

CITY OF
Lethbridge

CUSTOMER METERING REQUIREMENTS

**Electric Department
Metering Section**

March 17, 2011

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Glossary

AMR - Automatic Metering Reading.

CEC - Canadian Electrical Code, Part 1 and Amendments.

CSA - Canadian Standards Association.

AECUC - Alberta Electrical and Communications Utility Code.

Demand - The average value of power over a specified interval of time.

Energy - The integral of active power with respect to time. E.g. kilowatt-hours (kWh)

Harmonics - Distortions to the voltage and current waveforms from their normal sinusoidal shape.

Instrument Transformer Enclosure - The enclosure supplied and installed by the customer for the housing of instrument transformers.

Instrument Transformer Metering - Using a transformer in a metering circuit to step down the current and/or the voltage to a level that can be accommodated safely by the meter.

Interval Metering - Energy values are recorded for a specific time period on a continual basis typically 1 minute, 5 minutes, 15 minutes or 1 hour.

Meter Enclosure - The enclosure supplied and installed by the customer for the housing of a meter.

Meter Socket - A meter mounting device for the purpose of installing a self-contained meter.

Multiple Service - A service to a building such as an apartment building or shopping center that has two or more units and a common service entrance in which each unit is served and metered separately.

Network - Three-wire service obtained from two-phase wires and a neutral of a three-phase four-wire wye system. (120/208volts)

Polarity Mark - Marked indicators on a transformer to show the instantaneous direction of current flow through the windings. Current flow into the primary marker causes current flow out of the secondary marker.

Self-contained Meter - A meter designed to accommodate the full line current and voltage of the circuit.

Glossary (cont'd)

Single phase - A service comprised of a 120/240 volt three wire circuit.

Time of use metering - Energy and demand registrations are segregated into time blocks during each day. Each time block is assigned a rate period. These rate periods are scheduled by time, day of the week, holidays, and/or season.

Three phase - A service with three phase conductors and a grounded neutral.

SCA - Alberta Safety Codes Act.

Installed Capacity - The rated capacity in kilo-volt-amperes (kVA) of the City of Lethbridge transformer supplying the service.

Instrument Transformer - High accuracy current & voltage transformers approved by Industry Canada for revenue metering.

Meter, S-Base - A meter for use with socket-type mounting.

City of Lethbridge - Within this document "City of Lethbridge" means the City of Lethbridge Electric Metering Department and related staff.

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General Requirements

Access to Metering Equipment

City of Lethbridge employees or agents must have reasonable access to all City of Lethbridge metering equipment for the purpose of reading, testing and changing that equipment. Where ready access to the metering equipment is not given a key shall be provided solely for the City of Lethbridge use. A lock box may be installed, where required by the City of Lethbridge.

Safety Requirements (as per C.E.C.)

- ~ There shall be provided at each meter and distribution center a clear space in width not less than the width of the distribution center extending from the floor to a point not less than 15 cm above the highest unit of the distribution center and being a depth no less than 75 cm from the outmost protruding surface of the grouped equipment.
- ~ A minimum working space of 1 m wide by 2.2 m high is required in front of all electrical equipment and to the sides and back where access is required.
- ~ A minimum passageway of 1 m wide by 2.2 m high must be maintained as an entrance or exit from all electrical areas.
- ~ Metering equipment cannot be located in areas that are hazardous to anyone working on that equipment or to the metering equipment itself. This would include moving machinery, dust, vibration, fumes, water and moisture.
- ~ It is not permissible to mount water, sewer, gas or other pipes or equipment foreign to the electrical metering installation directly above electrical metering equipment or to encroach on minimum working space around electrical metering equipment.
- ~ In the areas where electrical metering equipment is installed, there must be adequate illumination and ventilation to carry out all work safely.
- ~ The City of Lethbridge will not install meters in:
 - alleyways or areas where the meter is unprotected from moving equipment
 - in the path of water from eaves or rainspouts
 - where the meter may be subject to steam, or corrosive hazardous vapors
 - where there are noticeable vibrations
- ~ The City of Lethbridge will not install meters in areas that are difficult to access such as:
 - open pits
 - near moving machinery
 - hatchways
 - closets
 - stairways

General Requirements (cont'd)

Care of Metering Equipment

The customer is required to exercise reasonable care for the protection of the City of Lethbridge metering equipment installed on the customer's premises. Should any damage occur or the metering equipment is lost or stolen after installation, the said property owner shall be liable for the cost of repair or replacement. Care should be taken in choosing the original location of metering equipment with regard to the potential for vandalism.

Temporary Meter Removal

The City of Lethbridge shall be responsible for the temporary meter removal from all commercial and industrial services. The City of Lethbridge requires notification of intent to remove a residential meter service. Only licensed electricians are allowed to remove residential meters. The City of Lethbridge Metering Department reserves the right to re-install and seal the residential meter service.

Non-Standard Services

Acceptance procedures

Whenever the requirements of this guide cannot be met, drawings must be submitted to the City of Lethbridge Metering Department for approval. The required drawings should be submitted as early as possible, before the ordering and installation of service entrance equipment or other associated equipment. Please note that any approval is only for the service in question and is not a general approval for future services.

Drawings and specifications

Two copies of equipment drawings, specifications and site plans are required by City of Lethbridge Metering Department for non-standard services. In some cases a hand drawn sketch that clearly shows the layout and dimensions is all that is needed. Drawings submitted must clearly show all equipment related to the revenue metering, including service entrance equipment and revenue metering enclosures. These drawings should show elevations and enclosure sizes. One copy will be returned when approved. You must have prints approved by the City of Lethbridge Metering Department for non-standard services.

Modifications

Customers shall obtain written approval from City of Lethbridge before modifying an existing service which may affect the metering. The customer may be charged for costs associated with any change required to City of Lethbridge facilities due to the service modification.

Others

All service entrances must be designed and constructed such that metered and unmetered conductors are not run in the same conduit or raceway.

Types of Metering

Self-Contained Metering:

Load Limits

The maximum load for a self-contained meter is 200 Amp per phase.

Voltage Limits

The maximum voltage limit for a self-contained meter is 600-volt phase to phase.

Table 1

Self-Contained Meters (up to 200 amps)				
Voltage	Phase	Wire	Connection	Socket
120/240	1	3		4 Jaw
120/208	1	3	Network	5 Jaw
120/208	3	4	Star (Y)	7 Jaw
277/480*	3	4	Star (Y)	7 Jaw
347/600	3	4	Star (Y)	7 Jaw

* not available on new services

Meter sockets are to be mounted:

- 1) As close as possible to the service box.
- 2) In a clean, readily accessible area that is satisfactory to City of Lethbridge.
- 3) Free from severe or continual vibration.
- 4) Level on the horizontal and vertical planes (buildings with sloping sides require special provisions).

Meter sockets must be installed in order that a meter sealing ring can be accessible at all times. Meter socket must be mounted such that the jaws are plumb through all vertical planes and the socket cleaned of all foreign matter before connection will be made.

Supply of Self-contained Metering Equipment:

The customer shall:

- ~ Supply and install a meter socket complete with a screw type or lever-lock sealing ring for City of Lethbridge use that conforms to CSA standards.
- ~ Make all connections within the meter socket.

City of Lethbridge shall:

- ~ Supply the meter and install the meter in the socket.

Note: Ringless meter sockets and sockets with current bypass switches (automatic circuit closures) will not be accepted for the metering at any installation serviced by City of Lethbridge.

Instrument Transformer Metering:

General

Instrument transformer type metering is required on all services exceeding 200 amps per phase. If it is required to enter an instrument transformer enclosure you must contact City of Lethbridge.

Metering Location of Instrument Transformer Metering Equipment

For City of Lethbridge owned distribution transformer installations, meter and metering equipment installation shall be connected on the load side of the distribution transformer, as close to the disconnect switch as possible. For service entrances feeding multiple buildings, all meters must be grouped together as close as possible to the main disconnect switch.

For customer owned distribution transformer installations, meter and metering equipment shall be connected on the line side of the distribution transformer.

Supply of Instrument Transformer Metering Equipment

The customer shall:

- ~ Supply and install a manufacturer pre-wired meter enclosure according to specifications shown in **table 2**.
- ~ Supply and install an instrument transformer enclosure according to specifications shown in **table 3**.
- ~ Supply and install a 35 mm conduit between the instrument transformer enclosure and the meter enclosure.
- ~ Supply and install all hardware, buswork, termination and/or cable required for primary connections to the instrument transformers.
- ~ Install City of Lethbridge supplied instrument transformers.
- ~ Supply and install 19 mm plywood behind all enclosures.

City of Lethbridge shall:

- ~ Supply instrument transformers.
- ~ Supply and install the secondary wiring.
- ~ Supply and install the meter.

The instrument transformers are available to the customer for installation at the City of Lethbridge.

Mounting of Instrument Metering Equipment

The customer is required to mount:

- 1) A meter enclosure.
- 2) An instrument transformer enclosure.
- 3) All instrument transformers.
- 4) A conduit between instrument transformer enclosure and meter enclosure.

The customer shall assume the cost of installing the above metering equipment.

The current transformers are to be mounted in the following manner:

- 1) Screwed to the back panel of the current enclosure and must be removable from the front. All mounting holes on the current transformer must be utilized.
- 2) Ensure that the current transformer nameplates are clearly visible when the enclosure is open.
- 3) Ensure that the current transformers are positioned with **the primary polarity mark toward the source of supply** and in an arrangement that will not obstruct access to the secondary terminals. (See Figure 4)
- 4) For single phase 3 wire CTs the supply, (line1/line2), shall be connected to the same side of the CT. (see Figure 2)

Connection of Instrument Metering Equipment

The customer is responsible to make all the connections to the instrument transformer primary. These connections should be properly secured and conductors shall be shaped or formed and supported so that no tension is applied to the current transformers.

City of Lethbridge will make all the connections to the instrument transformer secondaries, testing switch, and the meter.

Meter Enclosure

A separate meter enclosure is required for each instrument transformer service. This enclosure is a manufacturer pre-wired meter enclosure including a 13-jaw meter socket (for 3-phase services) or 4-jaw meter socket (for single phase services), a test switch and wiring from the test switch to the socket. Meter enclosure specifications are shown in table 2.

Table 2

Approved Meter Enclosures				
<i>No. of Jaws</i>	<i>Manufacturer Model No.</i>	<i>Specifications</i>	<i>Dimensions H x W x D (cm)</i>	<i>Manufacturer</i>
13-jaw	CT113-SWL	13 Jaw c/w Test switch 120/208, 277/480, 347/600 Volts 3 Phase, 4 Wire, Wye	48 x 30 x 14	Thomas & Betts, Microelectric Canada
13-jaw	602C3040C13- 603	13 Jaw c/w Test switch 120/208, 277/480, 347/600 Volts 3 Phase, 4 Wire, Wye	51 x 31 x 12	Meter Devices
4-jaw	CT104-SWL	4 Jaw c/w Test Switch 120/240 Volt 1 Phase, 3 Wire	48 x 30 x 14	Thomas & Betts, Microelectric Canada
4-jaw	602C3040C4610	4 Jaw c/w Test Switch 120/240 Volt 1 Phase, 3 Wire	51 x 31 x 12	Meter Devices

Note: Meter enclosures are available through local distributors.

Location of Meter Enclosure

- 1) Indoor in a clean readily accessible area that is satisfactory to City of Lethbridge.
- 2) In the same room as the instrument transformer enclosure.
- 3) Within a maximum of 7-m conduit run from the instrument transformer enclosure.

Mounting Meter Enclosure

- 1) With the center line of the enclosure 1 m to 1.8 m above the floor.
- 2) Level on both the horizontal and vertical planes.
- 3) Free of severe or continual vibration.

Grounding of Meter Enclosure

Each meter enclosure must be bonded.

Instrument Transformer Enclosures

A separate instrument transformer enclosure is required for each instrument transformer service according to the specifications shown in **table 3**.

Table 3

Current Transformers (CT's) and Enclosures								
<i>Service</i>			<i>Service Size in Amps</i>	<i>Current Transformer Enclosure Size cm (in)</i>			<i>Gauge</i>	<i>No. of CT's Required</i>
<i>Voltage</i>	<i>Phase</i>	<i>Wire</i>		<i>H</i>	<i>W</i>	<i>D</i>		
120/240	1	3	200-400	61 (24)	61 (24)	25 (10)	16	1 3-wire
120/240	1	3	401-600	76 (30)	76 (30)	25 (10)	16	1 3-wire
120/208 Y	3	4	200-600	76 (30)	76 (30)	25 (10)	16	3 2-wire
120/208 Y	3	4	601-1200	91 (36)	91 (36)	30 (12)	14	3 2-wire
120/208 Y	3	4	1201-1500	122 (48)	122 (48)	30 (12)	14	3 2-wire
277/480 Y*	3	4	200-1200	91 (36)	91 (36)	30 (12)	14	3 2-wire
277/480 Y*	3	4	1201-3000	122 (48)	122 (48)	30 (12)	14	3 2-wire
347/600 Y	3	4	200-1200	91 (36)	91 (36)	30 (12)	14	3 2-wire
347/600 Y	3	4	1201-3000	122 (48)	122 (48)	30 (12)	14	3 2-wire

*** Not available on new services**

Note: All dimensions are minimums.

Location of Instrument Transformer Enclosure

Instrument transformer enclosures shall be located:

- 1) Indoors in a clean readily accessible area that is satisfactory to City of Lethbridge.
- 2) In the same room as the meter enclosure.
- 3) Within a maximum of 7-m conduit run from the meter enclosure.
- 4) To conform to all other requirements.

The current transformer enclosure shall be equipped with vertically hinged doors, which are non-removable in the closed position. These doors shall be equipped with a latch and have provisions for securing the door with a City of Lethbridge padlock or seal. Cover plates are not acceptable on current transformer enclosures.

Conduit Requirements between Metering enclosure and Instrument transformer enclosure

A suitable conduit, of 35 mm minimum diameter and a maximum length of 7 m, is required between the instrument transformer enclosure and meter enclosure. This conduit shall be terminated with lock nuts and bushings except where threaded hubs are supplied.

The conduit is for the exclusive use of City of Lethbridge. When it is necessary to route secondary wires through compartments other than those reserved for City of Lethbridge's use, a suitable conduit or raceway shall be installed through each compartment for the exclusive use of City of Lethbridge. The run should be continuous and uninterrupted.

These services are generally single-phase 120/240 volt or 120/208 volt self-contained services supplying a building that has several meters supplied from a single service entrance.

Such meter installation shall be: (See Figure 1 for sample layout)

- 1) Located indoors.
- 2) Grouped together in an approved area, as close to main disconnect as possible.
- 3) Connected on the load side of the sub service disconnect.
- 4) Identified by address or unit number with a permanent legible label on all meter sockets and disconnects.
- 5) Mounted with the centerline of the meter at a height of 0.65 m to 1.8 m above the floor level.

The main service disconnect, splitter box, and sub-service disconnects must have provision for City of Lethbridge padlocks or seals.

Conduit Requirements between Metering enclosure and Instrument transformer enclosure (cont'd)

The customer shall:

- ~ Supply and install the meter sockets.
- ~ Supply and install all the service entrance equipment.

City of Lethbridge shall:

- ~ Supply and install the meters.

TEMPORARY SERVICES

Scope

The requirements of this section are supplementary to, or amendatory of, the general requirements of this booklet.

Compliance with Section 76 and other associated Sections of the Canadian Electrical Code Part 1 is also mandatory.

A temporary service is defined as a temporary electrical service (generally not to exceed a one year period) required for the construction of a permanent building or structure.

Classification of Temporary Services

Standard Temporary Service is a 120/240 or 120/208 volt, 200 amp or less, single phase service, where the utility will not be required to extend it's distribution to supply the temporary service.

Non-Standard Temporary Service is any temporary service that does not meet the requirements of a standard temporary service, and the meter shall be on the load side the main disconnect switch.

Charges

A connect/disconnect fee will apply to all temporary services within The City of Lethbridge.

Supply of Material

The developer or electrical contractor will be required to supply the service conductor, supply and install all service and metering equipment, placed within 20 meters of existing utility distribution, in accordance with the requirements of the Canadian Electrical Code Part 1.

Metering

All temporary services in the City of Lethbridge will be metered at the applicable residential or commercial rate. They shall be installed in accordance with the Canadian Electrical Code Part 1 and this book of requirements. The only temporary services that are exempt are listed in Section 3.9 of this booklet.

Overhead Service

The Customer shall supply and install the temporary pole, meter socket, secondary protection and the service conductor.

The City of Lethbridge will make the connections on the utility pole.

Underground Service

The Customer shall supply and install the temporary stub (next to an existing underground supply), meter socket, secondary protection, conduit, grounding, and underground service cable.

SERVICES WHICH DO NOT REQUIRE METERING

These are specific loads which do not require metering, as outlined in the current City of Lethbridge rate structure. The customer or his electrical contractor should contact the City of Lethbridge before construction, to confirm that a meter is not required.

Residential Service Metering:

Single- Phase Residential Service Metering – Single Meter Installations

These services are generally single-phase 120/240 volt or network 120/208 volt self-contained services supplying residential houses in urban and rural areas.

Such meter installation shall be:

- 1) On the outside wall of the house.
- 2) Connected on the line side of service disconnect.
- 3) Mounted with the centerline of the meter at a height of 1.5 to 1.8 m above the finished grade.

If the finished grade is to be completed at a future date, the customer must supply a platform to meet the height requirements. A minimum height of 1.5 m must be maintained when a permanent structure such as a deck is built in the clear access area of the meter.

A meter whose height above any finished grade becomes greater or less than the specified limits, or a meter that is otherwise rendered inaccessible due to alterations to the building or finished grade level, must be moved and be brought into the limits specified above within 30 days.

The customer shall:

- ~ Supply and install a CSA approved low voltage, socket type meter base.
- ~ Supply and install conduit, wire and all service entrance equipment.

City of Lethbridge Shall:

- ~ Supply and install the meter.

Single- Phase Residential Service Metering – Instrument Transformer Metering Installations

These services are required where the load will exceed 200 amps.

Such meter installation shall have

- 1) The meter mounted in the same room as the instrument transformer enclosure.
- 2) The meter mounted with the centerline of the meter at a height of 1.5 to 1.8 m above the floor.
- 3) Instrument transformer mounted inside, within an enclosure specified in table 3.
(See figure 2 for sample layout)
- 4) Instrument enclosure and meter shall be connected by a minimum 21 mm conduit.
Maximum length of conduit is 7 m.
- 5) The meter connected on load side of service disconnect switch. The disconnect switch must have provision for City of Lethbridge padlock or seals.

Single- Phase Residential Service Metering – Instrument Transformer Metering Installations (cont'd)

The customer shall:

- ~ Supply and install a 4-jaw meter socket as listed in **table 2**.
- ~ Supply and install an instrument transformer enclosure as listed in **table 3**.

City of Lethbridge shall

- ~ Supply the required current transformer.
- ~ Supply and install the secondary wiring.
- ~ Supply and install the meter.

Single- Phase Residential Services – Multiple Meter Installations (Duplexes/townhouses)

These services are generally single-phase 120/240 volt or network 120/208 volt self-contained services supplying a building that has several meters supplied from a single service entrance.

Such meter installation shall be:

- 1) Grouped together in an approved area.
- 2) Identified by address or unit number with a permanent legible label on all meter sockets and disconnects.
- 3) If mounted outside, mounted with the centerline of the meter at a height of 1.5 m to 1.8 m above grade level (the preferred height is 1.5 m).
- 4) If mounted inside, mounted at a height of 1.0 to 1.8 m above floor level. The main service disconnect, splitter box, and sub-service disconnects must have provision for City of Lethbridge's padlocks or seals.

The customer shall:

- ~ Supply and install the meter sockets.
- ~ Supply and install all the service entrance equipment.

City of Lethbridge shall:

- ~ Supply and install the meters.

Single- Phase Residential Services – Multiple Meter Installations (Apartments)

These services are generally single-phase 120/240 volt or network 120/208 volt self-contained services supplying a building that has several meters supplied from a single service entrance.

Such meter installation shall be: (See Figure 1 for sample layout)

- 1) Located indoors.
- 2) Grouped together in an approved area, as close to the main disconnect or splitter as possible.
- 3) Connected on the load side of the sub service disconnect.
- 4) Identified by address or unit number with a permanent legible label on all meter sockets and disconnects.
- 5) Mounted with the centerline of the meter at a height of 0.65 m to 1.8 m above the floor level.

The main service disconnect, splitter box, and sub-service disconnects must have provision for City of Lethbridge padlocks or seals.

The customer shall:

- ~ Supply and install the meter sockets.
- ~ Supply and install all the service entrance equipment.

City of Lethbridge shall:

- ~ Supply and install the meters.

Commercial Service Metering:

Single- Phase Commercial Service Metering – Single Meter Installations

These are commercial services where the service disconnect rating does not exceed 200 amps and metering shall be on the load side of the main disconnect switch.

The meter shall be mounted:

- 1) On the outside wall of the building.
- 2) At a height of 1.5 to 1.8 M.

The customer shall:

- ~ Supply and install an approved meter socket.
- ~ Supply and install all the service entrance equipment.

City of Lethbridge shall:

- ~ Supply and install the meters.

Single- Phase Network Commercial Service Metering – Multiple Meter Installations

These are commercial services where the service disconnect rating does not exceed 200 amps and metering shall be on the load side of the service disconnect.

The meters shall be mounted:

- 1) Grouped together in an approved area, as close as possible to main disconnect.
- 2) Identified by address or unit number with a permanent legible label.
- 3) At a height of 1.5 to 1.8 M.

The customer shall:

- ~ Supply and install approved meter sockets.
- ~ Supply and install all the service entrance equipment.

City of Lethbridge shall:

- ~ Supply and install the meter.

Single- Phase Commercial Service Metering – Instrument Transformer Metering Installations

These are commercial services where the service disconnect exceeds a rating of 200 amps. The meter shall be mounted in an approved area. The instrument transformer and meter enclosure shall be located indoors in the same room, with no more than 7m of conduit separating them. Metering shall be on the load side of the disconnect switch, adjacent to the switch.

The main service and instrument transformer enclosure must have provision for City of Lethbridge padlocks or seals.

The customer shall:

- ~ Supply and install a four-jaw meter socket as specified in table 2.
- ~ Supply and install an instrument transformer enclosure as specified in table 3.
- ~ Supply and install all the service entrance equipment.

City of Lethbridge shall:

- ~ Supply and install secondary wiring.
- ~ Supply and install the meter.

Three- Phase Commercial Service Metering – Self-Contained Metering

These are commercial services where the service disconnect rating does not exceed 200 amps. Meter shall be on the load side of service disconnect and mounted at a height of 1.5-1.8M.

Service disconnect must have provisions for City of Lethbridge padlocks or seals.

The customer shall:

- ~ Supply and install an approved meter socket.
- ~ Supply and install all service entrance equipment.

City of Lethbridge shall:

- ~ Supply and install the meter.

Three- Phase Commercial Service Metering – Instrument Transformer Metering Installations

These are services where the service disconnect rating exceeds 200 amps. Metering shall be on the load side of the customer's breaker. Meters and instrument transformer enclosure shall be located in the same room inside the building as the main disconnect panel, with no more than 7m of conduit separating them (See Figure 3 for sample layout)

Service disconnect must have provisions for City of Lethbridge padlocks or seals.

The customer shall:

- ~ Supply and install a 13-jaw meter socket as specified in table 2.
- ~ Supply and install an instrument transformer enclosure as specified in table 3.
- ~ Be responsible to make the primary connections to the instrument transformers.

Note: *Where the customer's peak load will be above 150 kVA the customer may be required to supply and install a 16mm conduit complete with 4 pair Category 5 cable run from the meter enclosure to main telecom panel. Check with the City of Lethbridge metering department for confirmation.*

City of Lethbridge shall:

- ~ Install the secondary wiring.
- ~ Make all the secondary connections.
- ~ Supply and install the meter.

Three- Phase Commercial or Industrial Service Metering – Primary Metering:

High voltage main service switchgear incorporating metering equipment must be constructed so that all instrument transformers required for the metering are readily accessible and installed in a separate non-interlocked compartment which is reserved for utility use only. Barriers are required between all sections of the equipment, including metered and unmetered conductors and sections reserved for the customer and City of Lethbridge.

High voltage main service switchgear shop drawings and a single line diagram with metering point clearly marked must be submitted for acceptance as soon as completed in order that City of Lethbridge can order any necessary equipment to complete metering arrangements without delay.

Supply of Instrument Transformer Metering Equipment

The customer is required to supply:

- 1) A meter enclosure according to specifications shown in table 2.
- 2) A section of high voltage main service switchgear for installation of instrument transformers that is acceptable to City of Lethbridge.
- 3) A 35 mm conduit between the instrument transformer compartment and the meter enclosure (7metre maximum).
- 4) All hardware, buswork, termination and/or cable required for primary connections to the current transformers.
- 5) 19 mm plywood if mounting metering enclosure outside of switchgear.
- 6) For single meter installations supply and install a 16 mm conduit complete with 4 pair Category 5 cable run from meter enclosure to main telecom panel. Check with the City of Lethbridge metering department for confirmation.

In addition at sites with preferred/alternate feeders the customer is required to supply:

- 1) A 61 x 61 x 25 cm auxiliary panel. This panel shall be equipped with a vertically hinged lockable door and be made of a minimum 14-gauge metal. Located adjacent to and between the meter enclosures.
- 2) A conduit run from this panel, complete with 4 pair. Cat 5 cable, to the main telecom panel (conduit run from meter to telecom panel is not required).
- 3) 27 mm conduit run from this panel to both meter enclosures.
- 4) A duplex receptacle supplied by a dedicated circuit in the panel.

City of Lethbridge will supply:

- 1) Revenue meters.
- 2) Instrument transformers (current and potential).
- 3) Secondary wiring.

The instrument transformers are available to the customer for installation at the City of Lethbridge. For any requirements above 600A, please contact the city for information on individual mounting and CT type required (bar or window).

Mounting of Instrument Metering Equipment

The customer is required to mount:

- 1) A meter enclosure.
- 2) All instrument transformers in the instrument transformer compartment.
- 3) A conduit between instrument transformer and meter enclosure.
- 4) For multiple interval metering sites, contact the city metering department.
- 5) For additional communication, conduit, or auxiliary enclosures contact the city metering department.

The customer shall assume the cost of installing the above metering equipment.

The instrument transformers, both current and potential, are to be mounted in the following manner:

- 1) Securely mounted in the instrument transformer compartment. All mounting holes on the instrument transformers must be utilized.
- 2) Instrument transformer's nameplates are clearly visible when the compartment door is open.
- 3) Current transformers shall be positioned with the primary polarity mark toward the source of supply and in an arrangement that will not obstruct access to the secondary terminals.
- 4) Potential transformers shall be connected to the buswork on the line side of the current transformers and shall be of a non-draw out style.

Connection of Instrument Metering Equipment

The customer is responsible to make all the connections to the instrument transformer primaries. These connections should be properly secured and conductors shall be shaped or formed and supported so that no tension is applied to the current transformers.

City of Lethbridge will make all the connections to current and potential transformer secondary, testing switch, and the meters.

Meter Enclosure

A separate meter enclosure is required for each instrument transformer service. This enclosure is a manufacturer pre-wired meter enclosure including a 13-jaw meter socket, a test switch and wiring from the test switch to the socket. Meter enclosure specifications are shown in table 2.

Location - Meter enclosures should be located:

- 1) In a clean readily accessible area that is satisfactory to City of Lethbridge.
- 2) In the high voltage room within a maximum of 7 m conduit from the instrument transformer compartment.
- 3) To conform to all other requirements.
- 4) In such an area as to maintain a 1 m clear zone around the enclosure to facilitate the mounting of any other auxiliary panels that might be required for auxiliary metering equipment or load management equipment.

If the arrangement specified above is impractical, consult with the City of Lethbridge for other arrangements.

Mounting - Meter enclosures shall be mounted:

- 1) With the center line of the enclosure 1 m to 1.8 m above the floor.
- 2) Level on both the horizontal and vertical planes.
- 3) Free of severe or continual vibration.

Grounding - Each meter enclosure must be bonded.

For outdoor high voltage main service switchgear installation, the instrument transformer compartment and meter enclosure must be of weather proof.

Instrument Transformer Enclosure

A separate non-interlocked compartment in the high voltage main service switchgear is required for each instrument transformer service. The size of such switchgear shall meet CSA standards. The switchgear requires hinged doors over all live electrical equipment. The door of the instrument transformer compartment shall be equipped with a latch and have provisions for securing the door with City of Lethbridge padlock or seal.

Conduit Requirements

A metal conduit, of 35 mm minimum diameter and a maximum length of 7 m, is required between the current transformer enclosure and meter enclosure. This conduit shall be terminated with lock nuts and bushings except where threaded hubs are supplied. The conduit must be a continuous run.

The conduit is for the exclusive use of City of Lethbridge. When it is necessary to route revenue metering secondary wires through compartments other than those reserved for City of Lethbridge's use, a suitable conduit or raceway shall be installed through each compartment for the exclusive use of City of Lethbridge.

Interval Metering Requirements

Where the distribution tariff requires the use of an interval meter, typically above 300 kVA, or if a customer requests, a meter that is capable of remote interrogation will be installed. To allow for automatic meter reading, an auxiliary PVC enclosure measuring 10" x 12" x 6" (preferably Hamond #PJ12106RT, hinged lockable door with back plate) shall be installed beside the meter enclosure with a 1½" nipple, close to the bottom of each cabinet and between cabinets. The customer shall install a 120V receptacle in the top left or top right corner of this cabinet to accommodate communication equipment.

City of Lethbridge will cover the cost of the interval meter and any auxiliary communication equipment where required by the distribution tariff. Otherwise, the customer shall assume the cost of the interval metering upgrade, auxiliary closure and power supply installation. Please call the City of Lethbridge metering department for details, as these requirements may change depending on the situation.

Use of Metering Signals for Customer Load Management System

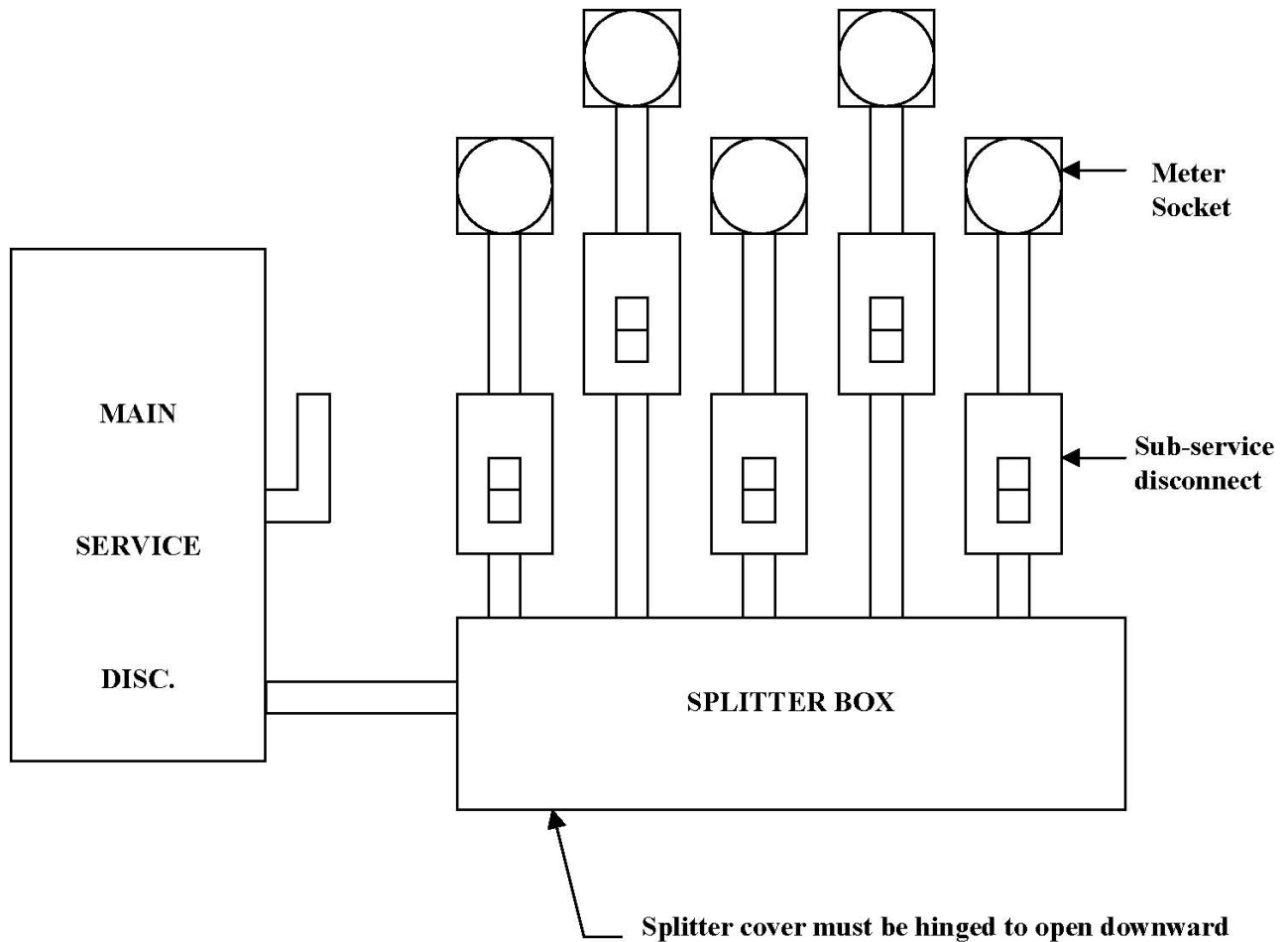
City of Lethbridge may provide metering signals to customers, commonly within the commercial and industrial rate classes, for their load management system upon receipt of a written request. In those circumstances where the metering signal is not an integral part of the customer's existing metering installation, City of Lethbridge may make necessary installation change and/or upgrade to provide metering signals to the customer. The customer may be required to provide a 120-volt AC power supply with a duplex receptacle.

Any required auxiliary metering equipment necessary shall be electrically isolated from City of Lethbridge revenue metering facilities. City of Lethbridge will maintain its metering installation during normal working hours. However, City of Lethbridge accepts no liability for the operation of customer's auxiliary metering equipment and continuity of such signals.

The City of Lethbridge assumes no responsibility for the accuracy of the pulse information.

The customer shall assume all incremental costs incurred by City of Lethbridge in order for the provision of metering signals and maintenance of such equipment, including auxiliary metering equipment.

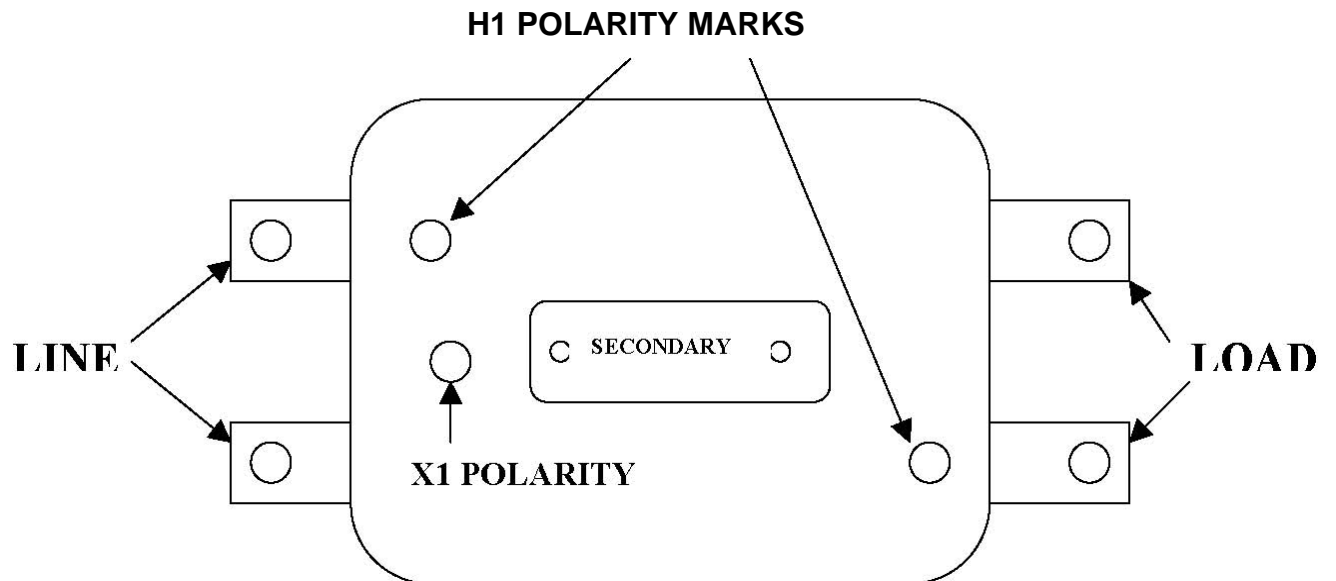
Figure 1
Multiple Meter Installation



- All meter sockets and sub-service disconnects must be identified by address and or unit number with a permanent legible label.
- Meter sockets must be mounted between 0.65 metres to 1.8 metres from the floor.
- Main service disconnect, splitter box, and sub-service disconnects must have provision for City of Lethbridge padlocks or seals.

Figure 2

Single phase transformer rated CT connection



- CONNECT THE IN-COMING SUPPLY TO THE LINE SIDE TERMINALS

Figure 3

Preferred Instrument Transformer Metering Layout
Commercial Three Phase Service

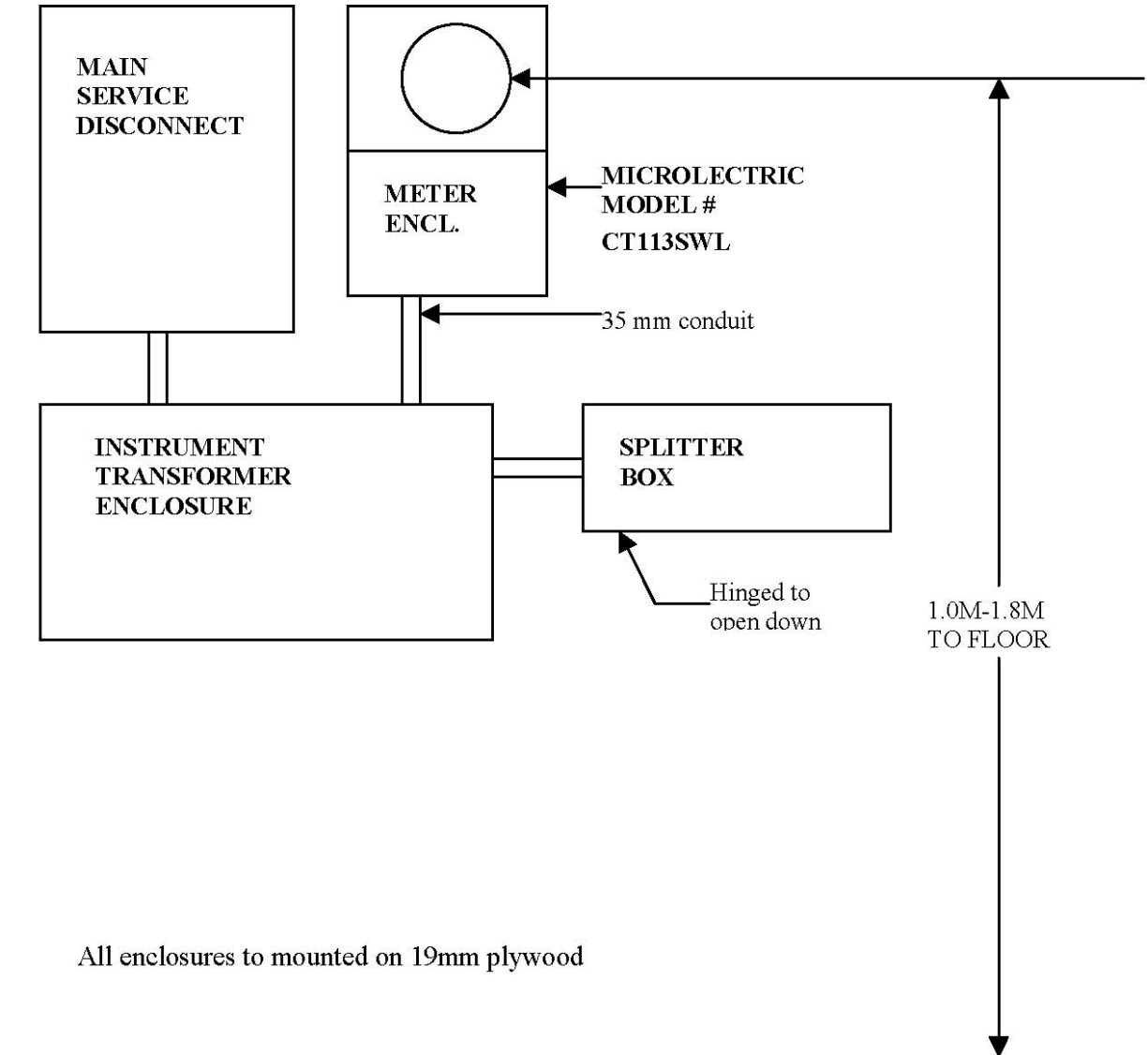
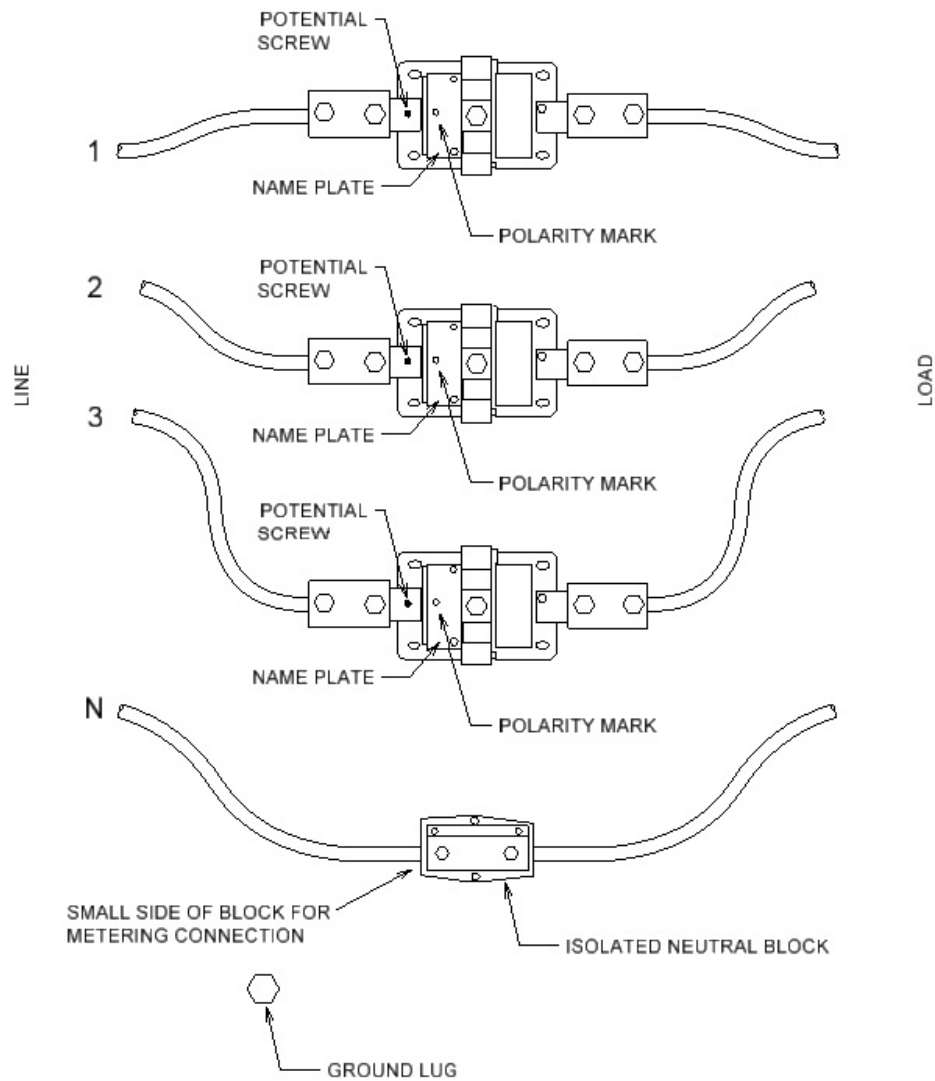


Figure 4
Three Phase CT Layout



Notes:

1. The neutral conductor must be run into the instrument transformer enclosure. The customer must install an isolated neutral block to facilitate connection of the potential wire for metering.
2. If load and line are reversed, the CT's must be reversed so that the polarity marks are always on the line side.
3. The isolated neutral block must be insulated from the enclosure and cannot be grounded.
4. Where parallel conductors are used for greater ampacity, only one neutral conductor need be connected to the isolated neutral block.