Meter Loop Specifications

Overhead & Underground Services

3/07/13


**Preface**

Wood County Electric Cooperative (WCEC) is required to follow the National Electric Safety Code (NESC).

For the safety of Cooperative Members, WCEC also requires it’s Members to follow applicable rules found within the National Electric Code (NEC) that pertain to electric service connection between WCEC and the Member. Compliance to these rules involving the service connection is generally determined by the WCEC Serviceman before setting the electric meter; however, such compliance to the NEC requirements is the responsibility of the Member’s electric installer.

WCEC recommends that electrical installations be completed by an electrician licensed by the state of Texas.

The effective date of this document is January 1, 2013. All previous documents pertaining to WCEC meter loop specifications are superseded by this document and should be discarded.

The document is made available in hardcopy via standard mail or by visiting the WCEC main and mobile office locations. The document is also made available electronically by way of the WCEC website and through email.

This document covers WCEC meter loop specifications and shall be followed under the following service instances:

1. All new service connects
2. Re-connect service requiring crew construction

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1) GENERAL
As required by Wood County Electric Cooperative (WCEC), Inc., P.O. Box 1827, Quitman, Texas 75783, 1-800-762-2203 or 903-763-2203. Office hours: 8:00AM to 5:00PM, Monday – Friday.

Notice: The following information is derived from various sections of the 2011 National Electric Code (NEC) and the National Electric Safety Code (NESC C2-2012). This information does not portend to accurately portray all possible variations of service installations, nor is it an exhaustive report of the NEC and NESC standards. The specification guidelines given are intended to meet or exceed the minimum requirements of the latest NEC and NESC.

Although Texas state law allows electrical work to be performed in or on a dwelling by a person who owns or resides in the dwelling, WCEC strongly urges Members to seek qualified assistance from Texas state licensed electricians. It is the responsibility of, and incumbent on the part of the installer, to at all times and in all cases adhere to the requirements of the governing issue of the NEC and NESC.

All wiring shall be in accordance with Articles of the latest edition of the NEC and the NESC.

Minimum requirements are shown on the attached standard and are not intended to supersede local codes.

Minimum requirements are shown on this standard and are not intended to conflict with any national or local code which may require more than the minimum indicated by the drawings.
2) OVERHEAD SERVICES

2.1) Clearance of Overhead Service Supply Cables: Services between 0-750 Volts must be of sufficient height to maintain the following standards (NESC Table 232-1).

**16 foot** minimum clearance above final grade for: (NESC Table 232-1)

- Roads, streets, and other areas subject to truck traffic.
- Driveways, parking lots, and alleys subject to truck traffic. May be reduced to 15 feet if not subject to truck traffic. (NESC Table 232-1 Note 13).
- Other areas traversed by such vehicles used for farm, forest, industrial, commercial sites, etc. (NESC Table 232-1 Note 25).

2.1.1) Residential Exceptions: For gable or mast Type service entrance weatherhead mounting where the height of a residential building does not permit it’s service drop(s) to meet minimum clearances as outlined in 2.1 above, the clearances can be reduced to the following: (NESC Table 232-1 Notes 7,8).

2.1.1.1) Residential driveways

- 12 feet for service wire drop(s) (150V Line-Ground)
- 10 feet for the lower of drip-loop or point-of-attachment (150V Line-Ground)

2.1.1.2) Other minimum clearance conditions may apply depending on the area crossed and/or the service voltage. The Cooperative may require a greater point of attachment height from the Member to facilitate clearance requirements mandated by specific conditions.

2.2) General Requirements:

2.2.1) WCEC requires a minimum 2” rigid conduit be used where the service mast (roof jack) for overhead service is used as a support for the service-drop conductors. This is required to improve ability of bearing the tension of service-
drop conductors (NEC 230.28).

2.2.2) The Member is responsible for the installation of the conduit and conductors between the weatherhead and meter base. Copper or equivalent aluminum conductors sized per NEC 310.15(B)(7) may be used. All weatherhead conductors must be insulated and designed for use in conduit. All connectors must be sized, tightened and have composition compatible for the type conductor used per the meter base/panel instructions and the NEC. The Member’s installer shall allow 18 inch minimum conductor tails outside of weatherhead for service connections.

2.2.3) The Member is responsible for the measurement and installation of conduit and cable from the bottom lugs of the WCEC meter base to the member’s disconnect or panel. The installer should ensure that the meter base is not energized before beginning work.

2.2.4) All weatherhead cables and underground cable from the overhead service meter base shall meet the requirements in Table 5.1.

2.2.5) The Member is responsible for the termination of the cable into the bottom lugs of the meter base and into the disconnect or panel.

2.2.6) Attachments of any kind shall not be affixed to WCEC owned poles. This includes, but not limited to, Member owned lights, fencing, antennae, etc.

2.2.7) A minimum of two (2) conduit straps shall be used when a conduit run is over 2 feet in length, and the maximum spacing between straps shall be 30 inches (NEC 230.51(A)).

2.2.8) All conduit shall be sized per Table 5.1 of this document. The conduit shall be rigid Schedule 40 Gray PVC buried at a minimum depth of 24 inches using 90 degree sweeps, locknuts, and plastic bushings.

2.2.9) The specification for the grounding conductor is a continuous soft drawn #6 AWG grounding electrode conductor that is free from exposure to physical damage. The grounding conductor shall be permitted to be run along the surface of the building construction without metal covering/protection if it is securely fastened to the construction. Otherwise, it shall be protected in ½ inch RMC, IMC, PVC, RTRC, or EMT type conduit (NEC 250.64 (B)) from meter base to the ground.
rod connection below grade. Conduit shall have locknuts and plastic bushings, and shall be secured to the structure wall (or other applicable support). Conductor shall be installed in one continuous length without splice or joint (NEC 250.62(B) & (C)).

2.3) **Permanent Buildings – OH Service Options (Figures 1-5):**

2.3.1) **Standard 23 Ft Meter Pole - (Figures 1 & 4):** To meet clearance requirements of the C2-2012 NESC, WCEC’s specification for a meter pole (Member-Owned-Pole-MOP) is a 23 foot pole. The Member will be responsible for the installation of the 23 foot meter pole with weatherhead, conduit, and meter base. WCEC meter bases are made available in 200A and 320A sizes. See Figures 1 & 4 for details.

2.3.2) **Min. 16 Ft Meter Pole with WCEC 30 Ft Lift-Pole Required (Figure 5):** In instances where a Member opts to install a meter pole that is less than the standard 23 foot pole (but under no circumstance less than a 16 foot pole) and that is located more than 8 feet away from an existing WCEC pole, a 30 foot lift-pole installed at WCEC expense will be required. The WCEC 30 foot lift-pole will be placed within 8 feet of the meter pole for required service wire clearance. No Member equipment is allowed on any WCEC owned pole. With the exception of the pole dimensions, the hardware specifications for a minimum 16 Ft meter pole shall be the same as for the Standard 23 Ft meter pole. See Figure 5.

2.3.3) **Mast & Gable Weatherhead Installation Specifications (Figures 2 & 3):** For overhead services with the service wire attachment made to a permanent building structure, there are two standard installation methods - mast & gable. These installations are described in Figures 2&3, respectively. Mast and Gable Weatherhead installations are not allowed on Mobile Home applications.

The **Mast Weatherhead (Figure 2)** installation requires that the weatherhead entrance be located not less than 2 feet and not more than 3 feet above the building roof line per the details given in Figure 2.

The **Gable / Wall (Figure 3)** mounted weatherhead installation located below the soffit of building per the details given in Figure 3.

2.4) **Mobile & Mfd Homes - OH Service Options (Figures 1, 8, 9, 12):**

For overhead service to mobile and manufactured homes the following is
specified:

2.4.1) **Standard 23 Ft Meter Pole - (Figures 1,8,12):** For overhead service a 23 Ft Member-Owned-Pole (MOP) is the standard and shall be equipped by the Member with the specified weatherhead, conduit, and WCEC available meter base. WCEC specifies that a 23 foot MOP be used; however, the alternative is described in item 2.4.2 below.

2.4.2) **Min. 16 Ft Meter Pole with WCEC 30 Ft Lift-Pole Required (Figure 1,9,12):** In instances where a Member opts to install a meter pole that is less than the standard 23 foot pole (but under no circumstance less than a 16 foot pole) and that is located more than 8 feet away from an existing WCEC pole, a 30 foot lift-pole installed at WCEC expense will be required. The WCEC 30 foot lift-pole will be placed within 8 feet of the meter pole for required service wire clearance. No Member equipment is allowed on any WCEC owned pole. With the exception of the pole dimensions, the hardware specifications for a minimum 16 Ft meter pole shall be the same as for the Standard 23 foot meter pole above. See Figures 1,9,12.

The meter pole shall be located so that service wires to the weatherhead do not cross the roof of the mobile home.

2.5) **OH Service - UG Entrance Requirements:**

Reference Section 3 below in regards to the WCEC specifications for the Member to install the underground conductors, conduit, mobile home disconnect panel, Mobile Home Feeder Assembly, etc., from the bottom of the meter base to the home.

3) **UNDERGROUND SERVICES**

3.1) **General Requirements:**

3.1.1) WCEC will supply and install a meter base on either an M8-10 pole or meter base pedestal (See 3.2, 3.3 below).

3.1.2) All conduit shall be sized per Table 5.1 of this document. This includes conduit from the meter base to the main disconnect, and shall have locknuts and plastic bushings. Conduit between meter base and main disconnect shall be rigid type.
3.1.3) The Member is responsible for the installation of the underground conduit and cable from the bottom lugs of the WCEC meter base to the member’s disconnect or panel. The installer should ensure that the meter base is not energized before beginning work.

3.1.4) Underground cable shall be installed in Schedule 40 gray PVC pipe buried at a minimum depth of 24 inches and using 90 degree sweeps.

3.1.5) The Member is responsible for the termination of the underground cable into the bottom lugs of the meter base and into the disconnect or panel.

3.1.6) The Member is responsible for the measurement of the underground cable needed between the meter base and the disconnect or panel. For new Underground Service applications only, the Member is eligible for up to 250 feet of underground wire required for the installation between the meter base and the disconnect or panel. The Member will be issued a wire ticket and required to obtain the wire from the Texas Electric Cooperative (TEC) warehouse located behind the WCEC office. The Field Service Representative (FSR) will determine the cable’s gauge (size). If the Member desires a larger cable than that determined by the FSR, then the Member will be required to pay the price difference.

3.1.7) Attachments of any kind shall not be affixed to WCEC owned poles or pedestal equipment. This includes, but not limited to, Member owned lights, fencing, antennae, disconnect equipment, etc.

3.1.8) Temporary service to a mobile or manufactured home is prohibited.

3.1.9) WCEC does not support or provide electrical service to any type of meter base mounted on the side of a mobile or manufactured home.

3.1.10) An outside Mobile Home Service Equipment (Disconnect Panel, “Feed Through Panel”) must be located in sight from and not more than 30 feet from the exterior wall of the mobile home it serves. The Mobile Home Service Equipment shall be rated at not less than 100 Amperes at 120/240 Volts, and provisions shall be made for connecting Mobile Home Feeder Assembly by a permanent wiring method. (NEC 550.32(A)(C).

3.1.11) Mobile Home Feeder Assembly conductors from the Service Equipment disconnect panel to the main panel inside a mobile home must consist of a (4)
four conductor Feeder Assembly (NEC 550.2) and color coded per NEC 550.33(A). Conductors must be rated per NEC 310.15 (B)(7) as shown in Section 5 of this document. The equipment grounding wire *(this is not the grounded neutral conductor, but is a 4th wire for grounding the mobile home equipment)* in this assembly shall be not less than an insulated #4 AWG stranded copper conductor or its insulated #2 AWG stranded aluminum equivalent. WCEC is allowing an aluminum conductor for the equipment grounding wire in Mobile Home Feeder Assemblies only.

3.2) Permanent Buildings – UG Service Options (Fig 6 & 7):

3.2.1) UG Service from Pole Mounted Transformer (M8-10) (Figure 6): To provide Underground Service to a permanent building from a WCEC overhead line, the existing WCEC pole or an additional 30 foot pole equipped with a weatherhead, conduit, and meter base will be provided and installed by WCEC. This is commonly called an “M8-10” pole assembly. This requires the Member to then install underground service conduit from the bottom of the meter base to their main breaker panel. With the exception of the underground conduit, no Member owned equipment is allowed to be mounted on or placed within 5 feet of any WCEC pole. See Figure 6 for details.

3.2.2) Underground Service from Pad Mount Transformer (Figure 7): WCEC will install the conduit and wire between an underground transformer to the underground meter base pedestal. The Member shall be responsible for trenching and installing the underground conduit and conductor at a depth of 24 inches in gray PVC schedule 40 conduit between the underground meter base pedestal and the Member’s service panel/breaker panel.

3.3) Mobile and Mfd Homes – UG Service Options (Figures 10, 11, 12):

3.3.1) UG Service from Pole Mounted Transformer (M8-10) (Figure 10, 12): To provide Underground Service to a mobile or manufactured home from a WCEC overhead line, the existing WCEC pole or an additional 30 foot pole equipped with a weatherhead, conduit, and meter base will be provided and installed by WCEC. This is commonly called an “M8-10” pole assembly. This requires the Member to then install underground service conduit from the bottom of the meter base to their service equipment disconnect and on to their distribution panel. With the exception of the underground conduit, no Member owned equipment, including the service equipment disconnect enclosure, is allowed to be mounted on or
placed within 5 feet of any WCEC pole. The Member’s service equipment disconnect enclosure must be located a minimum of 5 feet from the WCEC pole. See Figure 10 & 12 for details.

3.3.2) Underground Service from Pad Mount Transformer (Figure 11 & 12): WCEC will install the conduit and wire between an underground transformer to the underground meter base pedestal. The Member shall be responsible for trenching and installing the underground conduit and conductor at a depth of 24 inches in gray PVC schedule 40 conduit between the meter base pedestal, the Member’s Mobile Home Disconnect Panel and the Member’s Main Distribution Panel.

3.4) Security Light – UG Service (Figure 14):

WCEC will power the security vapor light directly from the transformer secondary if the security vapor light pole is to be located within 5 feet of the underground transformer. In this instance, WCEC will install the pole, conduit, and wire. The Member will be charged an unmetered flat rate for the vapor light service.

If the security light is to be located at distance of over 5 feet from the underground transformer, WCEC will install the pole, light, and riser at the requested location; however, the Member shall be responsible for trenching and installing the underground conduit and conductor from their breaker protection to the security light pole. The conduit and wire shall be trenched at a 24” minimum depth using schedule 40 gray PVC.

4) METER BASES
4.1) Available Ratings & Installation:

The Cooperative will supply the meter base and meter for a Member’s new service. WCEC has available meter bases rated at 200 and 320 Amperes for overhead and underground services. The maximum service entrance conductor size allowed with each meter base is: 200A base – up to 350MCM; 320A base – up to dual 350MCM. Hub sizes provided are 1”, 1.25”, 1.5”, 2”, 2.5”, and 3”. Meter bases using board mountings between the meter base and the meter pole must use treated lumber in all cases to be accepted. The Member shall install the meter base with lag screws. No uncovered knockout holes or other openings are allowed in the meter base or main disconnect enclosure (NEC 230.62).
WCEC does not allow any type of meter base to be mounted on the side of a mobile or manufactured home.

5) WIRE SIZES AND CONDUITS

Wire sizes and conduits shown on the associated drawings are minimums and shall be sized according to load and main size as recommended by the latest edition of the NEC. Minimum wire and conduit sizes for residential services are as shown in Table 5.1 below.

Feeder wire sizes for mobile and manufactured homes also follow NEC 310.15(B)(7) table and shall be rated at not less than 100 Amperes. Feeder conductors for mobile and manufactured homes shall be permanently installed and consist of four insulated, color-coded conductors identified by the factory or field marking of the conductors in compliance with NEC 310.110. Equipment grounding conductors shall not be identified by stripping the insulation. (NEC 550.33 (A,B)).

Conduit for all underground service wires shall be sized with Schedule 40 Gray PVC pipe per Table 5.1.
### TABLE 5.1
**Conductor Size for 120/240V, 3-Wire Dwelling Service, Single Phase, From NEC Table 310.15 (B)(7) and NEC Table 250.66**

<table>
<thead>
<tr>
<th>Service Size</th>
<th>Ungrounded Conductor (AWG/kcmil) (Notes 2, 4)</th>
<th>Minimum Neutral (Grounded Conductor) (Notes 3, 4)</th>
<th>Grounding Conductor to Ground Rod (NEC Table 250.66)</th>
<th>Rigid Conduit Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>Aluminum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 Amp Main</td>
<td>#4</td>
<td>#4 Cu,#2 Al</td>
<td>#6 Solid Copper (Note 6)</td>
<td>1.25” Minimum (Note 1)</td>
</tr>
<tr>
<td>125 Amp Main</td>
<td>#2</td>
<td>#4 Cu,#2 Al</td>
<td>#6 Solid Copper (Note 6)</td>
<td>1.25” Minimum (Note 1)</td>
</tr>
<tr>
<td>150 Amp Main</td>
<td>#1</td>
<td>#3 Cu,#1 Al</td>
<td>#6 Solid Copper</td>
<td>2” Minimum</td>
</tr>
<tr>
<td>200 Amp Main</td>
<td>2/0</td>
<td>#1 Cu, 2/0 Al</td>
<td>#4 Solid Copper (Note 5)</td>
<td>2” Minimum</td>
</tr>
<tr>
<td>320 Amp Main</td>
<td>350</td>
<td>4/0 Cu, 300 kcmil Al</td>
<td>#2 Solid Copper (Note 5)</td>
<td>3” Minimum</td>
</tr>
</tbody>
</table>

**Table 5 Notes:**

- Note 1) WCEC requires a minimum 2” rigid steel conduit be used where the service mast (roof jack) is used as a support for the service-drop conductors. This is required to improve ability of bearing the tension of service-drop conductors (NEC 230.28).

- Note 2) The minimum size ungrounded “hot” conductor shall be #4 AWG copper or #2 AWG aluminum equivalent.

- Note 3) The minimum size for a grounded neutral conductor is commonly allowed to be two standard trade sizes smaller than the ungrounded “hot” conductor under balanced load conditions, however caution should be used when using this reduction and NEC 220.61 should be consulted to calculate neutral currents for unbalanced or nonlinear load conditions. A grounded neutral shall never be reduced smaller than #4 AWG copper or #2 AWG aluminum equivalent. In addition, the grounded neutral conductor shall never be smaller than the required grounding electrode conductor found in Table NEC 250.66 (NEC 250.24(C)(1)). (Reference also NEC 215.2, NEC
220.61, NEC 230.42, NEC 310.15(B)(5b), NEC 310.15(B)(7)).

- Note 4) The Member is responsible for the installation of the conduit and conductors between the weatherhead and meter base. Copper or equivalent aluminum conductors sized per NEC 310.15(B)(7) may be used in the overhead service conduit. All overhead conduit conductors must be insulated and designed for use in conduit. All connectors must be sized, tightened and have composition compatible for the type conductor used per the meter base/panel instructions and the NEC. The Member’s installer shall allow 18 inch minimum conductor tails outside of weatherhead for service connections.

- Note 5) NEC 250.66(A) provides for an exception to grounding conductor size found in NEC Table 250.66 “where the grounding electrode conductor is connected to rod, pipe, or plate electrodes as permitted in 250.52(A) or (A)(7), that portion of the conductor that is the sole connection to the grounding electrode shall not be required to be larger than #6 AWG copper wire...” **WCEC requires grounding conductors to be copper only.**

- Note 6) WCEC allows a minimum #6 AWG copper grounding conductor when directly connected to ground rod, otherwise see Table 5.1 above.
6) CIRCUIT PROTECTION / DISCONNECT
No more than six circuit breakers may be used without installing a main breaker (NEC 230.71, NEC 225.33). A circuit breaker enclosure or main disconnect enclosure is required before the service will be connected. Disconnect/Panels using board mountings between the panel and the meter pole must use treated lumber in all cases to be accepted. The Member shall install the panel with lag screws.

For overhead meter base installations on permanent residents or buildings, the main disconnect must be mounted within 18 inches of the meter base at a readily accessible location either outside of a building or structure or inside nearest the point of entrance of the service conductors (NEC 230.70).

For services to mobile and manufactured homes, a Member’s Service Equipment Disconnect Panel is prohibited to be mounted on any WCEC owned pole and must be located at a minimum of 5 feet from the base of any WCEC pole. The Service Equipment Disconnect Panel must be in sight and within 30 feet of the mobile home it serves and rated for such, but no less than 100 Amperes. (NEC 550.32 (A)(C).

7) GROUNDING
7.1) Ground rods: Ground rods must be 5/8 inches in diameter and 8 feet minimum in length and shall be copper-weld or galvanized steel with an approved ground wire clamp. (NEC 250.52 (A5). Rods shall be buried with the top of the rod 6 inches below final grade and located 2.5 feet from a slab foundation or Member-Owned-Pole in undisturbed soil.

7.2) Grounding conductors: Must be sized at a minimum #6 AWG soft-drawn copper and be continuous from the meter base ground connection to the ground rod connector. For 200 & 320 Amp mains, the table in Section 5 above specifies a #4 AWG & #2 AWG copper grounding conductor respectively; however, Note 5 of the table provides an exception for a #6 AWG to be used in most common applications. (See Table 5 Note 5 for details).

7.3) Equipment grounding conductors: For mobile home applications the equipment grounding conductor (“4th wire”) in the feeder assembly shall be at minimum an insulated #4 AWG stranded copper conductor or an insulated #2
AWG stranded aluminum conductor. (See Figure 12). In this instance only, WCEC allows an aluminum *equipment* grounding conductor to be used in the Mobile Home Feeder Assembly.

### 8) TEMPORARY SERVICE INSTALLATIONS

#### 8.1) General

“Temporary electric power and lighting installations shall be permitted during the period of construction, remodeling, maintenance, repair, or demolition of buildings, structures, equipment, or similar activities.” (NEC 590.3 (A)) “Temporary wiring shall be removed immediately upon completion of construction or purpose for which the wiring was installed.” (NEC 590.3 (D)).

Temporary service to recreational vehicles, mobile homes, or manufactured homes is prohibited.

#### 8.2) Overhead Service – Temporary

A temporary construction pole must be within 8 feet of a permanent WCEC pole in order to maintain clearance requirements under Section 2 of this document. The temporary construction pole will be required to have adequate circuit protection in the form of circuit breakers. At least one circuit breaker will be required in order for WCEC to set a service meter.

#### 8.3) Underground Service – Temporary (See Figure 13)

This is the same as in Section 3.2 above with the exception that a Member may install a temporary 4”X6” treated post for an underground service. The Member shall be responsible for trenching and installing the underground conductor at a depth of 24 inches in gray PVC schedule 40 conduit between the meter base and the Member’s temporary service/disconnect panel. The temporary service/disconnect panel must be designed for underground use. WCEC will not connect the service where the service panel is not designed for an underground application. See Figure 13.

### 9) GLOSSARY OF TERMS AND DEFINITIONS

**30 Foot Lift-Pole** – A WCEC pole installed to support a Member’s service drop so that proper above ground clearance can be maintained. A 30-foot lift pole is required if the Member’s MOP (meter pole) is less than the standard 23 foot MOP.

**Circuit Breaker** – A device designed to open and close a circuit by non-automatic means and to open the circuit automatically on a predetermined overcurrent
without damage to itself when properly applied within its rating. (NEC 70-27)

*Disconnect Panel (Disconnecting Means)* – A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply (NEC 70-28). The disconnect panel provides fault protection for the conductors going from the meter base to the distribution panelboard.

*Distribution Panelboard* – A panel including buses and automatic overcurrent devices, and equipped with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall, partition, or other support; and accessible only from the front (NEC 70-31).

*Electric Conduit* – Pipe used as a raceway to route electric cables for services above and below ground. WCEC requires a minimum 2”, gray, schedule 40 thick, PVC conduit for underground services and a minimum 2” galvanized steel pipe for 200A, 320A overhead services.

*Equipment Grounding Conductor* – The conductive path(s) installed to connect normally non-current-carrying metal parts of equipment together and the system grounded conductor or to the grounding electrode conductor, or both (NEC 70-29). An equipment grounding conductor does not carry current except when there is an electrical fault. WCEC requires that a minimum insulated #4 AWG stranded copper conductor be used. For Mobile Home Feeder Assembly applications only, a minimum insulated #2 AWG stranded aluminum conductor equivalent may be used.

*Ground* – The earth (NEC 70-29)

*Grounded (Grounding)* – Connected (connecting) to ground or to a conductive body that extends the ground connection (NEC 70-29).

*Grounded Conductor* – A circuit conductor that is intentionally grounded to an earth ground (NEC 70-29). It is commonly known as the “neutral” conductor and carries current back to the electrical source.

*Grounding Electrode* – A conducting object through which a direct connection to earth is established (NEC 70-29). WCEC’s grounding electrode specification is a 5/8” X 8’ copperweld or galvanized steel ground rod.
**Grounding Electrode Conductor** – A conductor used to connect the system grounded conductor or the equipment, to a grounding electrode. WCEC requires that a minimum #6 AWG copper only grounding conductor be used.

**Manufactured Home** – A structure, transportable in one or more sections, that, in the traveling mode, is 8 body-feet or more in width or 40 body-feet or more in length, or when erected on site, is 320 sq. feet or more and that is built on a permanent chassis and designed to be used as a dwelling, with or without a permanent foundation, when connected therein. (NEC 550.2)

**Mobile Home** – A factory-assembled structure or structures transportable in one or more sections that are built on a permanent chassis and designed to be used as a dwelling without a permanent foundation where connected to the required utilities and that include the plumbing, heating, air-conditioning, and electrical systems contained therein. For the purpose of the NEC and unless otherwise indicated, the term mobile home includes manufactured homes. (NEC 550.2)

**Mobile Home Electrical Nameplate** – A metal nameplate on the outside adjacent to the feeder assembly entrance shall read as follows: “This connection for 120/240-Volt, 3 pole, 4-wire, 60 Hertz, _____ Ampere Supply.” The correct ampere rating shall be marked in the blank space. (NEC 550.11 (D)).

**Mobile Home Feeder Assembly** – The overhead or under-chassis feeder conductors, including the equipment grounding conductor, together with the necessary fittings and equipment or a power supply cord listed for mobile home use, designed for the purpose of delivering energy from the source of electrical supply to the distribution panelboard within the mobile home (NEC 550.2)

**Mobile Home Feeder Conductors** – Mobile home feeder conductors shall consist of either a listed cord, factory installed in accordance with NEC 550.10 (B), or a permanently installed feeder consisting of four insulated, color-coded conductors that shall be identified by the factory or field marking of the conductors in compliance with NEC 310.110. Equipment grounding conductors shall not be identified by stripping the insulation (NEC 550.33). WCEC requires that a minimum insulated #4 AWG stranded copper conductor or its insulated #2 AWG stranded aluminum equivalent be used for the (“4th wire”) equipment grounding conductor.

**Mobile Home Service Equipment, (Disconnect Panel, “Feed Thru Panel”)** – The
equipment containing the disconnecting means, overcurrent protective devices, and receptacles or other means for connecting a mobile home feeder assembly (NEC 550.2). The mobile home service equipment shall be located adjacent to the mobile home and not mounted in or on the mobile home. The service equipment shall be located in sight from and not more than 30 feet from the exterior wall of the mobile home it serves. Grounding at the disconnecting means shall be in accordance with NEC 250.32. (NEC 550.32 (A)). The mobile home service equipment shall have an 8’ X 5/8” copperweld or galvanized steel ground rod. Per NEC 550.32 (C) mobile home service equipment shall be rated at not less than 100 Amperes at 120/240 Volts, and provisions shall be made for connecting a mobile home feeder assembly by a permanent wiring method.

**MOP** – Member-Owned-Pole installed by the Member to WCEC specifications and used to support the service wire and meter base for a Member’s electrical service.

**Service Drop** – The conductors between the utility electric supply and the service point (NEC 70-32). For example, the conductors between the WCEC transformer to the weatherhead of a residential overhead service.

**Service Equipment** – The necessary equipment, usually consisting of a circuit breaker(s) or switch(es) and fuse(s) and their accessories, connected to the load end of service conductors to a building or other structure, or an otherwise designated area, and intended to constitute the main control and cutoff of the supply (NEC 70-32). (See Mobile Home Service Equipment).

**Service Point** – The point of connection between the facilities of the serving utility and the premises wiring. Note: The service point can be described as the point of demarcation between where the serving utility ends and the premises wiring begins. The serving utility generally specifies the location of the service point based on the conditions of service (NEC 70-32). For Members of WCEC, the service point for overhead service is located at the weatherhead. For underground service, the service point is located at the bottom terminals of the meter base.

**Ungrounded Circuit Conductor** – The conductor with no connection to ground and energized to carry electrical power to the load. Commonly known as the “Hot” conductor.

**WCEC** – Wood County Electric Cooperative, Inc. is a not-for-profit cooperative with
the mission of providing members with reliable electric service at a reasonable rate since 1938.

10) FIGURES
Figure 1: Member-Owned-Pole (MOP) - Standard 23 Ft.
Figure 2: Permanent Building - OH Service – Above Roof Mast
Figure 3: Permanent Building - OH Service – Cable/Wall

- 3 conductors with 18" min. tail; 2 black insulated, and 1 white or marked neutral conductor (See Sections 2.2 & 5)
- Conduit straps (See Section 2.2)
- Rigid conduit only (See Sections 2.2 & 5)
- Ground wire & EMT conduit (See Sections 2.2, 5, 7)
- Weatherhead
- Point of attachment
- Final spans and points of attachment must be more than 3 ft. from windows, doors, porches, balconies, stairs, and similar locations
- Stud construction
- See detail "A"
- Main disconnect enclosure within 18" of meter base. Rigid steel nipple required between disconnect and meter base with locknuts and plastic bushings. (See Sections 2.2 & 6)
- Meter base furnished by WCCEC (See Sect. 4.1)
- Rigid conduit from weatherhead hub
- White or marked neutral
- Soft drawn copper to ground rod (See Sections 2.2, 5, 7)
- Ground wire in conduit to ground rod
- Bushing with locknut
- Detail "A"
- 5/8 in. x 8 ft. ground rod with approved clamp, minimum 6 in. below grade and 2 1/2 ft. from foundation (See Sect. 7)
- Revises: WOOD COUNTY ELECTRIC COOPERATIVE, INC. OUTMAN, TEXAS

Cable/Wall Mount Meter Loop
For Overhead Service Installation

Template provided by Power Engineers, Inc.

Dwtn. by: Ond. by: Scale: 2/2013

Date:

Figure 3
Figure 4: Permanent Building - OH Service – Standard 23' MOP

OVERHEAD SERVICE TO UNDERGROUND ENTRANCE USING STANDARD 23 FT. METER POLE (Section 2.3.1)

23 Ft. Member-Owned Pole (MOP)

5' Min. Separation Weatherhead to Building

TRIPLEX
16 Ft. (See Section 2.1)
5'-6" to 6'
90 deg sweeps
GROUND ROD
8' x 5/8" (NEC 250.52(A))
MINIMUM 6' BELOW GRADE
AND 2 1/2 FT. FROM POLE
(See Sect. 7)

METER
Recommended
Brkr/Disc
Panel
MIN #6 AVG
Grounding
Conductor

GROUND ROD
8' x 5/8"
MINIMUM 6' BELOW GRADE
AND 2 1/2 FT. FROM SLAB
(See Sect. 7)

PERMANENT BUILDING

2' Sch 40 Gray PVC Conduit
Buried 24' Minimum Depth
(See Section 25.5, Table 5.1)

WOOD COUNTY ELECTRIC COOPERATIVE, INC.
OLTMAN, TEXAS

23 FT. METER POLE TO PERMANENT BLDG

DRAWINGS
DAM. BR. CED. BR. SCALE

Figure 4
Figure 5: Permanent Building - OH Service - 16’ MOP - 30’ Lift Pole Required

OVERHEAD SERVICE TO PERMANENT BLIG. USING MINIMUM 16 FT. METER (MOP) POLE WITH A REQ’D WCEC POLE WITHIN 8FT (Sect. 2.3.2)

CUSTOMER INSTALLED
MINIMUM 16 FT. ROUND METER POLE
MIN. 16’ X 4” TOP DIAMETER, SET 4FT DEEP.

GROUND ROD
8’ X 5/8’ (NEC 250.52 (A5))
MINIMUM 6’ BELOW GRADE
AND 2 1/2 FT. FROM POLE
(See Sect. 7)

2 Sch 40 Gray PVC Conduit
Buried 24” Minimum Depth
(See Section 2.5, 5, Table 5.1)

WOOD COUNTY ELECTRIC COOPERATIVE, INC.
QUINLAN, TEXAS

16 FT MOP - WCEC 30 FT LIFT-POLE

25
Figure 6: Permanent Building - UG Service – M810 Riser

Underground Service From Overhead Primary to Permanent Building (Section 3.2.1)
Figure 7: Permanent Building - UG Service – Pad Mount Transformer

The member shall be responsible for installing the underground conductor between the Breaker Panel and WCEC's underground meter-base.
Figure 8: Mobile Home - OH Service – Standard 23’ MOP

OVERHEAD SERVICE TO
MOBILE/MFD HOME WITH 23FT METER POLE
(See Section 2.4.1)

Standard 23 Ft.
Member-Owned-Pole (MOP)
Set 4.5 Ft. Deep. (See Figure 1)

30’ Max. Distance
Disconnect to Mobile Home
5’ Min. Separation
Weatherhead
to Mobile Home

Ground Rod 8’ X 5/8’
Min. 6’ Below Grade
2.5 Ft. From Pole
(See Sect. 7)

FEEDER ASSEMBLY (NEC 550.2)
(4 WIRE COLOR CODED (NEC 550.33(A))
IN CONDUIT (SCHEDULE 40, GRAY PVC PIPE, Min. 2ft deep)
(See Sections 2.5, 5, Table 5.1)
**Figure 9: Mobile Home - OH Service - 16’ MOP - 30’ Lift Pole Required**

**OH SERVICE TO MOBILE/MFD. HOME WITH 16 FT. METER POLE REQUIRING A WC/EC POLE WITHIN 8FT. (See Section 2.4.2)**

CUSTOMER INSTALLED
MINIMUM 16 FT. ROUND METER POLE
MIN. 16’ X 4’ TOP DIAMETER, SET 4FT DEEP.

Required Mobile Home
Service Equipment Panel
(See Figure 12)

GROUND ROD
8’ X 5/8’ (NEC 250.52 (A5))
MINIMUM 6’ BELOW GRADE
AND 2 1/2 FT. FROM POLE
(See Sect. 7)

FEEDER ASSEMBLY
(4-WIRE COLOR CODED)
(See Section 25, 5)

2’ Sch 40 Gray PVC Conduit (Table 5.1)
Buried 24” Minimum Depth

Revised

WOOD COUNTY ELECTRIC COOPERATIVE, INC.

16 FT MINIMUM MOP W/ 30 FT LIFT-POLE

DRAWN BY: DATED: SCALE

Figure 9
Figure 10: Mobile Home - UG Service – M810 Riser

UNDERGROUND SERVICE FROM OVERHEAD PRIMARY (M8-UG Service)
(See Section 3.1, 3.31)

The member shall be responsible for installing the underground conductor between WCEC's underground meter-base, Member's Service Panel, and Mobile Home.
Figure 11: Mobile Home - UG Service – Pad Mount Transformer

UNDERGROUND SERVICE FROM UNDERGROUND PRIMARY
(See Sections 3.1, 3.3.2)

The member shall be responsible for installing the underground conductor between WCEC’s underground meter-base, Member's Service Panel, and Mobile Home.

Underground Meter Loop

Mobile Home

Transformer

UG Meter Base

WCEC Installed
WCEC Mounted Equipment Only

Treated Post
4" x 4" - Mobile Home Service Panel

Post buried a minimum 2 ft in ground

WCEC Installed Conduit and Conductor

Member Installed Conduit and Conductor
2" SCH 40 Gray PVC w/90 degree sweeps
Min. 2 ft depth (See Section 5)

Ground
8" x 8"
Minimum 6" below grade
And 2 1/2 ft. from post
(See Section 7)

Feeder Assembly
(4 wire color coded 2"
inch sch 40 PVC, minimum
2 ft deep
(See Sect. 3.1)

Wood County Electric Cooperative, Inc.

Underground Service - Mobile Home

(Wood County Electric Cooperative, Inc.
Quinlan, Texas)

Figure 11

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Figure 12: Mobile Home – Mobile Home Service Equipment

MOBILE HOME SERVICE EQUIPMENT / DISCONNECT PANEL

RECOMMENDED CONDUCTOR SIZE

<table>
<thead>
<tr>
<th></th>
<th>FOR 200 AMP MAIN</th>
<th>FOR 100 AMP MAIN</th>
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<tbody>
<tr>
<td></td>
<td>Min Conductor Size</td>
<td>Min Conductor Size</td>
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<tr>
<td>120 Volt Conductors</td>
<td>4/0 AL, 2/0 CU</td>
<td>#2 AL, #4 CU</td>
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<tr>
<td>Neutral Conductor</td>
<td>2/0 AL, #1 CU</td>
<td>#2 AL, #4 CU</td>
</tr>
<tr>
<td>Insulated Equipment Grounding Wire (<em>4th wire</em>) Min.</td>
<td>#4 CU/#2 Al (Stranded)</td>
<td>#4 CU/#2 Al (Stranded)</td>
</tr>
</tbody>
</table>
Figure 13: Temporary - UG Service – Pad Mount Transformer

UNDERGROUND TEMPORARY SERVICE FROM A PAD MOUNT TRANSFORMER
(See Sections 3.1, 8.3)

The Member shall be responsible for installing the underground conduit and conductor between the WCEC meter base and the member's Service Panel stub post. WCEC will not connect temporary service panel if not designed for underground application.

[Diagram of underground temporary service from a pad mount transformer]
Figure 14: Security Light - UG Service – Pad Mount Transformer

Underground service to security vapor light from underground primary
(See Sect. 3.4)

1) WCEC will install and power light if light pole to be relocated within five (5) feet of transformer.
2) Otherwise, for locations beyond five (5), WCEC will install pole, light, and riser (36”1). In this instance, member will be responsible for powering light off member’s meter.

Wood County Electric Cooperative, Inc.
Guthrie, Texas

Underground Service – Security Light

Wood County Electric Cooperative, Inc.
Guthrie, Texas

Underground Service

<table>
<thead>
<tr>
<th>Owner</th>
<th>Date</th>
<th>Role</th>
</tr>
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<tbody>
<tr>
<td>WCEC</td>
<td>1-26-12</td>
<td>None</td>
</tr>
</tbody>
</table>

Figure 14