



# Delaware County Electric Cooperative Electric Service Specifications

*Guide to install electrical services in the  
Delaware County Electric Cooperative Territory*

F I R S T E D I T I O N

This edition supersedes all other drawings and specifications supplied by Delaware County Electric Cooperative with respect to service installations prior to October 15th, 2024.

# Contents

Purpose of this Document .....	4
CHAPTER 1 Introduction .....	4
General Service Information .....	5
Permanent Service .....	5
Temporary Service .....	5
Service Ampacities (Size) .....	5
CHAPTER 2 Overhead Service .....	5
Overhead Service .....	5
Overhead Line Clearances.....	8
Check List for Installing Overhead Service.....	10
Service Mast, Surface-Mount Meter .....	11
CHAPTER 3 Underground Secondary Service.....	12
Check List for Installing Underground Service .....	12
Locating Underground Utilities .....	13
Trenching .....	14
Installing Secondary Conductors in a Trench.....	15
Underground Secondary Conduit .....	15
Underground Service, Surface-Mount Meter .....	16
Underground Service, Pedestal Meter .....	17
Secondary Riser.....	18
CHAPTER 4 Underground Primary Installations.....	19
Transformer Installations.....	20
Safety Clearances around Transformers.....	20
Work Clearances around Transformers .....	21
CHAPTER 5 Meter Installations .....	23
Locating the Meter.....	23
Meter Location for a Residence .....	23
The meter must be located:.....	23
Do not locate meters: .....	23
Meter Location for a Business .....	24
The location of a meter for a business must be: .....	24

Meters must not be located: .....	24
Electrical Equipment Rooms (with prior approval).....	24
Clearances around the Meter .....	25
Meter Sockets .....	26
General Requirements for Meter Sockets .....	26
Grounding a Meter Socket.....	27
Meter Socket Installation Tips .....	28
Cable Runs.....	28
Services Metered Using Direct-Connect Meters .....	29
Current Transformer Metering .....	29
Multi-Meter Installations .....	30
CHAPTER 6 Right of Way Clearing Specifications.....	32
Clearing Right of Ways for Residential Locations .....	32
Clearing Right of Ways for Rural Locations.....	33
Glossary of Metering Terms.....	36

## Purpose of this Document

This document is to be used as a guide in the installation of new electric service to Delaware County Electric Cooperatives' members. The intention is to give standard drawings and guidelines for the safe installation of standard residential services. It is the responsibility of the homeowner to obtain the properly trained and licensed personnel that are suited for the tasks that are to be completed. These requirements do not replace the regulations of appropriate State, County or Municipal authorities having jurisdiction or NFPA 70, National Electrical Code (NEC) or the National Electrical Safety Code (NESC). The most recent versions of these publications should always be referenced prior to the task that is to be completed. The booklet is not intended to address all possible situations. This is not to be considered a do-it-yourself handbook and DCEC assumes no liabilities for the co-op member's wiring of his or her premises, equipment, or equipment operation.

**Note: In cases where DCEC clearances exceed NEC, NESC, or NFPA; DCEC requirements supersede the aforementioned.**

## CHAPTER 1 Introduction

Installing new electric service is a joint project between the co-op member and Delaware County Electric Cooperative (DCEC). DCEC is responsible for bringing power to the site, obtaining all easements per Cooperative Rules and Regulations Section 11, installing the meter in the socket provided by the member, and for energizing the service. The member is responsible for obtaining permits and inspections, providing the overhead line right of way or underground trench conduit and wire, and for installing the equipment at the service entrance.

Prior to any service connection the co-op member needs to contact DCEC (607) 746 - 2341 and schedule with DCEC staff to review all options available to the member. It is at this time all fees, permits and right of way issues can be discussed and reviewed with DCEC staff.

These specifications are based on and supplementary to the latest edition of the NFPA 70, National Electrical Code (NEC) issued by the National Fire Protection Association and are not intended to conflict with the NEC or municipal and state ordinances. The NEC is hereby made a part of these requirements by reference. Each co-op member is responsible for having all wiring installed in accordance with the NEC and the requirements of any local inspection authority and maintained in a safe condition. The local or state electrical inspector is the "authority having jurisdiction" and is, therefore, responsible for interpretation and enforcement of the NFPA 70, *National Electrical Code* (National Fire Protection Association 2023).

# General Service Information

## Permanent Service

Permanent service is defined as the long-term service to the dwelling, garage, or other permanent facility to be served by DCEC. Voltage for permanent services may be single phase 120/240 volts or three phase voltages (120/240, 120/208, and 277/480), with exceptions for special situations.

## Temporary Service

Delaware County Electric Cooperative does not currently offer temporary service and apologizes for any inconvenience this may cause.

## Service Ampacities (Size)

Services greater than 400-amps will be CT metered on a case-by-case basis as determined by DCEC.

**Note: DCEC requires a minimum of 200-amp service.**

# CHAPTER 2 Overhead Service

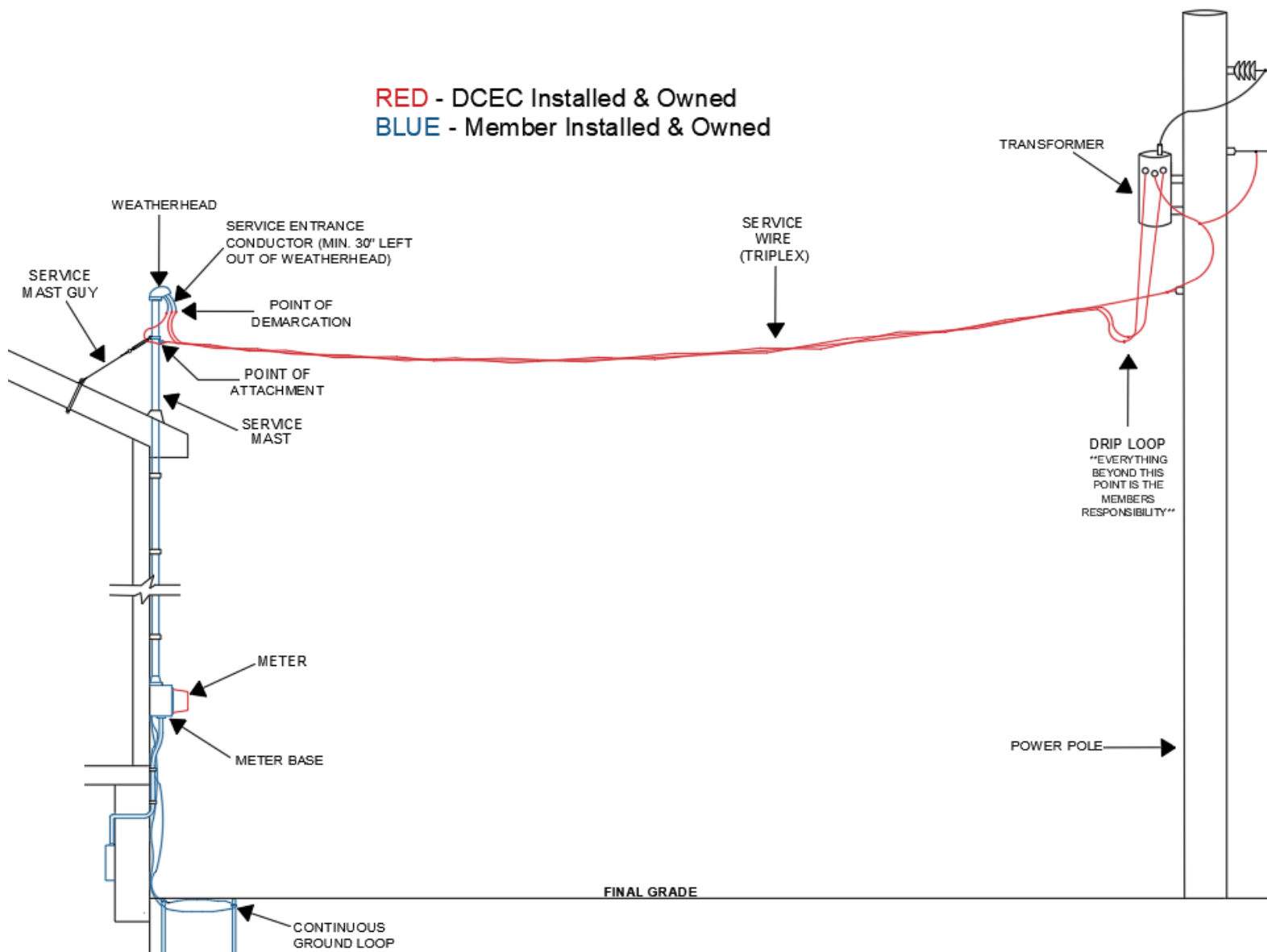
***Prior to any service connection the co-op member needs to contact DCEC (607)746-2341 and schedule with DCEC staff to review all options available to the member. It is at this time all fees, permits and right of way issues can be discussed and reviewed.***

## Overhead Service

The Overhead Service is typically the simplest and most cost-effective method to connect a permanent structure to the utility. DCEC will provide service from the DCEC facilities to the qualified "Service Point" if it meets all state and federal codes/permitting and is qualified under DCEC's Terms and Conditions.

The co-op member is responsible for providing, installing, and maintaining all equipment from the service point to the demarcation point except for the meter. DCEC is responsible for providing and installing the meter and making the final connections at the service point.

The co-op member is required to provide a point of attachment high enough and strong enough, to allow the utility to install the service line to meet the required clearances. If the span of the service line exceeds 100 feet, an intermediate support pole may be required to relieve the tension on the service connection.



**Figure 2-1. Common Features of an overhead mast type service**

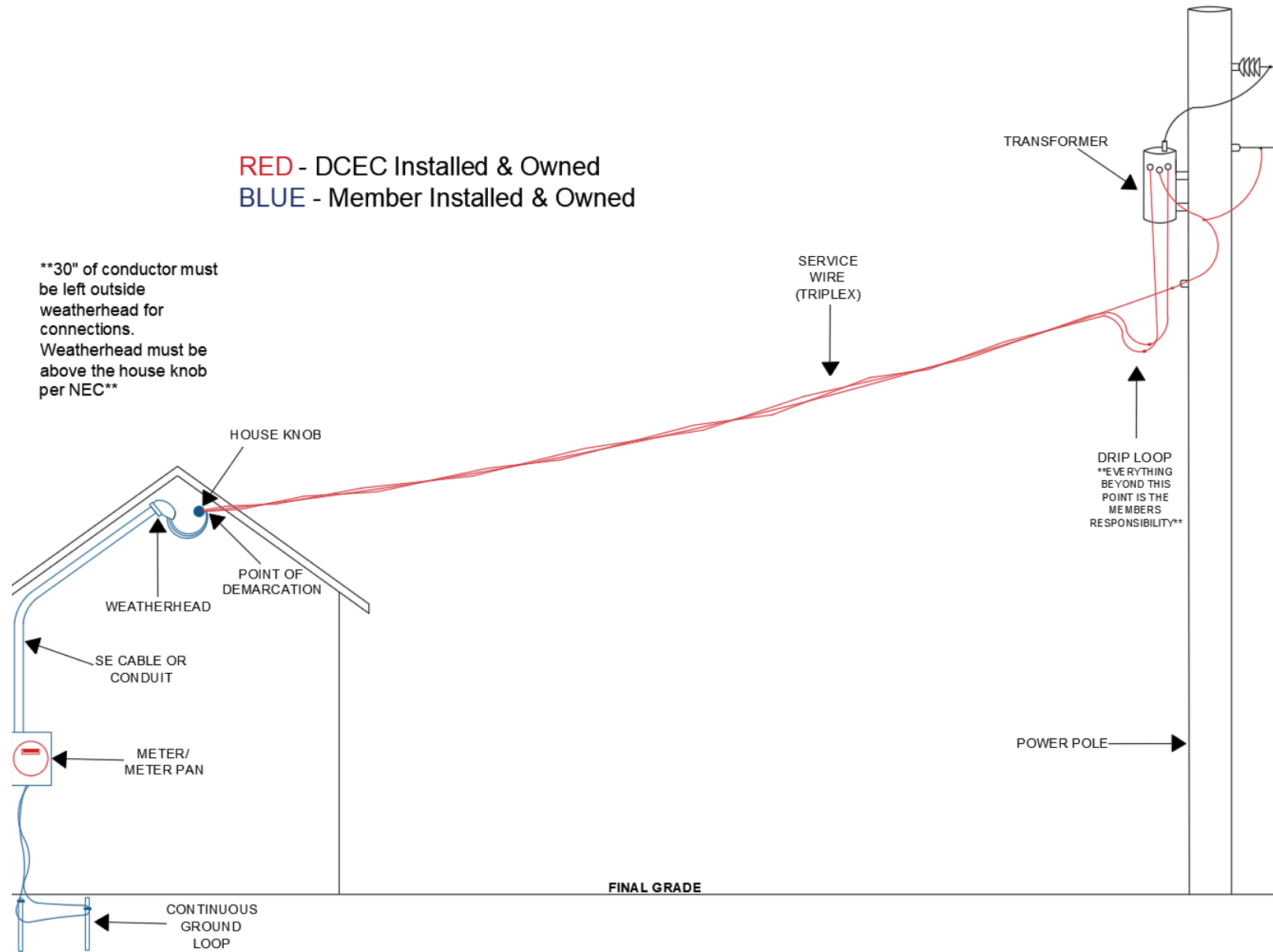
Figure 2-1 shows a finished installation of an overhead mast type service, using a service mast. The co-op member provides everything shown here, except for; the meter, the overhead service line, the power pole and pole-mounted equipment. After the electrician installs the required equipment, DCEC installs the meter in the meter socket, strings the service line, attaches the service line supporting wire (neutral) to the insulated clevis (house knob/mast clamp), and splices the conductors together.

**Note: If Secondary conductor is greater than 60' in length DCEC requires mast to be properly guyed.**

**Note: DCEC requires 2 ground rods to be installed and to form a continuous loop to the meter pan.**

**RED** - DCEC Installed & Owned  
**BLUE** - Member Installed & Owned

**\*\*30" of conductor must be left outside weatherhead for connections. Weatherhead must be above the house knob per NEC\*\***



**Figure 2-2. Common Features of an overhead service without a mast**

Figure 2-2 shows a finished installation of overhead service that does not utilize a mast. The member provides everything shown here, except the meter, the overhead service line, and the power pole and pole-mounted equipment. In this installation the weatherhead must be above the House Knob per *NFPA 70, National Electrical Code (National Fire Protection Association 2023)* In both installations, the member must leave a minimum of 30" of conductor outside the weatherhead for DCEC to make its connections.

**Note: Member must provide a suitable attachment point that can accommodate a 3/8" x 4" lag.**

**Note: DCEC requires 2 ground rods to be installed and to form a continuous loop to ground the meter pan.**

## Overhead Line Clearances

Figures 2-3, 2-4, 2-5 and 2-6 show clearances under overhead service lines, for the conditions most commonly encountered. For other situations and for details, see *NFPA 70, National Electrical Code (National Fire Protection Association 2023)*, the National Electrical Safety Code, or contact the electrical inspector for your area. The co-op member is required to provide a point of attachment high enough and strong enough, to allow the utility to install the service line to meet the required clearances. If the span of the service line exceeds 100 feet, an intermediate support pole may be required to relieve the tension on the service connection.

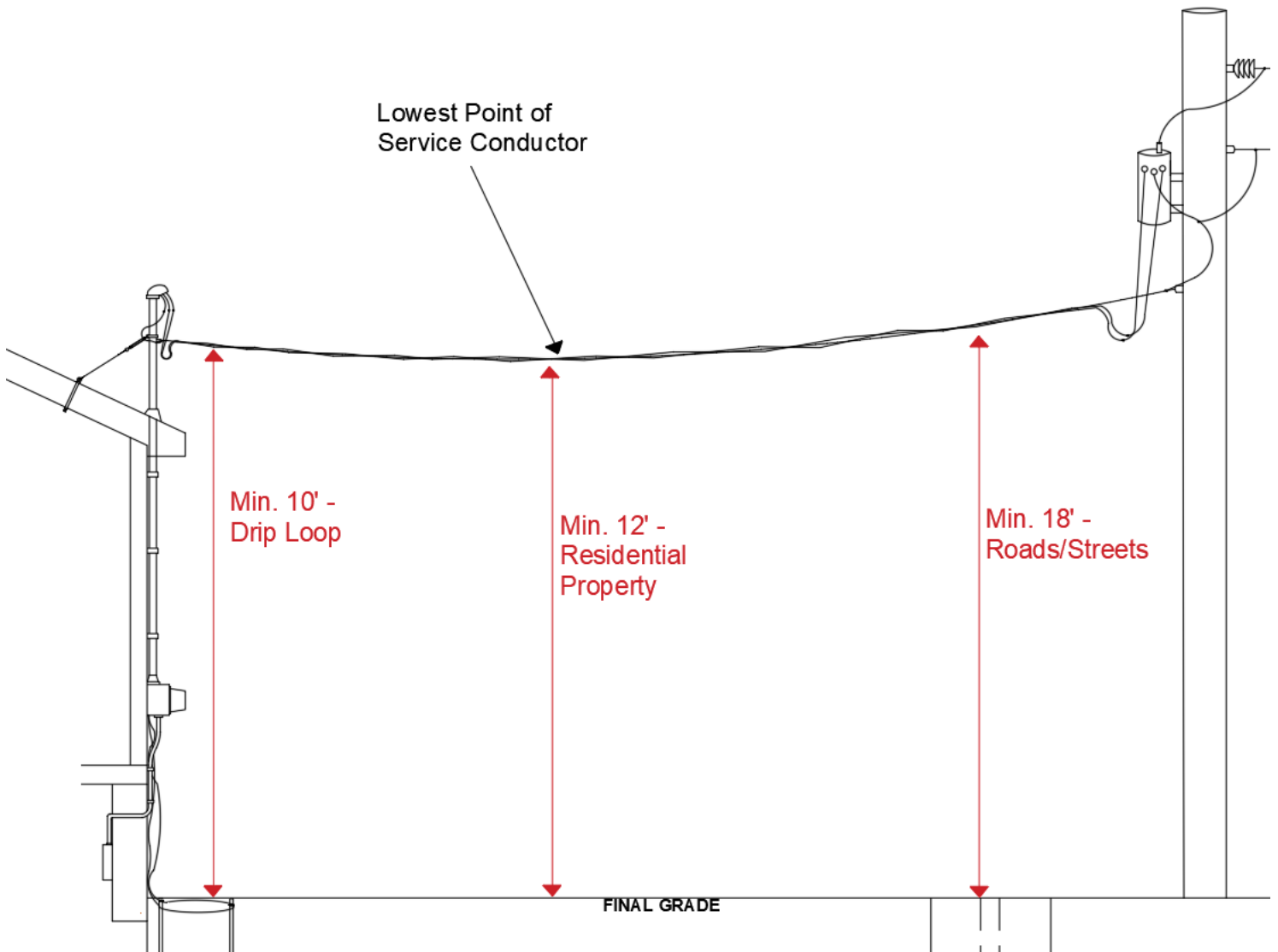


Figure 2-3. Clearances from ground



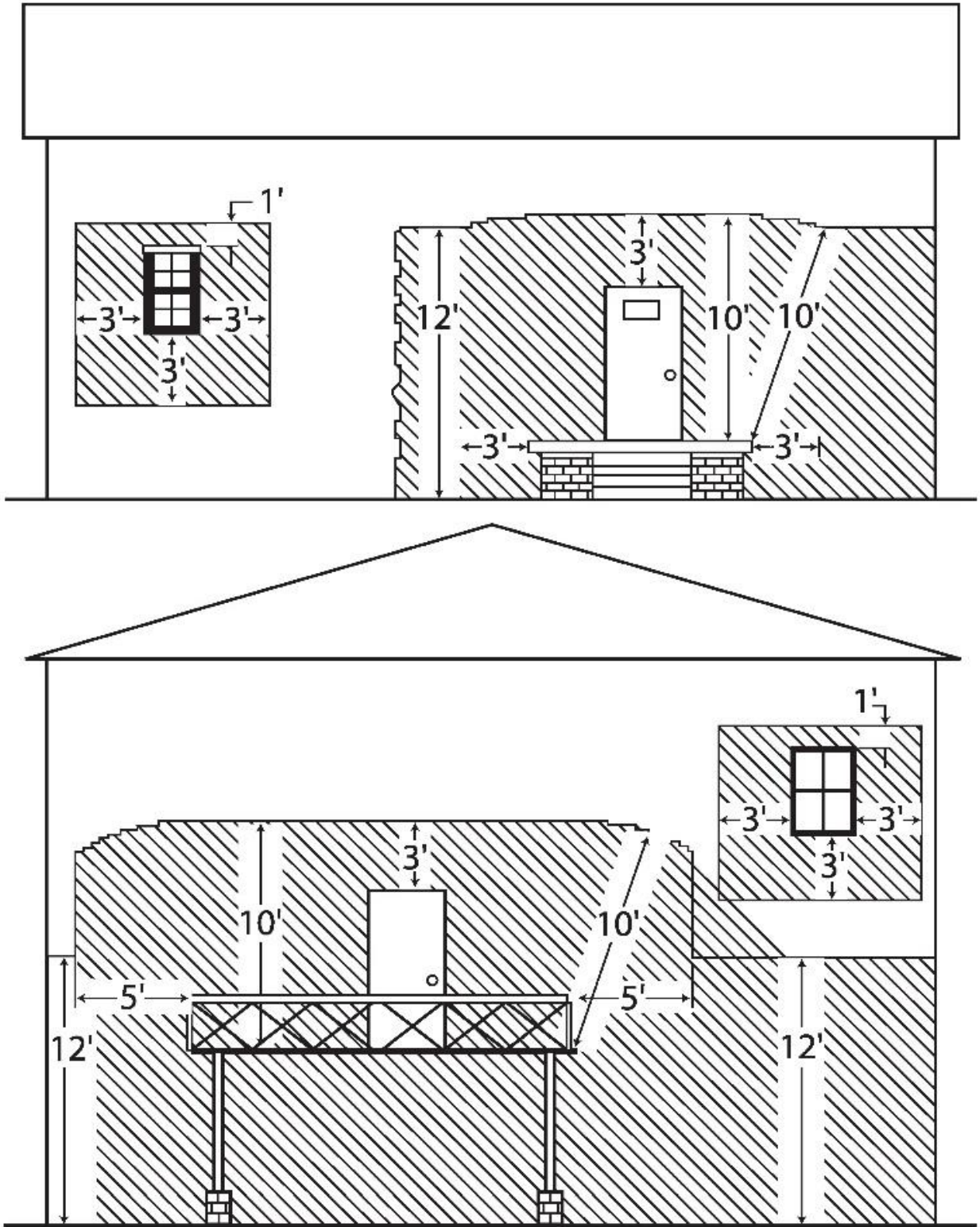
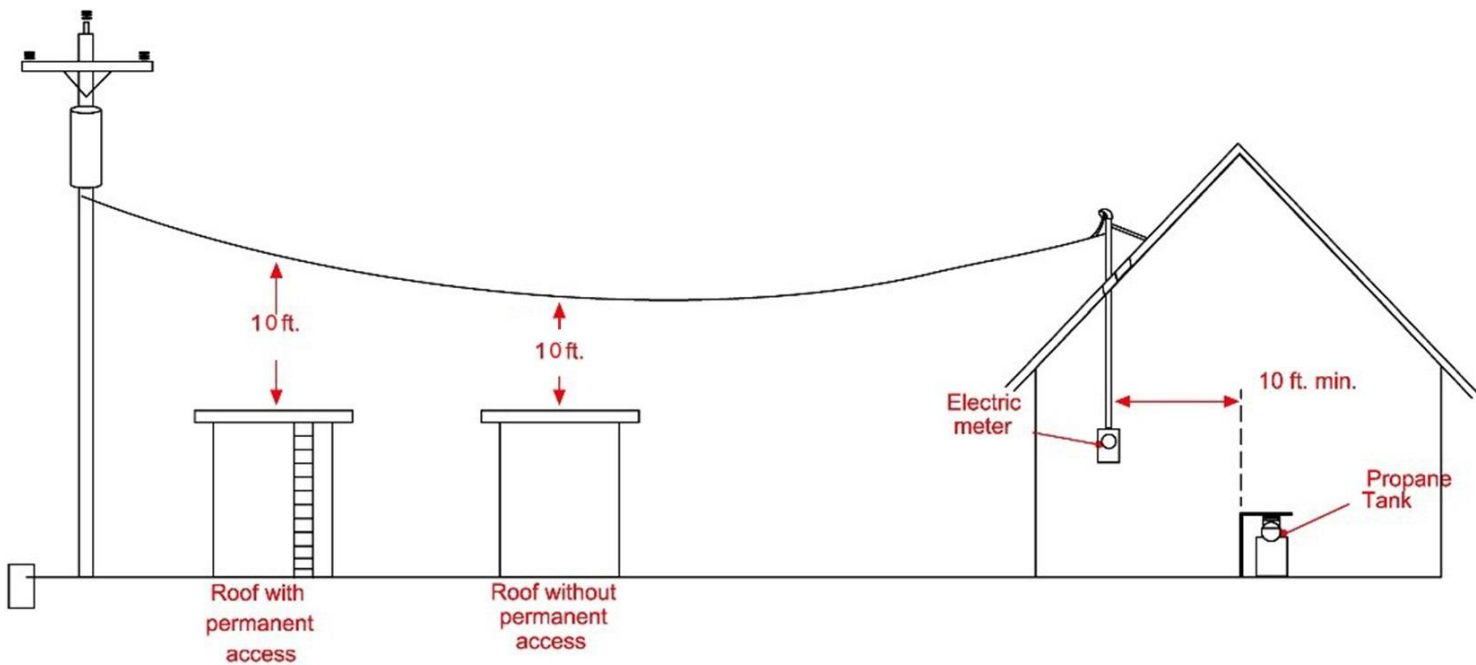


Figure 2-4. NESC Code clearances section 235



**Figure 2-5. Clearances over other structures**

**Note: DCEC Requires 10' min. of clearance over all structures thus exceeding NESC.**

### Check List for Installing Overhead Service

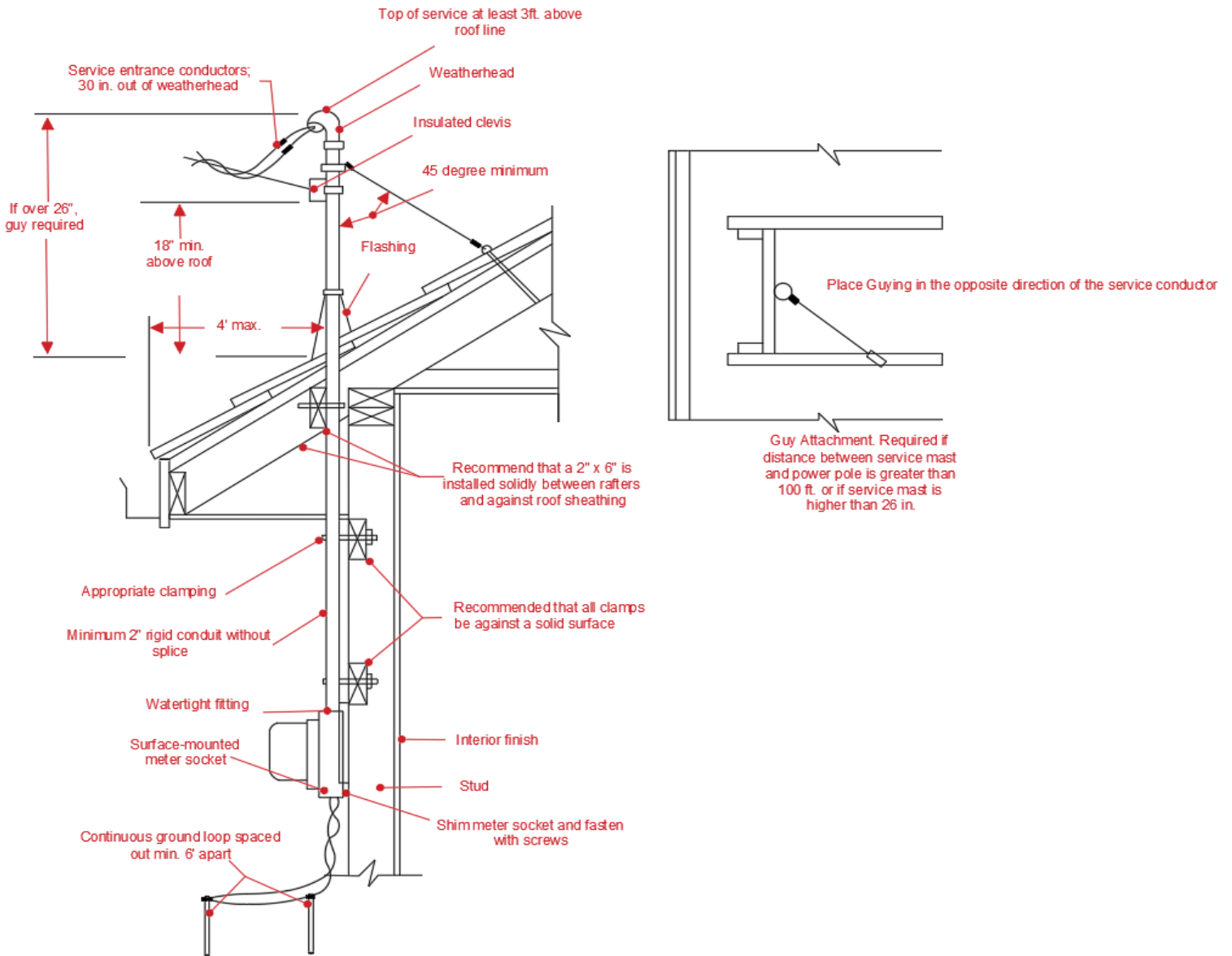
The co-op member is responsible for providing, installing, and maintaining all equipment from the Splice -service point to the service panel, except for the meter.

DCEC is responsible for providing and installing the meter and making the final connections at the service point.

To obtain new overhead service, the member shall:

1. Contact the utility to open an account, determine where the service line will originate from, request service, and set a meeting with DCEC staff if needed. The members will also need to provide DCEC with the load information of the new service.
2. Working with DCEC's staff, select a location for the meter. Figures 2-2 through 2-6 have details on overhead line clearances. At this time, DCEC staff will determine if any easements are required.
3. Install all of the Service Entrance Equipment.
4. Once all contracts are processed (if applicable), inspections and easements are received, fees are paid and the planning work is completed by DCEC staff, DCEC crews will be scheduled accordingly.

## Service Mast, Surface-Mount Meter



**Note: If Secondary conductor is greater than 60' in length DCEC requires mast to be properly guyed.**

**Figure 2-7. Surface mounted meter with a mast installation**

Figure 2-7 shows details of a service mast, with the meter on the surface of the building. The service shall be wired to an exterior meter as shown here. The member installs everything in the picture, except the meter.

After the member installs the Service Entrance Equipment, DCEC installs the meter in the meter socket, strings the service line, attaches the service line supporting wire (neutral) to the insulated clevis, and splices the conductors together.

## CHAPTER 3 Underground Secondary Service

***Prior to any service connection the co-op member needs to contact DCEC (607)746-2341 and schedule with DCEC staff to review all options available to the member. It is at this time all fees, permits and right of way issues can be discussed and reviewed.***

Underground services are an option available to qualified services. DCEC's staff shall determine if the structure qualifies.

An underground service is defined as a secondary voltage running from an existing or newly placed DCEC owned utility pole or equipment to the member's structure or meter pedestal. No underground services will be placed in the road right-of-way. Meters generally will not be allowed on DCEC's poles. Meters shall be placed on the side of the structure to be served or a pedestal located in a convenient location to the member and DCEC.

The member is responsible for providing, installing, and maintaining all equipment from the demarcation point to the service panel, except for the meter.

DCEC is responsible for providing and installing the meter and making the final connections at the service point.

### Check List for Installing Underground Service

To obtain new obtain underground service, the member:

1. Contacts the utility to discuss the project, to determine where the service line will originate from and the service point, and to request the service.
2. If requested, provides DCEC with:
  - Site drawings
  - Load information
  - Payment for pre-construction costs
3. Selects the type of meter installation that fits the situation. There are two options:
  - Surface-mount meter
  - Pedestal-mount meter
4. Calls the locating service ("UDIG" dial 811) to locate any existing underground wires, cables, or pipes. It is the member's responsibility for the digging and the safety of the job site. DCEC will do the locating of DCEC Owned conductors. However, UDIG must be contacted for all other utilities. (Consult local authorities for water and sewer.)
5. Installs the Service Entrance Equipment.
6. Digs a trench from the connection point to the meter location or structure.

7. Places the conductors in pipe and installs them in accordance with NEC an NESC specifications. Members **must** run conduit and wire 10' up the pole. DCEC will install member supplied conduit, wire, & weatherhead the remaining distance up the pole.
8. Labels the conductors at the meter location, and connects the conductors to the meter socket, if applicable. Specifically label the neutral on both ends.
9. Covers the wire/conduit in the trench.
10. Contacts the utility.

Then the utility:

1. Runs member supplied wire/conduit up DCEC pole.,
2. Connects the conductors at the Service point.
3. Installs the meter in the socket.

### Locating Underground Utilities

The co-op member must call the underground utilities locating service at least two full working days not including the day of calling (48 hours) before trenching or excavating for underground service. One call to the locating service notifies all utilities that locates are required. In some areas, not all utilities are members of the one-call system. In those areas, the member must contact each utility individually.

**Note: Member owned secondary underground services are not the responsibility of DCEC to locate, however DCEC will attempt to locate the service if you contact the Cooperative. DCEC is not responsible for the improper mark out of a member's secondary.**

Do not begin excavation until the locations of underground wires, cables, and pipes have been marked, or the utilities have informed the member that they have no facilities in the area.









Any digging within 24 inches of location marks must be done by hand.

The color code for marking underground utilities is:

---

### Color Coding of Underground Service

---

	WHITE - Proposed Excavation		ORANGE - Communication, Alarm or Signal Lines, Cables or Conduit
	PINK - Temporary Survey Markings		BLUE - Potable Water
	RED - Electric Power Lines, Cables, Conduit and Lighting Cables		PURPLE - Reclaimed Water, Irrigation and Slurry Lines
	YELLOW - Gas, Oil, Steam, Petroleum or Gaseous Materials		GREEN - Sewers and Drain Lines

**Table 3-1. Color code for marking underground services**

### Trenching

The member is responsible for digging the service trench and installing conduit and secondary conductors. The member backfills and compacts the trench.

Trenching rules and tips:

- Dig trenches in straight lines between takeoff points, to the greatest extent possible.
- Trench to the nearest side of the pole, or transformer, leaving the conduit or conductors exposed.
- Any trenching within 2 feet of power company facilities must be done by hand.
- If any conductors or pipes are encountered while digging, leave them covered.
- Provide extra depth when digging joint-use trenches to allow for soil to fall into the trench during the laying of the first cables, reducing the depth of the trench for other cables.
- Schedule the trenching so the trench is open for the shortest practical time to avoid creating a public hazard and to minimize the possibility of the trench collapsing due to other construction activity, rain, etc.
- The remainder of the trench is backfilled using available clean material. Pieces of scrap cable and other construction items must not be buried in the trench. Tamp the soil, leaving a slight mound to allow for settling.
- All rock, debris, scrap cable, and other construction items must be removed from the site.
- DCEC will sometimes request a certain placement of conduit on a pole. Never run conduit directly under the phone/ fiber attachment.

The member may place telephone, cable TV, or other electronic signal conductors in a trench with electric utility wires, providing the installation meets the requirements of the electric utility, and all other parties.

In certain cases, gas pipes may be installed in a common trench.

In special situations, water and sewer lines may be installed in a common trench. Installation of a “wet” service in a trench with electric utility wires requires prior approval by the electric utility.

## Installing Secondary Conductors in a Trench

### Underground Secondary Conduit

Install conduit from below the meter socket, to DCEC's pole, pad-mount transformer, or junction box. Conduit and cable must be sized in accordance with NEC specifications based on service size. All best practices shall be used to install the cable to ensure no damage is done to the service conductor.

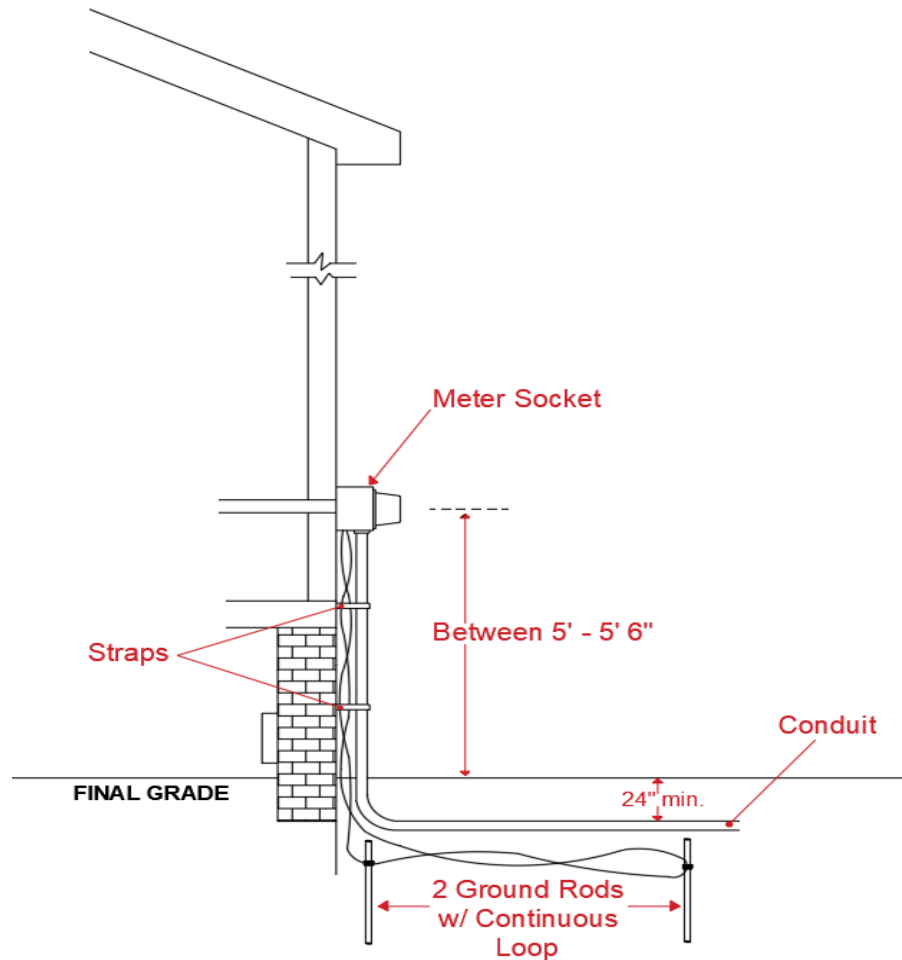
DCEC will energize power after the member completes backfilling the trench to the power company's satisfaction.

The member is responsible for sealing around conduit where it enters service panels.

If the conduit will enter the power company's vault, the member contacts DCEC to discuss the entry location and procedures.



## Underground Service, Surface-Mount Meter



**Figure 3-1. Underground service to surface-mount meter**

Figure 3-1 shows a finished underground installation with the meter on the surface of a house. The member is responsible for everything shown here, except the meter.

**Note: DCEC requires two ground rods to be installed and to form a continuous loop.**

The service is underground from DCEC to a stub out, handhole, or pad mount transformer (not shown here). Conductors placed in the trench bring the power to the conduit at the base of the service entrance.

After the member installs the Service Entrance Equipment, DCEC installs the meter in the meter socket. DCEC also completes the connections of the wires at the DCEC-installed pole or transformer pad-mount.



### Underground Service, Pedestal Meter

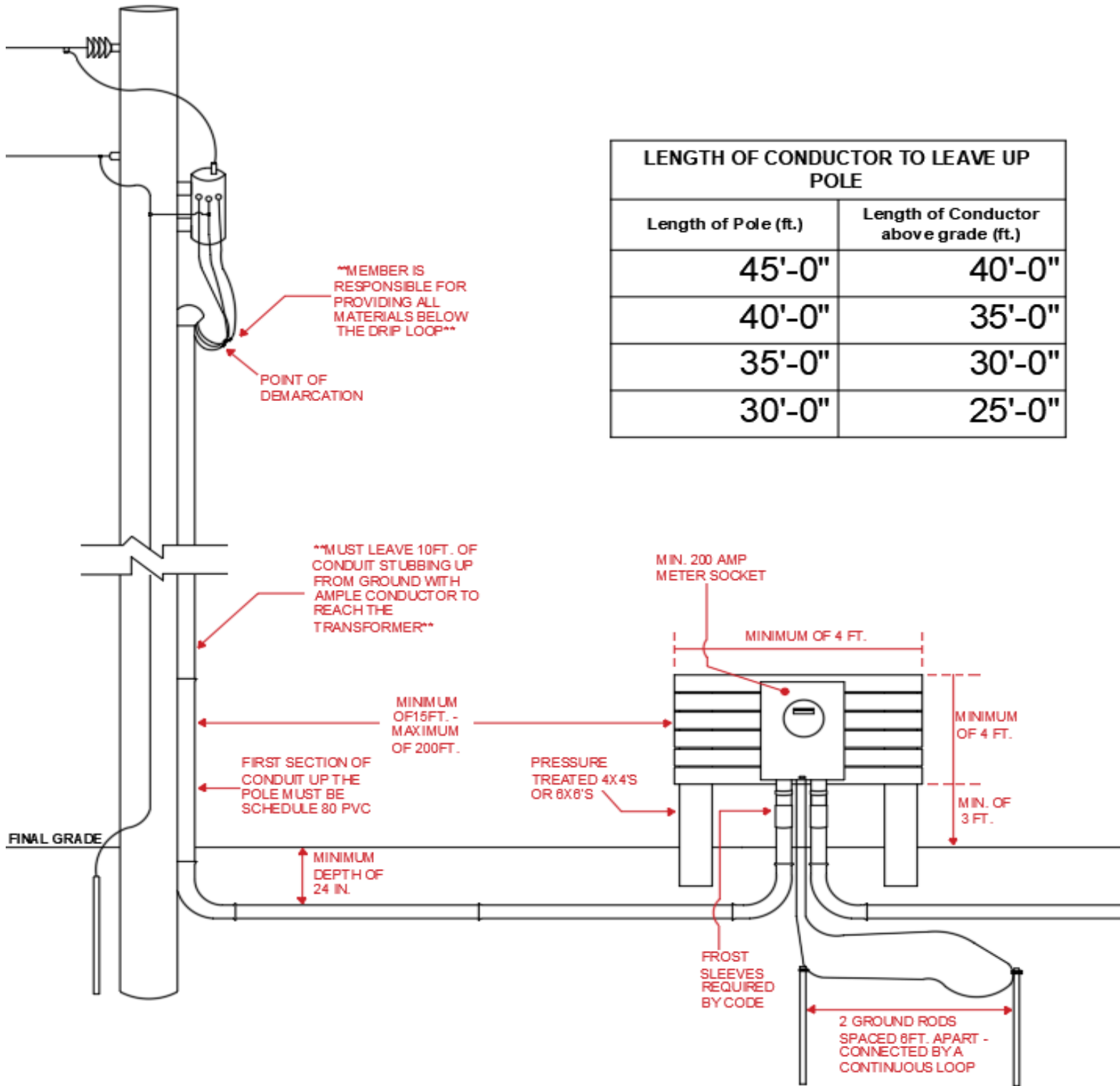


Figure 3-2. Underground service to a pedestal meter

A meter pedestal is a free-standing structure that supports service equipment for underground service. It is most commonly used with manufactured homes. If a meter pedestal is called for, it is the member's responsibility to purchase and install it.

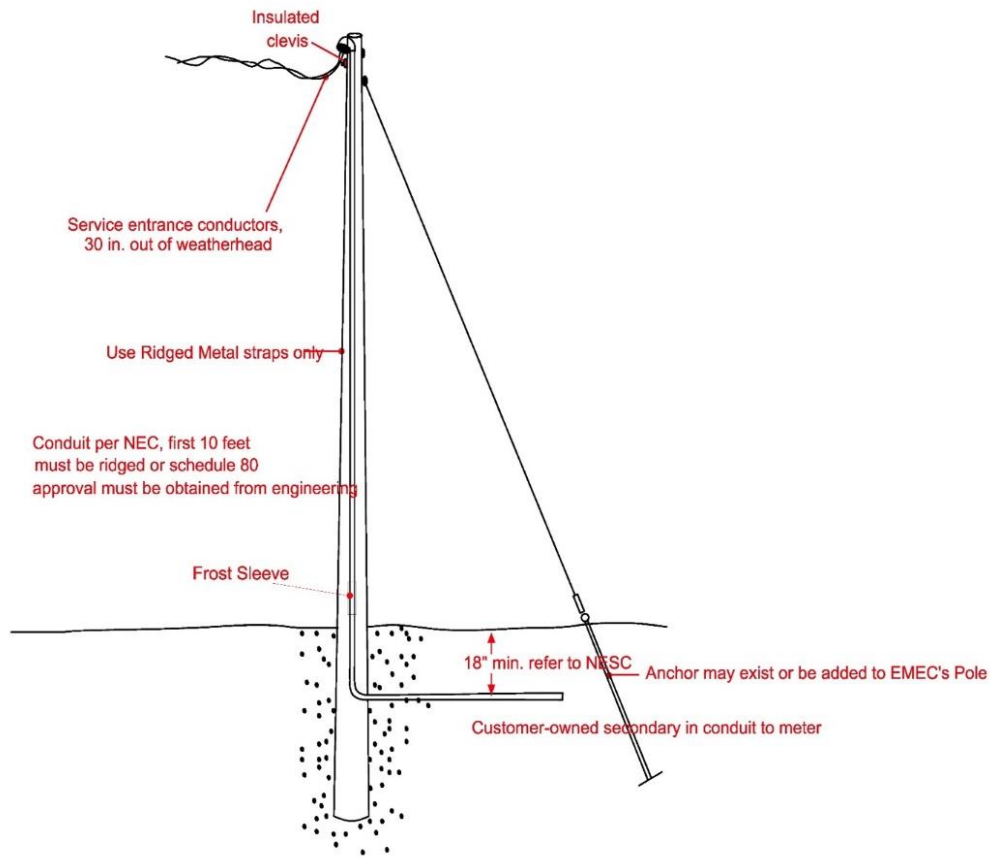
**Note: DCEC requires two ground rods to be installed and to form a continuous loop and ground meter pan.**

Install the meter pedestal between the home and normal public access. The pedestal usually contains the disconnect switch.

### **Secondary Riser**

The secondary riser is where the service conductor runs from DCEC's pole (either a primary pole or a secondary pole.) When running a secondary riser, the following statements apply.

1. During the planning phase, it will be determined the route and location of the riser. Should the riser be located in or near any vehicle traffic including the possibility of plowing, the first 10 feet of pipe must be rigid pipe.
2. If multiple pipes are going to be on a pole, stand-off brackets will be required otherwise attaching directly to the pole is acceptable only with the use of metal pipe clips.
3. The member will place all conductors in pipe prior to DCEC making its connections at the point of attachment.
4. The first 10 feet of pipe must be installed prior to DCEC's arrival for connection.
5. The member shall supply enough conductor beyond the weatherhead for 30" on a secondary pole and 84" on a primary pole. This will be discussed during planning.
6. DCEC will assist in the assembly of the final sections of pipe and weatherhead and will make the final connections to the service point/attachment.
7. If a metal pipe is used, it will require a ground per NEC. If an existing pole ground is available, the pipe may be bonded to the pole ground otherwise the member must install a new ground rod.
8. If a metal pipe is used, it will require a ground per NEC. If an existing pole ground is available, the pipe may be bonded to the pole ground, otherwise the member must install a new ground rod.



**Figure 3-4. Secondary Riser**

## CHAPTER 4 Underground Primary Installations

***Prior to any service connection the co-op member needs to contact DCEC (607)746-2341 and schedule with DCEC staff to review all options available to the member. It is at this time all fees, permits and right of way issues can be discussed and reviewed.***

Primary Underground installation will be handled by DCEC. This includes the planning phase, routing, and installation of associated primary material, conductor, and supplies. Underground primary will be addressed on a case-by-case basis with the intent to best serve DCEC members. **DCEC is responsible for choosing/approving the excavation contractor.**

## Transformer Installations

DCEC is responsible for installing a pad mount transformer at or near the member's site. The member is responsible for installing the service conductors in the trench, from the transformer to the building.

## Safety Clearances around Transformers

Clearances from pad mount transformers to structures are measured from the nearest metal portion of the transformer to the structure or any overhang.

The clearance from a building is 3 feet if the building has non-combustible walls (brick, concrete, steel, or stone), 10 feet if the building has combustible walls (including stucco).

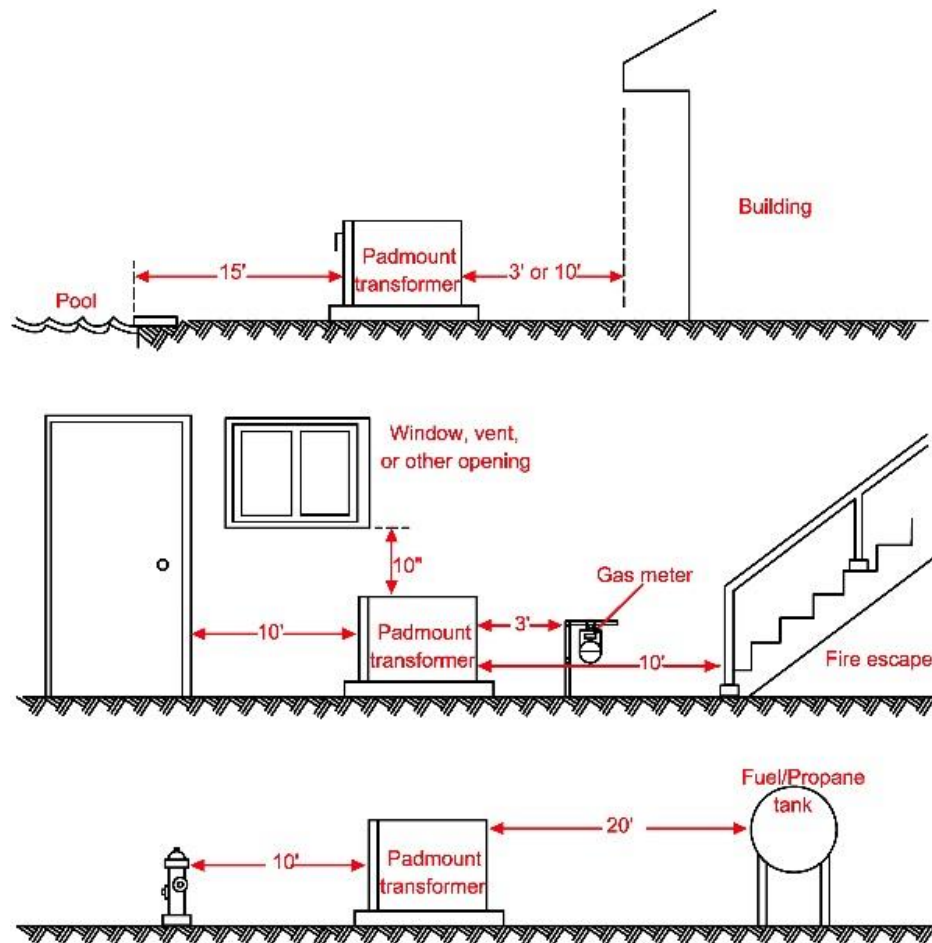


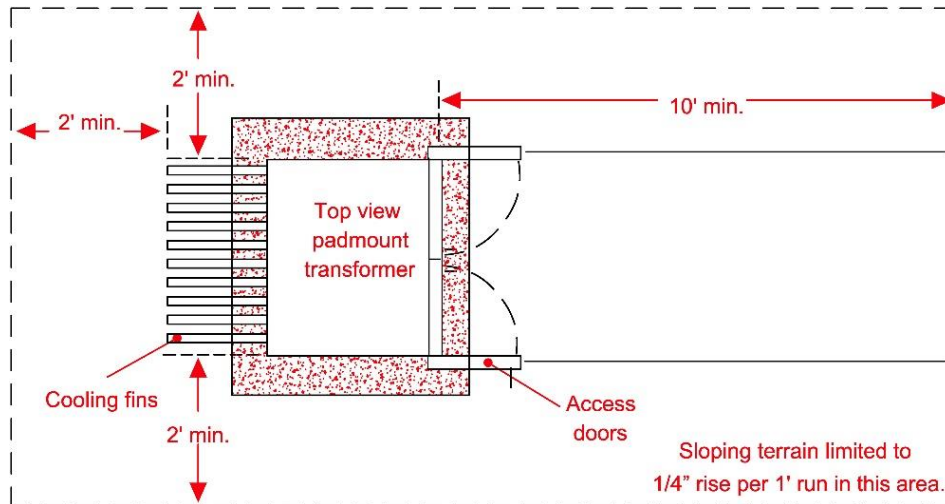
Figure 4-1. Safety clearances around a pad mount transformer

## Work Clearances around Transformers

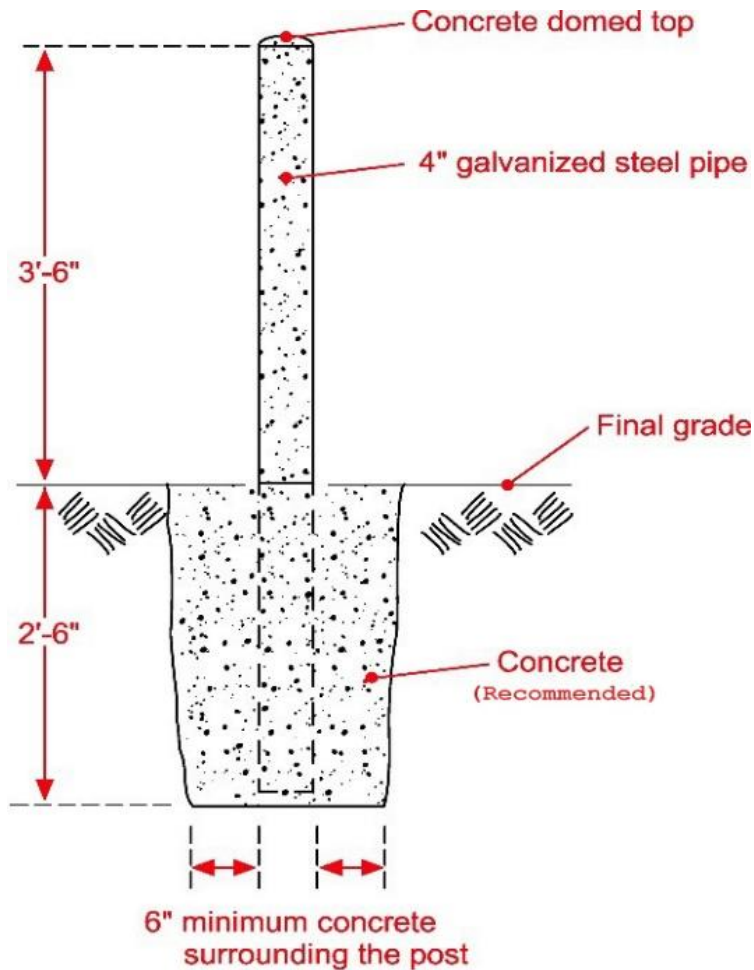
A minimum clearance of 10 feet of clear, level working space is required in front of a pad mount transformer, to allow use of hot sticks.

Landscaping and other obstructions must not encroach on these clearances.

**Note: It is the member's responsibility to maintain these clearances. If DCEC crews find violations during routine inspections, the member will be advised by letter and have 30 days to clear the obstruction, otherwise, DCEC will clear the obstruction at the cost of the member.**



**Figure 4-2. Work Clearances around a pad mount transformer/Guard Posts**



**Figure 4-3. Equipment guard post**

It is the member's responsibility to install and maintain guard posts where power company equipment is exposed to vehicular traffic.

Guard posts are also required where minimum clearances around equipment cannot be met. For example: Guard posts are required where pad mounted devices cannot be given 3 feet clearance from the back and sides of the device, and 10 feet from the front.

If the post is placed in stable soil, it is recommended to surround it with 6 inches of concrete. If the soil is unstable or sand, it is recommended surround the post with 12 inches of concrete.

If several guard posts are used, locate them no more than 5 feet apart. For extra visibility, paint the posts traffic yellow.

In some situations, a 6-inch diameter post is required, not the 4-inch post illustrated here.

## CHAPTER 5 Meter Installations

The member provides and installs all equipment beyond the service point: meter sockets, cabinets and enclosures, connection lugs, conduit, grounding, protection devices, and wiring from the socket to the load. Meter Sockets will be standard for all single-phase and three-phase installations where the load does not exceed 200 amperes and 400 amperes. All direct metered poly-phase services and 400-amp single-phase meter sockets must have a single handle-operated manual bypass which locks the meter blades in the socket jaws. The manual bypass operating mechanism must be visible when the meter is installed. It must not be possible to override the bypass by replacing the cover or sealing ring when the operating mechanism handle is in the bypassed position.

On CT rated services, DCEC provides and installs the meter, current transformers meter socket, and local wiring associated with the meters.

### Locating the Meter

It is in the mutual interest of the member and DCEC to install the meter in a location suitable for meter reading, testing, repair, and removal. The meter location is subject to approval by DCEC.

### Meter Location for a Residence

#### The meter must be located:

- Outside (DCEC must always have access to the meter)
- On ground level with the meter 5' to 5' 6" above the ground level
- If the meter is not located on the building, location must be approved by DCEC

#### Do not locate meters:

- Behind a locked fence or enclosure
- In areas subject to being fenced or enclosed such as patios, pool areas, decks, porches, and backyards
- Where shrubs or landscaping could obstruct access to the meter
- In an unsafe or inconvenient location, such as above a stairway or window well
- On a mobile structure such as a houseboat or mobile home
- Do not place a meter inside an enclosed cabinet that is not readily visible and accessible
  
- These are just a few items of major concern and is not a complete listing of where

not to locate the meter. The meter location must comply with all NEC and NESC rules and DCEC does have final approval for the location of the meter location.

The requirements listed above for residences also apply to meters for outbuildings such as detached garages, barns, shops, storage buildings, pump houses, and other structures that do not provide living spaces.

### **Meter Location for a Business**

#### The location of a meter for a business must be:

- Convenient to DCEC's service point
- On exterior wall 5' to 5' 6" above finished grade
- If the meter is inside, it must be in an electrical equipment room and must be approved by DCEC. DCEC must have access to this room at all times.
- Readily accessible by DCEC personnel

#### Meters must not be located:

- Behind a fence or enclosure
- In a place where safety could be compromised
- In a location with abnormal temperature, vibration, or corrosive conditions
- On a primary line pole
- On a mobile structure such as a trailer
- Areas where shrubs or landscaping could obstruct access to the meter
- These are just a few items of major concern and are not a complete listing of where not to locate the meter. The meter location must comply with all NEC and NESC rules and DCEC does have final approval for the location of the meter location

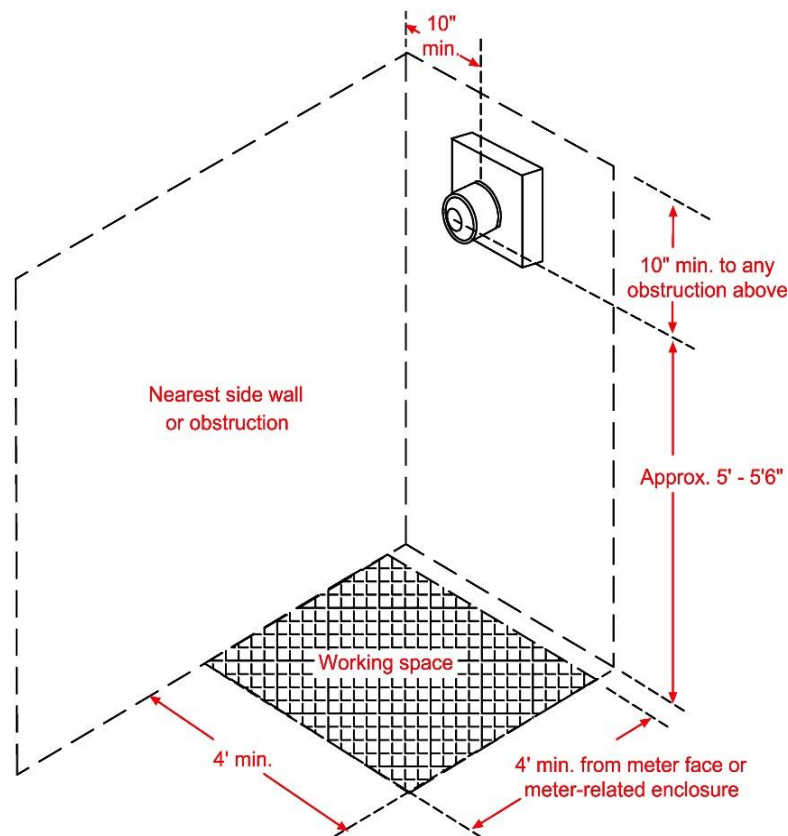
### **Electrical Equipment Rooms (with prior approval)**

Meters for business services may be located in an electrical room. Electrical equipment rooms must:

- Not be used for storage
- Be accessible during normal business hours and have an emergency contact number after hours
- Be well lit
- Be accessible through a door that opens directly to the outside, or with prior approval by DCEC, opens directly to the lobby of the building's main entrance. If the facility could be locked during normal business hours (such as a school, church, or meeting hall), the electrical equipment room door must open directly to the outside. The door must be at least 2 feet 8 inches wide and 6 feet 8 inches high, and open outward. The exterior of the door must have a sign saying, "Electrical Room." The member must supply a key to the door, or a key box approved by DCEC near the door.



## Clearances around the Meter



**Figure 5-1. Clearances around the meter**

Meter clearances are measured from the center of the meter socket, or from the center of the face of the meter.

The 10-inch clearance at the top and left side of the meter allows the meterman to see and align the meter blades to the meter socket jaws when installing the meter.

Install the meter socket between 5' and 5' 6" above finished grade.

Keep a clear working space 4-feet square, in front of the meter. This space must be permanently free of all obstructions.

Maintain a minimum clearance of 10 inches radially around the meter.

Allow 3 feet of clearance from a gas meter, and 3 feet from doors (if door open in towards the meter). DCEC has the final approval of meter location in an equipment room.

## Meter Sockets

Meter sockets come in six configurations. Residential services use the first two sockets shown here. Appendix 1 contains a list of approved meter Sockets.

Voltage	Current	Comment
120/240V, 3-wire	200 amps	Direct-connect socket
120/240V, 3-wire	201-320 amps	Direct-connect socket
120/240V, 3-wire	Above 400 amps	With CTs

## General Requirements for Meter Sockets

Meter sockets must:

- Be ringless (unless planned installation of Generlink equipment)
- Be rated NEMA 3R – for exterior use and rain tight
- Be installed level, plumb, and fastened securely to a rigid structure
- Have all unused openings in the enclosure, closed with plugs and secured tightly from the inside
- Be covered and sealed with a transparent cover if live lines are installed
- Not be jumpered to provide power
- Be acceptable to DCEC and Underwriters Laboratories (UL)

Most residential services use a socket with four jaws and a ground terminal.

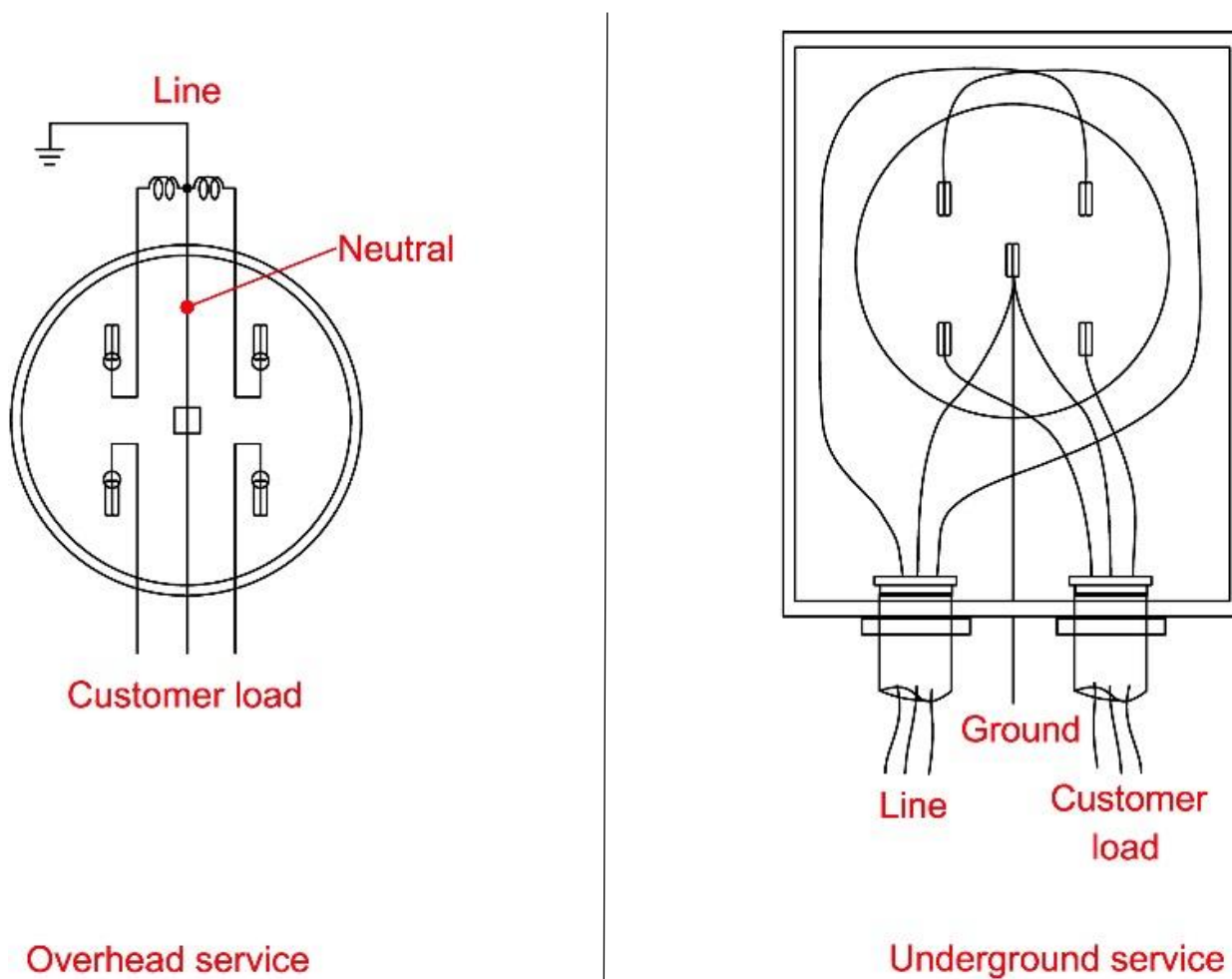


Figure 5-2. Residential meter socket connections

### Grounding a Meter Socket

Grounding must conform to the NEC. **DCEC requires that two ground rods are used, and grounds form a continuous loop and ground the meter pan.**

After installation, leave the connection to the ground rod visible for electrical inspection.

For safety, the top of the ground rod should be flush with or below ground level.

Factors which affect the ability of the ground rod to dissipate power surges include:

- The type of soil at the site. Examples: Clay soil has high conductivity, which is good, gravel has low conductivity which is bad.
- The condition of the soil; Damp is good, contact with the water table is very good, high salt content is good, frozen soil is bad.

- The size of the ground rod. The longer the rod and the larger the diameter, the better.
- The ground rod material. Copper is better than steel. Copper-clad steel is better than steel alone.
- The resistance across clamps and connections. **Note:** The integrity of these connections tends to deteriorate with time.

## Meter Socket Installation Tips

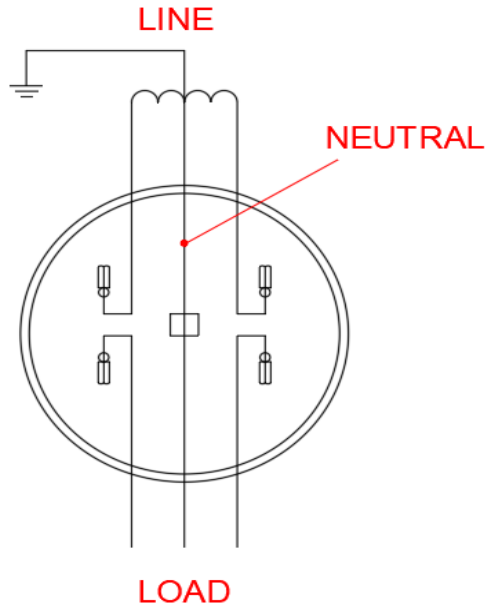
### Cable Runs

Metered circuits and un-metered circuits must not be intermixed in raceways or enclosures, except in special situations approved by DCEC. Member equipment is not allowed inside a meter enclosure or CT cabinet. Member load monitoring equipment, if installed, must be on the load side of the meter. Line-side conductors are connected to the top terminals of the meter socket, load-side conductors are connected to the bottom terminals of the meter socket.

After the installation is complete, make these mechanical checks: Conductors are not under undue strain on their terminals, connections are tight, terminals are rated for the size of conductor used, and strands have not been removed to make conductors fit under-sized terminals.

**Note: This is to be done prior to any wire being energized**

## Services Metered Using Direct-Connect Meters



**Figure 5-3. Connections for single-phase services using direct-connect meters**

### Current Transformer Metering

Current transformers are used with instrument-rated meters, to meter single-phase services greater than 400 amps (320 amps continuous). Smaller services use direct-connect meters.

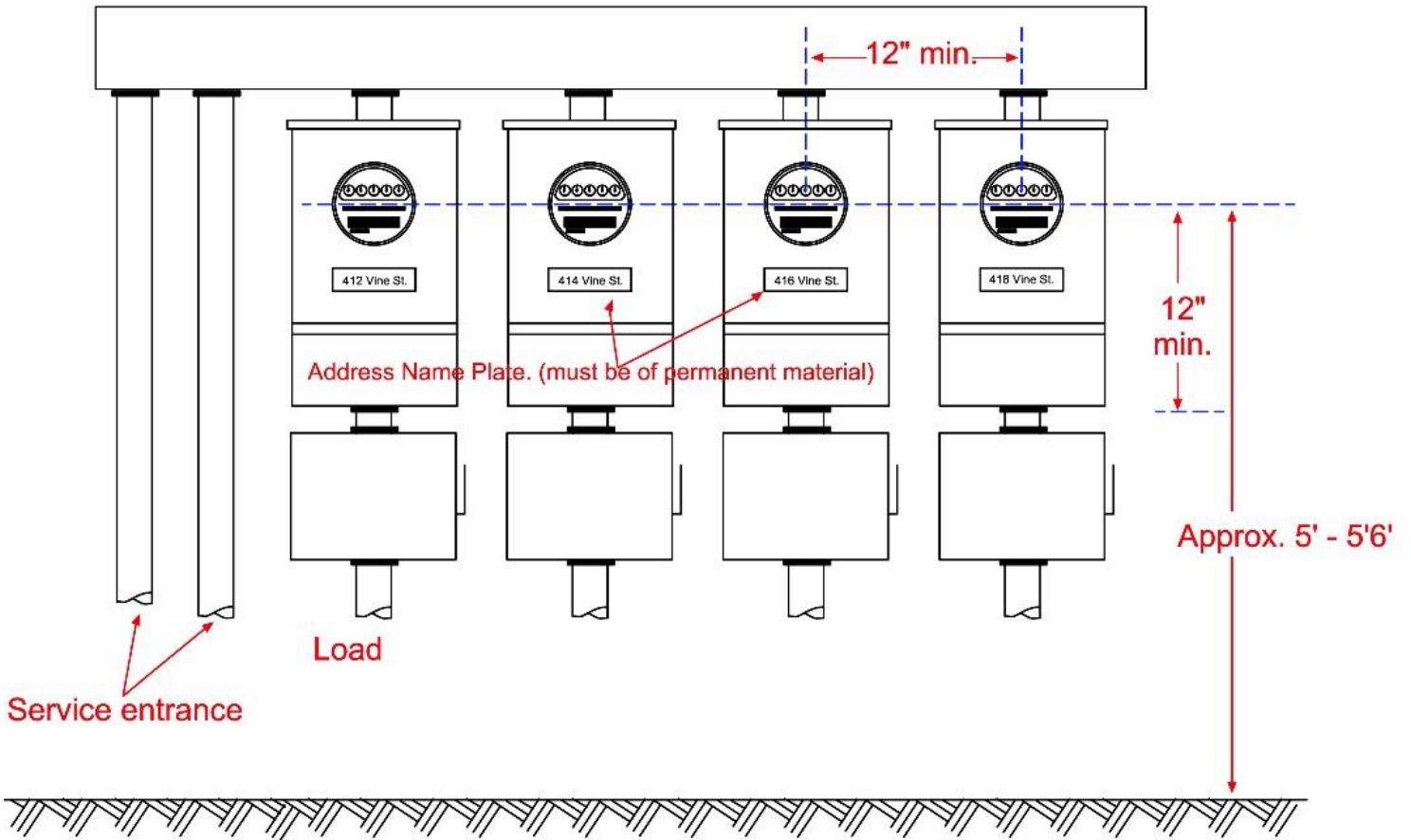
DCEC provides and installs the meter, current transformers, test switch, and local wiring associated with the meter, test switch, and CTs.

If Ct's are required, DCEC will provide the meter pan at the member's expense.

## Multi-Meter Installations

Figures 5-4 and 5-5 show a typical multiple-meter installation for services of 200 amps or less. If the installation has more than six meters, a main disconnect is required.

The clearances shown for this office installation also applies to factory-built multiple meter panels, except meters must be at least 3 feet above the floor.



Address nameplate must be placed inside meter enclosure to ensure the cover matches the correct meter location  
Labels must be of a permanent material such as an embossed plastic. NO hand written or printed labels.

Figure 5-4. Installation for an office building

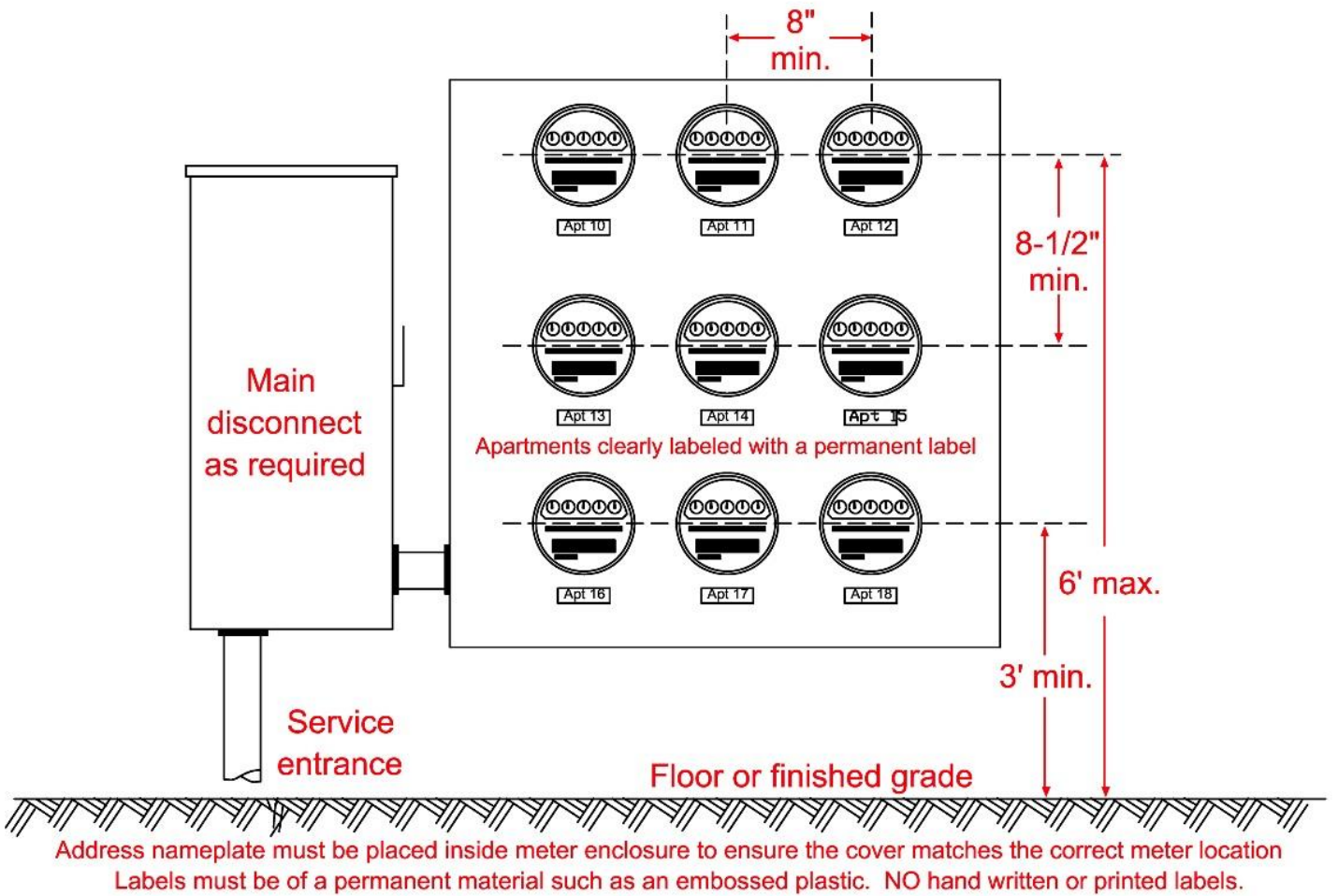


Figure 5-5. Installation for an apartment building

# CHAPTER 6 Right of Way Clearing Specifications

## Clearing Right of Ways for Residential Locations

Figure 6-1 demonstrates the required clearing of Right of Ways for residential locations. Residential locations are defined as developed, maintained and typically landscaped.

All branches in the red zone of Figure 6-1 below must be removed. This zone spans from 15 feet above the highest electrical conductor to 8 feet below the lowest electrical conductor, to 6 feet on either side of the closest conductor.

Healthy branches outside of this range, within 15 feet on either side of DCEC's pole, may be left at the discretion of DCEC.

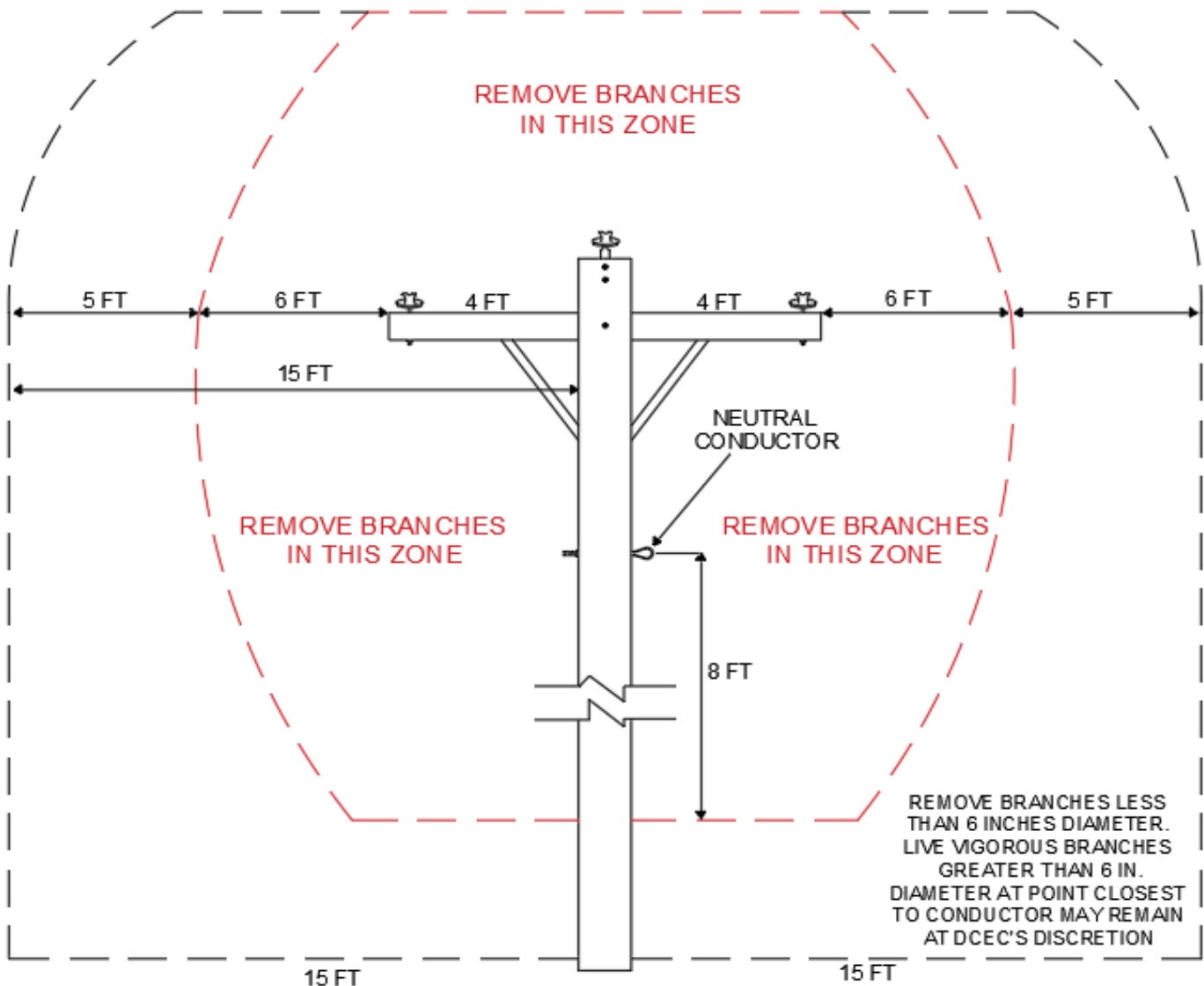


Figure 6-1. Residential R.O.W. Clearances



### Clearing Right of Ways for Rural Locations

Figure 6-2 demonstrates the required clearing of Right of Ways for Rural Locations. Rural locations are defined as not directly developed, not maintained, and are occupied by naturally occurring plants.

No trees are permitted to be located within 15 feet on either side of DCEC's pole. Trees that are located outside of the 30-foot R.O.W. but encroach the R.O.W. will be side trimmed at the discretion of DCEC. All branches that encroach within 15 feet above the highest conductor will be removed.

**Note: Trimming more than a 3rd of a tree may threaten the health of the tree.**

If a section of the R.O.W. has a total low-growth cover, a 5-foot-wide path must be hand cut or mowed to facilitate crew movement through the R.O.W.

All chipped branches shall not be piled, but spread throughout the R.O.W.

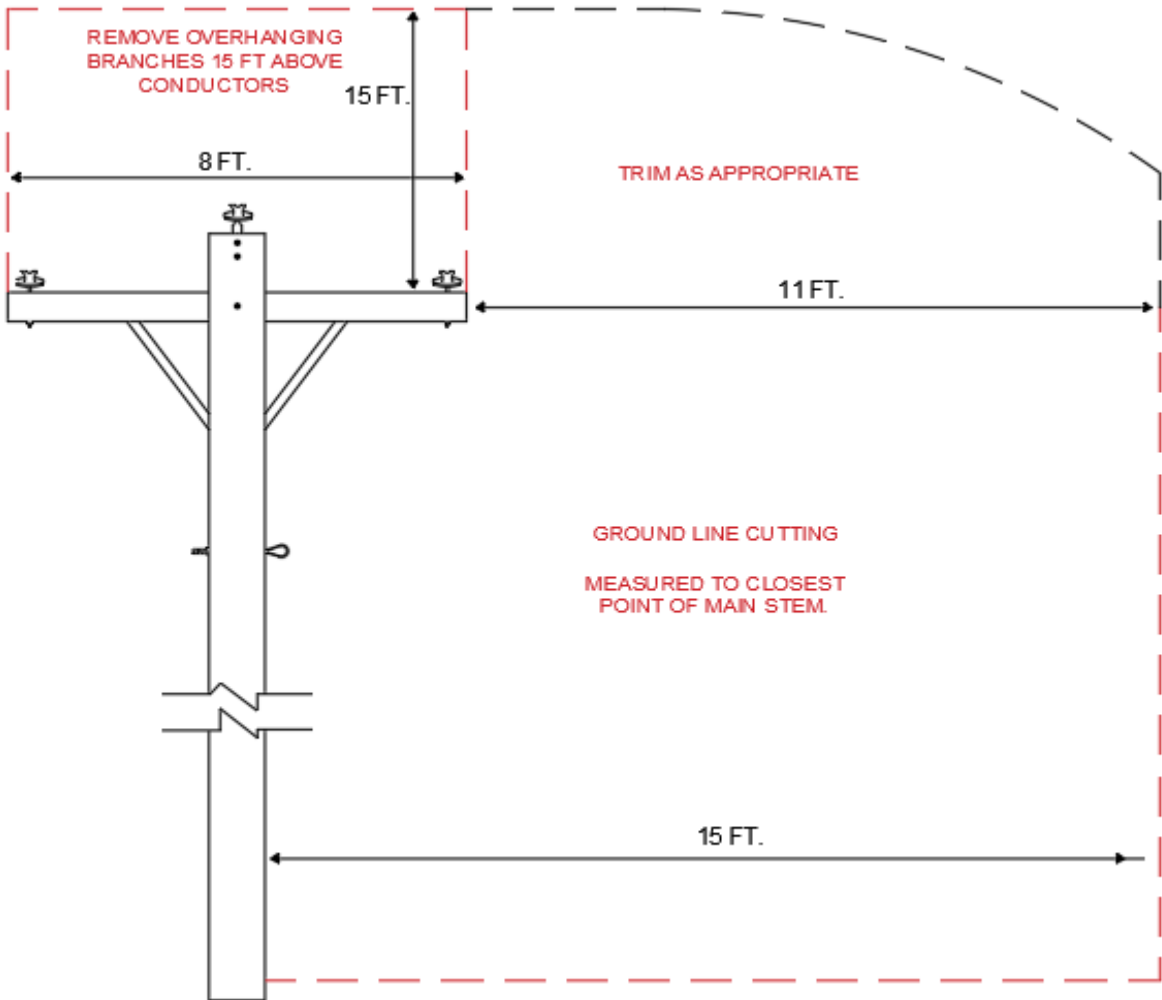
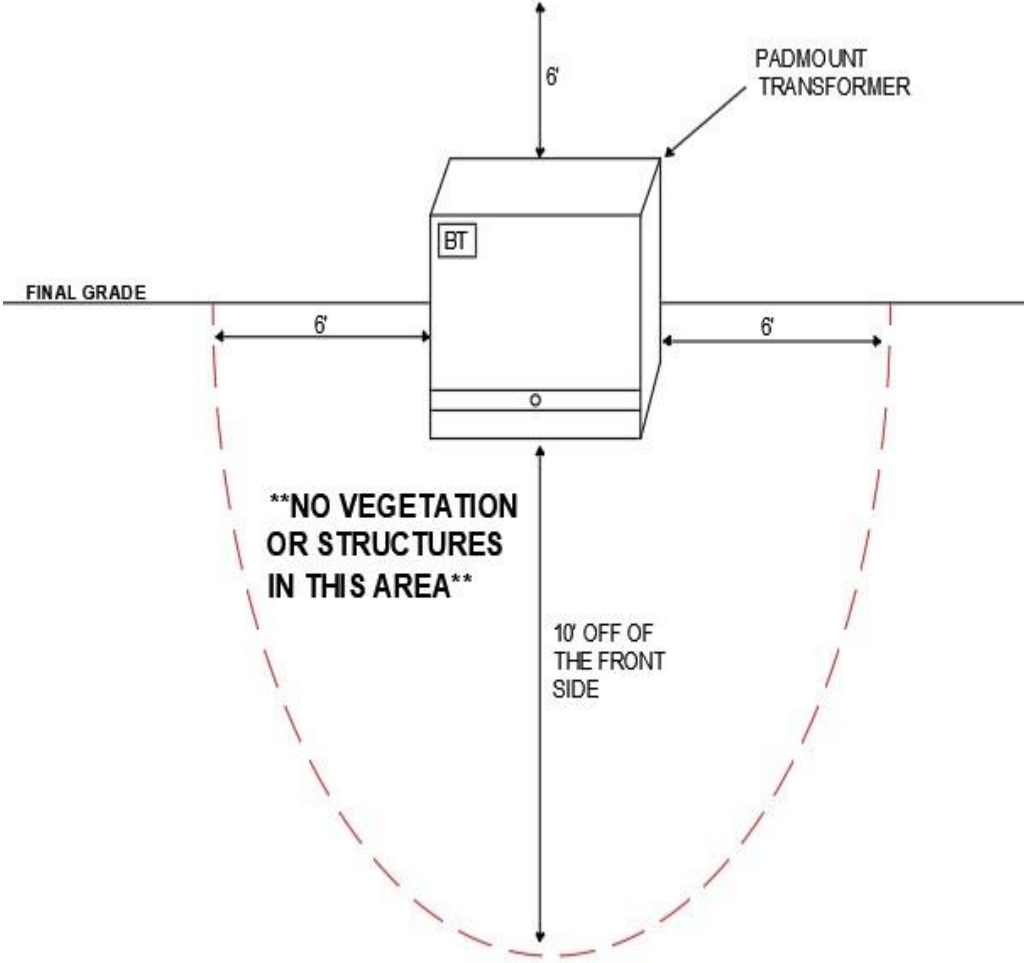


Figure 6-2. Rural R.O.W. Clearances

Clearances for Pad-Mount Transformers



**Figure 6-3. Pad-Mount Transformer (Side View) Clearances**

As seen In Figure 6-3 (above) and 6-4 (below), pad-mount transformers require a clear area of 6 feet on the sides and back of the transformer. The front side of the transformer requires 10 feet of clearance, to ensure the DCEC crews have ample space to perform maintenance.

Any vegetation and/or structures found within these zones will be removed at the expense of the member Immediately.

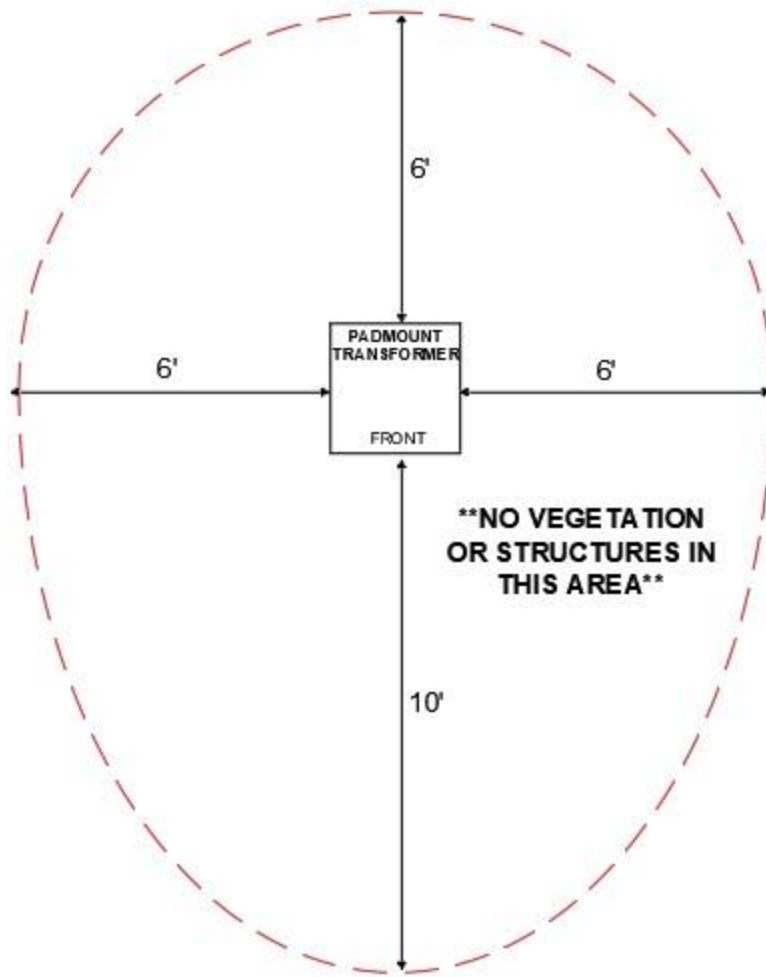


Figure 6-4. Pad-Mount Transformer (Top-Down View) Clearances

## Glossary of Metering Terms

- ANSI** – American National Standards Institute. An independent administrator and coordinator of voluntary industry standards.
- bypass** – A device which shunts current around the socket, so the meter can be removed without interrupting service.
- clearance** – A specified minimum distance between two objects to assure adequate space for safety, security, or access.
- common ground point** – The point where the grounding electrode connects to the equipment-grounding conductor and/or the circuit-grounding conductor.
- conduit** – A pipe with a smooth interior surface for easy drawing-in of electrical conductors. Conduit may be metallic or non-metallic.
- corrosion inhibitor** – An electrical joint compound used to retard oxidation at electrical connections.
- CT service** – A service type that does not support an inline (commonly used type) meter. Requires Current Transformers (CTs) to provide readings. Normally seen in larger transformers and 3 Phase load situations in the DCEC's service territory.
- current transformer** – A transformer whose secondary current is a precise fraction of its primary current. Using current transformers, high-current circuits can be measured with conventional meters. Abbreviation: CT.
- demand** – The average rate at which energy (kilowatt hours) is consumed during a specified interval of time.
- demarcation point** – The point at which the Cooperatives ownership ceases, and the member takes over the maintenance of wiring and equipment.
- direct-buried cable** – Cable which may be installed in the ground without the protection of a conduit.
- direct-connect meter** – A meter which carries full load current and connects across full line voltage. Also called a self-contained meter.
- drip loop** – A downward loop in the member's conductors, near where the member's conductors attach to the power company's overhead conductors, to prevent water from entering the service mast at the weatherhead.
- fault** – A partial or total failure of insulation which causes a short circuit between conductors, or between a conductor and ground, causing an abnormal current to flow. Also, a failure (break) in a conductor which causes an open circuit.

**fault current** – A current which flows between conductors, or between a conductor and ground, due to an abnormal connection between the two. A fault current flowing to ground may be called a ground fault current.

**guy** – A cable or brace that supports a mast or pole.

**hand-hole** – A shallow form of manhole giving access to a top row of ducts in an underground electrical system.

**house knob** – Insulated Wire holder, Reinforced Screw Type, typically used on the eve of a house for the point of attachment.

**instrument transformer** – A transformer which delivers as its output a precise fraction of the input line current or line voltage. Instrument transformers allow standard meters to measure high currents and voltages.

**instrument-rated meter** – A meter used in conjunction with instrument transformers, to measure high-voltage or high-current services. Also called a transformer-rated meter.

**line conductor** – A service conductor installed by the electric utility, to the meter.

**load conductor** – A service conductor to the member's load, after the meter.

**manual link bypass** – Provision for manually installing conductive links between the line and load terminals in the meter socket. These links maintain electrical service to the member when the meter is removed. Also called manual circuit-closing block.

**manufactured home** – A factory-assembled structure built on a permanent chassis, transportable in one or more sections, and designed to be used as a dwelling with a permanent foundation. Also called a modular home. New electric service to a manufactured home has the same requirements as installing new service to a permanent single-family residence.

**meter jaw** – A spring-loaded receptacle inside a meter socket which captures the terminals (blades) of a meter and connects the meter terminals to the service conductors.

**meter pedestal** – A factory-built assembly containing a meter socket and disconnect switches.

**meter ring** – A metal ring which secures the meter to the meter socket, which can be sealed by the electric utility to prevent tampering with the meter.

**meter socket** – The mounting device consisting of meter jaws, connectors, and enclosure for receiving a socket-type meter.

**mobile home** – A factory-assembled structure built on a permanent chassis, transportable in one or more sections, and designed to be used as a dwelling without a permanent foundation. Overhead service to a mobile home is provided by a meter pole. Underground service to a mobile home is provided by a meter pedestal.

**NEC** – National Electrical Code. National regulations for the installation of electrical equipment inside buildings. Published by the National Fire Protection Association. NEC rules apply to equipment on the member's side of the service point.

**NEMA** – National Electrical Manufacturers Association. A trade association which publishes standards for manufacturers of electrical equipment, including enclosures and racks.

**NESC** – National Electrical Safety Code. National regulations for the installation, operation, and maintenance of electric supply and communication lines. Published by Institute of Electrical and Electronics Engineers. NESC rules apply to equipment on the electric utility's side of the service point.

**neutral** – The grounded conductor in a single-phase three-wire, or three-phase four-wire system.

**point of attachment** – The point at which the utility's service conductors are mechanically attached to the member's premises. For overhead services, the point of attachment is usually an insulated clevis.

**power factor** – Technically, the cosine of the phase angle between the circuit voltage and current waveforms. Since phase angles are difficult to measure, power factor is usually derived by measuring power or impedance. Power factor is the ratio of active power to apparent power (watts divided by volt-amperes). Power factor has no units but is commonly expressed as a percentage. For example, if active power is 96 kW and apparent power is 100 kW, the power factor is 96%.

**primary voltage** – The voltage at which electricity is delivered from substations to distribution transformers. Primary voltage is greater than 600 volts.

**raceway** – An enclosed channel for holding wires or cables. If designated for line conductors, the raceway must be sealable. The intermixing of line and load conductors in the same raceway is not permitted.

**seal** – A locking device to secure a meter or other service equipment.

**secondary voltage** – The voltage at which electricity is delivered from distribution transformers to members. Secondary voltage is less than 600 volts.

**select backfill** – Soil or sand free from sharp objects, rocks, scrap building material, and corrosive material.

**self-contained meter** – A meter which carries full load current and connects directly across full line voltage. Also called a direct-connect meter.

**service drop** – For overhead service, the power company's service line between the distribution transformer and the point of delivery.

**service line** – Conductors from the distribution transformer to the member's point of delivery. See service drop, service lateral.

**service entrance equipment** – The service equipment which is supplied by the member: conduit, conductors, mast, weatherhead, meter base, enclosures, disconnects, and panels.

**service lateral** – For underground service, the service line between the distribution transformer and the point of delivery.

**service mast** – For overhead service, the conduit rising above the meter to provide mechanical protection to the member's conductors and to support the service drop from the power company.

**service point** – The point where the utility's service line makes the electrical connection to the member's wires. For overhead services, the point of delivery is the splice between the utility's and the member's conductors. For underground services, the point of delivery is the secondary lugs of the distribution transformer, or the service stub out, or the secondary hand hole – if the utility's existing service is on the member's property. If the utility's existing service is not on the member's property, the point of delivery is the member's property line. The utility determines the point of delivery based, in part, on convenient access to existing service.

**socket** – The mounting device for socket meters. Includes spring-loaded meter jaws, connectors for line and load conductors, and an enclosure.

**stub-out** – The location where the wires are terminated.

**temporary service** – Electric service during the construction phase of a project.

**test switch** – A device used to isolate connections to a meter from its instrument transformers.

**transformer-rated meter** – A meter used in conjunction with instrument transformers, to measure high-voltage or high-current services. Also called an instrument-rated meter.

**UL** – Underwriters Laboratories. An independent product-testing and certification organization.

**voltage transformer** – A transformer whose secondary voltage is a precise fraction of its primary voltage. Using voltage transformers, high-voltage circuits can be measured with conventional meters. Abbreviation: VT, or PT (potential transformer).

**weatherhead** – The conduit and end mechanism that receives the aerial wire from the transformer and runs down to the meter or demarcation point.