Citizens Electric Corporation

A Touchstone Energy® Cooperative

# Electric Service Guidelines

**REVISED FEBRUARY 2021**

# Citizens Electric Corporation (CEC)

Instructions to landowner or developer when planning facilities on their property.

1. **Always Look Up!** When locating a site for a home, mobile home, cabin, garage, grain bin, or any type of structure, "always look up." Safety to your life and property requires sufficient spacing from existing power lines to your new structure. This distance is provided for in the right-of-way easement agreement.

   When there is a conflict or question pertaining to electric lines, contact Citizens Electric Corporation. An analysis of your specific circumstances should be performed prior to construction.

   The following easement widths are dimensions that should be observed when planning your facilities. The electric pole line is located in the center of the easement. Buildings shall not be located within the easement corridor.

| Type of Electric Line | Easement Width |
|---|---|
| Transmission (cross country long span) | 100 feet |
| Transmission (urban short span) | 50 feet |
| Distribution Overhead (single phase or three phase) | 30 feet |
| Distribution Underground (single phase or three phase) | 15 feet |

2. Trees on and near the right of way – these trees endanger the electrical circuit and cause outages. They will be removed or trimmed on a cycle basis.

3. Service to a new facility: A **qualified electrician** should provide service equipment recommendations based on the maximum load to be served. Qualified individuals are responsible for supplying the appropriate service panel, conductor size and type, and also perform the installation of the service panel, meter socket, conduit and entrance head, wire, ground rods and clamps, etc.

   A. Home, RV/Temp. Service:
      1. Meter on structure, mast type
      2. Meter on structure, attachment on structure
      3. Meter on structure, underground
      4. Meter on CEC pole, mobile home
      5. Meter on CEC pole, overhead
      6. Meter on CEC pole, underground
      7a. Meter on CEC pole, underground (2 panels)
      7b. Meter on CEC pole, underground (2 panels) - option
      8. Meter on CEC pole, structure & well
      9. Meter on CEC pole, recreational vehicles
      10a. Metering Pedestal, underground service
      10b. Metering Pedestal, underground service - option
      11. Metering Pedestal 320 Amp Meter Breaker, U/G

B. Construction Power, or any other temporary connection:
    1. Meter on CEC pole, overhead
    2. Meter on post, underground

4. Underground Lines:
    A. When digging or excavating, call Missouri One Call System to verify the location of any Citizens Electric owned underground electric lines. **1-800-Dig-Rite (1-800-344-7483) or 811. Citizens Electric Corporation does not locate and is not liable for privately owned underground facilities**.

    B. On new installations, if customer requests underground electric, there is an additional charge. Contact CEC at 877.876.3511 - Option 5 for prices and specifications.

Thank you for your cooperation and help in addressing safety precautions for your electric service and preventing electrical contact accidents.

# Service to New Residential Facilities

For inquiries related to service to new facilities, contact CEC's Engineering Department at 877-876-3511 – Option 5.

See the attached guides for examples of:

Home, RV/Temp. Service:

1. Meter on structure, mast type
2. Meter on structure, attachment on structure
3. Meter on structure, underground
4. Meter on CEC pole, mobile home
5. Meter on CEC pole, overhead
6. Meter on CEC pole, underground

7a. Meter on CEC pole, underground (2 panels)
7b. Meter on CEC pole, underground (2 panels) - option

8. Meter on CEC pole, structure & well
9. Meter on CEC pole, recreational vehicles

10a. Metering Pedestal, underground service
10b. Metering Pedestal, underground service - option

11. Metering Pedestal 320 Amp Meter Breaker, U/G

Construction Power, or any other temporary connection:

1. Meter on CEC pole, overhead
2. Meter on post, underground

1. Individual Overhead Service and Secondary Conductors

In the event that only overhead service and/or secondary facilities are required, the Corporation shall construct all overhead service and secondary facilities to a point on Customer's permanent facility as designated by the Corporation, utilizing generally accepted utility practices, at no charge to the Customer. When said Customer requests the service conductors to extend past a point on the permanent facility as designated by the Corporation, Customer shall pay in advance of construction an additional charge equal to the Corporation's then-current average standard construction cost of single phase overhead extension.

2. Individual Underground Service and Secondary Conductors

A. Residential structures located in areas served by an overhead primary distribution system:

Customer requesting underground service conductors shall pay the Corporation in advance of construction an amount equal to the Corporation's then-current average standard construction cost of single phase underground extension less the average standard construction cost of single phase overhead extension, for

installation of such service from the transformer or lift pole to a point on the Customer's permanent facility as designated by the Corporation.

Upon completion of construction, Customer shall pay the Corporation for any unforeseen costs not included in the Corporation's original cost for an individual service or secondary extension such as trenching through rock, special material used for backfilling, drilling under roads, driveways and sidewalks, right-of-way clearing, etc.

B. Residential structures located in a subdivision served by an underground distribution system:

At the request of Customer, the Corporation will install underground service conductors from a transformer or pedestal (located on or within the property line of said residential structure) to a point on the permanent facility as designated by the Corporation. When the length of such service conductors exceed 125 linear feet, or when said Customer requests the service conductors to extend past a point on the permanent facility as designated by the Corporation, Customer shall pay the Corporation in advance of construction an additional charge equal to the Corporation's then-current average standard construction cost of single phase underground service applicable to the additional length.

Customer shall pay the Corporation for any unforeseen costs not included in the Corporation's estimate for an individual underground service or secondary extension such as trenching through rock, special material used for backfilling, drilling under roads, driveways and sidewalks, right-of-way clearing, etc.

C. When Customer agrees to furnish such trench and/or conduit meeting the Corporation's specifications, the Corporation shall deduct from Customer's required advanced payment the Corporation's then-current average standard construction cost of trenching and/or installing conduit from the total cost of the line extension as outlined in Section 2.A and 2.B above.

Thank you for your cooperation and help in addressing safety precautions for your electric service and preventing electrical contact accidents.

# Rural Missouri

## 10-Foot Rule – It's the Law!

**It's just common sense for anyone who must work near an energized electric transmission line to check with the utility that owns the line to make sure all safety precautions are taken. Well, it's also the law in the state of Missouri.**

**In 1991 the Missouri General Assembly passed the Overhead Power Line Safety Act, also called the 10-foot rule. The law requires that anyone who must work within 10 foot of a power line must first notify the utility that owns the line so safety precautions can be taken to help avoid tragedy.**

**Precautions may mean simply having a utility employee check the work area for safe clearances or it may involve disconnecting the line to avoid possible electrocution.**

**Under the law any person who comes into contact with a power line and didn't contact the utility that owns the line will be presumed negligent. This means that if a contractor's employee comes into contact with a line and the contactor didn't notify the utility before work began, then the contractor bears the responsibility for the accident.**

**If work must be done within 10 foot of the power line, play it safe and call the utility first. It could save a life.**

SERVICE ENTRANCE CONDUCTORS

SERVICE DROP CONDUCTORS

SERVICE POINT

- 2-1/2" GALVANIZED RIGID STEEL CONDUIT
- SERVICE ENTRANCE CONDUCTORS SHALL EXTEND 24" BEYOND WEATHERHEAD (MIN.)
- REFER TO RESIDENTIAL O/H SERVICE ENTRANCE CONDUCTOR CHART FOR PROPER CONDUCTOR SIZE
- IDENTIFY GROUNDED (NEUTRAL) CONDUCTOR PER NEC ARTICLE 200.6(B)

24" - 42" HIGH

18" MIN.

48" MAX.

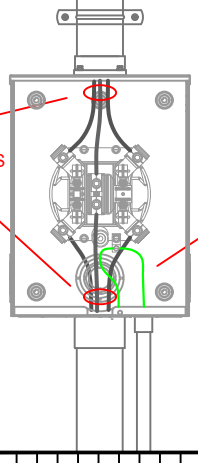
METER SOCKET SUPPLIED BY UTILITY, INSTALLED BY MEMBER

SERVICE DISCONNECT LOCATED IN READILY ACCESSIBLE LOCATION (WITHIN 10' OF POINT OF ENTRY) AS REQUIRED PER NEC ARTICLE 230.70

VERTICAL CLEARANCE
18' - DRIVEWAY
12' - PEDESTRIAN

5' TO 6' HIGH

TYPICAL METER SOCKET CONNECTIONS



SERVICE ENTRANCE CONDUCTORS

CONTINUOUS GROUNDING CONDUCTOR FROM EARTH GROUND TO SERVICE EQUIPMENT

- GROUNDING AND BONDING AS REQUIRED PER NEC ARTICLE 250
- INTERSYSTEM BONDING TERMINATION DEVICE AS REQUIRED PER ARTICLE 250.94(A)

WHEN SUPPLEMENTAL GROUND RODS ARE UTILIZED (NECESSARY WHEN GROUND RESISTANCE IS >25 OHMS), INSTALL IN ACCORDANCE WITH NEC ARTICLE 250

5/8" x 8' COPPER BONDED STEEL GROUND ROD AND PROPERLY SIZED GROUNDING CONDUCTOR PER ARTICLE 250.66

> 6 FT APART

| NO. | DATE | REVISIONS | DWN. | APPD. |
|---|---|---|---|---|
| 1 | 2.20.2020 | | SRH | JDC |

CITIZENS ELECTRIC CORPORATION
PERRYVILLE - STE. GENEVIEVE - FRUITLAND
877.876.3511 - Option 5

DATE: 6.20.18 | DWN: SRH | CHKD: ECA | APPD: JDC

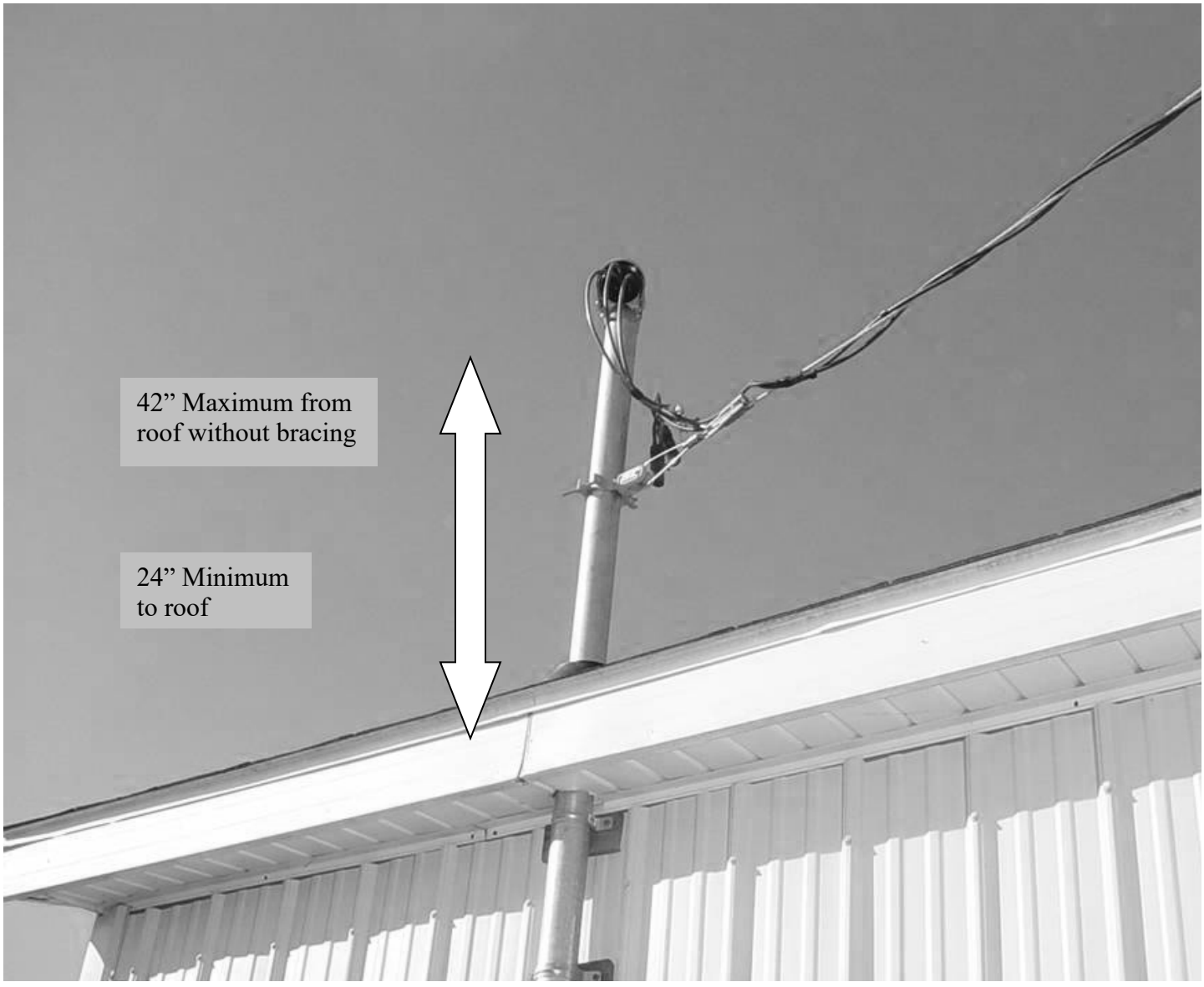
# SERVICE GUIDELINES

SERVICE (METER ON STRUCTURE-MAST)
200 AMPERE
STANDARD METER SOCKET

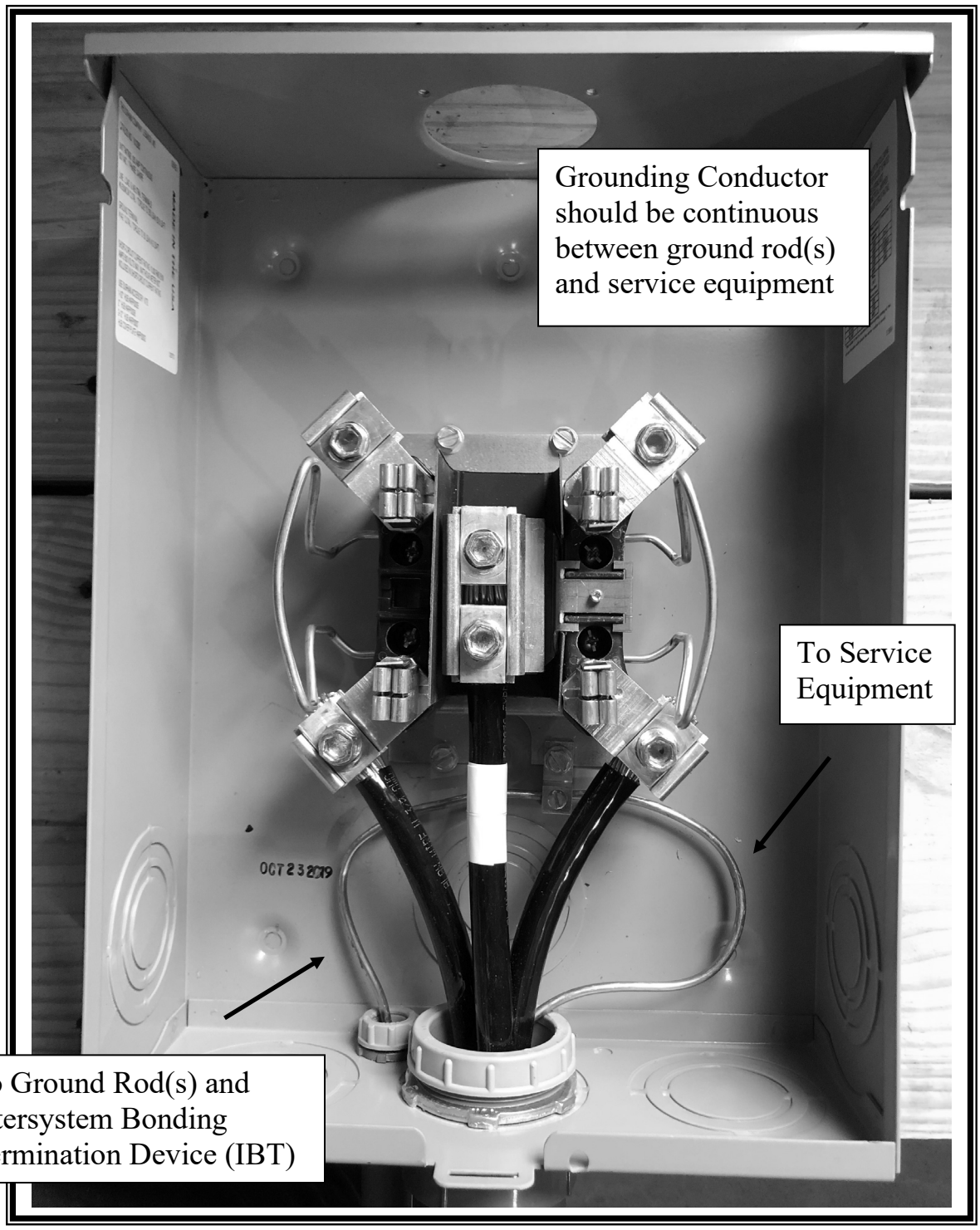
Drawing No.

3.A.1

# Meter on Structure, Mast Type
# 2½ inch Rigid Galvanized Conduit



# Required Grounding Methods



TYPICAL THRU-WALL INSTALLATION

EXTERIOR SIDING

FLAT WASHER, NUT, & LOCKNUT

CLEVIS, INSULATOR, AND BOLT SUPPLIED BY UTILITY, INSTALLED BY MEMBER

WOOD BRACING SUPPORTED BETWEEN STUDS TO ADEQUATELY SUPPORT CONDUCTOR WEIGHT

STUD

CLEVIS AND SPOOL INSULATOR - SUPPLIED BY UTILITY, INSTALLED BY MEMBER

SERVICE ENTRANCE CONDUCTORS

- REFER TO RESIDENTIAL O/H SERVICE ENTRANCE CONDUCTOR CHART FOR PROPER CONDUCTOR SIZE AND TYPE IDENTIFY GROUNDED (NEUTRAL) CONDUCTOR PER NEC ARTICLE 200.6(B)

SERVICE POINT

VERTICAL CLEARANCE
18' - DRIVEWAY
12' - PEDESTRIAN

5' TO 6' HIGH

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TYPICAL METER SOCKET CONNECTIONS

SERVICE ENTRANCE CONDUCTORS

CONTINUOUS GROUNDING CONDUCTOR FROM EARTH GROUND TO SERVICE EQUIPMENT

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# SERVICE GUIDELINES

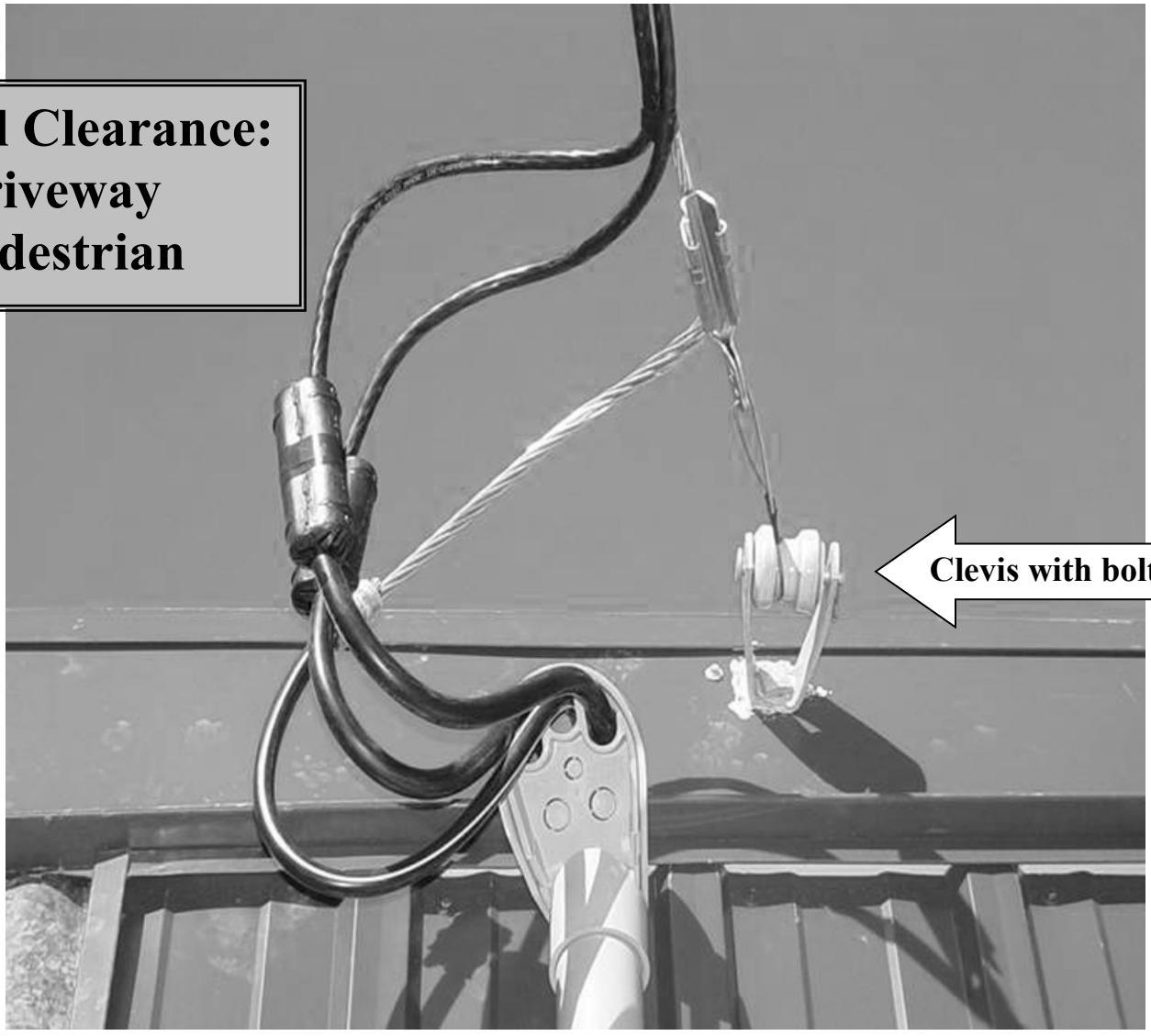
SERVICE (METER ON STRUCTURE-CLEVIS)
200 AMPERE
STANDARD METER SOCKET

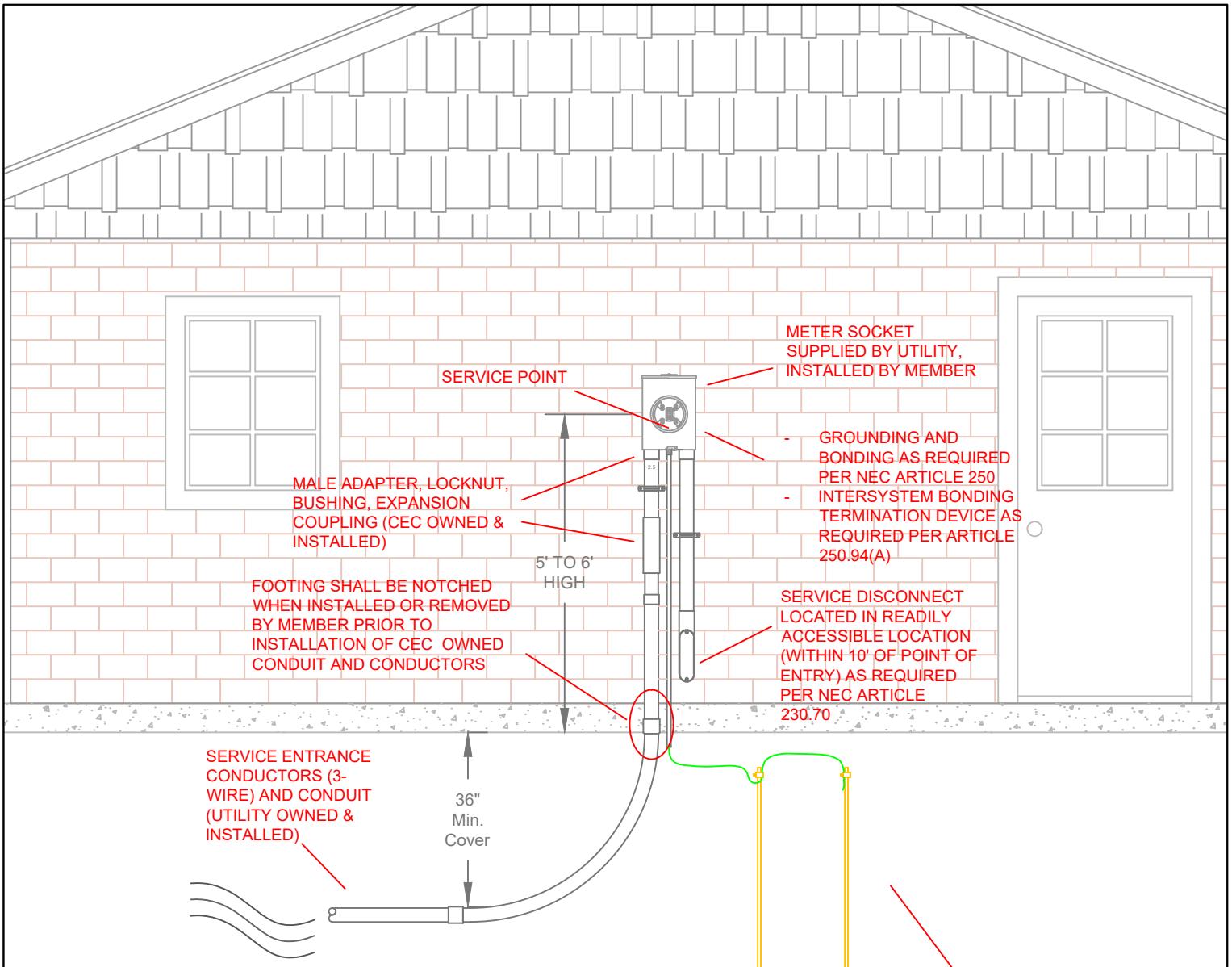
Drawing No.

3.A.2

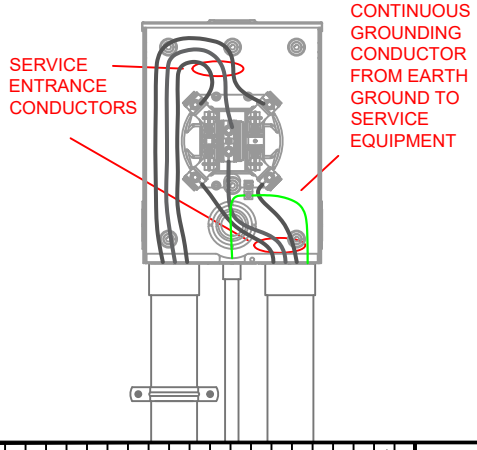
# Attachment on Structure
# Service Clevis with Bolt

**Vertical Clearance:**
**18’ - Driveway**
**12’ - Pedestrian**






TYPICAL METER SOCKET CONNECTION

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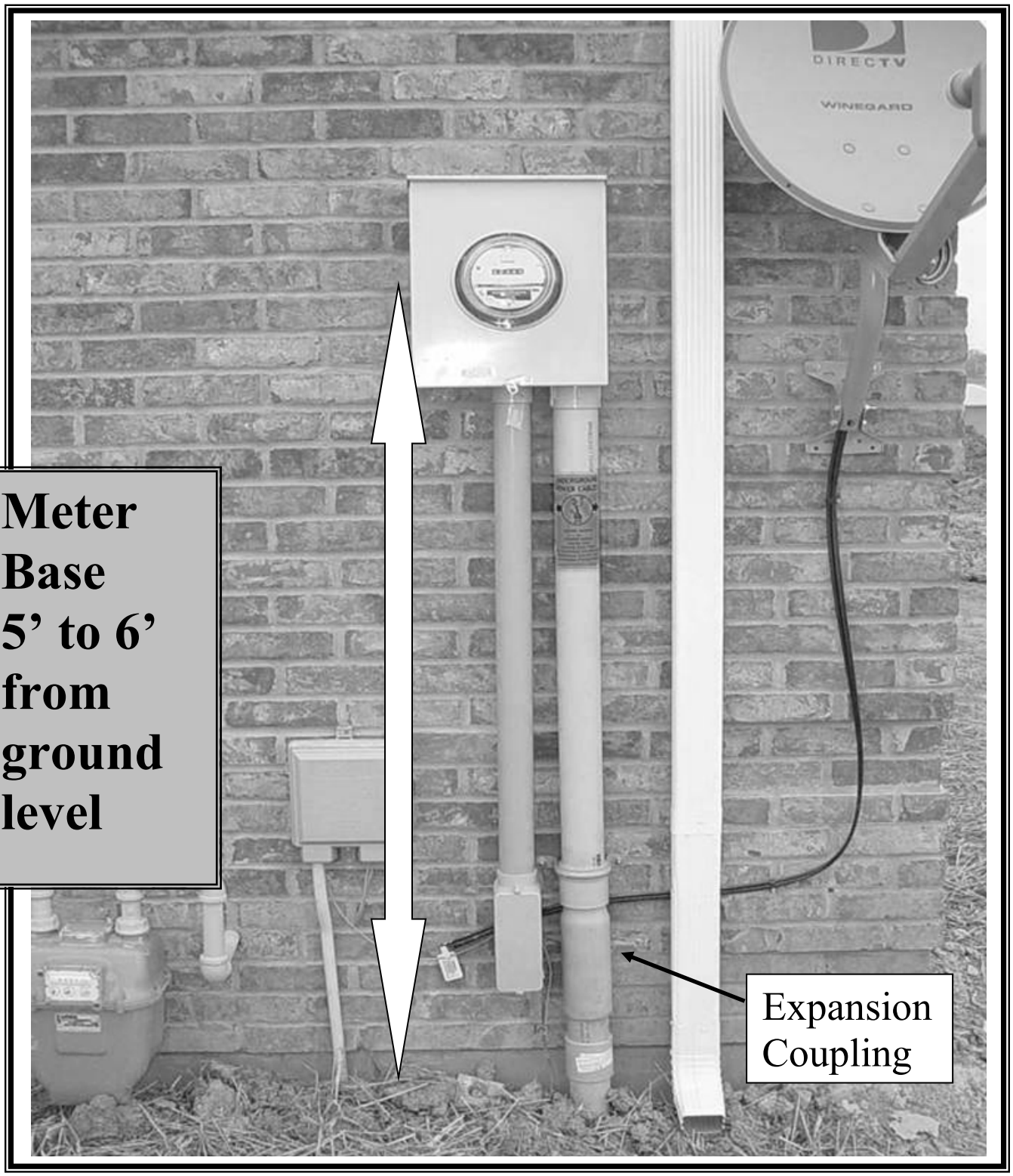
# SERVICE GUIDELINES

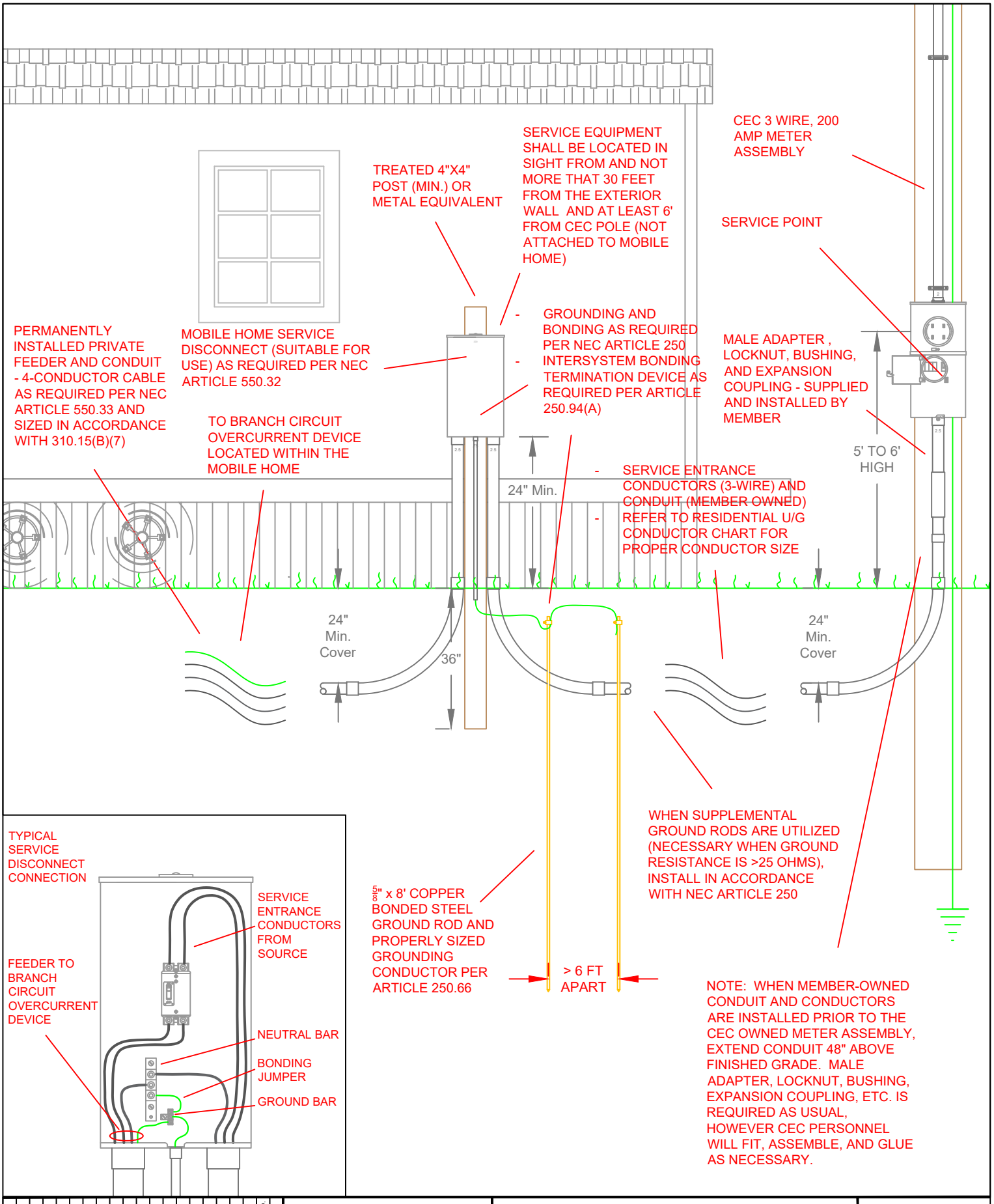
SERVICE (METER ON STRUCTURE-U/G)
200 AMPERE
STANDARD METER SOCKET

Drawing No.

3.A.3

# Meter on Structure, Underground






TYPICAL SERVICE DISCONNECT CONNECTION




| NO. | DATE | REVISIONS | DWN. | APPD. |
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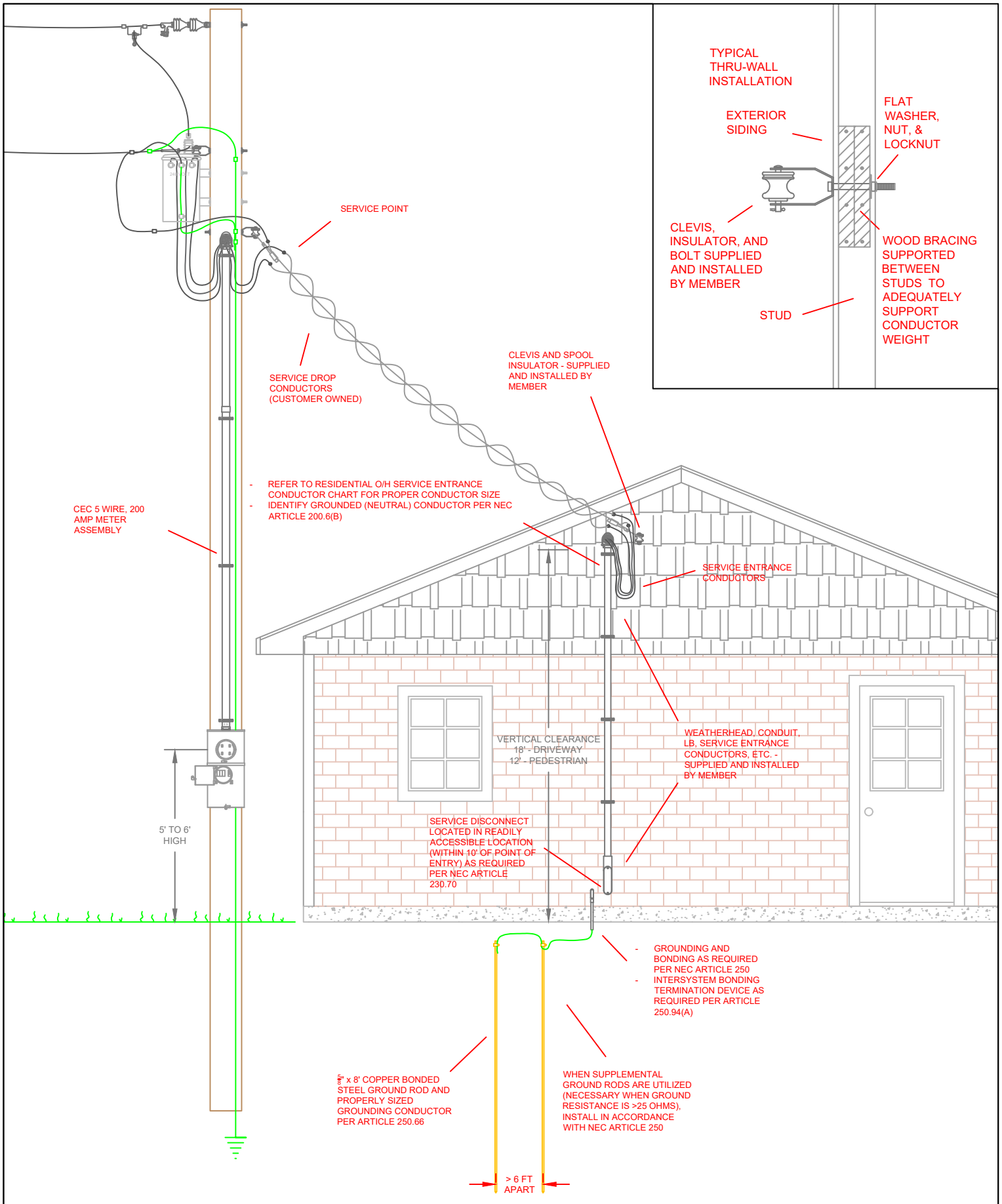
# SERVICE GUIDELINES

SERVICE (METER ON POLE-MOBILE HOME)
200 AMPERE
METER/BREAKER COMBINATION

Drawing No.

3.A.4

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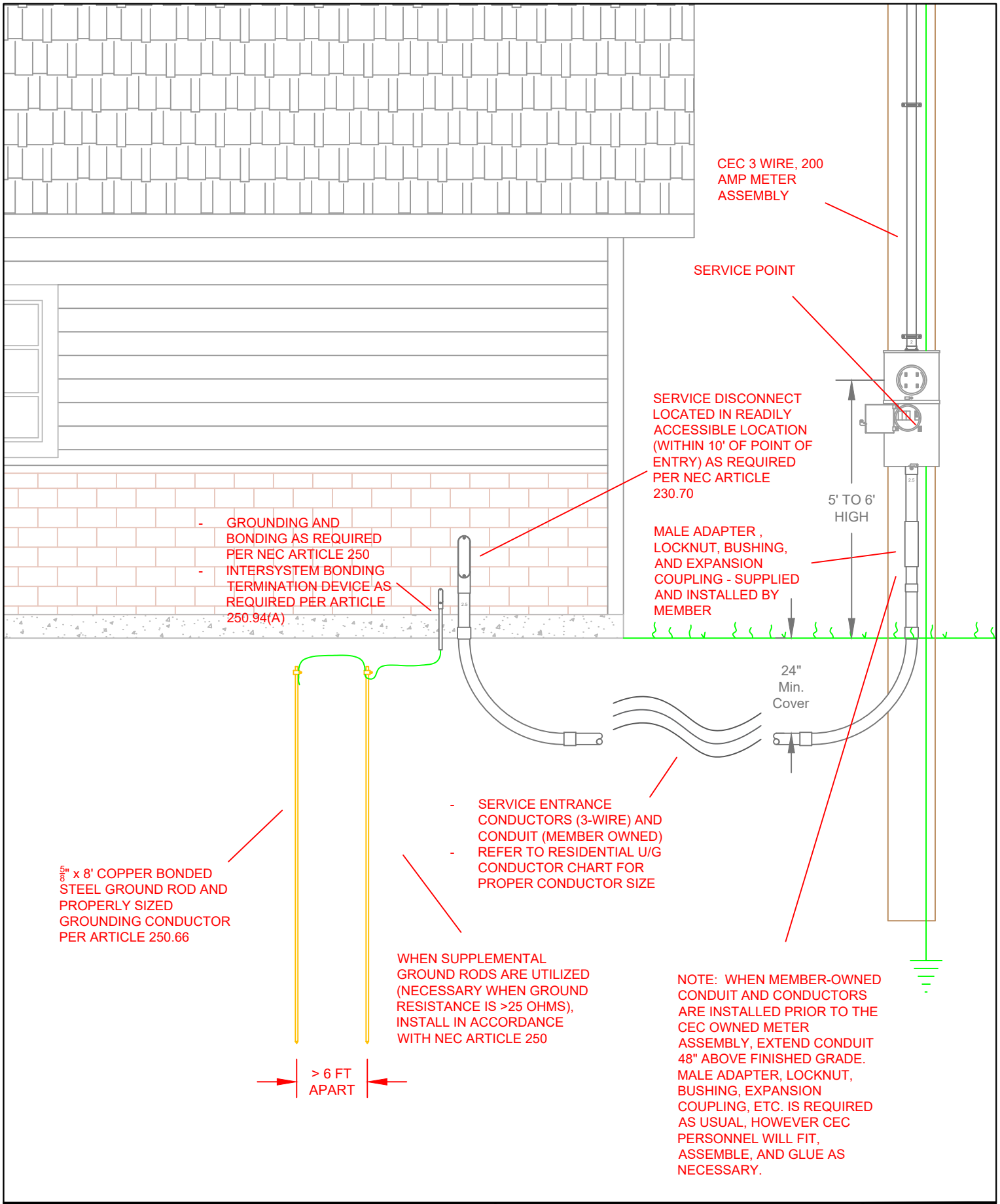
# SERVICE GUIDELINES

SERVICE (METER ON POLE-STRUCTURE O/H)
200 AMPERE
METER/BREAKER COMBINATION

Drawing No.

3.A.5

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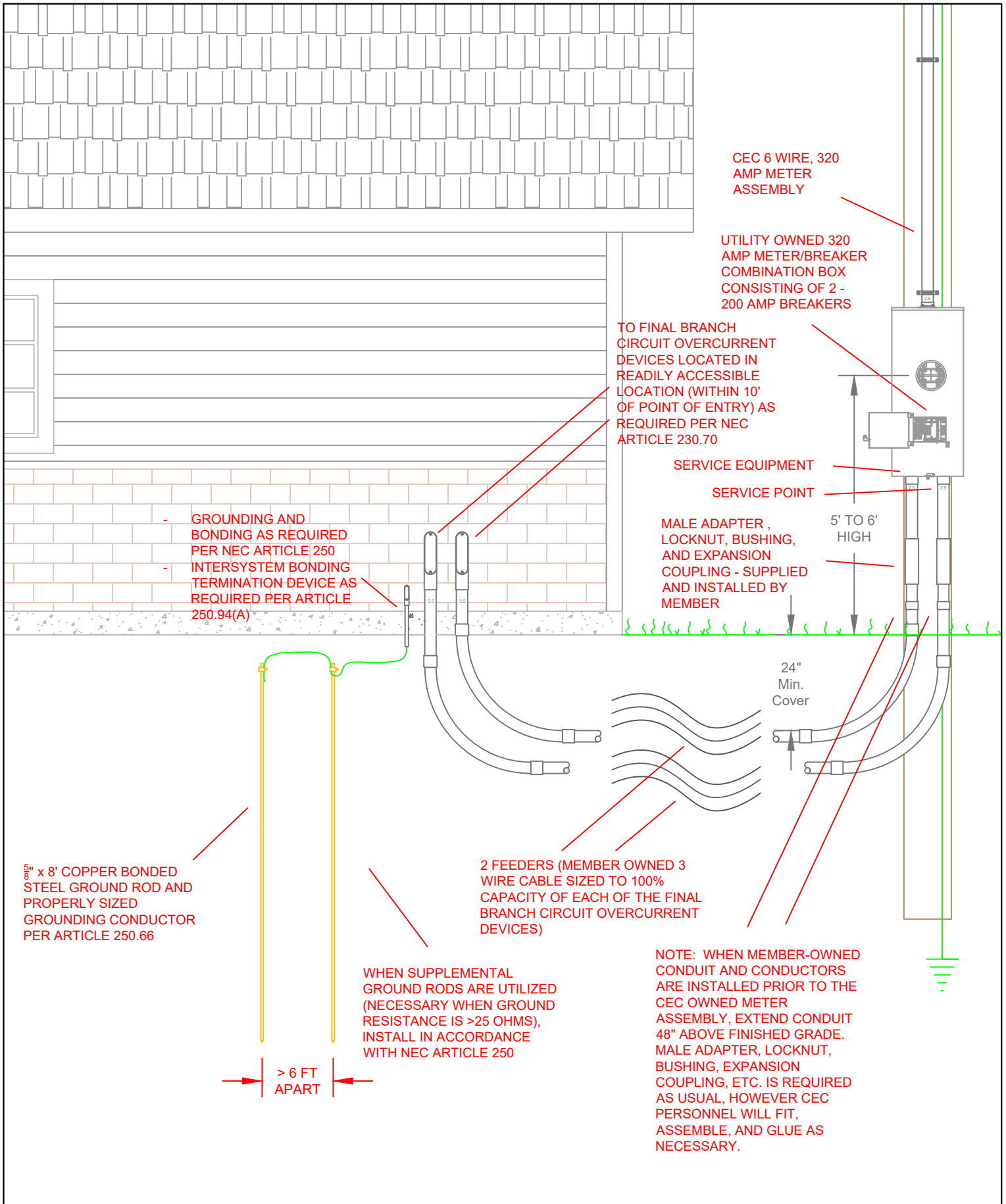
# SERVICE GUIDELINES

SERVICE (METER ON POLE-STRUCTURE U/G)
200 AMPERE
METER/BREAKER COMBINATION

Drawing No.

3.A.6

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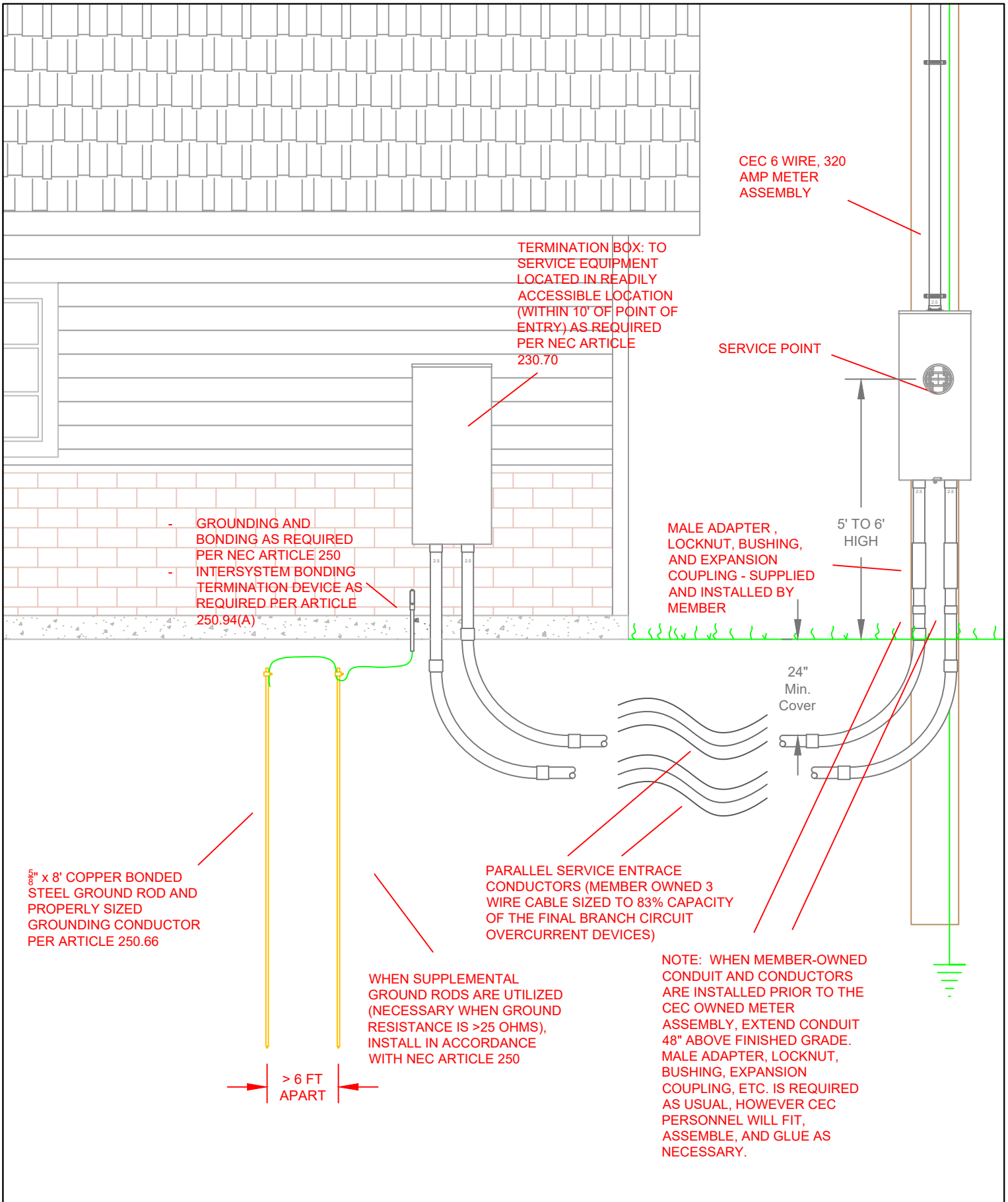
# SERVICE GUIDELINES

SERVICE (METER ON POLE-STRUCTURE U/G)
2-200 AMPERE
METER/BREAKER COMBINATION

Drawing No.

3.A.7a

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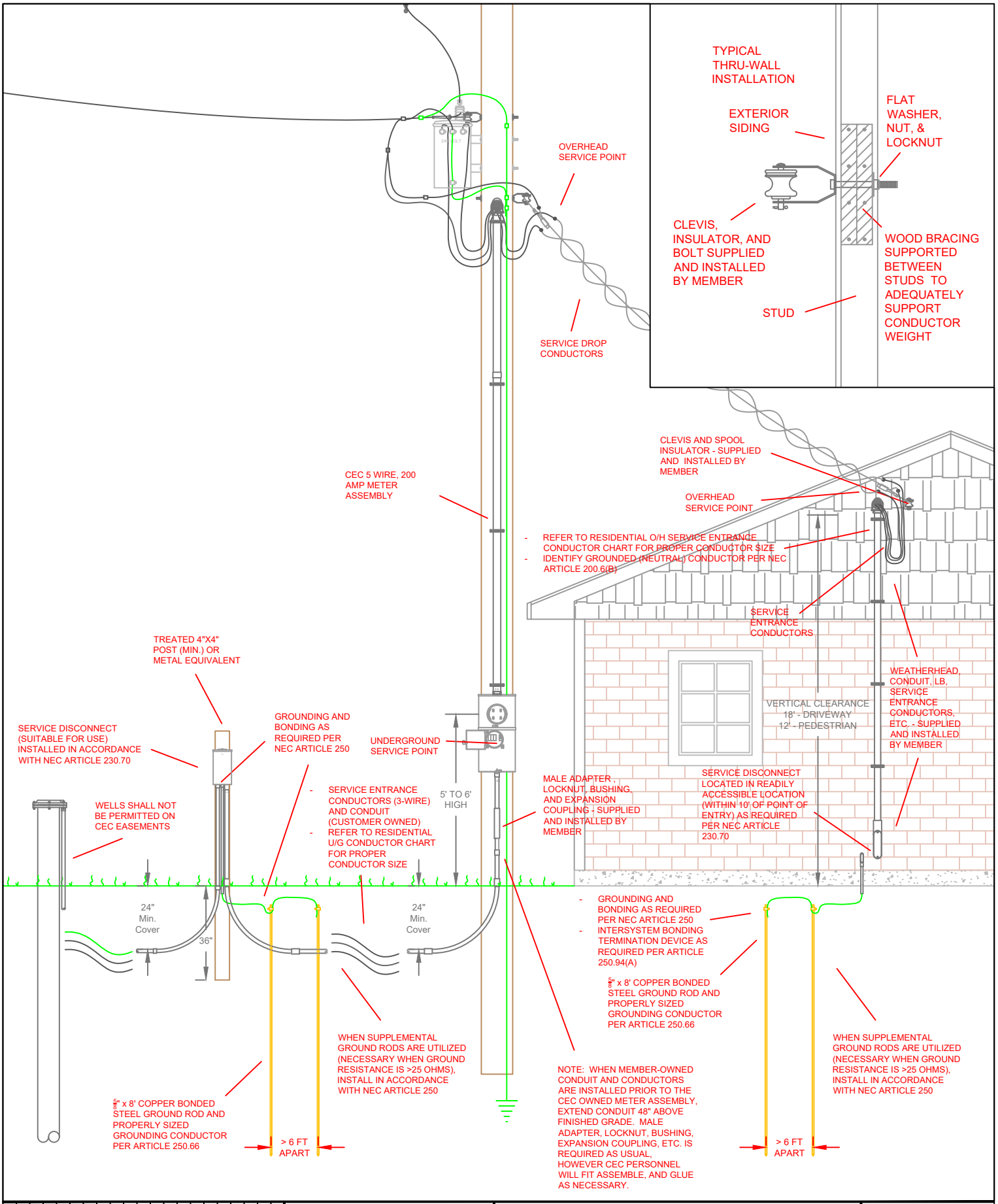
# SERVICE GUIDELINES

SERVICE (METER ON POLE-STRUCTURE U/G)
2-200 AMPERE
STANDARD METER SOCKET

Drawing No.

3.A.7b

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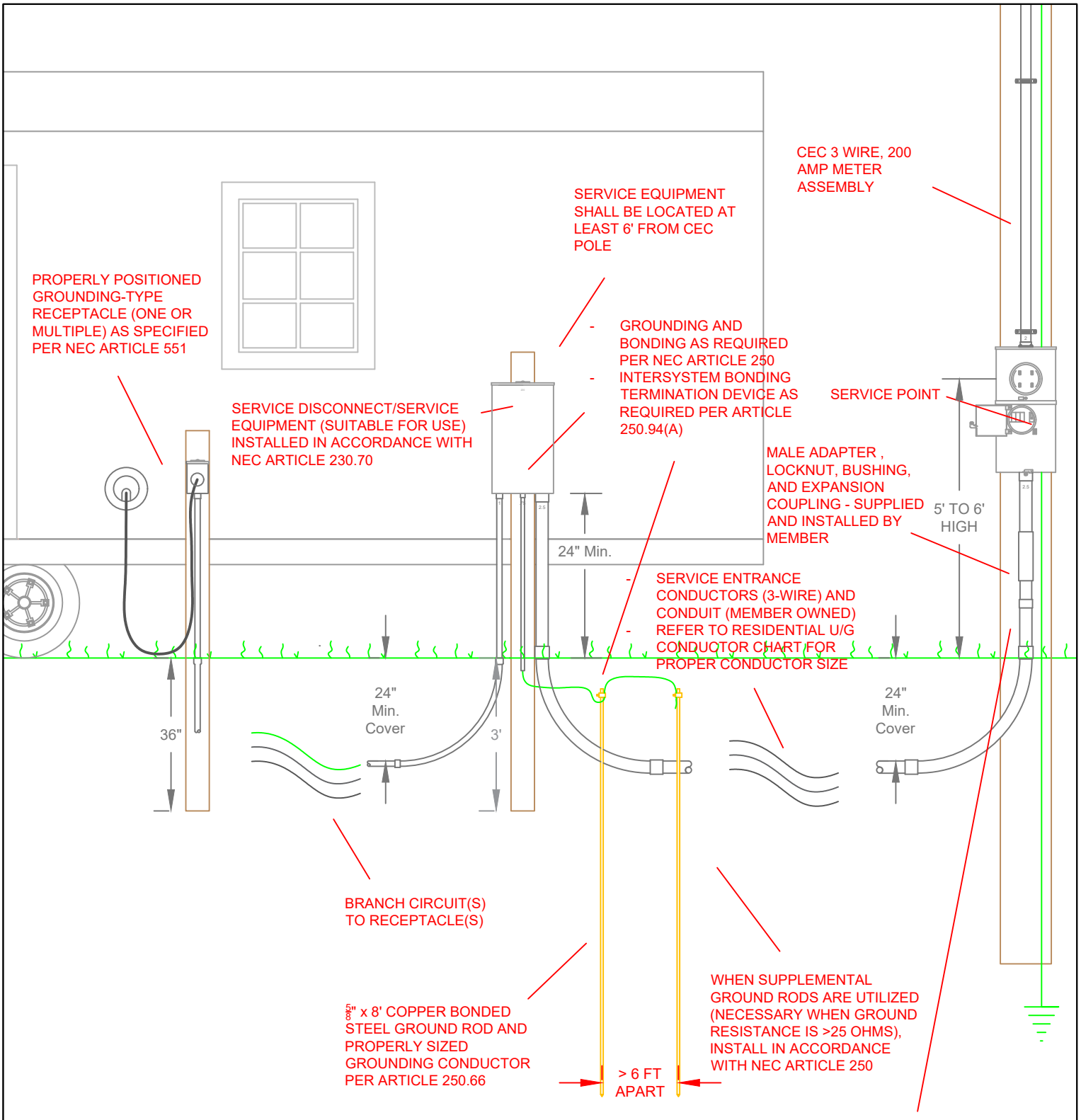
# SERVICE GUIDELINES

SERVICE (METER ON POLE-STRUCT. & WELL)
200 AMPERE
METER/BREAKER COMBINATION

Drawing No.

3.A.8




NOTE: WHEN MEMBER-OWNED CONDUIT AND CONDUCTORS ARE INSTALLED PRIOR TO THE CEC OWNED METER ASSEMBLY, EXTEND CONDUIT 48" ABOVE FINISHED GRADE. MALE ADAPTER, LOCKNUT, BUSHING, EXPANSION COUPLING, ETC. IS REQUIRED AS USUAL, HOWEVER CEC PERSONNEL WILL FIT, ASSEMBLE, AND GLUE AS NECESSARY.

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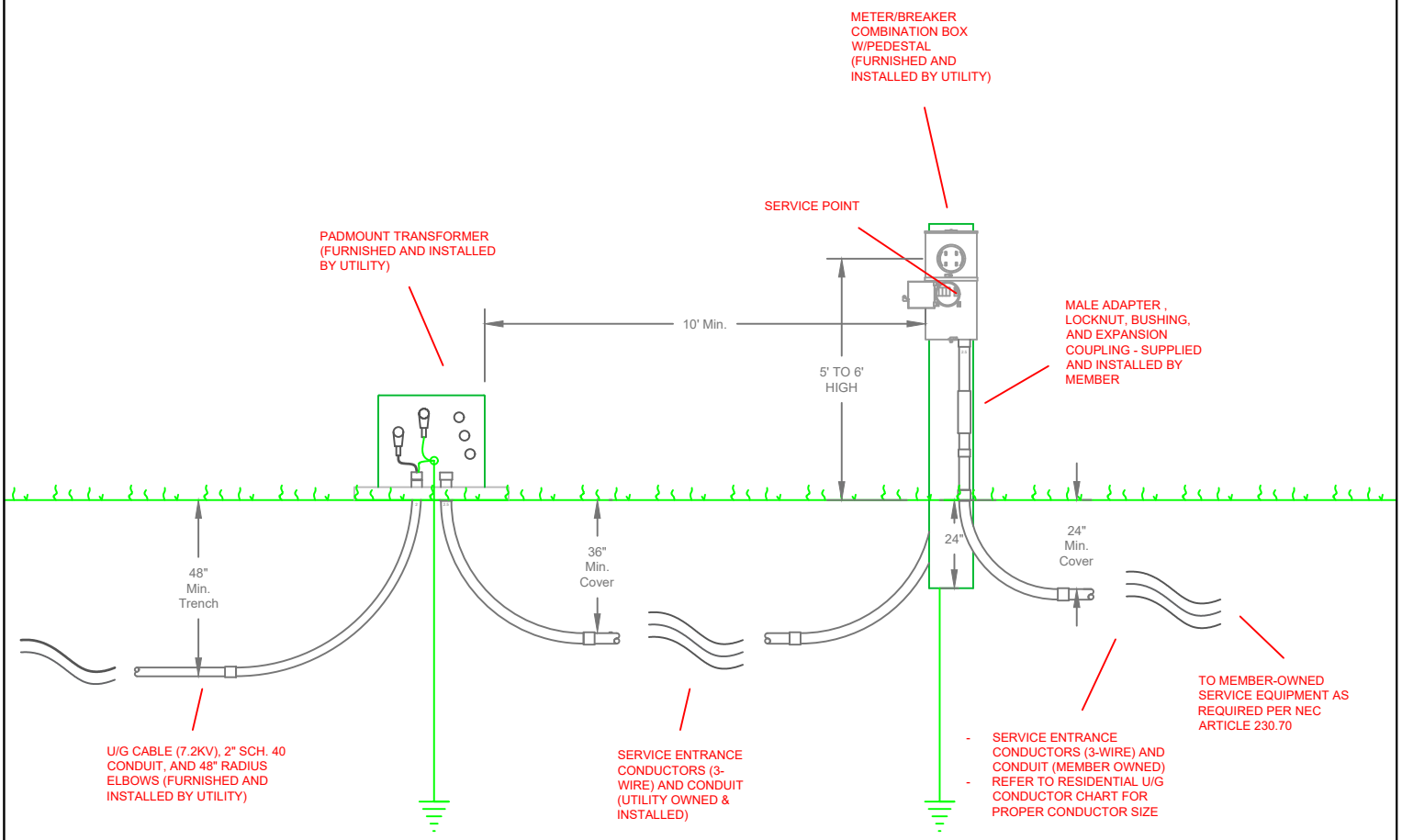
# SERVICE GUIDELINES

SERVICE (METER ON POLE-RECREATIONAL)
200 AMPERE
METER/BREAKER COMBINATION

Drawing No.

3.A.9

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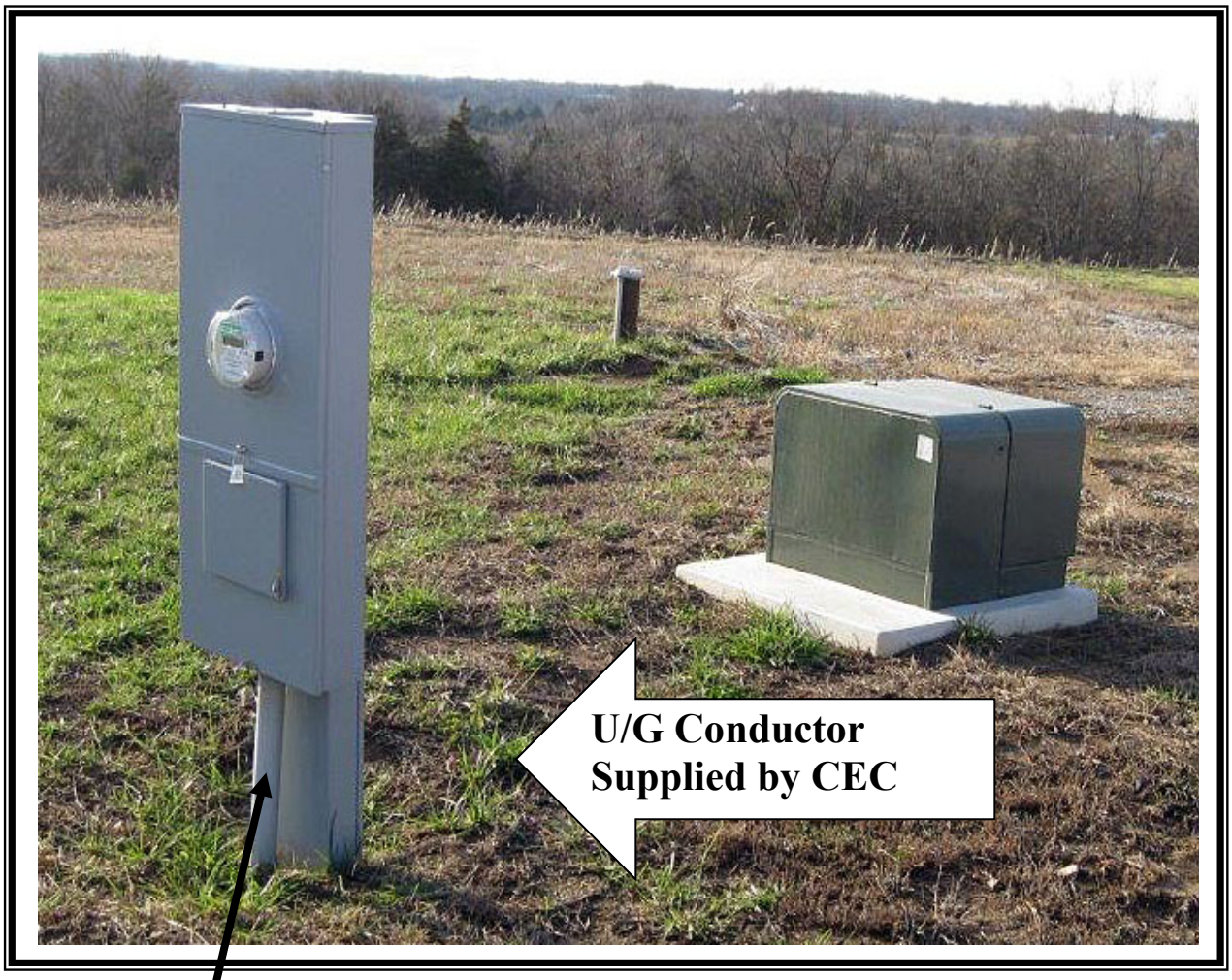
# SERVICE GUIDELINES

SERVICE (METERING PEDESTAL U/G SOURCE)
200 AMPERE
METER/BREAKER COMBINATION

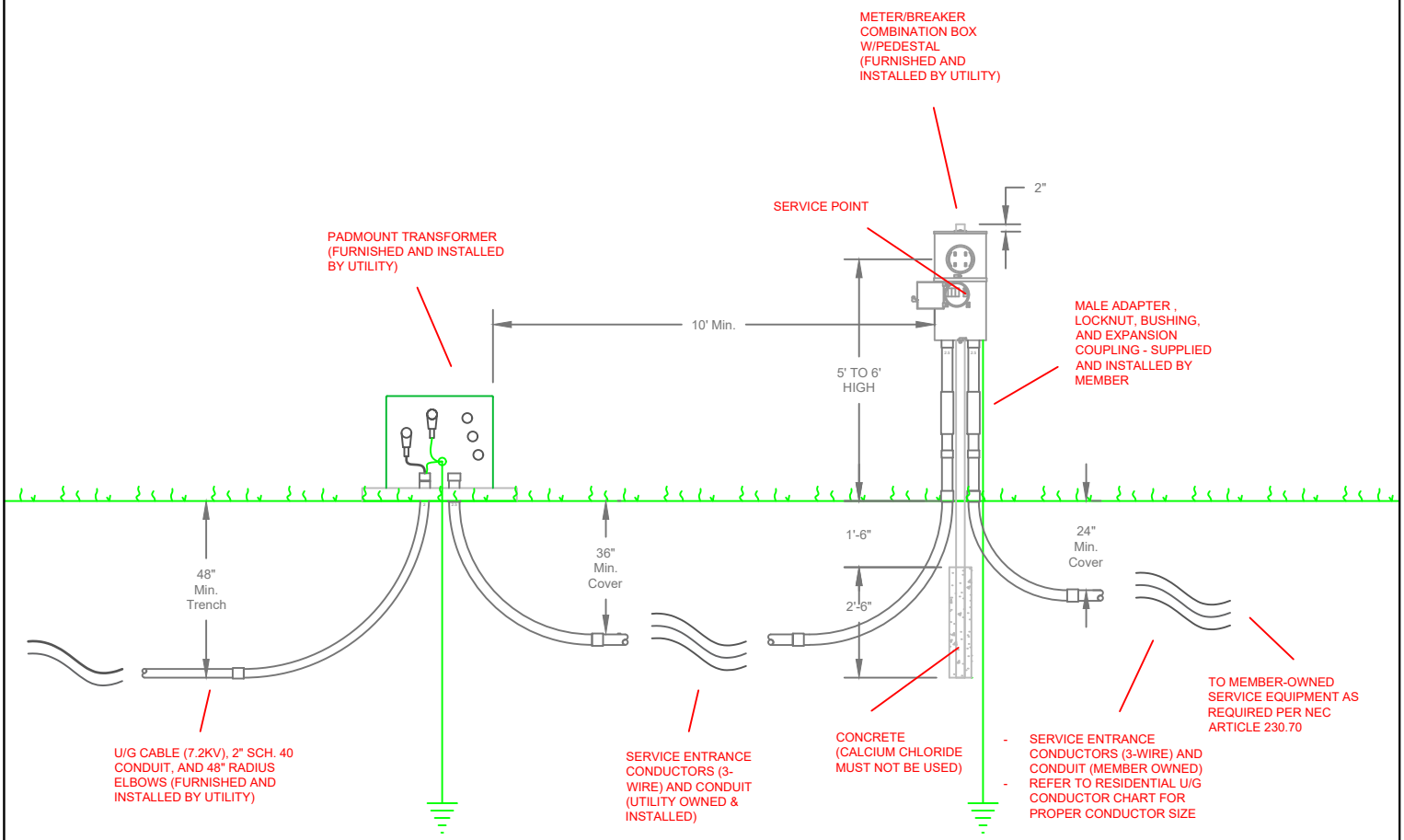
Drawing No.

3.A.10a

# Metering Pedestal, Underground




**Conduit & U/G Conductor to House or Building Supplied by Customer**

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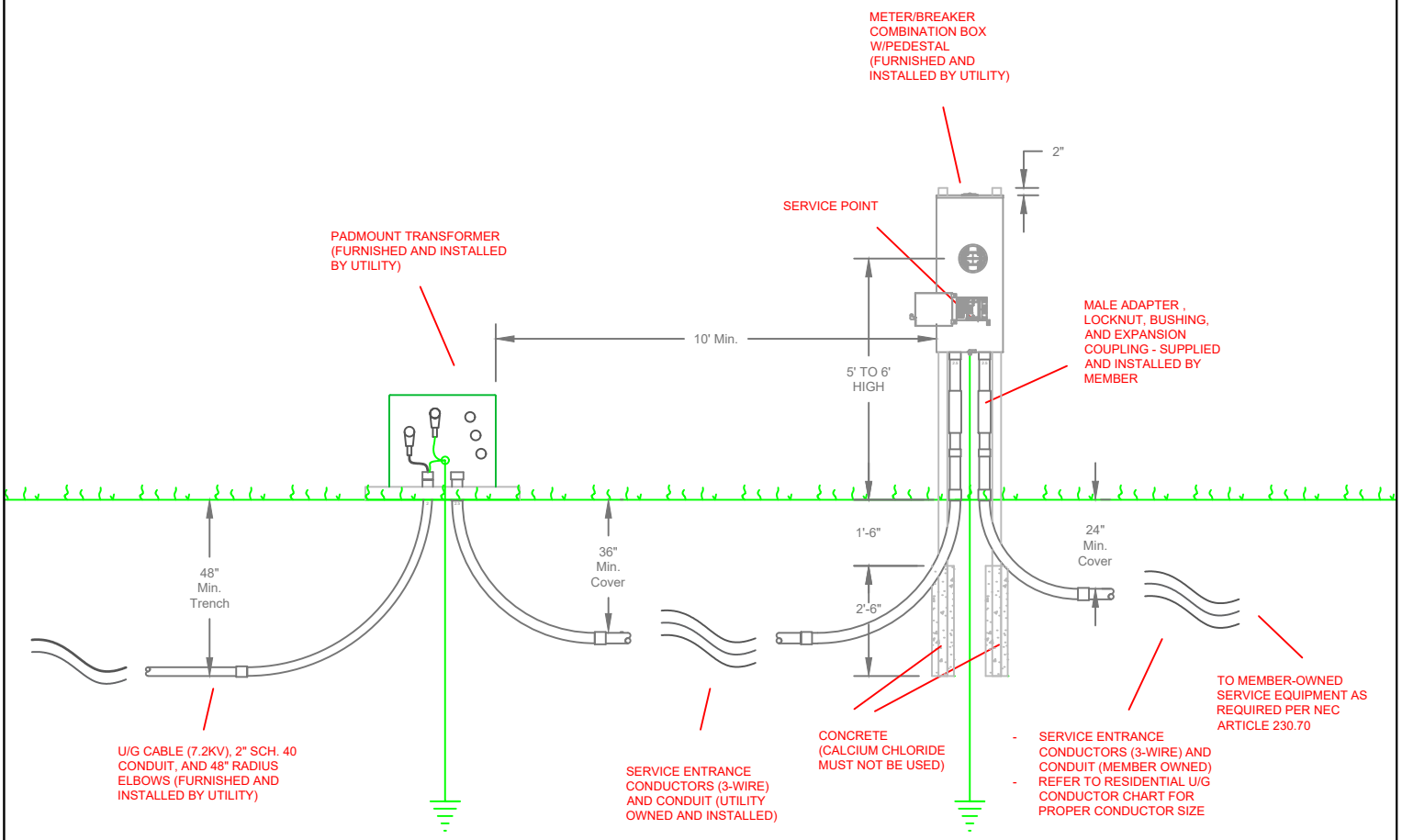
# SERVICE GUIDELINES

SERVICE (METERING PED. ALT. U/G SOURCE)
200 AMPERE
METER/BREAKER COMBINATION

Drawing No.

3.A.10b

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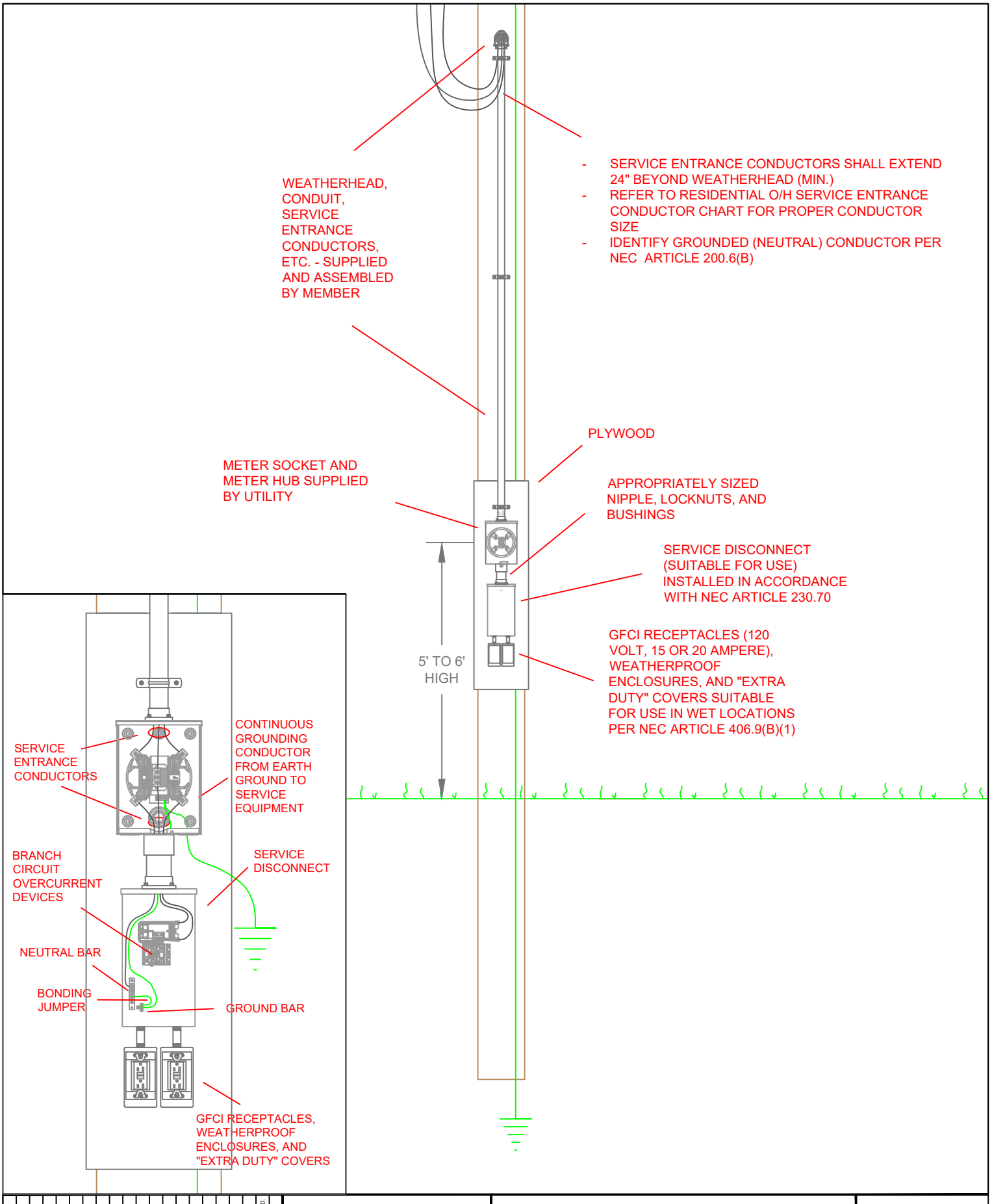
# SERVICE GUIDELINES

SERVICE (METERING PEDESTAL U/G SOURCE)
320 AMPERE
METER/BREAKER COMBINATION

Drawing No.

3.A.11

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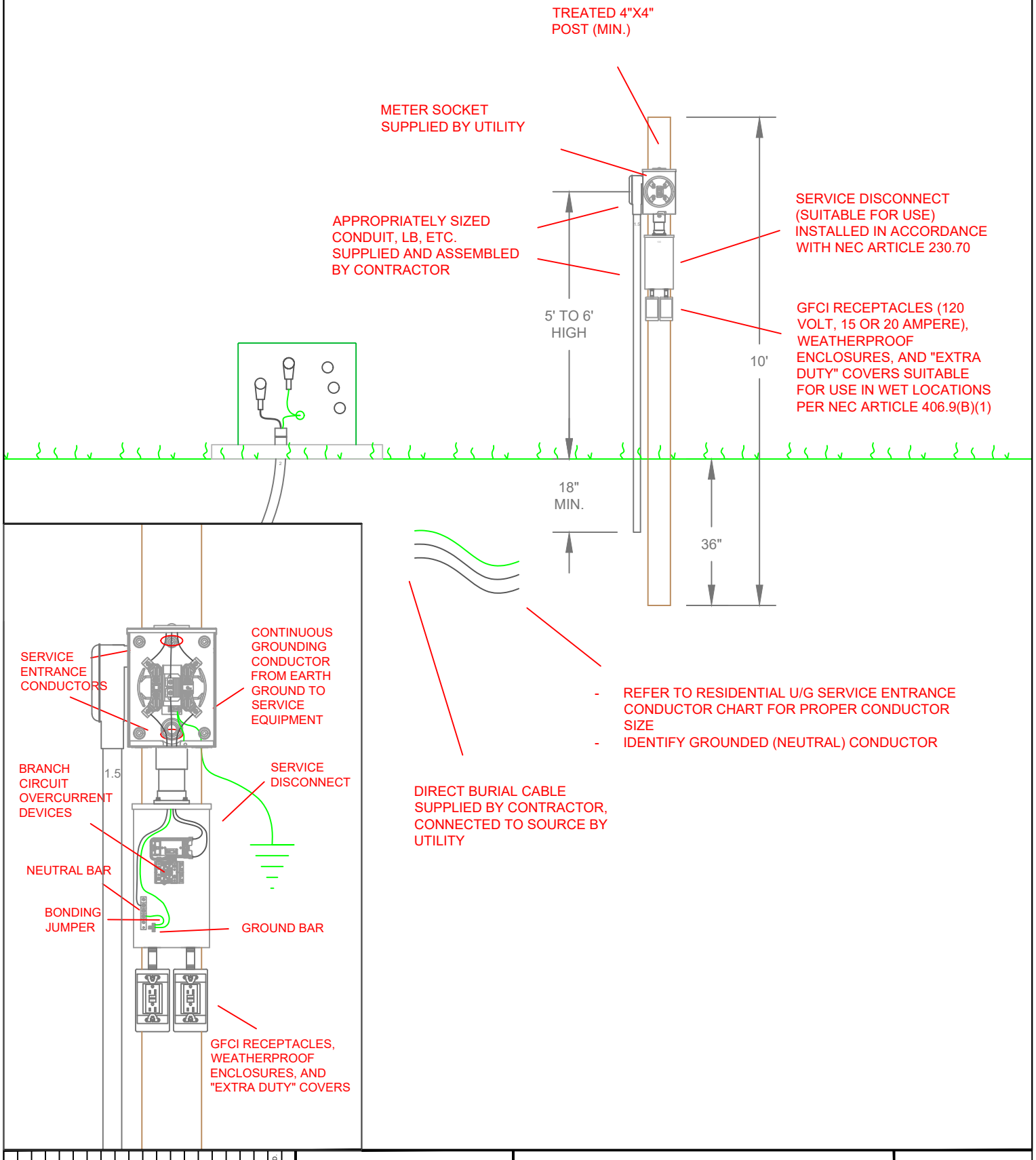
# SERVICE GUIDELINES

SERVICE (CONSTRUCTION POWER-O/H)
100 AMPERE
STANDARD METER SOCKET

Drawing No.

3.B.1

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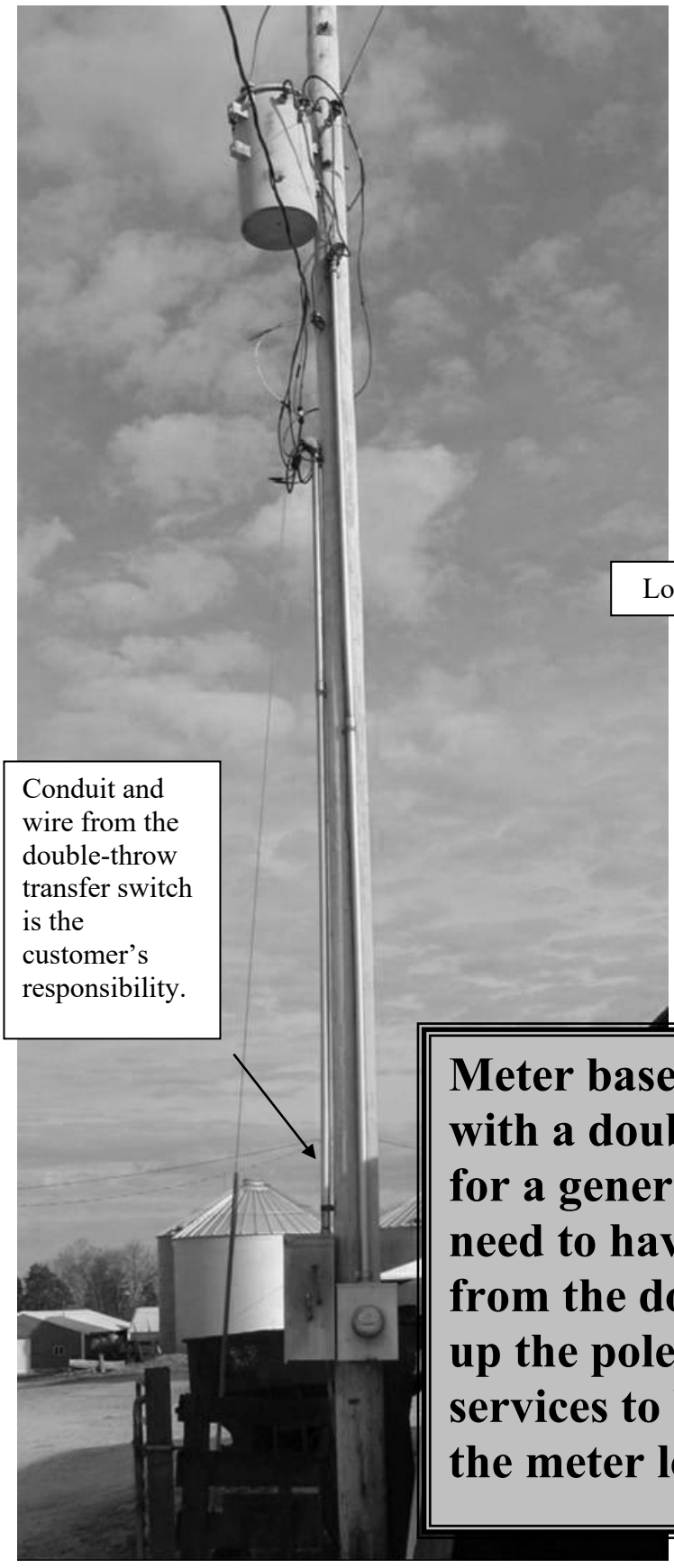
# SERVICE GUIDELINES

SERVICE (CONSTRUCTION POWER-U/G)
100 AMPERE
STANDARD METER SOCKET

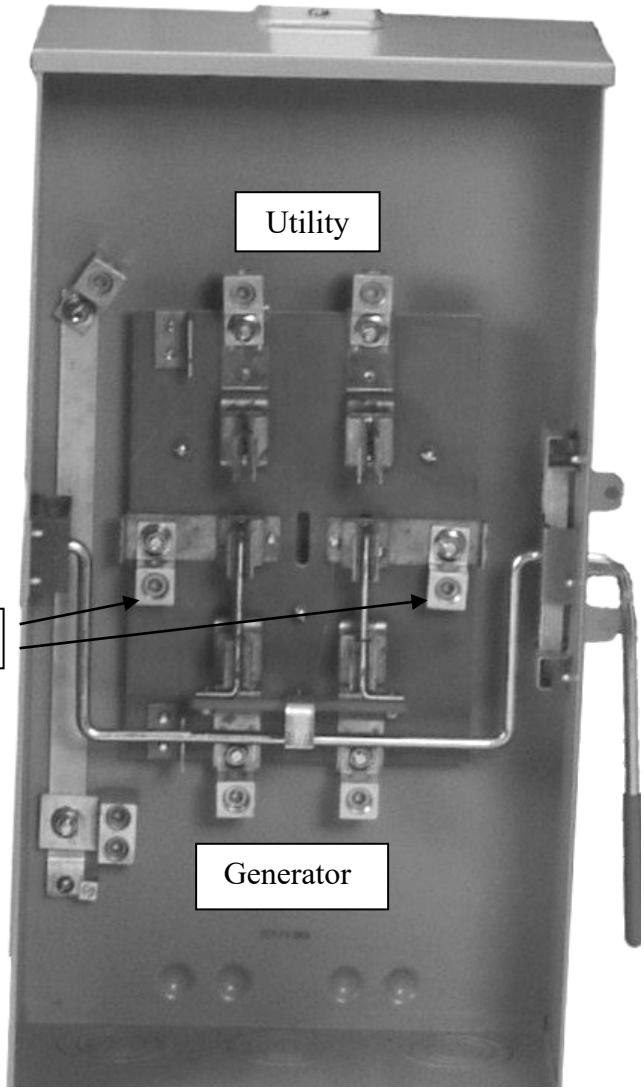
Drawing No.

3.B.2

# Meter Loop with Double-Throw Switch



Conduit and wire from the double-throw transfer switch is the customer's responsibility.




**Meter base on a CEC pole with a double-throw device for a generator hookup will need to have conduit going from the double-throw back up the pole for any overhead services to be connected to the meter loop.**

## MEMBER-OWNED RESIDENTIAL UNDERGROUND SERVICE ENTRANCE CONDUCTOR SIZE - SINGLE PHASE, 120/240 VOLT SYSTEMS

Based on 2017 NEC Table 310.15(B)(16) and sized in accordance with NEC Articles 310.15(B)(3)(a) and 310.15(B)(7)(1).

### Copper (THHN/THWN/THWN-2)

| Service Equipment Rating | Limiting Conductor Temperature Rating | Required Ampacity | Minimum Conductor Size | Conductor Ampacity | Maximum Length @ 83% & 3% Voltage Drop | Maximum Length @ 100% & 3% Voltage Drop) | Minumum Conduit Size | Minimum Size of Grounding Electrode Conductor (AWG) |
|---|---|---|---|---|---|---|---|---|
| 100 | 60°C | 83 | 3 - #3<br>3 - #2 (Option) | 85<br>95 | 189<br>228 | -<br>- | 1"(SCH. 40 PVC), 1.25"(SCH.80 PVC)<br>1.25"(SCH.40, SCH. 80 PVC) | #8 Copper |
| 150 | 75°C | 125 | 3 - #1<br>3 - #1/0 (Option) | 130<br>150 | 181<br>222 | -<br>185 | 1.25"(SCH.40, SCH. 80 PVC)<br>1.25"(SCH. 40 PVC), 1.5"(SCH.80 PVC) | #6 Copper |
| 200 | 75°C | 166 | 3 - #2/0<br>3 - #3/0 (Option) | 175<br>200 | 197<br>246 | -<br>205 | 1.5"(SCH.40, SCH.80 PVC)<br>2"(SCH.40, SCH.80 PVC) | #4 Copper |
| 300 | 75°C | 249 | 3 - 250 kcmil | 255 | 219 | 182 | 2"(SCH. 40 PVC), 2.5"(SCH.80 PVC) | #2 Copper |
| 400 | 75°C | 332 | 3 - 400 kcmil | 335 | 221 | 184 | 2.5"(SCH. 40 PVC), 3"(SCH.80 PVC) | #1/0 Copper |

### Aluminum (RHH/RHW/RHW-2)

| Service Equipment Rating | Limiting Conductor Temperature Rating | Required Ampacity | Minimum Conductor Size | Conductor Ampacity | Maximum Length @ 83% & 3% Voltage Drop | Maximum Length @ 100% & 3% Voltage Drop | Minumum Conduit Size | Minimum Size of Grounding Electrode Conductor |
|---|---|---|---|---|---|---|---|---|
| 100 | 60°C | 83 | 3 - #1<br>3 - #1/0 (Option) | 85<br>100 | 181<br>228 | -<br>189 | 2"(SCH.40, SCH.80 PVC)<br>2"(SCH.40, SCH.80 PVC) | #8 Copper |
| 150 | 75°C | 125 | 3 - #2/0<br>3 - #3/0 (Option) | 135<br>155 | 181<br>222 | -<br>185 | 2"(SCH.40, SCH.80 PVC)<br>2"(SCH. 40 PVC), 2.5"(SCH.80 PVC) | #6 Copper |
| 200 | 75°C | 166 | 3 - #4/0<br>3 - 250 kcmil (Option) | 180<br>205 | 197<br>231 | -<br>191 | 2.5"(SCH.40, SCH.80 PVC)<br>3"(SCH. 40, SCH.80 PVC) | #4 Copper |
| 300 | 75°C | 249 | 3 - 350 kcmil | 250 | 198 | 164 | 3"(SCH. 40, SCH.80 PVC) | #2 Copper |
| 400 | 75°C | 332 | 3 - 600 kcmil | 340 | 213 | 176 | 3.5"(SCH. 40 PVC), 4"(SCH.80 PVC) | #1/0 Copper |

## MEMBER-OWNED RESIDENTIAL OVERHEAD SERVICE ENTRANCE CONDUCTOR SIZE - SINGLE PHASE, 120/240 VOLT SYSTEMS

Based on 2017 NEC Table 310.15(B)(16) and sized in accordance with NEC Articles 310.15(B)(3)(a) and 310.15(B)(7)(1).

### Copper (THHN/THWN/THWN-2)

| Service Equipment Rating | Limiting Conductor Temperature Rating | Required Ampacity | Minimum Conductor Size | Conductor Ampacity | Minumum Conduit Size [1] | Minimum Size of Grounding Electrode Conductor |
|---|---|---|---|---|---|---|
| 100 | 60°C | 83 | 3 - #2 | 84 | 1"(RMC), 1.25"(SCH.40, SCH.80 PVC) | #8 Copper |
| 150 | 75°C | 125 | 3 - #1/0 | 132 | 1.25"(RMC, SCH.40 PVC), 1.5"(SCH.80 PVC) | #6 Copper |
| | | | 3 - #2/0 (Option) | 154 | 1.5"(RMC, SCH.40, SCH.80 PVC) | #4 Copper |
| 200 | 75°C | 166 | 3 - #3/0 | 176 | 1.5"(RMC), 2"(SCH40, SCH.80 PVC) | #4 Copper |
| | | | 3 - #4/0 (Option) | 202 | 2"(RMC, SCH.40, SCH.80 PVC) | #2 Copper |
| 300 | 75°C | 249 | 3 - 300 kcmil | 251 | 2.5"(RMC, SCH. 40, SCH.80 PVC) | #2 Copper |
| 400 | 75°C | 332 | 3 - 500 kcmil | 334 | 3"(RMC, SCH. 40, SCH.80 PVC) | #1/0 Copper |

### Aluminum (RHH/RHW/RHW-2)

| Service Equipment Rating | Limiting Conductor Temperature Rating | Required Ampacity | Minimum Conductor Size | Conductor Ampacity | Minumum Conduit Size [1] | Minimum Size of Grounding Electrode Conductor |
|---|---|---|---|---|---|---|
| 100 | 60°C | 83 | 3 - #1/0 | 88 | 2"(RMC, SCH.40, SCH.80 PVC) | #8 Copper |
| 150 | 75°C | 125 | 3 - #3/0 | 136 | 2"(RMC, SCH.40 PVC), 2.5"(SCH.80 PVC) | #6 Copper |
| | | | 3 - #4/0 (Option) | 158 | 2.5"(RMC, SCH. 40, SCH.80 PVC) | #4 Copper |
| 200 | 75°C | 166 | 3 - 250 kcmil | 180 | 2.5"(RMC), 3"(SCH.40, SCH.80 PVC) | #4 Copper |
| | | | 3 - 350 kcmil (Option) | 220 | 3"(RMC, SCH. 40, SCH.80 PVC) | #2 Copper |
| 300 | 75°C | 249 | 3 - 500 kcmil | 273 | 3.5"(RMC, SCH. 40, SCH.80 PVC) | #2 Copper |
| 400 | 75°C | 332 | 3 - 750 kcmil | 339 | 4"(RMC, SCH. 40, SCH. 80 PVC) | #1/0 Copper |

Note: [1] Minimum conduit required when utilizing a mast that supports the service drop conductors is 2-1/2" RMC.

## MEMBER-OWNED RESIDENTIAL OVERHEAD TRIPLEX SERVICE CONDUCTOR SIZE - SINGLE PHASE, 120/240 VOLT SYSTEMS

Based on 2017 NEC Table 310.15(B)(20) and sized in accordance with NEC Article 310.15(B)(7)(1).

### Aluminum (XHHW)*

| Service Equipment Rating | Limiting Conductor Temperature Rating | Required Ampacity | Minimum Conductor Size | Conductor Ampacity | Maximum Length @ 83% & 3% Voltage Drop | Maximum Length @ 100% & 3% Voltage Drop) |
|---|---|---|---|---|---|---|
| 100 | 75°C | 83 | #3 | 92 | 120 | - |
| | | | #2 (Option) | 106 | 153 | 124 |
| 150 | 75°C | 125 | #1/0 | 143 | 152 | - |
| | | | #2/0 (Option) | 165 | 191 | 155 |
| 200 | 75°C | 166 | #3/0 | 192 | 172 | - |
| | | | #4/0 (Option) | 224 | 212 | 172 |
| 300 | 75°C | 249 | 250 kcmil | 251 | 155 | - |
| 400 | 75°C | 332 | 400 kcmil | 339 | 165 | - |

* XLP is XHHW equivalent NEC type