



SEQUACHEE VALLEY ELECTRIC COOPERATIVE Minimum Guidelines for Wiring a Single-Family Dwelling

The Tennessee Department of Commerce and Insurance requires inspections of wiring jobs and approval is subject to the Deputy State Electrical Inspector. SVEC will not render service to any dwelling that has not been approved by the State. SVEC is responsible only for material and connections up to and including the final connection at the weather head and has no liability beyond the meter base on the consumer's premises. The homeowner or contractor must realize that regulations are revised periodically and that, before beginning construction, he/she should check the most current guidelines. Provisions must be made for a ground connection to the footer rebal.

Rough-In Inspection – All applicable circuit conductors and outlet boxes must be installed. **ALL** joint and switch legs must be made up. Ground wires must be twisted together and approved devices installed. Receptacles and switches or lighting fixture are not to be installed on rough-in inspection. If ceiling fans are going to be installed, approved boxes shall be provided. If switch box is going to be mounted in wall it shall be installed on rough-in. All holes drilled shall be 1/4" from edge or installed metal nail plates. All buildings shall have a rough-in inspection prior to insulating walls or covering wires.

A minimum 100 ampere three (3) wire service is required for any individual residence—house, cabin, apartment, etc., if electric heat is to be installed. In addition, the service must be adequate for the load served as determined by Article 220 of the 2008 National Electric Code.

Always consult SVEC for meter location. Mounting height for a meter is between 5 and 6 feet from center to finished grade. SVEC will furnish the meter base after the necessary inspection permits are purchased. Point of attachment for service drop conductors must be 12-feet or greater above finished grade (SVEC).

The service disconnecting means shall be installed at a readily accessible location nearest the point of entrance of the service entrance conductors. The service entrance equipment must be bonded and a 3-foot clearance in front of it. The service must be grounded as per the NEC. Interior metal water piping shall always be bonded to the service equipment, the grounded conductor, and grounding electrode conductor and other electrodes available. Footer steel must be used as a grounding electrode.

If a service mast is used to support the service drop, it shall be 2" rigid or IMC and shall extend above the roof a minimum of 24" to a maximum of 42". If higher, it should be guyed. If an eyebolt is used, SVEC will provide the bolt and the electrician shall install the same. If underground service is used, the minimum conduit size is---**refer to SVEC underground guidelines**. The customer will furnish the conduit and fittings from the transformer to the meter base. The customer will install a put rope in conduit, open, and close the trench which shall be 24" to the top of conduit from pole to meter location.

On all general lighting and outlet circuits, the wires shall be marked NMB. A general lighting circuit shall be provided for each 600 square feet or area of the dwelling, including the basement, but not including open porches or garages.

A wall switched light must be installed outside each pedestrian entrance to the residence. A wall switched light must be installed in every habitable room, in bathrooms, hallways, stairways, attached garages and detached garages with electric power. In habitable rooms other than kitchen and bathrooms, a wall switched receptacle outlet shall be permitted in lieu of a lighting outlet.

U/L listed smoke alarms (electric with battery backup) shall be installed in each sleeping area and outside the entrances to the sleeping areas on each level. These detectors must be linked. Motor homes and manufactured homes must have working smoke detectors per applicable codes.

Electrical Equipment

A light and outlet shall be installed in each unfinished basement, also in any attic or crawl space that contains equipment that could require servicing, or if the space is used for storage. Where equipment requires examination, adjustment, renewal, or repair, adequate working space shall be provided and maintained. This workspace shall not be less than thirty (30) inches in width. And headroom shall not be less than four (4) feet six (6) inches. Doorways providing access to equipment shall not be less than twenty-four (24) inches wide and three (3) feet six (6) inches high.

There shall be a vertical clearance of at least three (3) feet for use by those conducting necessary examination, adjustment, renewal or repair of equipment located in accessible attics. In addition, there shall be a walkway not less than twenty-four inches wide on the ceiling joist running from the attic opening to the unit, with no obstruction (such as ducts used or the purpose of circulating air, etc.)

Adequate space shall be provided to gain access to equipment from all locations (including under houses and in attics), should breakdown requiring replacement or major repair of equipment occur.

Where the HVAC equipment is installed in crawl spaces underneath dwelling units, a clear unobstructed crawl space not less than thirty inches (30) in height and twenty-four (24) inches in width should be maintained, and the unit shall be located not more than twelve (12) feet from the entry way opening.

Receptacle Outlets and Light Fixtures

Light fixtures in clothes closets 28" or less in depth shall be mounted on the ceiling or wall above the door. These fixtures shall be so located that the fixture is within four (4") inches of the intersection of the ceiling and entrance wall. Such fixture shall be thermally protected, and either incandescent recessed with solid lens or fluorescent with a class P ballast. Fixtures installed in closets or larger dimensions shall comply with the 2008 Edition National Electrical Code.

Tamper resistant receptacle outlets must be installed in every habitable room of the residence so that no point on any wall is over 6 feet from an outlet in the unbroken wall space of that room. In other words, you need an outlet within 6 feet of a doorway or fireplace, but in the rest of the room, the outlets may be 12 feet apart if there is no break in the wall between them. It is permissible to measure around corners of the unbroken wall. Any wall space 2 feet wide or greater requires a receptacle outlet. Outlets are not required behind hinged doors. Receptacle outlets in the ends of permanently installed baseboard heaters may be connected to the heater circuit. An outlet over 5'6" above the floor cannot be counted as an outlet in that space. Outlets on the floor within 18" of the wall may be counted as an outlet in that space.

You must install at least one receptacle outlet for laundry facilities. A 20-ampere circuit and no other receptacle outlets must feed the laundry receptacle outlets or lights shall be on this circuit. The washing machine outlet must be within 6 feet of the intended location of the washing machine.

GFCI Protection

The receptacle outlets in the kitchen counter top bathroom, outdoors, crawl spaces at or below finished grade, unfinished basements and in garages must be protected by a GFCI. All porches over 20 square feet must have GFCI outlet.

For one and two family dwellings, at least, 2 receptacle outlets must be installed outdoors for each dwelling unit, which is at **grade level** on the front and back of house. There must be a GFCI outlet within 25' of any outdoor HVAC unit.

For a one-family dwelling, at least, one receptacle outlet in addition to any provided for laundry equipment must be installed in each basement and in each attached garage, and detached garage with electric power.

All 125-volt receptacle outlets installed in an unfinished basement shall have GFCI protection and be so identified. All 125-volt receptacle outlets in boathouses shall have GFCI protection.

Bathroom receptacle outlets shall be supplied by, at least one 20 ampere branch circuit. Such circuits shall have no other outlets or lighting fixtures. You must install a receptacle outlet adjacent to each washbasin in every bathroom.

Hydromassage tub shall be ran on a separate 20 ampere, GFCI protected circuit.

To prevent nuisance tripping of the GFCI, it is recommended that this circuit be kept as short as possible and limited to the designated outlets. It is permissible to use more than one GFCI protected circuit. Appliance circuits in dwellings must be on a 20-ampere circuit even though they are not in the kitchen.

In the kitchen, a receptacle outlet must be installed in any wall space more than 12" wide over any countertop. Receptacles shall be installed so that no point along the counter wall is over 24" from a receptacle. Countertops 12" or wider, islands or peninsulas shall have at least one receptacle for each four (4) feet of countertop. A counter top broken by a sink or other item leaves a new wall space. Receptacle outlets behind refrigerators, freezers, or other fixed stationary equipment shall not count as an outlet in the wall space. All of the 125-volt receptacle outlets installed that serve counter top surfaces shall have ground fault circuit-interrupter protection.

The kitchen counter top area must have receptacle outlets supplied by, at least, two 20-ampere circuits. The receptacle outlets in the dining area and breakfast nook must be fed from a 20-ampere circuit, which may extend from the kitchen circuits. The circuits listed in this paragraph shall supply no other receptacle outlets or lights (with the exception of a clock outlet).

General Information

- Electrical service panel shall not be installed in a bathroom or clothes closets
- Stairway 6 steps or more shall have a switch on both landings. (3 way switch)
- If a dishwasher is to be installed, follow manufacturer's recommendation for size of circuit.
- Hallway ten (10) ten feet or longer shall have an outlet installed.
- If garbage grinder or compactor, or both, are to be installed, a circuit suitable for the load must be installed to them.
- A circuit suitable for the load with a minimum of 40 amperes is required for a complete range, either free standing or drop-in type (8 ¾ kW or more).
- If separate units, ovens and cook-top are installed they shall be served by individual circuits.
- A circuit suitable for the load with a minimum of 30 amperes is required for an electric clothes dryer.
- A circuit suitable for the load with a minimum of 30 amperes is required for a residential water heater with a 25 or 30-ampere double pole breaker.
- All HVAC shall be permitted and be installed before final inspection.
- All buildings shall have a final inspection. If temporary power is available, hook it to the electric panel.
- If aluminum conductors are used, an inhibitor shall be installed on all connections.
- Electric water heater shall have a disconnect within sight or capable of being locked in the open position.
- All HVAC units installed in accessible attics and in crawl spaces shall have a receptacle outlet within 25' and on same level with unit.
- All bedroom outlets, including smoke detectors and lighting must be AFCI (arc fault) protected with a maximum of 10 outlets per 15 amp AFCI circuit and 12 outlets per 20 amp AFCI circuit. ARC fault breakers must be "combination" type.
- An intersystem bonding terminal must be installed at the meter for cable, phone, etc.

SERVICE – SINGLE-FAMILY DWELLING

Rule of thumb Under Normal Conditions (Article 220)

Minimum

100 A - 1500 square feet under normal conditions: range, water heater, dryer**

200 A - 2000 square feet : all above +25 kW or less electric heat

225 A - 3000 square feet: all above +25 kW to 30 kW electric heat

400 A - 6000 square feet: all above + two 30 kW electric furnaces

** Minimum of 200 a recommended.

**WIRE SIZE FROM
WEATHERHEAD TO SERVICE**

COPPER (CU) CONDUCTOR

	100 A	200 A	225 A	400 A
2-Black (Hot)	4	2/0	3/0	400 KCM or 2/0 paralleled
1-White (neutral)	6	1	2/0	250 KCM or 1/0 paralleled
Bare CU ground	6	4	4	4
Conduit Size	1 ¼"	2"	2"	3"

ALUMINUM (AL) CONDUCTOR

	100 A	200 A	225 A	400 A
2-Black (Hot)	2	4/0	250 KCM	600 KCM or 250 KCM paralleled
1-White (neutral)	4	2/0	4/0	400 KCM or 4/0 paralleled
Bare CU ground	6	4	4	4
Conduit Size	1 ½"	2"	2 ½"	3"

BRANCH CIRCUITS (DWELLINGS)

Minimum Wire Size, Article 220, NEC

	Copper	Aluminum	SE Cable	Amps
Free Standing Range	8-3 W/gr	6-3 W/gr	Yes	40
Water Heater	10-2 W/gr	8-2 W/gr	Yes	25-30
Dryer (5 kW)	10-3 W/gr.	8-3 W/gr	Yes	30
Double Oven (Self Cleaning)	6-3 W/gr	4-3 W/gr	Yes	50
Range Top Combo	8-3 W/gr	6-3 W/gr	Yes	40
Single Oven (Standard)	10-3 W/gr	8-3 W/gr	Yes	30
Range Top (Standard)	10-3 W/gr	8-3 W/gr	Yes	30
Small Appliance Circuits	12-2 W/gr	No	No	20
Washer Circuit	12-2 W/gr	No	No	20
General Lighting Outlet	14-2 W/gr or 12-2 W/gr	No No	No No	15 20

Revised: July 2009