

in 210.8(B), the equipment shall be provided with branch-circuit power protected by a ground-fault circuit interrupter where required by other articles.

The particular application of underwater loudspeakers is unique in construction and wiring to pools and is addressed in Article 680. Other locations where audio equipment might be used "near bodies of water" are not addressed in Article 680. Locations where audio equipment is used near bodies of water are covered by 640.10.

The term *prevailing or tidal high water mark* recognizes that the edges of natural bodies of water can advance or recede. Such water level changes must be anticipated.

Unless required by other sections of the NEC, the requirement for GFCI protection does not apply where the equipment (specifically an amplifier or a receiver) is not installed near a body of water.

(B) Equipment Not Supplied by Branch-Circuit Power. Audio system equipment powered by a listed Class 2 power supply or by the output of an amplifier listed as permitting the use of Class 2 wiring shall be restricted in placement only by the manufacturer's recommendations.

Informational Note: See 640.10(A) for placement of the power supply or amplifier if supplied by branch-circuit power.

Part II. Permanent Audio System Installations

640.21 Use of Flexible Cords and Cables.

(A) Between Equipment and Branch-Circuit Power. Power supply cords for audio equipment shall be suitable for the use and shall be permitted to be used where the interchange, maintenance, or repair of such equipment is facilitated through the use of a power-supply cord.

(B) Between Loudspeakers and Amplifiers or Between Loudspeakers. Cables used to connect loudspeakers to each other or to an amplifier shall comply with Article 722. Other listed cable types and assemblies, including optional hybrid communications, signal, and hybrid optical fiber cables, shall be permitted.

Some loudspeakers are identified as being for outdoor use, as shown in Exhibit 640.1. The conductors supplying outdoor speakers must be identified for the environment.

See also

110.11, which specifies electrical equipment and conductors be identified for use in the operating environment and applies to audio equipment and its conductors

(C) Between Equipment. Cables used for the distribution of audio signals between equipment shall comply with Article 722. Other listed cable types and assemblies, including optional hybrid communications, signal, and hybrid optical fiber cables, shall be permitted. Other cable types and assemblies specified by the equipment manufacturer as acceptable for the use shall be permitted in accordance with 110.3(B).



EXHIBIT 640.1 Loudspeakers for outdoor use above ground or partially in ground. (Courtesy of Bose)

Informational Note: See 770.3 for the classification of composite optical fiber cables.

Δ (D) Between Equipment and Power Supplies Other Than Branch-Circuit Power. The following power supplies, other than branch-circuit power supplies, shall be installed and wired between equipment in accordance with this *Code* for the voltage and power delivered:

- (1) Storage batteries
- (2) Transformers
- (3) Transformer rectifiers
- (4) Other ac or dc power supplies

Informational Note: For some equipment, these sources such as in items (1) and (2) serve as the only source of power. These could, in turn, be supplied with intermittent or continuous branch-circuit power.

(E) Between Equipment Racks and Premises Wiring System. Flexible cords and cables shall be permitted for the electrical connection of permanently installed equipment racks to the premises wiring system to facilitate access to equipment or for the purpose of isolating the technical power system of the rack from the premises ground. Connection shall be made either by using approved plugs and receptacles or by direct connection within an approved enclosure. Flexible cords and cables shall not be subjected to physical manipulation or abuse while the rack is in use.

640.22 Wiring of Equipment Racks and Enclosures. Metal equipment racks and enclosures shall be bonded and grounded. Bonding shall not be required if the rack is connected to a technical power ground.

Wires, cables, structural components, or other equipment shall not be placed in such a manner as to prevent reasonable access to equipment power switches and resettable or replaceable circuit overcurrent protection devices.

Supply cords or cables, if used, shall terminate within the equipment rack enclosure in an identified connector assembly. The supply cords or cable (and connector assembly if used) shall