



**Clark Electric Cooperative**

Your Touchstone Energy® Partner



# Electricians & Wiremen's Handbook

Applicable to  
Clark Electric Cooperative  
Distribution System

Greenwood, WI

Revised: April 2013

**Operation Hours**  
**Monday - Friday**  
**8:00 - 4:30**

**715-267-6188 • 800-272-6188**



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# DIGGERS HOTLINE

## Call Before You Dig

One Call Center

Wisconsin  
Diggers Hotline

Open 24 Hours For Emergency Locates

1. Phone number from Wisconsin 1-800-242-8511 or 811
2. Hours of operation 6 AM – 6 PM Monday thru Friday excluding holidays
3. Wisconsin law requires that a minimum of three working days notice be given for any excavation other than emergencies
4. They will accept calls for emergencies, planned excavation, planning information, appointments and overhead information

APPLICABLE TO:  
CLARK ELECTRIC COOPERATIVE'S  
DISTRIBUTION SYSTEM

**1. PURPOSE**

To establish rules and policies governing the installation of electric services, wiring facilities, and utilization of electrical equipment on the premises of consumer members of Clark Electric Cooperative and to insure a practical, safe and adequate operational installation, in consideration of probable future expanded use of electricity.

**2. GENERAL INFORMATION**

- a. Two weeks before the installation of a new electrical service the Cooperative shall be notified in writing by the owner on forms provided by the Cooperative of the anticipated job.
- b. The Cooperative shall be notified 7 days in advance before any changeover or installation is made to allow for work scheduling.
- c. All electrical wiring installations whether new installations, rewired installations or extensions to existing installations shall be in accordance with the applicable provisions of the latest revisions of the State of Wisconsin Electrical Code and N.E.C.
- d. It shall be the responsibility of the electrical contractor or wireman performing the work to become familiar with the policies, practices, rules and regulations of the Cooperative before undertaking or commencing the work of the installation.
- e. It is realized that a handbook of this nature cannot possibly foresee all special situations or circumstances which may arise. Therefore, in the event a situation not covered in this book arises, the electrician or owner should consult with Cooperative management before proceeding with the installation so mutual agreement is reached in advance to insure prompt service by the Cooperative.
- f. All customer wiring installations must comply with Cooperatives Electric Service Rules, in addition, all customer wiring installations shall be done in accordance with all local, state, and federal codes and ordinances which may apply to the installation. The Cooperative will not interpret the electrical code. Questions concerning code interpretations should be referred to the local or state electrical inspector. The address and phone number is:

Wis Dept of Safety & Professional Services (DSPS)  
201 East Washington Avenue  
P.O. Box 7969  
Madison, WI 53707  
Phone: (608) 264-7823  
[www.dsps.wi.gov](http://www.dsps.wi.gov)

### **3. UNDERWRITERS LABORATORY APPROVAL**

All materials, devices and equipment installed or furnished as components of an electrical wiring or electrical utilization system on the premises of a consumer member shall have been approved by the Underwriters Laboratories Inc., and display an Underwriter's "Approved" label or equivalent testing laboratory.

### **4. METER SOCKETS AND PEDESTALS**

All single and multiple meter sockets installed on the Cooperative's system shall meet the Cooperative's standards for these devices listed below. Meters will not be installed unless all criteria for meter socket specifications outlined are met.

#### **Self-Contained 100 AMP Meter Sockets and Meter Pedestals**

- a. Sockets shall be constructed from steel in accordance with Underwriters Laboratories (UL) Standard No. 414 revised March 24, 1999, for meter sockets. Sockets constructed from aluminum or non-metallic materials are not allowed.
- b. 100 amp meter sockets and meter pedestals shall be furnished, installed and maintained by the member.
- c. 100 amp single phase meter sockets and meter pedestals shall be equipped with by-pass horns.
- d. Sockets and pedestals shall have ringless style covers with sealing provisions.
- e. Meter pedestals shall be adequately supported to maintain the vertical alignment of the meter in a level and plumb position throughout the life of the installation.

#### **Self-Contained 200 and 320 AMP Meter Sockets/Pedestals**

- a. All single phase 200 and 320 amp underground meter pedestals shall be purchased by the member from the Cooperative and installed by Cooperative.
- b. Underground meter pedestals shall not be installed closer than 60 feet to any building or structure except for mobile home services which may be installed not closer than 30 feet of the mobile home.
- c. Multi-phase, services larger than 320 amp or farm services may require the service entrance to be something other than a meter pedestal.
- d. Single phase meter sockets and meter pedestals greater than 100 amp shall be equipped with an approved lever-actuated locking jaw by-pass constructed such that the by-pass lever cannot be in the by-pass position with the socket cover installed.
- f. Sockets shall be equipped with an insulating, track resistant poly carbonate shield.
- g. Meter sockets used in overhead installations shall have a hub size of not less than 2".

- h. Meter sockets shall have ringless style covers with sealing provisions.

**Additional Requirements for self-contained Multiple Metering Sockets**

- a. Each meter socket shall have an individual ringless style cover with sealing provisions.
- b. The socket shall have permanent barriers to isolate the customers disconnect switch and wiring from the metering areas.
- c. Each line-side compartment shall have provisions for a Cooperative seal whether or not the compartment is designed to house a meter or not.

**5. INSPECTION OF NEW WIRING INSTALLATIONS**

- a. Any person or persons, firm or corporation, (owner of premises included) making or causing to be made, any electrical service installation on the premises of a consumer member of the Cooperative must present to the Cooperative a signed, notarized wiring Affidavit, setting forth the name of the owner of the premises on which the work was performed and a statement affirming that the materials furnished and the manner of installation is in accordance with requirements of applicable provisions of the latest revisions of the State of Wisconsin Electric Code and National Electric codes, and the policy of Clark Electric Cooperative asset forth herein. An affidavit for a temporary or permanent service must be in the office of the Cooperative prior to the Cooperative making any revisions to existing service facilities or rendering new service. (Affidavit forms may be obtained from the Cooperative). As of December 18, 2003, all new 1 and 2 family dwellings will have to pass a Uniform Dwelling Code inspection conducted by an approved inspector.
- b. The Cooperative reserves the right to refuse electric service to any new or rewired installation failing to pass inspection by Cooperative personnel until such defects or faults as revealed have been properly corrected.

**6. GROUNDING**

- a. **Grounding Conductor** - The grounded conductor shall not be less than the minimum size as required by Section 250.24(b) (1) of the NEC.
- b. All available grounding electrodes on the premises must be bonded together to form the grounding electrode system.
- c. Grounds to metal underground water pipes must be supplemented by two additional grounding electrodes such as ground rods.
- d. Grounding to the neutral system shall be at the service entrance main, not in the meter socket, in accordance with COMM 16.27.
- e. The customer shall install grounding electrode in accordance with provisions of Article 250 of Wis. COMM 16.26 (NEC 250-50) and COMM 16.27 (NEC 250-92).

- f. Clark Electric Cooperative shall install 2 – 5/8” x 8’ ground rods at any new meter pedestal installed by the Cooperative.

## **7. SERVICE AND SERVICE ENTRANCE**

- a. It is the policy of the Cooperative that the normal single phase residential service entrance shall be either a 200 amp metering pedestal with lever by-pass or a 320 amp metering pedestal with lever by-pass installed at a location determined by Cooperative personnel. The Cooperative will make available and provide for the installation of an approved metering pedestal.
- b. Multi-phase services, services greater than 320 amp or farm services may require special metering that will be determined by Cooperative personnel.
- c. In most cases the meter pedestal will be located not closer than 60 feet to the nearest structure. For services to mobile homes, the meter pedestal will be located not closer than 30 feet to the nearest structure.
- d. A member may choose an overhead service in which case the meter socket may be attached to a structure. The member must provide and install an approved meter socket with lever by-pass when the service is greater than 100 amps.
- e. Attachment of service wires to buildings must be made on structural supports and in such a manner that the attachment with support the load imposed by the service wires plus a reasonable safety factor.
- f. Where, in the opinion of the Cooperative, increased consumer member loading necessitates changes to the electrical facilities of the consumer, the Cooperative reserves the right to disconnect service until such changes are made. It is required that each new underground or overhead sub-service or feeder has a means of disconnect at the source end.
- g. All service meters, meter sockets and meter loops shall be rated for outdoor installations.
- h. Under no circumstance shall anyone other than Cooperative personnel break the meter seal or remove the Cooperative meter from the meter socket or the premises of which it was set.
- i. Each service entrance shall have approved service entrance equipment providing over current protection to the circuits of the interior wiring system installed and connected in accordance with the latest applicable provisions of the Wisconsin State Electrical Code and NEC.
- j. Meters are not to be installed on yard poles without the specific permission from the Cooperative.
- k. The grounded secondary neutral shall be continuous from the Cooperative’s distribution transformer to all points of the exterior and interior wiring installation and no switch,



circuit breaker or fuse shall be installed so as to break the continuity of the grounded neutral conductor.

***Exceptions:***

1. Cooperative owned neutral isolator
2. Member owned isolation transformer

**8. WIRING FOR ELECTRICAL MOTORS, NEC ARTICLE 430**

- a. Single phase motors should be limited to a maximum of 5 horse power to prevent excessive voltage dips on member's service, but up to 10 horsepower may be connected if the member is willing to accept excessive voltage dips on the secondary service.
- b. Single phase motors shall be limited to a maximum of 10 horsepower each without advanced approval of the Cooperative.
- c. The allowance of across the line starting or the requirement of reduced voltage starting of motors larger than 10 horsepower shall be determined by the Cooperative on an individual basis. All motor control switches shall be installed in strict accordance with the applicable provisions of the Wisconsin State Electrical Code and NEC.

**9. WIRING FOR THREE PHASE LOADS**

- a. Before connecting the wiring installation to serve any load involving electric motors or other loads requiring three phase service, the electrical contractor or owner must consult with the Cooperative management and furnish a list of the motors or other loads setting forth in detail the number of such motors or items of load, the horsepower of applicable rating of each item of load, the nature of operation and estimated hours of use per month for a calendar year. No such installation shall be made to receive service from the lines of the Cooperative without the advance approval of the Cooperative.

**b. ELECTRICAL EQUIPMENT**

All motors, appliances, or equipment connected to the Cooperative's system must be so designed, installed, and operated as not to cause undue disturbance to other customers nor to handicap the Cooperative in maintaining proper system conditions. It shall be the responsibility of the customer to provide equipment protection for conditions such as under voltage, over current, short circuit, loss of a phase, and phase reversal. Non-linear loads must conform to IEEE 519-1992.

**c. EQUIPMENT PROTECTION**

All equipment connected to the Cooperative's lines which may be damaged by loss of voltage on one phase shall be protected to insure that such equipment will be disconnected from the line in case of abnormal voltage conditions. Three phase motors shall be protected against single-phasing. This shall not necessarily prevent the automatic reconnection of the motor to the power supply on the return of normal voltage.

**d. FLUORESCENT AND GASEOUS TUBE LIGHTING**

High power-factor ballasts or transformers are required for fluorescent, mercury, metal arc., sodium, and neon tubing types of lighting by the Wisconsin Administrative Code, Section PSC 113.08.

## **10. GENERAL SPECIFICATIONS RELATING TO EXTERIOR AND INTERIOR WIRING INSTALLATIONS**

- a. Cartridge fuses of the replaceable link type shall not be used for any purpose.
- b. All grounding conductors in whatever location shall be suitably protected against mechanical damage.
- c. The minimum wire size required for an overhead exterior wire to any out buildings shall be No. 10 copper MHD-SP where the clear span does not exceed 50 feet; for spans longer than 50 feet, the minimum wire size shall be No. 8 copper MHD-WP. Where other than copper conductors are to be used the substitute conductor must have mechanical and electrical characteristics equal to the copper conductors specified above. The maximum clear span between supports for overhead wires should not exceed 150 feet.
- d. All connections involving overhead conductors shall be made with approved solderless connectors and covered.
- e. Overhead conductors of the exterior wiring system shall not be attached to or supported by poles of the Cooperative's distribution system unless specific permission has been granted.
- f. Interior wiring in hayloft, granaries and locations where highly combustible dust, gases or materials may be present, shall have the wiring installed in metallic conduit and all light bulbs in such locations shall have a dust tight enclosure.
- g. Interior wiring installations in damp or corrosive locations shall be made by using approved non-metallic sheathed cable. All fixtures, outlet fittings, sockets, etc., shall be non-conducting, moisture resistant materials installed in accordance with the applicable provisions of the National Electric Code or State of Wisconsin Electric Code.
- h. Over current protection may be circuit breakers or fuses. If fuses are used they shall be type S.

## **11. OVERHEAD SERVICES ON A BUILDING**

- a. Meter sockets will be furnished by the contractor, 100 amp rating for 100 amp service, 200 amp heavy duty rating for 2 – 100 amp services, 200 amp heavy duty for electric heat or house and barn.
- b. Rigid metallic conduit, rigid P.V.C. or E.M.T. must be used for service raceway.
- c. Galvanized locknuts on the outside and insulated bonding bushings on the inside are required in all sockets, switches and service switches, for all metallic service raceways to assure their electrical continuity.
- d. Conduit straps must be used within 1' of every socket switch, or fitting and 5' length of conduit.

- e. Conductor size shall conform to NEC 310 – 16 to 21 conduits shall conform to NEC Chapter 9. All materials used shall be approved or UL listed.
- f. Neutral conductors must be white, or clearly marked.
- g. Ground wire must run continuous from service switch to two 5/8" x 8' copperweld or galvanized ground rods, the first one 12" or more from the house wall or foundation. The top of the rod and conductors must be a minimum depth of 6" from the surface. Ground conductor must also be run to metallic piping systems, lightning rod, and other grounds within 6' of electrical grounds.
- h. Weatherhead must extend above the service lateral. Service wires shall extend 30" from the weatherhead. If a service mast is used to obtain a 10' minimum clearance of the service lateral to ground, a minimum 2" rigid metallic conduit must be used. The mast must be securely fastened to the building. It must extend above the roof so that service wires may be installed 18" or more above the roof surface and if the mast wire holder is more than 4' above the roof surface the mast must be securely guyed back to the roof.
- i. In case of more than one building on one meter loop or the meter location is not on the building or structure being served, a disconnect must be provided to disconnect all consumer's energized conductors at the meter location. If a double pole, double throw switch is used for this purpose, it must control all meter load conductors NEC 230.70.

## **12. 320 AMP OR LARGER URD CENTRAL POINT METERING SERVICES**

All material must be approved and be installed according to the Cooperative and code requirements. Conductors extending above ground must be run in approved raceway and extend to the top of switch or pedestal.

- a. 320 amp socket may be used for house and barn or any building with electric heat. Pedestals for metering, meeting the above specs, may be used on buildings with advanced approval from the Cooperative.
- b. The service riser will be a minimum of two 1/2" rigid metallic or nonmetallic conduit, run 15" to 18" below the finished grade. The grade will be finished to drain all surface water away from this point.
- c. The bottom of the riser must have a bushing or fitting to prevent abrasion.
- d. Service or subservice conductors running under concrete will be enclosed in minimum two 1/2" conduit that extends to the outer edge of the concrete. A sweep elbow will be used to make the bend. A felt bushing must be used where conduit goes through concrete.
- e. Pedestal may be manufactured self-contained unit for both meter and switches in one enclosure, installed according to the manufacturer specifications. It must be of the ringless type with the meter glass extending through the pedestal front.

- f. Self supporting structures for a conventional meter socket and switches may be used. This must be made up of galvanized metal and/or treated wood.
- g. If the service entrance meets the Cooperative specs for transformer metering, the metering cabinet will be furnished by the Cooperative. The contractor will furnish and install the supporting structure. Switches and associated wiring will be installed a minimum of 1 foot from the Cooperative pedestal.
- h. All pedestals and structures must be installed so that ground surface at pedestals and equipment is a minimum of 6" above surface at pedestals and equipment is a minimum of 6" above surrounding grade and 10' separation from a Cooperative pole or equipment.

### **13. POLE TOP METERING AND SWITCH ON NEW CONSTRUCTION**

- a. Complete metering to be furnished and installed by the Cooperative.
- b. Line side of pole top switch will be connected by the Cooperative on new construction only.
- c. Conductors and connection box for the stand-by generator shall be sized for maximum output of the generator. They may be run to a different location other than the pole if triplex and conduit is used.
- d. Pole top switch must be listed by UL and control all conductors to services on the premises. It shall be sized to carry maximum line and standby load.
- e. All load conductors shall be approved factory assembled cables.

### **14. INSTALLATION OF DOUBLE THROW ON EXISTING INSTALLATIONS**

#### **a. Standby Generating Equipment**

- 1) The customer shall install an approved double throw switch or throwover switches that are mechanically interlocked, are of adequate current and voltage rating and are so connected that the customer's generating equipment cannot energize the Cooperative's supply lines.
- 2) The double throw or throwover switch may be manually or automatically operated.
- b. A wiring affidavit must be filed with the Cooperative stating the size of switch, the number and size of services fed by the switch, overhead or underground.
- c. All material, connectors and labor to be furnished by the contractor.
- d. The Cooperative will disconnect power and will reconnect when line side of switch is connected.

## 15. MISCELLANEOUS

a. On a 4 wire delta secondary, the phase conductor having the higher voltage to ground on a 3 phase installation shall be identified by an outer finish that is orange in color. NEC 215.8.

b. Wisconsin State Electrical Code requires metallic well casings to be included as part of grounding electrode system NEC 250 – 43L.

**c. Article 348-Electrical Metallic Tubing**

DILHR 16.33 Use [NED 348-1] This is a department rule in addition to the requirements of NEC 348-1: Electrical metallic tubing shall not be used in direct contact with earth, in concrete slabs or floors poured on earth, or in exterior concrete walls below grade.

**d. Size and Rating**

General - Service entrance conductors shall be of sufficient size to carry the loads as computed in Article 220. Ampacity shall be determined from Section 310-15.

Ungrounded Conductors - Ungrounded conductors shall have an ampacity of not less than:

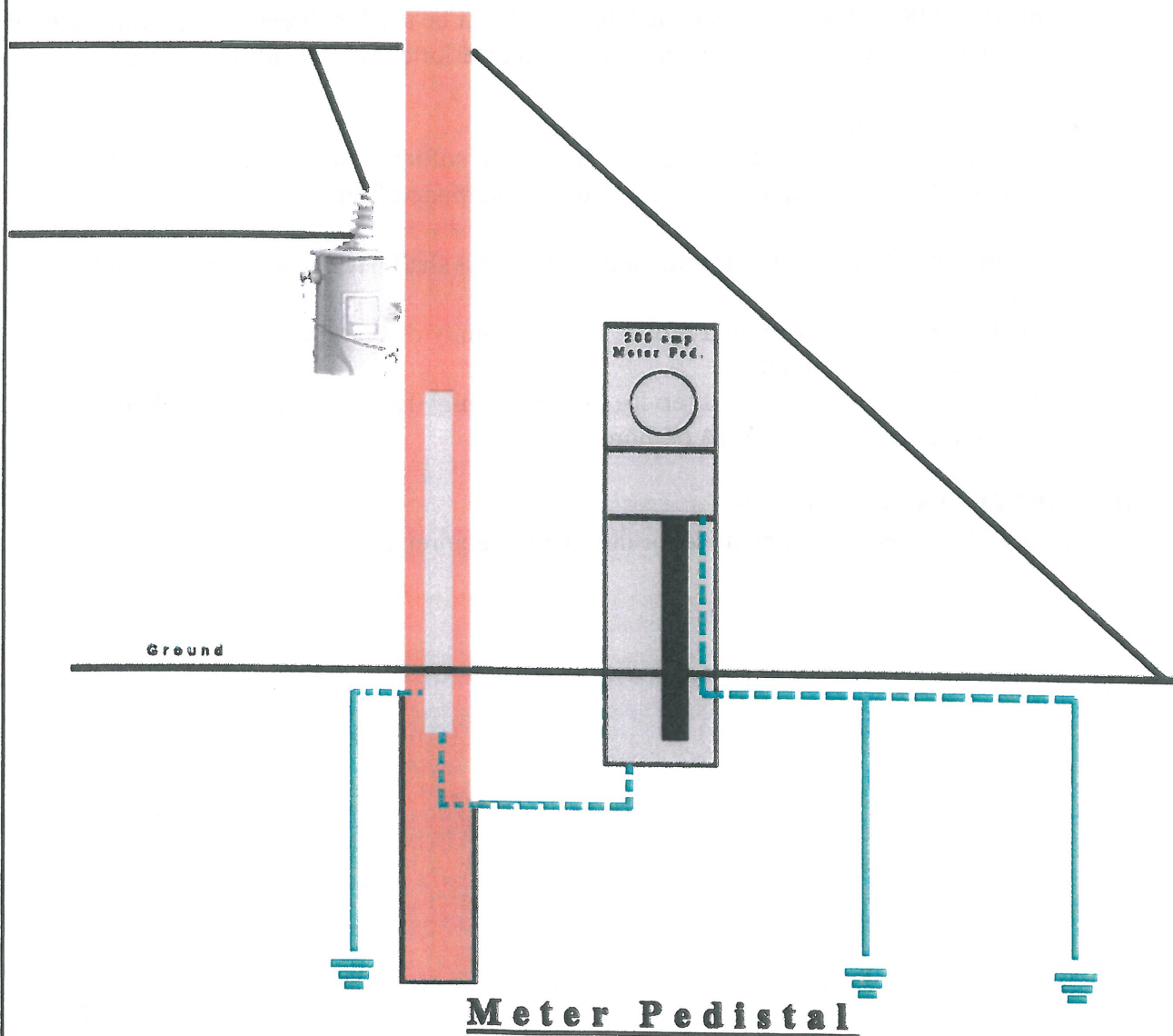
- 1) 100 amperes, 3-wire for a service to a one-family dwelling with six more 2-wire branch circuits.
- 2) 100 amperes, 3-wire for a service to a one-family dwelling with an initial net computed load of 10 KVA or more.

## 16. DUAL FUEL INSTALLATIONS

Contact Clark Electric Cooperative for installation requirements and rates.

## 200 amp Meter Pedestal Overhead Source

- Cooperative installs pole, riser shield and wire to member's Meter Pedestal
- Cooperative installs members's Meter Pedestal and grounds
- Member's Electrician wires from Meter Pedestal



Supplied With  
200 amp main wired in series  
Factory installed receptacle bridge,  
GFI receptical and 20 amp breaker kit

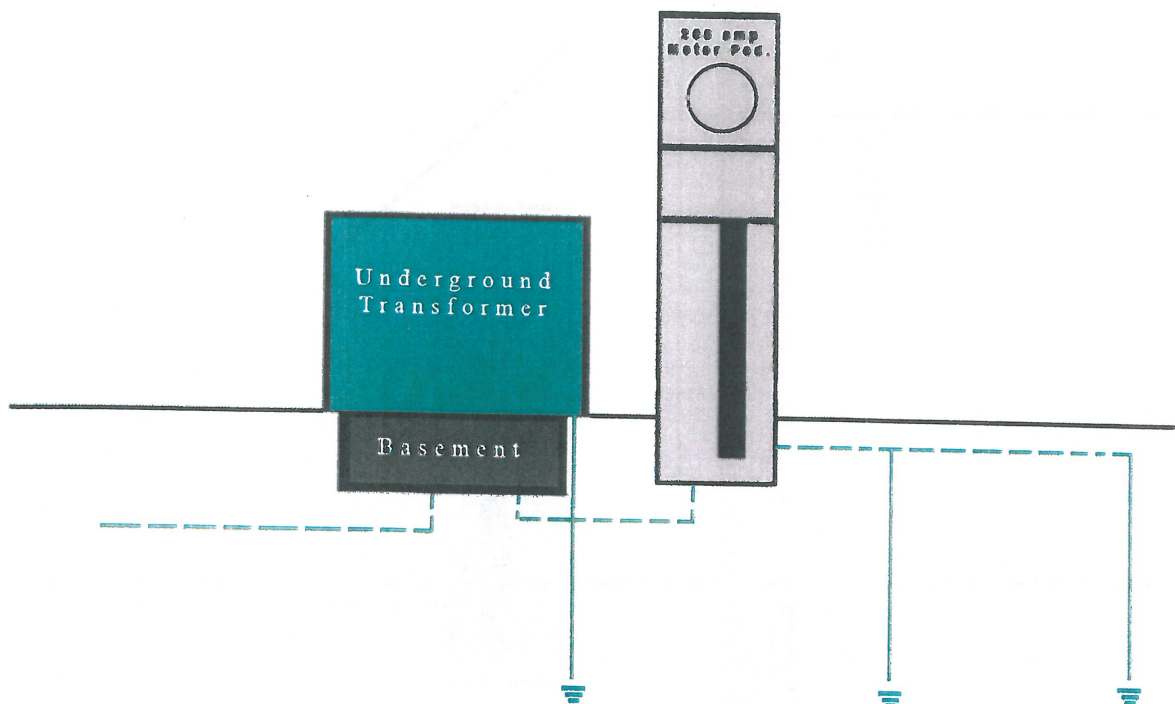
# 200 amp Meter Pedestal

## Underground Source

Cooperative installs pole, riser shield and wire to member's Meter Pedestal

Cooperative installs members's Meter Pedestal and grounds

Member's Electrician wires from Meter Pedestal

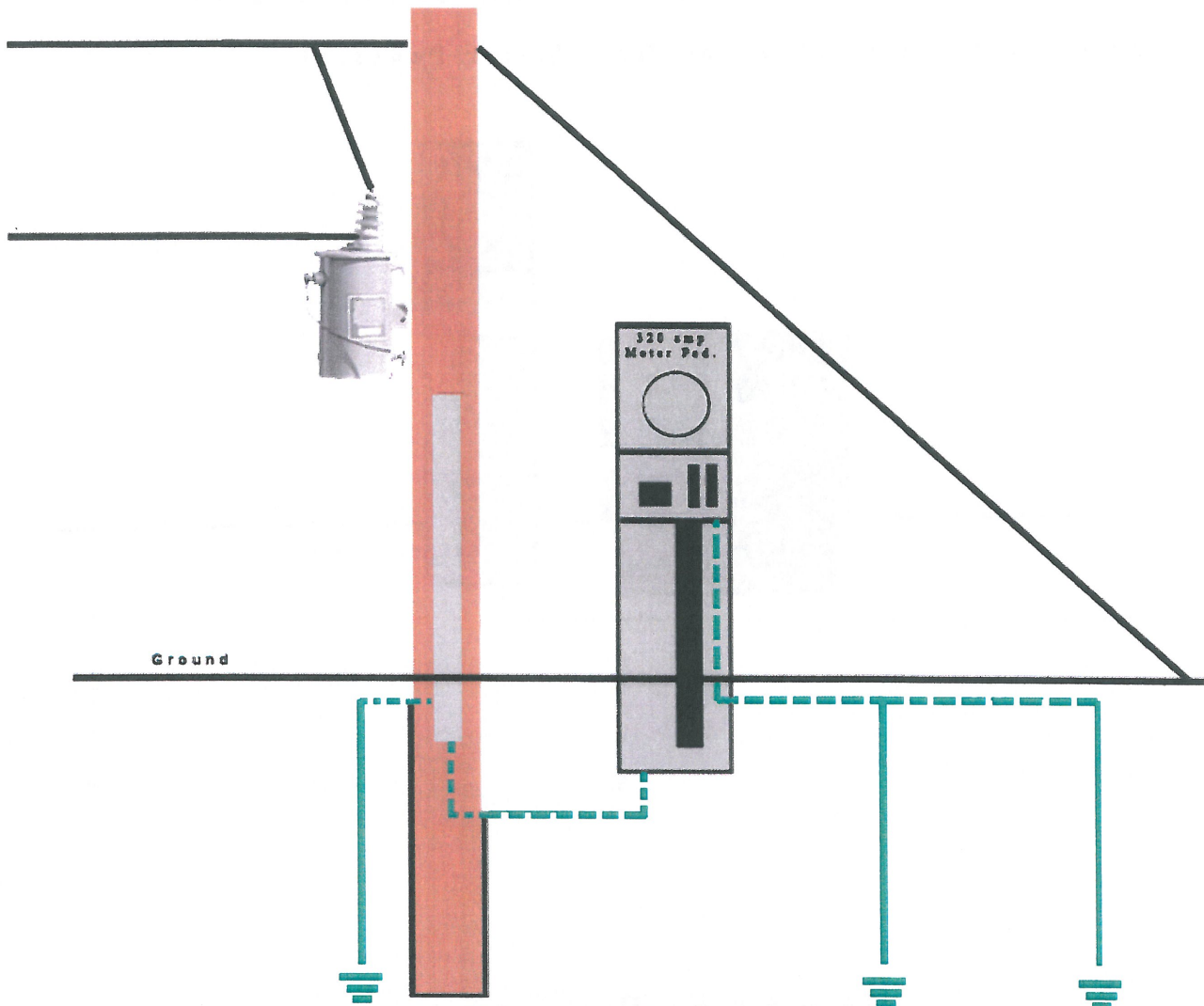


## Meter Pedestal

200 amp main wired in series  
Factory installed receptacle bridge,  
GFI receptical and 20 amp breaker kit

# 320 amp Meter Pedestal Overhead Source

- Cooperative installs pole, riser shield and wire to member's Meter Pedestal
- Cooperative installs members's Meter Pedestal and grounds
- Member's Electrician wires from Meter Pedestal



## Meter Pedestal

Durham Company  
(DUR-TBA 07834)

Supplied with  
2 - 200 amp Breakers

Provisions for  
1 - 2/pole plug in breaker  
20 amp GFI Power Outlet Available



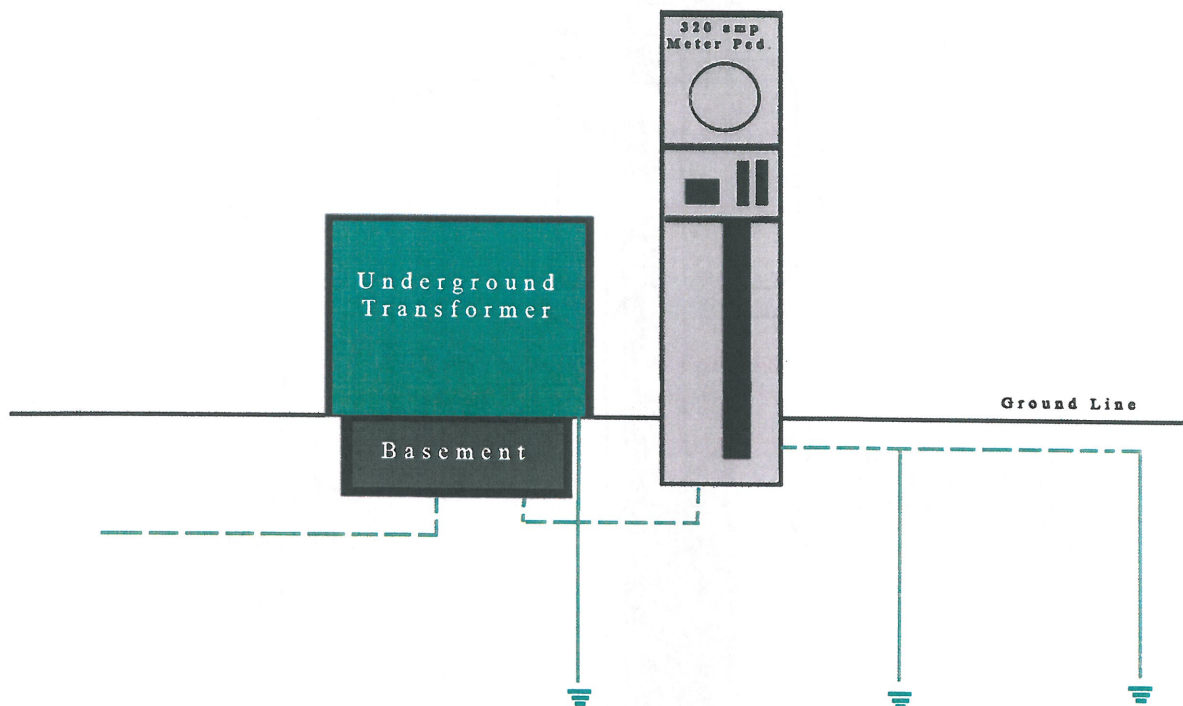
# 320 amp Meter Pedestal

## Underground Source

Cooperative installs pole, riser shield and wire to member's Meter Pedestal

Cooperative installs members's Meter Pedestal and grounds

Member's Electrician wires from Meter Pedestal



## Meter Pedestal

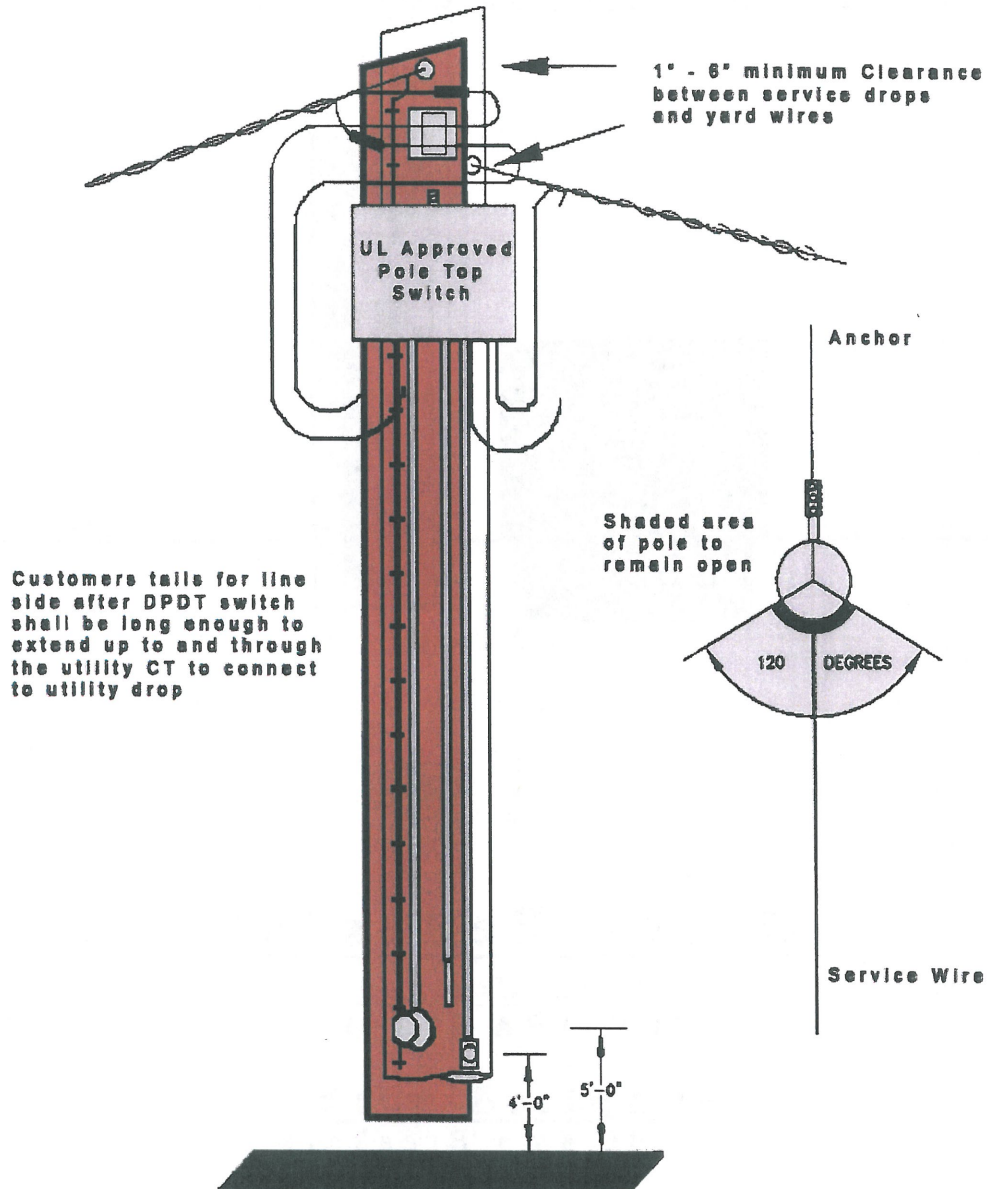
Durham Company  
(DUR-TBA 07834)

Supplied with  
2 - 200 amp Breakers

Provisions for  
1- 2/pole plug in breaker  
20 amp GFI Power Outlet Available

# C.T. Meter Pole With Double Throw Switch

## Pole Top Switch



# OVERHEAD SECONDARY SERVICE

SERVICE TO MOBILE HOME,  
TRAVEL TRAILER, OR  
WATER PUMP

CONDUIT, RIGID, EMT, OR PVC  
MINIMUM CONDUCTOR SIZE  
MOBILE HOME #3 CU

CONDUIT STRAPS, 5' APART, 1' FROM FITTINGS

METER SOCKET, 100 AMP, LOCATED  
APPROX. 5' ABOVE GROUND LEVEL

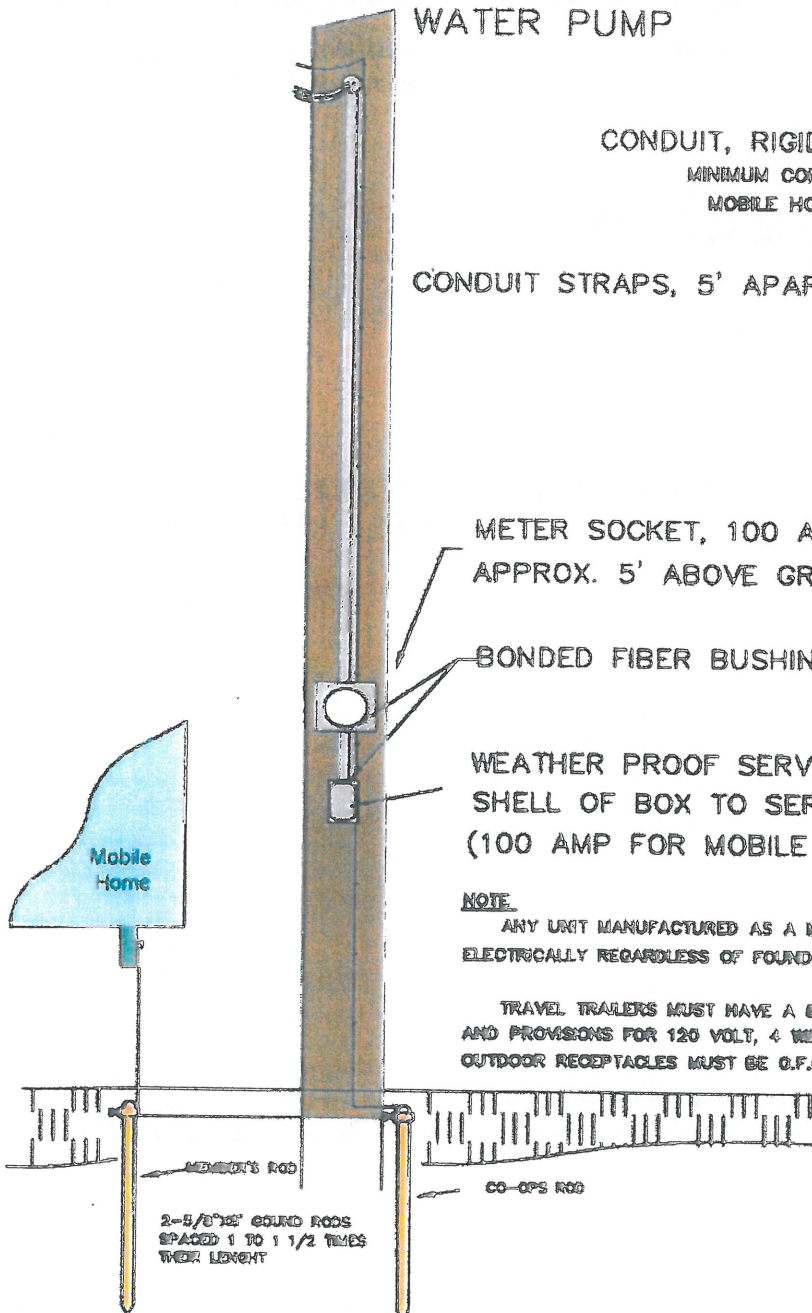
BONDED FIBER BUSHING OR EQUAL

WEATHER PROOF SERVICE SWITCH, GROUND  
SHELL OF BOX TO SERVICE NEUTRAL.  
(100 AMP FOR MOBILE HOME)

NOTE

ANY UNIT MANUFACTURED AS A MOBILE HOME IS CONSIDERED AS SUCH  
ELECTRICALLY REGARDLESS OF FOUNDATION OR USE.

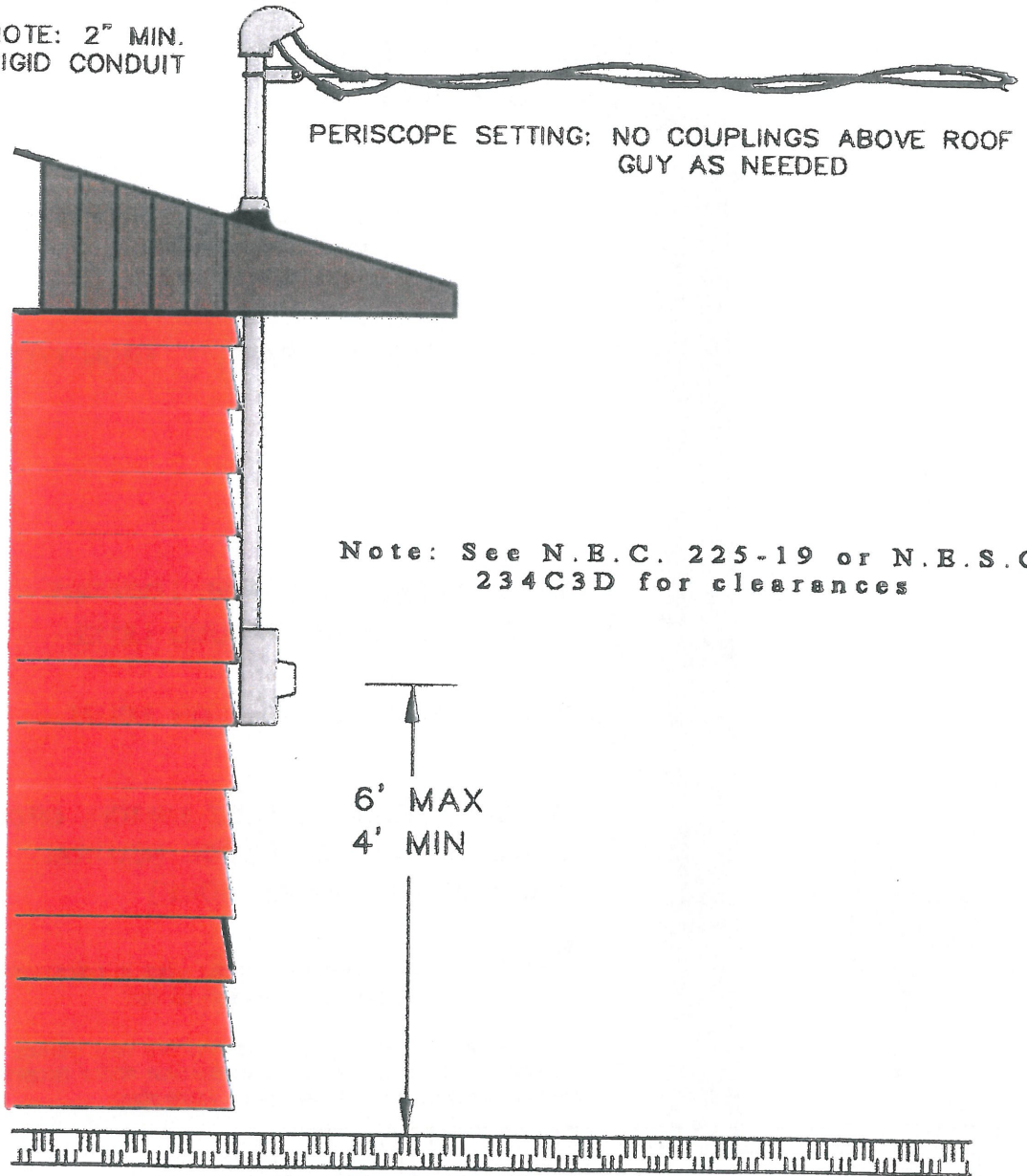
TRAVEL TRAILERS MUST HAVE A 60 AMP-240 VOLT SERVICE  
AND PROVISIONS FOR 120 VOLT, 4 WIRE WEATHER PROOF RECEPTACLES.  
OUTDOOR RECEPTACLES MUST BE G.F.C.I. PROTECTED.



# OVERHEAD SECONDARY SERVICE

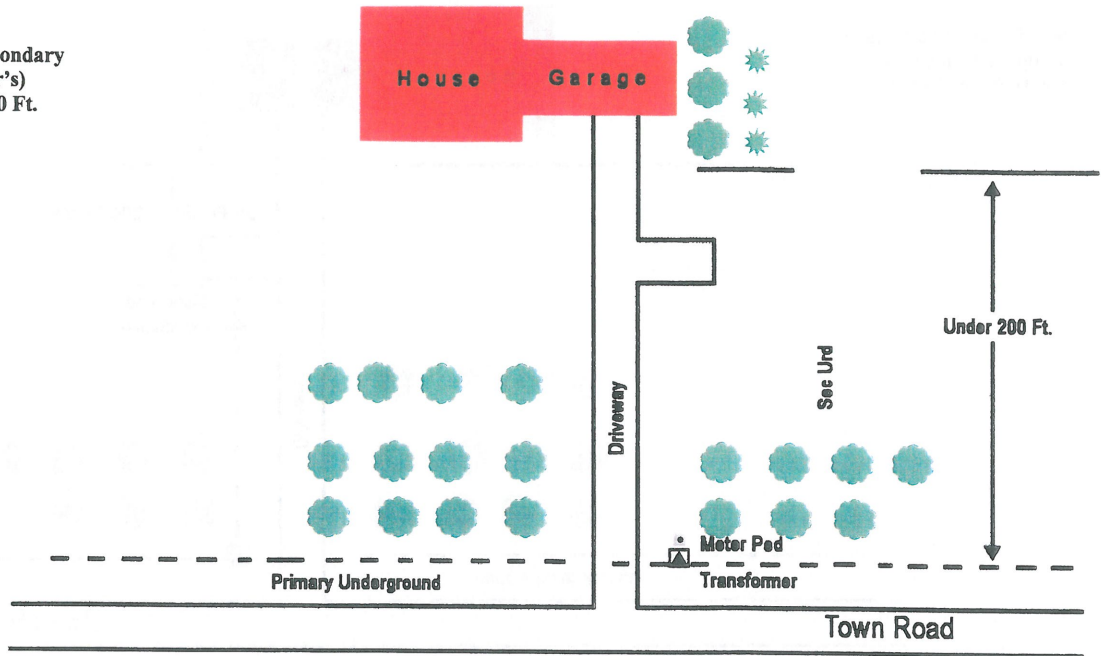
## OVERHEAD SERVICE MAST INSTALLATION

NOTE: 2" MIN.  
RIGID CONDUIT



Examples of building sites under 200 ft. from Clark Electric Cooperative facilities, meter point next to transformer by main line.

NOTE: Total Secondary (Coop. & Member's) Not To Exceed 300 Ft.

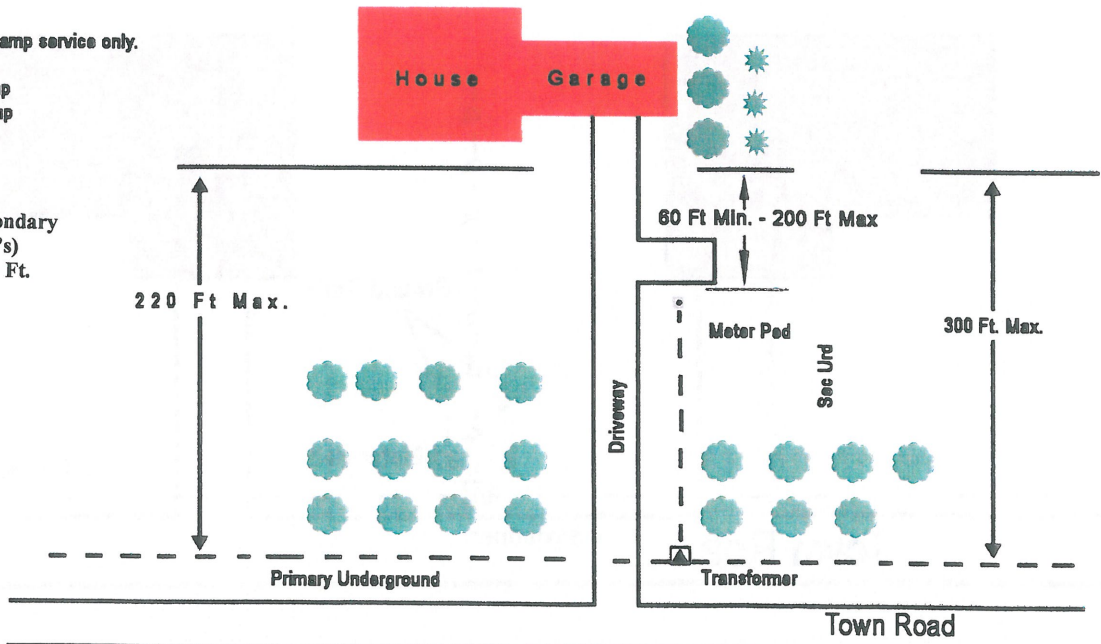


Example of building sites over 200 ft. and less than 300 ft. from Clark Electric Cooperative facilities.

For 200 amp or 320 amp service only.

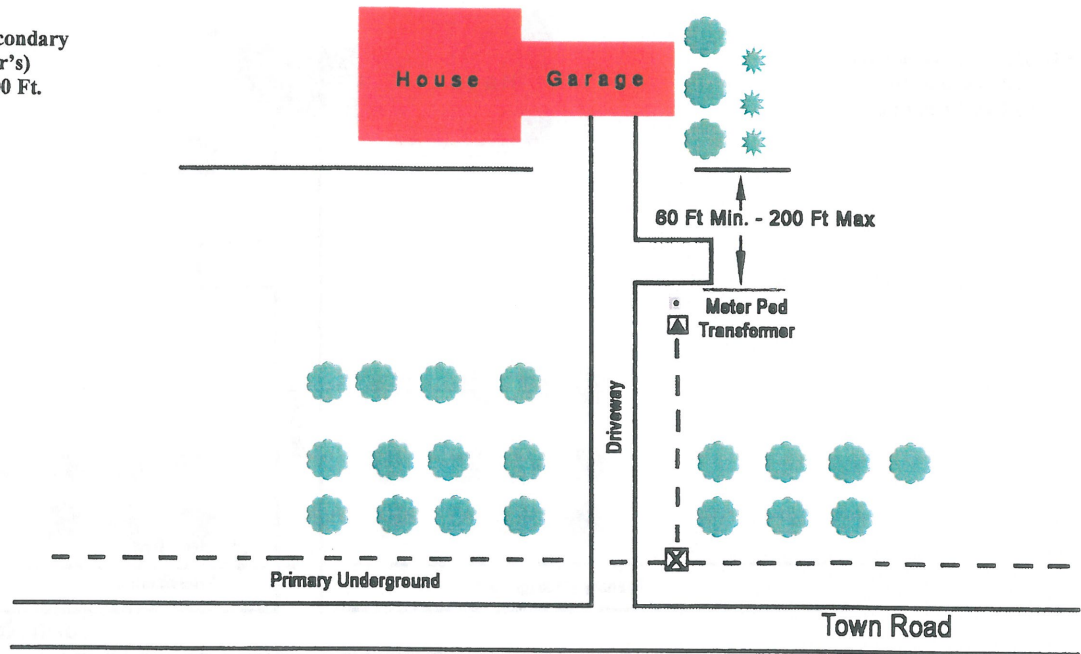
Notes: 4/0 for 200 amp  
350 MCM for 320 amp

NOTE: Total Secondary (Coop. & Member's) Not To Exceed 300 Ft.



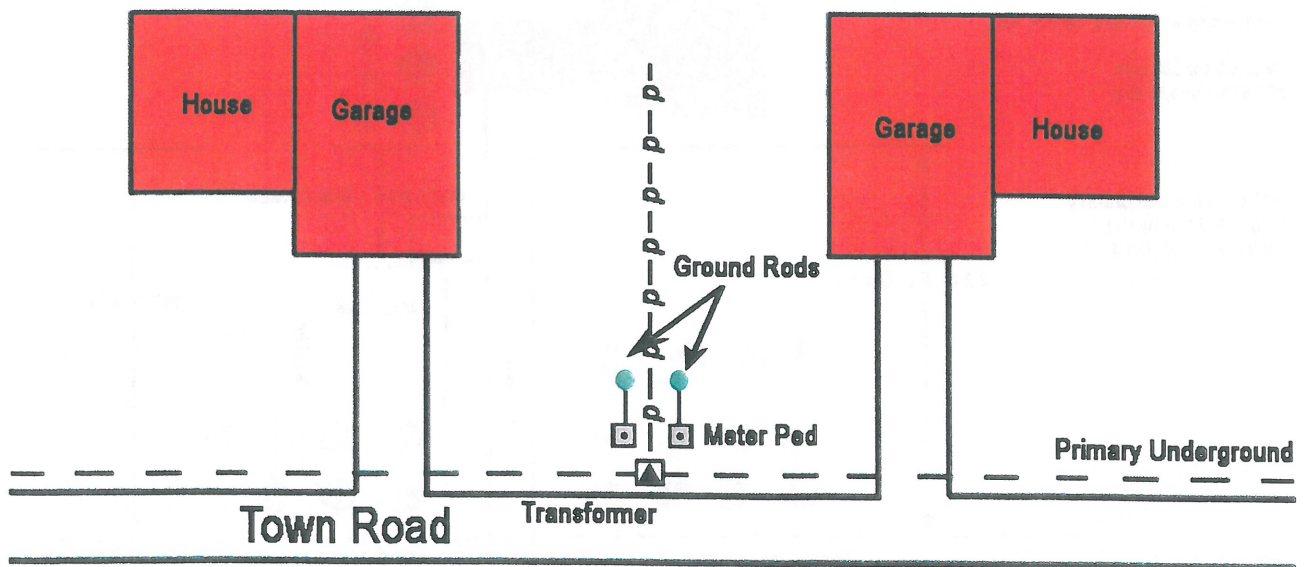
Example of building sites over 200 ft. and less than 300 ft. from Clark Electric Cooperative facilities.

NOTE: Total Secondary (Coop. & Member's) Not To Exceed 300 Ft.



### Example of A Sub - Division

Note: Total secondary not to exceed 300ft.



## Available Fault Current Table For Single-Phase, 120/240 Volt Services

1 - Phase Transformer Size	Available Fault Current (Symmetrical Amperes @ 10-240V)
15 kVa	4,167 A
25 kVa	6,944 A
37.5 kVa	10,417 A
50 kVa	13,889 A
75 kVa	20,833 A

### Notes:

1. Assumed transformer impedance = 1.5% for 1-phase transformer applications.
2. Available fault currents listed above assume an infinite 7,200 volt source impedance.
3. Do not use this table for three-phase services or for 1-phase panels fed from a 3-phase service.
4. Contact Clark Electric Cooperative for available fault currents on three-phase services.
5. Service entrance equipment shall be rated to interrupt the available fault currents listed above.
6. Calculated available fault currents above are at the secondary transformer terminals.

## POWER FORMULAS

KW	Volts, AMPS, Power Factor	$\frac{V \times A \times 1.73 \times PF}{1000} = KVA \times PF$
KVA	Volts, AMPS	$\frac{V \times A \times 1.73}{1000} = \frac{KW.}{PF}$
RKVA	Volts, AMPS, Power Factor	$\frac{V \times A \times 1.73 \times \sqrt{1 - (PF)^2}}{1000}$
HP - Engine Output	Generator KW, Generator Eff., Radiator Fan Horsepower, Battery Charging Generator Hp	$\frac{KW}{Efficiency} \times 0.746 + \frac{Rad BC}{Fan Hp} + \frac{Gen}{HP}$
KW - Required Motor	Motor Hp., Eff.	$\frac{Hp \times 0.746}{Efficiency}$
KVA - Required Motor	Motor Hp., Eff., Power Factor	$\frac{Hp \times 0.746}{Efficiency \times PF}$
AMPS	Hp., Volts	$\frac{Hp \times 746}{1.73 \times V \times Efficiency \times PF}$
AMPS	KW, Volts, Power Factor	$\frac{KW \times 1000}{V \times 1.73 \times PF}$
AMPS	KVA, Volts	$\frac{KW \times 1000}{V \times 1.73}$
Frequency	Rpm, Poles	$\frac{Rpm \times Poles}{2 \times 60}$
Poles	Frequency, Rpm	$\frac{2 \times 60 \times Frequency}{Rpm}$
Rpm	Frequency, Poles	$\frac{2 \times 60 \times Frequency}{Poles}$



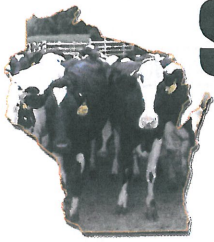
## AMPERE RATINGS - SINGLE PHASE

KVA	KW	115V	120V	230V	240V
12.5	12.5	109	104	54	52
18.75	18.75	163	156	82	78
25	25	217	208	109	104
31.25	31.25	272	260	136	130
37.5	37.5	326	313	163	156
50	50	435	417	217	208
62.5	62.5	543	521	272	260
75	75	650	625	326	313
93.8	93.8	816	782	408	391
125	125	1087	1042	543	521
156	156	1359	1302	679	651
187.5	187.5	1630	1563	815	781
219	219	1902	1823	951	911
250	250	2174	2083	1087	1042
281.9	281.9	2446	2344	1223	1172
312	312	2706	2604	1359	1302
375	375	3261	3125	1630	1563
438	438	3804	3646	1902	1823
500	500	4348	4167	2174	2083

**FULL LOAD MOTOR - RUNNING CURRENTS - NORMAL CONDITIONS**

H.P.	SINGLE PHASE						TWO PHASE						THREE PHASE													
	110V		200V		208V		220V		440V		550V		110V		200V		208V		220V		440V		550V			
	120V						240V		480V	600V		120V	110V	240V	200V	240V	208V	240V	480V	600V		480V	600V			
1/6	4.4	2.5	2.5	2.2																					1/6	
1/4	5.8	3.3	3.2	2.9																						1/4
1/3	7.2	4.1	4.0	3.6																						1/3
1/2	9.8	5.6	5.4	4.9																						1/2
3/4	13.8	7.9	7.6	6.9																						3/4
1	16.0	9.2	8.8	8.0																						1
1 1/2	20.2	11.5	11.0	10.0																						1 1/2
2	24.0	13.8	13.2	12.0																						2
3	34.0	19.6	18.7	17.0																						3
5	56.0	32.2	30.8	28.0																						5
7 1/2	80.0	46.0	44.0	40.0																						7 1/2
10	100.0	57.5	56.0	50.0																						10
15																										15
20																										20
25																										25
30																										30
40																										40
50																										50
60																										60
75																										75
100																										100
125																										125
150																										150
200																										200

AMPERE RATINGS - THREE PHASE								
KW	KVA	208V	240V	460V	480V	600V	240V	4160V
8	10	28	24	12	12	10	-	-
16	20	56	48	25	24	24	-	-
20	25	69	60	31	30	24	-	-
25	31.3	87	75	39	38	30	-	-
28	35	97	84	44	42	32	-	-
30	37.5	104	90	47	45	36	-	-
35	43.8	121	105	55	53	42	-	-
40	50	139	120	63	60	48	-	-
45	56.3	156	135	71	68	54	-	-
50	62.5	174	150	78	75	61	-	-
60	75	208	180	94	90	72	-	-
68	85	236	205	107	102	82	-	-
75	93.8	260	226	118	113	90	-	-
80	100	278	241	126	120	96	-	-
100	125	347	301	157	150	120	-	-
120	150	417	361	188	181	145	-	-
125	156	433	376	196	188	150	-	-
140	175	486	421	220	211	169	-	-
150	187	519	450	235	225	180	-	-
175	219	608	527	275	263	211	-	-
180	225	625	542	283	271	217	-	-
192	240	667	578	302	289	231	-	-
200	250	694	601	314	301	241	-	-
225	281.3	781	677	353	339	272	-	-
250	312	866	751	392	375	300	90	52
300	375	1040	902	471	451	361	96	56
320	400	1112	963	503	482	385	105	61
350	438	1216	1054	550	527	422	120	69
400	500	1388	1203	628	601	481	136	78
450	562.5	1562	1355	707	677	545	145	83
480	600	1667	1445	754	723	578	150	88
500	625	1735	1504	785	752	601	165	95
550	688	1908	1654	863	827	662	180	104
600	750	2082	1804	941	902	722	195	113
650	812	2233	1955	1020	977	782	211	121
700	875	2429	2105	1098	1053	842	226	130
750	938	2602	2255	1177	1128	902	241	139
800	1000	2775	2406	1255	1203	962	256	147
850	1063	2949	2556	1334	1278	1022	271	156
900	1125	3123	2706	1412	1353	1083	286	165
950	1188	3296	2857	1490	1428	1143	301	174
1000	1250	3470	3007	1569	1504	1203	316	182
1050	1312	3643	3157	1647	1579	1263	331	191
1100	1375	3817	3308	1726	1654	1323	346	200
1150	1438	3990	3458	1804	1729	1383	361	208
1200	1500	4163	3609	1883	1804	1443	376	173
1250	1563	4337	3759	1961	1879	1504		



# Safety First! Program

## DAIRY FARM REWIRING LOAN & GRANT PROGRAM

Wisconsin electric cooperatives have developed a uniform statewide farm wiring program entitled, "Safety First!" The purpose is to assist dairy farmers with the cost of rewiring projects and to promote safety.

### Loans and Grants

- A loan/grant combination is available up to \$25,000.
- Grants are available for 20 percent up to \$5,000 from the Wisconsin Electric Cooperative Association.
- Loans are available for 80 percent up to \$20,000 from your electric cooperative.
- Take up to 5 years to repay.
- 3 percent interest applies.

### Requirements

- Dairy farms only
- Existing farmstead
- Pre-program inspection
- Electrician's estimate
- Service agreement for length of loan
- Credit eligibility requirements

• **Do Not Start Up-grading Electrical Work Until Approved by Clark Electric Cooperative**



## Clark Electric Cooperative

### FOR MORE INFORMATION

#### CONTACT

Clark Electric Cooperative

124 N. Main St.

Greenwood, WI 54437

800-272-6188 715-267-6188



Wisconsin Electric Cooperative Association

**How will the loan be billed?** The monthly loan payment will be included on your electric bill.

**Will I have to sign a service agreement?** Yes. A service agreement, indicating that you will receive energy from your electric cooperative for the duration of the loan, is required.

**Can I apply for a grant and not a loan?** Yes, 20 percent of the total cost of the project, up to \$5,000, is available without applying for a loan.

**What are the credit eligibility requirements?** Members cannot have more than one late payment within the past 12 months.

**Who will do the electrical work?** You can choose your electrician as long as he/she is a Master Electrician or has passed the Certified Farm Wiring Course.

**Can I get a loan for wiring a new barn?** No, only existing structures are eligible. New barns must be wired according to the latest version of the code.

**Will funds be available to rewire my house as well as the barn?** Yes, if the service for the barn is served from the main panel in the house.

**Can I pay the loan off early without a penalty?** Yes.

**What happens if I default on my loan?** If you're delinquent on your loan (for 2 consecutive months), the loan will become due and payable immediately. The electric service may be subject to disconnection.

**Are there any fees associated with this loan?** Yes. Pre- and post-inspections by an approved state-certified inspector are required for the loan. However, your electric cooperative will pay the costs. The \$13 Uniform Commercial Code (UCC) filing fee will be your responsibility. Your electric cooperative will handle the processing of the UCC fee.

**When will I receive the grant money?** Grant money will be given after a post-inspection, when the wiring work is completed according to NEC, and all of the invoices and the wiring affidavit are given to your electric cooperative.

**Is there a lien on my property?** Yes. The rewiring project serves as collateral for the loan.

**How do I apply?** Contact your local electric cooperative. Your cooperative will schedule an appointment with an approved state-certified inspector and a representative of your cooperative to determine the extent of the project.

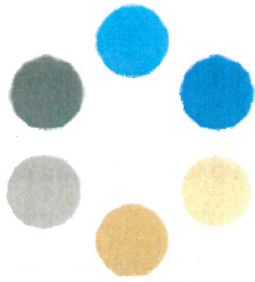
**What happens next?** You choose an approved Master Electrician to give you a bid on the project and provide your cooperative a copy of the bid. If the bid meets the loan/grant requirements, the project is given preliminary approval.

**What happens after the rewiring is completed?** We schedule the state-certified inspector to inspect the work and he/she provides written documentation that the work was completed according to NEC. You provide invoices from the electrician and the wiring affidavit. You choose if you want your cooperative to pay the electrician or the electrician and yourself. Your cooperative sends a check request for the grant money and you choose to whom you want the check payable to the electrician or the electrician and yourself.

**What expenses are covered under the loan and/or grant?** Labor and materials needed to rewire the farm are covered. Isolation transformers, rings of life, and other systems not defined in the NEC are not eligible expenses under this program. New construction is not eligible.

**How long is this program available?** This program began November 1, 2002, and will continue until funding is no longer available.

**How is the grant program funded?** Wisconsin Electric Cooperatives contribute annually towards the grant money.



# focus on energy

*The power is within you.*



## Focus On Energy Overview

Our Programs show Wisconsin residents how to reduce their carbon footprints and lower their costs of living by being more energy efficient. Whether they're switching to ENERGY STAR® qualified compact fluorescent light bulbs or building a Wisconsin ENERGY STAR Home - these efforts are really paying off. Last year alone, Wisconsin residents saved approximately \$10 million in energy costs by making simple lifestyle changes.

Let Focus on Energy show you how to protect the environment and get in on the savings by living more energy efficiently.

### Ways to Save Energy

Energy prices have increased in recent years and several factors have contributed to that. Focus on Energy wants residents and business owners to know that by making some simple changes around the home, farm, or office, energy costs can be managed. These and many more programs are there to help.

[Residential](#)    [Business](#)    [Commercial](#)    [Agriculture & Rural Business](#)

**For more information or questions regarding any of the Focus on Energy programs, please contact us:**

**Call:** 800.762.7077

**E-mail:** [Focusinfo@focusonenergy.com](mailto:Focusinfo@focusonenergy.com)

**Mail:** Focus on Energy  
431 Charmany Drive  
Madison, WI 53719



