



IMPORTANT!

2008

NATIONAL ELECTRIC CODE

ARTICLE 682

“NATURAL and ARTIFICIALLY MADE BODIES of WATER”

1. General

682.1 SCOPE. This article applies to the installation of electrical wiring for, and equipment in and adjacent to, natural or artificially made bodies of water not covered by other articles in this *Code*, such as but not limited to *aeration ponds, fish farm ponds, storm retention basins, treatment ponds, irrigation (channels) facilities.*

682.2 Definitions.

Artificially Made Bodies of Water. Bodies of water that have been constructed or modified to fit some decorative or commercial purpose such as, but not limited to, aeration ponds, fish farm ponds, storm retention basins, treatment ponds, irrigation (channel) facilities. Water depth may vary seasonally or be controlled.

Electrical Datum Plane. The electrical datum plane as used in this article is defined as follows:

- (1) In land areas subject to tidal fluctuation, the electrical datum plane is a horizontal plane 600 mm (2 ft) above the highest tide level for the area occurring under normal circumstances, that is, highest high tide.
- (2) In land areas not subject to tidal fluctuation, the electrical datum plane is a horizontal plane 600 mm (2 ft) above the highest water level for the area occurring under normal circumstances.
- (3) In land areas subject to flooding, the electrical datum plane 600 mm (2 ft) above the point identified as the prevailing high water mark or an equivalent benchmark based on seasonal or storm-driven flooding from the authority having jurisdiction.

- (4) The electrical datum plane for **floating structures and stages** that are (1) installed to permit rise and fall response to water level, without lateral movement, and (2) that are so equipped that they can rise to the datum plane established for (1) or (2) above, is a horizontal plane 750 mm (30 in.) above the water level at the floating structure or landing stage and a minimum of 300 mm (12 in.) above the level of the deck.

Equipotential Plane. An area where wire mesh or other conductive elements are on, embedded in, or placed under the walk surface within 75 mm (3 in), bonded to all metal structures and fixed nonelectrical equipment that may become energized and connected to the electrical grounding system to prevent a difference in voltage from developing within the plane.

Natural Bodies of Water. Bodies of water such as lakes, streams, ponds, rivers and other naturally occurring bodies of water, which may vary in depth throughout the year.

Shoreline. The farthest extent of standing water under the applicable conditions that determine the electrical datum plane for the specified body of water.

682.3 Other Articles. Wiring and equipment in or adjacent to natural or artificial bodies of water shall comply with the applicable provisions of other articles of this *code*, except as modified by this article. If the water is subject to boat traffic, the wiring shall comply with 555.13 (B).

Í Installation

682.10 Electrical Equipment and Transformers. Electrical equipment and transformers, including their enclosures, shall be specifically approved for the intended location. No portion of an enclosure for electrical equipment not identified for operation while submerged shall be located below the electrical datum plane.

682.11 Location of Service Equipment. On land, the service equipment for floating structures and submersible electrical equipment shall be located no closer than 1.5 m (5 ft) horizontally from the shoreline and live parts elevated a minimum of 300 mm (12 in.) above the electrical datum. Service equipment shall disconnect when the water level reaches the height of the established electrical datum plane.

682.12 Electrical Connections. All electrical connections not intended for operation while submerged shall be located at least 300 mm (12 in) above the deck of a floating or fixed structure, but not below the electrical datum plane.

682.13 Wiring Methods and Installation. Liquidtight flexible metal conduit or liquidtight flexible nonmetallic conduit with approved fittings shall be permitted for feeder and where flexible connections are required for services. Extra-hard usage portable power cable listed for both wet locations and sunlight resistance shall be permitted for a feeder or a branch circuit where flexibility is required. Other wiring methods suitable for the location shall be permitted to be installed where flexibility is not required. Temporary wiring in accordance with 590.4 shall be permitted.

682.14 Disconnecting Means for Floating Structures or Submersible Electrical Equipment.

(A) Type. The disconnecting means shall be permitted to consist of a circuit breaker, switch, or both and shall be properly identified as to which structure or equipment it controls.

(B) Location. The disconnecting means shall be readily accessible on land and shall be located in the supply circuit ahead of the structure or the equipment connection. The disconnecting means shall be located not more than 750 mm (30 in) from the structure or equipment connection. The disconnect means shall be within sight of, but not closer than 1.5 m (5 ft) horizontally from the edge of the shoreline and live parts elevated a minimum of 300 mm (12 in) above the electrical datum plane.

682.15 Ground Fault Circuit Interrupter (GFCI) Protection. Fifteen – 20-Ampere single phase, 125-volt through 250-volt receptacles installed outdoors and in or on floating buildings or structures within the electrical datum plane area that are used for storage, maintenance or repair where portable electric hand tools, electrical diagnostic equipment, portable lighting equipment are to be used shall be provided with GFCI protection. The GFCI protection device shall be located not less than 300 mm (12 in) above the established electrical datum plane.

ÍÍÍ. Grounding and Bonding

682.30 Grounding. Wiring and equipment within the scope of this article shall be grounded as specified in Part III of 553, 555.15, and with the requirements in Part ÍÍÍ of this article.

682.31 Equipment Grounding Conductors.

(A) Type. Equipment grounding conductors shall be insulated copper conductors sized in accordance with **250.122** but not smaller than 12AWG.

(B) Feeders. Where a feeder supplies a remote panel board, an insulated equipment grounding conductor shall extend from a grounding terminal in the service to a grounding terminal and a busbar in the remote panel board.

(C) Branch Circuits. The insulated grounding conductor for branch circuits shall terminate at the grounding terminal in a remote panel board or on the grounding terminal in the main service equipment.

(D) Cord-and-Plug Connected Appliances. Where required to be grounded, cord-and-plug connected appliances shall be grounded by means of an equipment grounding conductor in the cord and a grounding type attachment.

682.32 Bonding of Non-Current-Carrying Metal Parts.

All metal parts in contact with water, all metal piping, tanks and all non-current carrying metal parts that may become energized shall be bonded to the grounding bus in the panel board.

682.33 Equipotential Planes and Bonding of Equipotential Planes. An Equipotential plane shall be installed where required in this section to mitigate step and touch voltages at electrical equipment.

(A) Areas Requiring Equipotential Planes. Equipotential planes shall be installed adjacent to all outdoor service or disconnecting means that control equipment in or on water, that have metallic enclosure and controls accessible to personnel, and that are likely to become energized. The equipotential plane shall encompass the area around the equipment and shall extend from the area directly below the equipment out not less than 900 mm (36 in) in all directions from which a person would be able to stand and come in contact with the equipment.

(B) Areas Not Requiring Equipotential Planes. Equipotential planes shall not be required for the controlled equipment supplied by the service equipment or disconnecting means. All circuits rated not more than at 120 through 250 volts, single phase, shall have GFCI protection.

(C) Bonding. Equipotential planes shall be bonded to the electrical grounding system. The bonding conductor shall be solid copper, insulated, covered or bare and not smaller than 8AWG. Connections shall be made by exothermic welding or by listed pressure clamps that are labeled as being suitable for the purpose and are of stainless steel, brass, copper or copper alloy.