



SECTION 8: ELECTRIC DISTRIBUTION

8.0 INTRODUCTION

This section will cover the design standards of extensions to the Electric Distribution Network. These design standards include the civil and electrical distribution requirements for the extension of residential electric distribution.

8.0.1 GENERAL

This document, together with the Electric Utility Construction Standards, is intended to provide standards used by the Utility in addition to the Canadian Electrical Code (CEC) Part III (where applicable),

In all cases, the safety of the public and employees shall be taken into account when laying out the distribution extension. Professional judgment and sound engineering and construction practices shall govern.

8.0.1.1 Bareland and Commercial Developments

The provisions outlined in this document may not apply to bareland or commercial developments. The particulars of each development will be reviewed by the Electric Utility to identify any special requirements.

8.0.2 LEVEL OF SERVICE OBJECTIVES

The design standards outlined in this section will assist designers with standards that ensure the Electric Utility maintains a safe, reliable and cost effective system.

Material and construction standards also play an important role in maintaining the Utilities objectives and can be obtained from the City of Lethbridge Electric Utility.

Extensions to the electric distribution system will be designed and evaluated such that all customers, both existing and new, will not experience any lower level of service.

8.0.3 REFERENCE STANDARDS

- i. Canadian Electrical Code (CEC Part III where applicable)
- ii. City of Lethbridge Electric Utility Standards
- iii. Alberta Electrical Utility Code (AEUC)
- iv. City of Lethbridge Engineering Standards (Power Quality, Distributed Generation)



- v. City of Lethbridge Technical Terms and Conditions
- vi. Canadian Environmental Protection Act (Current edition)
- vii. Metering Guidelines
- viii. Alberta Common Ground Alliance Best Practices
- ix. CSA S250
- x. Alberta Safety Codes Act
- xi. Occupational Health Safety Codes Act

8.1 ELECTRIC DISTRIBUTION PLANNING REQUIREMENTS

See Section 2 for planning requirements.

8.2 ENVIRONMENTAL CONSIDERATIONS

Designs must take into account all current legislation. No polychlorinated biphenyls (PCB) materials or equipment, including light ballasts, shall be used.

Designers shall ensure provisions are adequate for the disposal of waste and other debris using approved containers. Under no circumstance shall waste be disposed of in trenches or pits.

8.3 TECHNICAL REQUIREMENTS

8.3.1 VOLTAGE LIMITS

The design shall take into account the service characteristics defined in the City of Lethbridge Technical Terms and Conditions for Distribution Wires Access and this document. Additional provisions may be adopted from time to time to ensure these standards are met or for special circumstances.

8.3.2 MEDIUM VOLTAGE CIRCUITS

All medium voltage systems are to be designed for loop feed. Where loop fed circuits cannot be completed because of phased development, it may be required to provide extra ducting for future loop feeds. Developments that span more than one year between phases may require temporary overhead or underground loop feeds be installed to ensure the integrity of the system.

8.3.3 ALIGNMENTS, LOCATIONS AND CLEARANCES

Line assignments for electric equipment in a street or avenue may be found in the City of Lethbridge Engineering Standards. All new development shall be street (front) serviced. The developer(s), at their expense, is responsible to provide easement where required. The City of Lethbridge's subdivision servicing – Investment Policy (DSP001) describes the Policy of the City of Lethbridge Electric Distribution utility for investing in subdivision developments. For details and the current City investment level see the latest



revision of The Investment Policy DSPool. The designer shall provide locations as soon as reasonably possible.

- i. Padmount transformers, pedestals, and streetlights are located at intersecting lot lines. A minimum of 1.0 m side clearance must be maintained for access.
- ii. Switching cubicle locations must have a 4.0 m operating clearance on the cubicle door sides and 1.0 m operating side clearance.
- iii. A minimum horizontal distance of 3.0m must be maintained between the electric centerline and water main and/or sewer centerlines.
- iv. A minimum horizontal distance of 2.0 m must be maintained between a power cable and a new tree installation.
- v. Pre-service lines on property shall extend through the utility right-of-way.
- vi. All pipelines and rail shall be done according to all relevant codes and standards as well as any additional requirements the pipeline/rail owner may have. All applications will be handled by the Electric Utility at the developers Expense.
- vii. In situations where variations may be required to these standards, prior written approval must be obtained from the Electric Utility.

8.3.3.1 Depth & Width

- i. All cables shall be placed at a depth to the relevant LEU trench standards
- ii. In situations where variations may be required, prior written approval must be obtained from the Electric Utility.
- iii. The maximum trench width will be 1.5 meters for 4 Party Construction.

8.3.3.2 Grades

The developed area to be serviced shall be graded to within 150 mm of final grade. Consultants shall indicate any changes to elevations proposed by the development if construction is to proceed prior to this requirement being met.

8.3.4 JOINT CONSTRUCTION

The designer shall coordinate the design with all shallow utilities including Street Lighting. All 4 party installations shall be installed in a common trench. A conscious effort by all utilities shall be taken to reduce the number of pedestals.

8.3.5 FEEDERS AND CABLES



8.3.5.1 Main Feeders

These feeders consist of three-phase, loop-fed circuits. The underground cable used for these circuits is 15 kV, single conductor.

8.3.5.2 Distribution Circuits

These feeders consist of three-phase and single phase, loop-fed circuits. The underground cable used for these circuits is 15 kV, single conductor.

8.3.5.3 Secondary Cables

Secondary cables are fed from the transformers to pedestals and from pedestal to meter base using USEB cable. Secondary services shall be kept as short as possible and be designed to limit the voltage drop to less than three (3) percent. A 6 kVA load shall be used on a 100 amp service and 10 kVA on a 200 amp service for calculating voltage drop.

The default service size for all residential will be 200 amp. Under special circumstances, with the Electric Utilities approval and where justified, 100 amp service will be acceptable, i.e. smaller condominium sites.

8.3.6 TRANSFORMERS

Doors and/or openings of transformers shall face the roadway. Clearances around transformers shall be as per all applicable standards in Section 8.0.3.

The following is the maximum number of single phase services that can be connected to a single phase transformer:

Table 8.3.6.1 Single Phase Transformer

Transformer size	100 amp services	200 amp services
50 kVA	15	10
75 kVA	25	15
100 kVA	N/A	20

8.3.7 ENCLOSURES

All designs shall utilize joint use pedestals where possible. The maximum number of services shall be 7 single-phase services per pedestal, which must include any street light services.



8.3.8 GROUND GRIDS

Ground grids shall not be located under existing or proposed sidewalks, curbs, roadways, gas line right-of-ways, on private property, or other known structures. If such a conflict exists, the equipment shall be moved to allow the ground grid installation.

8.3.9 STREET LIGHTS

Where possible, streetlights shall not be installed together with transformers or pedestals.