

Pierce Pepin Cooperative Services Metering Requirements



Single phase service

- A. Available voltages for single phase services is limited to 120/240 volts. *(800 amp maximum)*
- B. All meter sockets shall be installed with the center of meter at 5' 6" from ground level *(minimum of 4' and a maximum of 6')* and be accessible to cooperative employees.
- C. The meter position should be located so that it is not enclosed by buildings or concrete, such as retaining or basement walls, allowing the cooperative to obtain meter readings remotely. Other areas **not allowed** for meter installations include but are not limited to screened in porches, behind siding, inside boxes, cabinets or other enclosures, inside houses, barns or other buildings.
- D. Self-contained *(direct wired)* meters –
 - i. for a 200-amp service, a 200-amp lever bypass meter socket is required.
 - ii. for a 400-amp service, a 320-amp lever bypass meter socket is required.
 - iii. All 120/240-volt, single phase services will have the meter socket wired at 240 volts.

NOTE: meter sockets are supplied by the member, regardless of the load.

- E. For transformer rated services greater than 200 amps and up to 800 amps, an appropriately sized CT (*current transformer*) cabinet is required and is supplied by the member along with a 100-amp, non-lever bypass, 6-jaw (4S) socket. The meter socket should be mounted on the lock side of the CT cabinet (*opposite the hinge side*) with a 1-inch conduit between. The cooperative will supply the meter, current transformers (CT's), and any necessary wiring between these pieces of equipment.
- F. In certain situations, the cooperative may require the member to supply service wires in pipe between the metering point and the transformer. All connections in meter socket and transformer will be made by cooperative personnel. All secondary wires shall be sized appropriately for the size of the service.

Single phase service – apartment buildings and duplexes

- A. At a minimum, the member or contractor will provide enough service metering points in one enclosure to accommodate all residential dwellings being served at this location.
- B. In a meter bank configuration, the lower metering point can be as low as 3' to enable the top metering points to be at the 6' height (*measured from the center of the meter to ground level*).

Single phase service – communications towers

- A. A minimum of 4 service points is required at the same location (*preferably a meter bank configuration*) and positioned outside the security fence, if one is being installed. More service points may be necessary if the tower can support more than the minimum of 4 services.

Any exceptions to this section must be approved by the Cooperative.

3-phase service

- A. The following voltages are available for 3-phase services:

- i. 120/208
- ii. 277/480

NOTE: 120/240 volt 3-phase services are no longer available.

- B. Self-contained (direct wired) meters –

- i. for a 200-amp service: a 200-amp, 7-jaw, lever bypass meter socket is required.

NOTE: meter sockets are supplied by the member, regardless of the load.

- C. All 3-phase services greater than 200 amps will be metered with a transformer rated metering package. An appropriately sized CT cabinet is required and is supplied by the member. The meter socket should be mounted on the lock side of the CT cabinet (*opposite the hinge side*) with a 1-inch conduit between.
 - i. It is the member's responsibility to ensure that a main bonding jumper (*NEC 250.8 & 250.92 (A) (2)*) is installed between the neutral and the ground/cabinet per NEC Table 250.66.
 - ii. The cooperative will supply the meter, meter socket, current transformers (CT's), voltage transformers (VT's, *if necessary*) and any necessary wiring between these pieces of equipment.
- D. All meter sockets shall be installed with the center of meter at 5' 6" from ground level (*minimum of 4' and a maximum of 6'*) and be accessible to cooperative employees.
- E. The meter position should be located so that it is not enclosed by buildings or concrete, such as retaining or basement walls, allowing the cooperative to obtain meter readings remotely.
- F. In certain situations, the cooperative may require the member to supply service wires in pipe between the metering point and the transformer. All connections in meter socket and transformer will be made by cooperative personnel. All secondary wires shall be sized appropriately for the size of the service according to the NEC and State codes.

Any exceptions to this section must be approved by the Cooperative.

Metering Wiring

- A. For overhead services, the preferred wiring method of meter sockets is through the top (*line*) and out the bottom (*load*). However, there are other options depending on the specific location such as through the top (*line*) and out the back or side (*load*).
- B. For underground services, the preferred wiring method for line side wire entering through the bottom of the meter socket with these wires looped to be secured at the top of the line side lugs and the load wires exiting out the back, side or bottom of the meter socket.
- C. An approved antioxidant compound must be used on wiring connections.

Relocation

If changes are made by the member making the existing meter or service equipment unsafe or inaccessible, the member must make the appropriate changes and absorb the expense to correct this condition.

Unauthorized Use

The breaking of seals, tampering with meters, or unmetered wiring is prohibited by law in the state of Wisconsin, as well as by policy of Pierce Pepin Cooperative Services and violators are subject to criminal penalties.

Physical Protection of the Meter Socket and Meter

It is the responsibility of the Member to ensure that the meter socket and meter are protected from physical damage. If the meter socket is not located on the gable end of the building and is located under an eave where ice may fall and damage the meter, then an ice shield or roof shall be installed above the meter.

Conductor Types and Sizes

See NEC Table 310.15(B)(7)

<i>Service Size</i>	Copper <i>Minimum Size</i>	Aluminum <i>Minimum Size</i>
100 amp	#4	#2
150 amp	#1	2/0
200 amp	2/0	4/0
320 amp	*250 kcmil	*350 kcmil

** Or equivalent*

Grounding Specifications

Ground rods. NEC 250 Part III

- Two grounds are required; a minimum of eight (8) feet between the two grounds is required.
- Ground rods must be copper clad steel, and five-eighths (5/8) inch in diameter by eight (8) feet in length.

Ufer ground.

- In the situation where a “concrete encased electrode” (Ufer ground) has been installed per NEC 50.52(A)(3), then the need for supplemental electrodes per NEC 250 Part III are **not required**.

Ground wire.

- Ground wire must be #4 copper minimum or equivalent (see NEC Table 250.66 for proper size).
- Grounding conductors shall be continuous without splice. NEC 250.64(E).
- Ground wire shall be attached to service entrance neutral at main panel.
- For a 3-wire service, the main panel must be bonded to the neutral with a bonding screw. NEC 250.24(B).
- For a 4-wire service, the neutral and ground bus bar shall be bonded only at the central service location.

Specifications for Overhead Service:

Meter on Pole

See Diagram A

- 1) Overhead service with the meter on a pole must be grounded according to GROUNDING SPECIFICATIONS as detailed herein.
- 2) The meter pole should be located in close proximity to the load being served.
- 3) Member's weatherhead for service entrance wires shall be located above the point of attachment of the service drop conductors to the building or other structure. Exception: Where it is impractical to locate the service head above the point of attachment, the service head location shall be permitted not farther than 24 inches from the point of attachment. NEC 230.54(C).
- 4) Leave an 18-inch minimum drip loop for overhead services. NEC 230.54(F).
- 5) Disconnecting means with overcurrent protection shall be provided to disconnect the utility wiring from the premises wiring at any point where utility wiring terminates, and premises wiring continues underground. NEC 230.90.
 - a. The service overcurrent device shall be an integral part of the service disconnecting means or shall be located immediately adjacent thereto. NEC 230.91.
 - b. Overcurrent protection shall be provided in conjunction with all grade level switches, either as an integral part or located immediately adjacent thereto.
- 6) A separate conduit must be utilized for all load-side conductors. NEC 230.7

Specifications for Overhead Service:

Meter on Building

See Diagrams B and C

- 1) Overhead services with the meter installed on the building must be grounded according to GROUNDING SPECIFICATIONS as detailed herein.
- 2) Minimum service contact point is 12 feet above ground level for overhead service attachment. NEC 230.24(B)(2).
- 3) If a "through the roof" riser (service mast) is needed to obtain the required attachment height, it shall be supported to withstand strain of service drop conductors (2-inch minimum rigid metal conduit).
 - a. If the service mast extends more than 36 inches above the roofline, it must be guyed.
- 4) Member's weatherhead for service entrance cables shall be located above the point of attachment of the service drop conductors to the building or other structure. **Exception:** *Where it is impractical to locate the service head above the point of attachment, the service head location shall be permitted not farther than 24 inches from the point of attachment.* NEC 230.54(C).
- 5) Leave an 18-inch minimum drip loop for overhead services. NEC 230.54(F).

Diagram A

Permanent Pole

PPCS will supply and set the permanent service pole. Member must wire the pole as shown below. Contact PPCS for current charges. *Note: If pole top CT metering is required, please contact PPCS.*

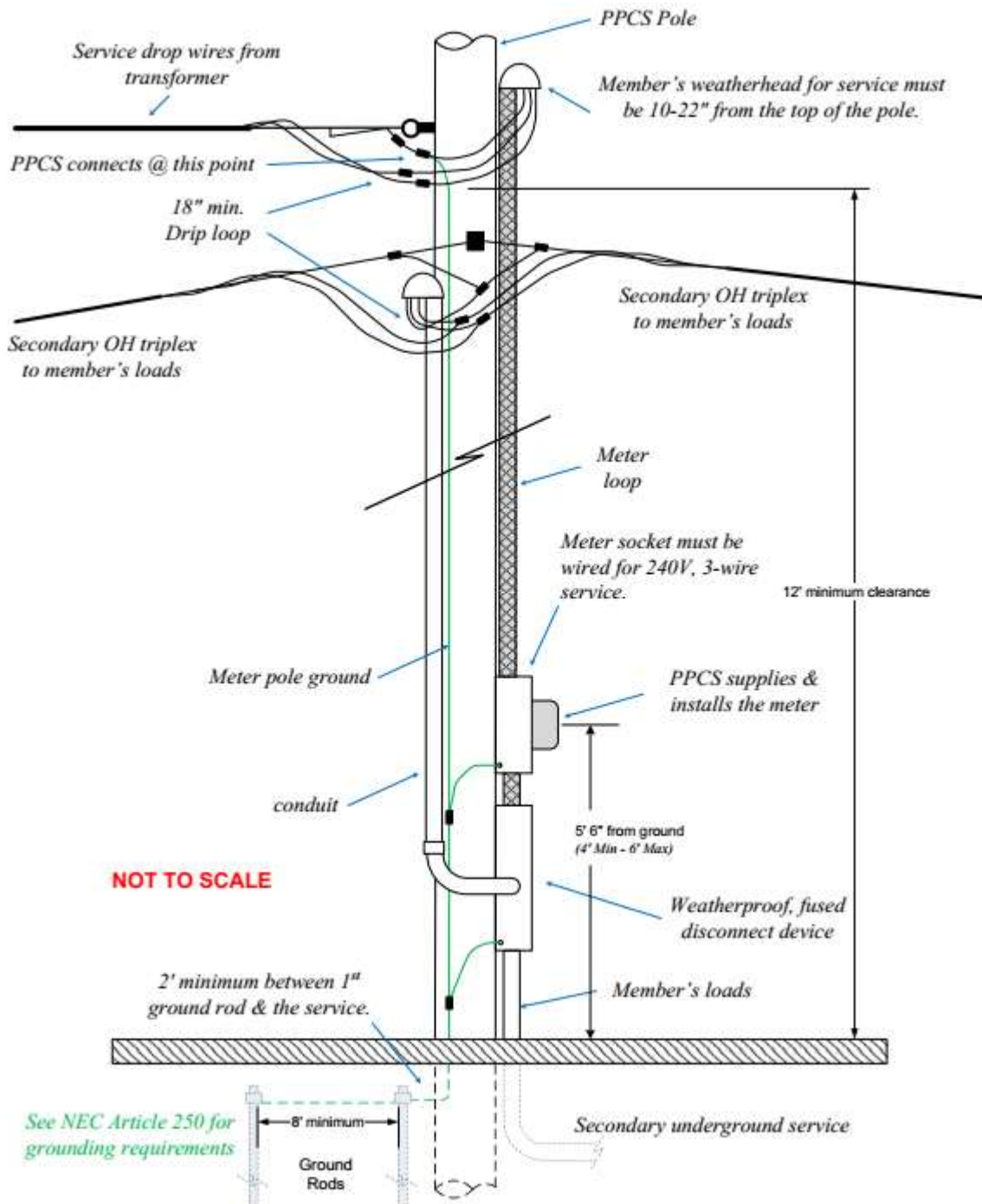


Diagram B

Service Mast Installation

Note: A special kit is available commercially that offers support and weatherproofing at the roofline.

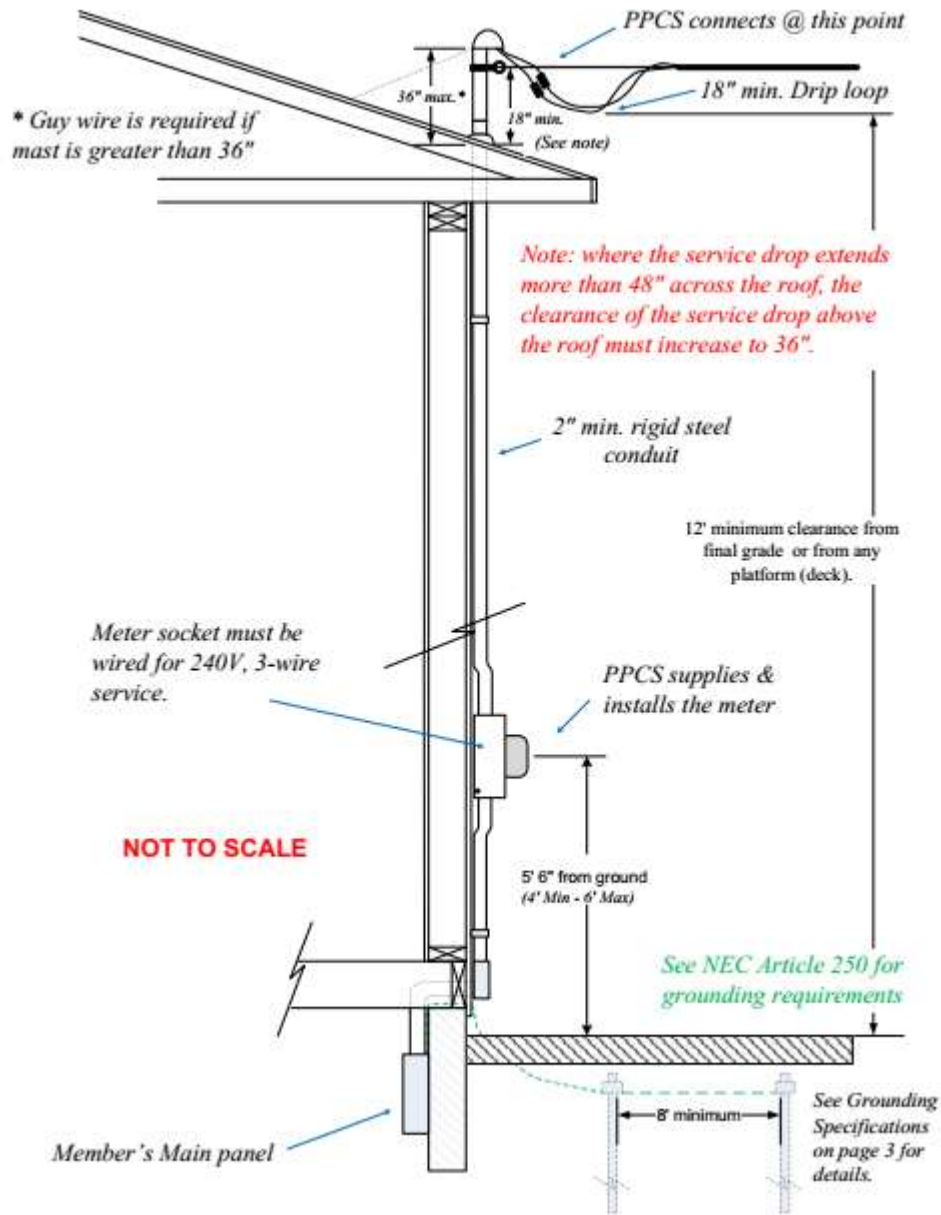
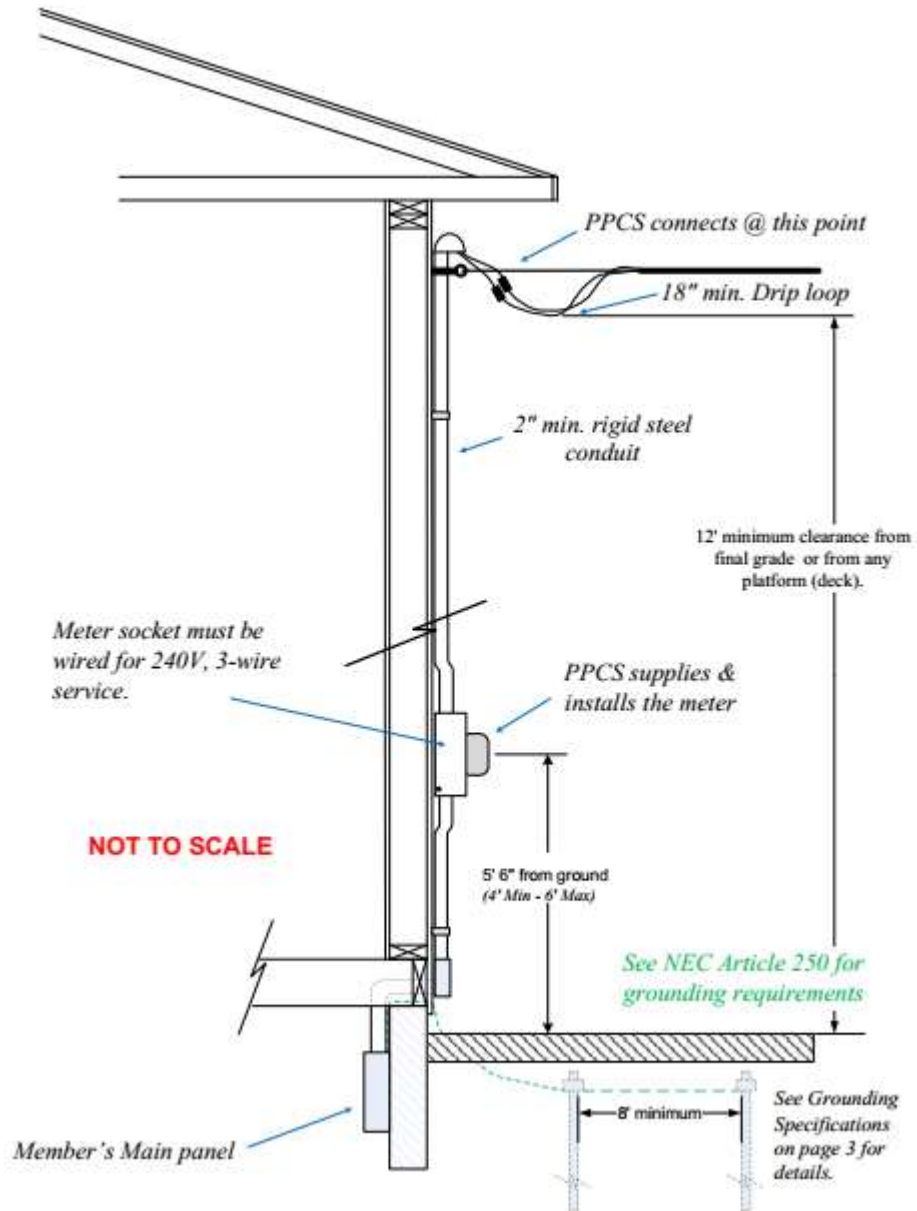


Diagram C

Service Mounted Socket Installation



Specifications for Underground Service

See Diagrams D and E

- 1) Underground service must be grounded according to GROUNDING SPECIFICATIONS as detailed herein.
- 2) Two-inch diameter protective conduit with bushings on each end must be provided by the member from the bottom of the meter socket to a depth of one (1) foot below grade for service conductors. Approved PVC or rigid metal conduit may be used. Thin wall conduit (EMT) is unacceptable. *NEC 362.12(4)*.
- 3) All ungrounded cables and conductors extending from the central service location shall have overcurrent protection located at the central service and sized in accordance with the ampacity of the ungrounded conductor. *NEC 230.90(A)*.
- 4) Disconnecting means with overcurrent protection shall be provided to disconnect the utility wiring from the premises wiring at any point where utility wiring terminates, and premises wiring continues underground.
 - a. The service overcurrent device shall be an integral part of the service disconnecting means or shall be located immediately adjacent thereto. *NEC 230.91*.
 - b. Overcurrent protection shall be provided in conjunction with all grade level switches, either as an integral part or located immediately adjacent thereto.

Diagram D

Temporary Underground Installation

Members requesting temporary underground service must supply and set the temporary pole or post with the required equipment on it as shown below. The temporary pole or post must be set within five (5) feet of the permanent service location. PPCS does NOT set or wire the temporary pole/post.

The service fees for temporary construction service apply.

(Contact PPCS for current information)

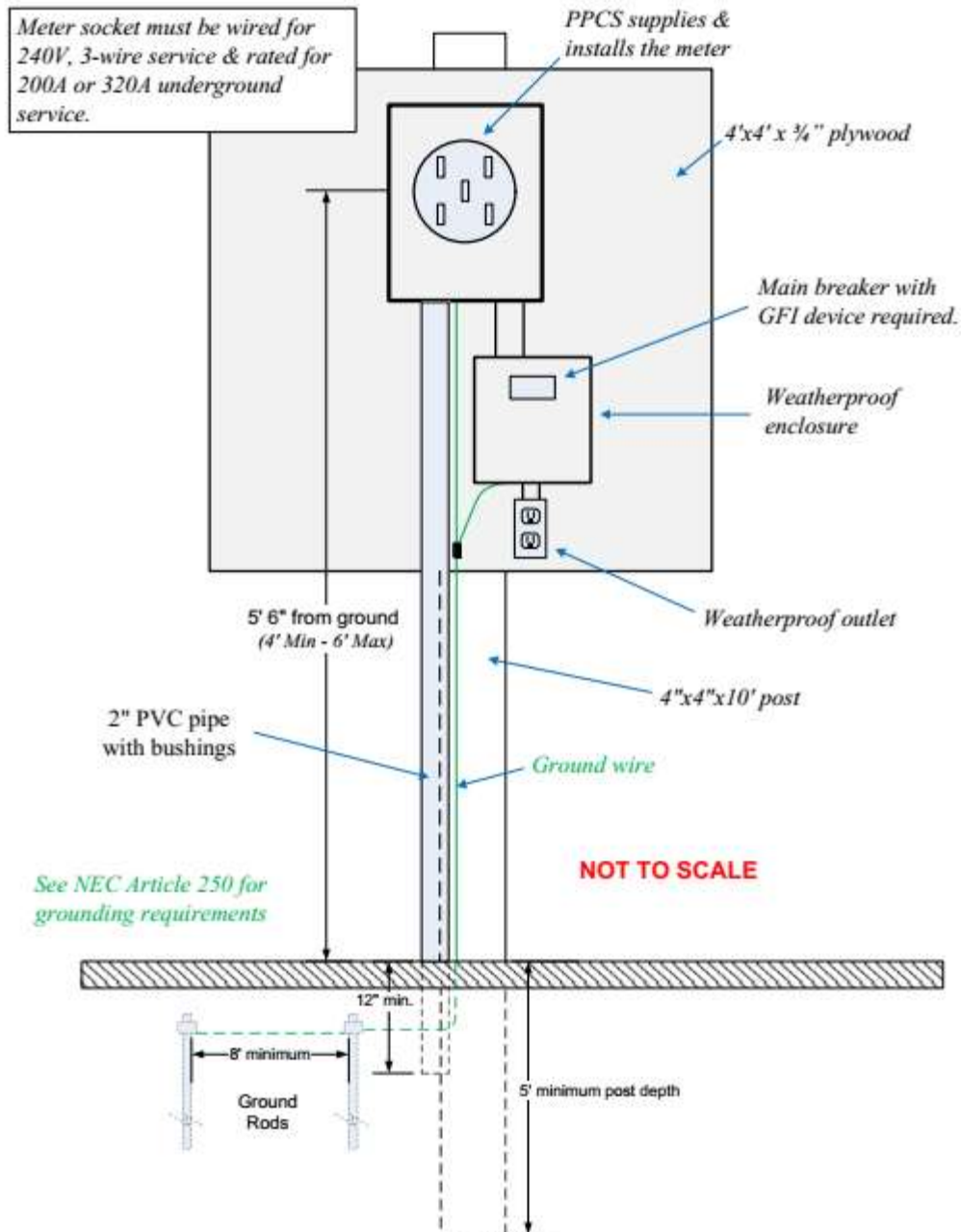


Diagram E

Underground Service Installation on Home

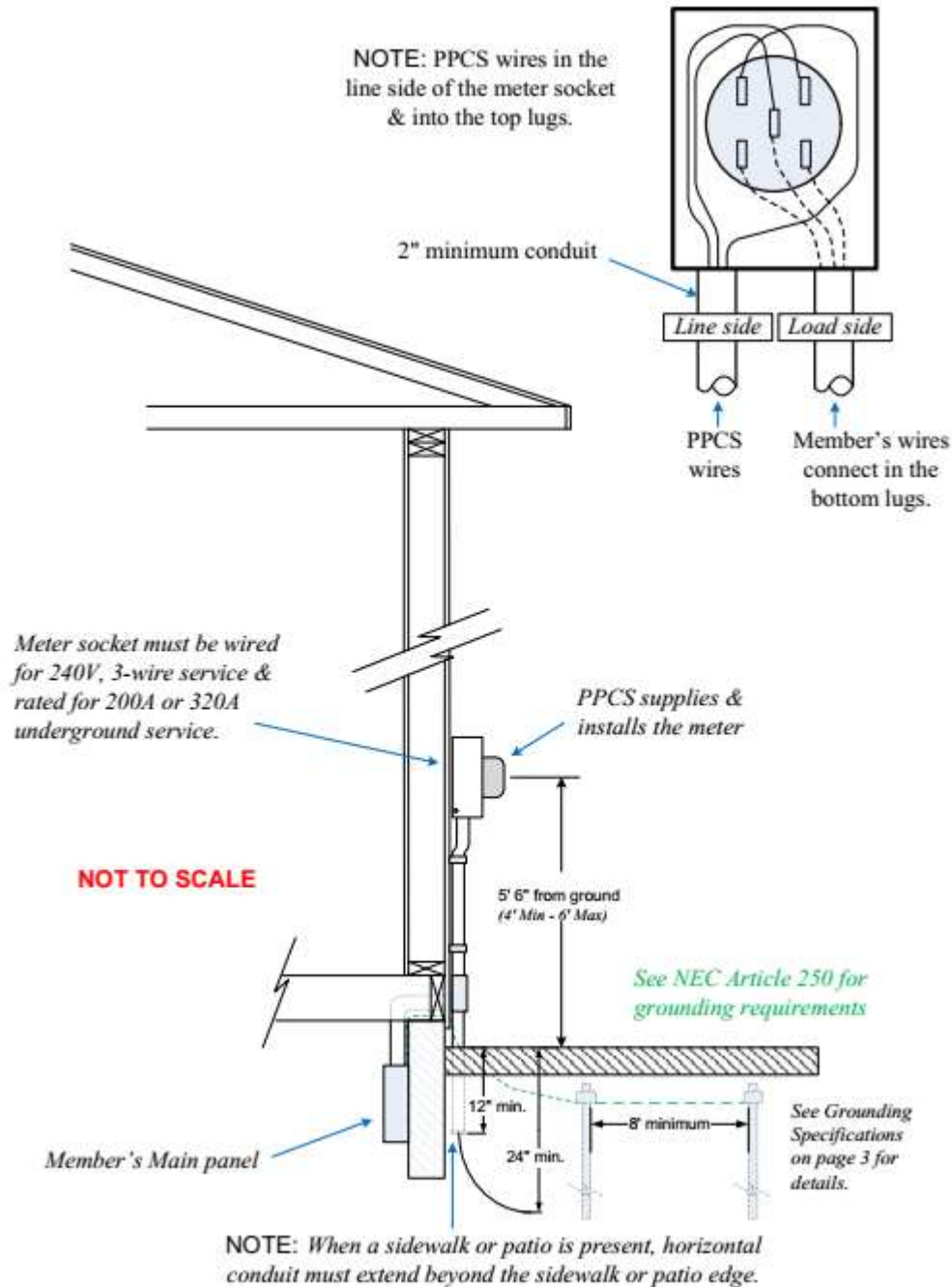
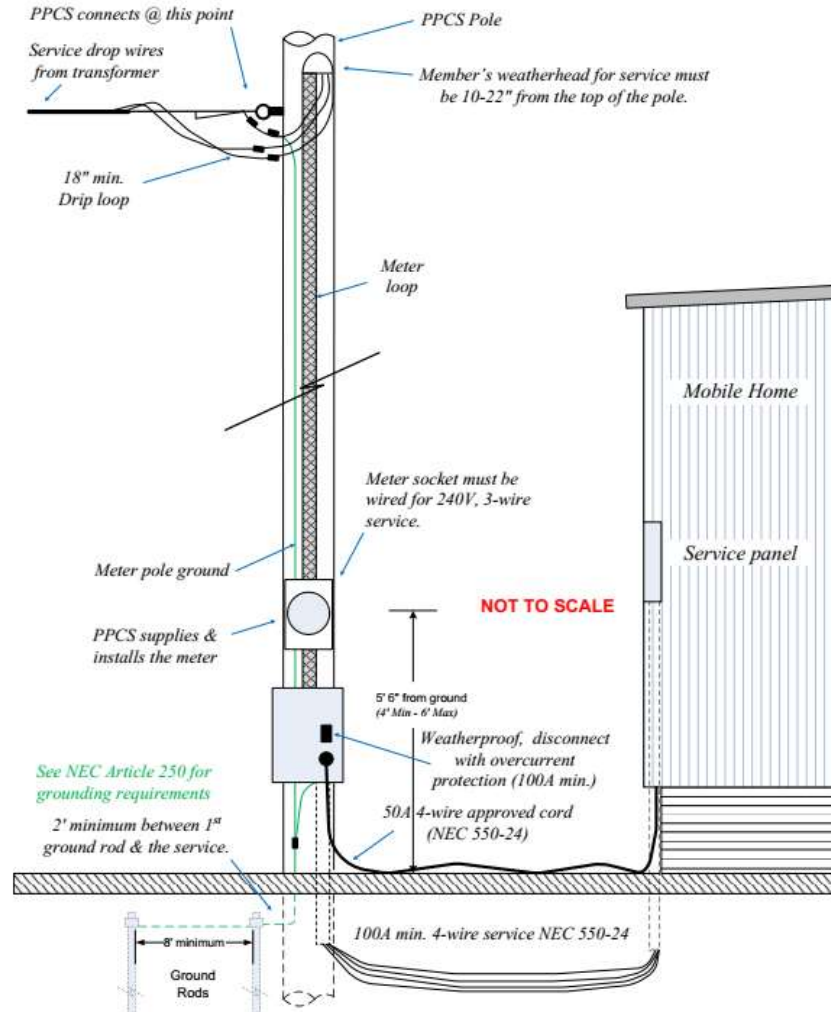


Diagram F

Mobile/Manufactured Home Service

Note: When mobile home is served underground, a 200-amp underground meter socket must be used. See item (1) on page 12 for more information on underground service.



Specifications for Mobile/Manufactured Home Service

- 1) Service to mobile homes shall comply with the NEC and the Wis. Adm. Code as they apply.
- 2) Service equipment (meter and disconnect) shall be located adjacent to the mobile home but not in or on it. Service equipment shall be located in sight from and not more than 30 feet from the mobile home it serves. *NEC 550.32(A)*.
- 3) Service equipment (meter and disconnect) may be installed in or on a manufactured home, provided that all seven of the conditions of *NEC 550.32(B)* are met.

Revisions and Modifications

This document may be updated and modified from time to time as requirements and specifications change; please contact Pierce Pepin's offices to make sure that you are using the most current version.

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- D. Self-contained *(direct wired)* meters –
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 - ii. for a 400-amp service, a 320-amp lever bypass meter socket is required.
 - iii. All 120/240-volt, single phase services will have the meter socket wired at 240 volts.

NOTE: meter sockets are supplied by the member, regardless of the load.

- E. For transformer rated services greater than 200 amps and up to 800 amps, an appropriately sized CT (*current transformer*) cabinet is required and is supplied by the member along with a 100-amp, non-lever bypass, 6-jaw (4S) socket. The meter socket should be mounted on the lock side of the CT cabinet (*opposite the hinge side*) with a 1-inch conduit between. The cooperative will supply the meter, current transformers (CT's), and any necessary wiring between these pieces of equipment.
- F. In certain situations, the cooperative may require the member to supply service wires in pipe between the metering point and the transformer. All connections in meter socket and transformer will be made by cooperative personnel. All secondary wires shall be sized appropriately for the size of the service.

Single phase service – apartment buildings and duplexes

- A. At a minimum, the member or contractor will provide enough service metering points in one enclosure to accommodate all residential dwellings being served at this location.
- B. In a meter bank configuration, the lower metering point can be as low as 3' to enable the top metering points to be at the 6' height (*measured from the center of the meter to ground level*).

Single phase service – communications towers

- A. A minimum of 4 service points is required at the same location (*preferably a meter bank configuration*) and positioned outside the security fence, if one is being installed. More service points may be necessary if the tower can support more than the minimum of 4 services.

Any exceptions to this section must be approved by the Cooperative.

3-phase service

- A. The following voltages are available for 3-phase services:

- i. 120/208
- ii. 277/480

NOTE: 120/240 volt 3-phase services are no longer available.

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Physical Protection of the Meter Socket and Meter

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Conductor Types and Sizes

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** Or equivalent*

Grounding Specifications

Ground rods. NEC 250 Part III

- Two grounds are required; a minimum of eight (8) feet between the two grounds is required.
- Ground rods must be copper clad steel, and five-eighths (5/8) inch in diameter by eight (8) feet in length.

Ufer ground.

- In the situation where a “concrete encased electrode” (Ufer ground) has been installed per NEC 50.52(A)(3), then the need for supplemental electrodes per NEC 250 Part III are **not required**.

Ground wire.

- Ground wire must be #4 copper minimum or equivalent (see NEC Table 250.66 for proper size).
- Grounding conductors shall be continuous without splice. NEC 250.64(E).
- Ground wire shall be attached to service entrance neutral at main panel.
- For a 3-wire service, the main panel must be bonded to the neutral with a bonding screw. NEC 250.24(B).
- For a 4-wire service, the neutral and ground bus bar shall be bonded only at the central service location.

Specifications for Overhead Service:

Meter on Pole

See Diagram A

- 1) Overhead service with the meter on a pole must be grounded according to GROUNDING SPECIFICATIONS as detailed herein.
- 2) The meter pole should be located in close proximity to the load being served.
- 3) Member's weatherhead for service entrance wires shall be located above the point of attachment of the service drop conductors to the building or other structure. Exception: Where it is impractical to locate the service head above the point of attachment, the service head location shall be permitted not farther than 24 inches from the point of attachment. NEC 230.54(C).
- 4) Leave an 18-inch minimum drip loop for overhead services. NEC 230.54(F).
- 5) Disconnecting means with overcurrent protection shall be provided to disconnect the utility wiring from the premises wiring at any point where utility wiring terminates, and premises wiring continues underground. *NEC 230.90.*
 - a. The service overcurrent device shall be an integral part of the service disconnecting means or shall be located immediately adjacent thereto. *NEC 230.91.*
 - b. Overcurrent protection shall be provided in conjunction with all grade level switches, either as an integral part or located immediately adjacent thereto.
- 6) A separate conduit must be utilized for all load-side conductors. NEC 230.7

Specifications for Overhead Service:

Meter on Building

See Diagrams B and C

- 1) Overhead services with the meter installed on the building must be grounded according to GROUNDING SPECIFICATIONS as detailed herein.
- 2) Minimum service contact point is 12 feet above ground level for overhead service attachment. NEC 230.24(B)(2).
- 3) If a "through the roof" riser (service mast) is needed to obtain the required attachment height, it shall be supported to withstand strain of service drop conductors (2-inch minimum rigid metal conduit).
 - a. If the service mast extends more than 36 inches above the roofline, it must be guyed.
- 4) Member's weatherhead for service entrance cables shall be located above the point of attachment of the service drop conductors to the building or other structure. **Exception:** *Where it is impractical to locate the service head above the point of attachment, the service head location shall be permitted not farther than 24 inches from the point of attachment. NEC 230.54(C).*
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Diagram A

Permanent Pole

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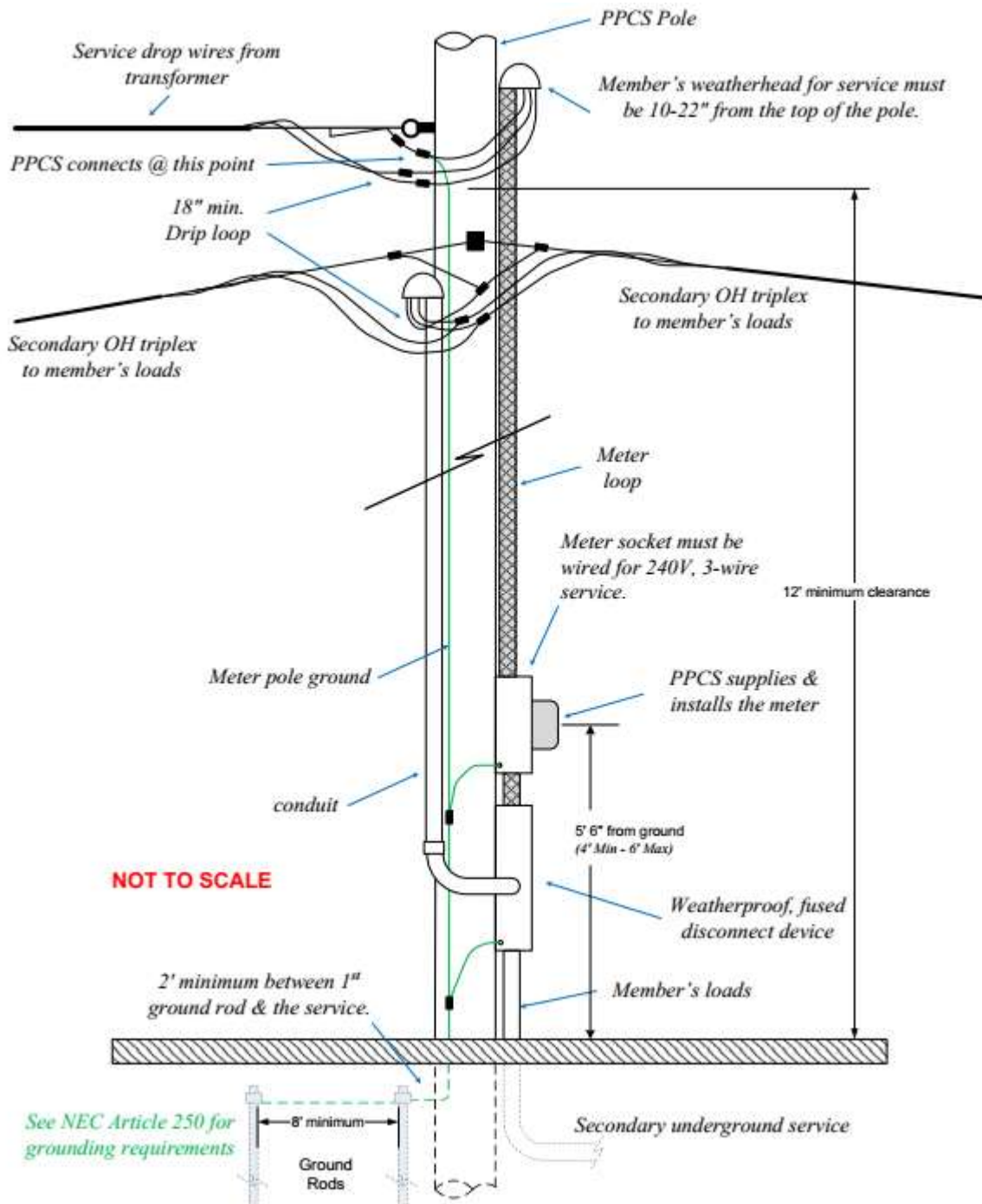
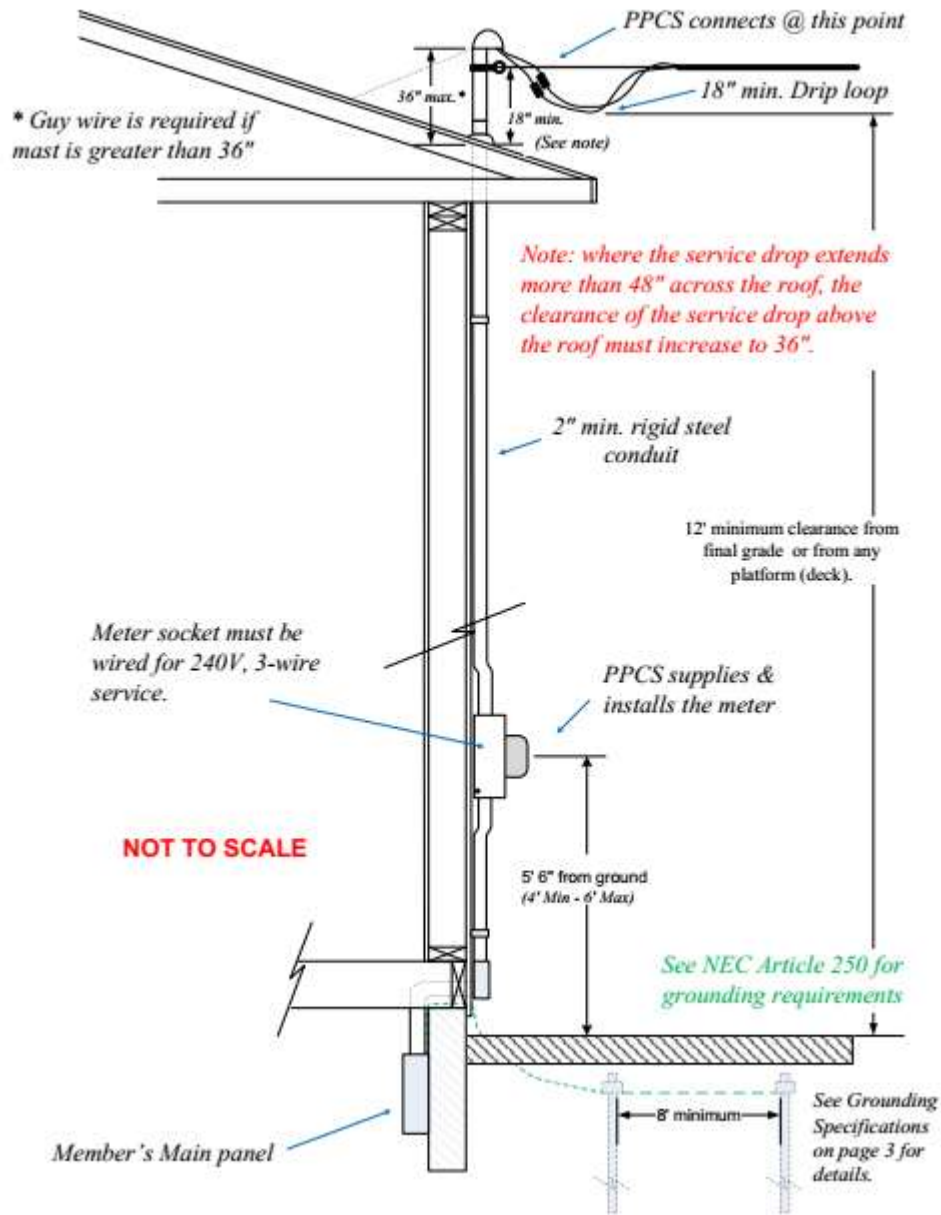


Diagram B

Service Mast Installation

Note: A special kit is available commercially that offers support and weatherproofing at the roofline.



Service Mounted Socket Installation



Specifications for Underground Service

See Diagrams D and E

- 1) Underground service must be grounded according to GROUNDING SPECIFICATIONS as detailed herein.
- 2) Two-inch diameter protective conduit with bushings on each end must be provided by the member from the bottom of the meter socket to a depth of one (1) foot below grade for service conductors. Approved PVC or rigid metal conduit may be used. Thin wall conduit (EMT) is unacceptable. *NEC 362.12(4)*.
- 3) All ungrounded cables and conductors extending from the central service location shall have overcurrent protection located at the central service and sized in accordance with the ampacity of the ungrounded conductor. *NEC 230.90(A)*.
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Diagram D

Temporary Underground Installation

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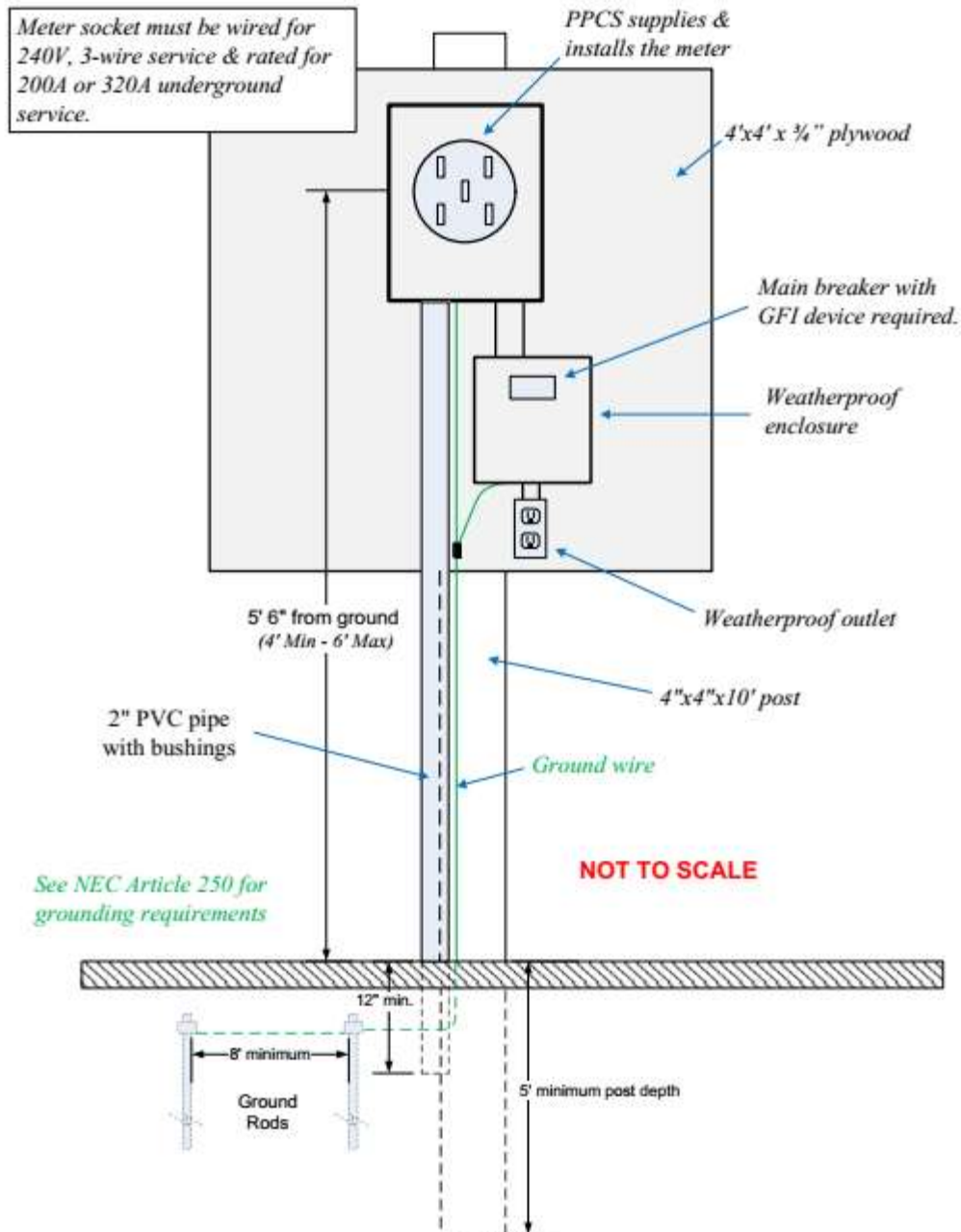


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Underground Service Installation on Home

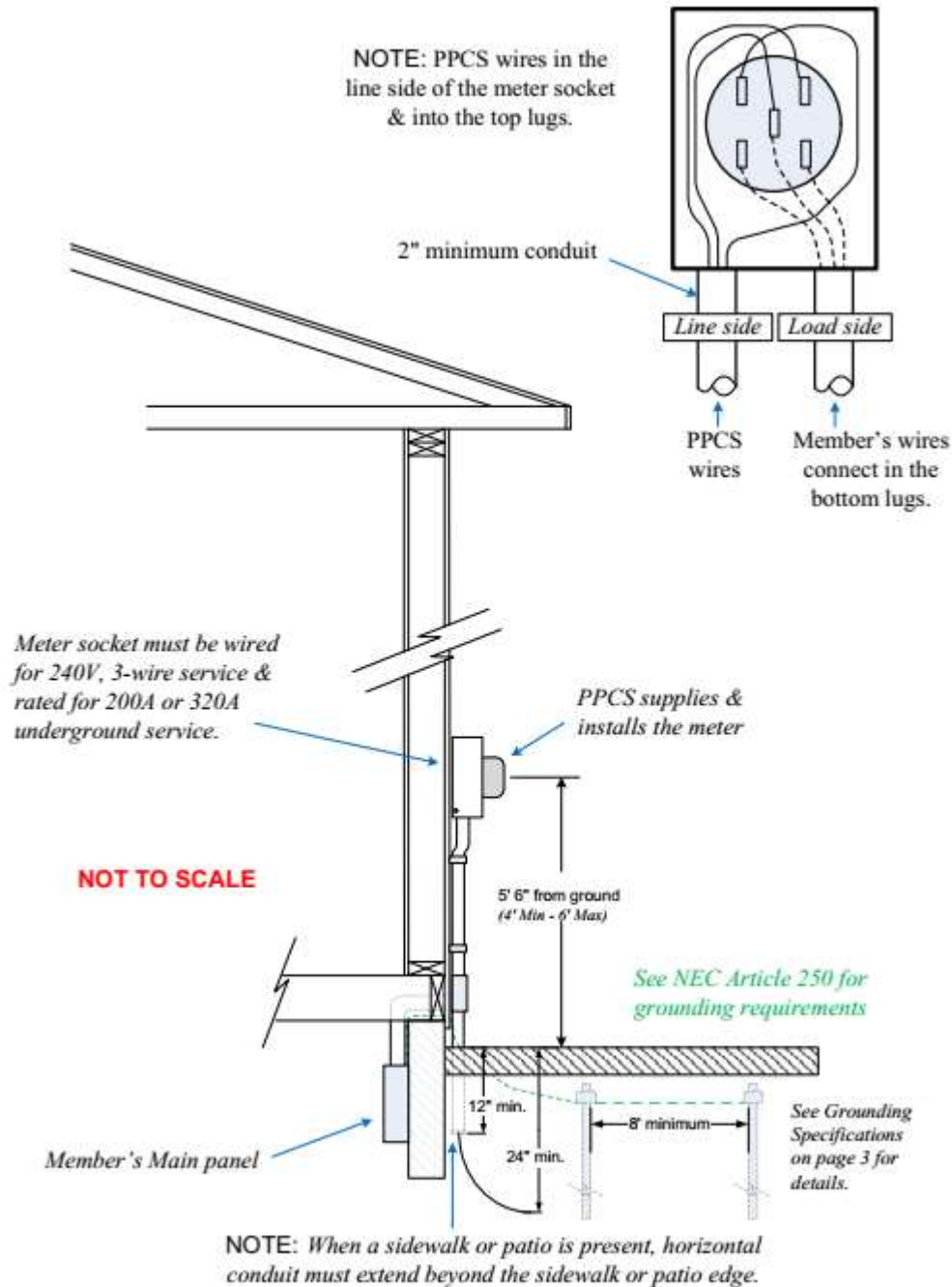
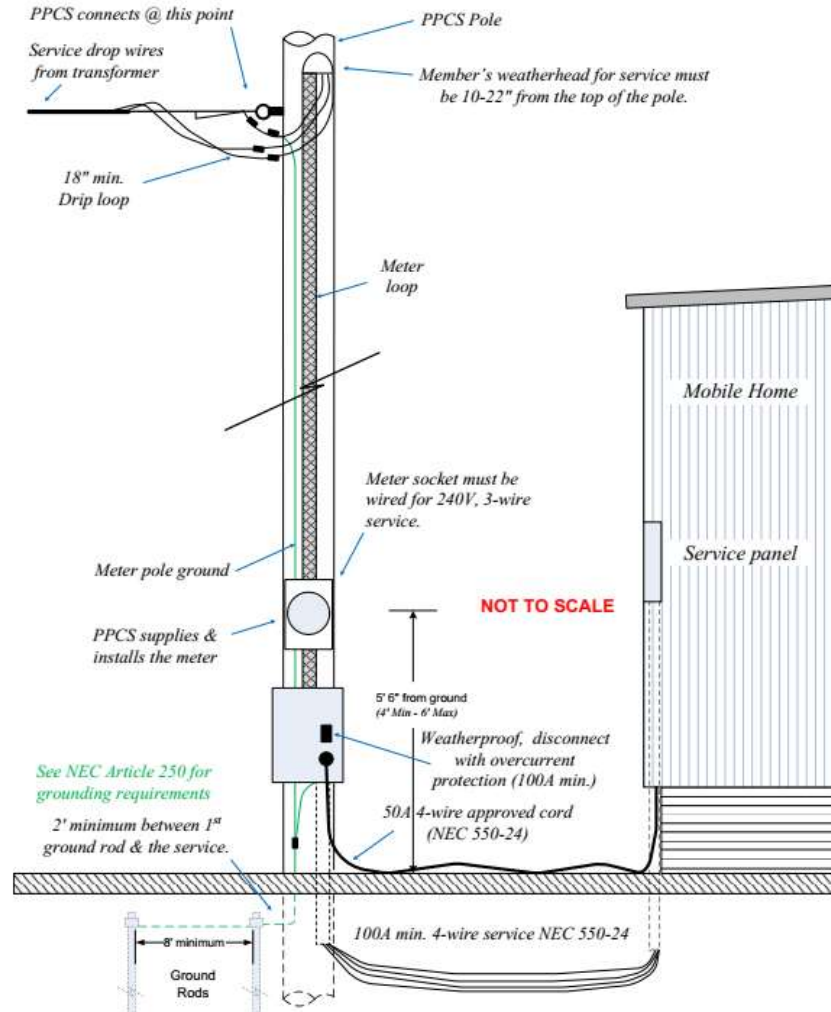


Diagram F

Mobile/Manufactured Home Service

Note: When mobile home is served underground, a 200-amp underground meter socket must be used. See item (1) on page 12 for more information on underground service.



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- A. For overhead services, the preferred wiring method of meter sockets is through the top (*line*) and out the bottom (*load*). However, there are other options depending on the specific location such as through the top (*line*) and out the back or side (*load*).
- B. For underground services, the preferred wiring method for line side wire entering through the bottom of the meter socket with these wires looped to be secured at the top of the line side lugs and the load wires exiting out the back, side or bottom of the meter socket.
- C. An approved antioxidant compound must be used on wiring connections.

Relocation

If changes are made by the member making the existing meter or service equipment unsafe or inaccessible, the member must make the appropriate changes and absorb the expense to correct this condition.

Unauthorized Use

The breaking of seals, tampering with meters, or unmetered wiring is prohibited by law in the state of Wisconsin, as well as by policy of Pierce Pepin Cooperative Services and violators are subject to criminal penalties.

Physical Protection of the Meter Socket and Meter

It is the responsibility of the Member to ensure that the meter socket and meter are protected from physical damage. If the meter socket is not located on the gable end of the building and is located under an eave where ice may fall and damage the meter, then an ice shield or roof shall be installed above the meter.

Conductor Types and Sizes

See NEC Table 310.15(B)(7)

<i>Service Size</i>	Copper <i>Minimum Size</i>	Aluminum <i>Minimum Size</i>
100 amp	#4	#2
150 amp	#1	2/0
200 amp	2/0	4/0
320 amp	*250 kcmil	*350 kcmil

** Or equivalent*

Grounding Specifications

Ground rods. NEC 250 Part III

- Two grounds are required; a minimum of eight (8) feet between the two grounds is required.
- Ground rods must be copper clad steel, and five-eighths (5/8) inch in diameter by eight (8) feet in length.

Ufer ground.

- In the situation where a “concrete encased electrode” (Ufer ground) has been installed per NEC 50.52(A)(3), then the need for supplemental electrodes per NEC 250 Part III are **not required**.

Ground wire.

- Ground wire must be #4 copper minimum or equivalent (see NEC Table 250.66 for proper size).
- Grounding conductors shall be continuous without splice. NEC 250.64(E).
- Ground wire shall be attached to service entrance neutral at main panel.
- For a 3-wire service, the main panel must be bonded to the neutral with a bonding screw. NEC 250.24(B).
- For a 4-wire service, the neutral and ground bus bar shall be bonded only at the central service location.

Specifications for Overhead Service:

Meter on Pole

See Diagram A

- 1) Overhead service with the meter on a pole must be grounded according to GROUNDING SPECIFICATIONS as detailed herein.
- 2) The meter pole should be located in close proximity to the load being served.
- 3) Member's weatherhead for service entrance wires shall be located above the point of attachment of the service drop conductors to the building or other structure. Exception: Where it is impractical to locate the service head above the point of attachment, the service head location shall be permitted not farther than 24 inches from the point of attachment. NEC 230.54(C).
- 4) Leave an 18-inch minimum drip loop for overhead services. NEC 230.54(F).
- 5) Disconnecting means with overcurrent protection shall be provided to disconnect the utility wiring from the premises wiring at any point where utility wiring terminates, and premises wiring continues underground. *NEC 230.90.*
 - a. The service overcurrent device shall be an integral part of the service disconnecting means or shall be located immediately adjacent thereto. *NEC 230.91.*
 - b. Overcurrent protection shall be provided in conjunction with all grade level switches, either as an integral part or located immediately adjacent thereto.
- 6) A separate conduit must be utilized for all load-side conductors. NEC 230.7

Specifications for Overhead Service:

Meter on Building

See Diagrams B and C

- 1) Overhead services with the meter installed on the building must be grounded according to GROUNDING SPECIFICATIONS as detailed herein.
- 2) Minimum service contact point is 12 feet above ground level for overhead service attachment. NEC 230.24(B)(2).
- 3) If a "through the roof" riser (service mast) is needed to obtain the required attachment height, it shall be supported to withstand strain of service drop conductors (2-inch minimum rigid metal conduit).
 - a. If the service mast extends more than 36 inches above the roofline, it must be guyed.
- 4) Member's weatherhead for service entrance cables shall be located above the point of attachment of the service drop conductors to the building or other structure. **Exception:** *Where it is impractical to locate the service head above the point of attachment, the service head location shall be permitted not farther than 24 inches from the point of attachment. NEC 230.54(C).*
- 5) Leave an 18-inch minimum drip loop for overhead services. NEC 230.54(F).

Diagram A

Permanent Pole

PPCS will supply and set the permanent service pole. Member must wire the pole as shown below. Contact PPCS for current charges. *Note: If pole top CT metering is required, please contact PPCS.*

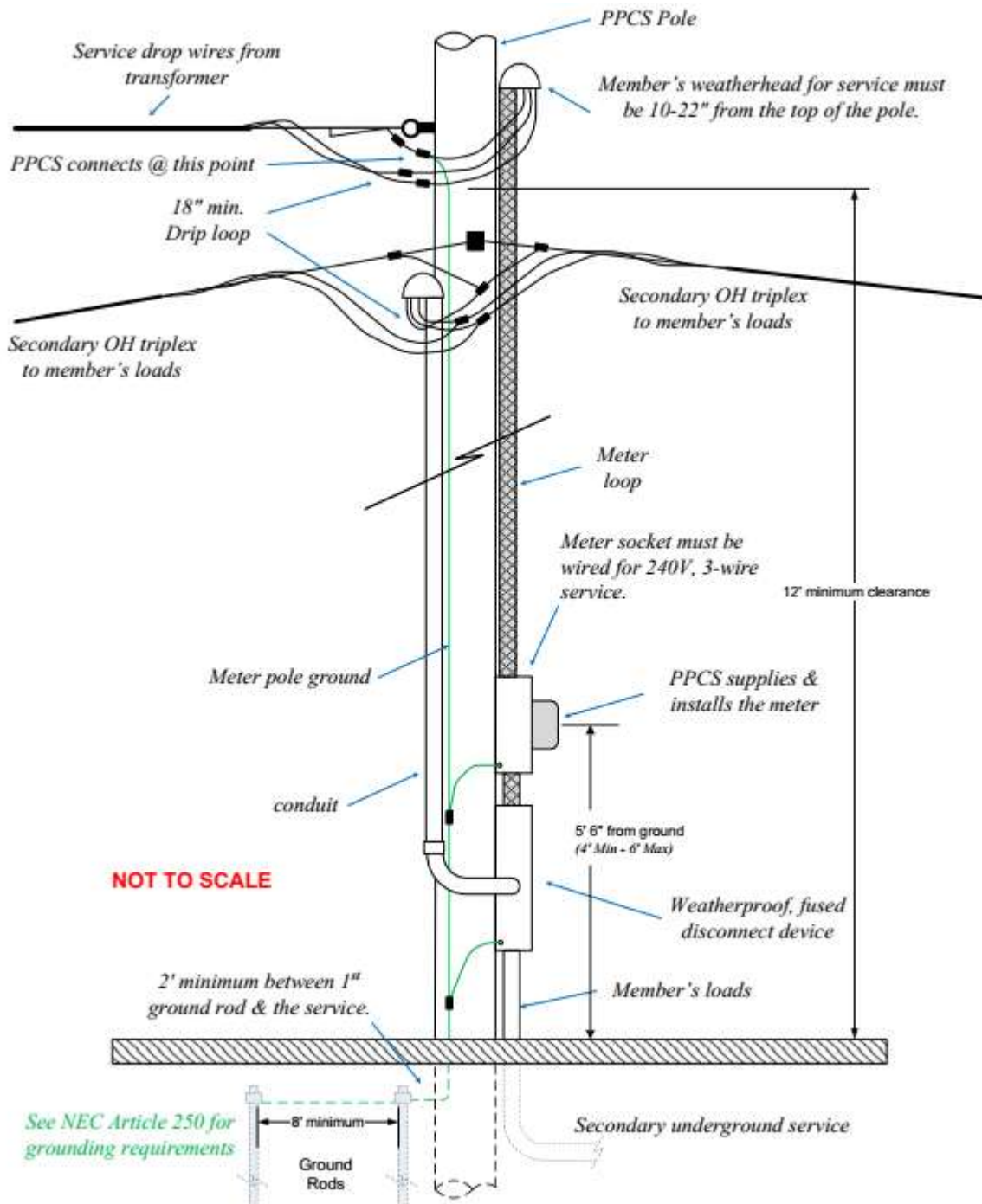
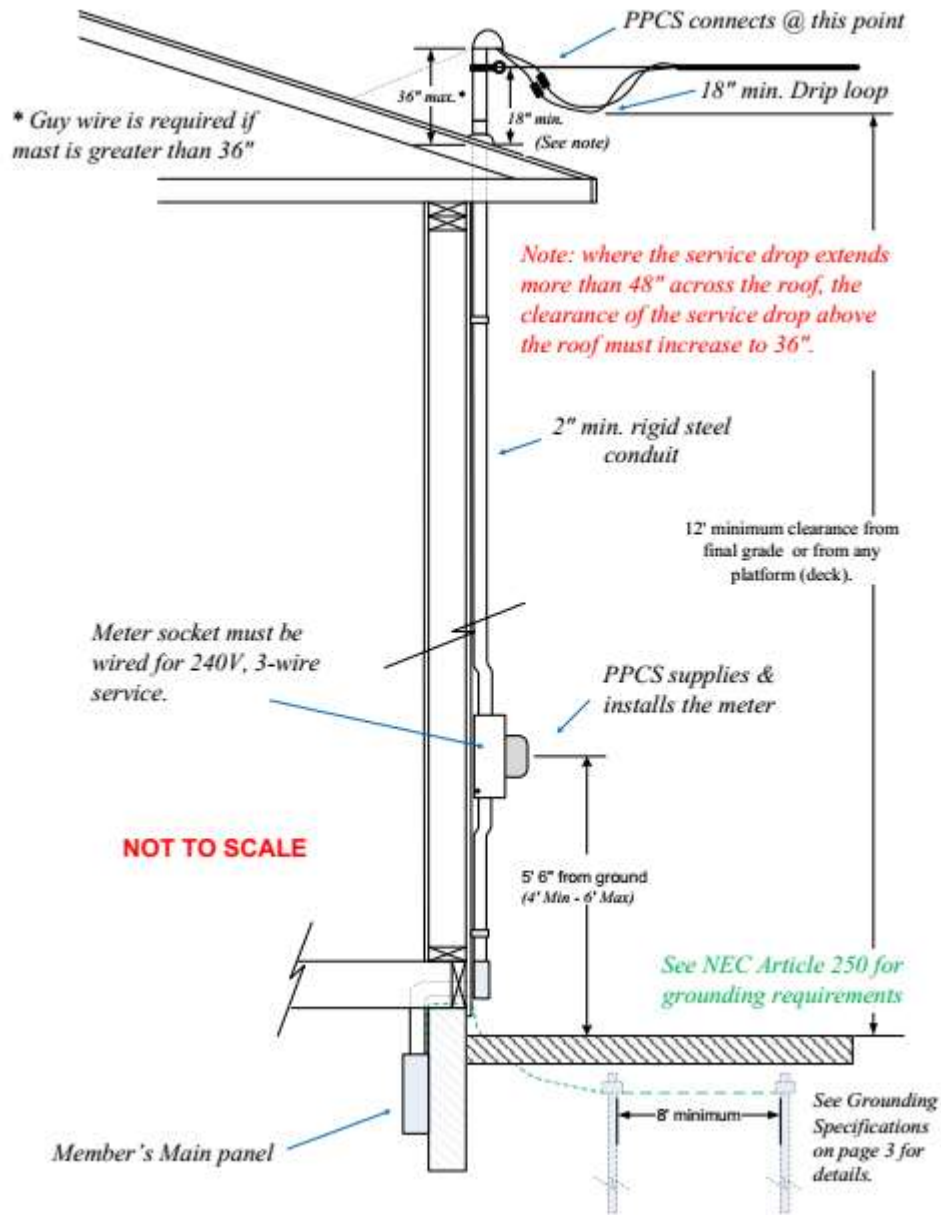


Diagram B

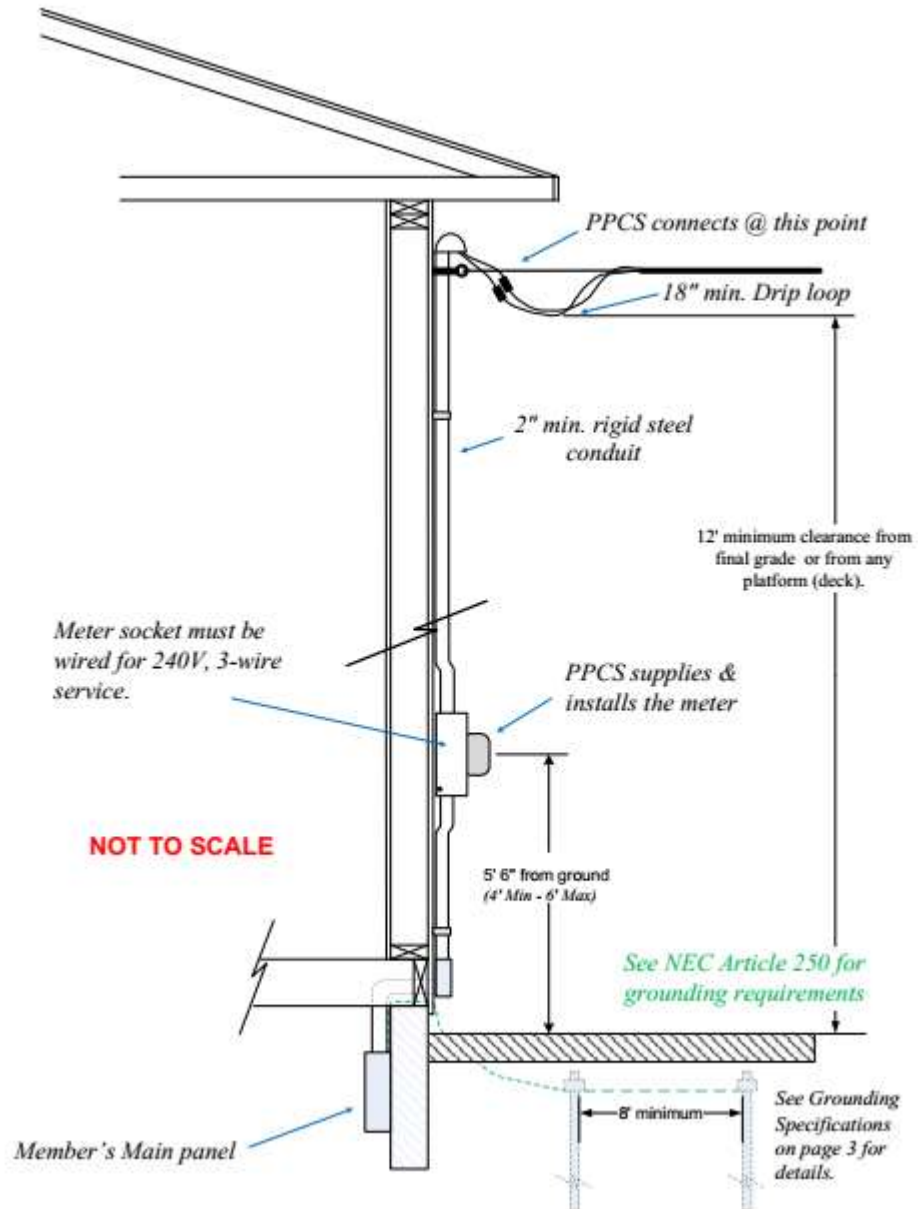
Service Mast Installation

Note: A special kit is available commercially that offers support and weatherproofing at the roofline.



Service Mounted Socket Installation

Service Mounted Socket Installation



-18" min. Drip loop

2" min. rigid steel
conduit

12' minimum clearance from
final grade or from any
platform (deck).

Meter socket must be wired for 240V, 3-wire service.

PPCS supplies & installs the meter

NOT TO SCALE

5' 6" from ground
(4' Min - 6' Max)

See NEC Article 250 for
grounding requirements

Member's Main panel

← 8' minimum →

See Grounding Specifications on page 3 for details.

Specifications for Underground Service

See Diagrams D and E

- 1) Underground service must be grounded according to GROUNDING SPECIFICATIONS as detailed herein.
- 2) Two-inch diameter protective conduit with bushings on each end must be provided by the member from the bottom of the meter socket to a depth of one (1) foot below grade for service conductors. Approved PVC or rigid metal conduit may be used. Thin wall conduit (EMT) is unacceptable. *NEC 362.12(4)*.
- 3) All ungrounded cables and conductors extending from the central service location shall have overcurrent protection located at the central service and sized in accordance with the ampacity of the ungrounded conductor. *NEC 230.90(A)*.
- 4) Disconnecting means with overcurrent protection shall be provided to disconnect the utility wiring from the premises wiring at any point where utility wiring terminates, and premises wiring continues underground.
 - a. The service overcurrent device shall be an integral part of the service disconnecting means or shall be located immediately adjacent thereto. *NEC 230.91*.
 - b. Overcurrent protection shall be provided in conjunction with all grade level switches, either as an integral part or located immediately adjacent thereto.

Diagram D

Temporary Underground Installation

Members requesting temporary underground service must supply and set the temporary pole or post with the required equipment on it as shown below. The temporary pole or post must be set within five (5) feet of the permanent service location. PPCS does NOT set or wire the temporary pole/post.

The service fees for temporary construction service apply.

(Contact PPCS for current information)

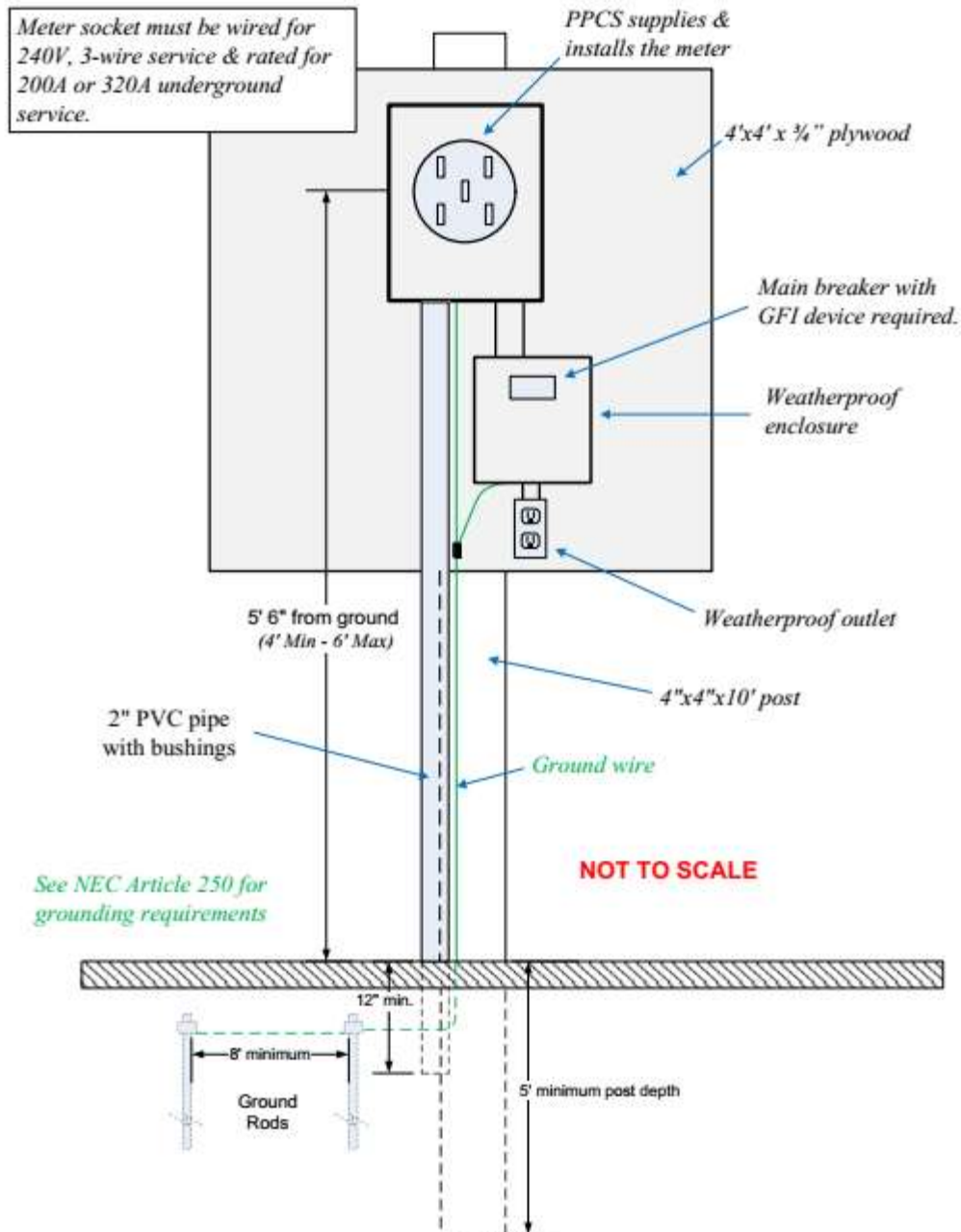


Diagram E

Underground Service Installation on Home

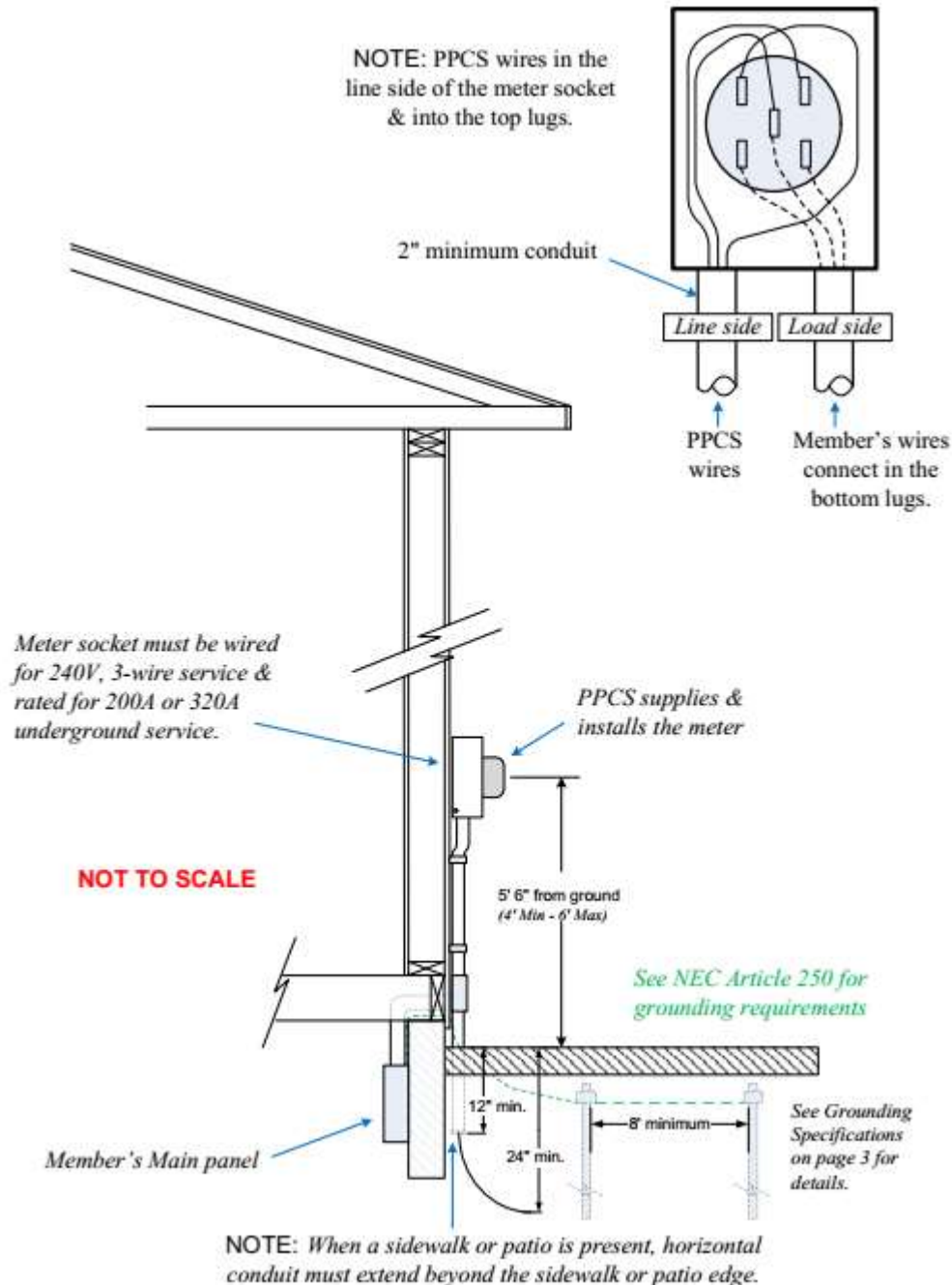
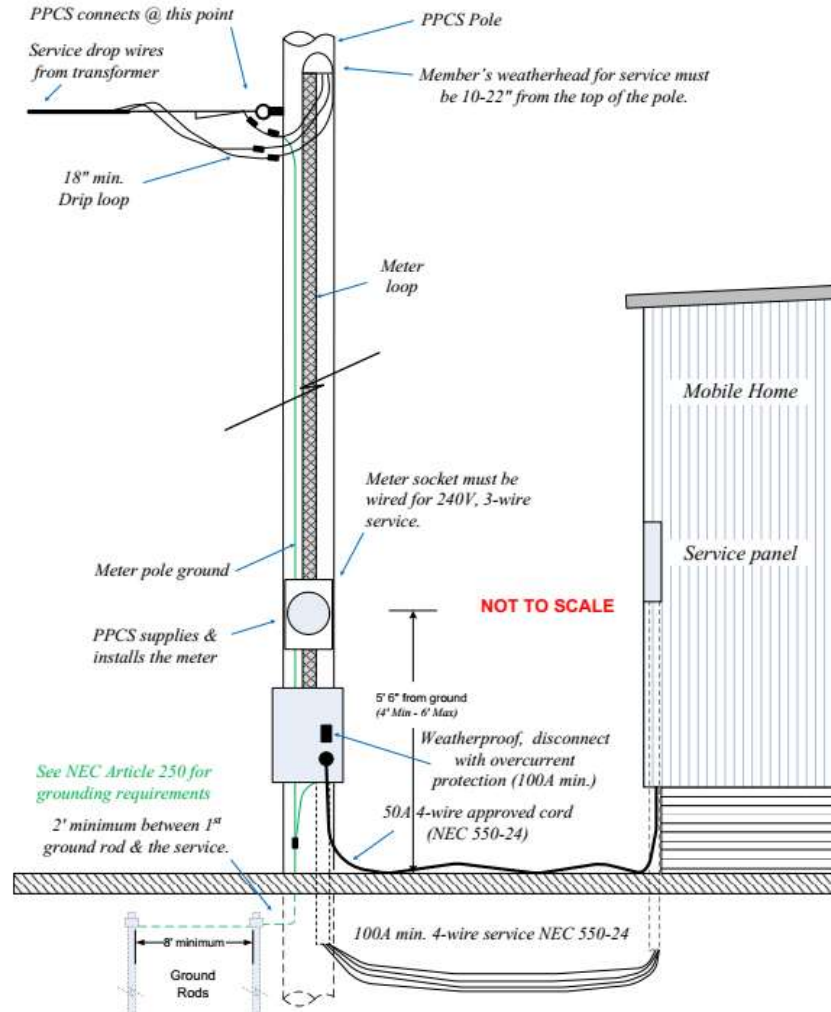


Diagram F

Mobile/Manufactured Home Service

Note: When mobile home is served underground, a 200-amp underground meter socket must be used. See item (1) on page 12 for more information on underground service.



Specifications for Mobile/Manufactured Home Service

- 1) Service to mobile homes shall comply with the NEC and the Wis. Adm. Code as they apply.
- 2) Service equipment (meter and disconnect) shall be located adjacent to the mobile home but not in or on it. Service equipment shall be located in sight from and not more than 30 feet from the mobile home it serves. *NEC 550.32(A)*.
- 3) Service equipment (meter and disconnect) may be installed in or on a manufactured home, provided that all seven of the conditions of *NEC 550.32(B)* are met.

Revisions and Modifications

This document may be updated and modified from time to time as requirements and specifications change; please contact Pierce Pepin's offices to make sure that you are using the most current version.