

500. GENERAL

- A. In accordance with the **National Electrical Code (NEC)**, a permanent and effective ground shall always be provided for all service entrance equipment. The neutral conductor shall also be grounded. See Section 502 for examples.
- B. The grounding of electric installations is essential for the safety of those using the electric service, personnel maintaining the service, and is a safeguard for the Customer's equipment.
- C. Intersystem Bonding is required by NEC 250.94. See section 503 for details.

501. GROUNDING ELECTRODE SYSTEM

- A. The grounding electrode system consists of one or more grounding electrodes and the conductors which connect the grounding electrodes to the grounded service entrance conductor (neutral) at the service equipment.
Grounding Electrodes NEC 250.52:
 - 1. Metal Underground Water Pipe. – NEC250.52 (A)(1)
 - 2. Metal Frame of a Building or Structure - NEC250.52 (A)(2)
 - 3. Concrete Encased Electrode (Ufer) - NEC250.52 (A)(3)
 - 4. Ground Ring - NEC250.52 (A)(4)
 - 5. Rod and Pipe Electrodes - NEC250.52 (A)(5)
 - 6. Plate Electrodes. - NEC250.52 (A)(6)
- B. If available on the premises at each building or structure served, each item in NEC 250.52 (A) 1-6, shall be bonded together to form the grounding electrode system.
- C. The grounding electrode conductor shall not be run through meter sockets, Instrument Transformer Cabinets, or the utility portion of a metering pedestal.
Exception 1: Metering equipment containing the service equipment.
Exception 2: Multiple metering installations.
- D. The ground rods and conductor shall be buried a minimum of 6 inches below final grade. This grounding electrode conductor is not required to be larger than #6 AWG copper or #4 AWG aluminum as permitted by NEC 250.53(E).
- E. **The grounding electrode conductor shall be one piece in length, supported and protected by rigid conduit or as required by NEC 250.64(B) where physical damage may occur.**
- F. Metal underground gas piping systems shall not be used as a grounding electrode or bonded to the grounding electrode system.



502. GROUNDING SERVICE ENTRANCE AND METERING EQUIPMENT

- A.** If two ground rods are installed, both ground rods shall be installed to left or right of meter socket but not in front. The grounding electrode conductor shall not pass in front of meter socket or pedestal.
- B.** For underground services **ONLY**, leave the top 2 inches of the ground rod exposed, prior to service installation, for Alliant Energy. Ground rods shall be covered after the service has been installed.
- C.** The electrical contractor is responsible for all bonding connections.
- D.** The CT cabinet and meter socket shall be bonded to the system neutral.

FIG 502A

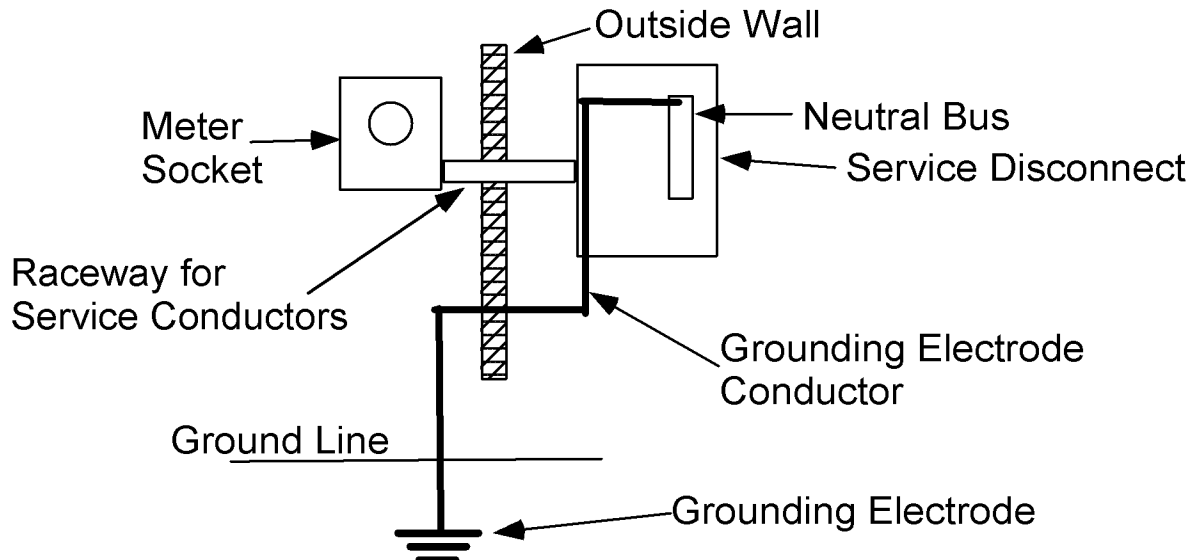
Wall Mounted Meter Socket

FIG 502B

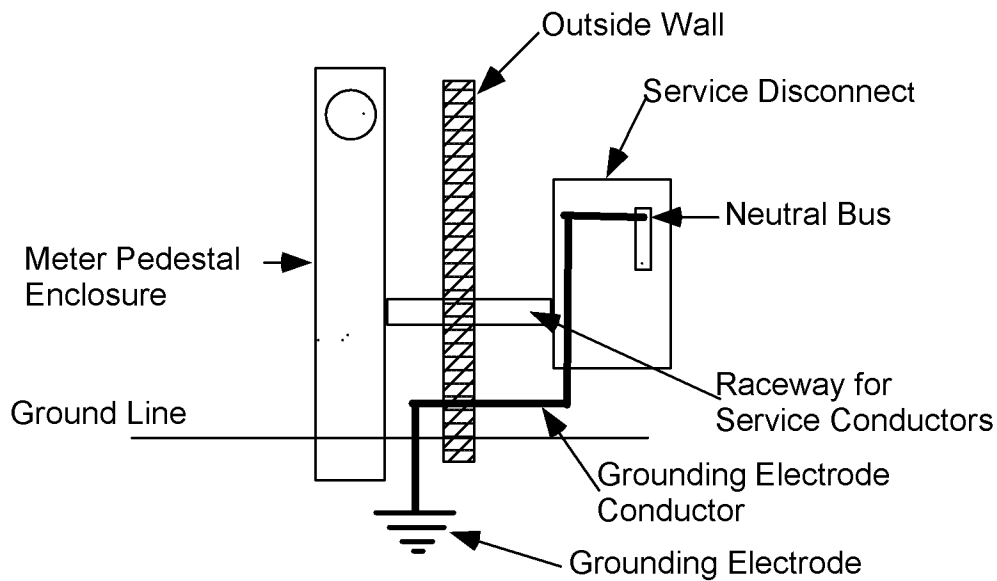
Grounding Single Self Contained Wall Mounted Meter Sockets and Pedestals

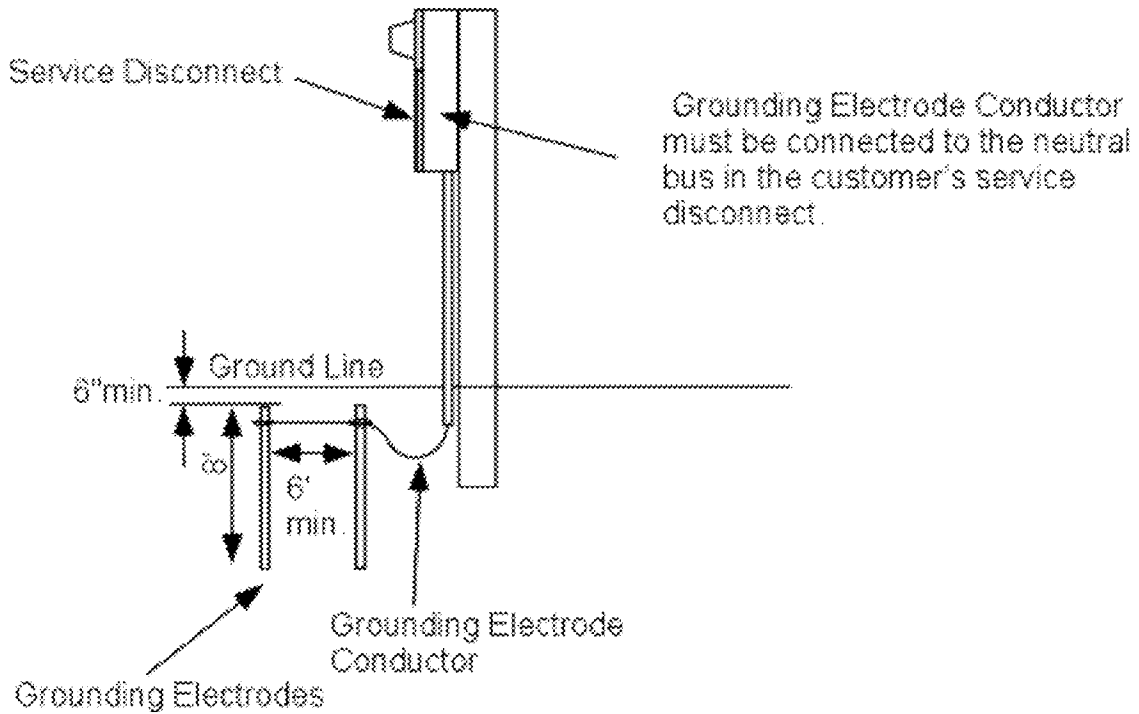
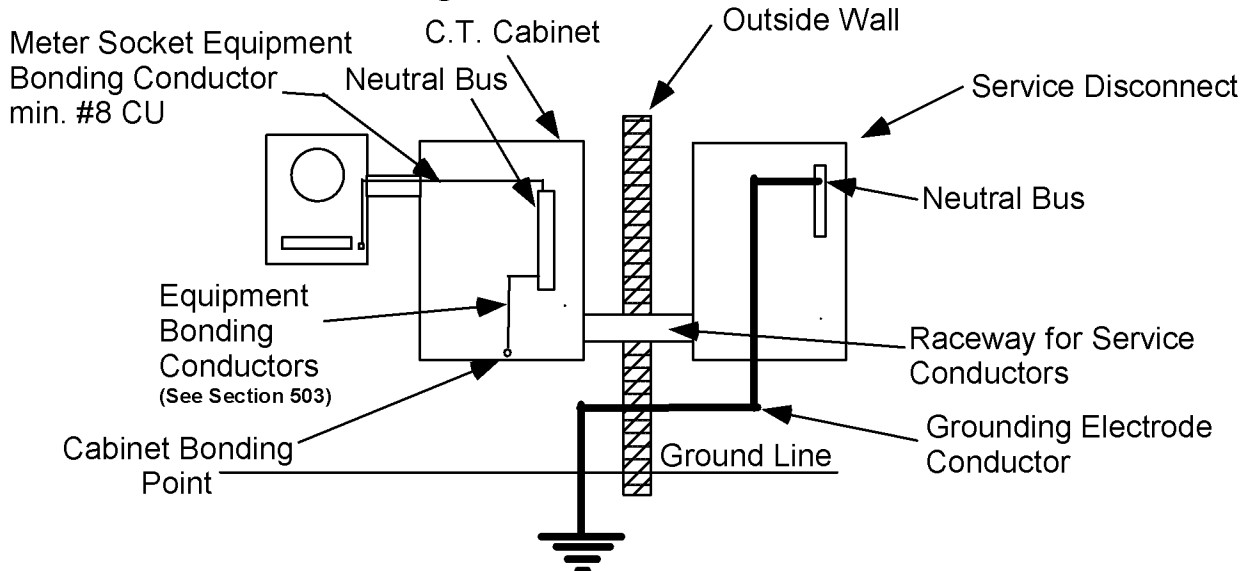
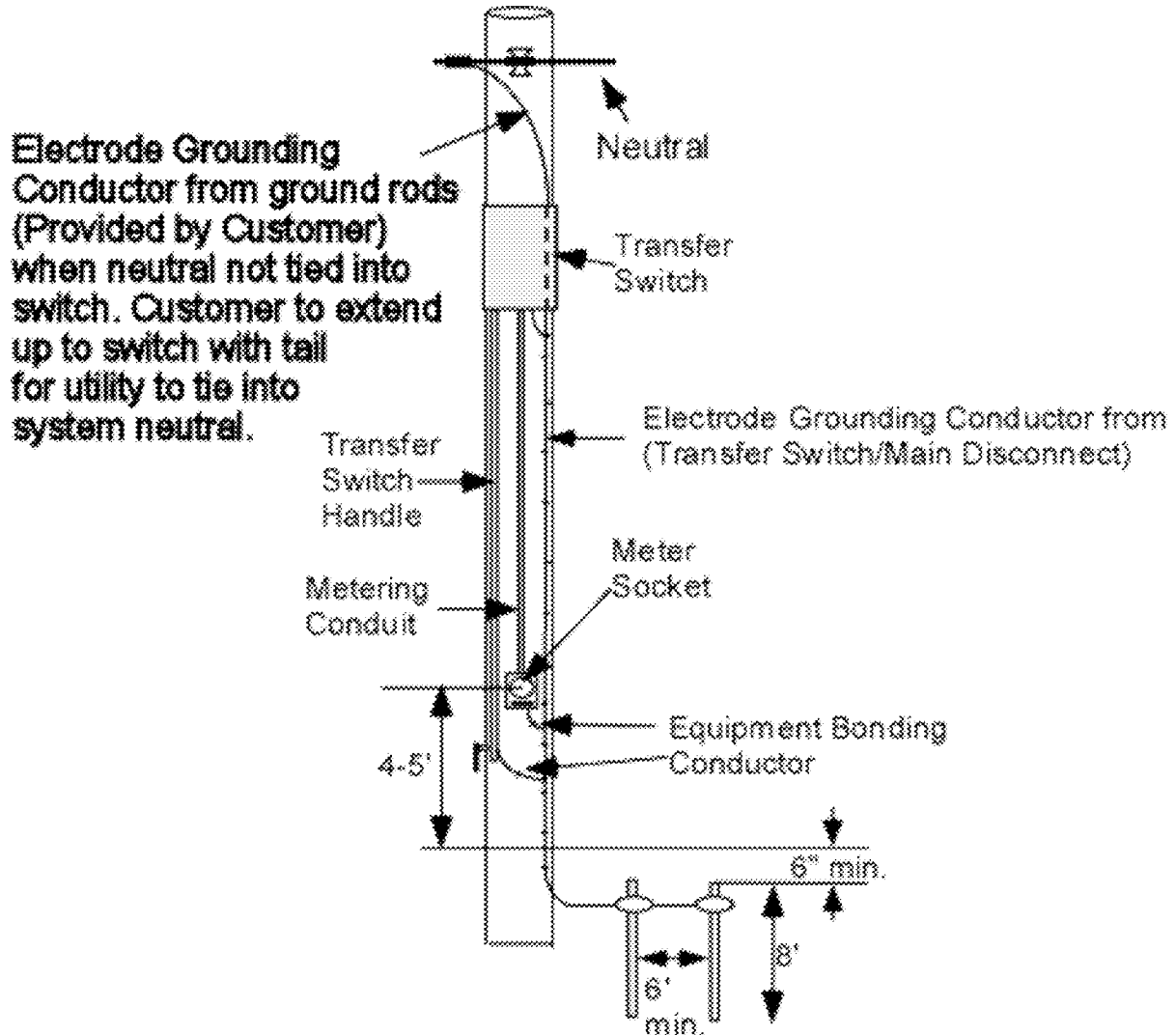
FIG 502C
Grounding Free Standing Pedestals

FIG 502D
Grounding Instrument Transformer Cabinets


FIG 502E
Grounding Farm Service Yard Poles

NOTES:

1. Pole Top disconnect switch grounding conductor and the grounding electrode shall conform to NEC 250.
2. The customer grounding electrode and grounding electrode conductor shall be completely separate from Alliant Energy's transformer grounding electrode and grounding electrode conductor.

**503. BONDING**

- A. Bonding shall be provided where necessary to ensure electrical continuity and the capacity to safely conduct any fault current likely to be imposed.
- B. Non-current-carrying metal parts of equipment shall be effectively bonded together, including but not limited to raceways, service enclosures, meter enclosures, etc.
- C. Bonding to other systems shall not be done within a metering enclosure. CATV, Cable Dish systems and Telephone Companies shall bond to the grounding electrode system, if available. If the grounding electrode system is not readily available bonding shall be done at the ground terminal bar in the main service entrance equipment. NEC 250.94,(2) (3).
- D. The following (if on the premises) shall be bonded into the grounding electrode system:
 - 1. Metal water piping system(s) installed in or attached to the building or structure
 - 2. Other metal piping system(s), including gas piping, installed in or attached to the building or structure
 - 3. Exposed structural steel that is interconnected to form a steel building frame
- E. Equipment bonding conductors on the supply side of service shall be sized according to NEC 250.102C. Table 503 may be used as a guide in determining the minimum size for equip. bonding conductors for metering cabinet installations.
- F. Table 503 assumes **75°C temperature ratings** for service entrance conductors, with no adjustment factor for more than 3 current-carrying conductors. On a 3-phase 4-wire wye service where the major portion of the load consists of nonlinear (harmonic) loads, the neutral shall be considered as a "current-carrying" conductor (NEC 310.15B4c); in such cases a larger equipment bonding conductor shall be used.



TABLE 503

Metering Cabinet Rating, Amps	Service Entrance Conductor Size (75°C Copper, AWG/kcmil)	Number of Runs	Minimum Equipment Bonding Conductor Size or Equivalent Area for Parallel Conductors (Copper, AWG/kcmil)
400	3/0	2	#2
	4/0	2	1/0
	600	1	1/0
600	3/0	3	1/0
	4/0	3	2/0
	350	2	2/0
800	3/0	4	2/0
	350	3	2/0
1200	350	4	4/0
	500	4	250
	600	3	250
1600	350	6	300
	500	5	350
	600	4	300
2000	350	7	350
	500	6	400
	600	5	400
2500	350	9	400
	500	7	500
	600	6	500
3000	350	10	500
	500	8	500
	600	8	600
	750	7	750



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