

NORTHEASTERN REMC



ELECTRIC STANDARDS MANUAL

NORTHEASTERN REMC

A Touchstone Energy® Cooperative



WARNING
Before digging or
trenching...

Call 811
Indiana Underground
Protection Service
1-800-382-5544

AVOID BURIED
POWER CABLES

NORTHEASTERN REMC

A Touchstone Energy® Cooperative



4901 East Park 30 Drive
P.O. Box 171 Columbia City, IN 46725
(260) 244-6111 (260) 625-3700
Fax (260) 625-3407
www.nremc.com

CONTENTS

	Page(s)
100, 200 or 400 AMP Residential Services	1 - 14
Commercial Services	15
Three-Phase Commercial Services	16
Commercial Meter Stub for CT Metering.....	17
Customer-Installed Temporary Service.....	18 - 20
Subdivision Lighting Meter Stub	21
Emergency Standby Generator	22 - 23
Portable Generator.....	24 - 25

100 or 200 AMP RESIDENTIAL SERVICES

1. The location of the meter base must be approved by Northeastern REMC. The electrician is to install an approved meter base on the house or meter stub as part of the service entrance. Approved meter bases shall be UL listed, have a ringless cover, a means for bypass (horns or lever) and be the proper size for the service (exception 320Amp can be used for a 400Amp service). Meter bases with an offset configuration (lugs to the side of the socket) will not be allowed, Meter socket / breaker combination cabinets must be in a side by side configuration meter socket / breaker combination cabinets with the meter socket over the main breaker will not be allowed unless the service is fed overhead.
2. No customer-owned facilities are allowed on Northeastern's poles. If found by Northeastern, facilities will be removed without notice.
3. Meter bases:
 - All four corners of the meter base must be secured. Use #10 galvanized screws or lag bolts.
 - Meter base must be mounted approximately 5 feet to center from final grade and level.
 - If a backboard is used, it must be solid wood material (cedar or pine).
 - Must have adequate working space in front of meter base. Air conditioners, furnace exhaust systems, and gas meters must be a minimum of 3 feet away from the meter base.
 - Repairs to the meter base and socket are the responsibility of the member. If the repairs cannot return the meter base to its original condition, the member will be notified in writing to replace the damaged meter base within 30 days to avoid the service being disconnected.
4. Aluminum electrical joint compound must be applied to all aluminum conductors when installed in the meter base and service panel.
5. On an underground meter base, install wire on bottom lugs only. On overhead services, install wires on both top and bottom lugs of meter base. Identify neutral wires with white or gray tape.

6. Underground down pipe (entrance pipe) must be 2-1/2 inch PVC schedule 80 or rigid galvanized pipe, and must extend 12 - 18 inches below ground. DO NOT use the center knock-out of an underground meter base for the 2-1/2 inch utility down pipe. PVC pipe must either be reamed or have bushings installed at both ends. If steel pipe is used, provide a plastic or fiber bushing at the lower end and a grounding bushing at the upper end. Bonding jumper from the bushing to the neutral lug in the meter base or ground lug shall be sized per the National Electrical Code. At the base of the entrance pipe, use a metal strap or hanger for support. Remove all concrete at the bottom of the riser pipe. If unable to remove concrete, install a 45 degree fitting, extending out past the concrete. **NOTE:** *If any decking, patios, sidewalks or other obstacles prohibit future accessibility to the bottom of the riser pipe, a 90 degree elbow must be installed, 2 feet below grade and conduit (furnished by contractor) must be extended out past obstacles for accessibility. Down pipe for 400 Amp services must be 4 inch schedule 80 PVC. Down pipes on underground services installed in concrete or asphalt must have an oversized sleeve around the conduit.*
7. Overhead risers must be 2 inch rigid galvanized conduit when extending through the roof line. If riser pipes are over 37 inches above the roof line, a guy support is needed (see REMC for details). Wires must extend 18 to 24 inches out past service head. Identify neutral conductor with white or gray tape.
- Wire holder (house knob) must be installed by the member to a suitable structure capable of withstanding a force of 1,500 pounds and at a height that maintains required clearances.
 - Minimum 18 inch clearance for drip loop (NESC 234c3d(i))
 - (1) no more than 4 feet from the roof edge
 - (2) install no closer than 3 feet from a window
8. Grounding:
All services must have two (1/2 inch x 8 feet or larger) ground rods. Ground rods must not be installed within 16 inches of the down pipe. Ground rods are to be spaced no less than 6 feet apart, and driven below grade level. A #6 copper wire (solid or stranded) must be installed continuously from the meter base or service panel neutral to each ground rod. No splices are allowed

in the ground wire. Use acorn type ground clamps approved for direct burial. If the ground wire is exposed to possible damage, install wire in 1/2 inch PVC conduit and securely strap. If metallic conduit is used to cover ground wire, both ends of raceway must be bonded to the grounding conductor. **When using a concrete encased grounding system, County inspection is required before footers are poured.**

9. Bonding:

The service panel must be bonded to the service neutral with approved screws or straps. Water systems and gas systems must be bonded according to the National Electric Code.

- All metal raceways, enclosures and/or conduits containing service conductors must be bonded in accordance with the National Electrical Code.
- A water line shall not be the sole means of grounding.

10. When either lightning rods or telephone ground rods are within 6 feet of the service ground, they must be bonded together with #6 stranded copper wire with approved clamps.

11. The main service equipment must have a main breaker or main breakers, be readily accessible, and grouped together. Thirty-six inches of working space in front of the main service equipment must be provided.

12. 2-1/2 inch PVC schedule 40 is required for a 200-Amp service under driveways and concrete areas. 4 inch PVC schedule 40 is required for a 400-Amp service. All conduits must be furnished by the customer and installed by Northeastern (unless inaccessible by trencher). If a 90-degree fitting is used, see note #6. If underground service wires **will pass within 5 feet of a well or an in-ground pool, customer must provide 2-1/2 inch or 4 inch schedule 80 PVC conduit for protection of that portion of buried wire.**

13. No underground services will be run under roads unless conduit is installed by the developer of a subdivision prior to acceptance of the roads by a public authority.

14. Manufactured Homes:

- If installed on pad only, service must be installed within 30 feet of the home (see meter stub details).
- If installed on concrete walls and pulling device removed, service is allowed on the home.
- If service panel is not adjacent to the meter base, then a service disconnect will be required.
- Manufactured homes with a meter stub are required to have a 4-wire cable from the meter stub disconnect to the home with a separate ground conductor with the bonding taking place only at the meter stub equipment disconnect.

15. Consult your county building department for local codes and requirements.

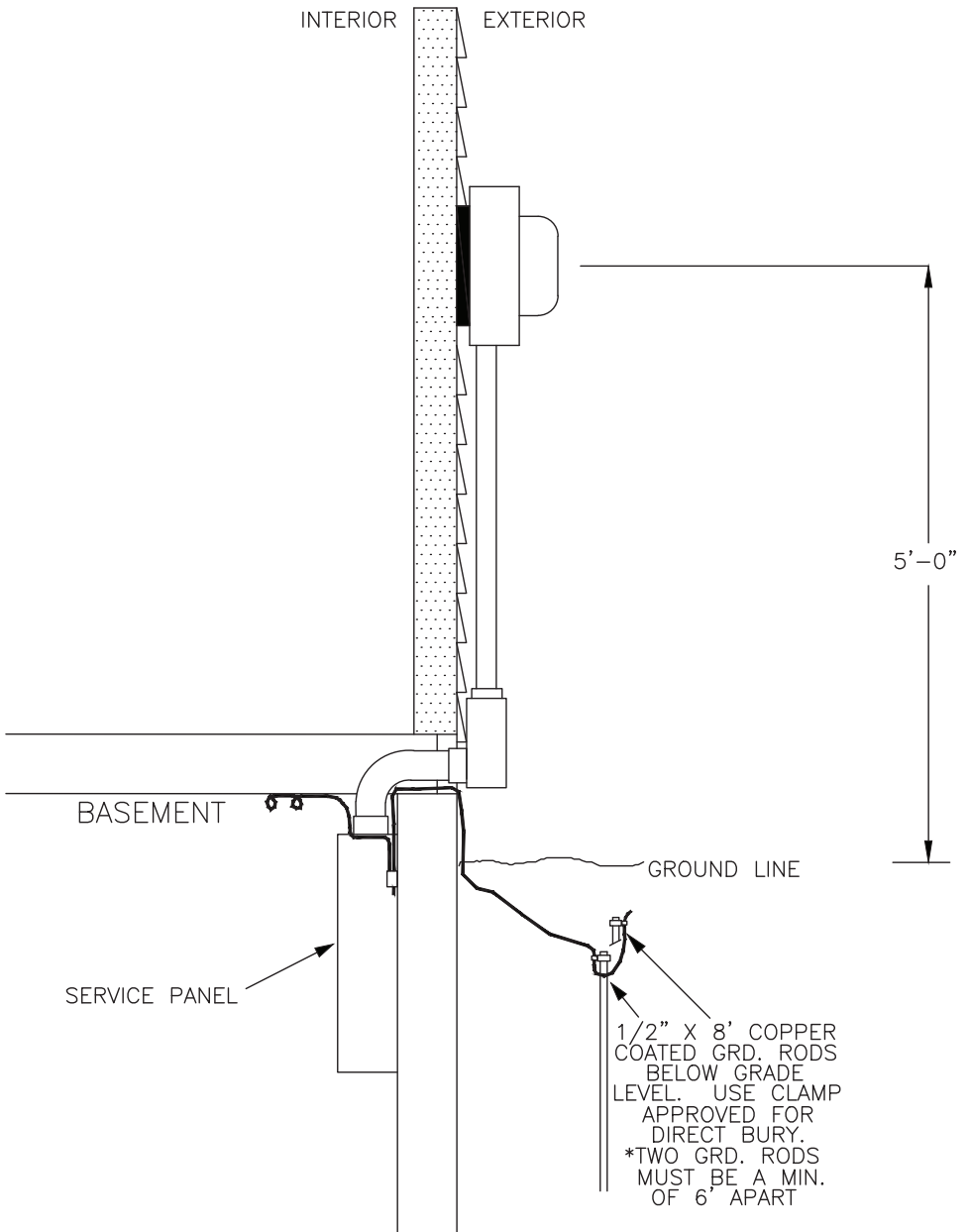
SERVICES – SINGLE FAMILY DWELLING

AMPACITY – DWELLING SERVICES AND FEEDERS*
 120/240, VOLTS, THREE–WIRE, SINGLE-PHASE
 RHW/THW/THWN/THHN/XHWE/USE

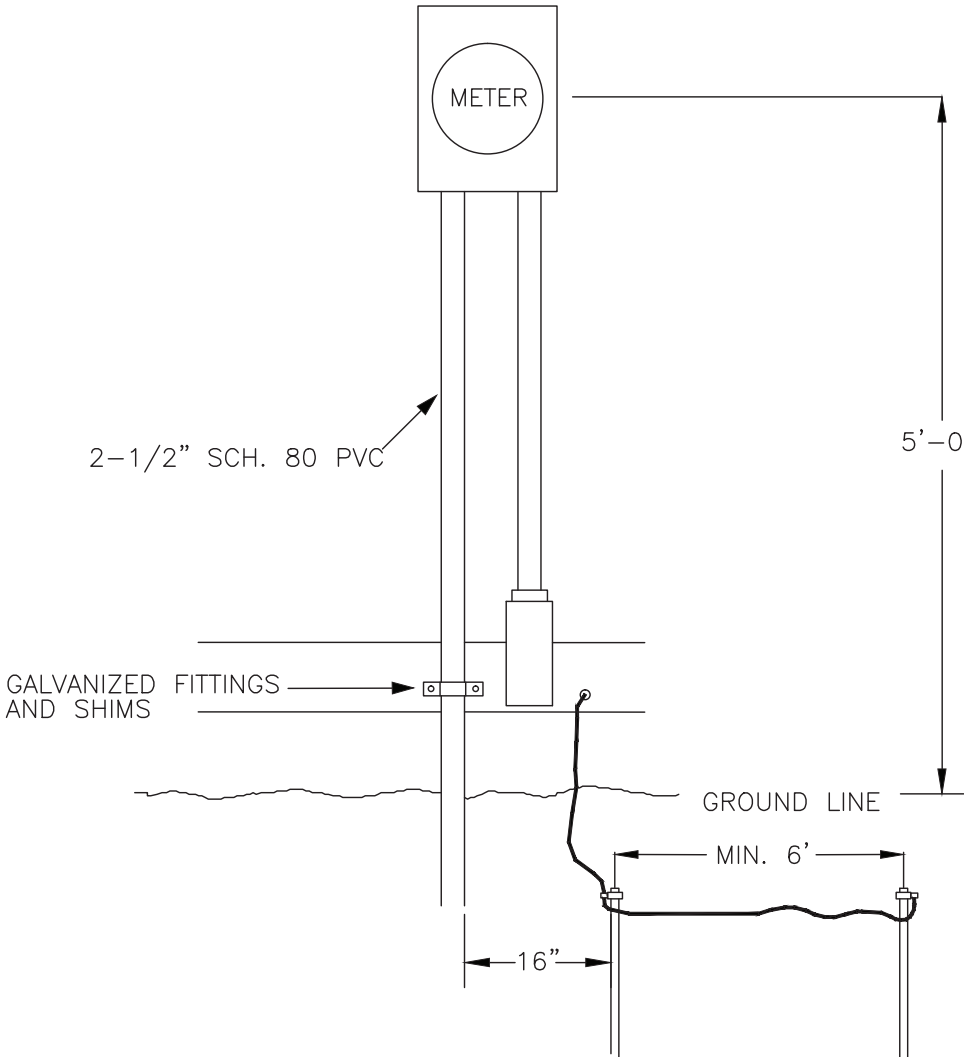
SIZE AWG OR kcmil	CONDUCTORS PERMITTED RATING IN AMPS	
	COPPER CONDUCTORS	ALUMINUM CONDUCTORS
4	100	–
3	110	–
2	125	100
1	150	110
1/0	175	125
2/0	200	150
3/0	225	175
4/0	250	200
250	300	225
300	–	250
350	350	300
400	450	–
500	–	350
600	–	400

NEC Grounding Electrode Conductor for Alternating Current

Size of Largest Ungrounded Service Entrance Conductor or Equivalent Area for Parallel Conductors (AWK/kcmil)		Size of Grounding Electrode Conductor	
		(AWK/kcmil)	
Copper	Aluminum or Copper-Clad Aluminum	Copper	Aluminum or Copper-Clad Aluminum
2 or smaller	1/0 or smaller	8	6
1 or 1/10	2/0 or 3/0	6	4
2/0 or 3/10	4/0 or 250	4	2
Over 3/0 through 350	Over 250 through 500	2	1/0
Over 350 through 600	Over 500 through 900	1/0	3/0
Over 600 or through 1100	Over 900 through 1750	2/0	4/0
Over 1100	Over 1750	3/0	250

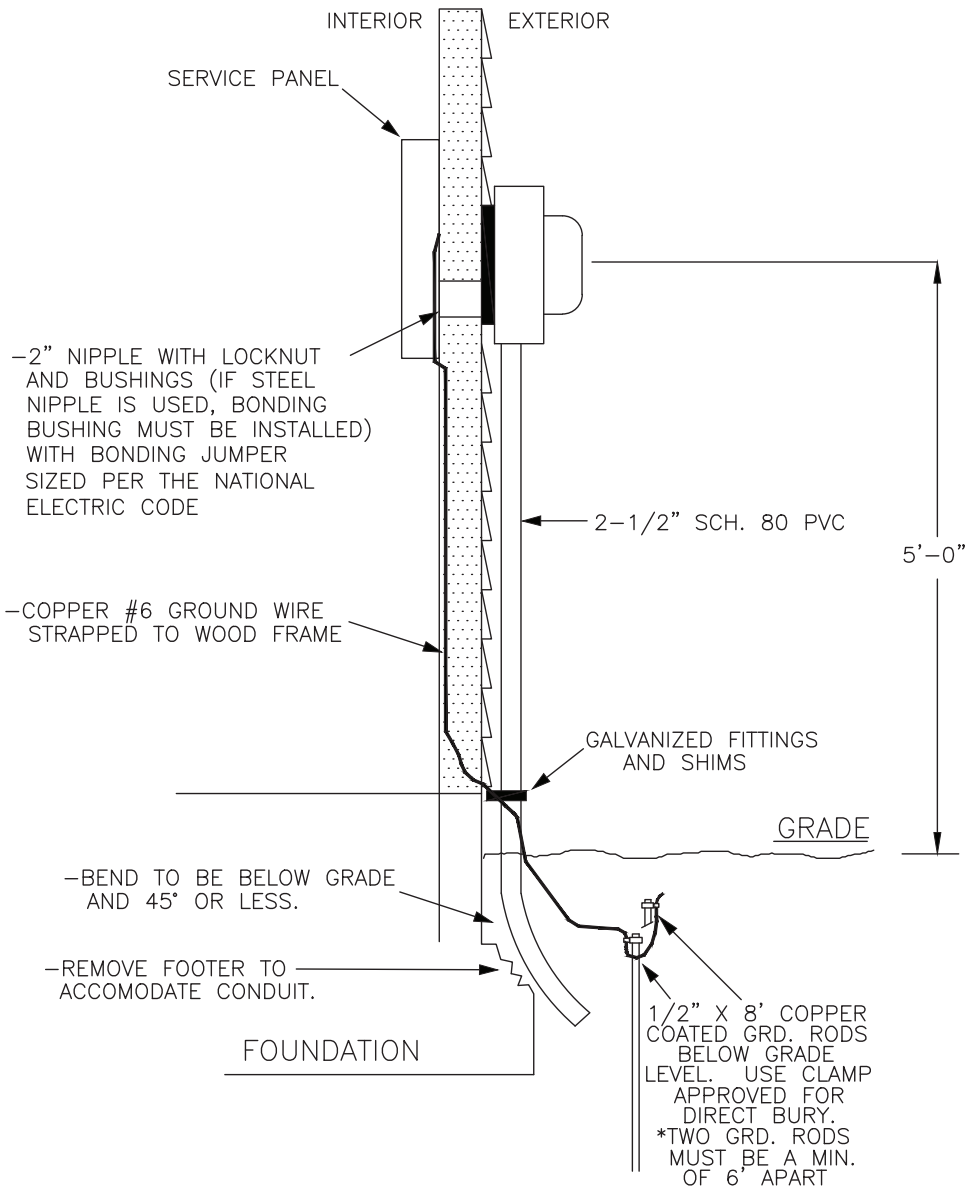


SERVICE PANEL IN BASEMENT

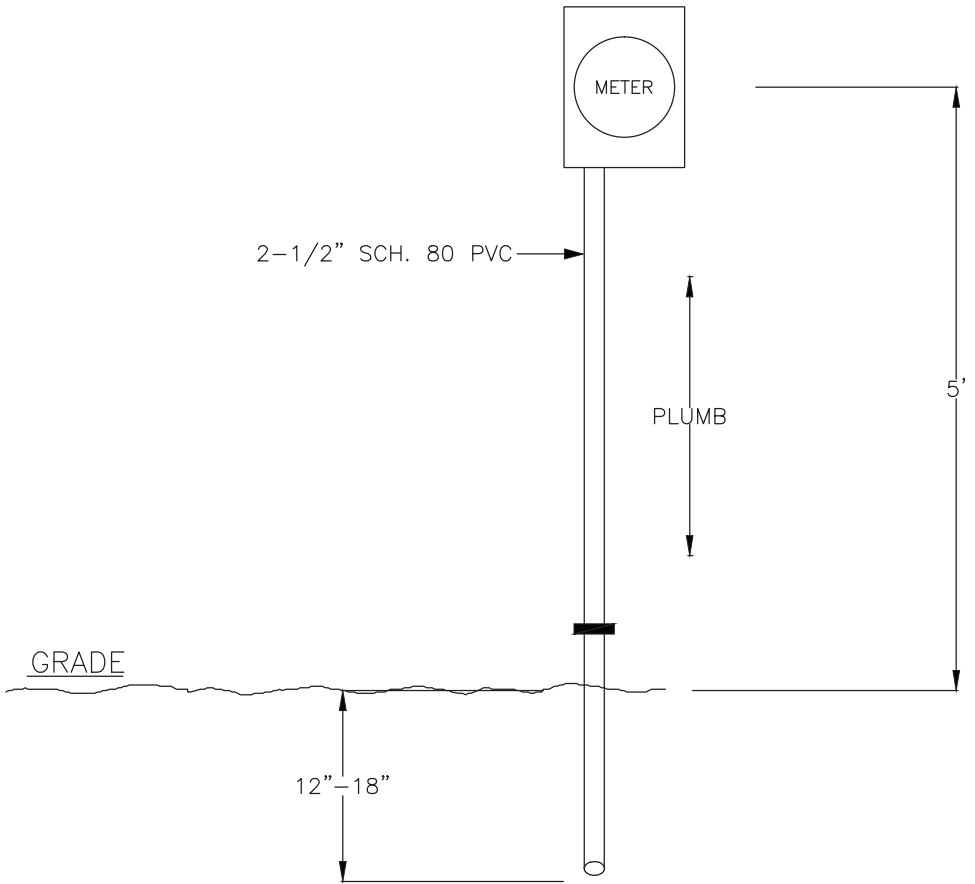


NOTES:

- 1) #6 WIRE MUST BE PROTECTED AGAINST DAMAGE WITH PVC CONDUIT.
- 2) USE 1/2" X 8' COPPER COATED GROUND ROD AND GROUND CLAMP APPROVED FOR DIRECT BURIAL BELOW GROUND LEVEL.
- 3) TWO GROUND RODS MUST BE A MINIMUM OF 6' APART.
- 4) METER BASE MUST BE LEVEL AND FASTENED SECURELY

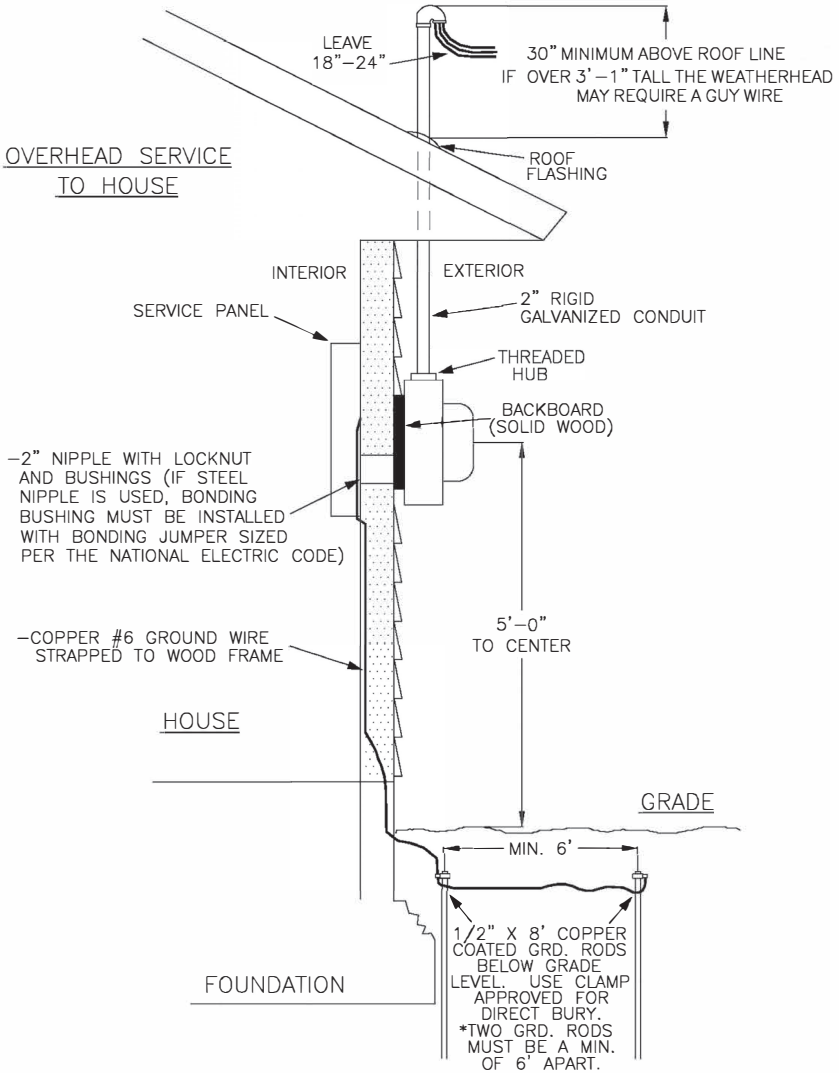


SERVICE TO HOUSE



NOTES:

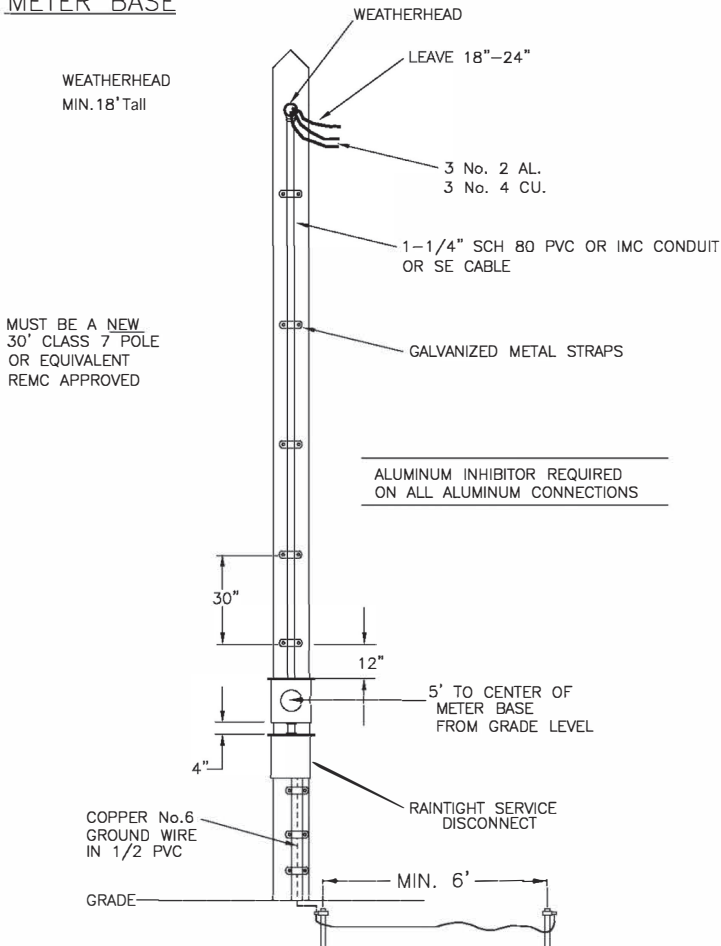
- 1) #6 WIRE MUST BE PROTECTED AGAINST DAMAGE WITH PVC CONDUIT.
- 2) USE 1/2" X 8' COPPER COATED GROUND ROD AND GROUND CLAMP APPROVED FOR DIRECT BURIAL BELOW GROUND LEVEL.
- 3) TWO GROUND RODS MUST BE A MINIMUM OF 6' APART.
- 4) METER BASE MUST BE LEVEL AND FASTENED SECURELY



Notes:

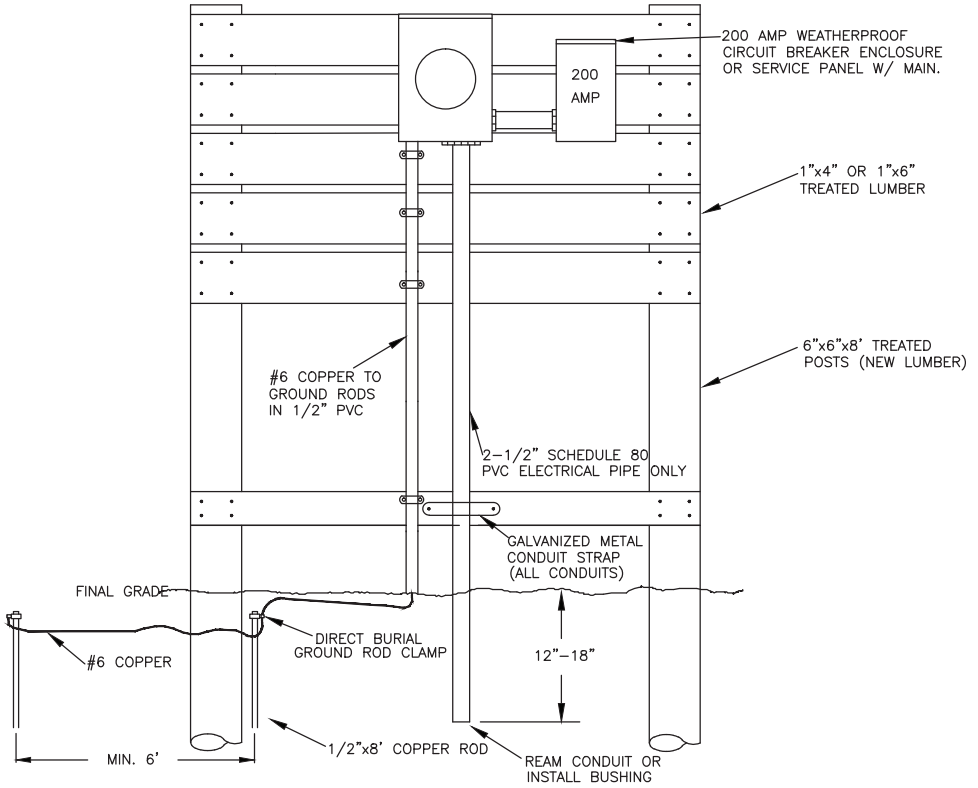
- 1) MEMBER WILL PROVIDE AND INSTALL A HOUSE KNOB (ANCHOR POINT) TO A SUITABLE STRUCTURE CAPABLE OF SUPPORTING A FORCE OF 1,500 LBS.

100 AMP
METER BASE



NOTES:

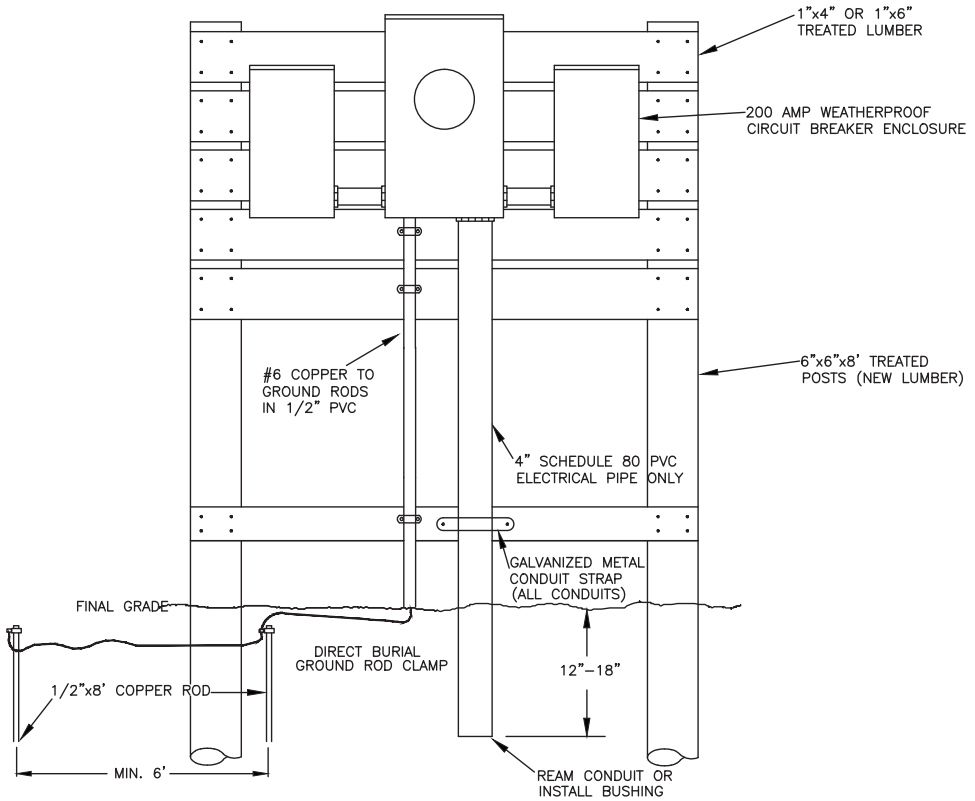
- 1) #6 WIRE MUST BE PROTECTED AGAINST DAMAGE WITH PVC CONDUIT.
- 2) USE 1/2"x 8' COPPER COATED GROUND ROD AND GROUND CLAMP APPROVED FOR DIRECT BURIAL BELOW GROUND LEVEL.
- 3) TWO GROUND RODS MUST BE A MINIMUM OF 6' APART.
- 4) MEMBER WILL PROVIDE AND INSTALL HOUSE KNOB (ANCHOR POINT) TO A SUITABLE STRUCTURE CAPABLE OF SUPPORTING A FORCE OF 1,500 LBS.



200 AMP METER STUB SERVICE (FOR FARM, MOBILE HOME, ETC.)

NOTES:

- CENTER OF METER MUST BE AS CLOSE TO 5' AS POSSIBLE ABOVE FINAL GRADE
- 6x6 POSTS MUST BE SET 3' DEEP
- SERVICE WIRE MUST BE 2/0 COPPER OR 4/0 ALUM. AND INSTALLED BY CONSUMER
- TWO GROUND RODS MUST BE A MINIMUM OF 6' APART.
- METER STUB SERVICES REQUIRE A FOUR WIRE CONDUCTOR CABLE WITH BOTH A GROUNDED (NEUTRAL) CONDUCTOR AND A GROUNDING (GROUND) CONDUCTOR INSTALLED BETWEEN THE METER STUB AND THE EQUIPMENT (HOME, BARN, OR MOBILE HOME) IT SERVES. IN ADDITION THE BONDING MUST TAKE PLACE AT THE STUB AND "GROUNDS" AND "NEUTRAL" CONDUCTORS REMAIN SEPARATE THROUGHOUT THE REMAINING SYSTEM



400 AMP METER STUB SERVICE

NOTES:

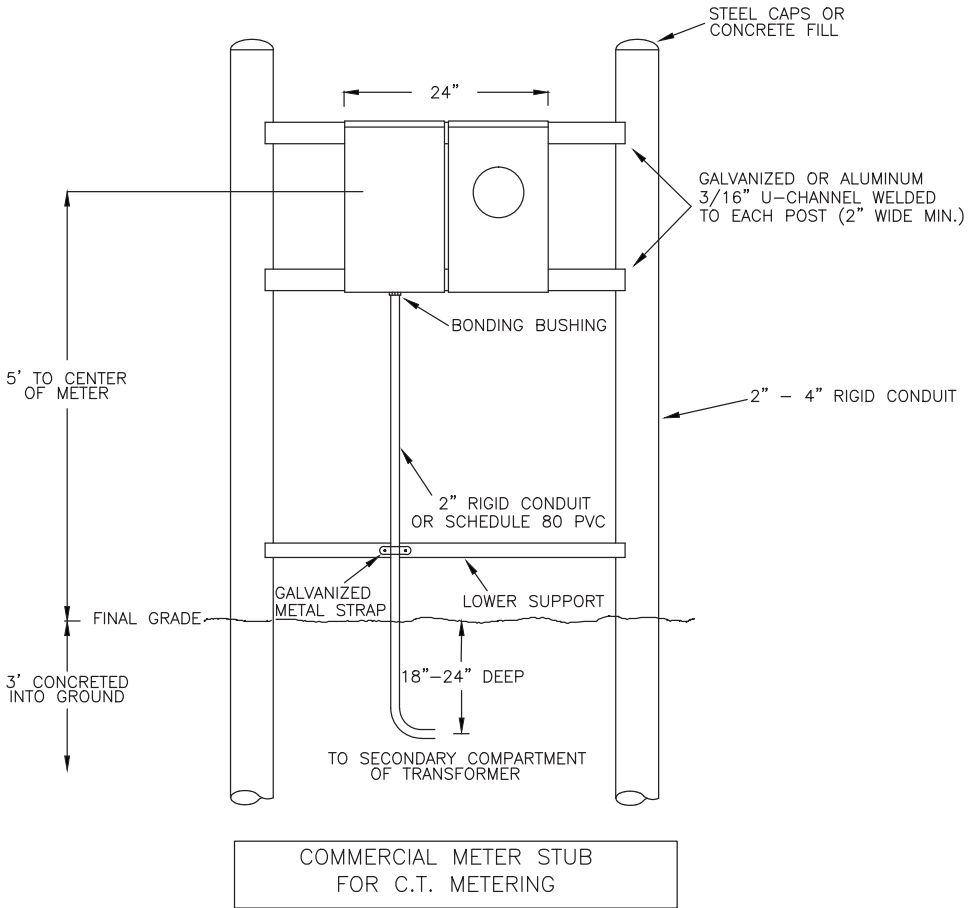
- CENTER OF METER MUST BE AS CLOSE TO 5' AS POSSIBLE ABOVE FINAL GRADE
- 6x6 POSTS MUST BE SET 3' DEEP
- SERVICE WIRE MUST BE 2/0 COPPER OR 4/0 ALUM. TO EACH SERVICE PANEL AND INSTALLED BY CONSUMER
- TWO GROUND RODS MUST BE A MINIMUM OF 6' APART.
- CIRCUIT BREAKER ENCLOSURES MUST BE GROUPED OR LOCATED IN THE SAME LOCATION
- METER STUB SERVICES REQUIRE A FOUR WIRE CONDUCTOR CABLE WITH BOTH A GROUNDED (NEUTRAL) CONDUCTOR AND A GROUNDING (GROUND) CONDUCTOR INSTALLED BETWEEN THE METER STUB AND THE EQUIPMENT (HOME, BARN, OR. MOBILE HOME) IT SERVES. IN ADDITION THE BONDING MUST TAKE PLACE AT THE STUB AND "GROUNDS" AND "NEUTRAL" CONDUCTORS REMAIN SEPARATE THROUGHOUT THE REMAINING SYSTEM

COMMERCIAL SERVICES

1. A customer requiring a 50 kVA or larger transformer must provide and install secondary lines from the transformer to the service panel (inside the building).
2. Northeastern will furnish a meter base and "CT" cabinet if required. The customer shall be responsible for the installation of the equipment provided by Northeastern. The customer must furnish and install electrical conduit of proper length and size to receive the service wires. The meter base must be located within easy access of the transformer.
3. The determination of the transformer location, meter location, route of service wires, and the length of service wires, shall remain the sole judgment of Northeastern.
4. On large commercial or industrial installations, Northeastern may elect to use primary metering at a location other than metering at the transformer. In such cases, the customer will be responsible for the service wires from the transformer to the service panel or disconnecting devices. Normally, Northeastern shall request the setting of the transformer adjacent to the building served (near the service panel or disconnecting devices).
5. If the "CTs" are installed inside the transformer, a commercial meter stub is required adjacent to the transformer pad (see drawing). The customer is responsible for the installation of this meter stub.

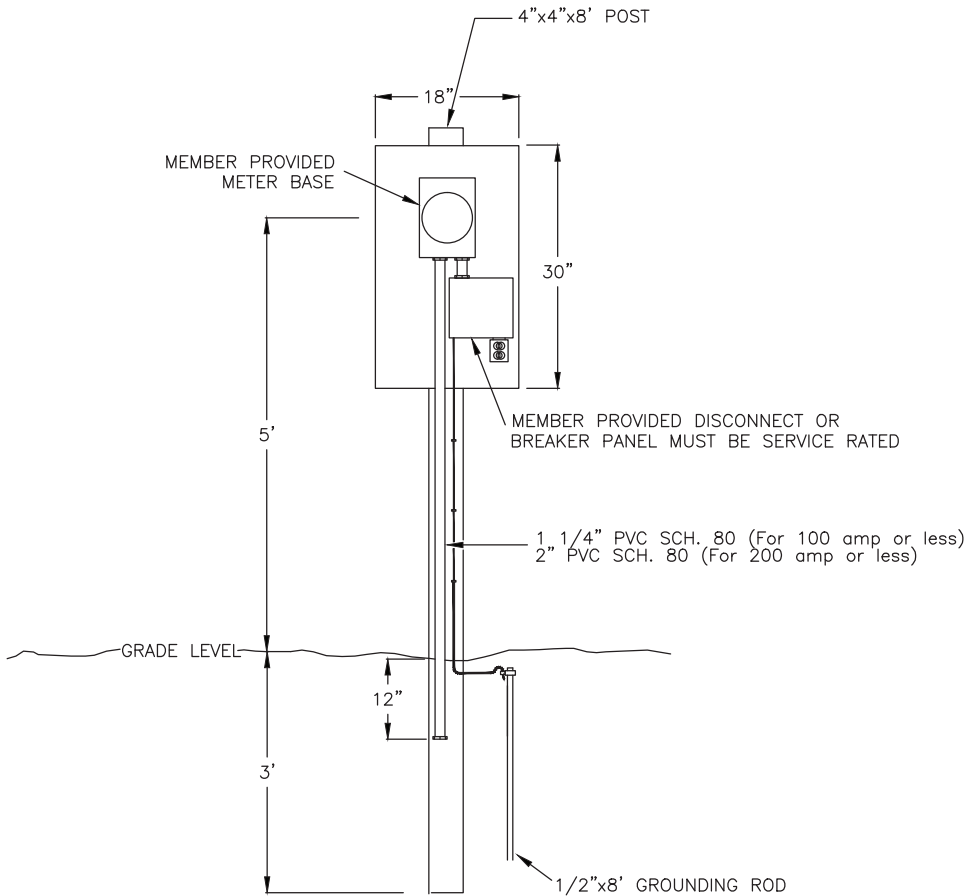
THREE-PHASE COMMERCIAL SERVICES

1. Any three-phase commercial service requiring an overhead installation must be approved by Northeastern REMC prior to installation.
2. If facilities require a padmount transformer, the minimum size that Northeastern REMC will install is a three-phase 45 kVA. Customer will be responsible for the concrete pad (according to Northeastern requirements) and all conduits, secondary wire and connections from the transformer to the panel inside the building.
3. Northeastern will furnish a 200-Amp meter base and a "CT" cabinet, if required. The customer will be responsible for the installation of the equipment provided by Northeastern. The customer must furnish and install electrical conduit of proper length and size to receive the service wires.
4. The determination of the transformer location, meter location, route and length of service wires shall remain the sole judgment of Northeastern.
5. If the "CT's" are installed inside the transformer, a commercial meter stub is required adjacent to the transformer pad (see drawing). The customer is responsible for the installation of this meter stub.
6. On larger commercial or industrial installations, Northeastern may elect to use metering at a location other than the transformer (primary metering). In such cases, the customer will be responsible for the service wires from the transformer to the service panel or disconnected devices.



CUSTOMER INSTALLED TEMPORARY

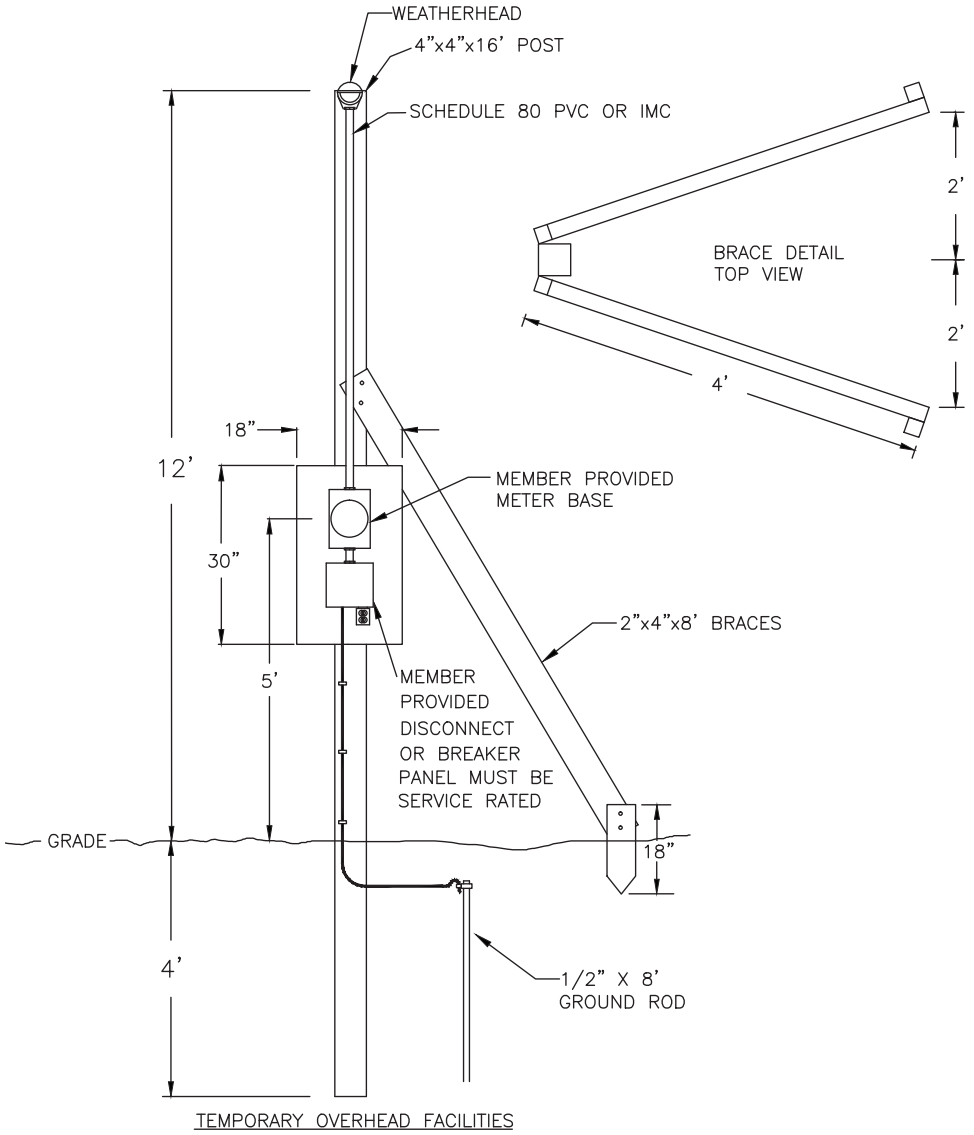
1. All temporaries must be installed within 5 feet of a padmount transformer or 10 feet of an overhead pole.
2. All service wires must be sized according to the service main or disconnect rating.
3. All equipment must be weatherproof and service rated.
4. All 120 Volt 20 Amp receptacles must be ground fault protected.
5. Ground wire must be #6 copper strapped every 12 inches to ground level.
6. Ground rod must be ½ inch by 8 feet with approved ground rod type clamp suitable for direct burial.
7. Customer must follow the National Electrical Code.
8. Temporary service supplied by a 50 kVA transformer or larger must have current limiting protection.



TEMPORARY UNDERGROUND FACILITIES

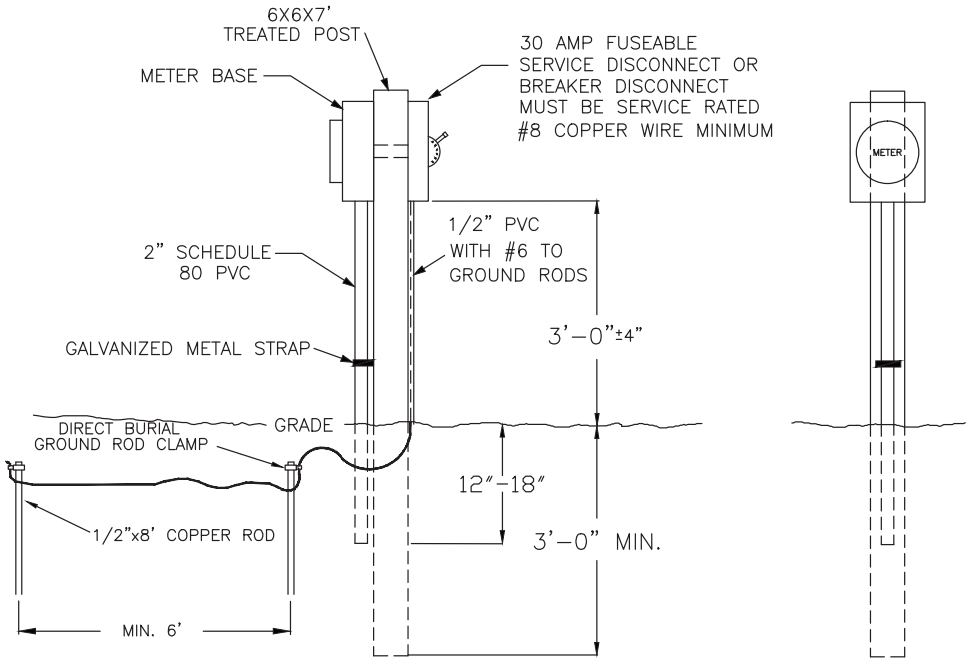
NOTES:

- INSTALL WITHIN 5' OF TRANSFORMER OR POLE



NOTES:

- 1) INSTALLED WITHIN 10' OF POLE
- 2) MEMBER WILL PROVIDE AND INSTALL HOUSE KNOB (ANCHOR POINT) TO A SUITABLE STRUCTURE CAPABLE OF SUPPORTING A FORCE OF 1,500 LBS.



SUBDIVISION LIGHTING SERVICE

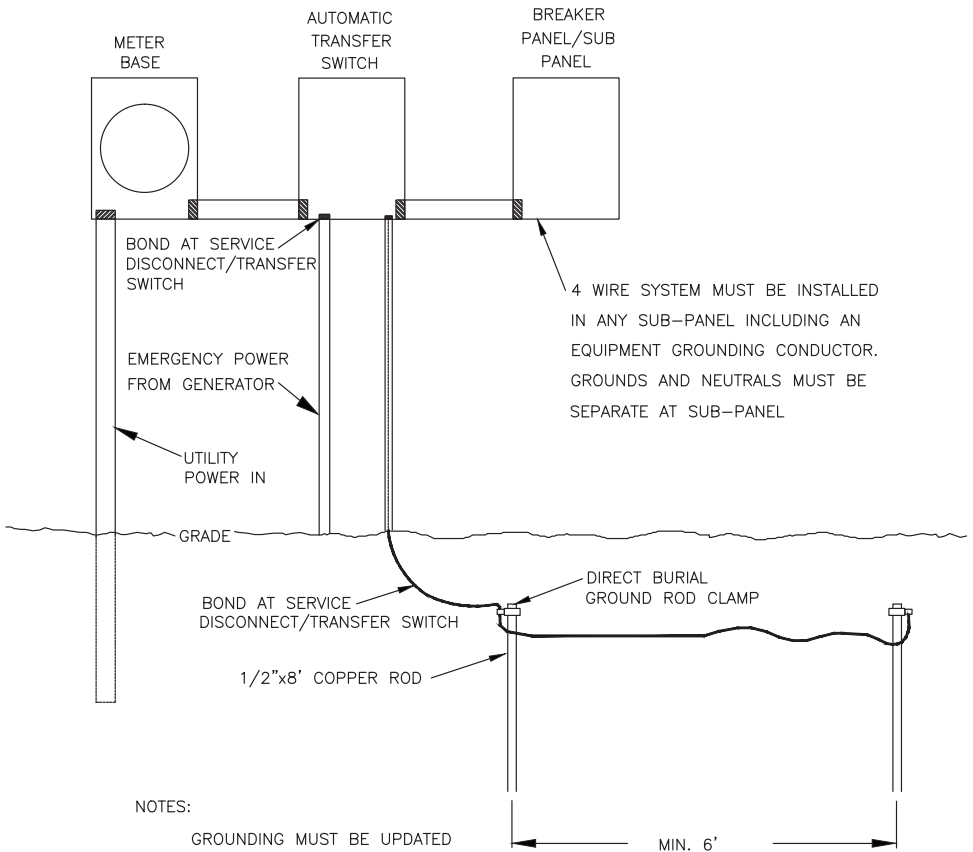
NOTES:

- 1) #6 WIRE MUST BE PROTECTED AGAINST DAMAGE WITH PVC CONDUIT.
- 2) USE 1/2"X 8' COPPER COATED GROUND ROD AND GROUND CLAMP APPROVED FOR DIRECT BURIAL BELOW GROUND LEVEL.
- 3) TWO GROUND RODS MUST BE A MINIMUM OF 6' APART.
- 4) INSTALL WITHIN 5' OF TRANSFORMER

Emergency Stand-By Generator

1. The member's generator installation must be inspected by both NREMC and the County Building Department. The member must have all of the permits required for a generator installation.
2. To eliminate the possibility of backfeed to the utility which could endanger the public and/or NREMC personnel and could cause damage to NREMC or member equipment, the transfer equipment must be installed in accordance with the NEC and the manufacturer's recommendations.
3. If used as a service disconnect, the transfer switch must be service rated. As this disconnects the service, bonding will need to take place inside of that enclosure. Grounding must be updated to the NEC and a 4th wire (equipment ground wire) must be ran to the breaker panel. The grounds and neutrals must be separate at the sub-panel.
4. If the Grounding Electrode Conductor is extended, a non-revisable crimp approved for the application must be used.

EMERGENCY STAND-BY GENERATOR



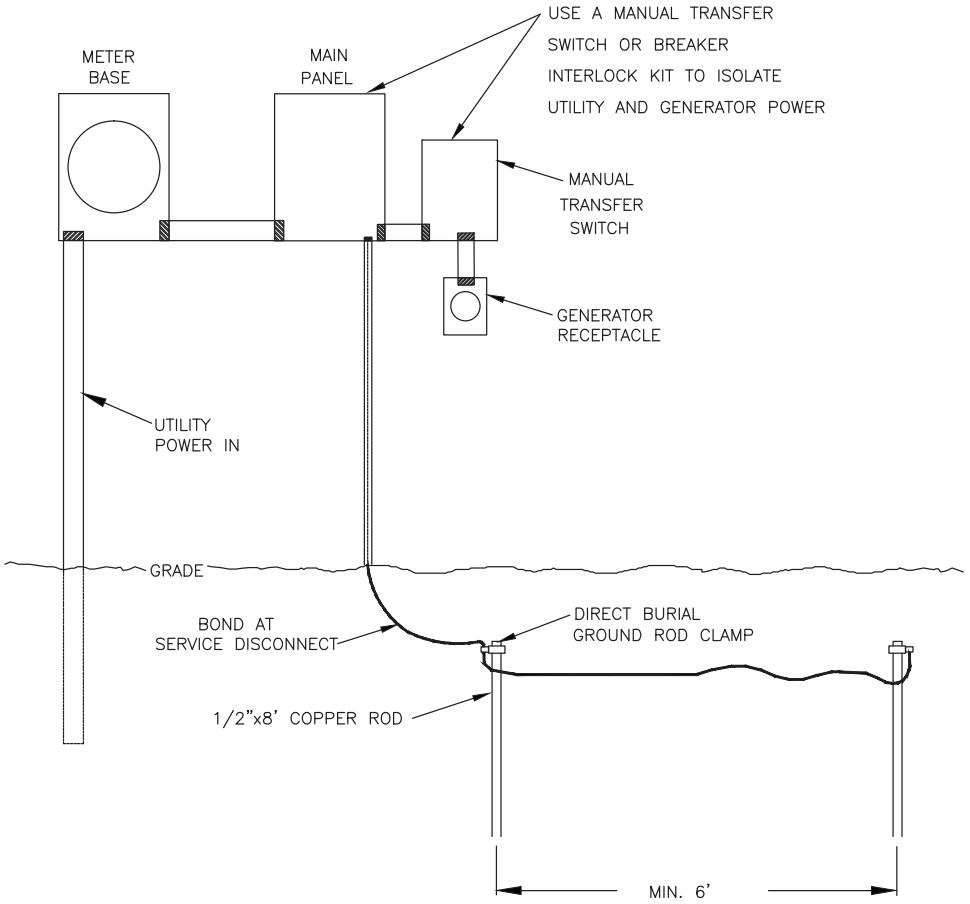
NOTES:

GROUNDING MUST BE UPDATED
2-1/2 X 8 GROUND RODS,
6' APART WITH CONTINUOUS #6
COPPER CONDUCTOR EXC.

Portable Generator Installation

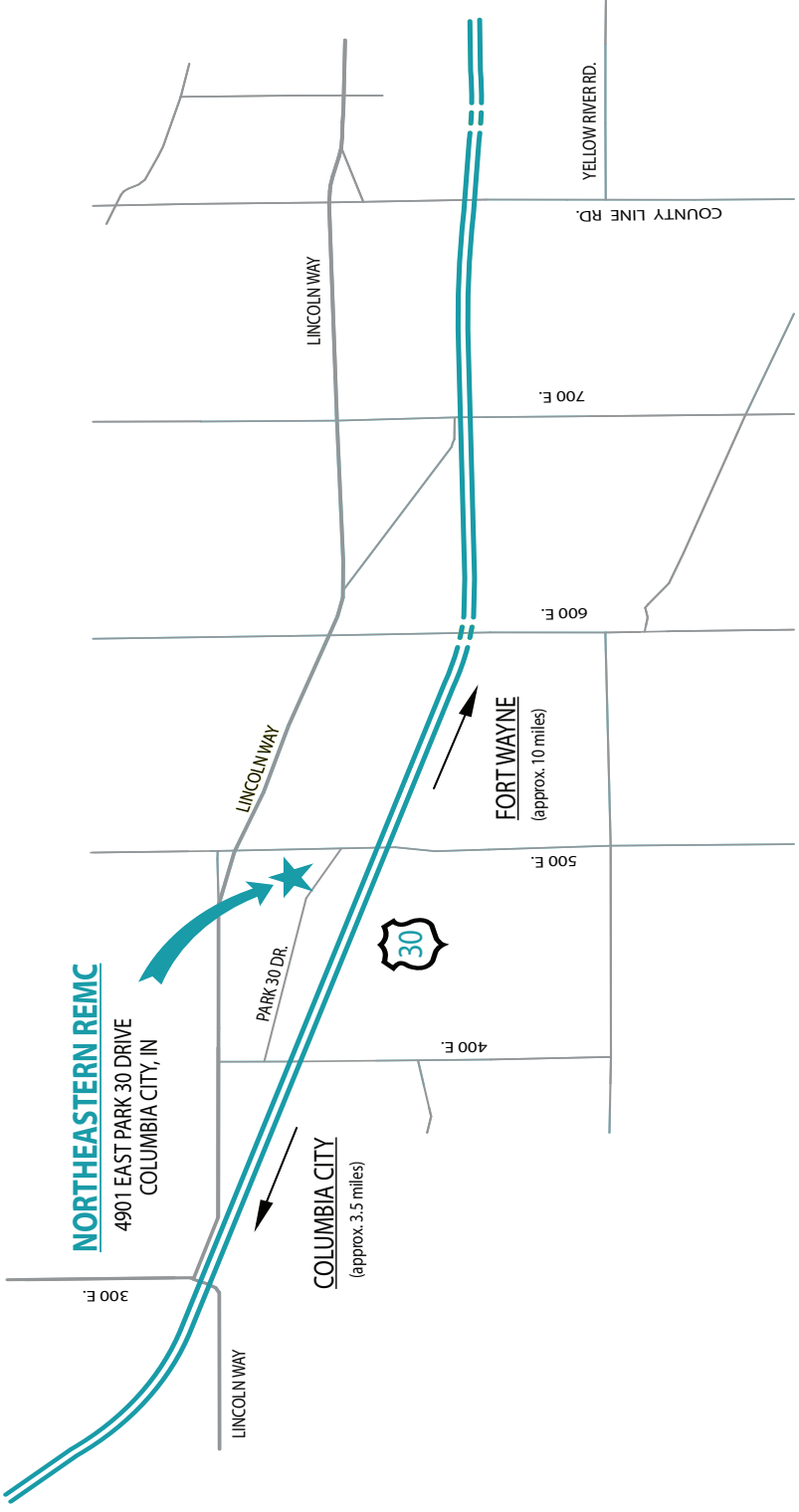
- 1) Member must install a permanent UL approved manual transfer switch or breaker interlock kit to isolate the utility circuit from the generator back up circuits.
- 2) Portable generators must be sized to the connected load, follow all NEC, local codes, and follow the manufacturer's recommendations.
- 3) DANGER! Electrocution may result if the generator circuit is not properly isolated from the utility. Damage to the generator or possible fire can occur if the generator is not properly installed.

PORTABLE GENERATOR



NORTHEASTERN REMC

4901 EAST PARK 30 DRIVE
COLUMBIA CITY, IN



COLUMBIA CITY
(approx. 3.5 miles)

FORT WAYNE
(approx. 10 miles)



300 E.

400 E.

500 E.

600 E.

700 E.

COUNTY LINE RD.

YELLOW RIVER RD.

LINCOLN WAY

LINCOLN WAY

PARK 30 DR.

LINCOLN WAY