

**N 555.38 Luminaires.**

**(A) General.** All luminaires and retrofit kits shall be listed and identified for use in their intended environment. Luminaires and their supply connections shall be secured to structural elements of the marina to limit damage from watercraft and prevent entanglement of and interaction with sea life.

**(B) Underwater Luminaires.** Luminaires installed below the highest high tide level or electrical datum plane and likely to be periodically submersed shall be limited to those luminaires that comply with the following:

- (1) Identified as submersible
- (2) Operate below the low-voltage contact limit defined in Article 100
- (3) Supplied by an isolating transformer or power supply in accordance with 680.23(A)(2)

Limiting sources of electricity in the water due to equipment failure resulting from not being suitable for the harsh environment at marinas is the objective of this requirement for listed or certified luminaires and retrofit kits. Durability and resistance of the equipment to the harsh effects of outdoor conditions are considerations in evaluating products for the marina environment. Additionally, limiting voltage levels and using isolating transformers or power supplies — as is done with underwater luminaires for swimming pools and other bodies of water covered by Article 680 — is another protection technique for reducing electrical hazards associated with luminaires within marinas and boatyards that are intentionally or likely to be periodically submerged.

**Part III. Floating Buildings**

Although the *NEC* does not cover electrical installations on ships or watercraft, it does cover installations for floating buildings. Floating buildings are permanently moored in one location, for example, restaurants, aquariums, and dwelling units. All other applicable articles apply to these floating buildings.

**See also**

**90.2(C)(1)** for the scope statement on floating buildings covered by the *NEC*

**90.2(D)(1)** for the scope statement on ships and watercraft (other than floating buildings) not covered by the *NEC*

**555.50 Service Conductors.** One set of service conductors shall be permitted to serve more than one set of service equipment.

**555.51 Feeder Conductors.** Each floating building shall be supplied by a single set of feeder conductors from its service equipment.

*Exception: Where the floating building has multiple occupancy, each occupant shall be permitted to be supplied by a single set of feeder conductors extended from the occupant's service equipment to the occupant's panelboard.*

**555.52 Installation of Services and Feeders.**

**(A) Flexibility.** Flexibility of the wiring system shall be maintained between floating buildings and the supply conductors. All wiring shall be installed so that motion of the water surface and changes in the water level will not result in unsafe conditions.

**(B) Wiring Methods.** Liquidtight flexible metal conduit or liquidtight flexible nonmetallic conduit with approved fittings shall be permitted for feeders 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 to a floating building where flexibility is required. Other raceways suitable for the location shall be permitted to be installed where flexibility is not required.

If a portable power cable is used as a feeder to a floating building, it is important to understand the differences between cable types. A cable designation with a "W" as the last letter is suitable for use in wet locations and is sunlight resistant. If "W" is the only letter, this indicates that the cable is a portable power cable. Where Type W cables from Table 400.4 are used to supply a floating building, they must be listed for use in wet locations and for sunlight resistance. Not all Type W cables are listed for wet location applications.

**555.53 Ground-Fault Protection.** The main overcurrent protective device that feeds the floating building shall have ground-fault protection not exceeding 100 mA. Ground-fault protection of each individual branch or feeder circuit shall be permitted as a suitable alternative. Outdoor outlets, shore power outlets, and boat hoists located at floating buildings shall comply with 555.35(B) and (C).

Overcurrent protection for supply conductors is provided by the service equipment. Since these conductors can develop leakage, ground-fault protection is required at the main device or, alternatively, for each feeder or branch circuit. Factors such as corrosion and equipment degradation or lack of maintenance can cause ground faults to the metal surfaces of floating buildings or shore-powered vessels. Persons in contact with those metal surfaces, in proximity to the water surrounding the metal surface, or attempting to exit the water via a metal swim platform or ladder could be subjected to an electric shock.

While branch-circuit GFCI devices, which may trip at as low as 4 milliamperes, are permitted to be used, this is not practical for all floating buildings due to normal leakage currents of appliances and other equipment in or on the floating building. Therefore, the ground-fault current level of the device is not permitted to exceed 100 milliamperes. Devices operating at current levels higher than those specified for a Class A GFCI in ANSI/UL 943, *Ground-Fault Circuit Interrupters*, do not provide GFCI protection of personnel, but they will open the circuit at much lower levels of ground-fault current than will a standard overcurrent protection device (OCPD). See the Informational Note for the