Permitting and Inspections Requirements

All electrical wiring, except some types of low voltage, require inspections and therefore a permit.

The inspector will need access to all portions of the new wiring installation. If it is fed from a panel in the house and out through the crawl space then he will need access in the house and the crawl space.

Specific Requirements

Electrical installations for spas and hot tubs are found in Article 680 of the National Electrical Code (NEC) and in the local amendments to the National Electrical Code. The comments and requirements related in this handout are intended to answer common problems and questions. For all requirements concerning spas and hot tubs consult the NEC and the local amendments to the NEC. The National Electrical Code is available at the municipal library; the local amendments are available from the Building Safety counter or on the Municipality of Anchorage website.

3rd Party Certification

Package spas and hot tubs must be 3rd party certified. Certified equipment bears a label from a testing laboratory such as the Underwriters Laboratory (UL), Canadian Standards Association (CSA) or Electrical Testing Laboratory (ETL). A spa or hot tub that does not bear a label must be field evaluated for conformance to the manufacturing standard. Field evaluations can be arranged through the website of the approved testing laboratory.

Location

Carefully choosing the location for a spa or hot tub can minimize the challenge of meeting code requirements. The NEC restricts where lights and receptacles may be in relation to the spa or hot tub.

The NEC also has requirements for bonding near a spa or hot tub which apply to metal parts 4" or larger located within 5' horizontally and 12' vertically even if they are not part of the spa or hot tub itself. Metal parts such as covers, door or window frames, ventilation openings, the metal grid of suspended ceilings metal gutters and metal fences are a few of the things that can be a challenge to properly bond per NEC requirements.

Bonding requirements may also include conductive perimeter surfaces around the spa or hot tub.

Wiring Methods in General

The NEC has specific requirements for the type of raceways permitted and for the type of equipment grounding conductor permitted for spas and hot tubs. The requirements depend on whether the installation is indoor or outdoor, whether it supplies the disconnection means or the spa or hot tub itself.

In general the area within 5' of an indoor spa or hot tub is considered to be a wet, damp or corrosive location. In these locations the wiring method must include a copper equipment grounding conductor.

For outdoor installations the location must consider existing overhead and underground wiring.

Disconnecting Means - NEC 680.13

A disconnecting means shall be provided and be accessible, located within sight from all pools, spas, and hot tub equipment, and shall be located at least 1.5m (5 feet) from the inside walls of the pool, spa, or hot tub.

Switching Devices - NEC 680.22(C)

Switching devices on the property shall be located at least 1.5m (five feet) horizontally from the inside walls of a pool unless it is a listed device approved for use in that area or separated from the pool by a solid fence, wall, or other permanent barrier.
Other Outlets - 680.22 (D)
Other outlets may include but are not limited to remote control, signaling, fire alarm and communications circuits must be at least 10' for the inside walls.

INDOOR SPAS AND HOT TUBS

Wiring methods – 680.43
Except for areas considered to be wet, damp or corrosive, the types of wiring approved for interior residential use are suitable. By exception, listed spa and hot tub packaged units rated 20 amps or less shall be permitted to be cord and plug connected.

Within any area considered to be wet, damp or corrosive, the wiring method used must include a copper equipment grounding conductor not smaller than #12 AWG with terminations suitable for the environment. NEC 680.21(A)(1)

Receptacles – 680.43(A)
- At least one 125-volt 15- or 20-ampere receptacle on a general-purpose branch circuit shall be located a minimum of 1.83m (6 feet) from and not more than 6m (20 feet) from the inside walls of the pool or hot tub
- No receptacle may be within 6' of the inside walls of the pool or hot tub.
- GFCI protection is required for all receptacles within 20' of the inside walls of a pool or hot tub.
- Any receptacle that provides power for a spa or hot tub shall be ground-fault circuit-interrupter protected.

Mounting Height of Lighting Fixtures, Lighting Outlets, and Ceiling-Suspended (Paddle) Fans. NEC 680.43(B)
Lighting fixtures, lighting outlets, and ceiling-suspended (paddle) fans located over or within 5' horizontally of the inside walls of the spa or hot tub...
- Shall not be less than 12' above the highest water level without restriction
- Shall not be less than 7 1/2' above the highest water level with GFCI protection
- May be less than 7 1/2' above the highest water level with GFCI protection and meeting the additional - requirements of NEC 680.43(B)(1)(c) (1) or (2)

Bonding NEC 680.43(D)
The following parts shall be bonded together:
- All metal fittings within or attached to the spa or hot tub structure.
- Metal parts of electrical equipment associated with the spa or hot tub water circulating system, including pump motors unless part of a listed, labeled and identified self-contained spa or hot tub.
- Metal conduit, and metal piping within 1.5m (five feet) of the inside walls of the spa or hot tub and that are not separated from the spa or hot tub by a permanent barrier.
- All metal surfaces that are within 1.5m (five feet) of the inside walls of the spa or hot tub and not separated from the spa or hot tub area by a permanent barrier. Exception: Small, isolated, conductive surfaces not likely to become energized.
- Electrical devices and controls that are not part of a listed spa or hot tub.

Methods of Bonding - NEC 680.43(E)
Metal parts that are required to be bonded shall be bonded by any of the following methods:
- The interconnection of threaded metal piping and fittings.
- Metal-to-metal mounting on a common frame or base.
- A solid copper bonding jumper, insulated, covered, or bare, not smaller than No. 8.

OUTDOOR SPAS AND HOT TUBS

Wiring Methods – NEC 680.21
The portion of the wiring inside of the residential structure can consist of any of the types of wiring approved for interior residential use. NEC 680.21(A)(1)

The portion of the wiring outside of the residential structure must include a copper equipment grounding conductor. Where installed in a corrosive environment near the spa or hot tub it must contain an insulated copper equipment grounding
conductor not smaller than #12 AWG and be installed in rigid metal conduit, intermediate metal conduit, jacketed MC Cable, or where protected from physical damage, PVC or reinforced thermosetting resin conduit. NEC 680.14(B), 680.21(A)(1)

Note: Nonmetallic rigid conduit is not approved for above ground use outdoors if exposed to physical damage due to brittleness in cold weather.

Flexible Connections - NEC 680.42(A)(2)
Listed packaged units utilizing a factory-installed remote panel-board shall be permitted to be connected with liquid-tight flexible metal, liquid-tight flexible non-metallic conduit per NEC 680.42(A)(1) or be cord and plug connected with a cord not longer than 4.6m (15 feet) where protected by a ground-fault circuit interrupter per NEC 680.42(A)(2). The receptacle must have a cover that is waterproof while in use.

Receptacles - NEC 680-22(A)(1) thru (A)(5)
- At least one 125-volt 15- or 20-ampere receptacle on a general-purpose branch circuit shall be located a minimum of 1.83m (6 feet) from and not more than 6m (20 feet) from the inside walls of the pool or hot tub
- No receptacle may be within 6' of the inside walls of the pool or hot tub.
- GFCI protection is required for all receptacles within 20' of the inside walls of a pool or hot tub.

Lighting Outlets – NEC 680.22(B)
- New outdoor lighting outlets must be at least 12’ above the maximum water level and at least 5’ horizontally from the inside walls of the spa or hot tub. NEC 680.22(B)(1)
- Existing outdoor lighting outlets within 5’ horizontally of the inside walls must be at least 5’ above the maximum water level, rigidly attached to structure and be GFCI protected. 680.22(B)(3)
- Lighting outlets in adjacent areas, between 5’ and 10’ horizontally from the inside walls and less than 5’ above the maximum water level, must be GFCI protected. 680.22(B)(4)
- For cord and plug connected luminaires - low voltage luminaires - low voltage gas fired luminaires, decorative fireplaces, fire pits and similar equipment see NEC 680.22(B)(5), (6) and (7)

Overhead Conductor Clearances - NEC 680.9
There must be a minimum of 4.4m (14.5 feet) in any direction from an observation stand, tower, or diving platform, and 6.9m (22.5 feet) in any direction from the water level or edge of water surface.

Underground Wiring - NEC 680.11
Only wiring necessary to supply the spa or hot tub is permitted under the spa or hot tub. All wiring within 5’ of the spa or hot tub must use one of the following wiring methods.
- Rigid metal conduit
- Intermediate metal conduit
- Rigid PVC conduit
- Rigid thermosetting resin conduit
- Type MC cable with an overall non-metallic jacket listed for underground use
- Liquidtight flexible metallic conduit
- Liquidtight flexible non-metallic conduit

Equipotential Bonding – NEC 680.26
All-metal parts over 100mm (four inches) in any dimension (except the metal bands or hoops used to secure wooden staves noted by NEC 680.42.B) within 1.5m (five feet) horizontal and within 3.7m (12 feet) above the spa or hot tub must be bonded together (NEC 680.26.B.5).

Conductive perimeter surfaces around a spa or hot tub must be bonded per 680.42(B).

Bob Doehl, Building Official
DATE: June 25, 2019
(Ref. 00-08; 03-03; 06-02; 06-05; 09-01)