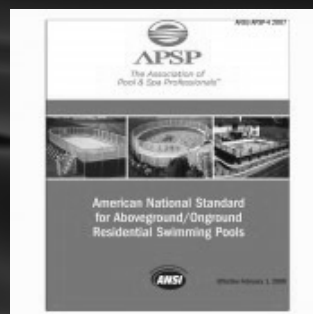


2009 IRC - Appendix G

AG103 – Swimming Pools

AG 103.2 – Above-Ground and On-Ground Pools shall be designed and constructed in conformance with ANSI/NSPI-4 (or ANSI/APSP-4)

*Standard for Aboveground/
Onground Residential
Swimming Pools*



Above-ground



Pool
SAFETY

On-ground



Pool
SAFETY

ANSI/APSP-4 Above/On Ground

1 Scope

1.1 Design, manufacturing, testing, care & use

1.2 For swimming & wading only. No diving boards, slides or other equipment to be added.



ANSI/APSP-4

3 Codes & compliance

3.2 Any after market or home-built deck, if allowed by manufacturer, shall comply with local code, including load capacity & fencing.

3.3 All decks shall meet local codes & comply with most recent ANSI/APSP-8.



ANSI/APSP-4

6 Pool & component design

Pool manufacturer responsible for structural design & materials

Component manufacturers responsible to ensure components can be protected from damage due to freezing

Vinyl liner manufacturer responsible for brittleness, winterization and thickness



ANSI/APSP-4

7 Instructions & responsibilities

Manufacturers responsible to provide written instruction manuals

7.1.6 Manufacturers shall advise homeowners that the installation must comply with local codes & may require permits for building, electrical, zoning, etc

7.2.3 Must advise that a barrier is necessary

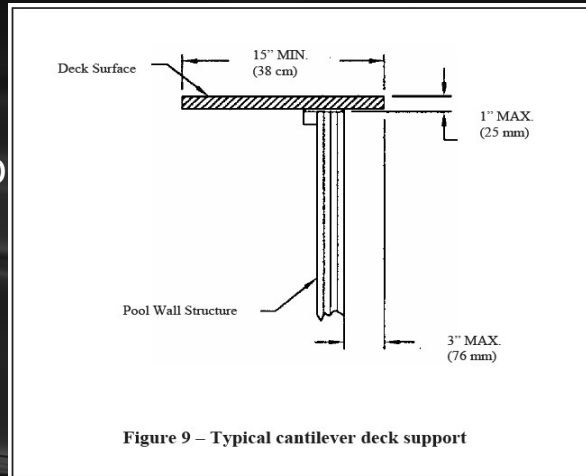
7.3 Installer responsible to follow regulations on setback, barriers, devices, and other conditions



ANSI/APSP-4

10 Raised decks & fencing

- LL 40 PSF
- Slip resistant
- Guards sim. to IRC



SAFELY

ANSI/APSP-4

11.10 Return inlets & suction outlets

References ANSI/APSP-7 2006 for suction entrapment avoidance

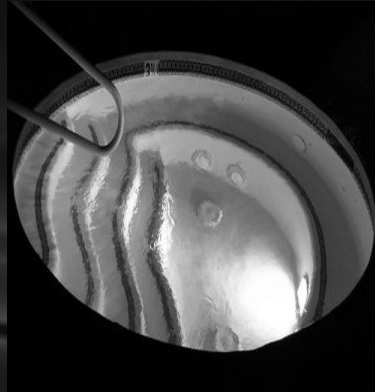
Pool SAFELY

2009 IRC - Appendix G

AG104 - Spas and Hot Tubs

AG104.1 Permanently installed spas and hot tubs

Designed and constructed in conformance with ANSI/NSPI-3 (*Standard for Permanently Installed Residential Spas*)



Pool
SAFETY

2009 IRC – Appendix G

AG104.2 Portable spas and hot **tubs**

Designed and constructed in conformance with ANSI/NSPI-6

(Standard for Residential Portable Spas)



Pool
SAFETY

Portable Spas and Tubs

- Important to remember that these are in a category of their own. They are seen more as an appliance and do not have the same requirements as swimming pools.
- Circulation and suction outlets are engineered by manufacturer in accordance with UL 1563 Section 36 (suction openings).
- UL 1563 - Electric Spas, Equipment Assemblies, and Associated Equipment



2009 IRC - Appendix G

AG105 - Barrier Requirements

AG105.1 Application. Controls design to protect against drowning by restricting access.



Barriers Required to Prevent Access



39

Pool
SAFETY

State Bldg Code Interpretation I-22-12

Question:

Would the installation of a replacement fence for an existing swimming pool that is a required barrier under Section AG105.2 require a building permit? I realize that Section R105.2 would normally exempt most fences from the permit requirement.

Answer:

Yes. Section AG105, of the 2003 International Residential Code portion of the 2005 State Building Code, controls the design of barriers for residential swimming pools, spas and hot tubs in order to provide protection against potential drowning by restricting access to swimming pools, spas and hot tubs. If someone were to use a fence as a "barrier", then Section R105.2, of the above code, would not apply and a building permit would be required for the barrier.

Pool
SAFETY

Barrier Requirements – AG 105

AG105.2 Outdoor swimming pool

In-ground, above ground, on ground

Swimming pool, hot tub or spa

Must comply with the following 10 items:



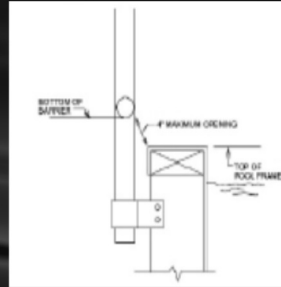
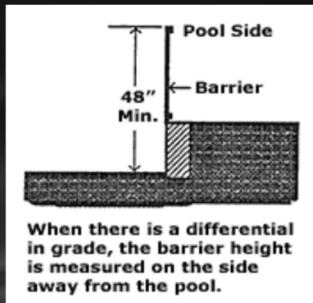
Barrier Rqmts – AG 105.2

1. Height: 48" min. from outside
2" max. opening at bottom (4" above ground)
2. Openings: 4" sphere
3. Solid barriers: No indentations or protrusions



Barrier Rqmts – AG 105.2

1.



Pool SAFETY

Barrier Requirements-AG 105.2

2.



Pool SAFETY

Barrier Requirements-AG 105.2

3.



Pool SAFETY

Barrier Requirements – AG 105.2

3. No protrusions



Pool SAFETY



Pool SAFETY
single story
and two
story



Pool SAFETY
single story
and two
story



Pool SAFETY



Pool SAFETY



Pool
single over
one fence
SAFELY



Pool
single over
one fence
SAFELY

Barrier Requirements –AG105.2

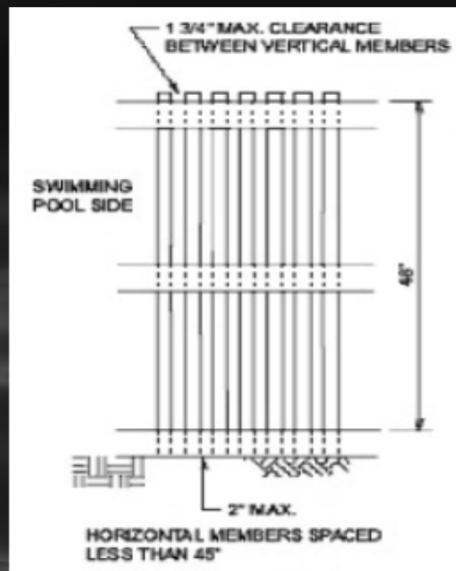
4. Horizontal & vertical members where horizontal members less than 45" apart (top to top):

- Horizontal members on pool side 1-3/4" max. between vertical members
- Decorative cutouts in vert. members, 1-3/4" max. openings



Barrier Requirements – AG105.2

4.



Barrier Requirements – AG105.2

5. Horizontal & vertical members where
horizontal members 45° or more apart:

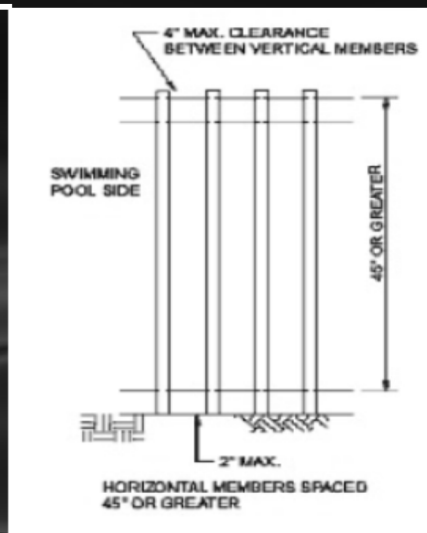
4" max. between vertical members

Decorative cutouts in vert. members, 1-
3/4" max. openings



Barrier Requirements – AG105.2

5.

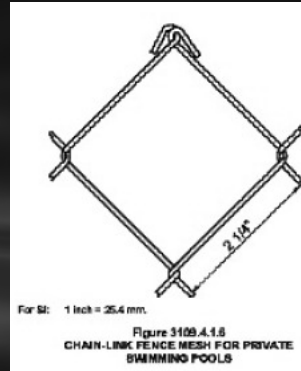


Barrier Requirements – AG 105.2

6. Chain link dimensions

Mesh size 2-1/4" square max.

Slats fastened at top or bottom, reduce to 1-3/4"



Doesn't agree with VGB 1406 Model Code language which states 1-3/4" mesh size



State Bldg Code Interpretation I-21-08

Question:

"While Section AG105.2 does not address a pool barrier made up only of horizontal members, Section AG105.2, Item #6, does address chain link mesh size of 2-1/4 inches square. Is a pool barrier made up of horizontal members to the height of 48 inches with a 3/4 inch space between the members a code compliant barrier?"

(A photograph is included illustrating the pool barrier composed of horizontal and vertical members with horizontal members not located on the swimming pool side.)

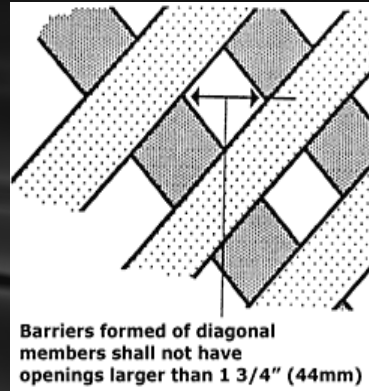
Answer:

Section AG105.2, Item #4 requires the barriers horizontal members, where the distance between the tops of the members is less than 45 inches, to have all horizontal members be located on the swimming pool side of the barrier.



Barrier Requirements – AG 105.2

7. Diagonal members:
1-3/4" maximum
openings



Pool
SAFETY

Barrier Requirements – AG 105.2

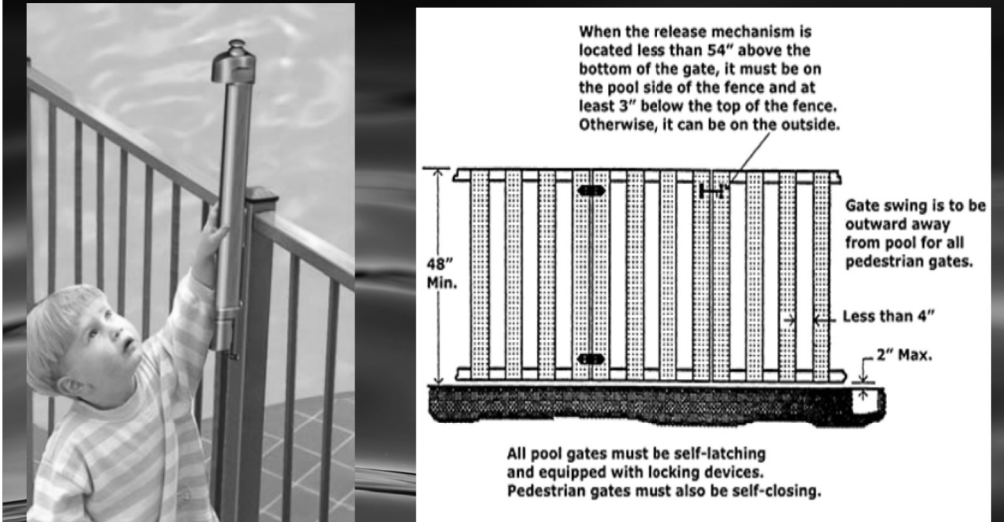
8. Access gates:

- Comply with 1 — 7, plus
- Accommodate a locking device
- Open outward
- Self-closing, Self-latching
- Other gates self-latching
- Release mechanism less than 54" above bottom of gate:
 - Pool side, at least 3" below top of gate,
 - No opening greater than 1/2" within 18"

Pool
SAFETY

Barrier Requirements – AG 105.2

8.



Barrier Requirements – AG 105.2

9. Dwelling wall part of barrier

Meeting one of the following:

9.1 Powered safety cover per ASTM F1346

9.2 Doors accessing pool

Audible alarm for door & screen, 30 sec

Auto reset

Manual deactivation for single opening

Deactivation switch min. 54" high

9.3 Other means of protection acceptable
of protection not less than 9.1 or 9.2



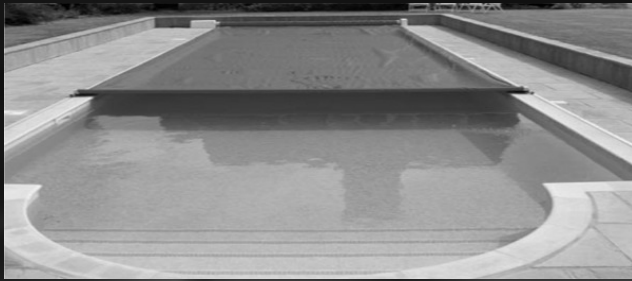
Barrier Requirements – AG 105.2

9.



Pool
SAFETY

Power Safety Cover



Pool
SAFETY

Barrier Requirements – AG 105.2

10. Above-ground structure is used as barrier or mounted on structure the ladder or steps shall be surrounded by a barrier which meets 105.2, Items 1-9



Pool
SAFETY

Barrier Requirements







Big box store



IMPORTANT SAFETY RULES

Read, Understand and Follow All Instructions Carefully Before Installing and Using the Product.

WARNING

- Continuous and competent adult supervision of children and the disabled is required at all times.
- Secure all doors, windows and safety barriers to prevent unauthorized, unintentional or unsupervised pool entry.
- Install a safety barrier that will eliminate access to the pool for young children and pets.
- Pool and pool accessories are to be assembled and disassembled by adults only.
- Never dive, jump or slide into an above-ground pool or any shallow body of water.
- Failure to set up pool on flat, level, compact ground or over filling could result in the pool's collapse and the possibility that a person lounging in the pool could be swept out/jected.
- Do not lean, straddle, or exert pressure on the inflatable ring or top rim as injury or flooding could occur. Do not allow anyone to sit on, climb, or straddle the sides of the pool.
- Remove all toys and flotation devices from, in and around the pool when it is not in use. Objects in the pool attract young children.
- Keep toys, chairs, tables, or any objects that a child could climb on at least four feet (1.22 meters) away from the pool.
- Keep rescue equipment by the pool and clearly post emergency numbers at the phone closest to the pool. Examples of rescue equipment: coast guard approved ring buoy with attached rope, strong rope not less than twelve feet (3.66m) long.
- Never swim alone or allow others to swim alone.
- Keep your pool clean and clear. The pool floor must be visible at all times from the outside barrier of the pool.
- If swimming at night use properly installed artificial lighting to illuminate all safety signs, ladders, pool floor and walkways.
- Stay away from the pool when using alcohol or drugs/medication.
- Keep children away from pool covers to avoid entanglement, drowning, or other serious injury.
- Pool covers must be completely removed before pool use. Children and adults cannot be seen under a pool cover.
- Do not cover the pool while you or anyone else is in the pool.
- Keep the pool and pool area clean and clear to avoid slips and falls and objects that may cause injury.
- Protect all pool occupants from recreational water illnesses by keeping the pool water sanitized. Don't swallow the pool water. Practice good hygiene.
- All pools are subject to wear and deterioration. Certain types of excessive or accelerated deterioration can lead to an operation failure, and can ultimately cause the loss of large quantities of water from your pool. Therefore, it is very important that you properly maintain your pool on a regular basis.
- This pool is for outdoor use only.
- Empty and store the pool when not in use for a longer period. See storage instructions.
- All electrical components shall be installed in accordance with Article 680 of the National Electrical Code (NEC), "Swimming Pools, Fountains and Similar Installations" or its latest approved edition.
- The installer of the vinyl liner shall affix on the original or replacement liner, or on the pool structure, all safety signs in accordance with the manufacturer's instructions. The safety signs shall be placed above the water line.

POOL BARRIERS AND COVERS ARE NOT SUBSTITUTES FOR CONTINUOUS AND COMPETENT ADULT SUPERVISION. POOL DOES NOT COME WITH A LIFE GUARD. ADULTS ARE THEREFORE REQUIRED TO ACT AS LIFE GUARDS OR WATER WATCHERS AND PROTECT THE LIVES OF ALL POOL USERS, ESPECIALLY CHILDREN, IN AND AROUND THE POOL.

FAILURE TO FOLLOW THESE WARNINGS MAY RESULT IN PROPERTY DAMAGE, SERIOUS INJURY OR DEATH.

Advisory:

Pool owners may need to comply with local or state laws relating to childproof fencing, safety barriers, lighting, and other safety requirements. Customers should contact their local building code enforcement office for further details.

English

18
PO

SAFETY RULES

SAVE THESE INSTRUCTIONS

Page 3

SAFETY

Barrier Requirements – AG 105

AG 105.3 Indoor Swimming Pools

Walls surrounding an indoor pool shall comply with AG 105.2, Item 9 (wall of dwelling serves as barrier)



Pool
SAFETY

Barrier Requirements – AG 105

AG105.4 Prohibited locations

Pool barriers cannot be climbable from other structures, equipment or objects



Pool
SAFETY

Barrier Requirements



AG 105.5 Barrier Exceptions.

Spas and hot tubs with safety cover which complies with ASTM F 1346.



State Bldg Code Interpretation I-17-08

Question: Based on the manufacturer's product specification for strength and installation instructions, can deer fencing be used as barrier for a pool?

Answer: A barrier's purpose is to restrict access to swimming pools, spas and hot tubs. The deer fencing product submitted along with the manufacturer's product specification installation instructions does not demonstrate deer fencing as a code compliant barrier.



AG 105.6 - Temporary Enclosure (CT Add)

- Must be in place prior to electrical inspection of any in-ground pool
- Min. 48" high
- 4" sphere rule
- Openings with a positive latching device



AG 105.6 - Temporary Enclosure



AG 105.7 – Pool Alarm (CT Add — CGS 29-265a)

Be on building permit and for substantial alteration

One or more families - residence

Must be installed with pool

50 db alarm when 15 lbs or more enters pool

Exempt: Hot tubs & portable spas



2009 IRC - Appendix G

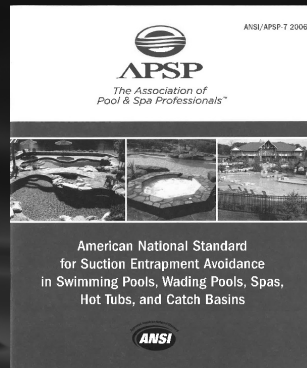
AG106 – Entrapment Protection for Swimming Pool and Spa Suction Outlets

AG106.1 General. Suction outlets shall be designed and installed in accordance with ANSI/APSP-7. (2006)



AG 106 Entrapment Avoidance

106.1 Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.



ANSI/APSP-7 Table of Contents

1. Scope
2. Normative references (to other standards)
3. Definitions
4. General requirements for suction entrapment avoidance systems and components
5. New construction
6. Existing pools and spas
7. Vacuum release systems



Section 1. Scope

- 1.1 General. This standard covers design and performance criteria for circulation systems including components, devices, and related technology installed to protect against entrapment hazards in residential and public swimming pools, wading pools, spas, hot tubs, and catch basins, hereinafter referred to as “pools and spas.”



Section 1.3 Exception

Commercial water parks and their associated suction systems are outside the scope of the standard.

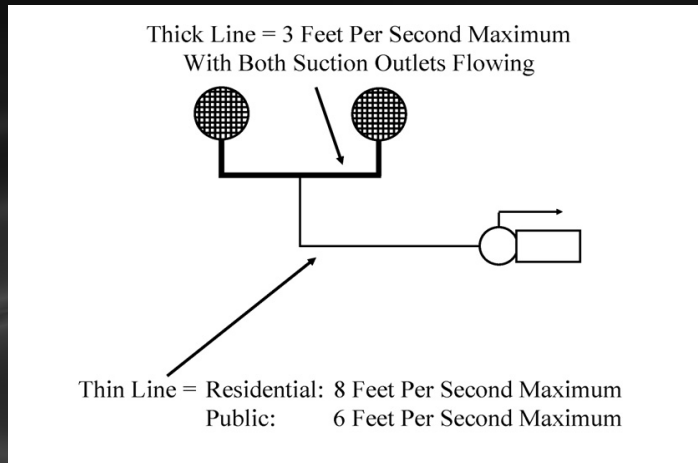


Section 4. General Requirements

- 4.1 Codes
- 4.2 Electrical components
- 4.3 DANGER
- 4.4 Water velocity
- 4.5 Listed suction outlets
ASME/ANSI A112.19.8
- 4.6 Minimum flow rating for each cover/grate
- 4.7 Dual cover/grate separation
- 4.8 Skimmers
- 4.9 Wall vacuum fittings



Section 4.4 Water Velocity



Section 4.5 Listed Suction Outlets

Must comply with AMSE/ANSI A112.19.8



AQUASTAR
pool products
A Safe Drain Is No Accident™

8" Round MoFlow™ Suction Outlet Cover and Mud Frame

VGB Series

The AquaStar line of suction outlet covers, compliant with the Virginia Graeme-Baker Pool and Spa Safety Act (ANSI/APSP 16-2011 and NSF/ANSI 50-2009a)

Features

For single or multiple drain use
3" sunk depth / min. 2" pipe
(see installation instructions)

Single:
Floor: 165 GPM at 3.2 fpi
Wall: 115 GPM at 2.2 fpi

Flow/wall: 77.8 GPM at 1.5 fpi
Flow/wall: 51.9 GPM at 1.0 fpi

14.6 square inch opening

Additional sump and frame versions also available

#316 stainless steel screws

Manufactured from superior UV-resistant engineered polymers

Meets or exceeds ANSI/APSP 16-2011 and NSF/ANSI 50-2009a national standards and ASTM G24 UV testing

Replace every five years from the date of installation

36 per case

NEW

U.S. patent D621009

Part # 8MFxxx

This AquaStar (all standard 8" models, American, Perma-Cover, Match, Waterway and most Custom Molded (CMT). At least two mud frame screws must be used to secure cover.

STANDARD COLORS

101	104
102	105
103	108

Replaces o/n
8A/WBxxx and 8F/Wxxx

Also available with Retrofit
Skimmer Equalizer Kit
p/n 8MFxxxx

VGB 2008 Compliant

1. 8" round MoFlow suction outlet cover
2. 8" round mud frame
3. #10 x 1" flat head Phillips type A screw, 316 ss, qty 4

P 877-768-2717 F 877-276-POOL Outside the US: P +1-805-639-5060 F +1-949-336-1940
info@aquastarpoolproducts.com www.aquastarpoolproducts.com

★ ★ PROUDLY MADE IN THE U.S.A.



ISWG1031HFCOC Rev E

CERTIFICATION OF COMPLIANCE

Contains: WG1031BHF Description: 9"x9" Suction Outlet Cover

Ratings: Floor: 264 GPM Wall: 224 GPM Open Area: 23.18 sq-in

Certified to Comply with Section 14.04 of the Virginia Graeme Baker Act (VGB) Pool & Spa Safety Act codified at 16 CFR part 1450. Initial Certification May 2011.

Manufactured: After September 10, 2009, by Division of Hayward Industries, Inc. at K4-A, 214028 Block K4-A, Export Processing Zone Wuxi New District Jiangsu Province PRC 214028, China.
Certified by Hayward Pool Products, 620 Division Street, Elizabeth, NJ 07207, Phone 908-355-7995
Contact at www.haywardnet.com

Record Custodian is Customer Service at www.haywardnet.com, Hayward Pool Products P.O. Box 5100 Clemmons, NC 27012-5100, Phone: 336-712-9900
<http://www.hayward-pool.com/pdf/literature/qxqhighcoc.pdf>

Date of Mfr: The Lot Number shown on the product label contains the Year & Month of manufacture. The first number represents the year (ex 1 = 2011) and the second character the month (A=Jan, B=Feb, H=Aug, I is skipped, J=Sep, etc)

Tested to ANSI/ASME 112.19.8-2007 (addendum 9b-2009) per Section 14.04 of the Virginia Graeme Baker Act (VGB) Pool & Spa Safety Act. Tested by IAPMO, 5001 E. Philadelphia Street, Ontario, CA 91761 (909)-472-4100 in April 2011. Certificate at: http://pki.iapmo.org/file_info.asp?file_no=0006353

Date of Installation:
Suction outlet components have a finite life, the cover/grate should be inspected frequently and replaced at least every 7 years or if found to be damaged, broken, cracked, missing, or not securely attached.

Hayward Pool Products acknowledges that it is a federal crime to knowingly and willingly make materially false, fictitious, or fraudulent statements, representations, or omissions on this certification.

9" X 9" Suction Outlet Cover WG1031BHF
9" X 9" Suction Outlet Cover WG1031BHF
9" X 9" Inner Frame WG1031F
9" X 9" Inner Frame WG1031F
1 1/2" Min
Finished Pool Surface
USE TO REINFORCE THE SP1833, SP1834FA2, AND SP1831

Warning – Suction Entrapment Hazard.
Suction in suction outlets and/or suction outlet covers which are installed in a small area and/or below the surrounding surface can cause severe injury or death due to body entrapment hazard.
To reduce the risk of body entrapment, installation of the field fabricated sumps must be such that the top of the mounted cover is a minimum of 1 1/2" above the finished pool surface over an area larger than 40" on a diagonal.





Recall of Pool and Spa Drain Covers: Frequently Asked Questions

10

CPSC, in cooperation with several manufacturers, has announced a voluntary recall of various swimming pool and in-ground spa drain covers. These questions and answers address this recall from May 26, 2011.

Pool and Spa Drain Cover Recall Frequently Asked Questions

These questions and answers explain the pool and spa drain cover recall from [May 26, 2011](#).

What is this recall about?

CPSC, in cooperation with several manufacturers, has announced a voluntary recall of various swimming pool and in-ground spa drain covers. A replacement or retrofit of these drain covers may be required in certain cases. A complete list of manufacturers involved can be found at CPSC's [recall website](#). Check the individual manufacturer's website for a list of the affected models.

Why is a recall necessary?

CPSC staff conducted an extensive investigation of the adequacy of the testing and certification process used to evaluate the flow rates of pool drain covers. We found that due to incorrect testing procedures, some swimming pool and in-ground spa drain covers were incorrectly rated for protection against body entrapment. Incorrectly rated covers could pose a possible entrapment hazard to swimmers and bathers.

What swimming pools or in-ground spas are affected by this recall?

This recall relates to certain models of drain covers manufactured by the companies listed above. If you have such a drain cover, and you have (1) a kiddie pool, wading pool, or an in-ground spa, or (2) a swimming pool with a single drain that has drain covers that were installed after Dec. 19, 2008, the drain covers may be part of the recall. Note:



Section 4.6 Min. Flow Rating for Each Cover

In dual and multiple submerged suction outlets (drains) each outlet must have the ability to handle 100% of the system's flow rate.

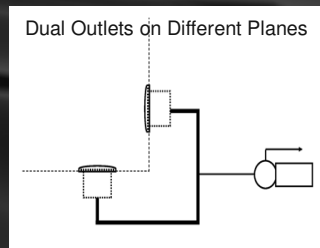
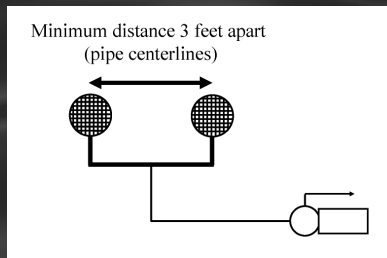
Check maximum flow rate capacity for each cover for submerged outlets (wall and floor).



Section 4.7 Dual Cover/Grate Separation

Separated by a minimum of 3 feet (center to center) of suction pipes, or

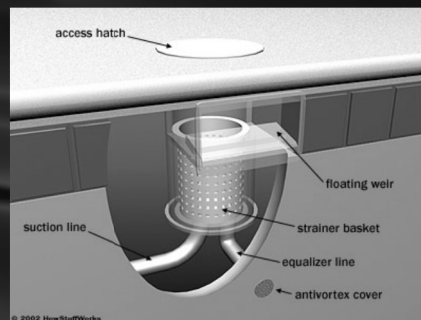
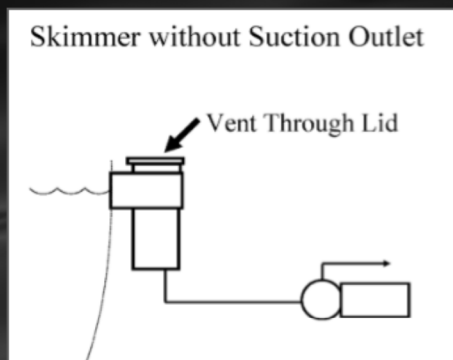
Located on two different planes
(bottom/vertical wall) (separate vertical walls)



Pool
SAFETY

Section 4.8 Skimmers

Vented to atmosphere through openings in lid, through a separate vent pipe, or incorporate an equalizer line



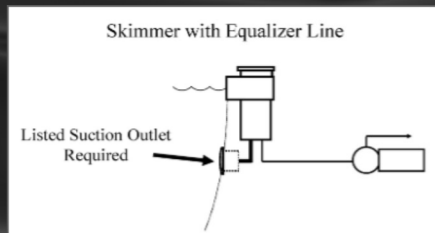
Pool
SAFETY

Section 4.8 Skimmers

Section 4.8.1

Equalizer lines, when used, shall be located on the wall with the center no more than 18 inches below the maximum operating level.

Protected by a listed suction outlet cover/grate



Pool
SAFETY

Section 4.9 Wall Vacuum Fittings

When used, vacuum cleaner fitting(s) shall be located in an accessible position(s) at least 6 inches and no greater than 18 inches below the water level and the self closing, self latching fitting shall comply with IAPMO SPS 4.

In addition the vacuum piping shall be equipped with a valve to remain in the closed position when not in use.

Pool
SAFETY

Section 4.9 Wall Vacuum Fittings



Pool
SAFETY

Section 4.9 Wall Vacuum Fittings

When used, vacuum cleaner fitting(s) shall be located in an accessible position(s) at least 6 inches and no greater than 18 inches below the water level and the self closing, self latching fitting shall comply with IAPMO SPS 4.

In addition the vacuum piping shall be equipped with a valve to remain in the closed position when not in use.

Pool
SAFETY

Section 5. New Construction

5.1 General

5.2 Submerged suction outlets are optional

5.3 Dual outlets

5.3.2 Dual outlet separation

5.4 Three-or-more outlets

5.5 Single unblockable suction outlet

5.6 Single outlet swim jet system



Section 5. New Construction

5.7 Single outlet – alternative suction system

5.8 Gravity flow systems

5.8.6 Fully submerged gravity outlet

5.8.7 Partially submerged gravity outlet

5.9 Outlet sumps in series

5.10 Other means. See 1.2



Suction Outlets (Main Drains)

ICC codes and Pool and Spa Safety Act refers to main drains, but new language is submerged suction outlets



Section 5.2 Submerged Outlets Optional

Pools without main drains

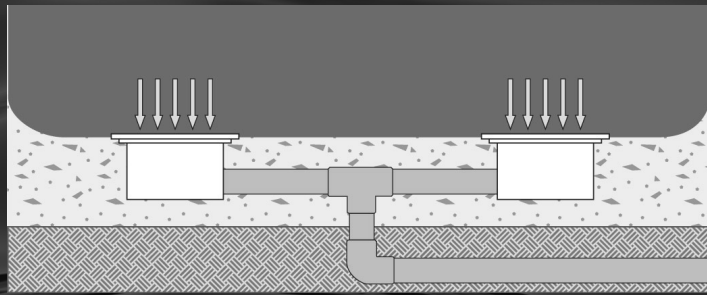
Skimmers or overflow systems must provide for 100 % of required system flow



Section 5.3 Dual Outlets

Listed outlets

Tee feeding from common line between the suction outlets shall be located approximately midway between the outlets



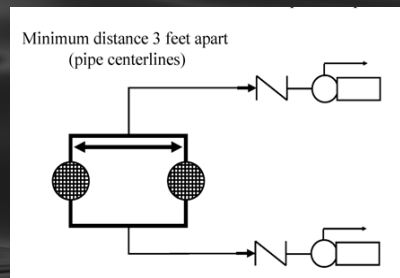
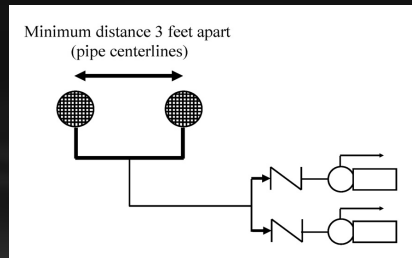
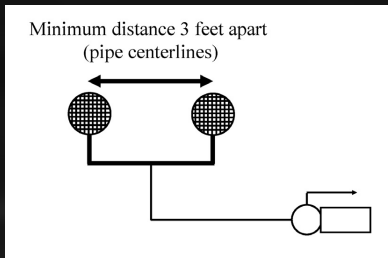
Pool
SAFETY

Dual Outlets



Pool
SAFETY

Section 5.3 Dual Outlets

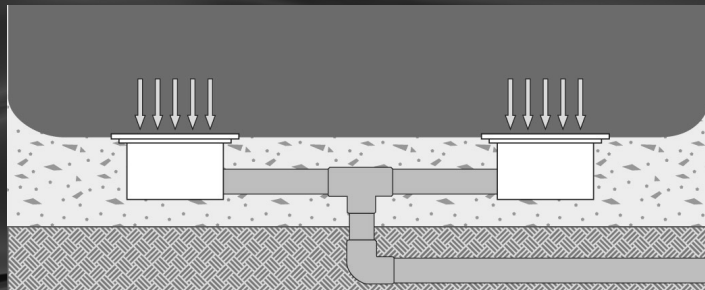


Pool
SAFETY

Section 5.3 Dual Outlets

5.3.1

Flow rating of each cover/grate shall be at least equal to the system's maximum flow rate

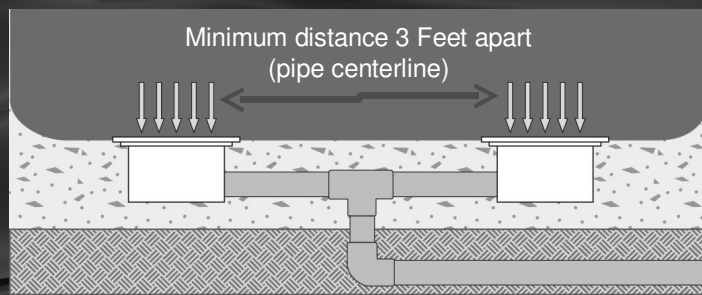


Pool
SAFETY

Section 5.3 Dual Outlets

5.3.2 Dual outlet separation

Minimum of 3 feet measured from center to center of the suction pipe. Or located on separate planes.



Pool
SAFETY

Section 5.3 Dual Outlets

5.3.2 Dual outlet separation

Minimum of 3 foot of separation measured center to center of the suction pipes



Pool
SAFETY

Section 5.3 Dual Outlets

5.3.2 Dual outlet separation

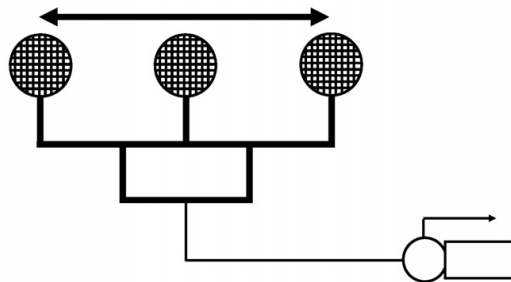
Can be on different planes



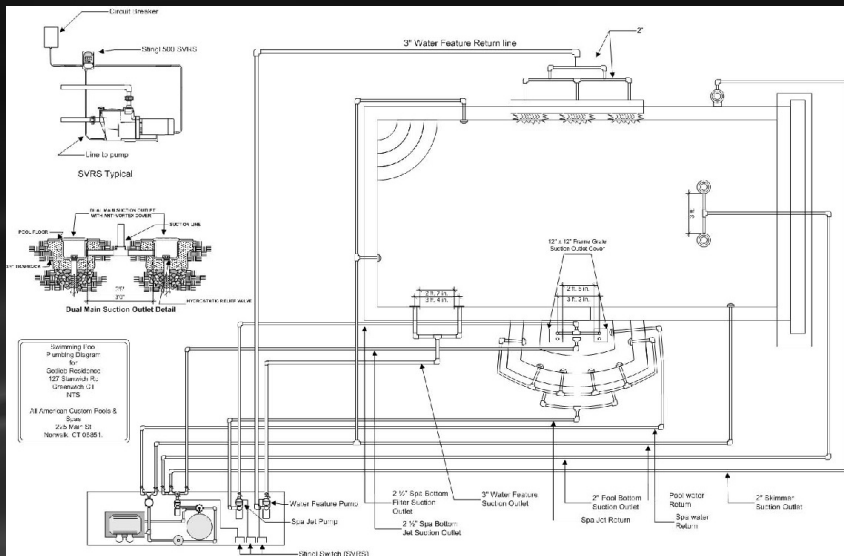
Section 5.4 Three or More Outlets

Three-or-More Outlets in Parallel to Single Pump

Minimum distance 3 feet between outermost outlets
(pipe centerlines)

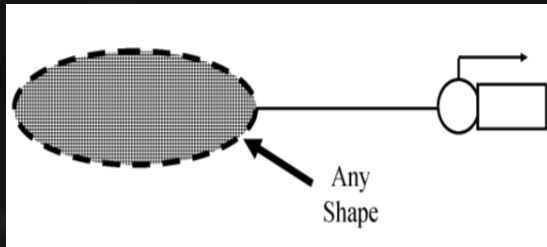


Plan Drawing for Permit

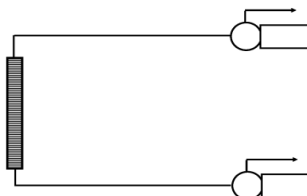


Pool SAFETY

Section 5.5 Single Unblockable Suction Outlet

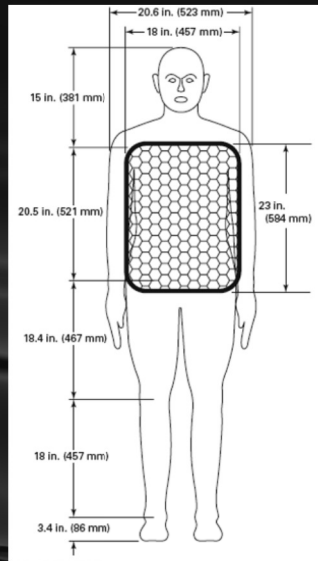


Single Unblockable Channel Outlet to Two Pumps



Pool SAFETY

Section 5.5 Single Unblockable Suction Outlet



Pool
SAFETY

Section 5.6 Single Outlet Swim Jet System



Pool
SAFETY

Section 5.7

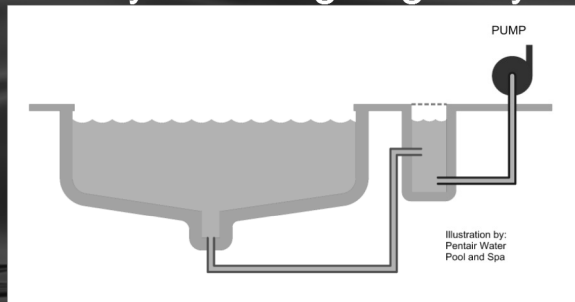
Single Outlet – Alternative Suction System

Single outlet alternative suction systems consist of a single listed suction outlet cover/grate utilizing a venturi-driven system for circulating water. Such systems shall be tested and listed by a nationally recognized testing laboratory as conforming to the most recent edition of ASME/ANSI A112.19.17 and ASTM F 2387-04.



Section 5.8 Gravity Flow Systems

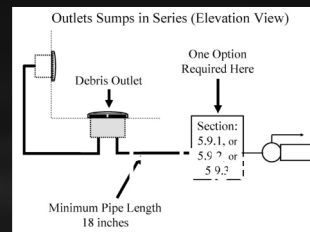
- Flow from a pool or spa to a vented reservoir may be partially or fully submerged
- 5.8.6 Fully submerged gravity outlet
- 5.8.7 Partially submerged gravity outlet



Section 5.9 Outlet Sumps in Series

Must have listed suction outlet covers/ grates

Between outlet and pump there one of the listed options:



- ◆ One additional suction outlet located a min. of 18 inches from the tee in the suction line to the pump(s); or
- ◆ An engineered vent system (7.2); or
- ◆ Listed SVRS in accordance with 7.1



Section 7 Vacuum Release Systems

NOTE: All vacuum release systems shall be tested on a single suction outlet with a listed safety cover in place. These devices/systems are not considered “backup” systems as there is no known suction vacuum release system that will completely protect against four of the five known hazards and presenting vacuum release systems as “backup” systems would promote a false sense of security among the users of these devices/systems.



2009 IRC Appendix G

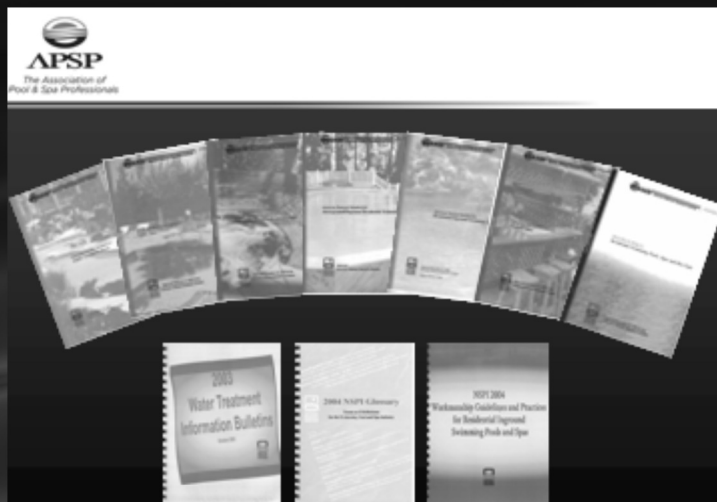
AG 108 Standards (new)

ANSI/APSP-7-06 Standard for Suction
Entrapment Avoidance in Swimming Pools,
Wading Pools, Spas, Hot Tubs and Catch
Basins

ASCE/SEI-24-05 Flood Resistant Design
and Construction



ANSI/NSPI (APSP) Standards



Resources

Northeast Spa & Pool Association – NESPA

www.nespspool.org

609-689-9111

Association of Pool & Spa Professionals

www.apsp.org

Consumer Product Safety Commission

Virginia Graeme Baker Pool & Spa Safety Act

www.poolsafely.gov



Electrical

E4203.1 Swimming pools- receptacle outlets
location: Receptacles shall not be located
less than six feet from the inside wall of any
pool or other body of water specifically
identified in each of the following sections:
NEC 680.22, 680.34, 680.43, 680.62,
680.71



Electrical

E4203.1.3 Swimming pools-GFCI protection:
All 15 and 20 amp, 125 or 240 v, single phase outlets supplying pool pump motors require GFCI protection whether supplied by a receptacle and cord connection or hard wired to the branch circuit outlet.



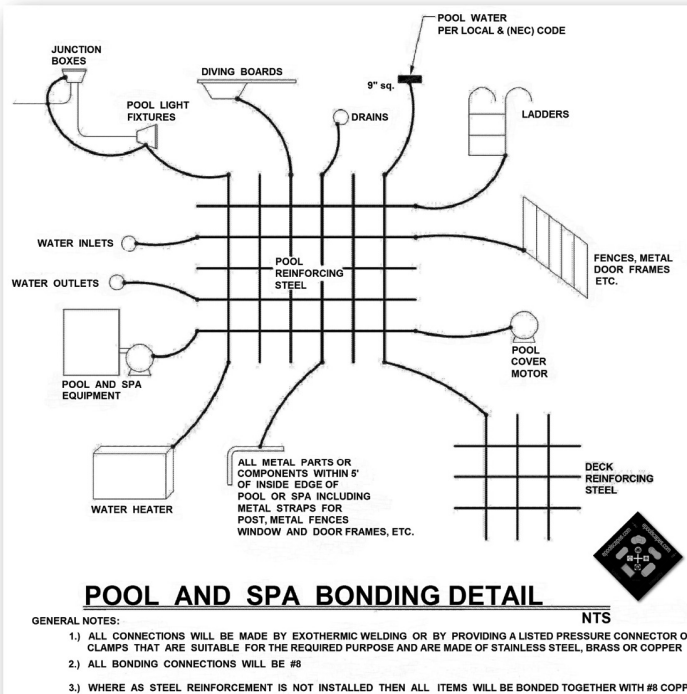
Electrical

E4204.2 Swimming pools- bonded parts: At least one #8 AWG copper conductor must be secured within or under the pool perimeter surface.



Electrical

E4204.3 Swimming pools- pool water: The pool water shall be intentionally bonded by means of a conductive surface area not less than 9 square inches installed in contact with the pool water. This bond shall be permitted to consist of parts that are required to be bonded in Section E4204.2.



Equipotential Bonding

Connecting various pool components together with bare copper wire to make them the same potential.

The purpose of equipotential bonding is to equalize the pressure (or voltage) around the pool so your body doesn't create the circuit between areas of differing potential which would result in getting shocked.

This is done by creating a “bonding grid”



Milton Gregory Grew, AIA
architect – building official

Mobile 203-217-1074

Email
mggrew@grewdesign.com

