

APPENDIX V

SWIMMING POOLS, SPAS AND HOT TUBS

This appendix is a North Carolina addition and not part of the 2015 *International Residential Code*. There will be no underlined text.

(The provisions contained in this appendix are adopted as part of this code.)

SECTION AV101 GENERAL

AV101.1 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- or two-family dwelling.

AV101.2 Pools in flood hazard areas. Pools that are located in flood hazard areas established by Table R301.2(1), including above-ground pools, on-ground pools and in-ground pools that involve placement of fill, shall comply with Section AV101.2.1 or AV101.2.2.

Exception: Pools located in riverine flood hazard areas that are outside of designated floodways.

AV101.2.1 Pools located in designated floodways. Where pools are located in designated floodways, documentation shall be submitted to the *building official*, which demonstrates that the construction of the pool will not increase the design flood elevation at any point within the *jurisdiction*.

AV101.2.2 Pools located where floodways have not been designated. Where pools are located where design flood elevations are specified but floodways have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed pool will not increase the design flood elevation more than 1 foot (305 mm) at any point within the *jurisdiction*.

SECTION AV102 DEFINITIONS

AV102.1 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 that 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, above-ground 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 the walls of the enclosing structure.

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

SECTION AV103 SWIMMING POOLS

AV103.1 In-ground pools. In-ground pools shall be designed and constructed in conformance with ANSI/NSPI-5 as listed in Section AV108.

AV103.2 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 AV108.

AV103.3 Pools in flood hazard areas. In flood hazard areas established by Table R301.2(1), pools in coastal high hazard areas shall be designed and constructed in conformance with ASCE 24.

SECTION AV104 SPAS AND HOT TUBS

AV104.1 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 AV108.

AV104.2 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 AV108.

SECTION AV105 BARRIER REQUIREMENTS

AV105.1 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 drown-

ings by restricting access to swimming pools, spas and hot tubs.

AV105.2 Outdoor swimming pool. An outdoor swimming pool, including an in-ground, above-ground or on-ground pool, hot tub or spa shall be surrounded by 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) or 4 inches (102 mm) where concrete or fixed solid material is used 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 above-ground 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 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 that 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 not exceed $1\frac{3}{4}$ inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed $1\frac{3}{4}$ 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 $1\frac{3}{4}$ inches (44 mm) in width.
6. Maximum mesh size for chain link fences shall be a $2\frac{1}{4}$ -inch (57 mm) square unless the fence has slats fastened at the top or the bottom that reduce the openings to not more than $1\frac{3}{4}$ 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 $1\frac{3}{4}$ inches (44 mm).
8. Access gates shall comply with the requirements of Section AV105.2, 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 larger than $\frac{1}{2}$ 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. Doors with direct access to the pool through that wall shall be equipped with an alarm that produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be listed and labeled in accordance with UL 2017. 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 as 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 above-ground 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:
 - 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 that meets the requirements of Section AV105.2, 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.

AV105.3 Indoor swimming pool. Walls surrounding an indoor swimming pool shall comply with Section AV105.2, Item 9.

AV105.4 Prohibited locations. Barriers shall be located to prohibit permanent structures, equipment or similar objects from being used to climb them.

AV105.5 Barrier exceptions. Spas or hot tubs with a safety cover that complies with ASTM F1346, as listed in Section AV107, shall be exempt from the provisions of this appendix.

**SECTION AV106
ENTRAPMENT PROTECTION FOR SWIMMING
POOL AND SPA SUCTION OUTLETS**

AV106.1 General. Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.

**SECTION AV107
ABBREVIATIONS**

AV107.1 General.

ANSI

American National Standards Institute
11 West 42nd Street
New York, NY 10036

APSP

Association of Pool and Spa Professionals
NSPI—National Spa and Pool Institute
2111 Eisenhower Avenue
Alexandria, VA 22314

ASCE

American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 98411-0700

ASTM

ASTM International
100 Barr Harbor Drive,
West Conshohocken, PA 19428

UL

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062-2096

**SECTION AV108
STANDARDS**

AV108.1 General.

ANSI/NSPI

ANSI/

NSPI-3—99 Standard for Permanently Installed Residential Spas AV104.1

ANSI/

NSPI—4-07 Standard for Above-ground/ On-ground Residential Swimming Pools..... AV103.2

ANSI

/NSPI-5—2003 Standard for Residential In-ground Swimming Pools AV103.1

ANSI/

NSPI-6—99 Standard for Residential Portable Spas AV104.2

ANSI/APSP

ANSI/

PSP-7—06 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs and Catch BasinsAV106.1

ASCE

ASCE/

SEI-24—05 Flood Resistant Design and ConstructionAV103.3

ASTM

F1346—91 (2003) Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot TubsAV105.2, AV105.5

UL

2017—2000 Standard for General-purpose Signaling Devices and Systems—with Revisions through June 2004AV105.2



MIKE CAUSEY, INSURANCE COMMISSIONER & STATE FIRE MARSHAL
BRIAN TAYLOR, CHIEF STATE FIRE MARSHAL

July 6, 2022

Mr. Michael Rettie
Chief Building Official
Orange County Planning & Inspections Department
131 W. Margaret Lane, Suite 101
PO BOX 8181
Hillsborough, NC 27278

**RE: 2018 NC Residential Code
2018 NCRC Section AV105 Barrier Requirements**

Mr. Rettie:

This letter is in response to your request for formal interpretation dated May 13, 2022, that was received in NCDOI by email on May 13, 2022. Your request for formal interpretation states:

“Mr. Rittlinger,
Please find attached a formal interpretation request, with supporting information to address Residential Code requirements for swimming pool barriers per Appendix V section AV105. Thank you for your attention to this request. I remain available if additional information or clarification of this request is needed.

Request: NC DOI determination of the maximum location distance permitted for barrier from a residential swimming pool.”

Remarks:

Code sections noted in this letter are referring to the 2018 edition of the NC Residential Code unless otherwise noted.

Attachment A is comprised of the request for formal interpretation as well as all supporting information submitted with the request.

Code Analysis:

2018 NCRC Section AV102 Definitions states in part:

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

2018 NCRC Section AV105.1 Application states in part:

AV105.1 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.

Comments: The installation of barriers around swimming pools, spas and hot tubs is intended to restrict access and provide protection against potential drownings and near drownings.

2018 NCRC Section AV105.2 Outdoor swimming pool states in part:

AV105.2 Outdoor swimming pool. An outdoor swimming pool, including an in-ground, above-ground or on-ground pool, hot tub or spa shall be surrounded by a barrier which shall comply with the following:

Comments: The section notes that barriers are required. The ten sets of criteria listed in the section (not shown in this letter for brevity) list various dimensional heights, spacings, openings and widths for the various materials used to construct barriers. Of note, code specifics for any fixed maximum distances for the location of barriers from the pool edge are not included in the section.

Conclusions:

Specific maximum distances for the location of barriers from the pool edge are not included in the code because fixed dimensions would be too restrictive for the infinite number of pool designs and pool area options that are available. The minimum intent of the code for the protection afforded by the barrier is to restrict access and provide protection against potential drownings and near drownings in the area dedicated to the use of the pool. The edge of the pool deck or patio and other limited areas near the pool intended primarily for use by associated swimmers can be used as guidance in determining compliance with the intent of the code.

Please call or email if you have comments or questions.

Sincerely,



David B. Rittlinger, PE, LEED AP
Chief Code Consultant
NCDOT-OSFM Engineering & Codes Division

cc: File
Bridget Herring, Chair – BCC
Danny Priest, Vice-Chair – BCC
David Smith, Chair BCC Residential Standing Committee