

RAY TOWNSHIP  
64255 WOLCOTT, RAY TWP MI 48096  
586-749-5171 / FAX 586-749-6190

COMPLETE ORDINANCE AVAILABLE AT [WWW.RAYTOWNSHIP.ORG](http://WWW.RAYTOWNSHIP.ORG)

Monday thru Thursday 9:00 a.m. to 5:00 p.m.

REQUIREMENTS FOR A POOL PERMIT

1. COMPLETED AND SIGNED APPLICATION FORM
2. THREE (3) SETS OF MANUFACTURES SPECIFICATIONS ON STRUCTURAL INTEGRITY TWO (2) SETS FOR ABOVE GROUND POOLS.
3. THREE (3) SITE PLANS indicating size, shape, and distance from property lines and easements, residence, out buildings, septic, and well.  
TWO (2) FOR ABOVE GROUND POOLS.
4. HOMEOWNER'S PERMIT (Estoppel Certificate) or BUILDERS LICENSE REQUIRED FOR BUILDER'S. Builder to furnish: Federal I.D. #, M.E.S.C. Employer #, Worker's Compensation Insurance Carrier, Driver's License #, and Birth date.
5. Electrical Permit (required) and Mechanical Permit may be required for some pools. Obtain at the Township office.
6. PLAN REVIEW FEE: \$50.00 due with application. (non-refundable)
7. \$500.00 CONSTRUCTION BOND required when permit is issued on **INGROUND POOLS.** \$250.00 CONSTRUCTION BOND required when permit is issued on **ABOVE GROUND POOLS.** Bonds will be refunded at time of final building approval if (I) building permit has not expired.
8. PERMIT FEE: Required when permit is issued. See fee schedule.

01/10/12

## GENERAL PROVISIONS

General Provisions

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4. The above regulations shall not apply to farm machinery or farm vehicles with farm license plates which are used for farm operations, provided that such storage takes place on a bona fide farm and that no such storage takes place within the minimum front yard setback..

### C. Storage of Commercial Vehicles in Selected Residential Districts

Storage of Commercial vehicles in excess of 24,000 pounds Gross Vehicle Weight (GVW) may be permitted by the Planning Commission subject to Special Approval Land Use and the following requirements:

1. Lot size: Minimum of five (5) acres, and having a sufficient minimum "design" width to complete an uninterrupted turn of said commercial vehicle.
2. The property shall be located within Section 35 or 36 of the Township and shall have direct access to a Class A road as designated by the Township and the Macomb County Department of Roads.
3. The vehicle must be solely owned and operated by the occupant of the property.
4. The minimum front yard setback for commercial vehicle storage shall be the established building setback line of the principle building, but in no case less than the minimum required front yard. The minimum side and rear yard setbacks shall be thirty (30) feet.
5. All vehicles and/or equipment must be stored completely within an approved enclosed structure
6. An approved method of screening shall be provided between the enclosed structure and adjacent residential uses or districts for the length of the storage structure and driveway servicing the structure.
7. The site plan shall indicate that fuel, fuel pumps and waste oil be contained within secondary containers.

## SECTION 217 SWIMMING POOLS.

All swimming pools erected in the Township greater than twenty-four (24) inches in depth shall comply with all applicable Building Codes as well as the following requirements:

- A. Pool Location. The pool or its fence must not be built within (as measured from the wall/edge of the pool):
  1. The required front yard or required corner lot side yard.
  2. Ten (10) feet of the side property line,
  3. Ten (10) feet of the rear property line,
  4. Ten (10) feet of any building on the lot.
- B. For the protection of the general public, all swimming pools shall be completely enclosed by a fence or other means of access control as required in the Building Code.

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The Building Inspector or the Township Supervisor is hereby authorized to apply to a court of equity to abate the nuisance created by such unlawful use or structure. Whenever the Building Inspector has declared a structure to be not conforming with the requirements contained in this Ordinance, the owner or occupant may be required to vacate such structure or premises and such structure or premises shall not again be used or occupied until it has been made to conform with this Ordinance.

### SECTION 2901 SCHEDULE OF FEES, CHARGES, AND EXPENSES.

- A. Fees, charges, and expenses shall be assessed as part of the application for special use permits, site plan review, appeals, building permits, certificates of zoning compliance, and amendments to defray expenses incurred in processing such application.
- B. The Township Board by resolution shall establish a schedule of fees, charges, and expenses.
  1. The schedule of fees, charges and expenses may be altered or amended by resolution duly adopted by the Township Board.
- C. No action shall be taken on any application or appeal until all applicable fees, charges, and expenses have been paid in full.

### SECTION 2902 VIOLATIONS AND PENALTIES

Any building or structure which is erected, altered, maintained or used or any use of land which is begun, maintained or changed in violation of any provisions of this Ordinance is hereby declared to be a nuisance per se. Any person, firm, or other organization which violates, disobeys, omits, neglects or refuses to comply with or resists the enforcement of any provisions shall be fined upon conviction not more than One Hundred (\$100.00) Dollars, together with the cost of prosecution or shall be punished by imprisonment in the County Jail for not more than ninety (90) days for each offense or may be both fined and imprisoned as provided herein at the discretion of the Court. Each and every day during which an illegal erection, alteration, or maintenance of use continues shall be deemed a separate offense. The imposition of any sentence shall not exempt the offender from compliance with the provisions of this Ordinance.

### SECTION 2903 REPEAL OF CONFLICTING PROVISIONS

The Ray Township Zoning Ordinance passed by the Township Board on November 18, 1997 and as amended, is hereby repealed: All other resolutions or ordinances, or parts thereof, in conflict with the provisions of this Ordinance are to the extent of such conflict, hereby repealed.

### SECTION 2904 VESTED RIGHTS

This Ordinance and any of the provisions hereof are not intended and shall not be construed to establish any vested right in or on behalf of any persons, firm or corporation in and to the continuation of any particular use, district, zoning classification or any activity therein and each of such matters are hereby declared to be subject to such later amendments to this Ordinance as may be necessary to appropriate for the further preservation and protection of public health, safety, welfare and morals.

## ADMINISTRATION

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2. No permit for erection, alteration, moving, or repair of any structure shall be issued until an application has been made for a certificate of zoning compliance, and the certificate shall be issued in conformity with the provisions of this Ordinance upon completion of the work.
3. The Building Inspector shall maintain a record of all certificates of zoning compliance.
4. Failure to obtain a certificate of compliance shall be a violation of this Ordinance and punishable under the applicable provisions of this Ordinance.

### D. Building Permits.

Where a building permit is required for the erection or structural alteration of a building (other than a single-family dwelling or farm dwelling and other than accessory building to such dwellings), a Site Plan shall be reviewed and approved in accordance with the provisions of this Ordinance prior to the issuance of a building permit.

Before proceeding with the erection, alteration or removal of any structure or building, a permit shall be first obtained from the Building Inspector. The application for such permit shall be made in writing and upon printed forms furnished by the Township.

All applications for building permits shall be accompanied by the appropriate number of sets of plans drawn to scale, showing the actual dimensions and shape of the lot to be built upon; the exact sizes and locations on the lot of structures already existing, if any; and the location and dimensions of the proposed structure or alteration. The application shall include such other information as lawfully may be required by the Building Inspector, including data on existing or proposed structures or alteration, existing or proposed uses of the structures and lot; the location of existing or proposed wells, septic systems or drains; the number of families, housekeeping units, or rental units the structure is designed to accommodate.

1. One (1) copy of the plans shall be returned to the applicant by the Building Inspector after he shall have marked such copy either as approved, or disapproved, and attested to same by his signature on such copy. One (1) copy of the plans, similarly marked, shall be retained by the Building Inspector.

### E. Certificates of Occupancy.

It shall be unlawful to use, or occupy, or permit the use, or occupancy of any structure or premises, or parts thereof, hereafter created, erected, changed, converted, or wholly or partly altered or enlarged in its use or structure, until a certificate of occupancy and zoning compliance shall have been issued therefore by the Building Inspector.

1. No occupancy permit shall be granted until the septic tank tile field and water supply system is inspected and approved by the Macomb County Health Department.
2. No change of use shall be made in any building, premises or land or part thereof now or hereafter erected, altered, or used that is not consistent with the provisions of this Ordinance and no such change or use or occupancy shall be made without the issuance of a certificate of occupancy and compliance for such new use.
3. A certificate of occupancy and compliance shall be applied for coincident with the application for a building permit. Where a certificate of use and occupancy is required not in conjunction with the issuance of a building permit, the same shall be issued on forms furnished by the Building Inspector. Every change of use shall require the issuance of a new certificate of use.

## APPENDIX G

# SWIMMING POOLS, SPAS AND HOT TUBS

*The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.)*

### SECTION AG101 GENERAL

**101.1 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.

**101.2 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 Sections 101.2.1 or AG101.2.2.

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

**AG101.2.1 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*.

**AG101.2.2 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 AG102 DEFINITIONS

**102.1 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 restricts 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.

**NONPORTABLE.** See "Swimming pool."

**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 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 AG108.

**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 AG108.

**AG103.3 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 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 AG108.

**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 AG108.

### 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, 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) 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 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 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 which 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 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 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 F 1346; or
    - 9.2. 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/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 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.** Walls surrounding an indoor swimming pool shall comply with Section AG105.2, Item 9.

**AG105.4 Prohibited locations.** Barriers shall be located to prohibit permanent structures, *equipment* or similar objects from being used to climb them.

**AG105.5 Barrier exceptions.** Spas or hot tubs with a safety cover which complies with ASTM F 1346, as listed in section AG107 of the code, shall be exempt from the provisions of sections AG105.2, AG105.3, and AG105.4 of the code.

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## SECTION 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.

ACCESSORY BUILDINGS  
DECK  
DETACHED GARAGE  
GAZEBO  
IN-GROUND POOLS  
PATIO  
POND  
PORCH

PLAN REVIEW FEE: \$50.00 (non-refundable)  
PERMIT FEE: \$100.00 PLUS REQUIRED INSPECTIONS  
PER INSPECTION REQUIRED: \$50.00

ACCESSORY BUILDINGS: \$20.00 "AFFIDAVIT OF ZONING  
COMPLIANCE" FEE

DETACHED ACCESSORY STRUCTURES UNDER 200 SQ. FT., NO PERMIT  
REQUIRED.

ABOVE GROUND POOLS (INCLUDES UP TO 36 SQ. FT. DECK)  
FENCE THAT REQUIRES A FOOTING  
HANDICAP RAMP  
MISCELLANEOUS

PLAN REVIEW FEE: \$50.00 (non-refundable)  
PERMIT FEE: \$20.00 PLUS REQUIRED INSPECTIONS  
PER INSPECTION REQUIRED: \$50.00

DEMOLITION:

PLAN REVIEW FEE: \$50.00 (non-refundable)  
PERMIT FEE: \$100.00 PLUS REQUIRED INSPECTIONS  
PER INSPECTION REQUIRED: \$50.00

ANY ADDITIONAL INSPECTIONS REQUIRED WILL BE CHARGED AT THE "PER  
INSPECTION REQUIRED" FEE ABOVE. RE-INSPECTION FEE \$50.00.

ELECTRICAL, MECHANICAL AND PLUMBING PERMITS ARE SEPARATE PERMITS.

REVISED 2/3/04

**RAY TOWNSHIP  
BONDS REQUIRED FOR BUILDING  
REVISED 7/21/03**

ALL BONDS PAID FOR AT TIME WHEN BUILDING PERMIT IS ISSUED.

RESIDENTIAL COMMERCIAL:	TO 3,499 SQ FT: \$ 1,000.00 3,500 SQ FT & OVER: \$ 2,000.00
ADDITIONS	TO 499 SQ FT: \$ 500.00 3,499 SQ FT: \$ 1,000.00 3,500 SQ FT & OVER: \$ 2,000.00
ACCESSORY BUILDING DETACHED GARAGE DECK GAZEBO IN-GROUND POOL PATIO POND PORCH	\$ 500.00
ABOVE GROUND POOLS	\$ 250.00
DEMOLITION RESTORATION/ALTERATION/REPAIR	BASED ON VALUE / MINIMUM \$500.00
SIGNS	\$500.00
FENCE	\$500.00

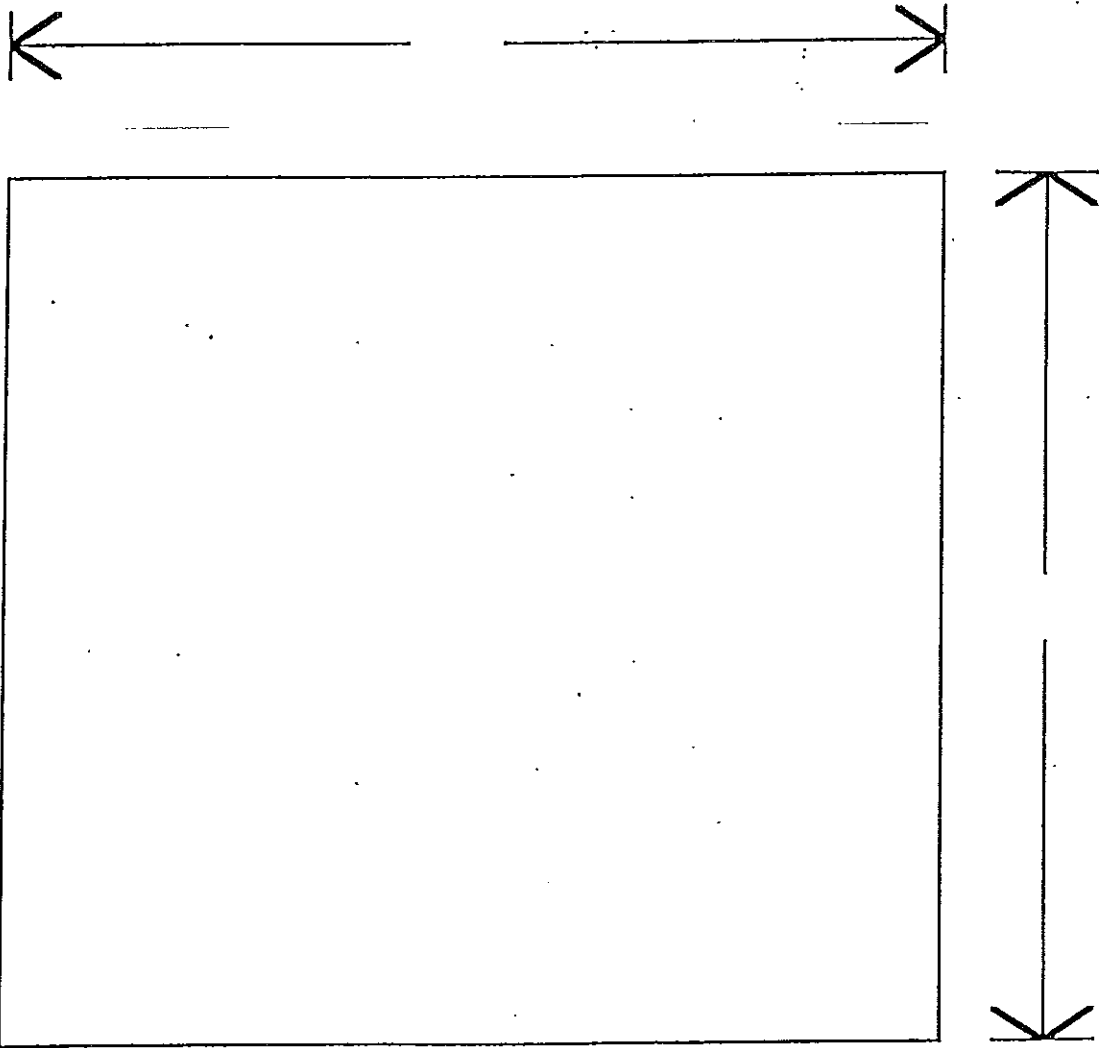
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APPROVED 3/21/00  
UPDATED 11/15/01  
REVISED 7/21/03

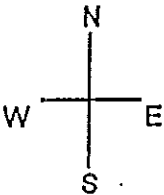


**PLEASE INDICATE:**

- 1. Size and shape of pool.
- 2. Distance from property lines and any easements.
- 3. Residence and any out buildings.
- 4. Location of septic field and well.
- 5. Location of Fence including relation to the pool.



NORTH  
ARROW



**ADDRESS:** \_\_\_\_\_

Table 680.8 Overhead Conductor Clearances

Clearance Parameters	Insulated Cables, 0-750 Volts to Ground, Supported on and Cabled Together with a Solidly Grounded Bare Messenger or Solidly Grounded Neutral Conductor		All Other Conductors Voltage to Ground			
	m	ft	0 through 15 kV		Over 15 through 50 kV	
			m	ft	m	ft
A. Clearance in any direction to the water level, edge of water surface, base of diving platform, or permanently anchored raft	6.9	22.5	7.5	25	8.0	27
B. Clearance in any direction to the observation stand, tower, or diving platform	4.4	14.5	5.2	17	5.5	18
C. Horizontal limit of clearance measured from inside wall of the pool	This limit shall extend to the outer edge of the structures listed in A and B of this table but not to less than 3 m (10 ft).					

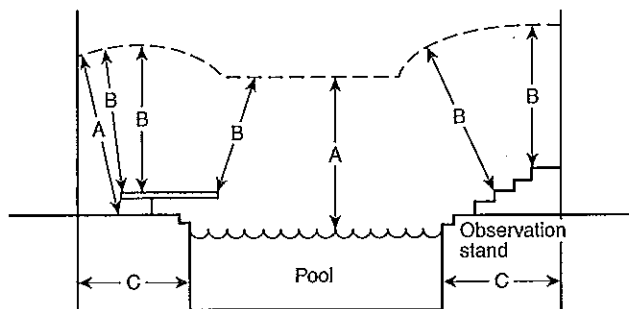


Figure 680.8 Clearances from Pool Structures.

Table 680.10 Minimum Cover Depths

Wiring Method	Minimum Cover	
	mm	in.
Rigid metal conduit	150	6
Intermediate metal conduit	150	6
Nonmetallic raceways listed for direct burial under minimum of 102 mm (4 in.) thick concrete exterior slab and extending not less than 162 mm (6 in.) beyond the underground installation	150	6
Nonmetallic raceways listed for direct burial without concrete encasement	450	18
Other approved raceways*	450	18

\*Raceways approved for burial only where concrete encased shall require a concrete envelope not less than 50 mm (2 in.) thick.

## II. Permanently Installed Pools

**680.20 General.** Electrical installations at permanently installed pools shall comply with the provisions of Part I and Part II of this article.

### 680.21 Motors.

**(A) Wiring Methods.** The wiring to a pool motor shall comply with (A)(1) unless modified for specific circumstances by (A)(2), (A)(3), (A)(4), or (A)(5).

**(1) General.** The branch circuits for pool-associated motors shall be installed in rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit, reinforced thermosetting resin conduit, or Type MC cable listed for the location. Other wiring methods and materials shall be permitted in specific locations or applications as covered in this section. Any wiring method employed shall contain an insulated copper equipment grounding conductor sized in accordance with 250.122 but not smaller than 12 AWG.

**(2) On or Within Buildings.** Where installed on or within buildings, electrical metallic tubing shall be permitted.

**(3) Flexible Connections.** Where necessary to employ flexible connections at or adjacent to the motor, liquidtight flexible metal or liquidtight flexible nonmetallic conduit with approved fittings shall be permitted.

**(4) One-Family Dwellings.** In the interior of dwelling units, or in the interior of accessory buildings associated with a dwelling unit, any of the wiring methods recognized in Chapter 3 of this *Code* that comply with the provisions of this section shall be permitted. Where run in a cable assembly, the equipment grounding conductor shall be permitted to be uninsulated, but it shall be enclosed within the outer sheath of the cable assembly.

**(5) Cord-and-Plug Connections.** Pool-associated motors shall be permitted to employ cord-and-plug connections. The flexible cord shall not exceed 900 mm (3 ft) in length. The flexible cord shall include a copper equipment grounding conductor sized in accordance with 250.122 but not smaller than 12 AWG. The cord shall terminate in a grounding-type attachment plug.

**(B) Double Insulated Pool Pumps.** A listed cord-and-plug-connected pool pump incorporating an approved system of double insulation that provides a means for grounding only the internal and nonaccessible, non-current-carrying metal parts of the pump shall be connected to any wiring method recognized in Chapter 3 that is suitable for the location. Where the bonding grid is connected to the equipment grounding conductor of the motor circuit in accordance with the second sentence of 680.26(B)(6)(a), the branch-circuit wiring shall comply with 680.21(A).

**(C) GFCI Protection.** Outlets supplying pool pump motors connected to single-phase, 120 volt through 240 volt branch circuits, rated 15 or 20 amperes, whether by receptacle or by direct connection, shall be provided with ground-fault circuit-interrupter protection for personnel.

### 680.22 Lighting, Receptacles, and Equipment.

#### (A) Receptacles.

**(1) Circulation and Sanitation System, Location.** Receptacles that provide power for water-pump motors or for other loads directly related to the circulation and sanitation system shall be located at least 3.0 m (10 ft) from the inside walls of the pool, or not less than 1.83 m (6 ft) from the inside walls of the pool if they meet all of the following conditions:

- (1) Consist of single receptacles
- (2) Employ a locking configuration
- (3) Are of the grounding type
- (4) Have GFCI protection

**(2) Other Receptacles, Location.** Other receptacles shall be not less than 1.83 m (6 ft) from the inside walls of a pool.

**(3) Dwelling Unit(s).** Where a permanently installed pool is installed at a dwelling unit(s), no fewer than one 125-volt, 15- or 20-ampere receptacle on a general-purpose branch circuit shall be located not less than 1.83 m (6 ft) from, and not more than 6.0 m (20 ft) from, the inside wall of the pool. This receptacle shall be located not more than 2.0 m (6 ft 6 in.) above the floor, platform, or grade level serving the pool.

**(4) GFCI Protection.** All 15- and 20-ampere, single-phase, 125-volt receptacles located within 6.0 m (20 ft) of the inside walls of a pool shall be protected by a ground-fault circuit interrupter.

**(5) Measurements.** In determining the dimensions in this section addressing receptacle spacings, the distance to be measured shall be the shortest path the supply cord of an appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, doorway with hinged or sliding door, window opening, or other effective permanent barrier.

#### (B) Luminaires, Lighting Outlets, and Ceiling-Suspended (Paddle) Fans.

**(1) New Outdoor Installation Clearances.** In outdoor pool areas, luminaires, lighting outlets, and ceiling-suspended (paddle) fans installed above the pool or the area extending 1.5 m (5 ft) horizontally from the inside walls of the pool shall be installed at a height not less than 3.7 m (12 ft) above the maximum water level of the pool.

**(2) Indoor Clearances.** For installations in indoor pool areas, the clearances shall be the same as for outdoor areas unless modified as provided in this paragraph. If the branch circuit supplying the equipment is protected by a ground-fault circuit

interrupter, the following equipment shall be permitted at a height not less than 2.3 m (7 ft 6 in.) above the maximum pool water level:

- (1) Totally enclosed luminaires
- (2) Ceiling-suspended (paddle) fans identified for use beneath ceiling structures such as provided on porches or patios

(3) **Existing Installations.** Existing luminaires and lighting outlets located less than 1.5 m (5 ft) measured horizontally from the inside walls of a pool shall be not less than 1.5 m (5 ft) above the surface of the maximum water level, shall be rigidly attached to the existing structure, and shall be protected by a ground-fault circuit interrupter.

(4) **GFCI Protection in Adjacent Areas.** Luminaires, lighting outlets, and ceiling-suspended (paddle) fans installed in the area extending between 1.5 m (5 ft) and 3.0 m (10 ft) horizontally from the inside walls of a pool shall be protected by a ground-fault circuit interrupter unless installed not less than 1.5 m (5 ft) above the maximum water level and rigidly attached to the structure adjacent to or enclosing the pool.

(5) **Cord-and-Plug-Connected Luminaires.** Cord-and-plug-connected luminaires shall comply with the requirements of 680.7 where installed within 4.9 m (16 ft) of any point on the water surface, measured radially.

(C) **Switching Devices.** Switching devices shall be located at least 1.5 m (5 ft) horizontally from the inside walls of a pool unless separated from the pool by a solid fence, wall, or other permanent barrier. Alternatively, a switch that is listed as being acceptable for use within 1.5 m (5 ft) shall be permitted.

(D) **Other Outlets.** Other outlets shall be not less than 3.0 m (10 ft) from the inside walls of the pool. Measurements shall be determined in accordance with 680.22(A)(5).

Informational Note: Other outlets may include, but are not limited to, remote-control, signaling, fire alarm, and communications circuits.

**680.23 Underwater Luminaires.** This section covers all luminaires installed below the normal water level of the pool.

**(A) General.**

(1) **Luminaire Design, Normal Operation.** The design of an underwater luminaire supplied from a branch circuit either directly or by way of a transformer or power supply meeting the requirements of this section shall be such that, where the luminaire is properly installed without a ground-fault circuit interrupter, there is no shock hazard with any likely combination of fault conditions during normal use (not relamping).

(2) **Transformers and Power Supplies.** Transformers and power supplies used for the supply of underwater luminaires, together with the transformer or power supply enclosure, shall be listed for swimming pool and spa use. The transformer or power supply shall incorporate either a transformer of the isolated winding type, with an ungrounded secondary that has a grounded metal barrier between the primary and secondary windings, or one that incorporates an approved system of double insulation between the primary and secondary windings.

(3) **GFCI Protection, Relamping.** A ground-fault circuit interrupter shall be installed in the branch circuit supplying luminaires operating at more than the low voltage contact limit such that there is no shock hazard during relamping. The installation of the ground-fault circuit interrupter shall be such that there is no shock hazard with any likely fault-condition combination that involves a person in a conductive path from any ungrounded part of the branch circuit or the luminaire to ground.

(4) **Voltage Limitation.** No luminaires shall be installed for operation on supply circuits over 150 volts between conductors.

(5) **Location, Wall-Mounted Luminaires.** Luminaires mounted in walls shall be installed with the top of the luminaire lens not less than 450 mm (18 in.) below the normal water level of the pool, unless the luminaire is listed and identified for use at lesser depths. No luminaire shall be installed less than 100 mm (4 in.) below the normal water level of the pool.

(6) **Bottom-Mounted Luminaires.** A luminaire facing upward shall comply with either (1) or (2):

- (1) Have the lens adequately guarded to prevent contact by any person
- (2) Be listed for use without a guard

(7) **Dependence on Submersion.** Luminaires that depend on submersion for safe operation shall be inherently protected against the hazards of overheating when not submerged.

(8) **Compliance.** Compliance with these requirements shall be obtained by the use of a listed underwater luminaire and by installation of a listed ground-fault circuit interrupter in the branch circuit or a listed transformer or power supply for luminaires operating at not more than the low voltage contact limit.

**(B) Wet-Niche Luminaires.**

(1) **Forming Shells.** Forming shells shall be installed for the mounting of all wet-niche underwater luminaires and shall be equipped with provisions for conduit entries. Metal parts of the luminaire and forming shell in contact with the pool water shall be of brass or other approved corrosion-resistant metal.

All forming shells used with nonmetallic conduit systems, other than those that are part of a listed low-voltage lighting system not requiring grounding, shall include provisions for terminating an 8 AWG copper conductor.

**(2) Wiring Extending Directly to the Forming Shell.** Conduit shall be installed from the forming shell to a junction box or other enclosure conforming to the requirements in 680.24. Conduit shall be rigid metal, intermediate metal, liquidtight flexible nonmetallic, or rigid nonmetallic.

(a) *Metal Conduit.* Metal conduit shall be approved and shall be of brass or other approved corrosion-resistant metal.

(b) *Nonmetallic Conduit.* Where a nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper bonding jumper shall be installed in this conduit unless a listed low-voltage lighting system not requiring grounding is used. The bonding jumper shall be terminated in the forming shell, junction box or transformer enclosure, or ground-fault circuit-interrupter enclosure. The termination of the 8 AWG bonding jumper in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect the connection from the possible deteriorating effect of pool water.

**(3) Equipment Grounding Provisions for Cords.** Other than listed low-voltage lighting systems not requiring grounding wet-niche luminaires that are supplied by a flexible cord or cable shall have all exposed non-current-carrying metal parts grounded by an insulated copper equipment grounding conductor that is an integral part of the cord or cable. This grounding conductor shall be connected to a grounding terminal in the supply junction box, transformer enclosure, or other enclosure. The grounding conductor shall not be smaller than the supply conductors and not smaller than 16 AWG.

**(4) Luminaire Grounding Terminations.** The end of the flexible-cord jacket and the flexible-cord conductor terminations within a luminaire shall be covered with, or encapsulated in, a suitable potting compound to prevent the entry of water into the luminaire through the cord or its conductors. If present, the grounding connection within a luminaire shall be similarly treated to protect such connection from the deteriorating effect of pool water in the event of water entry into the luminaire.

**(5) Luminaire Bonding.** The luminaire shall be bonded to, and secured to, the forming shell by a positive locking device that ensures a low-resistance contact and requires a tool to remove the luminaire from the forming shell. Bonding shall not be required for luminaires that are listed for the application and have no non-current-carrying metal parts.

**(6) Servicing.** All wet-niche luminaires shall be removable from the water for inspection, relamping, or other maintenance.

The forming shell location and length of cord in the forming shell shall permit personnel to place the removed luminaire on the deck or other dry location for such maintenance. The luminaire maintenance location shall be accessible without entering or going in the pool water.

**(C) Dry-Niche Luminaires.**

**(1) Construction.** A dry-niche luminaire shall have provision for drainage of water. Other than listed low voltage luminaires not requiring grounding, a dry-niche luminaire shall have means for accommodating one equipment grounding conductor for each conduit entry.

**(2) Junction Box.** A junction box shall not be required but, if used, shall not be required to be elevated or located as specified in 680.24(A)(2) if the luminaire is specifically identified for the purpose.

**(D) No-Niche Luminaires.** A no-niche luminaire shall meet the construction requirements of 680.23(B)(3) and be installed in accordance with the requirements of 680.23(B). Where connection to a forming shell is specified, the connection shall be to the mounting bracket.

**(E) Through-Wall Lighting Assembly.** A through-wall lighting assembly shall be equipped with a threaded entry or hub, or a nonmetallic hub, for the purpose of accommodating the termination of the supply conduit. A through-wall lighting assembly shall meet the construction requirements of 680.23(B)(3) and be installed in accordance with the requirements of 680.23. Where connection to a forming shell is specified, the connection shall be to the conduit termination point.

**(F) Branch-Circuit Wiring.**

**(1) Wiring Methods.** Branch-circuit wiring on the supply side of enclosures and junction boxes connected to conduits run to wet-niche and no-niche luminaires, and the field wiring compartments of dry-niche luminaires, shall be installed using rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, rigid polyvinyl chloride conduit, or reinforced thermosetting resin conduit. Where installed on buildings, electrical metallic tubing shall be permitted, and where installed within buildings, electrical nonmetallic tubing, Type MC cable, electrical metallic tubing, or Type AC cable shall be permitted. In all cases, an insulated equipment grounding conductor sized in accordance with Table 250.122 but not less than 12 AWG shall be required.

*Exception: Where connecting to transformers for pool lights, liquidtight flexible metal conduit shall be permitted. The length shall not exceed 1.8 m (6 ft) for any one length or exceed 3.0 m (10 ft) in total length used.*

(2) **Equipment Grounding.** Other than listed low-voltage luminaires not requiring grounding, all through-wall lighting assemblies, wet-niche, dry-niche, or no-niche luminaires shall be connected to an insulated copper equipment grounding conductor installed with the circuit conductors. The equipment grounding conductor shall be installed without joint or splice except as permitted in (F)(2)(a) and (F)(2)(b). The equipment grounding conductor shall be sized in accordance with Table 250.122 but shall not be smaller than 12 AWG.

*Exception: An equipment grounding conductor between the wiring chamber of the secondary winding of a transformer and a junction box shall be sized in accordance with the overcurrent device in this circuit.*

(a) If more than one underwater luminaire is supplied by the same branch circuit, the equipment grounding conductor, installed between the junction boxes, transformer enclosures, or other enclosures in the supply circuit to wet-niche luminaires, or between the field-wiring compartments of dry-niche luminaires, shall be permitted to be terminated on grounding terminals.

(b) If the underwater luminaire is supplied from a transformer, ground-fault circuit interrupter, clock-operated switch, or a manual snap switch that is located between the panelboard and a junction box connected to the conduit that extends directly to the underwater luminaire, the equipment grounding conductor shall be permitted to terminate on grounding terminals on the transformer, ground-fault circuit interrupter, clock-operated switch enclosure, or an outlet box used to enclose a snap switch.

(3) **Conductors.** Conductors on the load side of a ground-fault circuit interrupter or of a transformer, used to comply with the provisions of 680.23(A)(8), shall not occupy raceways, boxes, or enclosures containing other conductors unless one of the following conditions applies:

- (1) The other conductors are protected by ground-fault circuit interrupters.
- (2) The other conductors are grounding conductors.
- (3) The other conductors are supply conductors to a feed-through-type ground-fault circuit interrupter.
- (4) Ground-fault circuit interrupters shall be permitted in a panelboard that contains circuits protected by other than ground-fault circuit interrupters.

#### 680.24 Junction Boxes and Electrical Enclosures for Transformers or Ground-Fault Circuit Interrupters.

(A) **Junction Boxes.** A junction box connected to a conduit that extends directly to a forming shell or mounting bracket of a no-niche luminaire shall meet the requirements of this section.

(1) **Construction.** The junction box shall be listed as a swimming pool junction box and shall comply with the following conditions:

- (1) Be equipped with threaded entries or hubs or a nonmetallic hub
- (2) Be comprised of copper, brass, suitable plastic, or other approved corrosion-resistant material
- (3) Be provided with electrical continuity between every connected metal conduit and the grounding terminals by means of copper, brass, or other approved corrosion-resistant metal that is integral with the box

(2) **Installation.** Where the luminaire operates over the low voltage contact limit, the junction box location shall comply with (A)(2)(a) and (A)(2)(b). Where the luminaire operates at the low voltage contact limit or less, the junction box location shall be permitted to comply with (A)(2)(c).

(a) *Vertical Spacing.* The junction box shall be located not less than 100 mm (4 in.), measured from the inside of the bottom of the box, above the ground level, or pool deck, or not less than 200 mm (8 in.) above the maximum pool water level, whichever provides the greater elevation.

(b) *Horizontal Spacing.* The junction box shall be located not less than 1.2 m (4 ft) from the inside wall of the pool, unless separated from the pool by a solid fence, wall, or other permanent barrier.

(c) *Flush Deck Box.* If used on a lighting system operating at the low voltage contact limit or less, a flush deck box shall be permitted if both of the following conditions are met:

- (1) An approved potting compound is used to fill the box to prevent the entrance of moisture.
- (2) The flush deck box is located not less than 1.2 m (4 ft) from the inside wall of the pool.

(B) **Other Enclosures.** An enclosure for a transformer, ground-fault circuit interrupter, or a similar device connected to a conduit that extends directly to a forming shell or mounting bracket of a no-niche luminaire shall meet the requirements of this section.

(1) **Construction.** The enclosure shall be listed and labeled for the purpose and meet the following requirements:

- (1) Equipped with threaded entries or hubs or a nonmetallic hub
- (2) Comprised of copper, brass, suitable plastic, or other approved corrosion-resistant material
- (3) Provided with an approved seal, such as duct seal at the conduit connection, that prevents circulation of air between the conduit and the enclosures
- (4) Provided with electrical continuity between every connected metal conduit and the grounding terminals by means of copper, brass, or other approved corrosion-resistant metal that is integral with the box

**(2) Installation.**

(a) *Vertical Spacing.* The enclosure shall be located not less than 100 mm (4 in.), measured from the inside of the bottom of the box, above the ground level, or pool deck, or not less than 200 mm (8 in.) above the maximum pool water level, whichever provides the greater elevation.

(b) *Horizontal Spacing.* The enclosure shall be located not less than 1.2 m (4 ft) from the inside wall of the pool, unless separated from the pool by a solid fence, wall, or other permanent barrier.

(C) **Protection.** Junction boxes and enclosures mounted above the grade of the finished walkway around the pool shall not be located in the walkway unless afforded additional protection, such as by location under diving boards, adjacent to fixed structures, and the like.

(D) **Grounding Terminals.** Junction boxes, transformer and power-supply enclosures, and ground-fault circuit-interrupter enclosures connected to a conduit that extends directly to a forming shell or mounting bracket of a niche luminaire shall be provided with a number of grounding terminals that shall be no fewer than one more than the number of conduit entries.

(E) **Strain Relief.** The termination of a flexible cord of an underwater luminaire within a junction box, transformer or power-supply enclosure, ground-fault circuit interrupter, or other enclosure shall be provided with a strain relief.

(F) **Grounding.** The equipment grounding conductor terminals of a junction box, transformer enclosure, or other enclosure in the supply circuit to a wet-niche or no-niche luminaire and the field-wiring chamber of a dry-niche luminaire shall be connected to the equipment grounding terminal of the panelboard. This terminal shall be directly connected to the panelboard enclosure.

**680.25 Feeders.** These provisions shall apply to any feeder on the supply side of panelboards supplying branch circuits for pool equipment covered in Part II of this article and on the load side of the service equipment or the source of a separately derived system.

**(A) Wiring Methods.**

(1) **Feeders.** Feeders shall be installed in rigid metal conduit or intermediate metal conduit. The following wiring methods shall be permitted if not subject to physical damage:

- (1) Liquidtight flexible nonmetallic conduit
- (2) Rigid polyvinyl chloride conduit
- (3) Reinforced thermosetting resin conduit
- (4) Electrical metallic tubing where installed on or within a building

(5) Electrical nonmetallic tubing where installed within a building

(6) Type MC cable where installed within a building and if not subject to corrosive environment

*Exception:* An existing feeder between an existing remote panelboard and service equipment shall be permitted to run in flexible metal conduit or an approved cable assembly that includes an equipment grounding conductor within its outer sheath. The equipment grounding conductor shall comply with 250.24(A)(5).

(2) **Aluminum Conduit.** Aluminum conduit shall not be permitted in the pool area where subject to corrosion.

(B) **Grounding.** An equipment grounding conductor shall be installed with the feeder conductors between the grounding terminal of the pool equipment panelboard and the grounding terminal of the applicable service equipment or source of a separately derived system. For other than (1) existing feeders covered in 680.25(A), exception, or (2) feeders to separate buildings that do not utilize an insulated equipment grounding conductor in accordance with 680.25(B)(2), this equipment grounding conductor shall be insulated.

(1) **Size.** This conductor shall be sized in accordance with 250.122 but not smaller than 12 AWG. On separately derived systems, this conductor shall be sized in accordance with 250.30(A)(3) but not smaller than 8 AWG.

(2) **Separate Buildings.** A feeder to a separate building or structure shall be permitted to supply swimming pool equipment branch circuits, or feeders supplying swimming pool equipment branch circuits, if the grounding arrangements in the separate building meet the requirements in 250.32(B). Where installed in other than existing feeders covered in 680.25(A), Exception, a separate equipment grounding conductor shall be an insulated conductor.

**680.26 Equipotential Bonding.**

(A) **Performance.** The equipotential bonding required by this section shall be installed to reduce voltage gradients in the pool area.

(B) **Bonded Parts.** The parts specified in 680.26(B)(1) through (B)(7) shall be bonded together using solid copper conductors, insulated covered, or bare, not smaller than 8 AWG or with rigid metal conduit of brass or other identified corrosion-resistant metal. Connections to bonded parts shall be made in accordance with 250.8. An 8 AWG or larger solid copper bonding conductor provided to reduce voltage gradients in the pool area shall not be required to be extended or attached to remote panelboards, service equipment, or electrodes.