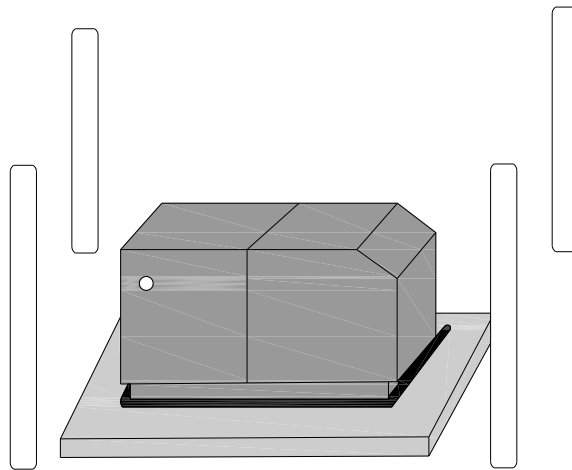




Specification for Underground Padmount Service 3 phase and single phase



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Visit our Website at: www.lakecountrypower.coop

Lake Country Power Disclaimer

*Please read this brochure carefully. This brochure is intended to cover only the general requirements applicable throughout the service territory of Lake Country Power (LCP). It is not intended to be all inclusive of existing policies. **PLEASE NOTE:** There are restrictions on maximum starting current for motors.*

If you have any questions, please contact a Lake Country Power New Service Representative at one of our service centers:

**Cohasset, Mountain Iron or Kettle River
1-800-421-9959**

General Requirements

The consumer shall provide and install to Lake Country Power specifications:

1. Concrete transformer pad for three phase service. See specifications for pad on pages 4-5.
2. Secondary conductors for services larger than 320 amps.
3. All conduits when required. (Including in & out of the meter socket)
4. Meter sockets for services greater than 200A and for CT-rated services. Note that meter sockets for CT-rated services must be purchased by the consumer from LCP.
5. CT or Transition cabinet (including ALL connectors). See list of pre-approved cabinets on page 7.
6. Consumer to install CTs (provided by LCP) into the CT or Transition Cabinet.
7. Guard posts when required by Lake Country Power.

Lake Country Power to provide and install:

1. Transformer pad for single phase service.
2. Transformer.
3. Primary conductors.
4. Secondary conductors for services 320 amps or less.
5. Current transformers (CT) when required. (Consumer is responsible for the installation of the CTs)
6. Terminations (including connectors) in ALL transformers.
7. Connect LCP conductor to consumer owned equipment.
8. Transformer grounding.
9. LCP will provide a 200 amp meter socket with utility disconnect on a pedestal next to the transformer for single phase services - contact a New Service Representative for details.

Conductor & Metering Equipment Requirements

Conductor:

When required, LCP will provide the secondary for underground service where the “General Service” size is 320 amps or LESS and any “Load Management Service” size is 320 amps or LESS. When either service exceeds 320 amps, the consumer must install, own and maintain all secondary conductors.

ALL terminations within the transformer (including connectors) shall be provided by Lake Country Power.

Within the transformer, consumer owned conductors are limited to the following:

1. Three Phase Transformer
 - 6 per phase
 - Maximum size 500 mcm
2. Single Phase Transformer
 - 4 per LEG
 - Maximum size 250 mcm

If this limitation will be exceeded or the service size is larger than 1,000 amps, the consumer will be required to install a transition cabinet within twenty (20) feet of the transformer. This cabinet is often used to contain the CT's and mount the meter socket. Lake Country Power will provide conductors from the transformer to the cabinet. The consumer must supply and install all conduits. For specific details on this type of construction, contact a Lake Country Power New Service Representative and see page 6.

Metering Equipment:

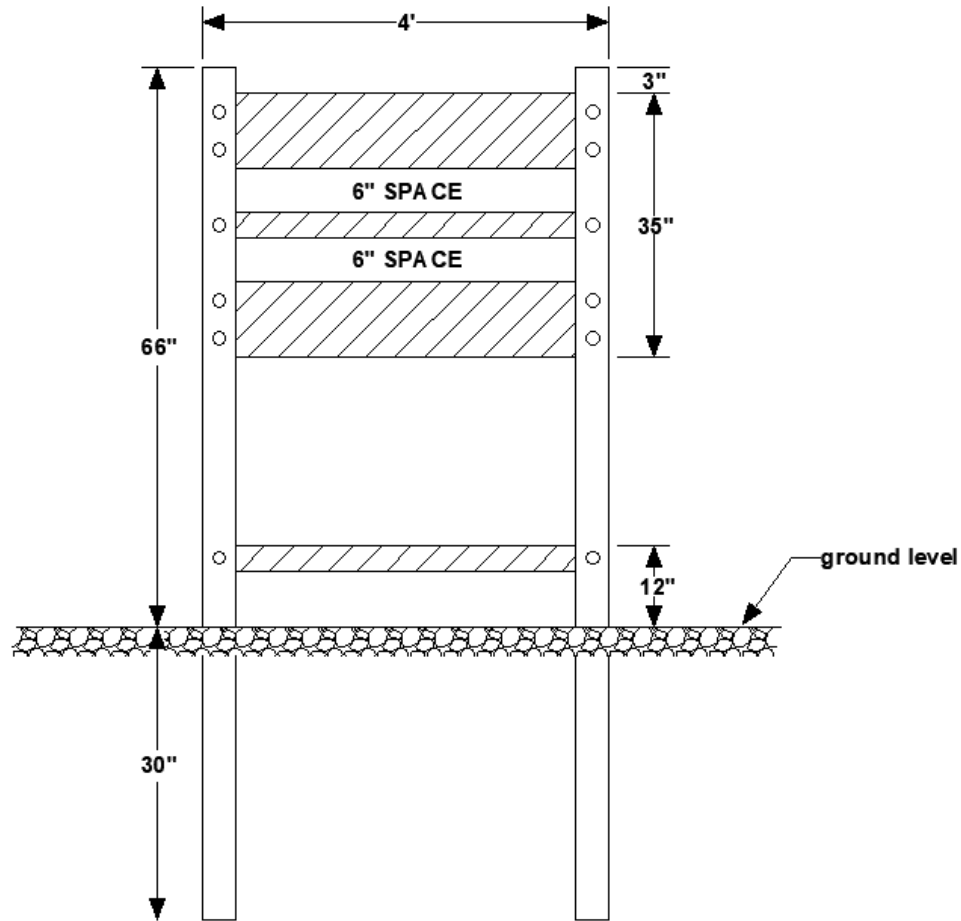
Self-contained metering will be used for 200 amp services. The consumer point of ownership is at the secondary lugs at the bottom of the meter enclosure. For services 320 amps or less, either self-contained or transformer rated metering may be used (future load growth should be considered). Transformer rated metering will be used where service ratings exceed those for self-contained metering.

Meters and current transformers (CT) will be provided by LCP. The consumer will provide and install the meter socket. LCP offers both self-contained and transformer rated sockets for sale. Sockets for transformer rated services must be purchased from LCP.

For transformer rated metering, the consumer will provide and install a CT cabinet, normally adjacent to the meter socket and install conduit (minimum of 1" diameter) between the cabinet and socket. Do not mount meter socket on the cabinet door or where the cabinet door will interfere with the meter when opened. See list of pre-approved cabinets on page 7.

Wiring between the CT's and the meter socket will be performed by Lake Country Power.

H-Structure Construction Specifications



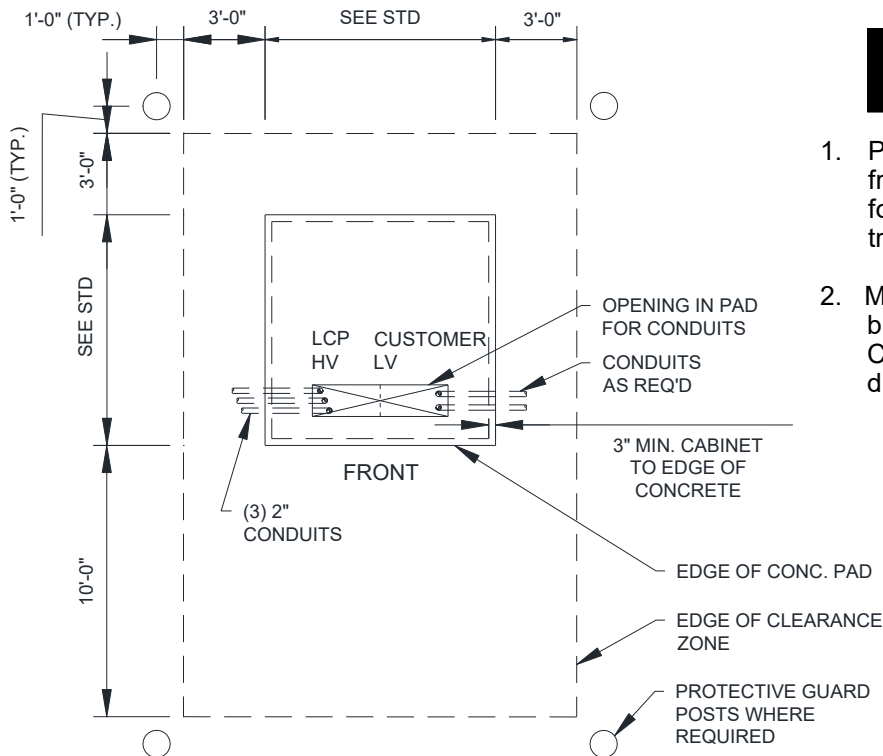
Material required (minimum timber size and recommended bolts).

- 2-4"x4"x8' treated posts
- 2-2"x4"x4' treated cross members
- 2-2"x10"x4' treated cross members
- 12-3/8"x6" carriage bolt w/ washers and nuts

Responsibilities

- Wood structure by member or consumer's electrician
- Meter bases installed by consumer or consumer's electrician
- Trench to LCP pole by consumer if greater than 320A—minimum of 24" deep
- Load side conductors and all conduits supplied by consumer.
- Source side conductors supplied by Lake Country Power if 320A or less.

3Ø Transformer Concrete Pad Specifications Up to 1000kVA (Page 1)



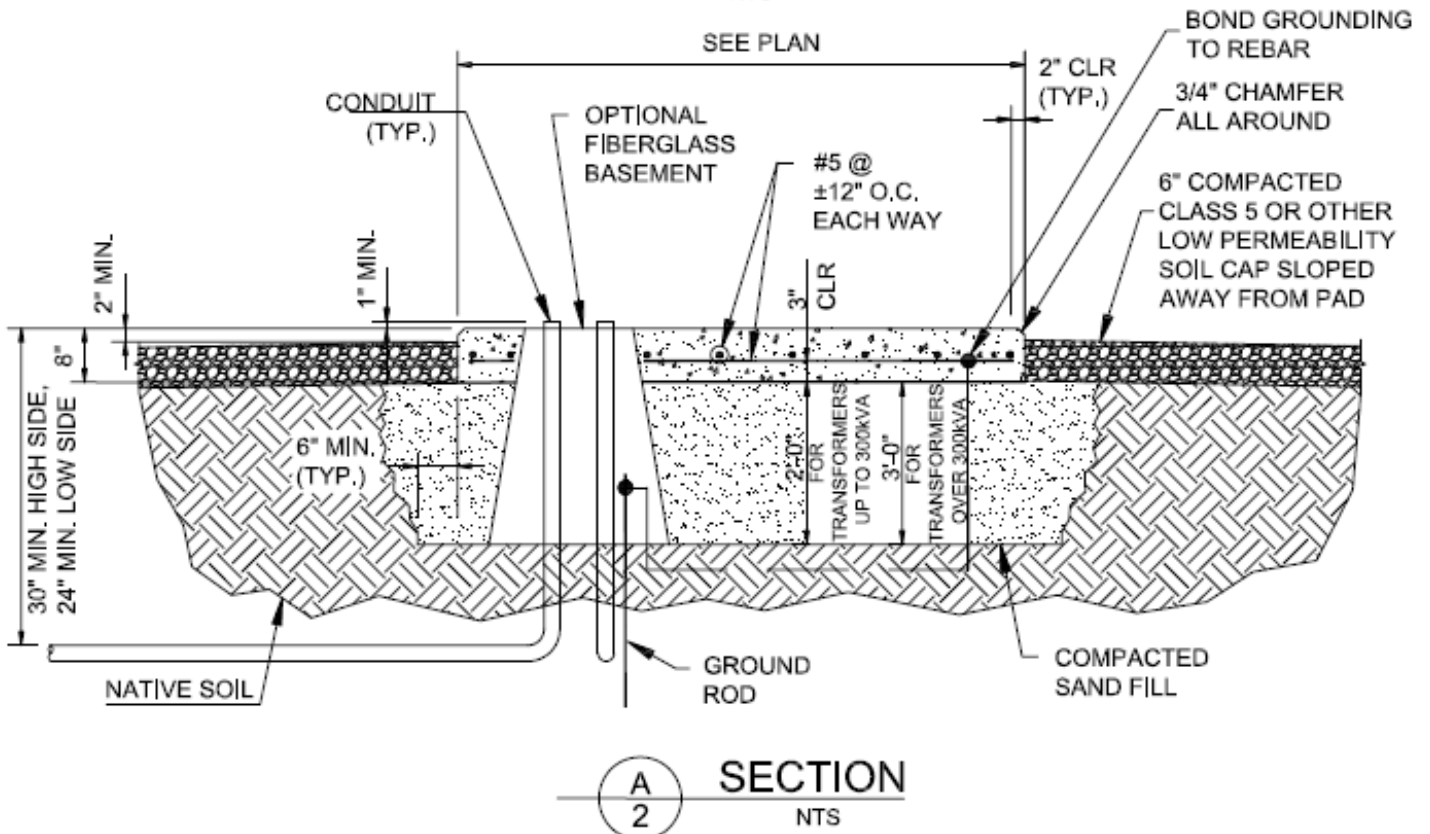
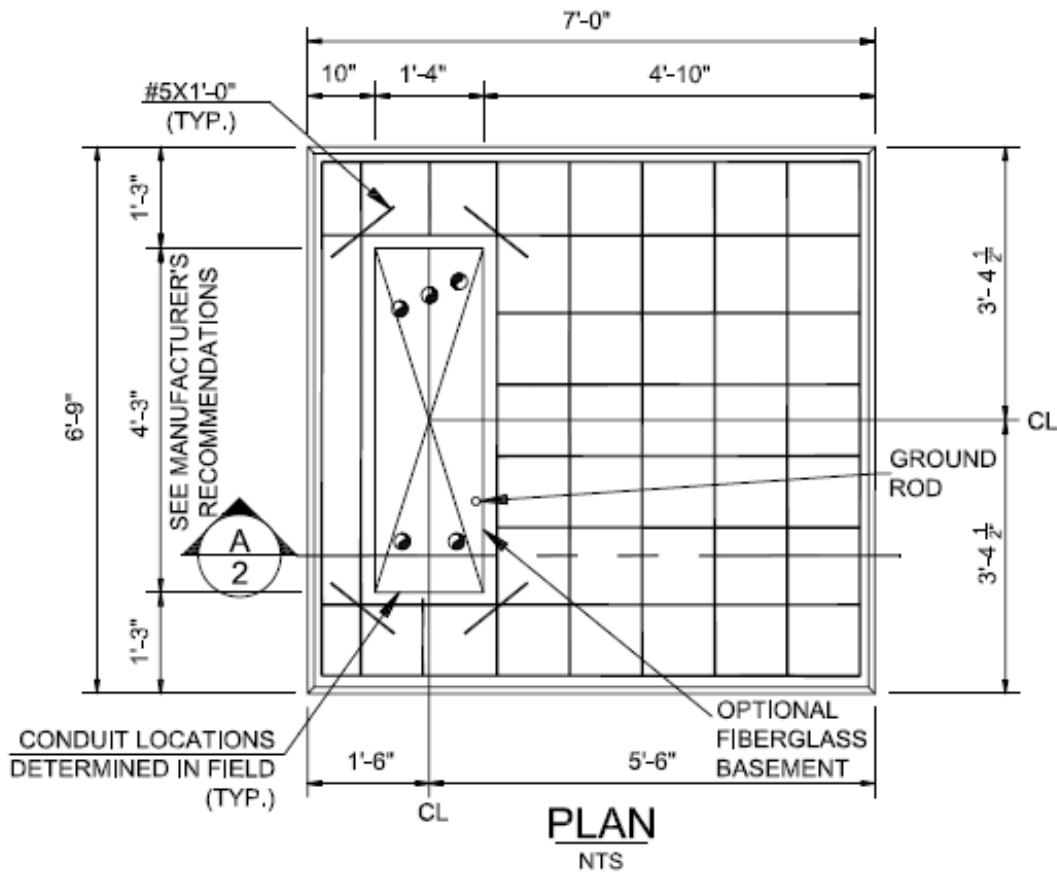
Clearance Notes:

1. Provide a minimum clearance of 10'-0" in front and 3'-0" on the sides and rear of pad for operation and maintenance of transformer.
2. Maintain a minimum distance of 25 feet from building overhangs and fire escapes. Contact a new service representative for direction if these clearances cannot be met.

General Notes

1. Excavate below foundation bottom to depth indicated. Compact subgrade and clean sand fill to 95% modified proctor density.
2. All fill shall be placed in loose lifts of 4" or less to achieve the specified density.
3. Concrete shall be detailed, placed, and finished in accordance with ACI 318 and ACI 301.
4. All cast in place concrete shall develop 4500 P.S.I. compressive strength at 28 days. 3/4" Aggregate, 6% ±1.5% AIR, 0.45 max w/c ratio, type I cement.
5. Provide plastic protected bar supports to position reinforcing bars in reinforced concrete.
6. Prior to placing concrete, all reinforcing steel shall be free of rust, scale, or any foreign material.
7. All reinforcing shall conform to ASTM A615 GR60 deformed bars.
8. Concrete shall be thoroughly consolidated by mechanical vibration applied internally. Vibrators shall be operated at a frequency of not less than 4500 impulses per minute.
9. All exposed edges shall be chamfered 3/4".
10. Finish concrete to a light broom finish. Apply purchaser approved cure and seal product.
11. Follow applicable recommendations of the latest editions of ACI 305R and 306R for hot or cold weather concreting, respectively.
12. Design assumes native soils are suitable for foundation construction. Questionable soils shall be brought to the attention of the engineer.
13. Confirm pad dimensions and opening sizes with actual transformer being installed.

3Ø Transformer Concrete Pad Specifications Up to 1000kVA



Transition Cabinet Notes

Lake Country Power to provide:

1. Padmount transformer, primary conductors, primary terminations and transformer ground grid.
2. Secondary conductors from the transformer to transition cabinet and secondary terminations at transformer and transition cabinet.

Consumer to provide:

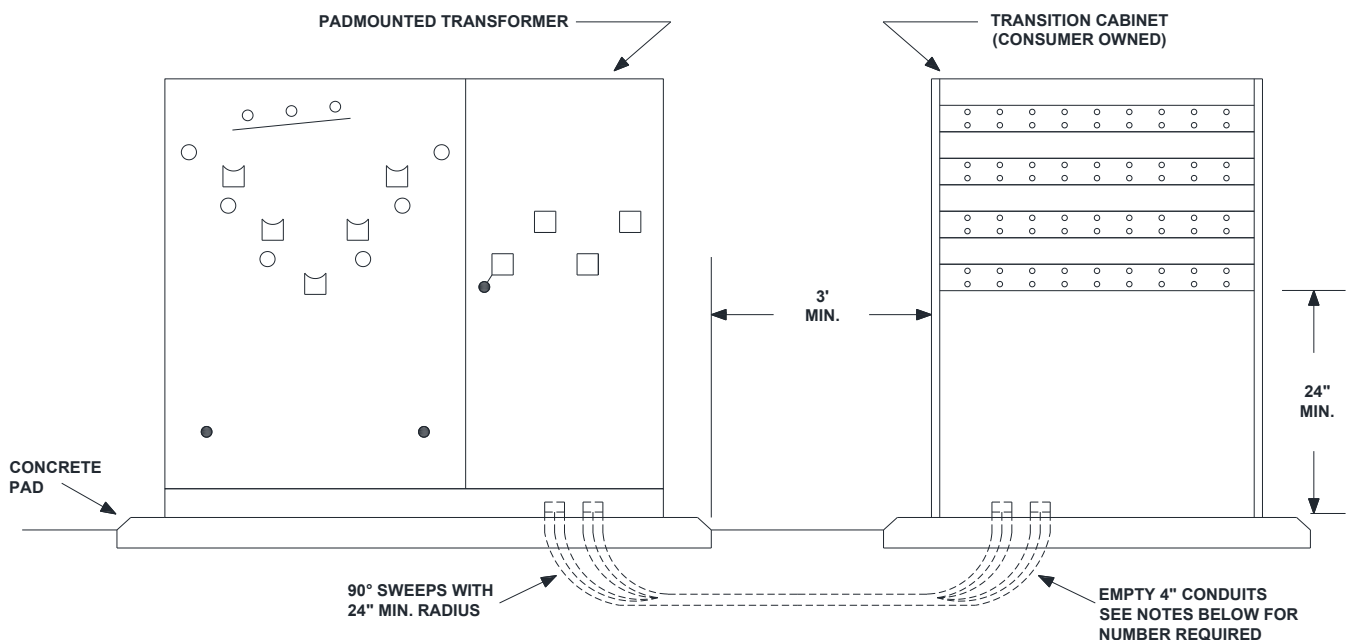
1. Concrete transformer pad, guard posts (if required) and conduits.
2. Transition cabinet with all bus-work and concrete pad. The transition cabinet shall be constructed such that the height of the lowest busbar shall not be less than 24" above the bottom of the cabinet. See page 7 for a list of pre-approved cabinets.
3. Empty 4 inch conduits from transformer to transition cabinet. The number of conduits required per service is as follows:

<u>Service Size</u>	<u>Number of Conduits</u>
200 - 2,000 Amp	4
2,500 - 3,000 Amp	6
Over 3,000 Amp	Contact Lake Country Power

Install conduits at extreme right of LV side of transformer pad opening and a maximum of 1 inch above the transformer pad and transition cabinet pad.

4. Secondary conductors, terminations and conduits from transition cabinet to consumer service entrance.

3 Phase Underground Service WITH Transition Cabinet



Pre-approved list of CT Cabinets and Transition Cabinets

Lake Country Power has pre-approved the use of the following CT cabinets and Transition cabinets from Electro-Mechanical Industries (EMI) and American Midwest Power (AMP). If another model of cabinet is requested to be used, drawings of the cabinet are to be submitted to LCP engineering for approval before purchase and installation. LCP does not require a PT cabinet for 480V services at this time.

Cabinet Type	Rating	Manufacturer	Model Number
CT cabinet (1-Phase)	400-600A	EMI	CTB146M-MNP
CT cabinet (1-Phase)	400-600A	AMP	MNPCT46-3L
CT cabinet (1-Phase)	800A	EMI	CTB180M-MNP
CT cabinet (1-Phase)	800A	AMP	MNPCT8-3L
CT cabinet (3-Phase)	400-600A	EMI	CTB346M-MNP
CT cabinet (3-Phase)	400-600A	AMP	MNPCT46-4L
CT cabinet (3-Phase)	800A	EMI	CTB380M-MNP
CT cabinet (3-Phase)	800A	AMP	MNPCT8-4L
CT cabinet (3-Phase)	1200A	EMI	CTB312MX-MNP
CT cabinet (3-Phase)	1200A	AMP	MNPCT12-4L
Transition cabinet	800A	AMP	MNPSCC8-4*CT
Transition cabinet	1000A	AMP	MNPSCC10-4*CT
Transition cabinet	1200A	AMP	MNPSCC12-4*CT
Transition cabinet	1600A	AMP	MNPSCC16-4*CT
Transition cabinet	2000A	AMP	MNPSCC20-4*CT
Transition cabinet	2500A	AMP	MNPSCC25-4*CT
Transition cabinet	3000A	AMP	MNPSCC30-4*CT
Transition cabinet	4000A	AMP	MNPSCC40-4*CT

*add suffix (A) for aluminum bus or (C) for copper bus

Note: all cabinets rated at 1200A and below accept bar type CTs with 2-hole NEMA pads on either end.



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Electrician Checklist for CT- rated services

Please complete the following items prior to scheduling Lake Country Power to finalize the meter wiring and installation on a new CT- rated service:

- Review and follow all applicable requirements in the Specification for Underground Padmount Service document.
- Verify the concrete transformer pad for 3-phase services has been built per LCP specifications. Pad must cure for a minimum of 7 days before the transformer is set. If less curing time is desired, a high early mix may be used and additional cylinders should be cast so the concrete can be tested. The test results must be presented to LCP and show that the concrete has reached at least 70% of design strength prior to setting the transformer.
- Verify an LCP approved CT or Transition cabinet has been properly installed and grounded.
- Verify the meter socket has been properly installed and grounded. Note: Do not mount the meter socket on cabinet door or where door may interfere with the meter.
- Verify that a minimum 1" diameter conduit has been run from the CT cabinet to the meter socket.
- Verify the CTs have been installed with the white dot or H1 side of the CT towards the utility source side of the cabinet.

Once the above items have been completed, contact an LCP New Service Representative at 1-800-421-9959 to schedule the meter installation.