



CITY OF  
*Lethbridge*

**City of Lethbridge  
ELECTRIC UTILITY**

**2021 TECHNICAL TERMS and CONDITIONS for  
DISTRIBUTION WIRES ACCESS.**

Contact information:

City of Lethbridge Electric Utility (LEU) Infrastructure  
Services, City of Lethbridge  
910 4<sup>th</sup> Ave. S.  
Lethbridge, AB. T1J 0P6  
Phone: 311  
Email: electricdesign@lethbridge.ca

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## Forward

**Introduction** The “Technical Terms and Conditions for Distribution Wires Access” is a technical document outlining the terms and conditions for wires access for the distribution system. Terms used in this document have similar meanings as defined in the Terms and Conditions for Consumer Services.

The City of Lethbridge Electric Utility (LEU) is responsible for planning, designing and engineering the Distribution line extensions using LEU’s standards for material, design and construction.

These Customer Terms and Conditions govern the relationship between LEU and the Customers that require a service connection to LEU’s Electric Distribution System or other Services. These Customer Terms and Conditions will also govern the relationship between LEU and a Retailer or another person whom the Customer has assigned to act on its behalf in its dealing with LEU regarding the provision of electric distribution service

**Standards** LEU’s construction standards comply with the Alberta Electrical Utility Code under the Alberta Safety Codes Act.

**Information** This document is an outline of the terms and conditions that must be met to connect to the Distribution System. For more detail and answers to any questions, please contact 311.

## **Section One: Making an Application for New Services, Upgrades or Changes**

### **A. Written Notice**

Lead time required to review and order any required equipment requires a customer give LEU reasonable written notice of any changes in service requirements, including any significant change in load.

#### **Failure to give written notice**

If a customer does not give written notice nor obtains written approval from LEU for any additions or changes in load or location, the customer will be liable for any damage to LEU equipment caused by the addition or changed installation.

### **B. Submission of Information**

To enable LEU to start the planning process, the information in the list below is required. Typically, the process will take five to seven weeks but special or unusual equipment requirements may take longer.

#### **1. A declaration of load characteristics, which includes the following information:**

- the kVA load (peak demand and normal operating);
- main breaker size;
- the type and loading of electrical equipment such as large motors, arc furnaces, any harmonic producing loads, UPS or generation facilities, etc.;
- load profiles such as maximum, duration, or peak load;
- preferred voltage (for more information see “3. Maximum Service Size” on page 11);
- whether the service is single or three phase; ▪ the details of grounding; ▪ the protection settings.

#### **2. The date of required connection.**

#### **3. Is there an overhead or underground preference?**

#### **4. Submission of drawings.**

### **C. Drawing Requirements**

All of the drawings that are submitted, where applicable, must be fully dimensioned and scaled. Where non-standard installation is proposed, please make sure the submitted drawings are stamped and signed by a professional engineer.

**1. Residential development**

When the customer is a residential developer, the customer is required to submit a complete set of approved engineering drawings and a complete set of legal and design files in an electronic format using pdf/AutoCAD software. The following information is required:

a) Drawings

- an easement plan;
- deep utility plans;
- sidewalk cover sheet;
- overland drainage plan;
- driveway plan;
- grade plan;
- electrical surface equipment layout plan;
- authenticated street light design.
- location of power poles, guy wires, communication surface facilities

b) Agreements

- Signed *Underground Electrical Distribution Installation Agreement* – not required for infills.

**2. Commercial or Industrial development**

The customer is required to submit a complete set of approved engineering plans and electrical details as follows:

- engineering site plan with legal property description showing all buildings on the property;
- street designations and municipal address;
- location of service entrance, switchgear, meter centers and other utilities (power poles, guy wires, gas, communications, sewer, water, etc.);
- property boundary designations and dimensions of building to the property lines;
- a single line diagram showing the following five items.
  - a. The size of the main disconnect or bus.
  - b. The size, type and number of service conductors.
  - c. All of the provisions for metering.
  - d. A load summary or anticipated peak demand.
  - e. The power quality control equipment.

**D. Acceptance of Drawings**

To ensure the distribution system is maintained at a consistent high standard, all consultants and contractors must obtain the acceptance of their plans including the location of the service conductors from LEU. Additional requirements are as follows:

- submit one set of completed drawings to LEU for secondary voltage services; and
- submit a set of shop drawings for the switchgear to LEU for primary voltage service.

**E. Environmental Information**

Environmental issues and the safety of its employees are important to LEU. To prevent any accidents that may put the health of its employees at risk or create environmental concerns, the customer is required to supply LEU information regarding potential or actual contamination, waste or hazardous materials or other adverse environmental conditions on the customer's premises on or near where LEU facilities are to be located. The customer has a continuing obligation to provide LEU with copies of all environmental assessments relating to the premises.

**F. Site Conditions**

All cable routes must be within 150mm of final grade and free from obstruction before the electrical installation can begin. Where a padmounted transformer is to be installed by LEU, the Developer or their agent must supply survey of final site grading.

LEU's 3 phase padmounted transformer pad is designed to sit on average sub-soil material with bearing strength of 200 kPa. LEU must be informed of any poor sub-soil material on site (e.g., slough, loose material, soft clay, etc.) that may cause uneven settlement to the transformer; otherwise, the customer will be responsible for all expenses incurred to rectify any problem that develops.

**G. Protection Equipment Information**

**1. Fault level considerations**

The short circuit rating of the customer's equipment at the connection point should be not less than the design fault level of LEU's distribution system to which it is connected. LEU will provide the fault level at the customer's connection point upon request.

**2. Customer relaying and protection**

It is the customer's responsibility to provide suitable protective equipment such as fuses, circuit breakers and relays, adequate to protect their equipment against phase failure, low voltage or high voltage, and the maximum available short circuit level of the system at the point of supply. Short circuit levels and relevant protection characteristics for the installation are available from LEU upon request.

The customer will demonstrate to LEU that the customer's protective devices shall coordinate with LEU's protective equipment. Under no circumstances will the customer's load be permitted to adversely affect other LEU customers or LEU's distribution system. It is the customer's responsibility to commission the service entrance equipment. To ensure the safety of its employees and LEU equipment, LEU reserves the right to observe the commissioning test. LEU also requires a commissioning report certified by a certified professional engineer.

**H. Customer's Equipment**

All of the customer's electrical equipment must be Canadian Standards Association (CSA) approved and have a completed inspected by the Code Part 1 inspection authorities.



**I. Easements & Rights-Of-Way**

Utility rights of way are a requirement of electrical servicing when LEU must cross over, under or across a titled property other than the property that requires servicing. When utility rights of way are required, the property owner whose property would be encumbered must be in agreement to the rights of way before LEU can proceed.

**1. Customer's land**

The customer shall grant to LEU such easements or rights-of-way, in perpetuity, for erecting and maintaining its extension, or extensions, on, over, or under the land of the customer, as may be necessary to complete and maintain any such extension or extensions, and any further continuations or branch extensions as LEU may require to enable it to supply and service other customers.

**2. Intervening land**

The customer is responsible for the granting of and delivery to LEU, free from cost, permanent easements, or rights-of-way, from the owners of intervening private property, on, over, or under whose property it is necessary to extend in order to supply and service the customer.

**3. Procurement by customer**

Customers applying for the construction of an extension may be required to secure to, and for LEU, all necessary and convenient rights-of-way and to pay any associated costs.

**4. Delays**

Applications for a service that is to be constructed where LEU does not hold an easement or rights-of-way, may be delayed while a satisfactory right-of-way or easement is obtained.

Requirements of easements and rights-of-way shall be in accordance of the Subdivision Approval.

**J. Permits and Licenses**

The customer's electrical installation must conform to all relevant and applicable legislation. The customer or the customer's representative must provide to LEU all of the necessary permits, licenses and authorizations prior to commencement of service or any change of service requirements at any connection point. At any time before or after commencing the supply of electrical services, LEU may inspect the customer's installation, but is not under an obligation to do so. Such inspection shall not relieve the customer from its responsibility in respect of its wiring or electrical equipment.

**K. Customers selling to the Power Pool**

All customers intending to sell electricity into the Power Pool should refer to *LEU Generator Interconnection Guidelines*.

**L. New Connections, Service Upgrades**

New connections or service upgrades will only be made after:

- the customer's electrical installation meets or exceeds the criteria outlined in this document;
- an electrical permit and Site ID have been obtained;
- the customer's electrical installation has been approved by LEU's Planning & Building Department or other responsible authorities; and
- the customer's account has been confirmed to be in good standing.

**Section Two: Access to LEU Facilities**

**A. Right to enter property**

In order to keep the distribution system running efficiently, LEU's employees or agents must reserve the right to enter a customer's property at any reasonable time, for the purpose of installing, maintaining, monitoring or removing LEU facilities.

**B. Reasonable access**

The customer must also provide LEU with reasonable access to all LEU facilities located on the customer's property. This includes all transformers, switches and any other facilities owned, leased or operated by LEU.

In all agreements between the customer and LEU regarding the management of vegetation, the customer is asked to give LEU permission to manage vegetation on the property owned or controlled by the customer and the right to maintain proper clearances in accordance with the Alberta Electrical Utility Code. LEU will make every effort to notify the customer before such work is performed.

In order to provide safe operating conditions, it is important that a customer does not place any structures that would interfere with the proper and safe operation of LEU facilities or which would adversely affect compliance with any applicable legislation.

Please consult the Metering Guidelines for more details.

## Section Three: Conditions of Service

### A. Number of Services

The limitation on the number of services permitted to a building or a piece of land are determined as follows:

- the number of services per building shall be as permitted in the Canadian Electrical Code; and
- one voltage level shall be selected from the voltages available in the area to best suit the customer's requirements.

### B. Service Locations

To ensure the maintenance of a high quality of electrical utility service and keep costs down, LEU must approve the proposed location of any service lines and service entrances before construction commences.

### C. Maximum Service Size

#### 1. Residential secondary metered service

Table 1 Max size - Residential Secondary Metered Services

<b>Residential Secondary Metered Services</b>		
Service Voltage	Max. Size of Overhead Services permitted.	Max. Size of Underground Services permitted.
120/240V, 1 phase, 3 wire	200 A single house	400 A single house or 400 A apartment building.
208/120V, 3 phase, 4 wire	*Special permission only*	*Special permission only*

#### 2. Commercial Secondary Metered Service

Table 2 Commercial Secondary Metered Service

	<b>Commercial Secondary Metered Services</b>	
<b>Service Voltage</b>	<b>Max Size of Overhead Services Permitted</b>	<b>Max Size of Underground Services Permitted</b>
<b>120/240V – 1 phase, 3 wire</b>	<b>200A</b>	<b>400A *special permission only*</b>
<b>208/120V – 3 phase, 4 wire</b>	<b>400A</b>	<b>1500A</b>
<b>208/120V – 3 phase, 3 wire</b>	<b>*special permission only*</b>	<b>Not Available</b>
<b>480/277V – 3 phase, 4 wire</b>	<b>Not available</b>	<b>Available with long lead times</b>
<b>600/347V – 3 phase, 4 wire</b>	<b>Not Available</b>	<b>Please See Distribution Engineering</b>

#### 3. Commercial Primary Metered Service.

Table 3Max size - Commercial Primary Metered Services

<b>Commercial Primary Metered Services</b>		
Service Voltage	Max. Size of Overhead Services permitted.	Max. Size of Underground Services permitted.
13.8 kV, 3 phase, 4 wire	Not available.	Please see Distribution Engineering

**3. Unmetered Service.**

LEU allows unmetered secondary distribution connections in extremely isolated instances. LEU only allows unmetered sites where the service is small (less than 1 kW) and has a consistent and predictable energy load and is subject to LEU discretion. Meeting these conditions does not guarantee that LEU will allow a service to be unmetered. LEU does not invest in the installation of distribution facilities for unmetered services.

The following process is required by anyone wishing to connect an unmetered site to the LEU system.

1. The project developer shall contact the LEU distribution planning department to discuss whether or not the proposed site qualifies as an unmetered site.
2. The developer of the site will be required to provide the electric distribution planning department with the following information: location of the service, voltage, load (kW) indicating a list of devices connected at the site, a declaration of intended use, and a declaration of control device installation.
3. The developer is required to install a meter base on all unmetered sites for future metering if required by the city.

**D. Sensitive and Special Loads**

Special and specific requirements may apply to certain loads. Some examples of these requirements are as follows:

- For computer loads, customers must install their own motor generator-set, U.P.S., or other equipment that may be necessary for voltage stabilization and reliability.
- A separate service may be considered for special voltage sensitive loads such as x-ray units. Only the voltage sensitive loads can be considered for a second service; normal building loads must always be served by the normal building service.

**E. Meter Services**

**1. Installation of Meters**

LEU, or its agent, shall install and seal one or more meters for the purpose of measuring the energy delivered to a customer. Time of use or interval meters shall be installed for a customer who has a connected load equal to or exceeding 300 kVA.

For new customers moving into existing space, LEU will make an estimate of site demand, and if the estimate is greater than or equal to 300 kVA, an interval meter will be

installed. For an existing site where modifications are made to the infrastructure requiring the load to be equal to or in excess of 300 kVA, an interval meter will be installed. In these cases, the costs of the new interval meter, including installation, will be borne by LEU.

## **2. Responsibility of Customer**

Each customer shall provide and install a meter socket or meter enclosure and other approved and required facilities suitable for the installation of meter or metering equipment in accordance with LEU's current Metering Guide.

### **1. Location**

LEU, based on the type of service requested and convenience of access to the meter, shall designate meter locations. Where a meter is installed on a customer-owned pole, the pole shall be provided and maintained by the customer as required by the Canadian Electric Code and any other applicable statutes, regulations, standards and codes.

### **2. Access to Metering Equipment**

LEU or its agent, may, at any reasonable time, read, inspect, remove and test its meter equipment installed on property owned or controlled by the customer. LEU's employees, agents and other representatives shall have the right to enter property owned, occupied or controlled by a customer at all reasonable times and intervals for the purpose of installing, maintaining, replacing, testing, monitoring, reading or removing equipment and appliances or other facilities or of discontinuing service or for any other purpose incidental to the provision of consumer services and the customer shall not prevent or hinder entry.

An eligible retailer will provide customer site specific data to LEU or its agent for each site it provides services. Such data will include:

- Retailer name, identification and contact information;
- LWSP meter number; and
- Customer Site identification number and contact information.

## **F. Off-Cycle Meter Read or Meter Testing**

LEU or its agent will test any meter provided by LEU or its agent at the request of the customer subject to the charges set out in the Fee Schedule which forms part of the Distribution Access Tariff. If a customer suspects that its meter may be malfunctioning, the customer may request that their retailer arrange for an off-cycle meter read and/or testing of the meter. If the retailer determines an off-cycle read or test of the meter is warranted the retailer may request that LEU or its agent test the meter. LEU or its agent will test any meter at the request of the retailer subject to the charges set out in the retail Access Services Fee Schedule which forms part of the Distribution Access Tariff. If LEU or its agent determines the meter is operating outside tolerances specified by Measurement Canada, the cost of testing and replacement will be borne by LEU or its agent.

## 5. Changes to Metering

LEU or its agent may at any time change any meter it installed.

Should a customer request a new meter and/or a communication device be attached to the existing meter, the request shall be made in accordance with the provisions set out in section one. LEU or its agent shall provide, install, test, and maintain the requested metering and/or communication device. The customer shall bear all cost incurred by LEU in providing and installing the meter and/or attaching the communication device including any annual cost associated with maintenance or meter reading services. LEU or its agent shall complete installation of the meter or attachment of the communication device, if reasonably possible, within 30 days of receiving a request from the customer. LEU or its agent shall invoice the customer upon installation.

### G. Guidelines for Connecting Generators to LEU Distribution System

Any customer who has a facility designed to allow any kind of electric generator to operate in parallel with LEU's system must follow, and fulfill the requirements outlined in "*Generator Interconnection Standards*" found in the City of Lethbridge Electric Utility Webpage. Parallel operation occurs whenever an electrical path (connection) exists between the generator's terminals and LEU's connection point, regardless of the number of cycles the parallel operation occurs.

### H. Power Quality

A customer cannot use the electric service in such a manner as to cause power quality problems on LEU's system, such as undue interference with another customer's service or undue stress on LEU's system equipment. Undue interference may include excessive harmonic distortion, voltage fluctuations or frequency deviations. A customer who causes power quality problems on LEU's system is responsible to take whatever action is required to correct these problems, at the customer's expense and to LEU's satisfaction.

All customers connected to LEU system are responsible for adhering to Engineering requirements that meet the requirements cited below. These limits help to protect LEU customers from undue interference from other customers' electrical equipment. Electric service may be disconnected if a customer's facilities are operated in a way that causes these limits to be exceeded and results in power quality problems on LEU's system or to adjacent to LEU customers. The LEU employs System Voltage Regulation so voltage regulation can be impacted as a result. Please consult with LEU Design and Engineering for more details.

- CAN/CSA C235:19 Preferred Voltage Levels for AC systems up to 50,000V
- IEEE 519-2014, IEEE Recommended Practices and Requirements for Harmonic Control.
- CAN/CSA-C61000-3-6:18, Electromagnetic Compatibility (EMC) Part 3-6: Limits – Assessment of Emission Limits for the Connection of Distorting Installations to MV, HV and EHV Power Systems
- CAN/CSA-C22.3 No.3-98 Reaffirmed 2007, Electrical Coordination

- IEEE 776-2018, IEEE Recommended Practice for Inductive Coordination of Electric Supply and Communication Lines
- CAN/CSA C61000-3-7: 17, Electromagnetic Compatibility (EMC) Part 3-7: Limits - Assessment of emission limits for fluctuating loads in MV and HV Power Systems – Basic EMC publication
- IEC 61000-4-15: 2010, Electromagnetic Compatibility (EMC) Part 4-15: Testing and Measurement Techniques – Flickermeter – Functional and design specifications
- IEEE Std 1453-2015, IEEE Recommended Practice for Measurement and Limits of Voltage Fluctuations and Associated Light Flicker on AC Power Systems
- CSA 22.3 No. 9:20, Interconnection of distributed energy resources and electricity supply systems
- IEEE Std 1547-2018, IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces

In the event a more recent revision is available for the above standards, the more recent standard will take precedence. For additional information please see the *City of Lethbridge Electric Utility Power Quality Specifications*.

**I. Protection Coordination**

The customer is responsible for providing suitable protective equipment which will isolate the customer's system for faults on the customer's equipment. This protection must coordinate with LEU's system protection to ensure that the customer's system is isolated before LEU's protection operates.

**J. Motors - Limitation of Size on Single Phase**

Individual motors of 5 horsepower or more shall not be allowed on a single-phase service.

**K. System Load Balance**

Customers shall provide and maintain, in an approved condition, a wiring distribution system so designed and operated that proper phase balance shall be maintained on LEU's system.

**L. Impedance Grounded Systems**

LEU shall approve the installation of impedance grounding systems. If approved, the installation must conform to all relevant and applicable legislation and Alberta Electric Utility Code as well as any LEU requirements.

**M. Overvoltage**

Customers with shunt compensation or harmonic filters must ensure that these devices do not cause overvoltage conditions on LEU's system.

**N. General Rules - Service Installation Route**

**1. LEU determine route.**

LEU determines the best route for all service installation along public thoroughfares and easements provided by the customer and may determine the route of a service installation made on private property. If the applicant requests a route different than that determined

by LEU, LEU will provide, if possible, the service installation along the requested route if the applicant agrees to pay all additional costs including any additional operating and maintenance costs resulting from the use of that route. LEU cannot fulfill the customer's request for a different route if the requested route is contrary to LEU's standards and practices.

**2. LEU Ownership**

LEU owns, operates, and maintains all facilities to the line of demarcation.

**O. Alternate Service**

**1. Dedicated alternate service**

The definition of a dedicated alternate service is, "The utility's capability to supply a specified level of capacity or all of a customer's electrical requirements from a feeder other than one which is the usual supply."

Transfer to the alternate may be automatic, or manual switching performed by the customer; LEU should not be required to do any construction work or dispatch any personnel to the field or the customer's premises to transfer the customer to the alternate. An alternate service does not imply guaranteed service or 100% reliability.

**2. Non-dedicated service**

The definition of a non-dedicated service is, "The utility's capability to serve an unspecified level of capacity up to all of a customer's electrical requirements from a feeder other than the one which is the usual supply."

At this time, *LEU* staff must perform transfer to the alternate service. This alternate service does not imply any particular level of guaranteed service or 100% reliability.

**3. Alternate service**

Alternate service is an electric service to a customer from an electrically independent primary voltage circuit, which provides a second path of supply in the event of the failure of the first electrically independent circuit. Alternate service facilities include, but are not limited to, the substation and distribution line capacity reserved for the customer's exclusive use, plus any additional metering or switching equipment required which is beyond LEU's normal responsibility.

LEU will provide alternate service at the request of a customer who demonstrates a requirement for a higher than normal degree of service continuity. LEU will maintain the alternate service to the best of its ability consistent with the need to operate and maintain its overall distribution system. Any alternate service will be provided only under a contract between LEU and a customer and at the sole cost of the customer.

Alternate service contracts include, without limitation, the following:

- The customer's alternate service kVA demand requirement and the period of time for which alternate service is required.



- The design and arrangement of both the preferred and alternate circuits will be at the option of LEU. The customer shall install and maintain an approved primary voltage transfer switch. The characteristics, arrangement, and operation of such switch and the associated circuits shall be subject to LEU's approval.

**P. Line Extensions**

**1. Definitions of applicant**

Applicant in this section means a person or public or private entity seeking one of the following:

- a) a line extension to serve new construction; and/or
- b) a line extension to obtain additional capacity or change in service conditions from existing distribution facilities.

**2. Line extension**

A line extension is defined as being an installation of a new or additional distribution facilities from a point on LEU's existing distribution system which is adequate to serve the applicant's needs to a connection point as determined by LEU.

**3. Distribution facilities**

Distribution facilities are all structures and devices needed to distribute energy at any of the primary or secondary voltages provided by LEU. Distribution facilities must be installed in accordance with applicable laws, codes, and LEU standards and practices.

**4. Line extension cost**

The line extension cost will include all costs outlined in the LEU Investment Policy for new servicing, LEU indirect charges and any relocation or rearrangement of existing distribution facilities. Line extension cost does not include payments to a third party for easements or rights-of-way.

**5. General**

ROUTE: LEU will determine the route of all line extensions. If an applicant requests a different route than that determined by LEU, LEU may provide service along the requested route if the applicant pays LEU all additional costs resulting from the use of that route and the requested route is not contrary to LEU standards and practices.

RESPONSIBILITY FOR COSTS: Applicants are responsible for all line extension costs as outlined in the LEU Investment Policy. In addition, any payments to a third party for easements or rights-of-way or other costs will be the responsibility of the applicant. The developer shall pay the actual cost of any relocation or rearrangement of LEU's distribution or the placement of underground facilities within an existing overhead area when requested by the developer.

TEMPORARY FACILITIES: Where LEU reasonably believes that a requested service will be temporary, it may require the customer requesting the service to pay the actual total cost of installation and removal of the service, plus the cost of unsalvageable material. A

customer may be charged an estimated cost for removal of the temporary service when the removal date is unknown.

**Q. A Requested Relocation of Equipment**

The cost for removal or relocation of distribution facilities made at the request of a customer is the responsibility of the customer.

## Section Four: Disconnection and Reconnections of Service

### A. Disconnection

1. To ensure adequate safety, LEU may withhold connection or may disconnect a customer's service without notice if, in its reasonable opinion, there is a danger to life or property.
2. LEU may, without notice, terminate a customer's service where, in the opinion of LEU:
  - i the wiring of the customer's facilities fails to comply with applicable law; or
  - ii the use of the service may cause damage to LEU's facilities or interfere with or disturb service to any other *LEU* customer; or
  - iii there are violations of *Power Quality Specifications and Guidelines*; or
  - iv there are violations of the *Generator Interconnection Guidelines*.
  - v *There are violations of the Metering Guidelines*.
3. LEU will reconnect the service when the safety problem or other violation is resolved.
4. A customer's service may be disconnected for non-payment. See *Terms and Conditions of Electric Services*.

### B. Re-connections

No re-connection (except as provided for), installation, alteration or addition will be permitted by LEU until the proper electrical inspection authority has issued a current permit authorizing the supply of electric energy. However, a current permit for reconnection will not be required where the service has been cut-off for non-payment of bill or a change of occupant provided there have been no alterations or additions subsequent to the issuance of the last current permit.

## Section Five: Service Characteristics

### A. Steady State Voltage Variation Limits

LEU will, within the scope of these terms and conditions, endeavor to maintain the steady state voltage at the service entrance to a level according to the limits presented below.

Note: Steady state is any condition on LEU’s system that lasts for longer than one minute.

The following table is an overview of the recommended voltage variation limits at service entrances as per the most current CSA CAN3-C235.

*Table 4 Steady State Voltage Variation Limits*

Nominal System Voltages		Low Extreme Operating Conditions	Low Normal Operating Conditions	High Normal Operating Conditions	High Extreme Operating Conditions
Single Phase	120/240	106/212	110/220	125/250	127/254
	240	212	220	250	254
	480	424	440	500	508
	600	530	550	625	635
Three Phase 4 – Wire	208/120 Y	190/110	194/112	216/125	220/127
	480/277 Y	424/245	440/254	500/288	508/293
	600/347 Y	530/306	550/318	625/360	635/367

Voltages outside the indicated limits for normal operating conditions but within the indicated limits for extreme operating conditions require improvement or corrective action on a planned and programmed basis, but not necessarily on an emergency basis.

Voltages outside the indicated limits for extreme operating conditions require improvement or corrective action on an emergency basis. The urgency for such action will depend on factors such as location and nature of load or circuit involved, the extent to which limits are exceeded with respect to voltage levels and duration, and other such factors.

Voltages within the indicated limits for normal operating conditions do not require improvement or corrective action.

### B. Reliability / Continuity

#### 1. Service interruption and shortage of supply

LEU will exercise reasonable diligence and care to provide a continuous and sufficient supply of electric energy to the customer, but does not guarantee continuity or sufficiency of supply. LEU will not be liable for interruption or shortage of supply nor for any loss or damage occasioned thereby.

**2. Temporary suspension of service for repairs**

LEU, whenever it shall find it necessary for the purpose of making repairs or improvements to its system, will have the right to suspend temporarily the delivery of electric energy. In all such cases as reasonable notice, as circumstances will permit, will be given to the customer and the making of such repairs or improvements will be performed as rapidly as may be practicable and, if practicable, at such times as will cause the least inconvenience to all customers.

**3. Apportionment of supply during time of shortages**

Should a shortage of electrical energy supply ever occur, LEU will apportion its available supply among its customers as authorized or directed by the Alberta Electric System Operator (AESO). In the absence of an AESO order, the utility will apportion the supply in the manner that appears to it most equitable under the prevailing conditions.

**4. Emergency load control**

Whenever instability or cascading outages could result from actual or expected transmission overloads or other contingencies, or whenever such conditions exist in the system of another company with which LEU's system is interconnected, LEU will take such reasonable steps as the time available permits to maintain system stability. Such steps shall include but are not limited to the reduction or interruption of service to one or more customers.

**C. Restoration Priorities**

During a major outage due to events such as a major storm, LEU has established priorities for service restoration. Restoration procedures are designed to get the greatest number of customers back in service as quickly as possible with special consideration given to critical customers that are essential to public welfare.

LEU will not give priority to any customer, but employ the above process over LEU's service area.

**D. Frequency**

The Alberta Interconnected System operates at a nominal frequency of 60 Hertz (Hz). Frequency deviations on the Alberta system may occur.

**E. Power Quality**

LEU makes every effort to ensure that harmonic distortion levels on its system are within the limits specified in IEEE Standard 519 - IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems and that voltage fluctuations on its system are within the limits specified in "*Power Quality Specification and Guidelines for Customers*".

## **Section Six: Primary Metered Areas**

### **A. Primary Voltage – 13.8 kV**

A customer may be primary metered at their discretion and agreement by the LEU. All primary metered services will utilize a LEU owned metering cabinet according to LEU standards installed at the property line of the customer's property. All primary cables and equipment downstream of this metering cabinet will be the customer's responsibility. Changes required to accommodate primary metering shall be at the customer's expense. The following conditions also apply:

1. Suitable relaying shall co-ordinate with LEU's system. This shall be checked and approved by LEU before relays and equipment are ordered.
2. The customer shall own the distribution transformers and associated equipment.
3. The customer's switchgear shall have an interrupting capability as designated by LEU.

## Section Seven: Ownership Boundary /Line of Demarcation

Based on the distribution systems available for the area and the customer electrical service requirements, one of the following supply methods will be provided to the customer:

- overhead single-phase or three-phase secondary service;
- underground single-phase secondary service;
- underground three-phase secondary service; or
- underground three-phase primary service.

The tables found on the following pages outline the responsibilities of LEU and the customer for each type of service.

The LEU demarcation policy is consistent with the AEUC definitions. Please see the latest STANDATA for more detail.

### A. **Meters, Transformers and Communication Devices**

LEU or its agent will provide, own and maintain any meter or meters, transformer (both potential and current type transformers) and communication devices required in the supply of service of the current characteristics specified by the rate under which the service is provided. The supply of transformers shall be limited to those required for a single standard transformation. Each meter, transformer where installed and communication devices where installed, shall remain the sole property of LEU or its agent, regardless of the degree to which the meter may be affixed to the Customer's premises, or to premises owned, occupied or controlled by the Customer or equipment.

### B. **Ownership and removal**

All equipment supplied by LEU or its agent shall remain its exclusive property, and shall have the right to remove the same from the premises of the customer at any time after the termination of service from whatever cause.

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Table 5 Responsibilities for Supplying Overhead Single or Three Phase Secondary Services

<b>Overhead Single or Three Phase Secondary</b>		
<b>Activity</b>	<b>LEU</b>	<b>Customer</b>
Installing civil structures.	Install temporary service pole at the customer's expense if road crossing is required.	Install temporary service pole on private property, if required.
Installing electrical equipment.	Install service conductors to service head and make connections	Install all necessary electrical equipment to receive service. Make provision for metering installation. The customer will pay installation costs as quoted when application is reviewed. Obtain electrical permit from Electrical Inspection Section of LEU Planning and Building Department or other responsible authority.
Maintaining distribution system.	Repair or replace service conductors as required.  Repair or replace metering equipment, at the customer's expense, as required.	Maintain the service entrance equipment in a safe condition. Repair or replace service pole as required. Maintain proper clearances from <i>LEU</i> facilities. Exercise reasonable care to protect metering equipment.



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Table 6 Responsibilities for Supplying Single-Phase Underground Secondary Services

<b>Underground Single Phase Secondary</b>		
<b>Activity</b>	<b>LEU</b>	<b>Customer</b>
Installing civil structures.	Install pullboxes, transformer pads, switching cubicle pads and primary cable conduits. Install and remove temporary overhead feeder poles.	The installation of ducts on private property. The customer will pay servicing fees as quoted when application is reviewed. Pay estimated costs for skip or infill development and any nonstandard subdivision services. Pay estimated cost for extra services for irrigation, controller, temporary
Installing electrical equipment.	The installation of primary cables, transformers, secondary enclosures, to the corner of the customer's property. For residential services, LEU will preservice secondary cables to the property line. When customer is ready to receive service, LEU will install the service cables to the meter base. (NOTE: Single phase for commercial servicing is only available in limited areas.)	Install all necessary electrical feeders, etc. equipment to receive service. Make provision for metering installation. The customer will pay servicing fees as quoted when application is reviewed. Pay estimated cost for skip or infill development and non-standard subdivision services. Pay estimated cost for irrigation, controller, temporary feeders, etc. Obtain electrical permit from LEU Planning and Building Department
Maintaining distribution system.	Maintains transformer, primary cables and service conductors (residential only) within easement or road allowance. Repairs or replaces metering equipment at the customer's expense.	or other responsible authority. Maintain the service entrance equipment in a safe condition. Maintains service conductors on private property (commercial only) Maintain proper clearances from LEU's facilities so not to interfere with the proper and safe operation of these facilities. Exercise reasonable care to protect metering equipment.

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For residential subdivision developments in LEU, *Underground Electrical Distribution Installation Agreement* will apply.

Table 7 Responsibilities for Supplying Underground Three-Phase Secondary Services

<b>Underground Three Phase Secondary</b>		
<b>Activity</b>	<b>LEU</b>	<b>Customer</b>
Installing civil structures.	The installations of primary cable conduit in road ROW's, pull boxes, transformer pads and switching cubicle pads. Install and remove temporary overhead feeder poles.	Possible installation of slushcrete encased primary conduit on Private Property (when required at LEU's discretion) and secondary conduit from electrical room to the transformer pad or enclosure. The customer will pay servicing fees as quoted when application is reviewed. Pay estimated cost for extra services for irrigation, controller, temporary feeders, etc.
Installing electrical equipment.	The installation of primary cables, switching cubicles, enclosures and transformers. Install temporary overhead feeder pole lines.	Install all necessary electrical <i>equipment</i> to receive service. The installation of secondary cables. The customer will pay servicing fees as quoted when application is reviewed. Pay estimated cost for irrigation, controller, temporary feeders, etc. Make provision for metering installation. Obtain electrical permit from Electrical Inspection section of LEU's Planning and Building Department or other responsible
Maintaining distribution system.	The maintenance of transformers and primary cables. All of the maintenance of pull boxes, transformer pads, and primary conduit. Repairs or replaces metering equipment at the customer's expense as required	Maintain the service entrance authority. equipment in a safe condition. The maintenance of secondary conduits and cables. Maintain proper clearances from <i>LEU</i> facilities. Exercise reasonable care to protect metering equipment.

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Table 8 Responsibilities for Supplying Underground Three-Phase Primary Metered Services

<b>Underground Three Phase Primary Metered</b>		
<b>Activity</b>	<b>LEU</b>	<b>Customer</b>
Installing civil structures.	The installation of pull boxes, switching cubicle and primary metering pads, and primary cable conduit on road ROW's. Temporary O/H feeders	Installs primary voltage switchgear base and all other necessary civil structures. The customer will pay servicing fees as quoted when application is reviewed. Pay estimated cost for temporary
Installing electrical equipment.	The installation of primary cables, primary metering unit, and switching cubicles.	Installs the high voltage switchgear feeder, etc. and all other electrical equipment downstream of the metering unit. The customer will pay servicing fees as quoted when application is reviewed. Pay estimated cost for temporary feeders, etc. Obtain electrical permit from Electrical Inspection section of LEU's Planning and Building Department or other responsible
Maintaining distribution system.	LEU's equipment up to the metering unit.	Maintain the customer owned authority. equipment in a safe condition. Maintain proper clearances from LEU facilities. Exercise reasonable care to protect metering equipment.