This handout answers questions most often asked by homeowners. This information is a guide to the most common questions. It is not intended, nor shall it be considered, a complete set of requirements. The wiring must be done to the standards of the latest state-adopted National Electrical Code (NEC). Libraries and electrical supply dealers may have other books available to further assist you.

An Electrical Permit is required for all electrical work, including wiring a garage. In a single-family residence, experienced owners/homesteaders may obtain the permit to do the work themselves. For other residential occupancies, such as rental properties, an electrical contractor must be hired to do the work and obtain the permit.

Rules to operate by:

1. Most homeowners choose to run the electrical underground. The two most popular methods are direct-burial cable or PVC (plastic) conduit. Direct burial cable is designated as UF (Underground Feeder) or for larger sizes, USE (Underground Service Entrance).

2. PVC conduit must be approved as electrical conduit. Other types, such as PVC plumbing pipe, are not acceptable. Standard insulated conductors may be pulled inside the PVC. These single conductors must have a “W” (water-resistant) in the designation stamped on the jacket of the wire. Examples of such designations include: THWN, XHHW, etc. Type “Romex” or Non-Metallic Cable (NM-B) cannot be run inside underground conduit, because the outer jacket of the NM-B is not rated for wet locations. PVC conduit must be buried at 18 inches below grade. (This is measured to the top of the conduit, so the trench will have to be deeper than 18 inches.)

3. Romex or NM-B may be used inside the garage. It must be drilled and inserted through the studs, not run on the face of them. Also, never drill through factory roof trusses, run the Romex or NM-B on the top edge in a location where it will not be damaged. Romex or NM-B cable is to be routed so it is not subject to physical damage.

4. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in garages must be a Tamper-Resistant (TR) type and protected by a Ground Fault Circuit Interrupter (GFCI), including any receptacles for garage door openers or specific appliances. There are two forms of GFCI-protected devices. You may use a tamper-resistant receptacle-type, GFCI-protected device or a breaker-style GFCI protective device. Both devices are installed at the beginning of the circuit to be protected and several standard tamper-resistant outlets may be protected “downstream” by one GFCI outlet. See the manufacturer’s instructions for details. On a GFCI, the wire is the power in and the load is the power out to other receptacles. TR receptacles are designed with a “shutter” over the slots so only a standard cord cap (plug) can be inserted. Add-on plug covers are not acceptable.

Any receptacles on the exterior of the garage must be tamper-resistant (TR), GFCI-protected and Weather Resistant (WR). (There will be a “WR” visible on the face of the receptacle.)

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5. If a single circuit with a grounding conductor (either green or bare and attached to the grounding system in the house) is run from the house to the garage, no ground rod is required at the garage, see Detached Garage Supplied by a Three-Wire Branch Circuit. For feeders from the house to the garage, an eight-foot ground rod must be driven at the garage. A grounding conductor is required with the branch circuit or feeder. When a feeder or more than one circuit is supplying the garage, a grounding electrode is required at the garage. If there is no existing grounding electrode, (metal underground water pipe) a ground rod is required and connected to the equipment grounds in the garage, see Detached Garage Supplied by a Four-Wire Feeder. This ground rod may be driven right outside the garage with a #6 copper ground wire attached to it. If the wire is subject to physical damage on the outside or inside of the garage, it must be protected by conduit. The easiest method of protection is typically 1/2-inch PVC. The #6 wire must be attached to the grounding system for the electrical in the garage.

6. The minimum wiring required in a detached garage that has electricity would include a means to disconnect the power to the garage, switches at the service door to control a light inside the structure, and a light outside the garage service door. Vehicular (overhead) doors of a garage are exempt from any lighting requirements. A minimum of one GFCI-protected readily-accessible receptacle somewhere inside the garage is also required.