ROCK ENERGY COOPERATIVE

Empowering Members Since 1936

GROUNDING

STANDARDS

ELECTRIC SERVICE STANDARDS – GROUNDING & BONDING

This section contains the typical grounding and bonding requirements for service types listed within this document. Not all grounding and bonding situations are covered in this section. It is the responsibility of the member and the Authority Having Jurisdiction (AHJ) to verify all *NEC* and other applicable code grounding requirements are met.

GENERAL RULES

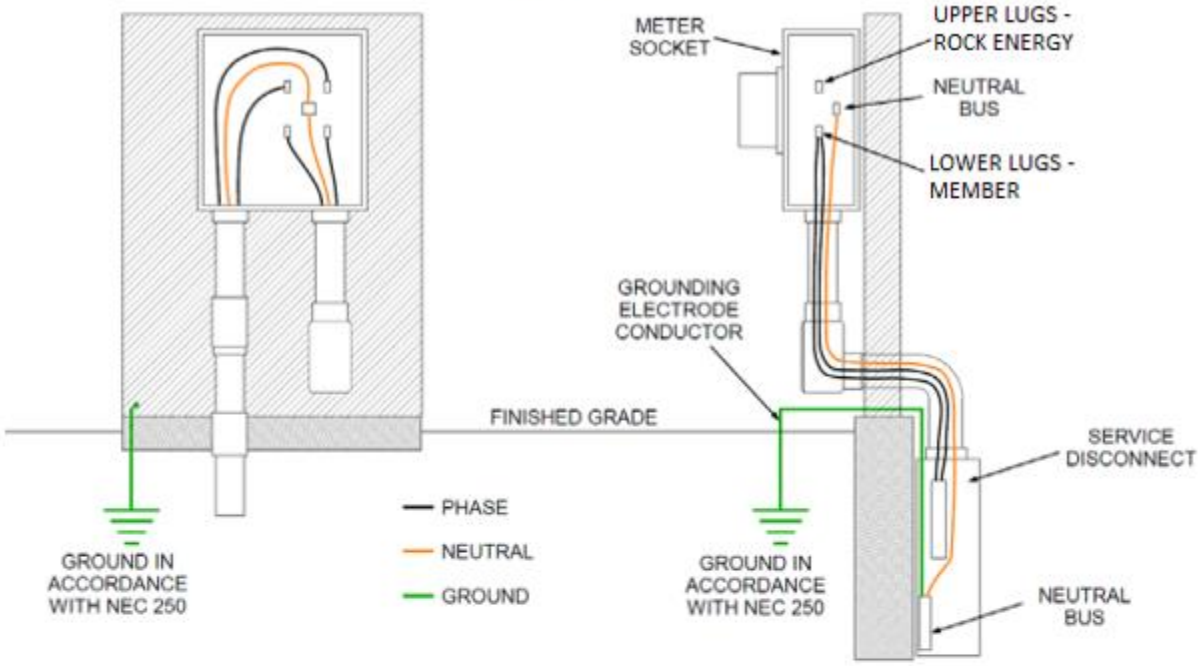
A. Should the installing contractor or electrician need to disconnect the electrical service at any point, the installer must contact Rock Energy to schedule a time for Rock Energy crews to perform the disconnect. Cutting the meter seal or making any alterations to Rock Energy's equipment by anyone other than Rock Energy crews will result in a tampering fee being applied to the member's bill.
B. The grounding of electrical installations is essential for the safety of those using the electric service, personnel maintaining the service, and is a safeguard for the member's equipment.
C. The grounding electrode conductor (GEC)
    1. The grounding electrode conductor shall not be routed through meter sockets, metering transformer cabinets, or a metering pedestal without a service disconnect.
    2. The grounding electrode conductor may be terminated in one of the following:
        a) In the service disconnect (s)
        b) In the metering equipment containing a service disconnect
        c) In the termination compartment of multiple metering installations
D. Metal underground gas piping shall not be used.
E. If two ground rods are installed, both ground rods shall be installed to the left or to the right of the meter socket but not in front. The grounding electrode conductor shall not pass in front of the meter socket or pedestal.
F. For all 3-Phase, 4 Wire services, the member's grounded (neutral) conductor shall be terminated on the first service disconnect or series of service disconnects (6 switch rule).
G. Grounding bushings and equipment bonding jumpers shall be used on all metallic conduit installations using concentric or eccentric knockouts.

WIRING INSPECTIONS

A. Member wiring installations shall meet the minimum requirements as set forth by current NFPA 70 NEC, state regulatory commissions, and the local Authority Having Jurisdiction (AHJ). Rock Energy shall receive written approval from the AHJ.
B. Where no inspection authority exists, Rock Energy shall receive a complete signed copy of WI or IL wiring affidavit before energizing any new or modified electric service.
C. Rock Energy reserves the right to inspect for compliance with these standards but assumes no responsibility for the inspection of the member's installation.

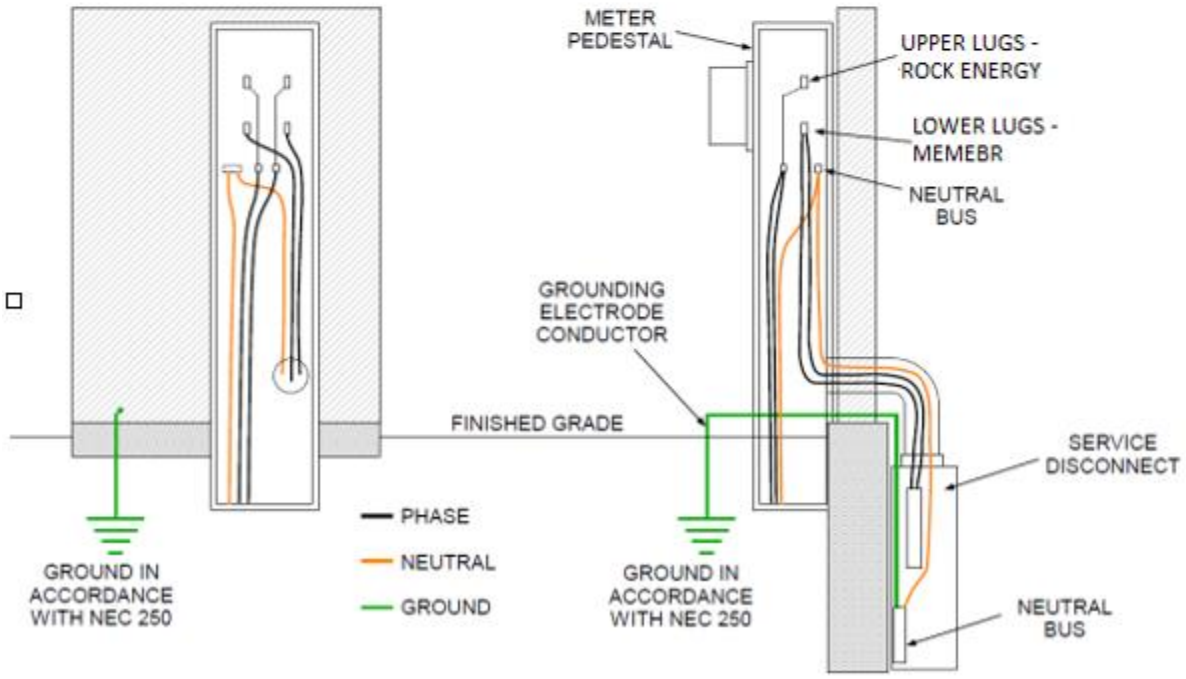
GROUNDING - WALL MOUNTED METER SOCKET

FIGURE 1



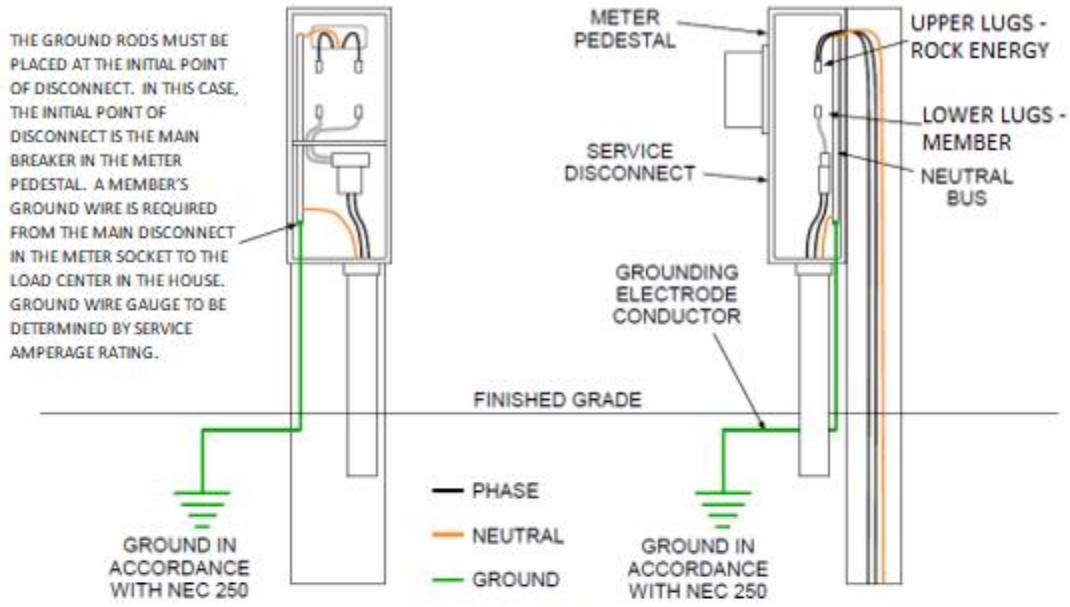
GROUNDING - WALL MOUNTED SOCKET PEDESTAL

FIGURE 2



GROUNDING - FREE STANDING PEDESTALS WITH BREAKER (MAIN)

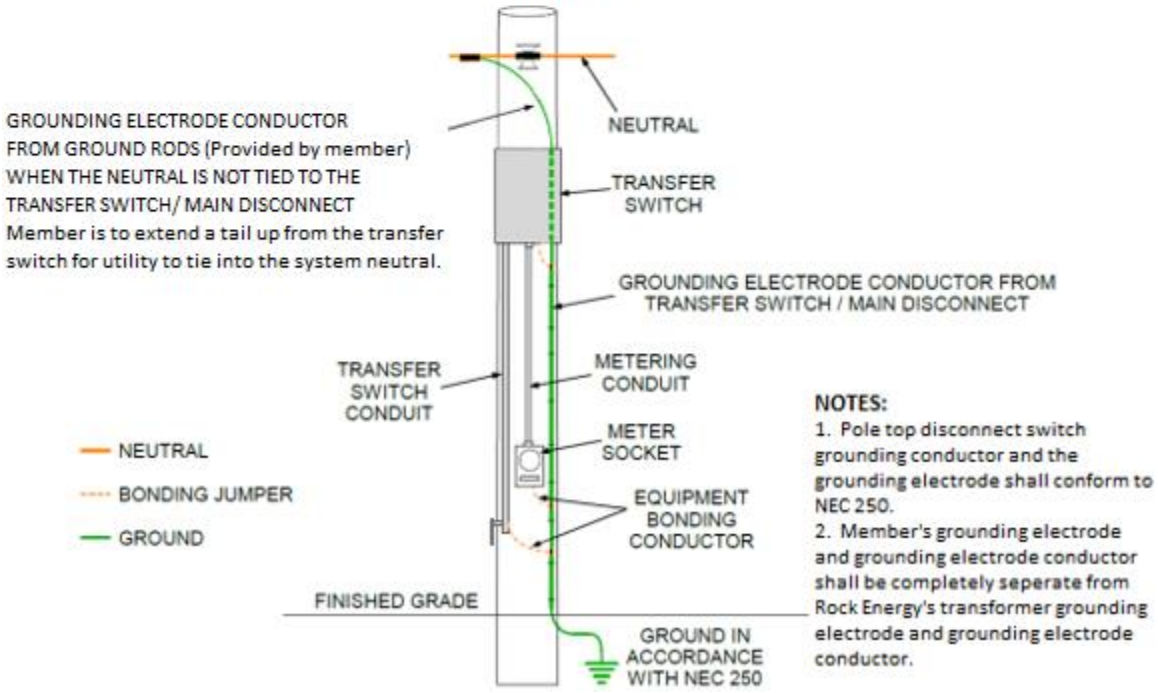
FIGURE 3



ONLY 1 SET OF GROUND RODS IS ALLOWED AND THEY MUST BE AT THE INITIAL POINT OF DISCONNECT

GROUNDING - FARM SERVICE YARD POLES

FIGURE 4

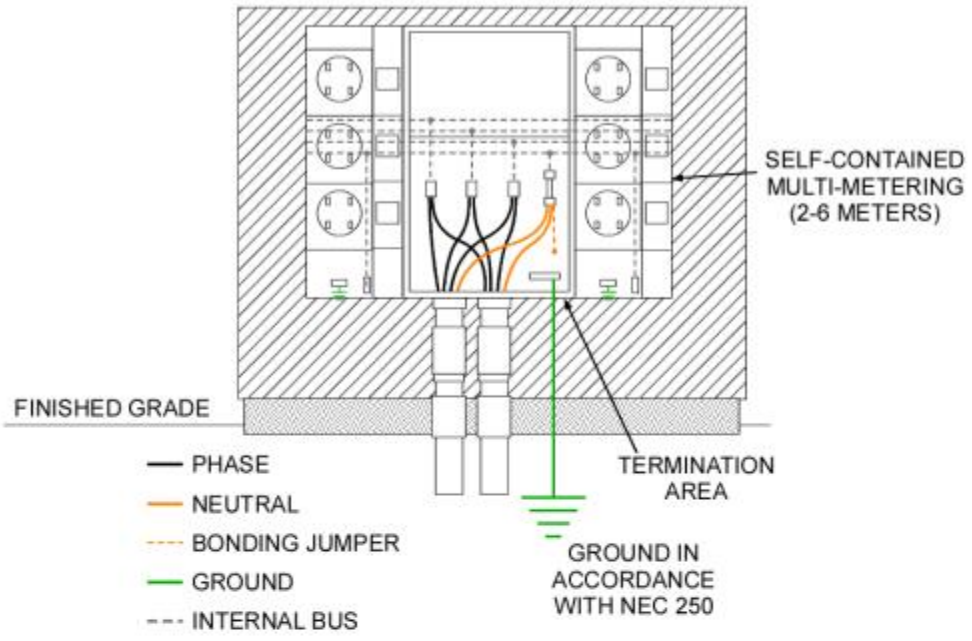


NOTES:

1. Pole top disconnect switch grounding conductor and the grounding electrode shall conform to NEC 250.
2. Member's grounding electrode and grounding electrode conductor shall be completely seperate from Rock Energy's transformer grounding electrode and grounding electrode conductor.

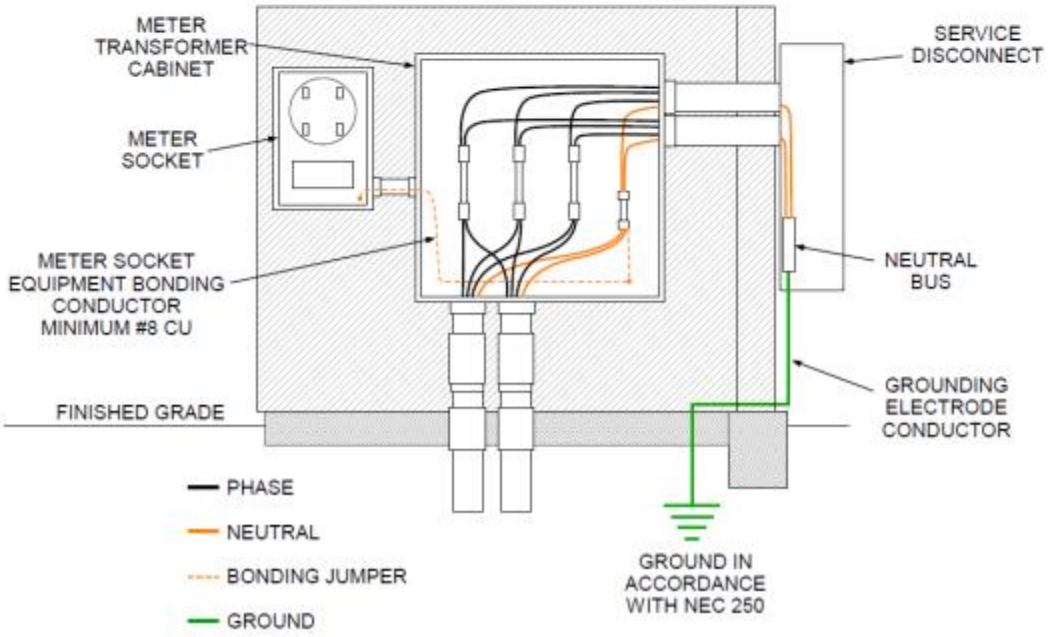
GROUNDING - MULTIMETERING (2-6 METERS)

FIGURE 5



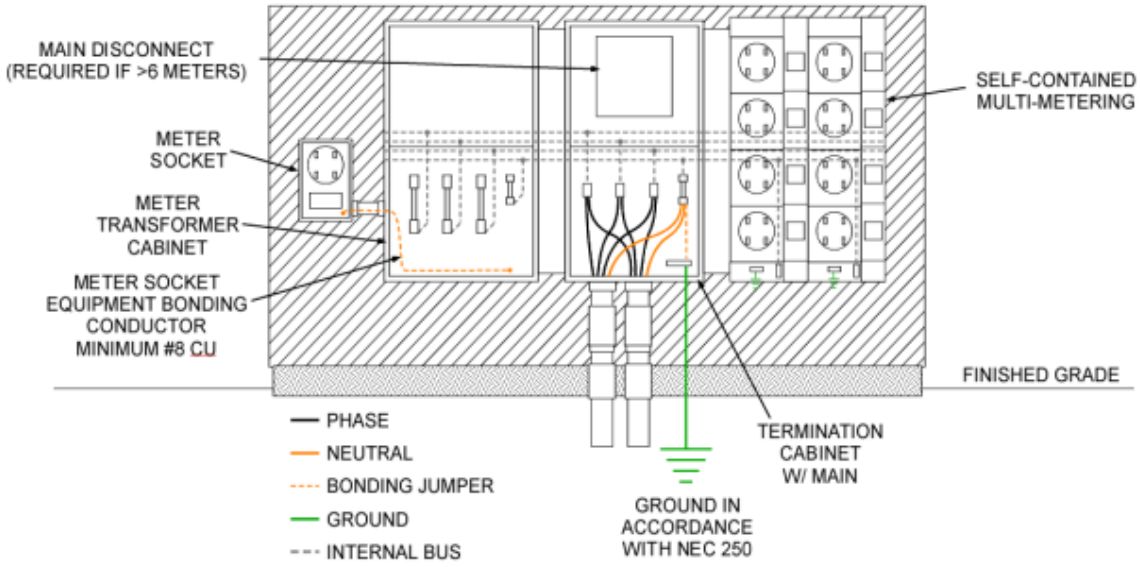
GROUNDING - METERING TRANSFORMER CABINET

FIGURE 6



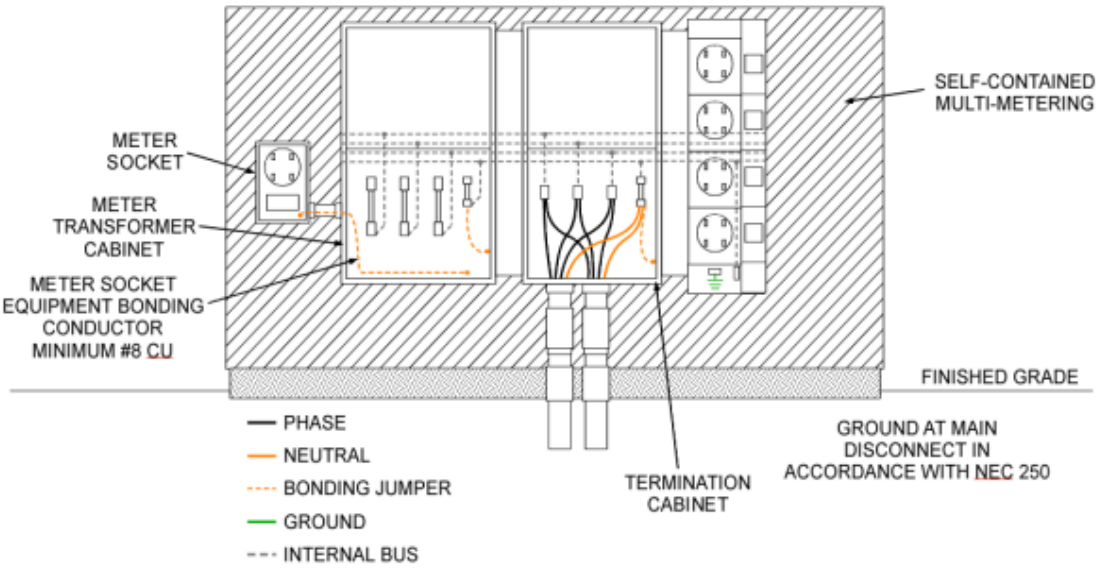
GROUNDING - TERMINATION CABINET W/MAIN, METERING TRANSFORMER CABINET, MULTIMETERING

FIGURE7



GROUNDING - TERMINATION CABINET WITHOUT MAIN, METERING TRANSFORMER CABINET, MULTIMETERING

FIGURE 8



BONDING

BONDING SERVICE ENTRANCE AND METERING EQUIPMENT

A. The electrical contractor is responsible for all bonding connections.
B. The termination cabinet, the metering transformer cabinet, and the meter socket enclosure shall be bonded to:
    1. The system neutral when they are located on the line side of or at the main disconnect.
    2. The equipment grounding conductor, when all of the following apply:
        a) They are installed on the load side of the main disconnect
        b) No service ground-fault protection is installed
        c) They are located immediately adjacent to the main disconnect
C. Bonding shall be provided where necessary to ensure electrical continuity and have the capacity to safely conduct any fault current likely to be imposed on it.
D. Intersystem bonding – CATV, satellite 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. The intersystem bonding shall not be done in or on the metering equipment, refer to Wisconsin PSC 114.099.
E. Meter disconnect switches nominally rated not in excess of 600 volts shall have a short circuit rating equal to or greater than the available short circuit current. These devices shall also be grounded and bonded according to NEC 250.

BONDING CONDUCTOR SIZING

A. Equipment bonding conductors on the supply side of service shall be sized according to NEC. The following tables shall be used as a guide in determining the minimum size for equipment bonding conductors for metering cabinet installations.

B. These tables assume 75˚C temperature ratings for service entrance conductors, with no adjustment factor for more than three 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; in such cases, a larger equipment-bonding conductor shall be used.

Aluminum Bonding Conductor - NEC Reference Table

Metering Cabinet Rating	Service Entrance Conductor Size 75°C	kcmil	75˚C Ampacity (per run)	Number of Runs	Total Ampacity	Service Entrance Conductor Total Area	Bonding Conductor Area	Minimum Equipment Bonding Conductor Size or Equivalent Area for Parallel Conductors	
Amps	**AL**	**kcmil**	**Amps, per run**	**Runs**	**Amps**	**kcmil**	**kcmil**	**AL, AWG/kcmil**	**Cu, AWG/kcmil**
Notes:		**(5)**	**(4) (6)**					**(1)* (2)****	**(3)**
400	250	250	205	2	410	500	63	** 1/0	#2
	350	350	250	2	500	700	88	** 3/0	1/0
600	250	250	205	3	615	750	94	** 3/0	1/0
	350	350	250	3	750	1050	131	** 4/0	2/0
800	250	250	205	4	820	1000	125	** 4/0	2/0
	350	350	250	4	1000	1400	175	** 4/0	2/0
1200	350	350	250	5	1250	1750	219	** 4/0	2/0
	500	500	310	4	1240	2000	250	* 250	3/0
	600	600	340	4	1360	2400	300	* 350	4/0
1600	350	350	250	7	1750	2450	306	* 350	4/0
	500	500	310	6	1860	3000	375	* 400	250
	600	600	340	5	1700	3000	375	* 400	250
2000	350	350	250	8	2000	2800	350	* 350	4/0
	500	500	310	7	2170	3500	438	* 600	350
	600	600	340	6	2040	3600	450	* 600	350
2500	750	750	385	7	2695	5250	656	* 750	500
	1000	1000	445	6	2670	6000	750	* 750	500
3000	750	750	385	8	3080	6000	750	* 750	500
	1000	1000	445	7	3115	7000	875	* 1200	700

NEC Reference Notes:

(1) Size – Supply-Side Bonding Jumper – 12.5%
(2) Up to 1750 kcmil
(3) Equivalent Copper to Aluminum
(4) 75˚C Ampacity
(5) Conductor Properties Table
(6) Neutral Conductor Not Considered a "Current-Carrying" Conductor

Copper Bonding Conductor - NEC Reference Tables

Metering Cabinet Rating	Service Entrance Conductor Size 75°C	kcmil	75°C Ampacity (per run)	Number of Runs	Total Ampacity	Service Entrance Conductor Total Area	Bonding Conductor Area	Minimum Equipment Bonding Conductor Size or Equivalent Area for Parallel Conductors	
Amps	CU	kcmil	Amps, per run	Runs	Amps	kcmil	kcmil	CU, AWG/kcmil	AL, AWG/kcmil
Notes:		(5)	(4) (6)					(1)* (2)**	(3)
400	3/0	168	200	2	400	336		** #2	1/0
	4/0	212	230	2	460	454		** 1/0	3/0
	600	600	420	1	420	600		** 1/0	3/0
600	3/0	168	200	3	600	504		** 1/0	3/0
	4/0	212	230	3	690	636		** 2/0	4/0
	350	350	310	2	620	700		** 2/0	4/0
800	350	350	310	3	930	1050		** 2/0	4/0
	500	500	380	3	1140	1500	188	* 4/0	350
1200	350	350	310	4	1240	1400	175	* 4/0	350
	500	500	380	4	1520	2000	250	* 250	400
	750	750	475	3	1425	2250	281	* 350	600
1600	350	350	310	6	1860	2100	263	* 350	600
	500	500	380	5	1900	2500	313	* 350	600
	600	600	420	4	1680	2400	300	* 350	600
	750	750	475	4	1900	3000	375	* 400	600
2000	350	350	310	7	2170	2450	306	* 350	500
	500	500	380	6	2280	3000	375	* 400	600
	600	600	420	5	2100	3000	375	* 400	600
	750	750	475	5	2375	3750	469	* 500	750
2500	500	500	380	7	2660	3500	438	* 500	750
	600	600	420	6	2520	3600	450	* 500	750
	750	750	475	6	2850	4500	563	* 700	1200
3000	500	500	380	8	3040	4000	500	* 500	750
	600	600	420	8	3360	4800	600	* 700	1200
	750	750	475	7	3325	5250	656	* 700	1200

NEC Reference Notes:

(1) Size – Supply-Side Bonding Jumper – 12.5%

(2) Up to 1750 kcmil

(3) Equivalent Copper to Aluminum

(4) 75°C Ampacity

(5) Conductor Properties Table

(6) Neutral Conductor Not Considered a "Current-Carrying" Conductor