875—62.19(88A) Electrical. Electrical conductors and electrical equipment installed and utilized on or around permanent and temporary amusement parks and amusement rides shall conform to National Electrical Code, NFPA Number 70-1975. The following rules are stated for emphasis and clarification and are supplemental to the National Code. If any conflict exists or appears to exist, the National Code shall have precedence.

62.19(1) *Installation.* Portable electrical systems required by temporary amusement rides or devices and temporary structures shall be installed by a qualified electrician.

62.19(2) *Grounding.* A carnival shall not operate until all grounding electrode conductors, equipment and safety grounding connections are secured, polarized and tested. The grounding conductors shall conform to the National Electrical Code, NFPA Number 70-1975, Article 250—Grounding, Paragraphs 250-94 Size of Alternating Current Grounding Electrode Conductor and 250-95 Size of Equipment Grounding Conductors. The path to ground from circuits, equipment and conductor enclosures shall be permanent and continuous and shall have ample carrying capacity to conduct currents liable to be imposed on it, and shall have impedance sufficiently low to limit the potential above ground and to facilitate the operation of the overcurrent devices in the circuit.

a. *Service ground.* Equipment or generators operating from a separate supply or supplies which are located closer than 8 feet and all service equipment within itself shall be bonded together. The service ground shall be established by connecting the grounding conductor to the service entrance neutral bar in the hot truck or generator and to an approved type service grounding electrode such as ground rods. If 25 ohms or less is not obtained by a single grounding electrode such as a ground rod plate or pipe it shall be augmented by one additional grounding electrode of the type permitted by code.

b. *Circuit and equipment safety.* From the service entrance neutral bar, the circuit grounded and equipment safety grounding conductors shall be continuous and separate throughout the entire system. The portable outlet and terminal boxes shall contain a service ground through grounded receptacles for both circuit and safety. The equipment safety grounding conductors shall be attached to each ride, device or concession booth such that impedance is sufficiently low to limit the potential above ground and to facilitate the operation of the overcurrent devices in the circuit. Separate steel tracks or steel framework, such as roller coaster tracks or big slides, shall have grounding the same as the service equipment.

62.19(3) *Current limiting devices.* Conductors shall be fused or protected to their current carrying capacities. No more than six disconnect switches are to be in the hot truck or generator unless a main switch is provided. All distribution lines from hot trucks or generators shall be either 100 amp. or 200 amp. capacity. No fuses or current limiting devices shall be installed in the neutral or grounding conductors. Motors and lighting circuits shall be fused separately.

62.19(4) *Concession booth wiring.* Concession booth overhead wiring may be done with approved Type C brewery cord (not smaller than No. 12 with a built-in tracer for identification of the neutral wire) and weatherproof, pigtail lamp sockets, polarized, soldered and taped to the brewery cord with polarized male cord cap on the end that plugs into the current supply. Approved type pin sockets are acceptable when used on stranded conductors. Lengths up to 40 feet may be used without a messenger support wire provided the tie off on each end terminates in an insulating block or knob. S.O. cord sets may be used. Cord sets not to be installed lower than 8 feet except where they are not accessible to the public. Other concession booth wiring may include any of the approved National Electrical Code wiring methods suitable for the condition of use. Portable wiring methods are covered specifically by Article 400 of the National Electrical Code, NFPA Number 70-1975; Section 305 shall also be utilized. If lamps and long sockets are lower than 8 feet, they shall be guarded and grounded.

62.19(5) *Bus bars.* Bus bars shall be located low or near the bottom of the cabinet. Separate bus bars shall be provided for grounding neutral and phase conductors.

Color codes painted on inside and outside of box, but not on contact surfaces of bus bars, are to be:

Ground—Green or Green with Yellow Strip	1st Phase—Black
Neutral—White or Natural Gray	2nd Phase—Red
	3rd Phase—Blue

On a four-wire delta-connected secondary, the phase conductor having the higher voltage to ground shall be orange. These color codes are to carry on through all connected wiring from service through portable power outlet and terminal boxes. Buses shall not be less than 200 ampere capacity. The load terminals in a switch-board or panel board shall be located so that it will be unnecessary to reach across or beyond a live bus (hot bus) to make a local connection.

62.19(6) *Portable power, terminal box, supply cords, and cables.*

a. *Portable power outlet and terminal box.* Boxes are to be rain tight and kept locked during the time when the general public is in the area. Wood boxes may be used if insulated on all sides with fire resistant material or painted with insulating varnish. The service power shall be connected to the box by receptacles mounted on the exterior walls which includes the safety grounding. The distribution within the box shall be accomplished by neutral terminal bar(s) and circuit breakers or fuses. The branch circuits which include the equipment safety grounding shall obtain their power through receptacles mounted on the exterior of the box. The exterior openings of the receptacles must be at least 6 inches above ground level and provided with a protective cover, draining eave or canvas, that will avoid the possibility of rain on the receptacle. If it is required to run conductors directly through an opening on the wall of the box for additional service or to obtain required ampacity, the opening(s) shall be color coded and shall be sized to prevent public accessibility to the interior of the box. The fuses or breakers, in the boxes, shall be secured permanently in place, and all connections to the bus bars within the boxes to be made with threaded screws and lugs of the proper size to fasten wiring in place.

b. *Supply cords and cables.* Portable or permanent cord or cable assemblies supplying power to the current-limiting disconnect of a ride, concession booth, or device shall contain within the assembly a conductor of equal size for equipment grounding. All conductors within the assembly shall not be smaller than #12 awg (American Wire Gage) wire and cords or cable assemblies purchased for this purpose after May 1, 1975, shall not be smaller than #10 awg (American Wire Gage) wire. Current-carrying conductors within the assembly shall be protected with current-limiting devices rated at or below the current-carrying capacity of the conductors.

62.19(7) *Power sources.* Electrical power sources shall be located in a manner permitting proper maintenance and shall be protected either by guards, fencing or enclosure to prevent exposure to hazard and to secure the equipment from the public.