Permitting and Inspections Requirements

All electrical wiring, excepting most types of low voltage, requires 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.

Installation Requirements

Electrical installations for spas and hot tubs are found in Article 680 of the 2008 National Electrical Code (NEC) and in the local amendments to the 2008 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 local UL office or other approved testing agency.

INDOOR SPAS AND HOT TUBS

Wiring methods

The types of wiring approved for interior residential use are suitable, including nonmetallic cable. Installation of the wiring must be appropriate for the material used.

Receptacles

All receptacles on the property shall be located at least 1.8m (six feet) measured horizontally from the inside walls of the spa or hot tub. All receptacles of 125 volts located within 3m (ten feet) of the inside walls of a spa or hot tub shall be protected by a ground-fault circuit interrupter. There shall be at least one 125-volt, 15- or 20-ampere receptacle on a general-purpose branch circuit located a minimum of 1.8 m (six feet) from and not more than 3m (ten feet) from the inside wall of the spa or hot tub. Receptacles that provide power for a spa or hot tub shall be ground-fault circuit-interrupter protected.

Wall Switches (NEC 680.43 [C])

Switches shall be located at least 1.5m (five feet), measured horizontally, from the inside walls of the spa or hot tub.

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 the spa or hot tub or within 1.5m (five feet) from the inside walls of the spa or hot tub shall be a minimum of 2.3m (7’6”) above the maximum water level and shall be protected by a ground-fault circuit interrupter. NEC 680.43(B) 1c: Lighting fixtures meeting the requirements of (1) or (2) and protected by a ground-fault circuit interrupter shall be permitted to be installed less than 2.3m (7’6”) over a spa or hot tub.

1) Recessed fixtures with a glass or plastic lens and nonmetallic or electrically isolated metal trim, suitable for use in damp locations.

2) Surface-mounted fixtures with a glass or plastic globe and a nonmetallic body or a metallic body isolated from contact. Such fixtures shall be suitable for use in damp locations.
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, 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; and 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.

Methods of Bonding (NEC 680.43[E])
All metal parts associated with the spa or hot tub shall be bonded by any of the following methods:

a) The interconnection of threaded metal piping and fittings.
b) Metal-to-metal mounting on a common frame or base.
c) A copper-bonding jumper, insulated, covered, or bare, not smaller than No. 8 solid.

OUTDOOR SPAS AND HOT TUBS

Wiring Methods NEC 680.25[A]
The portion of the wiring inside of the residential structure can consist of any of the types of wiring approved for interior residential use, including nonmetallic cable, that has a copper equipment grounding conductor; NEC 680.42 (C).

The wiring on the exterior of the building shall have an insulated equipment-grounding conductor installed with the feeder conductors in rigid metal conduit or intermediate metal conduit or nonmetallic rigid conduits. Electrical metallic tubing shall be permitted to be used to protect conductors where installed on the building. NEC 680-21(A). Note: Nonmetallic rigid conduit is not approved by the electrical inspector for above ground use outdoors if exposed to physical damage due to brittleness in cold weather.

Flexible Connections (NEC 680.42[A])
Listed packaged units utilizing a factory-installed remote panelboard shall be permitted to be connected with not more than 1.8m (six feet) of liquid-tight, metallic, flexible conduit or be cord and plug connected with a cord not longer than 4.6m (15 feet) if protected by a ground-fault circuit interrupter. A receptacle(s) that provides power for the spa or hot tub shall be permitted between 1.83m and 3m (six feet and ten feet) from the inside walls of the pool, and, where so located, shall be single and of the locking and grounding types and shall be protected by a ground-fault circuit interrupter(s). (NEC 680-22[A]). The receptacle should have a "waterproof while in use “ trim cover if exposed to rain, etc.

Disconnecting Means (NEC 680.12 and 22 [D])
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.

General purpose Receptacles (NEC 680-22[A3])
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 wall of the pool. This receptacle shall be located not more than 2m (6’6”) above the floor, platform, or grade level serving the pool. All 125-volt receptacles located within 6m (20 feet) of the inside walls of a pool shall be protected by a ground-fault circuit interrupter, NEC 680.22.A.5. NOTE: In determining the above dimensions, the distance to be measured is the shortest path the supply cord of an appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, doorway with hinged or sliding door, window opening, or other effective permanent barrier. NEC 680.43.A.4. Note: For a receptacle supplying a cord connected hot tub see "flexible connections."

Lighting Fixtures, Lighting Outlets, and Ceiling-Suspended (Paddle) Fans (NEC 680.43[B])
Lighting fixtures, lighting outlets, and ceiling-suspended (paddle) fans shall not be installed over the pool or over the area extending 1.5m (five feet) horizontally from the inside walls of a pool unless no part of the lighting fixture or ceiling-suspended (paddle) fan is less than 3.7m (12 feet) above the maximum water level. Lighting fixtures and lighting outlets installed in the area extending between 1.5m and 3m (five feet and 10 feet) horizontally from the inside walls of a pool shall be protected by a ground-fault circuit interrupter unless installed 1.5m (five feet) above the maximum water level and rigidly attached to the structure adjacent to or enclosing the pool. Existing lighting fixtures and lighting outlets located less than 1.5m (five feet) measured horizontally from the inside walls of a pool shall be at least 1.5m (five feet) above the surface of the maximum water level, shall be rigidly attached to the existing structure, and shall be protected by a ground-fault circuit interrupter. Cord-connected lighting fixtures shall meet the same specifications as other cord- and plug-
connected equipment as set forth in NEC 680.22.B.5, where installed within 4.9m (16 feet) of any point on the water surface, measured radially.

**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.

**Overhead Conductor Clearances (NEC 680.8)**
There must be a minimum of 4.4m (14.5 feet) in any direction to the observation stand, tower, or diving platform, and 6.9m (22.5 feet) in any direction to the water level, edge of water surface.

**Underground Wiring (NEC 680.10)**
Underground wiring, including service wires to the house, shall not be permitted under the pool or within the area extending 1.5m (five feet) horizontally from the inside wall of the pool unless this wiring is necessary to supply pool equipment permitted by this article. Where space limitations prevent wiring from being routed 1.5m (five feet) or more from the pool, such wiring shall be permitted where installed in rigid metal conduit, intermediate metal conduit, or a nonmetallic raceway system. All metal conduit shall be corrosion resistant and suitable for the location. A burial depth of 450mm (18 inches) is sufficient for all types of acceptable wiring installed under the exception due to space limitations.

**Bonding**
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). The common bonding grid shall be permitted to be the structural reinforcing steel of a concrete pool where the reinforcing rods are bonded together by the usual steel tie wires or the equivalent; the wall of a bolted or welded metal pool; or a solid copper conductor, insulated, covered, or bare, not smaller than No.8 NEC 680.26.C.

Ron Thompson, Building Official
DATE: January 6, 2009
(Ref. 00-08; 03-03; 06-02; 06-05)