Electric Service Guide for Residential Construction

TABLE OF CONTENTS

Energizing Life: A Commitment that Goes Beyond Reliability

At KCP&L, we know you expect electricity to always be there. And you should. So we've worked hard to build one of the best reliability records in the industry. We also want to make sure you have the service you need, when you need it. Whether you're remodeling your existing home or building a new one, this brochure is your guide to permitting, inspecting and energizing your project from start to finish.

CONTACTING KCP&L

Most construction or service upgrades can now be managed effortlessly online at **kcpl.com**. To order a new service meter, remove a temporary meter, upgrade existing service or for a complete copy of KCP&L's current service standards for all construction, click "Business" then "Builders/Contractors." If you would like to speak to a customer service representative, please call (816) 471-KCPL (5275) or 1-(888)471-KCPL (5275).

EXISTING HOME REMODELING OR ADDITIONS

Start by considering the extent of your project and the role your electric service will play. Then you can begin to organize the information you'll need and the actions you'll need to take to get the job done.

For example, new homes or many projects that involve new construction require city permits and inspections before permanent electric service can be connected. Smaller projects within the home may simply require an electric service upgrade. But even for these, you can save time by having the right information handy when you call KCP&L.

Changing your electric service

One of the most common service alterations is an upgrade to the electric service panel—from 60 amps to 100 amps, from 100 amps to 200 amps, and so on. Upgrades are generally needed when a family "outgrows" its existing service due to remodeling, room additions or installation of a new major electric appliance. KCP&L seldom charges for these alterations.

This type of service upgrade will require a new main disconnect panel or "breaker box" and a new entrance wire connection from the outside meter socket. A new "riser" from the meter may be needed to meet National Electric Code Standards. See *KCP&L's Electric Service Standards* for your specific installation.

Another common change of electric service involves moving the overhead service drop underground. This is generally done as a safety precaution when families decide to add a backyard pool, deck or patio, or simply to improve aesthetics. A new meter socket and entrance wire may be required. Refer to *KCP&L's Electric Service Standards*.

For a copy of *KCP&L's Electric Service Standards*, visit **kcpl.com** and search "Electric Service Standards."

Follow these simple steps to make the job efficient and hassle-free.

Step 1—The Permit. Whether you are doing the electrical work yourself or hiring an electrician, a wiring permit may be required. You can obtain one at your municipal or county offices.

Step 2—Initiate Your Service Request. With permit in hand, call KCP&L, or enter your request online at **kcpl.com**. Be prepared with all the information in the chart titled *Service Alterations, Upgrades or Upgrades for Room Or Deck Additions*. Our representative will take your information and enter it into our system for scheduling.

Step 3—KCP&L Service Visit. A designer will visit your service address to inspect the project and determine the best location for the new meter socket. Within five days following the visit, a temporary construction "pigtail" will be installed, if requested. You'll also be advised of any charges for your project. These will need to be paid before KCP&L can remove the pigtail and connect your new service.

Step 4—Inspection. Once the electrical work is completed, inside and out, call your electrical inspector's office for a safety inspection. This must be completed before KCP&L can reconnect your service. The inspector will contact KCP&L to approve connection, generally the following working day. KCP&L will inspect the alteration outside your home when the work is finished.

Virtually every city and county in KCP&L's service territory requires routine inspections of electrical work performed by homeowners or licensed electricians. The agency conducting the inspection generally will be responsible for granting wiring permits. KCP&L cannot connect your electrical service until we've received inspection approval from the governing body that completed the inspection. For exact instructions and requirements where you live, contact your local city or county offices.

Step 5—Connect Service. KCP&L will schedule a construction crew to remove the temporary pigtail and connect your new service following receipt of approval from your city or county.

What you need to know before you call.

When you are ready to initiate a project request, call KCP&L or log on to kcpl.com. If you call our Customer Contact Center, a representative will take your information and direct your request to the service center nearest to you. To save time and inconvenience, make sure you have the following information before you call:

SERVICE ALTERATIONS OR UPGRADES FOR ROOM OR DECK ADDITIONS:		
Your KCP&L account number or service address	Acct No.:	
	Address:	
Whether a temporary disconnect or "pigtail" will be needed (See page 2, Step 3)	Check One:	o Yes
		o No
Your current service level	o 100 amp	
	o 200 amp	o Other:
Your new service level	o 100 amp	
	o 200 amp	o Other:
Whether your service will be overhead or underground	o Overhead	o Underground
Your wiring permit number		
Your targeted completion date		
Your phone numbers	Daytime: ( )	
	Evening: ( )	
Your electrician's name and phone number	Name:	
	Phone: ( )	

**KCP&L will install a hard-wired disconnect at no cost for service alterations from 60A to 100A and from 100A to 200A. A hard-wired disconnect will not be installed on service alterations 200A and above. 200A alterations and above will require a "show up." Note that only KCP&L employees are allowed to cut or remove a meter seal.*

If you prefer, you can fax your information to KCP&L at **(816) 654-1125**. Please provide a complete description of your project including all the information listed above. Be sure to include your daytime and evening telephone numbers so that we can reach you if there are questions.

BUILDING A NEW HOME

New home construction is hectic enough without last minute surprises. Here are some tips to help you understand what you need to do for temporary and permanent electric service.

Step 1—Initiate Your Service Request. Call KCP&L or enter your request online at **kcpl.com** as soon as possible to get your service order started. Be prepared with all the information in the chart labeled *New Home Construction* on the following page. Our customer care representative will take your information and enter it into our system.

Step 2—Survey, Legal Description and Easements. Copies of your property's legal description, e.g. warranty deed, and plot plan are needed by KCP&L before electrical service planning for new construction can begin. Both should have been provided to you at closing. Together these documents help KCP&L identify utility easements, property corners, building setbacks, distances and more.

In addition, your property should have ground stakes or metal rods for locating the corners. Often they are just below the surface. If they cannot be located, you may need to have the property surveyed and a copy of the survey sent to KCP&L.

Step 3—Temporary Service During Construction. There are two types of temporary electric service: customer-provided or KCP&L-provided service.

Before you call

Once again, you can initiate your project request by calling KCP&L or online at **kcpl.com**. If you call, our representative will take your information and direct your request to the service center nearest to you. For new home construction, make sure you have the following information ready:

NEW HOME CONSTRUCTION			
The name for your new account			
Your service address and billing address (if different)			
Lot and block number (if any)			
Subdivision or development name (if any)			
Plat or phase of development (if more than one)			
Your phone numbers	Daytime: ( )		
	Evening: ( )		
Your electrician's name and phone number	Name:		
	Phone: ( )		
Whether your home heating will be gas or electric	o Gas	o Electric	
Your new service level	o 100 amp		
	o 200 amp	o Other:	
Whether temporary service for construction is required	Temporary service needed: o Yes o No		
	If yes:	o Customer Provided	o KCP&L Provided
The date on which you'll be ready for permanent service			
Whether your service line will be overhead or underground	o Overhead	o Underground	

KCP&L SERVICES AT A GLANCE

Most construction services surrounding temporary or permanent connection of electric service are performed by KCP&L. Others are the responsibility of the property owner and should be done by a licensed electrician. While most of KCP&L's services are free, some involve materials or labor and will result in a minimum charge. Call us if you have questions about a service not listed.

CURRENT TRANSFORMERS

Current transformers (C.T.'s) are required on all single-phase services over 400A. Installation of C.T.'s requires the customer to provide and install a C.T. cabinet and a splice box if needed. KCPL will provide the C.T.'s and meter socket. The customer is required to install the provided C.T. meter socket and C.T.'s. See DWG 900.1-28 for standard drawing of single phase residential C.T. installation. C.T.'s are installed with the polarity mark towards the transformer and are separate from other metering and control circuits.

TEMPORARY SERVICE

Customer-Provided Temporary Service. This is generally 120/240 volt, 3-wire service although other voltages may be available. Inspections by the city or county governing agency and by KCP&L are required before KCP&L can connect this type of temporary service.

Customer-Owned Temporary Service

Jurisdiction	Prior to May 22, 2017	Effective May 22, 2017
KCP&L - KS & MO	$350*	$350*
KCP&L - GMO	n/a	$300

*$380 in Olathe, KS

KCP&L-Provided Temporary Service. This is available in 120 volts, so only 120-volt equipment can be operated from this temporary service. No city or county inspection is required.

If your job calls for other voltages, these will be limited to the voltages available at your construction site. If no secondary voltage is available, you'll need to order a construction project to build the desired service. The construction project requires additional time beyond the normal 3-5 working days normal for temporary services. Construction time and material charges will be billed if temporary facilities are not used as part of the permanent service.

To avoid construction delays, contact KCP&L as soon as you know that temporary service will be needed. Otherwise you may need to use a generator to avoid delays or added construction costs.

Once the electrical work has been completed, inside and out, call your electrical inspector's office for a safety inspection. This must be completed before KCP&L can connect your service. The inspector will contact KCP&L to approve the connection, generally the following working day. Depending on complexity, we many need to inspect the outside of your home one last time before scheduling a construction crew to connect the service.

Remember to have the temporary service meter removed if it's no longer needed.

KCP&L-Owned Temporary Service

Jurisdiction	Prior to May 22, 2017	Effective May 22, 2017
KCP&L - KS & MO	$300*	$300*
KCP&L - GMO	$100	$250

*$330 in Olathe, KS

ANTICIPATING AND CONTROLLING COSTS

The decisions you make regarding service size and distribution can result in additional construction charges. Costs to provide service in rural settings can be higher than in cities where distribution lines are closer and more readily accessible. Start planning early and have your KCP&L representative help you identify potential costs so you can anticipate, and know how you can control them. Visit **kcpl.com** for the latest edition of our Electric Service Standards.

STANDARD CHARGES

KCP&L - GMO service area (formerly served by Missouri Public Service & St. Joseph Light & Power)		
STDOHUG	Conversion of existing overhead service to underground service	$480
STDUGOV100	Excess of 100' underground service charge	$2.52

KCP&L Kansas & Missouri service area		
STDMV1OH	Moving one end of existing overhead service drop (Updated to 2 hours)	$200
STDRPLCOH	Replacing an existing overhead service drop	$485
STDUGOHDIS	New permanent underground service from overhead distribution	$505
STDOHUG	Conversion of existing overhead service to underground service	$745
STD+SECPED	Additional charge where a new secondary pedestal is required	$300
STDALTUGNW	Major alteration of existing underground service where new cable is required	$440
STDUGOV100	Excess of 100' underground service charge	$1.35
STDALTUGCP	Minor alteration of existing underground service where no new cable is required and all excavation is completed by customer	$295
STDREVCNCL	Design time for revisions or cancelled jobs	$50

GLOSSARY OF TERMS

Alteration. Any change in the electric service. Although this is generally an upgrade in the service panel—from fuses to breakers, main switch size from 60A to 100A or 200A—it also can be a change from overhead to underground service. Relocating the service to accommodate a new room or deck is another example where a fee may be charged.

Ampere (amp, A). The standard unit for measuring strength or rate of flow of an electric current. Also the measure of residential electric service. (100A or 200A, etc.)

C.T.'s (current transformers). Current transformers convert the flow of electrical current at the input to a different level of flow at the output. This facilitates using the same meter in different installations.

Customer-Provided Temporary Service. A metered service, usually 120/240V, provided by the customer during construction. Voltages may vary as determined by availability and the customer. A fee will be charged, and an inspection is required prior to service connection.

Service Hook. A device anchored to a building, which supports the overhead service drop. The device must be able to support a 900-pound stress.

Inspection. An inspection of a completed electrical project is the responsibility of the governing body for that area. Once approved, the inspecting agency will notify KCP&L. We cannot connect permanent service without approval.

KCP&L- Provided Temporary Service. A 120V metered service provided and installed by KCP&L for a fee. No city or county inspection is required for this type of service.

Meter Socket. A metal box fitted with a sealed, removable lid into which the electric meter is placed.

National Electric Code (NEC). A procedural guide for wiring projects used by all governing bodies to ensure proper, safe and consistent wiring practices by homeowners and electricians. The governing bodies themselves, however, have final authority to approve or deny electric service.

Overhead Service. Also called a service drop, this system delivers electric service from the pole, through suspended wires, to a home or building.

Permit Number. The number issued when a permit is purchased prior to starting any electrical wiring project. These are required in most areas.

Pigtail (or temporary disconnect). Wiring installed by KCP&L at no charge that enables the electric service to be disconnected for safety while working on the electric service panel (120/240V only.) KCP&L recommends using a qualified electrician.

Riser. A vertical PVC (plastic) or metal pipe mounted on top of the meter socket to protect and insulate the service entrance wires.

Underground Service. Power lines buried and encased in PVC (plastic) that delivers electric service from pole, transformer or secondary pedestal to a home or building.

Weatherhead. A PVC (plastic) or metal cap at the top of the riser that prevents water from entering the meter socket.

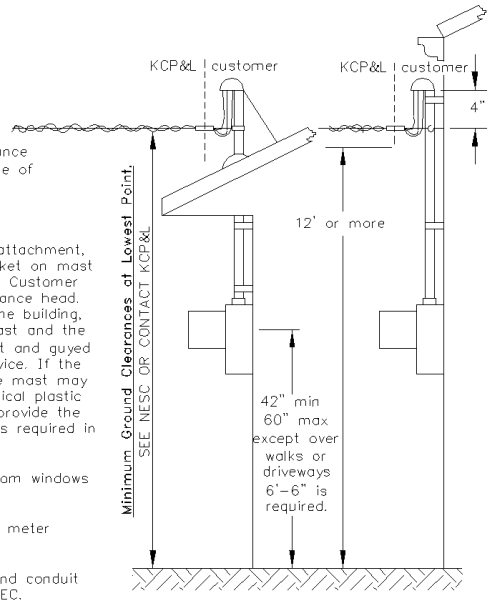
KCP&L APPROVED COMMERCIAL METER SOCKETS

Visit KCPL.com and follow the link at the bottom of the page to the Construction Standards for the list of approved meter sockets.

QUICK OVERVIEW OF CONSTRUCTION PROCESS

This is the sequence of activities that occurs for new construction projects.

Step	ACTION OR INFORMATION REQUIRED
1	Customer calls KCP&L's Customer Service Center at **(816) 471-5275 or 1-(888) 471-5275** or enters service request online at **kcpl.com**. KCP&L recommends you request both temporary and permanent service at the same time.
2	Service request is sent to your nearest KCP&L service center.
3	KCP&L makes a field visit to confirm that power is available to your site or to determine what will be needed to provide it.
4	KCP&L contacts you for your project requirements—including service size and construction schedule. Estimate charges may apply.
5	Customer provides survey information to KCP&L, if needed.
6	Customer locates and marks property corners.
7	KCP&L completes a construction drawing.
8	Customer signs easements before construction can begin.
9	KCP&L schedules project for construction after customer's work is completed and has passed KCP&L & city or county inspection.
10	KCP&L connects permanent service after city or county inspection and our own approval.



NOTES

A. Customer to own and install service entrance conductors with a minimum of 24" outside of weatherhead.

B. Service drop connections by KCP&L.

C. Customer to own and install the service attachment, such as service hook, wire holder or bracket on mast capable of supporting a 900 pound force. Customer to own and install service mast with entrance head. If the mast extends above the eave of the building, the service should be attached to the mast and the mast must be 2" (min) rigid galv. conduit and guyed or braced as required to support the service. If the service attachment is on the building, the mast may be rigid metal, EMT or Schedule 40 electrical plastic conduit. The height of attachment must provide the clearance to ground or to the roof line as required in the National Electrical Code.

D. Install meter socket at least 36" away from windows and doors. (KCP&L required)

E. Customer will furnish and install approved meter socket and hub.

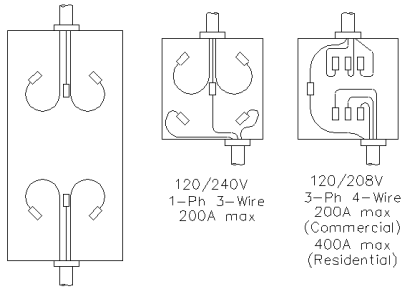
F. Customer's service entrance conductors and conduit are to be sized in accordance with the NEC.

G. Customer must not use meter enclosure to terminate or enclose his system ground.

H. Provide some slack ahead of terminations in the meter socket to allow for future maintenance.

I. Color-code conductors according to NEC.

Typical Connections by Customer



Customer furnished and owned material:

DESCRIPTION
hub
meter socket
entrance head
conduit straps
conductor
service mast
#6 Cu ground wire
1/2"x8' ground rod

OVERHEAD SERVICES SELF-CONTAINED METERS

DWG REV: 03/29/10 | DWG: **520.1-3**

NOTES

A. Approved meter socket furnished & installed by Customer. Customer should not use meter socket to enclose or terminate his system ground.

B. Insulated bushing furnished and installed by Customer. Position prefabricated conduit slip joint to compensate for soil settling. Leave sufficient slack in service conductors to allow joint to work.

C. All conduit – electrical plastic whole-inch size conduit furnished, properly installed, owned, and maintained by customer. KCP&L to inspect before backfilling.

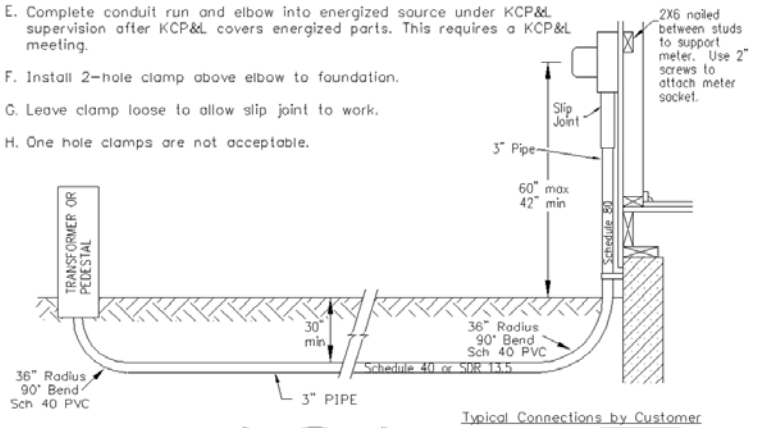
D. Customer shall provide a continuous heavy duty pull synthetic cord in the conduit with a minimum of 36" of cord extending from ends of conduit. Cord shall be free of knots and ties.

E. Complete conduit run and elbow into energized source under KCP&L supervision after KCP&L covers energized parts. This requires a KCP&L meeting.

F. Install 2-hole clamp above elbow to foundation.

G. Leave clamp loose to allow slip joint to work.

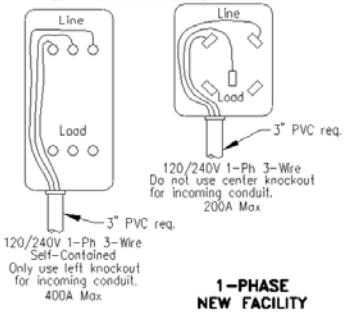
H. One hole clamps are not acceptable.



Typical Service Entrance

- Address must be on outside of building.
- Backfill must consist of dirt or sand only. Do not use frozen material, rocks, clods, or debris.
- Customer's service entrance conductors and conduit should be sized in accordance with the NEC. Meter should be located on end of house nearest service pedestal or transformer, not on the back.

Typical Connections by Customer



SWITCH SIZE (A)	REQUIRED CONDUIT SIZE	MAXIMUM SERVICE LENGTH
100	3"	180
200	3"	180
400	3"	140

1-PHASE
NEW FACILITY
RESIDENTIAL UNDERGROUND SERVICES SINGLE FAMILY & DUPLEX

DWG REV: 08/13/12	DWG: **820.1-3**

NOTES

A. Approved meter socket furnished and installed by Customer. Do not use meter socket to enclose or terminate his system ground.

B. Insulated bushing furnished and installed by Customer.

C. Position prefabricated conduit slip joint to compensate for soil settling. Leave sufficient slack in service conductors to allow joint to work.

D. Do not Do not use center knockout for incoming conduit.

E. All conduit-electrical plastic whole inch size conduit furnished, properly installed, owned and maintained by customer. KCP&L to inspect before backfilling.

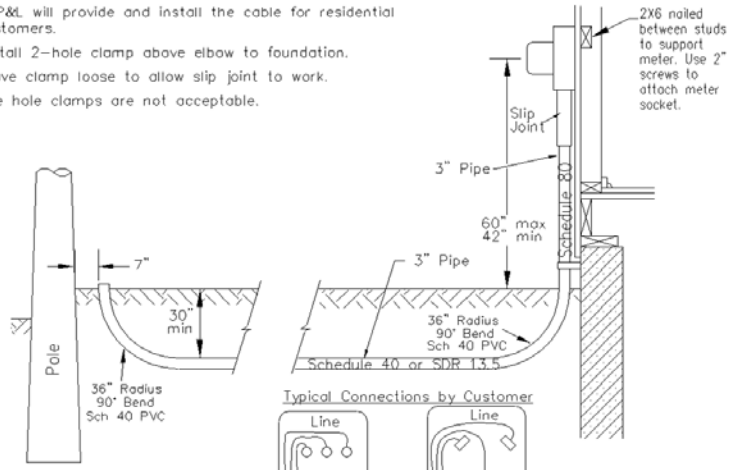
F. Commercial customers must provide and install cable, leave enough cable to go up the pole.

G. KCP&L will provide and install the cable for residential customers.

H. Install 2-hole clamp above elbow to foundation.

J. Leave clamp loose to allow slip joint to work.

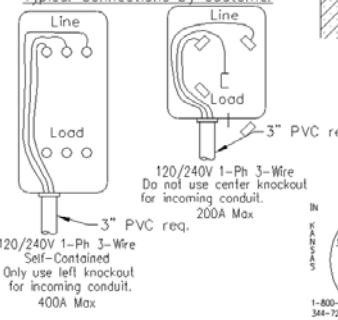
K. One hole clamps are not acceptable.



Typical Service Entrance

- Backfill must consist of dirt or sand only. Do not use frozen material, rocks, clods or debris.
- Customer's cable and conduit should be sized to meet National Electrical Code and/or local requirements.

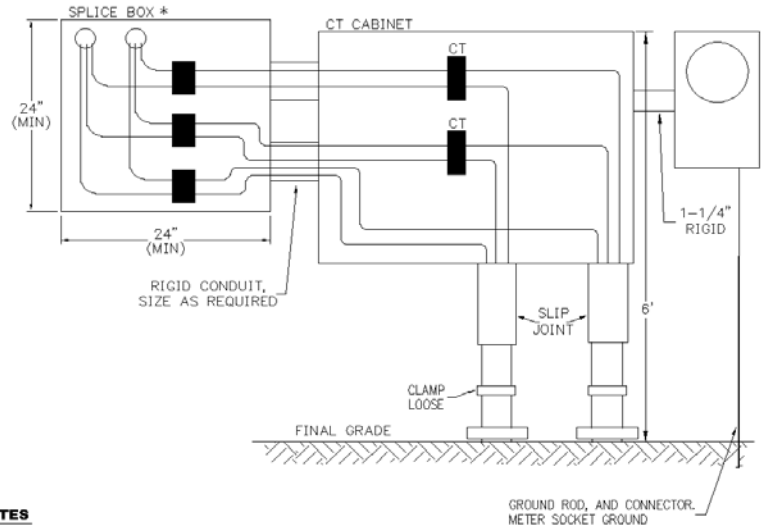
Typical Connections by Customer



SWITCH SIZE (A)	REQUIRED CONDUIT SIZE	MAXIMUM SERVICE LENGTH
100	3"	180'
200	3"	180'
400	3"	140'

1-PHASE
UNDERGROUND SERVICES 400A OR LESS OVERHEAD SECONDARIES

DWG REV: 08/13/12	DWG: **820.1-9**



NOTES

A. Locate center of meter socket 42" to 60" above grade.

B. Use 1-1/4" rigid metallic conduit to ensure electrical bonding between CT cabinet and meter socket. Rigid metallic conduit is required between the CT cabinet and the splice box of sufficient size to accommodate service entrance cable.

C. Ground shall not pass through CT cabinet.

D. Splice block to provide for four 500kcmil conductors, (required only if splice box is installed).

E. Position prefabricated conduit slip joint to compensate for soil settling. Leave sufficient slack in service conductors to allow joint to work.

F. Use non-corrodible 2-hole conduit strap or strut.

G. Fasten clamp system to sill plate.

H. 1-hole clamps are not acceptable.

J. Splice box and CT cabinet furnished and installed by Customer on outside of building. The splice box and CT cabinet must be of a reasonable size to allow for cable bending radius and workability. Dimensions are minimums only.

K. Meter can and CTs furnished by KCP&L; installed by Customer on outside of building.

L. For Residential service: Customer must furnish and install conductor from Customer disconnect to splice blocks in splice box and all conduit. KCP&L will furnish and install service conductor to splice box.

For Commercial service: Customer must furnish and install conduit and conductor. Service conductors must be continuous from the transformer to the splice box or service entrance (when no splice box is installed). KCP&L does not allow splicing of service entrance cables.

M. Customer must furnish and install a hasp for CT cabinet and splice box.

N. CTs must be securely attached to either a piece of aluminum or galvanized steel that is mounted to the back of the CT cabinet with mounting studs that are permanently attached to the cabinet. Do not attach the CT's through the back of the cabinet to the wall.

* **O.** Splice Box required for Residential installation, optional for Commercial/Industrial.

P. For Commercial Service: KCP&L must complete connections at the transformer. Call for an appointment.

Q. Color-code wires per NEC specifications.

R. The neutral shall pass through the CT cabinet.

1-PHASE METERING INSTALLATION FOR SERVICE GREATER THAN 400A

DWG REV: 01/20/15	DWG: 900.1-28