

Spa/Hot Tub Installations – Residential

This handout is intended to provide important information for spa/hot tub installations. Adherence to the electrical and building code citations noted herein is crucial to ensure that critical life safety items are proactively addressed. All electrical contractors involved in the installation of a spa or hot tub, are required to be licensed per Idaho State Code, and obtain permits prior to beginning any work. Having a qualified, licensed electrical contractor helps to reduce the liability for spa/hot tub suppliers, and the installers they recommend. By having a legally permitted and inspected spa/hot tub installation, the homeowners and others who use the equipment can be assured that the installation is safe. Upon delivery of a hot tub, the location and placement are critical, and often never considered. There are serious life safety concerns given the relationship to water, electricity and the glass in nearby windows and doors.

New Construction

Given: A Hot tub is to be installed at a later date (unknown). As part of the main residential electrical permit, a “pre-wired” or “future circuit” may be roughed in, and shall be inspected to meet minimum National Electrical Code requirements during construction. A separate hot tub permit is NOT required at this point in time. Since the hot tub location is not known, future location or placement does not need to be identified in advance. It is strongly recommended that one inch electrical metallic tubing (1” EMT conduit) is installed and/or adequate size feeder wire in copper or aluminum, for **any** hot tub that could potentially be installed; the number of motors, full load amps and actual breaker size of the equipment is not known. This will reduce risk of improper wire sizing and potential removal. A separate electrical permit is required separately for the actual hot tub installation and wiring into the “pre-wired or future” circuit that was previously installed.

Hot tubs are usually always placed too close to doors and windows (non-safety glass), too close to the “future” main disconnect, and too close to receptacles, lights, fans, and other metal parts that require grounding & bonding due to proximity to water. This presents challenges for homeowners and inspectors as many code sections are violated.

Hot tubs are technical installations which require a good licensed electrical contractor with experience, to help the process go smoothly. Safety around water, glass and electricity is essential.

Please review and familiarize yourself with the 2017 National Electrical Code (NEC) and the 2009 International Residential Code (IRC) sections below.

National Electrical Code and International Residential Code reference

- NEC Article 680 part IV: Spas and Hot Tubs - a spa or hot tub installed outdoors shall comply with the provisions of parts 1 and 2 of article 680, except as permitted in 680.42(A) and (B) that would otherwise apply to pools installed outdoors. (this brings the entirety of part 1 and 2 covering pools, into the requirements for hot tubs and is often overlooked).
- NEC 300.4: Protection against physical damage: Where subject to physical damage, conductors shall be protected. (conductors are often placed on concrete surfaces where they may be walked on, or in areas where they may be hit by lawn equipment).
- NEC 350.12(1) and 356.12(1): Liquid-tight flexible metal conduit (LFMC) and flexible non-metallic conduit (LFNC) shall not be used where subject to physical damage.
- NEC 680.42(A)(1): LFMC or LFNC (flex is often installed in areas subject to physical damage, which is prohibited by the NEC).
- NEC 680.13: Maintenance Disconnecting Means. One or more means to simultaneously disconnect all ungrounded conductors shall be provided for all utilization equipment other than lighting. Each means shall be readily accessible and within sight from its equipment, and shall be located at least 5-feet horizontally from the inside walls of a pool, spa or hot tub.

(equipment is usually inside the hot tub enclosure and typically accessible from only one side of the hot tub. The access door and equipment must be within sight of the disconnect. It is usually best to face the access door in direct line-of-sight with the disconnect, so the hot tub pumps and motors are visible from the disconnect, and the disconnect is visible from the motors and access door).
- NEC 680.44: Protection – GFCI protection is required. Unless listed and labeled to identify assembly that includes integral GFCI protection.
- NEC 680.22(C): Switching Devices - switching devices, time clocks, etc. shall be located at least 5-feet horizontally away from the inside walls of a spa or hot tub. (problems occur when a hot tub or spa is placed too close to existing switches, time clocks, etc.)
- NEC 680.22(D): Other Outlets - other outlets must be at least 10-feet away from the inside wall of hot tubs and spas.
- NEC 680.22 (B): Lights, paddle fans, lighting outlets, and ceiling suspended paddle fans must be installed at least 5-feet horizontally away from the inside walls of the hot tub or spa, and shall be installed as a height not less than 12-feet above the maximum water level. (hot tub placement is often done without considering the placement of lights and ceiling fans that may be existing in patio covers, etc.)

- NEC 680.22 (B)(3): Area lighting, receptacles and equipment - existing lights and lighting outlets located less than 5-feet measured horizontally from the inside walls, shall be not less than 5-feet above the surface of the maximum water level, and shall be rigidly attached to the existing structure, and shall be protected by a GFCI protection. (hot tub placement is often done without considering the placement of new or existing lights and ceiling fans).
- NEC 680.22 (B)(4): GFCI Protection in adjacent areas - lights, lighting outlets, and ceiling suspended paddle fans installed in the area between 5-feet and 10-feet horizontally from the inside walls of a pool shall be protected by a GFCI unless installed not less than 5-feet above the maximum water level and rigidly attached to the structure adjacent to or enclosing the pool. (hot tub placement is often done without considering the placement of new or existing lights and ceiling fans).
- NEC 680.22(A)(1): Required receptacle - where a permanently installed pool is installed at a dwelling unit, no fewer than one 125 volt, 15 or 20 amp receptacle installed on a general purpose branch circuit, and GFCI protected per 680.22(A)(4) shall be not be located less than 6-feet from, and not more than 20-feet from, the inside wall of the hot tub or spa. This receptacle shall be located not more than 6-feet, 6-inches above the floor, platform, or grade level serving the pool. (hot tubs are often placed either too close or too far from existing receptacles, and are generally not added until the inspector writes a correction).
- NEC 680.26: Equipotential bonding - the equipotential bonding required by this section shall be installed to reduce voltage gradients in the hot tub, spa, or pool area. (bonding is required in an area 5-feet horizontally and 12-feet vertically around the perimeter of the hot tub. The parts that apply to hot tubs are 680.26 (B) which requires a solid #8 or larger copper conductor be used, 680.26 (B)(7) - requires all fixed metal cables, raceways, piping and all fixed metal parts shall be bonded. This is also often overlooked. An example of this is a metal rain gutter which is present and within 5-feet of the hot tub. Other examples are a fixed metal hand rails, metal stem wall vent covers, and metal foundation stem wall vent screens, which would also need to be bonded if within the distances described. Essentially, all metal parts within the specified distance in and around the hot tub, are required to be bonded (grounded) for safety of electrical voltages imposed by natural or other forces).
- NEC 680.42 (B)(4): An equipotential bonding plane is required in this installation.
- IRC Section R308: Safety Glass - the International Residential Code (IRC) which is currently adopted by the City of Meridian, specifies requirements for safety glass in hazardous locations. These locations include pool, spa and hot tubs areas. Generally speaking, glass windows and walls facing hot tubs must comply with the life safety requirements of the code. Typically, 60 inches is the horizontal distance separation in the IRC, however, there are other requirements. (hot tubs and spas are located in areas, without understanding the life safety requirements which municipal inspectors are required to verify).

Questions, please call our electrical inspectors at (208) 887-2211.