

ENMAX POWER CORPORATION



**Requirements
for
Distribution
Wires Access**

December 7, 2016

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Foreword

Introduction

This document outlines the basic procedural and technical requirements that must be met by the customer for ENMAX Power Corporation (EPC) to provide an electrical service connection within the EPC service area (see Figure 1 below), but excluding the downtown network area. This document is supplemental to the ENMAX Power Corporation Distribution Tariff Terms and Conditions which can be found at www.enmax.com. In case of discrepancies, the Distribution Tariff Terms and Conditions document shall prevail.

Definitions/ Acronyms

Customer

The term 'customer' includes developers, consultants, and electrical contractors during the design and construction phases. Once electrical service is established, 'customer' is defined by the Electric Utilities Act as a person purchasing electricity for the person's own use.

AEUC

Alberta Electrical Utility Code

CEC

Canadian Electrical Code

Network Area

For information concerning electrical servicing in the downtown network area, refer to the 'Network Servicing Policies and Guidelines' which can be found at www.enmax.com.

RCN

Replacement Cost New

Standards

EPC construction standards comply with the AEUC under the Alberta Safety Codes Act, CEC, and accepted electrical utility practices.

URW

Utility Right-of-Way

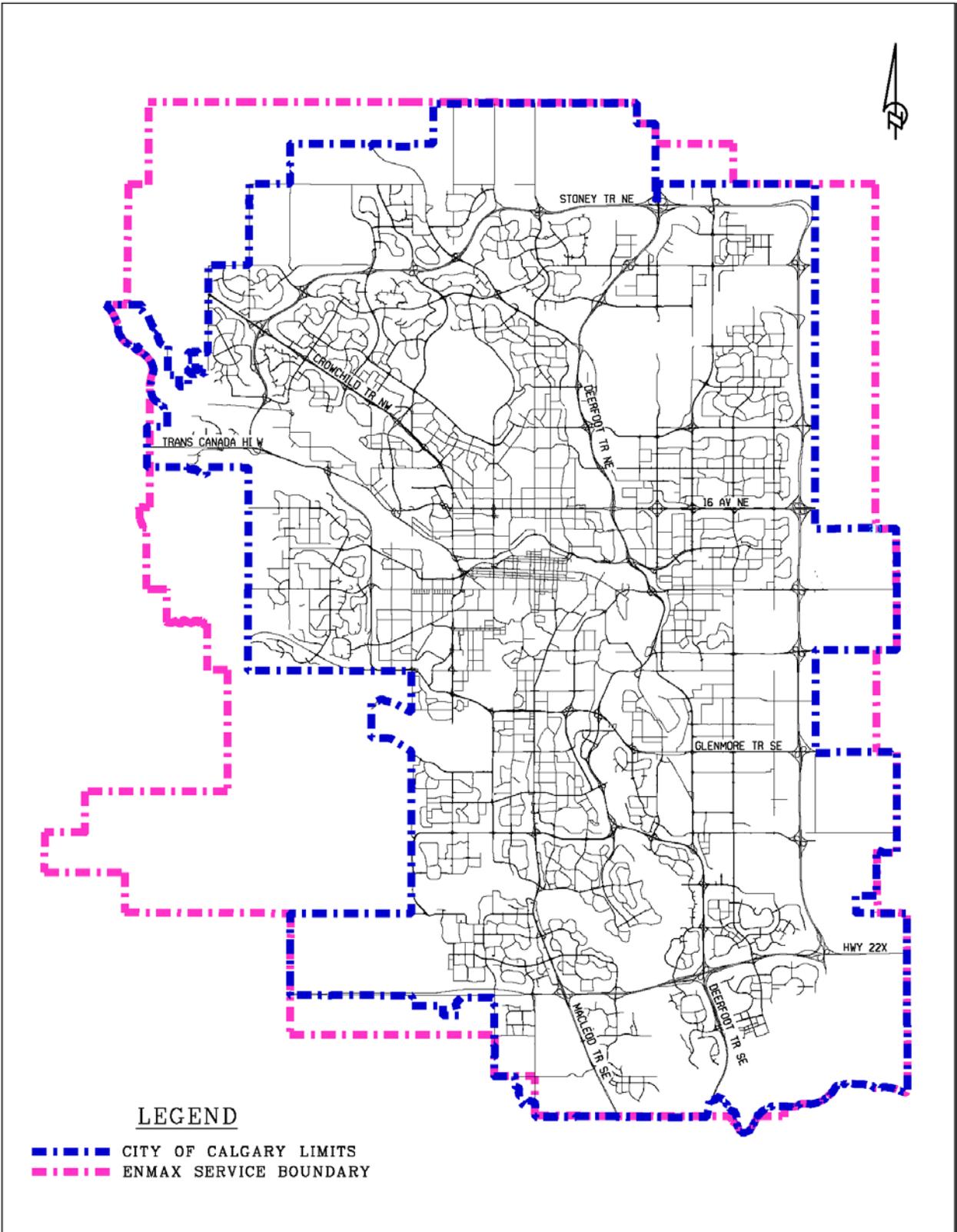


Figure 1 – EPC Service Area

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

Written Notice

A customer must give EPC written notice of any changes in service requirements, including a change in load requiring an ampacity increase to the main breaker or the fuse size for main disconnect.

If a customer neither gives written notice nor obtains written approval from EPC for any additions or changes in load or location, the customer shall be liable for any damage to EPC equipment caused by such additions or changes.

1. New Connections and Service Upgrades

New connections or service upgrades will be provided only after:

- project quotation and a drawing indicating EPC's proposed facilities and location for wires service has been accepted and signed by the customer
- the customer's electrical installation meets the criteria outlined in this document, and the ENMAX Power Corporation Distribution Tariff Terms and Conditions
- an electrical permit has been obtained from City of Calgary Electrical Inspection
- site ID has been obtained, and
- the customer's electrical installation has been approved by City of Calgary Electrical Inspection or other responsible authorities and the customer's account has been confirmed to be in good standing

Where customer owned generation facilities are planned, refer to 'Section Three – 7. Connecting Generators to EPC Distribution System'

2. Joint Use Trenching

The cost of a joint use trench is shared equally amongst all parties utilizing the shared trench for such things as communication, natural gas, electric utilities, and/or customer owned facilities. If a customer requests joint usage of an EPC trench located on private property (e.g. to add communication ducts) and a company/utility chooses not to invest in the duct/trench, the customer is responsible for any additional costs.

3. Submission of Information

To enable EPC to start the design process, the information listed below is required (as applicable):

- in-service date
- type of electrical service installation (overhead or underground)
- metering requirements - primary or secondary metered (see Section Six – Primary Metered Areas)
- secondary voltage and service size (see Section Three - 5. Maximum Service Size)
- electrical single line diagram (including main breaker/fuse size, bus ampacity, metering, etc)
- anticipated maximum demand
- the type and loading of electrical equipment such as large motors, arc furnaces, harmonic producing loads, UPS or generation facilities, and
- submission of drawings (see 4. Drawing Requirements)

4. Drawing Requirements

All of the drawings submitted must be fully dimensioned and to scale where applicable. Drawings must be provided in standard Microstation CAD format (.dgn) in NAD83 coordinate system with 3TM projection.

Note: the drawings submitted to EPC are used for design and construction layout purposes. Any revisions (after the initial submission) to the drawings must be submitted to EPC in a timely manner prior to quotation. EPC will not be responsible for the relocation/alteration of any installed facility resulting from the use of outdated drawings.

Residential Development

To initiate the EPC design process, the customer must provide the following information. Plans must be fully dimensioned and scaled where applicable.

- two copies of the tentative legal plan
- subdivision plan
- easement/right-of-way plan
- deep utility plan
- sidewalk cover sheet
- overland drainage plan
- shallow utilities plan
- driveway plan

- grade plan
- size of the service (100A, 200A, or 400A)
- extra coil length (i.e. more than 25 m) where required, and
- a tentative in-service date

Commercial or Industrial Development

Drawing requirements may vary depending on the type of projects. The typical drawing requirements for commercial or industrial projects are as follows:

- electrical and mechanical site plan
- site grading plan
- drainage plan
- street designation and municipal address
- location of service entrance, switchgear, meter centers and other utilities (gas, communications, sewer, water, etc.)
- property boundary designations, building layout, and dimensions of building to the property lines
- deep utilities
- shallow utilities
- a single line diagram showing the following items:
 - voltage
 - size of the main bus or panel
 - size of the main fuse disconnect or breaker
 - size, type, and number of service conductors
 - metering provisions
 - power quality control equipment
 - generation facilities

5. Acceptance of Drawings

At the time of acceptance of the EPC quotation, the customer must return a signed copy of EPC's design, indicating acceptance of the proposed EPC facility layout. Changes to the scope of work following drawing acceptance may result in a revised quotation to the customer.

6. Payments

The customer shall submit payment as per the terms outlined in the project quotation letter. EPC will make an applicable investment as per EPC's investment policy as outlined in the ENMAX Power Corporation Distribution Tariff Terms and Conditions.

EPC may offer the customer a credit application. If applicable and the customer

meets EPC's credit criteria, a deposit may be requested with the balance of payment due at the completion of construction.

Note that EPC may also request a design deposit from customers to cover preliminary engineering costs incurred in preparation of a customer quotation.

7. Line Assignment

Where new infrastructure is required within road allowance or public property, acceptance and authorization for line assignment must be granted by the appropriate municipality or governing body prior to construction commencing.

8. Permits and Approvals

Prior to the installation of EPC overhead and underground facilities, all project applicable permits and approvals must be obtained by EPC. These may include but are not limited to the following:

- Alberta Transportation
- Alberta Environment
- The City of Calgary Parks and Urban Forestry
- Railway Crossing Agreements (CP, CN, City of Calgary Light Rail Transit)
- Pipeline Crossing Agreements
- Navigable Waters
- Department of Fisheries and Oceans

9. Environmental Information

The customer is required to supply EPC with information regarding potential or actual contamination, waste or hazardous materials, or other adverse environmental conditions on the customer's premises on or near where EPC facilities are to be located. The customer has a continuing obligation to provide EPC (upon request) with copies of all environmental assessments relating to the premises.

The customer must ensure that EPC equipment, such as but not limited to: transformers, switching cubicles, and manholes, is protected from contact when disposal of wastes and deleterious materials occurs on the customer's property.

10. Site Conditions

The grade along the entire area of proposed alignment must be within 150 mm of final grade and free from obstruction before the electrical installation can begin. If installed facilities subsequently require alterations (i.e. height adjustments) because the final grades do not conform to the site grading plans, the cost of such

adjustments will be the responsibility of the customer.

Incremental cost incurred by EPC, due to changes to an approved design by the customer, shall be charged to the customer. Changes to the scope of work may result in additional charges to the customer and may not be covered by EPC investment policies.

Delays caused by obstruction on the customer site which impede the installation of EPC's facilities may result in additional charges to the customer.

According to the above criteria, if the entire site is not ready for construction, extra costs surrounding construction set up may be applied.

Transformer boxpads, switch cubicles, pullboxes etc. require subsoil material having a minimum bearing strength of 200 kPa. EPC must be informed of any poor subsoil material on site (i.e. wet material, loose material, soft clay, etc.) that may cause unacceptable settlement of the transformer. Otherwise, the customer shall be responsible for the expenses incurred in rectifying any resulting problems.

Frozen Ground Conditions

The customer is responsible for additional costs associated with construction during frost conditions. Costs may result from extra activities such as hydrovacating, ground thawing or ripping along the trench line and excavation sites. Customers may choose to alter their project timelines to avoid frost charges.

Compaction

EPC will compact the trenchline and equipment locations in accordance with the City of Calgary compaction guidelines.

11. Protection Equipment Information

Fault Level Consideration

The short-circuit rating of the customer's service panel and distribution protection must be higher than or equal to the design fault level at the connection point of the EPC distribution system. The customer is responsible for all fault calculations beyond the transformer secondary bushings. EPC may request the customer to provide these calculations prior to connecting electrical service.

Customer Relaying and Protection

The customer is responsible for providing protective devices such as fuses, circuit breakers, or relays, that are capable of protecting the customer's equipment against phase failure, low voltage, high voltage, and the maximum available short-circuit current. Short-circuit current levels at the transformer secondary bushings or delivery point for primary metered services and relevant protection

characteristics are available from EPC.

The customer shall demonstrate to EPC that their protective devices will coordinate with EPC's protective equipment for primary metered services. Under no circumstances will the customer's system be permitted to adversely affect other EPC customers or EPC's equipment.

The customer is responsible for commissioning the primary metered high voltage switchgear and associated customer owned equipment. To ensure the safety of EPC's employees and equipment, EPC reserves the right to observe the commissioning test, and requires a commissioning report certified by a Professional Engineer.

12. Customer's Equipment

The customer's electrical equipment must comply with all applicable standards, codes, and regulations.

13. Easements & Rights-Of-Way

A URW or easement provides immediate service access to electrical equipment and allows a utility to use the land within the URW in controlled ways. EPC will require a URW when EPC has to cross over, under, or upon a titled property other than the property that requires the proposed electrical service. EPC will require a URW for common property within a condominium. When a URW is required, the owner of the property to be encumbered must agree to the URW or easement before EPC can proceed. For more information see the 'Utility Rights-of-Way' brochure available at www.enmax.com. Contact the EPC Land department for other questions regarding land.

Customer's Land

The customer shall grant to The City of Calgary and/or EPC such easements or URW, in perpetuity, for erecting and maintaining its extension(s) on, over, or under the land of the customer, as may be necessary to complete and maintain any such extension(s) that EPC may require to enable it to supply and service other customers.

Intervening Land

The customer requesting electrical service is responsible for the granting of and delivery to The City of Calgary and/or EPC, free from cost, permanent easements or URW from the owners of private property on, over, or under whose property it is necessary to extend in order to supply and service the customer.

14. Construction Delays

Incremental construction costs incurred by EPC due to customer changes to an approved design shall be charged to the customer. The customer may also be

accountable for additional costs resulting from customer driven changes to the project scope or schedule.

Delays due to obstructions in the EPC construction zone, caused by the customer, may result in additional charges to the customer.

15. Building Clearances – Public Safety

In accordance with the AEUC:

- a) anyone working near power lines must maintain safe limits of approach; and
- b) person(s) responsible for the design or construction of any infrastructure near powerlines must follow clearance requirements.

Any change(s) required to EPC's facilities in order to maintain the greater of the minimum clearances as stated within the AEUC (or Canadian Standards Association) and the current EPC minimum standard clearances shall be at the expense of the person(s) responsible for non-compliance. This is notwithstanding any City of Calgary or Municipality Authority approvals.

16. Electrical Permits

Permits and Licences

The customer's electrical installation must conform to all applicable legislation. The customer must obtain all necessary permits, licences and authorizations before electrical service connection. At any time before or after electrical service connection, EPC may inspect the customer's installation, but is under no obligation to do so. Such inspection shall not relieve the customer from their responsibilities to conform to all applicable legislation.

17. Upgrade or Relocation of EPC Facilities

If a customer requests the upgrade, relocation, or removal of distribution facilities, any associated costs are the responsibility of the customer. The customer is also required to pay for any changes to associated joint use facilities such as TELUS, Shaw, Street Lights, or other affected infrastructure. This includes obtaining all necessary approvals, URWs and easements. In addition, the customer is responsible to obtain consent from anyone who may be affected by the proposed change for reasons such as, but not limited to:

- significant alteration of viewscapes
- access, and
- use and enjoyment of existing amenities.

EPC reserves the right to refuse the request to upgrade, relocate, or remove distribution facilities if such a change is not feasible.

Section Two: Access to ENMAX Power Corporation's Facilities

1. Right to Enter Property

Refer to the ENMAX Power Corporation Distribution Tariff Terms and Conditions Section 18.3.1.

2. Reasonable Access

The customer must provide EPC with reasonable access to all EPC facilities located on or near the customer's or public property, as well as in road allowance. This includes all transformers, switches, pullboxes, and any other facilities owned, leased or operated by EPC.

The customer is required to give EPC permission to manage vegetation on the property owned or controlled by the customer, and the right to maintain proper clearances in accordance with the AEUC. EPC will make every effort to notify the customer before such work is performed.

To ensure the safe operation of the electrical equipment by EPC personnel, the customer shall not place any structures (eg. fences, garden sheds, retaining walls, etc.) or vegetation (eg. trees, shrubs, etc) that will interfere with the safe operation of EPC facilities or affect compliance with any applicable legislation. Proper clearance to equipment must be maintained at all times.

The customer shall not modify final design grading along or in the vicinity of EPC's infrastructure which may cause clearance, drainage or operational issues. For further information, contact EPC Engineering.

Section Three: Conditions of Service

1. Number of Services

The limitation on the number of services permitted to a building or a piece of land is determined by the CEC. If multiple services to one building are requested and comply with the CEC, EPC will require a single point of disconnection from EPC's distribution system. The customer will be accountable for any additional costs associated with provision of the single point of disconnect. In cases where additional infrastructure is required, a URW or easement on a customer's property may be required.

2. Service Locations

The transformer location proposed by the customer must be approved by EPC before design of electrical service commences.

EPC may request voltage drop calculations from the customer to ensure steady state voltage variation limits are met. (See Section Five, Table 4 - Voltage Variation Limits at Service Entrance)

3. Underground Secondary Service Installations

Commercial

On private property outside of any URW boundary, the customer shall provide and install all necessary duct required for the secondary voltage service cables from the building to EPC's duct at the secondary side of the transformer. The customer shall provide and install all secondary voltage cables required. All work done at or near the transformer must be done under EPC's supervision and inspected by EPC before energization.

Note: if a transformer for a commercial service is located within a URW, EPC will perform the installation of any secondary ductwork required within the URW and charge the customer accordingly.

Residential

For single family, and semi-detached dwellings, EPC will provide a service coil at property line. The customer shall install duct from property line to their service entrance and install the secondary voltage cable (i.e. service coil).

For multi-family dwellings, the EPC transformer supplying the service is usually located within a URW. EPC installs secondary duct from the transformer to a 'stub' location just outside of the URW. The customer is accountable for the cost of this EPC ductwork. The customer shall install secondary duct from the 'stub' to their ganged meter base and is also responsible for the sizing, supplying and installing

of all secondary voltage cables to the transformer.

All work done at or near the transformer must be done under EPC’s supervision and inspected by EPC before energization. The customer is accountable for EPC costs associated with EPC supervision and inspection.

4. Location of Surface Facilities

The customer shall provide the necessary space (as determined by EPC) for all EPC’s facilities such as transformers, pull boxes, switchgear, poles, or anchors, as per EPC’s requirements. Sufficient space must allow for both the physical size of the equipment as well as the clearance requirements for safe operation and maintenance of the equipment. Contact EPC Engineering for further information.

5. Maximum Service Size

Table 1: Single Phase Secondary Metered Service – Maximum Allowable Service Size

Maximum Allowable Service Size		
Single Phase Secondary Metered Service		
Supply Voltage (Line to Ground)	Size of Overhead Services Permitted	Size of Underground Services Permitted
7.6 kV-120/240 V 1 phase 3 wire	*400 A	**600 A
14.4 kV-120/240 V 1 phase 3 wire	*400 A	**600 A

* Based on 50 kVA transformer

** Based on 75 kVA transformer

Table 2: Three Phase Secondary Metered Service – Maximum Allowable Service Size

Maximum Allowable Service Size		
Three Phase Secondary Metered Service		
Supply Voltage (Line to Line)	Size of Overhead Services Permitted	Size of Underground Services Permitted
13.2 kV-120/208 V 3 phase 4 wire	400 A	3000 A
25 kV-120/208 V 3 phase 4 wire	400 A	2000 A
13.2 kV-277/480 V 3 phase 4 wire	Not available	2000 A
25 kV-277/480 V 3 phase 4 wire	Not available	2000 A
13.2 kV-347/600 V 3 phase 4 wire	Not available	2000 A
25 kV-347/600 V 3 phase 4 wire	Not available	2000 A

Contact EPC Engineering for single and three phase voltage availability within the EPC service area.

Table 3: Primary Metered Service – Minimum Allowable Service Size

Minimum Allowable Service Size		
New Commercial or Industrial Primary Metered Service		
Supply Voltage	Size of Overhead Services Permitted	Size of Underground Services Permitted
7.6/13.2 kV 3 phase 4 wire	Not available	Single electrical services greater than the ampacities shown in Table 2 must be primary metered. EPC will give consideration to supplying large customer loads with multiple services and transformers. See Section Three - 1. Number of Services
14.4/24.9 kV 3 phase 4 wire	Not available	

6. Sensitive and Special Loads

Certain customer loads may require special requirements. In these instances the customer may choose to install additional customer owned equipment at their cost for reliability of supply. Some examples of these requirements are as follows:

- A customer installed Uninterruptible Power Supply (UPS) may be necessary for critical loads to avoid power interruption in the event of a power outage.
- A customer may consider a separate service for special voltage sensitive loads which may be affected by voltage fluctuations caused by load distribution within the customer owned electrical equipment. This second service must meet CEC requirements and EPC’s standards.

7. Connecting Generators to EPC Distribution System

Customers wishing to connect a generator to their facilities for the purposes of export, load shaving, or emergency backup must meet requirements set out by EPC and contact generationinterconnection@enmax.com.

Customers are also responsible to contact the Alberta Utilities Commission at www.auc.ab.ca to ensure they have received all the required approvals.

EPC has created a document titled ‘Guide for Generator Interconnection to the Wires Owner Distribution System’ to assist customers with their generation design. This document may be found on the ENMAX website www.enmax.com.

Note that EPC does not provide design or consulting services to customers. EPC

recommends customers engage the services of a registered (APEGA) professional engineer or registered (APEGA) engineering consulting firm qualified to provide design and consulting services for electrical interconnection facilities.

8. Motors

Refer to 'Power Quality Specifications and Guidelines for Customers' available at www.enmax.com.

9. Power Quality

A customer must not use their electric service in such a manner as to cause power quality problems on the EPC system, such as undue interference with another customer's service or undue stress on EPC equipment caused by excessive harmonic distortion, voltage fluctuations or frequency deviations. A customer who causes such power quality problems is responsible for taking the action necessary to resolve them, at the customer's expense and to EPC's satisfaction.

All customers connected to the EPC system are responsible for adhering to harmonic and voltage fluctuation limits set out in the EPC document 'Power Quality Specifications and Guidelines for Customer' available at www.enmax.com. These limits are intended to protect EPC 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 the EPC system.

Protection Coordination

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

If the customer's main breaker trip setting is adjustable, the customer must inform EPC if this setting is increased from the maximum value shown on the single line diagram provided to EPC by the customer.

10. Customer Load Balance

If a three phase load imbalance caused by customer load distribution is discovered by EPC, the imbalance shall be rectified by the customer at the customer's expense.

11. Impedance Grounded Systems

The installation of impedance grounded systems must conform to all relevant and applicable legislation, IEEE Standards, and the AEUC. EPC will provide labeling indicating the presence of an impedance grounded system for the equipment. The

customer is responsible for installing the label on customer owned equipment and ensuring the customer owned impedance grounding equipment is maintained and operating as designed.

12. Overvoltage

Customers using capacitors for power factor correction or harmonic filters must ensure that these devices do not cause overvoltage conditions on the EPC system.

13. Service Installation Route

EPC determines the best route for all service installations on public and private property. If the customer requests a route different from that determined by EPC, EPC will, if possible, accommodate the request, provided that the customer agrees to pay EPC all additional costs accruing from the use of the requested route. EPC cannot fulfill a request for a different route if that route is contrary to EPC standards and practices.

EPC will determine the service type (overhead or underground) and routing based on engineering design requirements and area development conditions.

14. Single and Three Phase Service Availability

EPC will only connect a single phase service from a three phase source when adequate protection and isolation means are in place. If the customer requires a single phase service at a location where only three phase underground distribution is available, the customer is responsible for all costs associated to provide incremental infrastructure, less applicable EPC investment.

Alternatively, if a three phase service is required where only single phase distribution is available, the customer is responsible for all costs associated to provide incremental infrastructure, less applicable EPC investment.

15. Dedicated Alternate Service

A dedicated alternate service is defined as the utility's reserved capability to supply a specified level of a customer's electrical requirements from a supply different than the customer's normal supply. In order to qualify for a dedicated alternate service, the customer's demand must be 1 MVA or greater. A dedicated alternate service will be provided only under a contract between EPC and the customer.

Customers requesting a dedicated alternate service will pay the following costs:

- The cost of any new distribution facilities, and/or the Replacement Cost New (RCN) of existing distribution facilities, required to provide the dedicated alternate service. See section 18.5.2 of the 'ENMAX Power Corporation Distribution Tariff Terms and Conditions'. The cost attributed to the customer will be based on the percentage of the facilities' total

capacity reserved for the alternate service. If the unused capacity of the dedicated alternate service is not required by EPC at the time of construction, then the customer must pay 100% of the construction cost.

- A one time pre-paid operations and maintenance charge of 20% of the customer's portion of the new construction cost and/or RCN of existing facilities.

In addition to the above costs, the customer shall be responsible for any transmission and/or substation related charges that the Alberta Electric System Operator (AESO) or EPC deems necessary.

The design and arrangement of both the standard and the dedicated alternate services will be determined by EPC. The customer shall install and maintain an approved primary voltage transfer device. The characteristics, arrangement, and operation of this transfer switch and the associated circuits shall be subject to EPC Engineering approval.

The customer shall provide an interlock scheme to ensure EPC's points of delivery cannot be paralleled and shall sign an 'operating agreement' with EPC which details the operations of the transfer switch and associated circuits.

16. Non-dedicated Alternate Facilities

A non-dedicated alternate facility is defined as an additional connection point to a customer in addition to the normal source. EPC may invest towards the capital cost of non-dedicated alternate facility as per EPC's investment policy.

17. Line Extensions

A line extension is defined as the installation on the existing EPC distribution system of new or additional distribution facilities adequate to serve the customer's additional load requirements in reaching a connection point determined by EPC.

Distribution Facilities

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

Line Extension Costs

The total line extension cost includes labour, material, and equipment involved in the design, installation, and inspection of the line extension. The total cost includes, but is not limited to, the costs of transformers, meters, conductor, permits, tree trimming/removal, EPC indirect charges, and any necessary rearrangement of existing distribution facilities. The total cost includes payments to a third party

for easements or URWs.

Customers are responsible for all line extension costs, less the applicable EPC investment. In addition, any payments to a third party for easements, URWs, or other costs, shall be the responsibility of the customer.

Route

EPC will determine the route of all line extensions. If the customer requests a route different from that determined by EPC, EPC may accommodate the request provided that the following are met:

- 1) the customer pays EPC all additional costs resulting from the use of the requested route
- 2) the route is not contrary to EPC standards and practices, and
- 3) the route is accepted by City of Calgary Line Assignment.

Overhead Standard

New Development

Feeders are constructed to an overhead standard. Customers have the option of funding the incremental cost for an underground feeder.

If the construction of overhead facilities is not deemed feasible due to restrictions or conflicts imposed by existing development or EPC construction standards, then the customer will be accountable for the cost for any incremental facilities necessary.

Existing Development

Customers requesting existing overhead facilities to be placed underground must fund the entire cost of rebuilding the existing overhead facilities underground.

18. Optional Facilities

EPC's investment will not apply to facilities requested by the Customer that are, in the opinion of EPC, beyond what is required to provide safe, reliable and economic service consistent with current EPC standard practice or are expected to cause increased operation and maintenance expenses to EPC. Additional facilities requested by the Customer that are also useful to EPC may be eligible for investment at EPC's discretion.

19. Temporary Facilities

Requested services that are deemed temporary by EPC will require the customer to pay EPC's total cost of installation and removal of the service, less the value of the salvageable material.

When a commercial or residential development is not immediately adjacent to EPC's permanent supply infrastructure, EPC reserves the right to provide temporary supply infrastructure, at the cost of the customer, in such a way to maintain supply integrity and security. EPC may augment this temporary infrastructure to maintain adequate supply at the customer's expense.

EPC also reserves the right to utilize such temporary infrastructure to supply adjacent developments similarly located at a distance from EPC's permanent supply facilities.

Section Four: Disconnection and Reconnection of Service

1. Disconnection

Refer to Section 18.6 De-Energization of Service in the 'ENMAX Power Corporation Distribution Tariff Terms and Conditions'.

2. Reconnection

EPC will reconnect the service when all corrections to those conditions identified in Section 18.6 De-Energization of Service in the 'ENMAX Power Corporation Distribution Tariff Terms and Conditions' are implemented to the satisfaction of EPC and the customer's facilities are approved by The City of Calgary or other responsible authority.

A current permit for reconnection will not be required when the service has been cut off or had a current limiting device applied for non-payment or a change of occupant, provided that there have been no alterations or additions since the issuance of the most recent permit. See 18.6.4 Re-Energization of Service in the 'ENMAX Power Corporation Distribution Tariff Terms and Conditions' for more information.

Section Five: Service Characteristics

1. Steady State Voltage Variation Limits

EPC will, within the scope of the 'ENMAX Power Corporation Distribution Tariff Terms and Conditions', endeavour to maintain the steady state voltage at the service entrance at a level within the limits presented below.

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

Table 4 is an overview of the voltage variation limits at the service entrance as per the Canadian Standards Association CAN3-C235.

Table 4: Voltage Variation Limits at Service Entrances

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

- Voltages within the indicated limits for normal operating conditions do not require improvement or corrective action.
- Voltages outside the indicated limits for normal operating conditions, but within the indicated limits for extreme operating conditions will require improvement or corrective action on a planned basis, but not necessarily on an immediate 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, nature of the load or circuit involved, extent to which limits are exceeded (with respect to voltage levels and duration), and other such factors.

EPC is responsible to resolve voltage conditions outside the indicated limits above and will develop a plan and cover the costs for any corrective action required.

2. Frequency

The Alberta Interconnected System operates at a nominal frequency of 60 hertz.

3. Power Quality

Refer to EPC's 'Power Quality Specifications and Guidelines for Customer' document available at www.enmax.com.

4. Service Interruption and Shortage of Supply

EPC will exercise reasonable diligence and care to deliver a continuous and sufficient supply of electric energy to the customer, but does not guarantee continuity or sufficiency of supply.

Apportionment of Supply During Time of Shortages

In the event of a shortage of electrical energy supply, EPC will apportion the supply in the manner that in EPC's judgement is the most reasonable under the prevailing conditions.

Emergency Load Control

Whenever instability or cascading outages could result from actual or expected transmission overloads, other contingencies, or whenever such conditions exist in the system of another company with which EPC's system is interconnected, EPC will take 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.

5. Restoration Priorities

During a major outage due to events such as a major storm, EPC will utilize a priority system 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 customers that are essential to public welfare (e.g. hospitals).

Section Six: Primary Metered Areas

1. 13 kV and 25 kV Service Area

Single electrical services exceeding 2MVA in connected load must be primary metered. EPC will give consideration to supply large customer loads with multiple services and transformers. See 'Section Three - 1. Number of Services'.

The following is required for primary metered services:

- When the service consists of two sources of supply, the main breakers must be interlocked to ensure EPC's points of delivery cannot be paralleled. The customer shall provide an interlock scheme and the customer shall sign an operating agreement with EPC which details the operation of the transfer device and associated circuits.
- The customer shall submit a copy of their high voltage switchgear shop dwgs for EPC review and acceptance. These drawings should be submitted for review prior to fabrication of the switchgear.
- The customer's switchgear shall have a fault current interrupting capability as designated by EPC Engineering.
- The customer shall install suitable protection relaying to coordinate with EPC's system. The customer must provide a protection and coordination study which must be approved by EPC Engineering prior to energization.
- The customer shall ensure that CSA approved grounding facilities exist in the incoming high voltage supply compartment and metering compartment that meets EPC requirements.
- The customer shall provide suitable enclosures for EPC's current transformers (CTs), potential transformers (PTs), and revenue meter. For detailed metering information refer to the EPC 'Metering Standard' which can be found at www.enmax.com.
- The customer is responsible for the installation and maintenance of their high voltage switchgear and all customer owned distribution equipment. The transformer(s) may be owned by the customer or leased.
- The customer high voltage switchgear must be located such that adequate working clearance is provided to ensure EPC can safely operate/maintain their equipment (i.e. incoming high voltage cables and metering equipment).
- The customer's electrical installation must be approved by City of Calgary Electrical Inspection prior to energization of the service by EPC.

Section Seven: Specific Requirements for URD Developments

1. URD Servicing

In accordance with a City of Calgary bylaw, an underground electrical system shall be mandatory, except as otherwise authorized by the approving authorities. It may be either a modified underground system (i.e. main feeder overhead) or a total underground system at the Developer's option.

Servicing shall be from the front street or lane only and the design shall be the most economical and efficient.

2. Pre-Installed Road Crossing Ducts

The Developers, may at their option, install road crossing ducts for the use of EPC, communications and gas installations in advance of the usual construction period for these facilities. If the Developer chooses to do so, then the following conditions must be met:

- Duct requirements must be obtained from EPC and the communication and gas utilities before any ducts are installed.
- The ducts must be installed in accordance with the current City of Calgary specification regarding pre-installed road crossing ducts.
- Inspection will be performed by EPC personnel to ensure compliance with EPC standards and specification regarding depth, cover, and compaction.
- If the installation of the road crossing duct does not meet specifications, the Developer shall be responsible for the costs of repairing or replacing the road crossing. EPC or their subcontractor shall notify the Developer or their agent of all incorrect road crossings.

3. Modified Underground System

The following conditions shall apply only to a modified underground system:

- The Developer shall provide a URW alignment with twenty four (24) hour vehicle access adjacent to the main overhead feeder.
- When the subdivision plan requires the use of an anchor for the overhead pole system not adjacent to a lot line, an underground span shall be installed instead of the overhead span. In such event, the Developer shall pay the difference in cost between the underground span and the overhead

span. The Developer shall be notified of this requirement, if any, at the time of circulation of the tentative plan and shall be given the opportunity to revise the plan of the subdivision so as to avoid, if possible, the installation of such underground span.

- Where within any portion of the subdivision the use of side yard easements or a street front main feeder is required due to the subdivision design, the main feeder shall be placed underground. The Developer shall pay the difference in cost between the underground and overhead feeder. If possible, EPC and the Developer will attempt to ensure that the subdivision can accommodate the overhead main feeder.

4. Total Underground System

Where the main feeder is placed underground at the request of the Developer, the Developer shall pay the actual cost of the underground feeder less EPC's allowance for an overhead feeder.

5. Sites Requiring Three Phase Power

Commercial development, apartment, multi-family residence and school sites which require three phase power may not necessarily be serviced by the most economical routing of the three phase main feeder. Where the three phase source is not immediately adjacent to these sites, infrastructure will be provided to these sites at an additional cost to the Developer at the time of the initial servicing of the subdivision.

6. Conditions of Standard Subdivision, Detached and Semi-detached Dwelling Units

See Section 18.7.2 Conditions of Standard Subdivision Detached and Semi-detached Dwelling Units in 'ENMAX Power Corporation Distribution Tariff Terms and Conditions'.

7. Conditions for Non-Standard Subdivision

The cost to the Developer shall be the actual cost of construction, less the EPC non-standard residential investment level.

Section Eight: Responsibilities for Supplying Services

1. Responsibilities for Supplying Services

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

- overhead single or three phase secondary metered service (Table 5)
- underground single phase secondary metered service (Table 6)
- underground three phase secondary metered service (Table 7)
- underground three phase primary metered service (Table 8)

The following tables provide details of the activities for which EPC and the customer are responsible. The activities notes are for general guidelines only and may not cover all project requirements. Cost accountability for these activities will be determined at the design stage of a project.

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

Responsibilities for Supplying Overhead Single or Three Phase Secondary Metered Services		
Activity	EPC	Customer
Installing civil structures	Install service pole(s) outside of private property.	Install service pole(s) on private property, if required
Installing electrical equipment	Install single span of service conductors to customer service mast and make connections to customer secondary	Install additional spans of service conductor if required. Install all necessary electrical equipment including meter base to receive service. Obtain electrical permit from The City of Calgary or other responsible authority.
Maintaining distribution system	Repair or replace primary voltage conductors and single span of secondary service as required. Repair metering equipment, as required. If requested by customer, replace metering equipment at customer's expense.	Maintain the service entrance equipment in a safe condition. Repair or replace customer service pole(s) as required. Maintain proper clearances from EPC facilities. Exercise reasonable care to protect metering equipment.

Table 6: Responsibilities for Supplying Underground Single Phase Secondary Metered Services

Responsibilities for Supplying Underground Single Phase Secondary Metered Services		
Activity	EPC	Customer
Installing civil structures	<p>Install pullboxes, transformer pads, ducts for primary cables and 3rd Party Utility ducts.</p> <p>Install any ductwork that may be located inside of a URW on private property.</p>	<p>Install secondary and 3rd Party Utility ducts on private property and outside of URWs.</p>
Installing electrical equipment	<p>Install transformers and primary voltage cables.</p> <p>For residential single-family and semi-detached bareland condominiums, install secondary voltage service cables to the customer's property line.</p> <p>Leave the service coil for the customer's contractor to install to the meter base.</p>	<p>Install all electrical equipment including meter base necessary to receive service.</p> <p>Install secondary duct and service cable to meter base and make connection.</p> <p>Make provision for metering installation.</p> <p>Obtain electrical permit from The City of Calgary or other responsible authorities.</p>
Maintaining distribution system	<p>Maintain transformer, primary voltage cables, as well as secondary voltage cables on public lands or within a URW.</p> <p>Repair metering equipment, as required.</p> <p>If requested by customer, replace metering equipment at customer's expense.</p>	<p>Maintain the service entrance equipment in a safe condition.</p> <p>Maintain secondary cable on private property that is outside the URW.</p> <p>Maintain proper clearances from EPC facilities so as not to interfere with the proper and safe operation of these facilities.</p> <p>Exercise reasonable care to protect metering equipment.</p>

Table 7: Responsibilities for Supplying Underground Three Phase Secondary Metered Services

Responsibilities for Supplying Underground Three Phase Secondary Metered Services		
Activity	EPC	Customer
Installing civil structures	<p>Install pullboxes, transformer pads, switching cubicle base, ducts for primary cables and 3rd Party Utility ducts.</p> <p>Install any ductwork that may be located inside of a URW on private property.</p>	Install secondary and 3 rd Party Utility ducts on private property and outside of URWs.
Installing electrical equipment	<p>Install primary voltage cables, switching cubicles and transformers.</p> <p>Install overhead pole lines as required.</p>	<p>Install all necessary electrical equipment including meter base to receive service.</p> <p>Install secondary voltage cables.</p> <p>Make provision for metering installation.</p> <p>Obtain electrical permit from The City of Calgary or other responsible authorities.</p>
Maintaining distribution system	<p>Maintain pullboxes, primary duct, transformer pads, transformer and primary voltage cables.</p> <p>Repair metering equipment, as required.</p> <p>If requested by customer, replace metering equipment at customer's expense.</p>	<p>Maintain service entrance equipment in a safe condition.</p> <p>Maintain secondary ducts and secondary voltage cables, including mitigating concerns relating to water ingress into facilities.</p> <p>Maintain proper clearances from EPC facilities.</p> <p>Exercise reasonable care to protect metering equipment.</p>

Table 8: Responsibilities for Supplying Underground Three Phase Primary Metered services

Responsibilities for Supplying Underground Three Phase Primary Metered Services		
Activity	EPC	Customer
Installing civil structures	Install ductwork, pullboxes, switching cubicle bases, and 3 rd Party Utility ducts upstream of the demarcation point as determined by EPC.	Install secondary and 3 rd Party Utility ducts on private property and outside of URWs. Install primary voltage switchgear base and all other necessary civil structures except as installed at the discretion of EPC.
Installing electrical equipment	Install primary voltage cables and switching cubicles up to the incoming cell of the customer's high voltage switchgear.	Install high-voltage switchgear and all other electrical equipment downstream of the high voltage switchgear. Make provision for metering installation. Obtain electrical permit from the City of Calgary or other responsible authority.
Maintaining distribution system	Maintain distribution equipment up to the demarcation point (incoming cell of the customer's switchgear). Repair metering equipment, as required. If requested by customer, replace metering equipment at customer's expense.	Maintain service entrance equipment in a safe condition. Where EPC metering tanks (padmount or non-standard polemount) are used, customer is responsible for maintenance of distribution system downstream from metering point. Maintain proper clearances from EPC facilities. Exercise reasonable care to protect metering equipment.

2. Meter Equipment and Instrument Transformers

EPC will provide, own and maintain any meters and related equipment (potential or current type instrument transformers), required in the supply of service.

The supply of distribution transformers by EPC shall be limited to those required for a single standard transformation.

Secondary metered services installed by EPC shall have one meter per service. EPC reserves the right to refuse sub-metering.

3. Ownership and Removal

All equipment supplied by EPC shall remain the exclusive property of EPC. In all cases of termination of service, EPC shall retain the right to remove its equipment from the customer's premises at any time after termination.