



Installation Guidance for Permanent Swimming Pools

Created by City of Dover, Division of Inspection Services

This handout was drafted as a proactive approach for electrical safety and code compliance. This handout may be used for in-ground pools, hot tubs, spas, indoor pools and above ground pools (capable of holding water in depth greater than 42")

1. **A SEPARATE ELECTRICAL PERMIT IS REQUIRED** along with the **Building Permit**.
2. **NO CONCRETE OR BACKFILLING** shall occur until the bonding has **passed inspection**.
3. Guniting pools **MUST** be inspected prior to spraying guniting – **reminder to schedule an inspection**.
4. Luminaires located within the pool must be **INSPECTED AND APPROVED PRIOR TO FILLING THE POOL WITH WATER**.
5. Individual copper conductors installed in exterior raceways shall have a continuous insulation with a "W" rating. No deviation from the required colors is permitted. That is: white for neutral, and green for equipment grounding.

2015 INTERNATIONAL ENERGY CONSERVATION CODE

- 403.9.1 Pool heaters.** All pool heaters shall be equipped with a readily *accessible* on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LPG shall not have continuously burning pilot lights.
- 403.9.2 Time switches.** Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps.
- 403.9.3 Pool covers.** Heated pools shall be equipped with a vapor-retardant pool cover on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12.

2017 NEC REQUIREMENTS

- 110.3 **INSTALLATION & USE;** listed or labeled equipment shall be used or installed in accordance with any instructions included in the listing or labeling. Also see 680.4
- 300.5 **UNDERGROUND INSTALLATIONS** minimum cover requirements. (PVC typically 18")
Expansion joints shall be installed as required by 300.5 (J)
- 314.23 Threaded boxes or conduit bodies must be supported (when installed without additional support) by two or more conduits threaded weather tight into the enclosure or hubs.
- 352.12 PVC SHALL NOT be used for support of luminaires or other equipment.
- 406.9 Receptacles installed in **wet locations** shall have a weatherproof enclosure with a suitable cover, the integrity of which is not affected when a plug cap is inserted.
- 408.4 Circuit identification shall be clear and part of a circuit directory of a panel board.
- 680.8 Cord & Plug connected motors **SHALL NOT** exceed 3' in length & **SHALL** be at least #12 AWG copper with a grounding type attachment plug.
- 680.11 **Underground Wiring** Underground wiring shall be permitted to be RMC, IMC, PVC, RTRC, or MC, Suitable for the conditions subject to that location Minimum cover requirements shall comply with T300.5. Wiring shall not be permitted under the pool unless supplying permitted pool associated equipment.
- 680.12 **Equipment rooms and Pits.** Electrical equipment shall not be installed in rooms or pits that do not have drainage that prevents water accumulation during normal operation or filter maintenance. Equipment shall be suitable for the environment in accordance with 300.6
- 680.13 **MAINTENANCE DISCONNECTING MEANS** shall be readily accessible, installed within sight of all utilization equipment, be located at least 5' horizontally from the inside wall of a pool, spa or hot tub and simultaneously disconnect all ungrounded conductors.

If you have any questions please feel free to contact the Electrical Inspector, Clarence Worden (603- 516-6038). Building Inspection Division, 262 Sixth Street, Dover NH 03820-4169. Fax (603) 516-6146.

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- 680.21 **Motors (A) Wiring Methods.** The wiring to a pool motor shall comply with (A)(2) unless modified for specific circumstances by (A)(2), (A)(3), (A)(4), (A)(5). Wiring methods in corrosive environments described in 680.14 shall comply with 680.14(8). Wiring methods in these locations will have an insulated grounding conductor sized by Table 250.122.
- 680.22 **RECEPTACLES** on the property must be located at least 6 feet away from the pool, **GROUNDING TYPE, AND GFCI PROTECTED.**
- 680.22 (A) (1) Required **receptacle:** at least one 125v, 15 or 20 ampere receptacle shall be provided a minimum of 6' and no further than 20' from the inside wall of the pool. This receptacle shall be located not more than 6 feet, 6 inches above the floor, platform or grade level.
- 680.22 (B) **LUMINAIRES, LIGHTING OUTLETS, AND CEILING SUSPENDED PADDLE FANS** The above equipment shall not be installed over the pool or over the area extending 5' horizontally from the inside walls unless no part of the luminaire is less than 12' above the maximum water level unless specifically permitted.
- 680.22 (C) **LUMINAIRES, LIGHTING OUTLETS, AND CEILING SUSPENDED PADDLE FANS** The above equipment shall not be installed over the pool or over the area extending 5' horizontally from the inside walls unless no part of the luminaire is less than 12' above the maximum water level unless specifically permitted.
- 680.23 **TRANSFORMERS FOR UNDERWATER LUMINAIRES** shall be listed, labeled and identified for pool use. Transformers shall be an isolated winding type with an ungrounded secondary that has a grounded metal barrier between the primary and secondary windings or be double insulated.
- 680.23 **UNDERWATER LUMINAIRES** shall be listed or labeled with factory cord and associated junction box. A **green insulated #8 AWG copper bonding jumper shall be installed within** non-metallic conduit.
The termination of the 8 AWG copper bonding jumper in the forming shell shall be encapsulated in a listed potting compound. **Proper curing time shall be considered while filling the pool with water.**
- 680.23(F)(1) **BRANCH CIRCUIT WIRING** for pool associated equipment shall be any wiring method permitted by Chapter 3.
- 680.23(F)(2) Branch Circuit Equipment grounding for pool associated luminaires shall be connected to a **green insulated copper conductor** installed with the circuit conductors and shall be sized in accordance to table 250.122 but not smaller than #12 AWG.
- 680.24 **Junction Boxes and Electrical Enclosures.** Construction. The junction box shall be listed, labeled, and identified as a swimming pool junction box and shall comply with 680.24 (1), (2), (3).
- 680.25 **FEEDERS** shall be a wiring method permitted by Chapter 3. Where installed in a corrosive environment the equipment grounding conductor shall be an insulated **copper** conductor sized in accordance to table 250.122 but not smaller than #12 AWG.
- 680.26 **EQUIPOTENTIAL BONDING** required by this section shall be installed to reduce voltage gradients in the pool area. Conductive Pool Shells shall be bonded with structural reinforcing steel or copper conductor grid.
EQUIPOTENTIAL BONDING shall be installed a minimum of 6" below the finished perimeter surfaces. Bonding of conductive pools (i.e. gunite) shall be attached a minimum of 4 pts uniformly spaced around the perimeter of the pool to the pool reinforcing steel or copper conductor grid. **Wire mesh** installed in concrete decking is **not** considered structural steel. All metal parts within 5' horizontally of the pool, (i.e. metal piping, fence, awning, door and window frames), including the pump motor are required to be bonded together by a solid 8 AWG copper conductor.
- 680.26 (C) **POOL WATER** intentional bond of a minimum of 9 sq. in. shall be installed in contact with the poolwater.

Other code articles, which may apply:

680.9 Water Heaters,
680.27 (A) Underwater audio equipment,
680.27 (8) Electrical operated pool covers
680.27 (C) Deck area heating

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