

GUIDELINES FOR ELECTRIC SERVICE

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Guidelines for Electric Service

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CONTACT INFORMATION:

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Underground Locates in Colorado: 811

I. Scheduling for Electrical Line Extensions or Service Work.

If you plan to construct a house, set a mobile home, install a pump, uprate an existing service, require temporary construction power, etc., please note the following guidelines:

- Grand Valley Power will do our best to serve your electrical requirements. However, to avoid delays in the construction of your service work/line extension, please plan accordingly. Actual construction scheduling is dependent on workload, crew availability, and material availability at the time your job is processed.
- A Grand Valley Power Service Planner will meet with you to design the necessary
 - electric facilities and provide a cost estimate. Depending on the magnitude of the project and workload, up to 10 business days are required.
- If right-of-way easements or permits are required, these documents must be received before the line extension/service contract with Grand Valley Power can be executed.
- After upfront payment and executing a contract for service, a minimum of five business days is required for job processing and material procurement.
- Crew and material availability determine when a line extension or service can be scheduled. Crew availability is subject to progress on other ongoing work and can be directly affected by weather-related storm damage. To get an approximate construction start date, call the Operations Department (See Contact Information on page 2).
- Before performing any trenching or digging, all Customer/Developer provided trenching requires underground utility locates (See Contact Information on page 2).
- Underground construction can be directly affected by frost conditions of over 6" depth.
 - Underground construction will not be performed by Grand Valley Power during the months that such frost conditions exist. Grand Valley Power may decline underground extensions during the times of the year when excessive frost prevails.
- Customer-owned underground facilities, including irrigation, water, sewer, and electric lines, shall be located by the Customer before Utility Construction (setting poles, meter pedestals, pad-mounted transformers, or any trenching) can be scheduled.
- If the Customer is unable to locate Customer-owned underground facilities and requests the Utility to proceed with construction, the Customer shall be responsible for damage and repair of Customer-owned facilities not located. Grand Valley Power shall locate only Utility-owned electric underground facilities.

II. Service Entrance Surge Protector

At the request of the Customer, new 200-amp residential services can be provided with a Service Entrance Surge Protector (SESP) installed by Grand Valley Power with the. A SESP can also be installed by Grand Valley Power in newly uprated services or existing services. Contact the Engineering/Operations Department for details. This device diverts or arrests the worst part of the surges from the power system before they can enter your house.

Ultimate whole house surge protection is best achieved by using a SESP at the meter base and quality surge suppressors for interior point of use applications.

III. Customer trenching option – “Point of Delivery”

Secondary underground services as provided by the Customer/Developer can be connected to a variety of “Points of Delivery” as preferred by the Customer/Developer. The attached specifications illustrate some of these options.

Grand Valley Power authorizes the Customer/Developer to provide (furnish and install) trench and underground secondary service wire from a Grand Valley Power “Point of Delivery” or service wire connection to the Grand Valley Power meter. This installation must conform to the National Electrical Code. Grand Valley Power strongly recommends these underground services do not exceed 300 feet from the “Point of Delivery” to the meter.

In all cases where a Customer/Developer builder is providing trench and underground service wire to a Grand Valley Power meter, Mesa County shall inspect the installation before clean backfill is added as part of the Mesa County inspection process. Minimum depth is 24”; however, Grand Valley Power recommends customer service wire be installed at 36” depth. **Grand Valley Power strongly recommends that the service wire be installed in conduit.**

The area where Grand Valley Power facilities will be installed must be within 6” of final grade and free of obstructions. All installation depths refer to final grade.

All Customer/Developer provided trenching requires underground utility locates before digging. Digging without calling can disrupt service to an entire neighborhood, endanger your life and those around you, and potentially result in fines and repair costs. Calling (8-1-1) or (1-800-922-1987) before every digging job gets your underground utility lines marked for free and helps prevent undesired consequences.

The Customer/Developer’s service wire must be covered and backfilled before the meter is installed, and the service wire is energized.

Grand Valley Power will locate and make all necessary repairs after installation of all Customer/Developer underground service wire from the “Point of Delivery” to the meter as a service to the Customer. If the Customer/Developer installed wire requires numerous repairs, Grand Valley Power will stop making repairs, and the Customer will be required to replace the

wire. Grand Valley Power will not repair any secondary faults where pavement, concrete, or buildings has been installed over the wire. Grand Valley Power will not be responsible for repairing landscaping after a service wire fault is repaired. If the repair requires an underground bore due to paving, construction, or landscaping over the wire, the costs of the bore will be the responsibility of the Customer.

The trenching option is also available for the underground primary (7,200 volts and above) portion of the service work or line extension. Grand Valley Power requires the trench depth to be 48" deep for primary conductors.

IV. Customer Service Entrance Requirements

1. External disconnect switch or circuit breaker

For all single-phase 200-amp and 320-amp services, three-phase 200-amp services, and all services where a single transformer is serving more than one service, Grand Valley Power requires the Customer to provide (furnish and install) a visible external disconnect switch or circuit breaker adjacent to the Grand Valley Power meter. (Applies to meters on pedestals, poles, or building/structures.) The disconnect switch or circuit breaker should be on the load side or customer side of the Grand Valley Power meter/socket. This requirement applies to all new and uprated service entrance/meter loop installations of the Grand Valley Power system.

The purpose of the outside or external disconnect switch or breaker is to provide a method of quickly and safely disconnecting the electrical service in the event of a fire, maintenance, additions to the electrical panel, or electrical problems on the interior of the customer's system.

The sizing, fusing, and application of the disconnect switch or circuit breakers are the responsibility of the Customer's Electrician.

For single-phase and three-phase services that utilize current transformers and only serve a single service, an outside disconnect is recommended but not required.

2. Meter Sockets

Grand Valley Power does not furnish single-phase 320-amp, 200-amp or 100/125 ampere meter sockets, or Meter Main and All-In-One combination meter socket-breaker panels. The customer shall supply these meter sockets. A 200-amp meter housing is required on new building construction and additions as a Grand Valley Power standard. The exception is manufactured housing that requires only a 125-amp meter housing. The meter housing must be a "ringed" style enclosure to protect GVP from energized equipment during meter installation.

Grand Valley Power will supply all three-phase meter sockets and single-phase meter sockets utilizing current transformers.

Meters shall be installed in an outside location that is accessible at all times. Meter mounting devices shall be installed so that the center of the meter cover is at least 4½ feet and no greater than 5½ feet above the finished grade. Grand Valley Power does not require a cold sequenced/fused meter socket.

3. Replacement Meter Sockets

The replacement of a meter socket is considered an “uprated” service by Mesa County and requires a Mesa County inspection. Mesa County requires a building permit for new or changed out (uprating 60-amp to 200-amp, etc.) electrical services. Existing services requiring meter socket replacement will require a Mesa County permit and inspection.

4. Meter Pedestal and Ground Rod

Grand Valley Power can supply a meter pedestal at the Customer’s expense (see specs), or the Customer can fabricate their own (see guidelines). Grand Valley Power provided meter pedestals should be provided with a main 200-amp breaker. The Grand Valley Power meter pedestal is arranged to accommodate other small-frame breaker(s) (total 150-amps), provided by the Customer. The underground service conductors provided by the Customer/Developer from the meter pedestal to the house shall be terminated by the Customer/Developer at the breaker load terminals. Main breaker lugs limit the maximum size service wire to 300 MCM.

One driven ground rod shall be provided by Grand Valley Power at the pole base if the Grand Valley Power meter pedestal is within 6 feet of the pole. Grand Valley Power meter pedestals at distances over 6 feet from the pole will have a separate external ground rod at the pedestal location.

5. Meter Seals and or Meter Loops

Meter seals and/or meter loops are not to be cut by anyone other than Grand Valley Power. Scheduling for uprates is to be coordinated through the Operations Department at least one day in advance. Grand Valley Power will disconnect the service in the morning of the day scheduled and reconnect later in the day after being inspected by Mesa County. Unauthorized cutting of loops and seals is considered meter tampering and can be prosecuted under provisions of the law.

6. 400-amp service load center and metering

Grand Valley Power utilizes 320-amp meters for 120/240 volt single-phase 400-amp installations by the customer at the customer’s cost. All-In-One combination meter socket-breaker panels are available through local suppliers with two 200-amp main breakers.

7. Three-phase metering equipment

Grand Valley Power furnishes self-contained meter sockets of 200-amp for 120/208, 120/240, or 277/480 volt three-phase, grounded four-wire, wye services.

All three-phase loads larger than 200-amps require a CT housing cabinet provided by the customer. Grand Valley Power furnishes the meter socket and current transformers for installation by the customer. CT cabinets shall be a hot sequenced bus style; (800 A and less bar type CT, greater than 800 A window style CT.)

8. Mesa County Inspection Requirements

Inspection and sticker ("green tag") of the electrical service entrance equipment remain the responsibility of Mesa County. Grand Valley Power shall not connect services without a Mesa County inspection sticker.

9. Underground Service Conduits

Underground Service entrance conduits on the line side provided by the Customer into the meter socket shall be a minimum of 2", except for larger conduits as requested by Grand Valley Power or required by the National Electric Code. A slip joint is recommended on underground risers/conduits whenever they come up through a concrete slab or sidewalk.

10. Grand Valley Power provided Meter Poles

Grand Valley Power furnishes and installs meter poles if requested by the customer. Customer provided meter poles are not acceptable, except for temporary service. Pole standoff brackets are not required on customer service conduits installed on Grand Valley Power meter poles. The only exception is for a second service to an existing meter pole with the first service on standoff brackets.

The weatherhead should be 12-inches below the Grand Valley Power provided service wire attachment. The customer should provide 30 inches of wire (pigtails) from weather head for Grand Valley Power attachment to service wire. The height of the top of the mast must be a minimum of 13-feet to provide an 11-foot attachment to the drip loop.

11. Electrical gutter, two or more meters

If an electrical gutter is required to split the line side service entrance for two or more meters, the gutter shall be equipped with meter sealable slotted tabs as an integral part of the gutter/cover.

12. Front lot line delivery

Front lot line delivery is the Grand Valley Power subdivision/lot standard with the meter located on the side/front of the house. Service is provided at the front lot line by Grand Valley Power to

an electrical junction box or pad-mounted transformer, which serves as the “Point of Delivery”. Underground service wire to the house is furnished and installed by the Customer/Builder from the Grand Valley Power junction box, or pad-mounted transformer to the house. Grand Valley Power shall terminate the Customer/Builder wire inside the junction box or pad-mounted transformer. The Customer/Builder shall trench to one-foot from the junction box and leave an additional 8-feet of wire past the junction box for Grand Valley Power installation. The same applies to temporary construction power set-up.

V. Tap Fee and Refunds

Customers paying for the Grand Valley Power construction of primary high voltage line extension are eligible for a tap refund if and when other customers tap this line section per a five-year contract. All tap fee refund provisions expire after five years.

The original construction cost is proportioned to the location of the tap and the number of customers sharing this line section. Thus if one customer taps at the end of the new extension, the original customer receives half (1/2) of the original primary extension cost, less the cost of their transformer and service work. Tap refunds are calculated by Grand Valley Power.

Subdivision and Mainline Only contracts are not eligible for tap refunds.

VI. Power Quality and Service Voltage vs. Service Lengths

Care must be taken by the Customer to avoid excessively long secondary service runs. Long secondary and/or service conductors can result in voltage drop, voltage rise, and voltage flicker problems. See the write up on Service Voltage vs. Service Lengths.

Grand Valley Power can assist as necessary to help determine the cause of power quality problems associated with the operation of motors, equipment, lighting, or service design. Please contact the Engineering Department if you have any questions concerning power quality.

SERVICE VOLTAGE VS. UTILIZATION VOLTAGE AND SERVICE LENGTHS

Service voltage levels are maintained to conform with Rural Utility Service (RUS) and American National Standards Institute (ANSI) standards. RUS and ANSI require that the minimum service voltage be 114 volts. A minimum of 114 volts is required at the service location, which corresponds to the "Point of Delivery" to the customer.

ANSI requires that the minimum utilization voltage be 110 volts. The utilization voltage of 110 volts is at the terminals of equipment or the outlets located in the house or building. These 110 volts allows for 4 volts drop in the customers wiring from the "Point of Delivery" to the outlet. At minimum voltage levels, these voltage drops correspond to 114 volts at the service point and 110 volts at the utilization point.

If the customer decides to take service at a pedestal or service pole near the transformer and run their own service conductor, the length of their service conductor may cause inadequate voltage levels at the equipment or outlets. Grand Valley Power only assures voltage to the "Point of Delivery" of 114 volts. To maintain a voltage of 110 volts at the point of utilization, the customer only has 4 volts drop allowed in his house wiring and the wiring from the meter to his house. If the customer has a long distance from the meter to his house and large loads at the house, the customer may not be able to limit the voltage drop to 4 volts from the meter to the outlet.

Another major concern of these long customer-owned services is voltage flicker. Voltage flicker is the change in voltage resulting from an increase in load, such as starting motors, using arc welders, etc. Voltage flicker is mostly noticeable in the dimming of lights when the motor is started. The amount of voltage flicker is directly proportional to the length of service conductors. Larger conductors will help reduce the voltage flicker, but may not eliminate the problem. As an example, when a 1 HP 120 volt motor starts, with a 50-foot #2 Aluminum service, the voltage flicker is approximately 3-4 volts. If the same motor starts on a 300-foot #2 Aluminum service, the voltage flicker is approximately 11 volts. The customer may or may not notice a voltage flicker of 3-4 volts; however, a flicker of 11 volts will be noticed by a momentary dimming of lights. If the conductor size on the 300-foot service is increased to 1/0 Aluminum, the voltage flicker will be reduced to approximately 8 volts. An 8-volt flicker would also be noticed by a momentary dimming of lights.

By keeping service lengths short, voltage flicker can be minimized. If a customer installs a long length of service conductor from the metering point to his house, he is increasing his voltage flicker. By increasing the size of the service conductor, the voltage flicker can be reduced but will not be eliminated.

Customer Furnished Meter Sockets

Single-Phase 320, 200, or 100/125-amp Overhead or Underground Service

200-amp meter housings are the minimum size sockets required on new building construction and additions.

The 100/125-amp meter housings are still allowed for use for rewiring for replacement of furnaces, appliances or upgrading services rated at 100 amps or less. A 200-amp housing is recommended.

The use of 200-amp housings does not require the service to be upgraded to 200 amp unless required by applicable codes.

The 100/125-amp meter housing will be allowed for use on services with small loads such as signs and sprinkler controllers.

The above guidelines do not apply to stacked meter housings or mobile home meter pedestals. Please contact Grand Valley Power for meter housing guidelines for these purposes.

All meter sockets shall be ringless with printed fiber cover plate and must be U.L. approved. Grand Valley Power does not require a fifth terminal; however, if equipped with the fifth terminal, it shall be in the 9 o'clock position.