



Consumers Power Inc. Single Phase Service Requirements

Effective June 2019

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This Electrical Service Requirements manual (ESR) was prepared to aid the applicant through the process of obtaining service from Consumers Power Inc. (CPI). It is the applicant's responsibility to ensure compliance with this manual. The applicant is liable for all work performed by, or on behalf of, the applicant, and any resulting loss or damage. This manual applies to new, relocated, rewired, and upgraded single phase residential services. If additional information is required, please contact CPI at 541.929.8588 or via email at info@cpi.coop.

1. Steps for New Service or Service Revisions

1.1. Getting Started

Gather details and visit our website. You will need the following information; the meter base size, voltage needed, type of electrical load, contractor info, site address with parcel number, and a sketch of your job site.

1.2. Submit an Application

An application must be submitted via our website for each new meter to be served, or for changes to an existing meter location. The application is available at: <https://www.cpi.coop/construction-revisions/application-for-construction/>. A Field Investigation Fee must be paid for the application to be submitted.

1.3. Appointment With a Field Engineering Technician

CPI will assign a Field Engineer Technician (FET) to your project after your application has been received. An appointment will be scheduled (typically within two weeks) to meet on-site to review your plans and CPI's requirements. At the time of your appointment, your building location must be staked.

1.4. Designing Your Project

The Field Engineer Technician will design your project and have an invoice issued. The invoice will be sent to you via email or mail and is valid for 90 days. The invoice must be paid in full before CPI will proceed with construction, and all construction must be complete within 120 days of payment.

1.5. Permits, Right of Way, and Easements

All permits, rights of way, and easements required for the installation and maintenance of the electrical facilities that serve the applicant must be acquired, approved, and recorded prior to scheduling construction. CPI will provide the easement documents, if required. The applicant will be responsible for securing all necessary signatures and

notarizations. All documents must be returned to CPI for recording with CPI and applicable counties. If special permits (such as road, railroad, and forest service) are required for the applicant's project, CPI will submit the required permits.

1.6. Trench Inspection

Each Applicant is responsible for all trenching, and providing conduit, pull string and meter base. All trench must be inspected by a CPI representative. Trench inspection are typically completed within two working days of being requested. To schedule a trench inspection contact the assigned FET or call (541) 929-8588.

1.7. Construction

Once CPI has been notified that a meter base is "green tagged", the work will be released to CPI's Operations Department for scheduling. Typically, work can be scheduled for completion within two weeks. During heavy construction season, scheduling for completion may be closer to three weeks.

2. General Requirements

2.1. Maximum Available Fault Current

The applicant shall furnish equipment to withstand available fault current. Upon request, CPI will supply information required to calculate the maximum fault current available at the applicant's service entrance. This information is only valid at the time of construction.

2.2. Temporary Service Disconnect

Temporary service disconnect of applicant-owned equipment may be required to safely maintain and upgrade facilities belonging to the applicant or CPI. If applicant requires a disconnect please contact CPI to coordinate disconnection at (541)929-8588.

2.3. Applicant Equipment on CPI Poles

Applicant owned equipment including, but not limited to, metering equipment, switching devices, conduits, conductors, luminaries, etc., are no longer permitted on CPI poles. Applicant will be required to remove all such equipment.

2.4. Call Before You Dig

Oregon state law requires the applicant/excavator call for underground utility cable locations at least two full working days (48 hours) prior to any excavation. Excavation shall not start until facilities have been marked by an underground locator service, or until the service confirms that no facilities exist in the area.

IMPORTANT: Call 8-1-1 or (800)332-2344 before you dig.

2.5. Grounding and Bonding

Grounding and bonding are critical for safety and electrical reliability. The applicant is responsible for ensuring all installed electrical service equipment and wiring is grounded and bonded in accordance with applicable NEC requirements.

2.6. Vegetation/Landscape

The applicant shall maintain the premises such that vegetation and landscaping do not block, conceal, or interfere with CPI's access, operation, or maintenance of facilities.

2.7. Power Quality

Unless otherwise specified in a service agreement, electric service is intended to be continuously available. CPI does not guarantee constant or uninterrupted delivery of electric service and shall have no liability to its members or any other persons for any interruption, suspension, curtailment or fluctuation in electric service or for any loss or damage caused thereby.

Electric service supplied by CPI may be subjected to voltage disturbances which do not normally affect the performance for typical electrical equipment. These disturbances may result in the improper operation for voltage sensitive equipment.

The applicant shall provide devices adequate to protect their equipment from high and low voltage, from overload. Devices between the meter and the socket may be allowed at the sole discretion of CPI.

2.8. Generation

2.8.1. Backup generation: Contact CPI prior to installation of any generation equipment. Any service found with a generator installed without permanently installed transfer switch ("break-before-make") will be permanently disconnected until transfer switch can be installed and inspected. Resultant to CPI Service Rules and Regulation #4; CPI shall disconnect or isolate any wire, line, or equipment that could reasonably be expected to endanger life or property.

2.8.2. On-site generation: All interconnected generation installations should be approved by CPI prior to installation. Single phase generation installations greater than 30 Amps shall have a manual/lockable disconnect switch. The disconnect switch must be readily accessible to CPI at all times, and located within 10 feet of CPI's meter. For additional solar requirements contact CPI at (541)929-8520.

3. Service and Meter

3.1. Type of Services

CPI's standard single phase electric secondary service voltages is, 120/240 Volts, 3-Wire.

All other voltages must be approved in advance by CPI.

CPI does not guarantee the constancy of its voltage or frequency; neither does it guarantee against the loss of service, and shall not be held responsible for damages caused by any of the above conditions.

3.2. Load Requirements

Large loads can create operational problems or may cause objectionable voltage dips to neighboring customers. For this reason, the following requirements apply to equipment connected to single-phase services. The applicant shall provide the necessary control equipment which will, to CPI's satisfaction, eliminate excessive starting current or undesirable voltage fluctuations, or excessive harmonics on CPI's circuits. CPI's Service Rule and Regulation #4: CPI can de-energize an unsafe or non-compliant service installation.

Requirements:

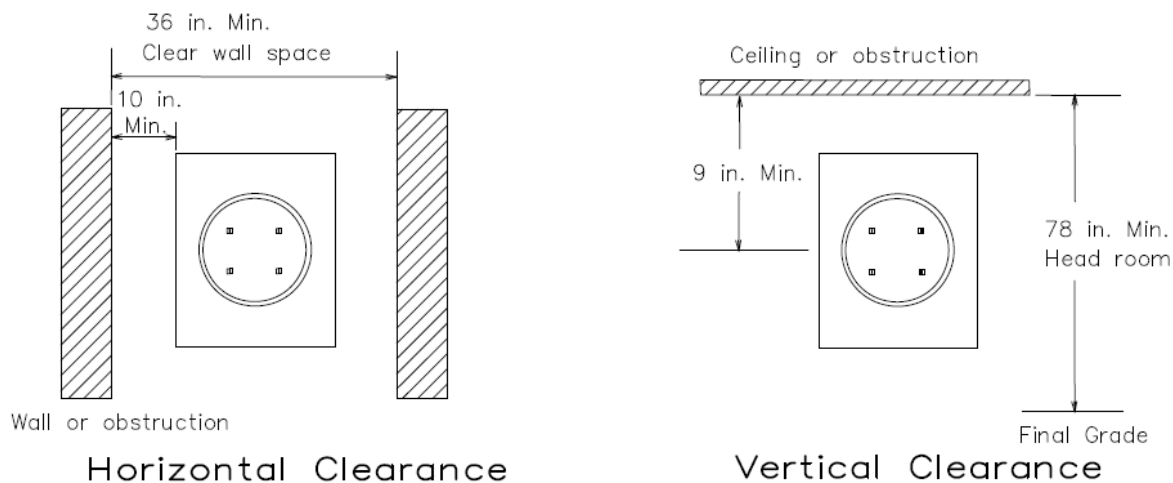
- Consult CPI regarding the use of motors larger than 5 horsepower. Reduced or soft starts may be required.
- Air conditioners and heat pumps larger than 5 tons require prior approval from CPI.
- Consult CPI regarding space or water heaters greater than 48 amps (11.5 kW), or any AC Level II electric car charger. This equipment could cause objectionable voltage dips to neighboring members, and a service upgrade maybe required.
- CPI will require the applicant to use three-phase service if, in CPI's judgment, the applicant's load is excessive or the applicant's motors, equipment or operating characteristics could cause objectionable voltage dips to neighboring customers.
- Loads greater than 100 kVA through one service point require three-phase service.
- Single-phase service over 320 amps requires current transformer metering.

3.3. Service Location and Clearance

The location of the applicant’s service entrance is an important consideration for safety, access, and privacy.

- Service entrance locations shall be approved by a CPI representative prior to installation.
- Service entrance location must be accessible at all times and should not be located in areas which are inconvenient to enter, or where accessibility will be obstructed by future alterations or additions.
- The service entrance location for residential applicants must be located on the front of the building or no more than 10 feet back from a front corner.
- Service entrance shall not be located within 36 inches of gas meter, window, door, or directly over any window well, stairway, ramp, or steps.
- Service entrance location shall be unobstructed with a working space of 36 inches wide x 36 inches deep x 78 inches high. See Figure 3.1
- Meter socket should be mounted between 4 and 6 feet above ground level.

Figure 3.1 Meter Socket Clearance Requirements



3.4. Residential Meter Socket

- Acceptable meter sockets are manufactured in accordance with the current EUSERC, ANSI-C12, and UL/ANSI-414 requirements.
- The applicant must provide and install the meter socket, complete with terminal lugs, meter jaws, and sealing means for all sections.
- All sockets shall be ring-type. Ring-less meter sockets are **NOT** allowed.
- A single-phase, direct connect underground residential socket that has a maximum current capacity of 125, 200, or 400 (320 continuous) amps and is approved by ANSI, UL, EUSERC, and CPI may be used.
- Residential services requiring greater than 400 amps (320 amp continuous) will require CPI approval, and require current transformer metering. Contact CPI for approval and requirements.
- Residential underground-approved combination meter socket for 100 and 200 amp maximum, single-phase service (EUSERC 301 and 301A). The variable dimensions indicated in Figures 3.2 and 3.3 are listed in Table 3.1
- Residential underground-approved meter socket for 400 amp maximum (320 amp continuous), single-phase service (EUSERC 302A and EUSERC 302B). See Figure 3.4
- Applicant-owned conductors cannot enter or pass through CPI compartment in the meter socket except in a 320 amp meter socket.

Figure 3.2 100 and 200 Amp Underground Single Phase Service (EUSERC 301)

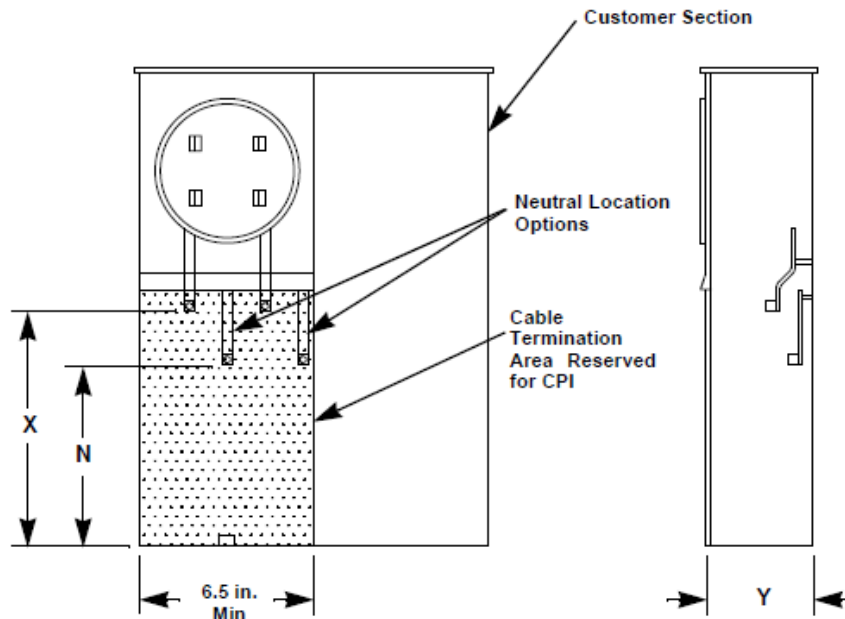


Figure 3.3 200 Amp Maximum Underground Single Phase Service (EUSERC 301A)

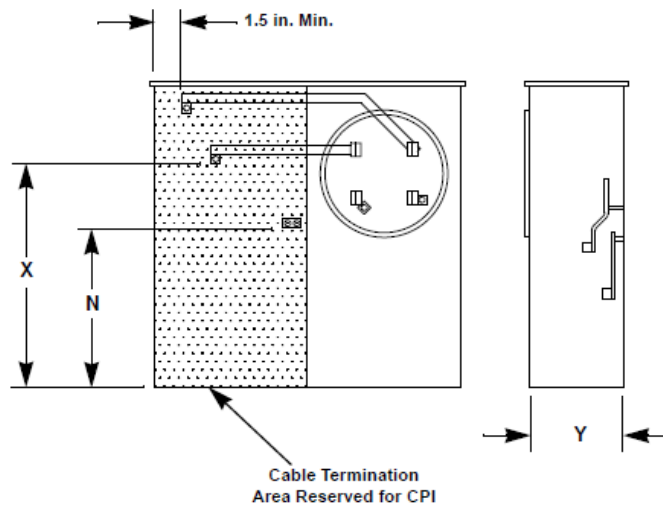
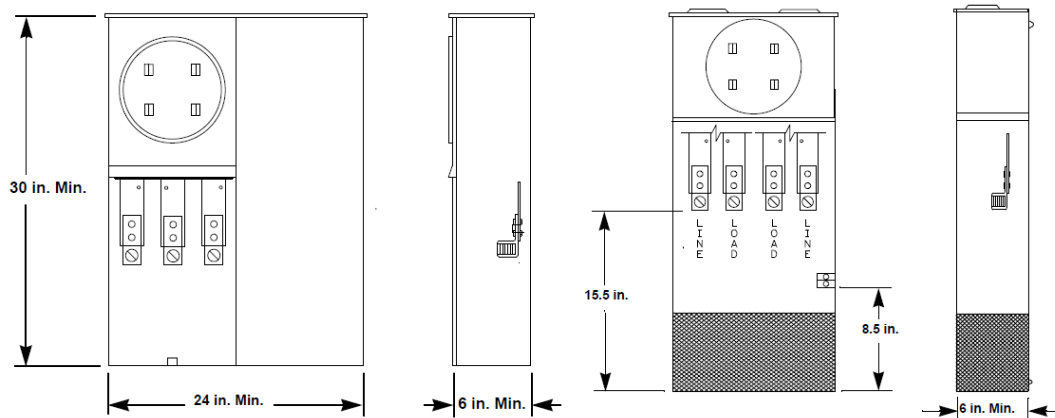


Table 3.1 Dimensions for 100 and 200 Amp Underground Single Phase Service (EUSERC 301 and 301A)

Amps	Dimensions (inches)		
	N	X	Y
125	6	8	4
225	8.5	11	5

Figure 3.4 400 Amps (320 Amp Continuous) Underground Single Phase Service (EUSERC 302A and EUSERC 302B)



3.4.1. Meter Socket Mounting

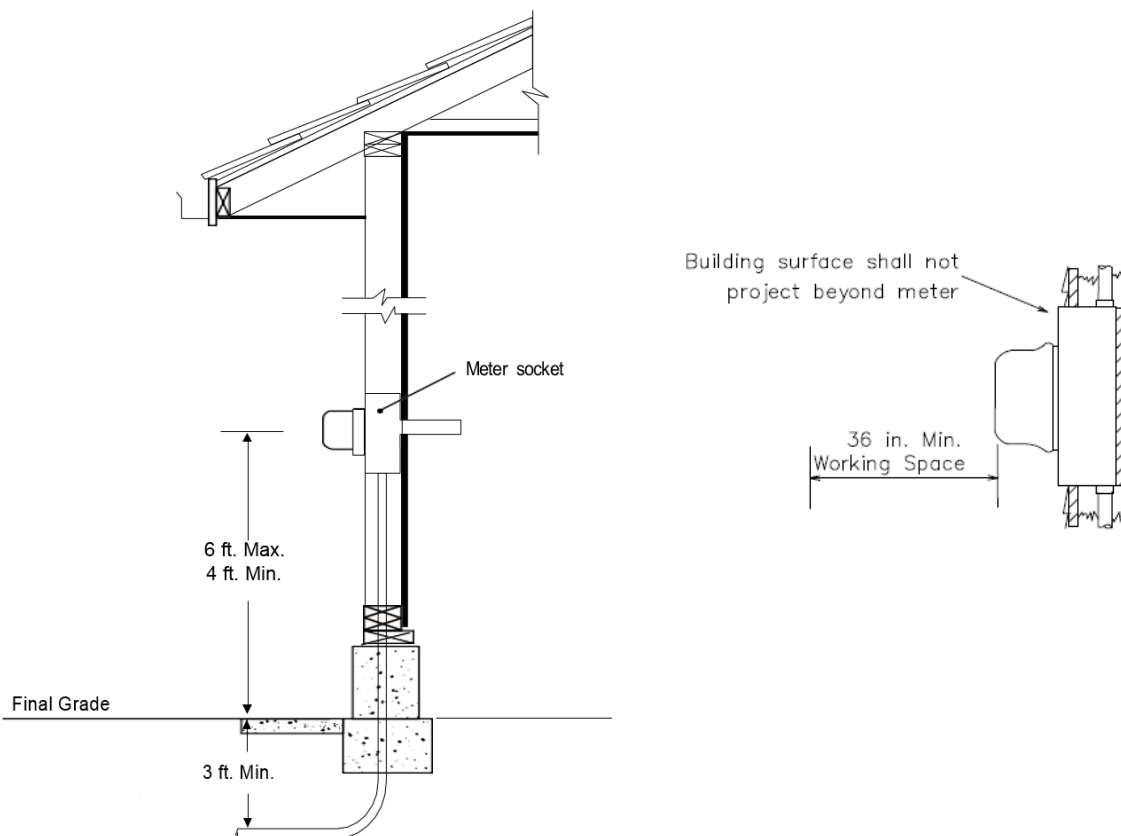
Meter socket mounts must meet the following requirements:

- Sockets must be plumbed in all directions and securely mounted to a rigid surface.
- Conductors must be securely fastened to their respective terminals and arranged in a manner which will not interfere with the installation of CPI's conductors, the meter, or cover.
- Meter clearances must comply with Figure 3.1.
- The unmetered service conductor and the metered service conductor shall not be run in the same conduit, raceway, or gutter.

3.4.2. Flush Mount Meter

- Flush-type box or meter cabinet designed specifically for flush-mount shall be installed.
- Building surface must not extend beyond the face of the meter box, or inhibit the opening of the meter box face, see Figure 3.5.

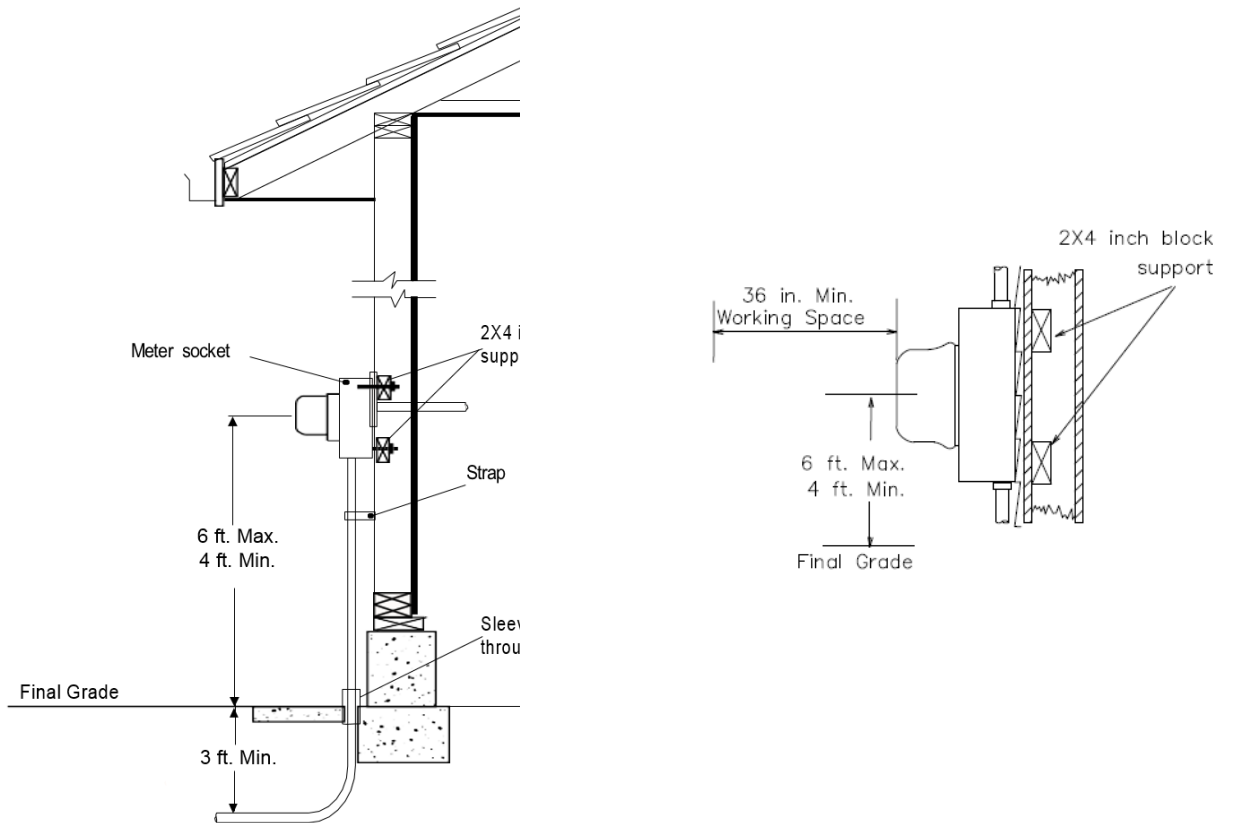
Figure 3.5 Flush Mounted Meter



3.4.3. Surface Mount Meter

- Surface mount meter panels must have a minimum of two 2 X 4 inch back supports, see Figure 3.6.
- Use a strap to secure the conduit to the building.

Figure 3.6 Surface Mounted Meter

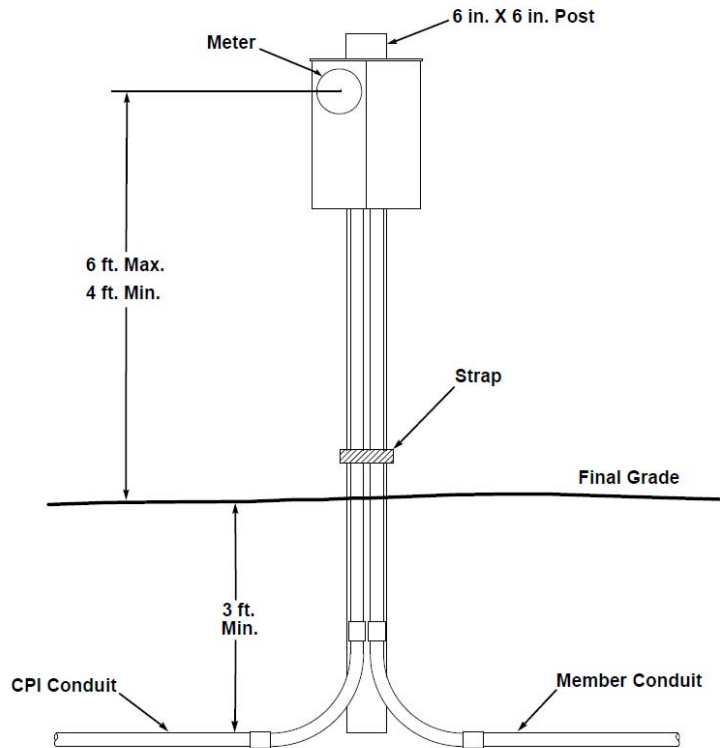


3.4.4. Post Mount Meter Pedestal

The following requirements apply when installing a post-mounted, freestanding residential meter pedestal such as the one shown in Figure 3.7.

- A minimum 6 x 6 inch pressure-treated wood post owned by the applicant must be installed. Firmly tamp the earth around the post; dome the earth to allow for settling. A railroad tie is not an acceptable alternative to the 6 x 6 inch pressure-treated wood post.
- The post shall be set no less than 3 feet below ground level with suitable backfill.
- Use a strap to secure the conduit to the post.
- CPI will determine the exact location of the meter.

Figure 3.7 Post-Mount Meter Pedestal



4. Underground Requirements

4.1. General

The applicant is responsible for the trenching, backfilling, compaction, conduit, transformer pads or vaults, excavation, site restoration, and for all associated costs on the premises. This also includes costs for work outside the project to allow connection to CPI facilities.

- All primary line and secondary services must be in conduit. Consult CPI for conduit layout, and for equipment foundation requirements for secondary and primary extensions.
- All surface structures must be within 20 feet of a maintained drivable surface.
- Maximum service length from a transformer is 150 feet, and 50 feet from a service pedestal.
- The applicant must provide space for the transformer or pedestal on private property.
- In most cases, CPI will install, maintain, and own the underground service lateral from CPI's distribution line or transformer in the applicant's conduit to the point of delivery.
- The applicant is responsible for all costs associated with boring if that method is required.
- The applicant is responsible for recognizing potential surface and subgrade water flows and coordinating with CPI to minimize potential runoff problems.
- An aerial extension (primary or secondary) to connect a new underground service is not allowed, unless CPI determines it is necessary.
- All excavating within road right-of-way will be completed by CPI approved excavators and cost will be included in estimate.

4.2. Trenching and Back Fill Requirements

4.2.1. Trenching

- Before trenching, the applicant shall have the route staked by a CPI representative. Any trenching or any part of a conduit system installed before approval of route from CPI may be subject to rejection or revision.
- The applicant shall provide all trenching. All trenching work shall comply with all OSHA requirements, including shoring required when the combined height of the trench and the spoil exceeds 5 feet.
- The applicant shall keep the spoil at least two feet away from the open trench.
- Trench bottoms shall be level and made of well-tamped earth or selected backfill without sharp rises and drops in elevation. Rock spurs or ridges shall not project into the trench. The applicant is responsible for ensuring a clean trench prior to conduit installation.

- A joint utility trench should be wide enough to leave required separation between utilities. A minimum of 12 inches of separations horizontal and vertical is required between utilities.
- Provide trenching to a depth of 36 inches of minimum cover over conduit for secondary services.
- Provide trenching to a depth of 48 inches of minimum cover over conduit for primary lines.
- If rock or other obstructions are encountered, consult CPI.

Figure 4.1 Primary Trench Horizontal Configuration Detail

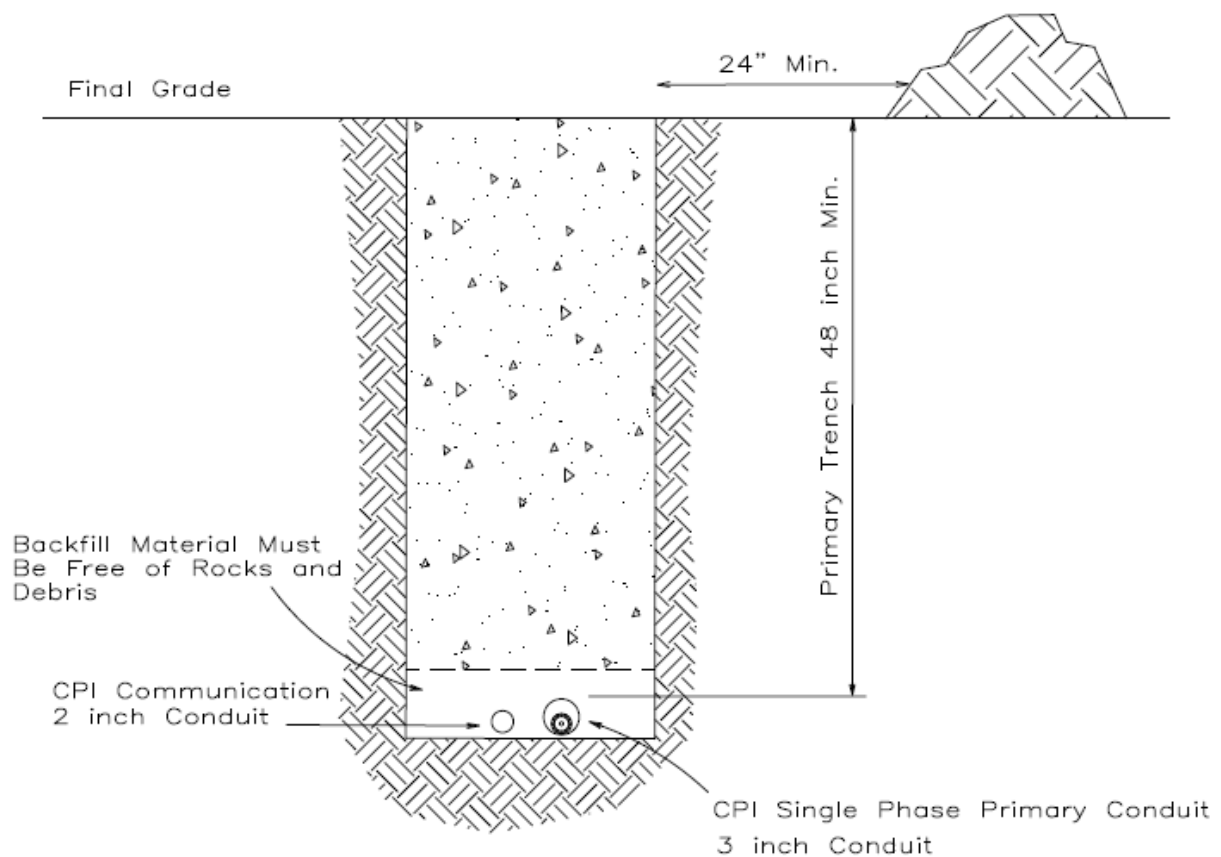
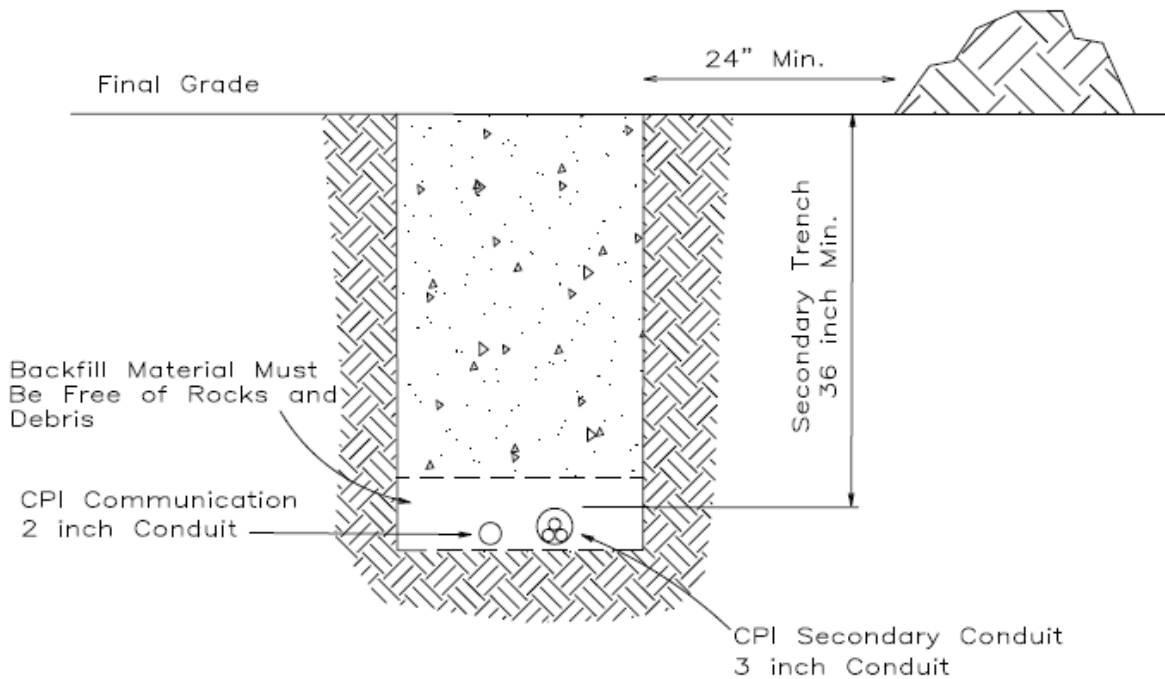


Figure 4.2 Secondary Trench Horizontal Configuration Detail



4.2.2. Backfill

- Backfill material within 6 inches of the conduit must be free of rock and debris.
- Backfill in the remainder of the trench must be free of rocks larger than 4 inches in diameter, sharp rocks, construction waste, or organic material.

4.3. Conduit

The following list of requirements applies to all conduit installations:

- Before installing any conduit system, the applicant shall have the route of the conduit system staked by a CPI representative. Any conduit system or any part of a conduit system installed before approval of route from CPI may be subject to rejection or revision.
- Conduit for primary and service runs shall be 3 inch, unless otherwise specified. See Table 4.1
- All primary and service conduit runs shall have a 2 inch communication conduit run parallel, See Figures 4.1, 4.2, Trenching Details.

- The applicant shall ensure that the conduit is located away from (and never underneath) buildings, building foundations or other structures (including retaining walls). Conduit runs parallel to building must be a minimum of 6 feet away from the building or structure.
- Applicant-installed conduit must be inspected by a CPI representative before backfill.
- The applicant shall provide and install electrical grade fiberglass or schedule 40 gray PVC conduit and long radius sweeps (elbows) below grade, and schedule 80 above grade.
- No more than 270 degrees of bend allowed for each conduit run.
- All sweeps shall be factory made PVC or fiberglass as specified. Field bends or field heat bends are not acceptable. See Sweep Radius Specifications in Table 4.1
- All PVC joints must be glued. All factory- or field-cut conduits must be chamfered to prevent damage to cables.
- 3 inch to 2.5 inch smooth wall swedge reducer may be used, if needed at the meter socket.
- When conduit terminates at CPI's equipment, the applicant shall consult CPI for the exact conduit location. The applicant shall not install conduit within two feet of the equipment, unless requested by CPI.
- When conduit terminates at CPI's pole, the applicant shall consult CPI for the exact conduit and sweep location. Vertically terminated conduit should be a minimum of 4 inches to a maximum of 6 inches from the pole. See Figure 4.3.
- The applicant shall keep conduit free of dirt and debris during installation.
- The applicant may be required to proof conduit systems with a mandrel that confirms 80% of the nominal conduit diameter. The mandrel sizes for a 3 inch conduit proofing mandrel shall be 2.5 inch diameter and a minimum length of 3.5 inches.
- CPI will not install a conductor if the conduit system is improperly constructed. The applicant is responsible for repairing crushed conduit, including the cost for the crew to return to the job site.
- The applicant shall not install member-owned conductors in the same conduit system with CPI's conductors.
- The applicant shall provide a flat pull line (preferred) or poly rope (alternative) capable of withstanding 200 lbs. of tension, installed with 10 feet of extra line able to extend from each end of the conduit. Secure the pull line inside the ends of the conduit and cap or cover both ends.
- A stronger conduit material, larger conduit size, additional conduits, or a larger bend radius may be required for longer runs or larger sweep radius may be required for long runs or more than three bends. The applicant shall obtain written approval from CPI for exceptions.

Figure 4.3: Vertical Termination at Pole

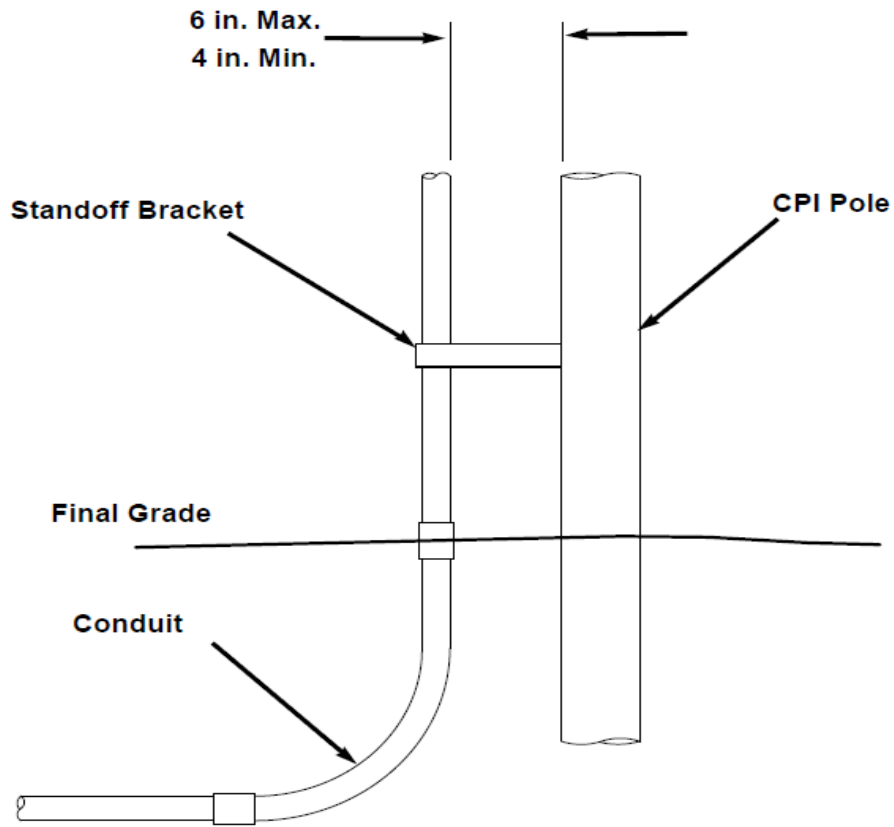


Table 4.1 Conduit Requirement

Phase	Load	Maximum Conduit Length from Transformer (ft.)	Maximum Conduit Length from Pedestal (ft.)	Conduit Size	Max. Degree of Bends	Sweep Radius (inches)
Single	100 to 320 Amps	150	50	One 3-inch	270	36
Single	400 to 600 Amps	150	NA	Two 3-inch	270	36
Single	Greater than 600 Amps	150	NA	Contact CPI	270	36

4.4. Ground Sleeve

- Locate ground sleeve for transformer or junction with access doors away from building or other barriers to allow safe working practice.
- No vegetation or trip hazards permitted in work space.
- Minimum distance required for the ground sleeve see figure 4.4
- Consult with CPI on additional required clearances from building fire escapes, air vents, gas meters, windows, and doors.
- Excavate an area of 60 by 60 inch and 24 inches deep below final grade. All soil beneath the pad site must be compacted and level. Base of the excavation shall be filled with 6 inches of compacted 3/4-inch minus gravel prior to setting the vault or ground sleeve to prevent settling, See Figure 4.5.
- Provide one yard of 3/4-inch minus gravel for backfill around the ground sleeve.

Figure 4.4: Minimum Ground Sleeve Clearances

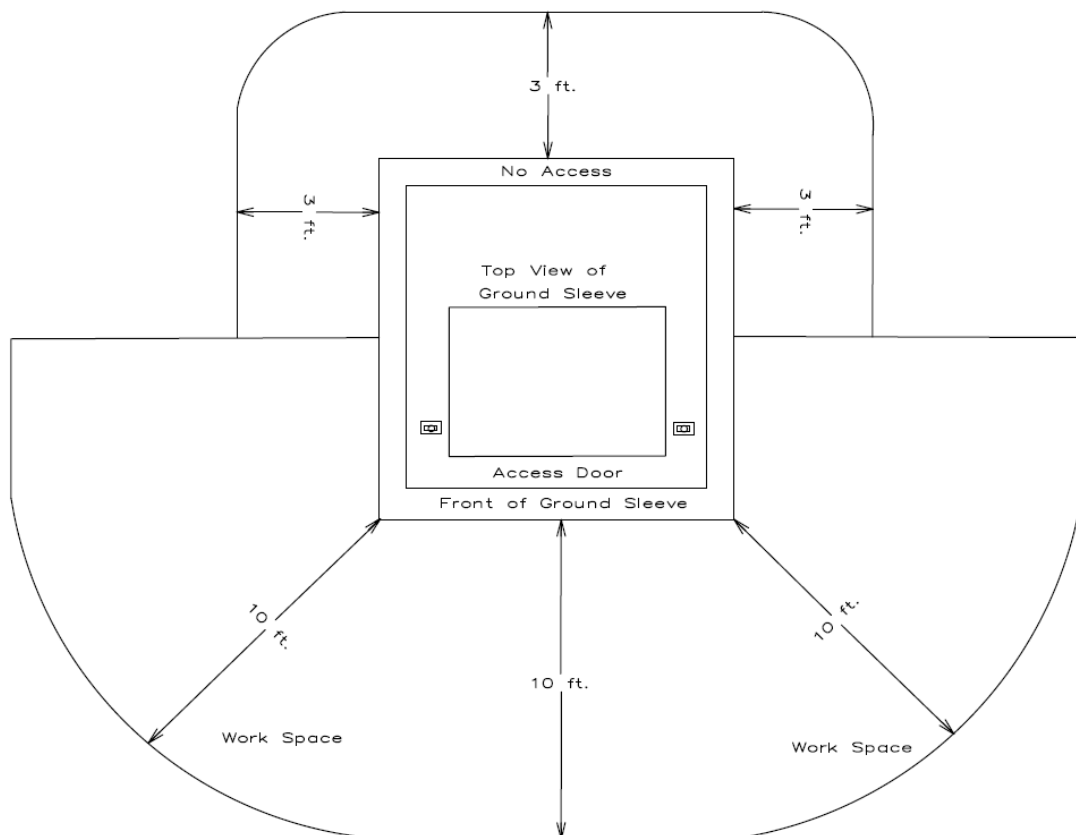
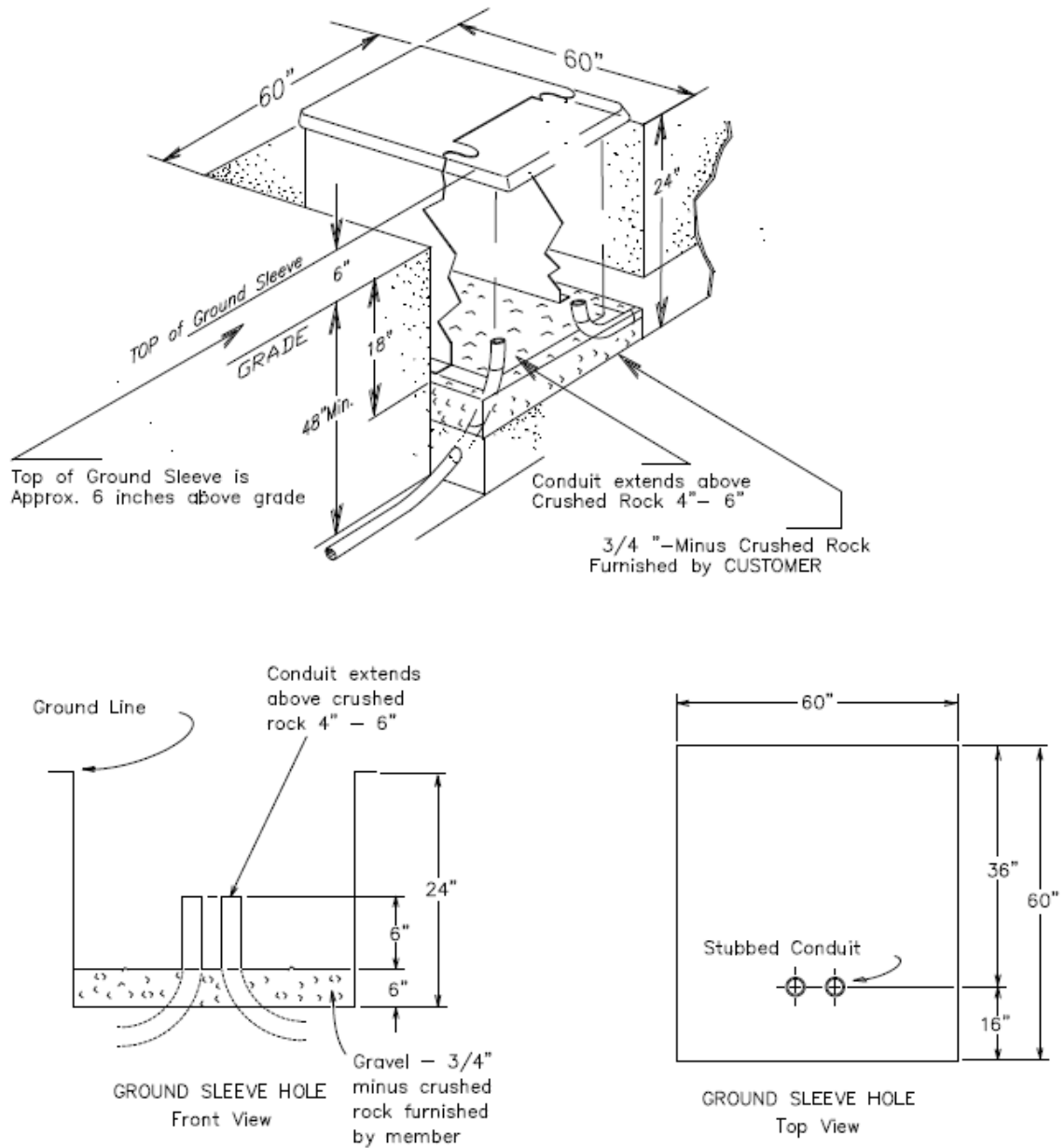


Figure 4.5: Excavation Details



5. Temporary Construction Service

5.1. General Requirements for Temporary Service

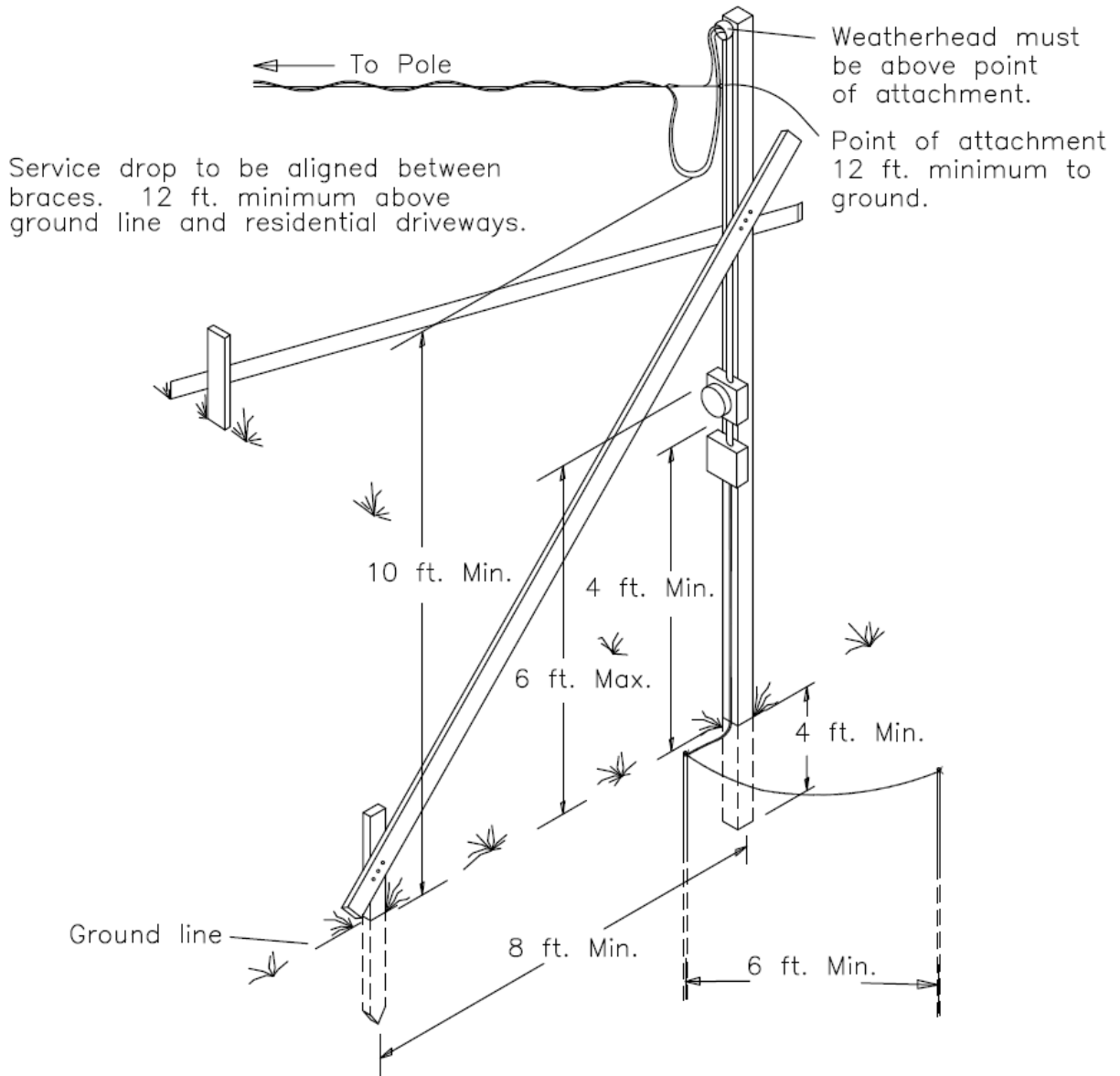
Upon request, CPI can supply temporary service at a location adjacent to the cooperative's facilities. Contact CPI for associated fees to install temporary service.

Installation of a temporary construction service cannot exceed 180 days of use.

5.2. Overhead Temporary Service

- All posts, poles, and stakes must be one continuous piece.
- To ensure strength, the pole or post must be free of any defects that weaken the wood. This includes any visible wood decay, sucker knots, spike knots larger than 1/3 of any face, and checks greater than ½-inch wide.
- All temporary construction service posts, poles, and timbers shall be pressure or thermally treated with an approved preservative.
- The pole or timber for overhead temporary service shall be no less than 20 feet long. A pole shall be no less than 5 ½ inches in diameter at the top; a timber shall be 6 x 6 inch.
- The pole or timber shall be set no less than 4 feet below ground level with compacted soil.
- Grounding per NEC Article 250
- 2 X 4 inch Brace – Minimum 12 feet
- 2 X 4 inch Stake – Set in ground minimum of 2 feet.
- A pole or timber length minimum of 25 feet is required for service drop crossing driveways.
- The distance between the electric utility point of attachment and the temporary service pole or 6 x 6 inch post must be between 10 feet min. and 30 feet max.
- The applicant's equipment must have proof of county electrical inspection before CPI will connect.
- See Figure 5.1

Figure 5.1 Temporary Overhead Service



5.3. Underground Temporary Service

- The applicant shall provide all trenching.
- The applicant-provided service conductor size shall be at least No. 8 copper or No. 6 aluminum.
- The applicant supplied conductor shall be long enough to connect to CPI terminals.
- Grounding per NEC Article 250
- Conduit must be rigidly fastened to the post.
- The post is applicant-owned and shall be made of pressure or thermally treated wood with a minimum size of 4 ×4 inch.
- The post shall be set no less than 3 feet below ground level with suitable backfill.
- A main breaker is required in post installations.
- The applicant's equipment must have proof of county electrical inspection before CPI will connect.
- The code-enforcing agency may require that the grounding connection be visible when the electrical inspection is made. For safety reasons, however, the top of the ground rod should be flush with or below the ground level.
- See Figure 5.2

Figure 5.2 Temporary Underground Service

