SCHEDULE "F"

Town of Cardston

Licensed Occupant Guide: Municipal Attachments

Electrical Distribution System Operational Documents

Version 1.023

Contents

1. Scope

- This document provides the details and requirements for attaching and approving Municipal Attachments on Cardston Electric Utility poles. This document also provides various ways and options in providing electric service to Municipal Attachments, as required.
- The application for joint use request is provided in the New Electrical Connections (Licensed Occupant) Service Request Form. This can be found at (https://www.cardston.ca/government/municipal-services/electrical)

2. Purpose

- To provide details and requirements for the safe installation and operation of municipal attachments on Cardston Electric Utility poles and to meet applicable codes and regulations.

3. Normative References

- Workers shall be competent in Cardston Electric Utility standards:
  - Town of Cardston Joint Use: Small Connected Devices
  - Town of Cardston Joint Use Process Guide

4. Legislation

Alberta Electrical Utility Code (AEUC) (See Annex A)

- The Alberta Electrical Utility Code (AEUC), provides the minimum safe limits of approach for persons and equipment performing activities near overhead power lines and definitions of utility worker and qualified utility worker.
- A person must notify Cardston Electric Utility, by calling 403-653-5672, before any activities are undertaken or equipment is operated within 7.0 meters of Cardston Electric Utility's electric distribution system, to:
  - Determine the voltage of the power line; and
  - Establish the same limit of approach distance as listed in section 2-014 and table 1.
- Section 2-014 and Table 1, safe limits of approach
  - 0 – 750 V insulated, or polyethylene covered conductors .....0.3 m
  - 0 – 750 V bare, uninsulated .....1.0 m
  - Above 750 V insulated conductors .....1.0 m
  - 0.75 kV – 40 kV.....3.0 m
- The required safe limits of approach do not apply to movement of persons, equipment, buildings, vehicles, or objects under Cardston Electric Utility's overhead power lines.

Occupational Health and Safety Code

- Occupational Health and Safety Code – Alberta Regulation 191/2021 and Explanation Guide provides further guidance on the safe limit of approach distances as specified in the AEUC.
- Section 225 (2), An employer must notify the operator of an energized overhead power line before work is done or equipment is operated in the vicinity of the power line at distances less than the safe limits of approach as specified below and obtain the operator's assistance in protecting workers involved.
  - 0 – 750V insulated or polyethylene covered conductors .....0.3 m
  - 0 – 750V bare, uninsulated .....1.0 m
  - Above 750V insulated conductors .....1.0 m
  - 0.75V – 40kV .....3.0 m

CSA C22.3 No. 1-15, Overhead Systems

- CSA C22.3 No. 1-15, Overhead Systems, specifies the Minimum Vertical Separations at a Joint Use structure (6) and working space to allow workers to have access to equipment and conductors and to allow for the installation of the equipment on the structure. Cardston Electric Utility's interpretation is that these separations do not include the minimum approach distance required by AEUC.

  - 0 – 750V supply conductors and Communication line plant 1.0m
  - > 0.75kV up to and less than 22kV supply conductors 1.2m
  - Luminaires span wires or brackets and communication line plant
    - Not effectively grounded 1.0m
    - Effectively grounded 0.1m

5. Typical Municipal Attachments and Methods of Attachment

Banners

- Banners might have large dimensions and can act as a wind sail on poles when secured on both ends. The added wind loading on poles may exceed the strength rating of a pole. Thus, the required information as specified below shall be provided to Cardston Electric Utility. This information will be used by Cardston Electric Utility to evaluate pole loadings and to ensure that the structure is fit for attachment prior to giving an approval to attach.
- For new extension of streetlight facilities on new developments and where there are intentions of attaching banners, the requirements to attach banners on streetlight poles are to be identified at the start of the project. This will help ensure that appropriate streetlight poles are ordered and installed for these applications.
- Banners should be attached to poles by using spring loaded banner arms with clamps. Spring loaded banner arms help reduce the wind loading on poles.
- Other methods of attachments may be allowed including fixed (single or double arm) and swivel banner arms strapped on the pole. However, these methods of attachments may cause significant loading and may cause the streetlight poles unfit for banner attachments.

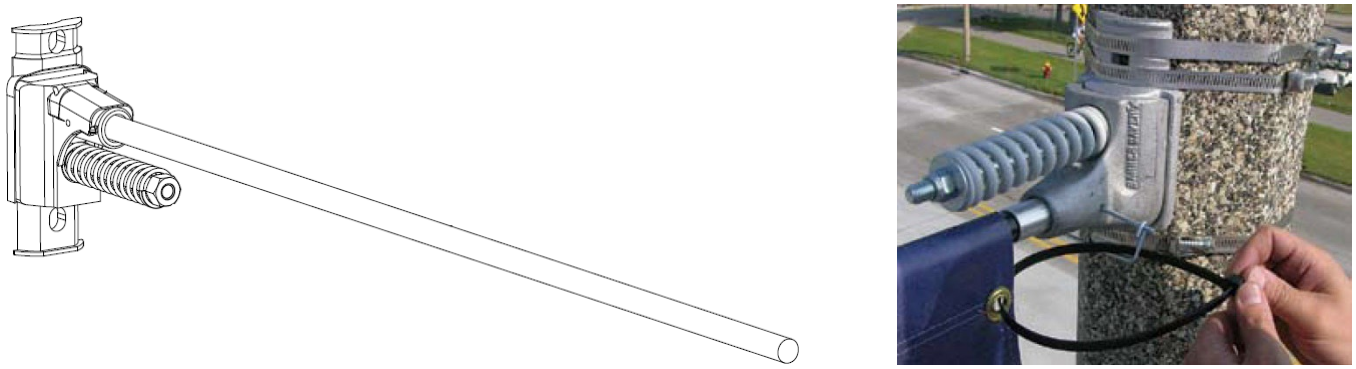

Figure 1: Banner arm, spring loaded, complete with fiberglass rod

Municipal Christmas Lighting

- Municipal Christmas lighting may be connected to Cardston Electric Utility's electric distribution system within the months of December through to February, as specified in Cardston Electric Utility's tariff rate 500.
- The addition of Christmas lighting loads in the distribution system shall be designed and built to meet cable ampacity and voltage drop requirements (See Annex B, Transformer and Voltage Drop Calculations). Where these requirements are not met, modifications or upgrades may be needed before connecting these loads in the system. All needed upgrades are attributed to the customer.
- Christmas lighting fixtures are to be attached on streetlight poles by using clamps. Drilling on the streetlight poles is not allowed since it will lead to rusting.

Planters

- Planters attached on Cardston Electric Utility poles can add significant weight and wind loading on the structure. As such, streetlight pole loadings are to be evaluated by Cardston Electric Utility prior to giving approvals to attach.
- Planters are to be attached on streetlight poles by using clamps. Drilling on the streetlight poles is not allowed since it will lead to rusting.
- The customer shall be responsible to attach the planters to the proper height and clearances to ground as per applicable regulations.

Security Cameras

- Applications for security camera attachments and taking electric service on poles shall follow the Town of Cardston Joint Use: Small Connected Devices requirements.

Solar Speed Signs

- Solar speed signs on streetlight poles can add significant weight and wind loading on the structure. These attachments have its own power source (i.e., solar and battery) and will not usually require an electric service.
- Streetlight pole loadings shall be evaluated by Cardston Electric Utility prior to giving approvals to attach. Any applicable structural evaluation fees, as may be required, will be attributed to the customer.
- The solar panel, control box, and speed sign shall be attached to streetlight poles by using clamps. Drilling on streetlight poles is not allowed since it will lead to rusting.
- The Customer shall be responsible to attach the solar speed signs to the proper height and clearances to ground as per applicable regulations.

Traffic and Speed Signs

- Traffic and speed signs on poles shall be attached to streetlight poles by using clamps. Drilling on the streetlight poles is not allowed since it will lead to rusting.
- The Customer shall be responsible to attach the traffic and speed signs to the proper height and clearances to ground as per applicable regulations.

6. Required Details of Proposed Attachments on Poles

- The Customer shall provide details of the proposed attachment on poles. The information will be used to evaluate the integrity of the pole in accommodating the proposed attachment and to determine how electric service is to be supplied to these attachments, as may be required.
- The Customer shall also use the pole attachement application form as provided by the Cardston Electric Utility.

Banners

- Quantity of banners on each pole
- Size and dimensions of banners (Height and Width) (mm)
- Weight of banner (kg)
- Type of banner material (i.e., fabric, plastic, vinyl, metal, etc.)
- Height of attachments from ground (provide sketch) (mm)

NOTE: The height of attachments may be limited with the type of streetlight poles. In addition, the banner's height of attachment shall meet the required ground clearances. For example, if banners are proposed to hang over the road right of way, the lowest part of the banner shall meet the required road clearances.

- Method of mounting (i.e., fixed, swivel, strapped on poles, spring loaded banner arms).
- Height of upper banner arm.
- Height of lower banner arm/eye bolt.
- Are there wind holes in the banner?

- For attachments on streetlight poles, at what side of the pole is the banner to be attached? (i.e., same side or opposite side of the luminaire?)
- Is this a permanent or temporary attachment?
- Length of time banners will be attached on the pole (Months).

Christmas Lights

- Quantity of Christmas Light Fixture on each pole?
- Attachment type (i.e., fixed, swivel, strapped on the pole).
- Dimensions (Width x Height) (mm)
- Weight (kg)
- Height of attachments from ground (provide sketch) (mm)

NOTE: The height of attachments may be limited with the type of pole. In addition, the banner's height of attachment shall meet the required ground clearances. For example, if banners are proposed to hang over the road right of way, the lowest part of the fixture shall meet the required road clearances.

- Supporting arm length of the fixture, if applicable
- Total electrical load (kW) per fixture
- Voltage (V)
- Number of phase and wire (for example, 1-phase, 2 wire)
- For attachments on streetlight poles, at what side of the pole is the fixture to be attached? (For example, same side or opposite side of the luminaire?)
- Is this a permanent or temporary attachment?
- Length of time Christmas light fixtures will be attached on the pole (If temporary, indicate how many months).

Planters

- Indicate quantity of planters on each pole
- Attachment type (i.e., fixed, swivel, strapped on the pole)
- Dimensions (Width x Height) (mm)
- Weight (kg)
- Height of attachments from ground (provide sketch) (mm)

NOTE: The height of attachments may be limited with the type of streetlight poles. In addition, the banner's height of attachment shall meet the required ground clearances. For example, if banners are proposed to hang over the road right of way, the lowest part of the fixture shall meet the required road clearances.

- Supporting arm length of the fixture, if applicable
- For attachments on streetlight poles, indicate what side of the pole is the fixture to be attached (For example, indicate if same side or opposite side of the luminaire).
- Is this a permanent or temporary attachment?
- Length of time planters will be installed by (If temporary, indicate how many months).

Speed and Traffic Signs

- Size and dimensions (mm) (height, width, depth) of each equipment / device
- Mass (kg) of each equipment / device
- Height of attachments from ground (provide sketch) (mm)

NOTE: The height of attachments may be limited with the type of streetlight poles. In addition, the banner's height of attachment shall meet the required ground clearances. For example, if banners are proposed to hang over the road right of way, the lowest part of the equipment / device shall meet the required road clearances.

- Method of mounting (i.e., strapped on the pole)

7. Recommended and Restricted Poles for Pole Attachments

Recommended poles for pole attachments

- Streetlight poles – for the intent of this document, streetlight poles shall refer to underground fed steel streetlight poles. Generally, streetlight poles are available for pole attachments unless identified as restricted in the following sections. Streetlight poles are to be inspected, evaluated for structure loading, and appropriateness before giving approvals to attach.
- Tangent wood poles (simple framing for supporting conductors without guying or deadend) usually provide better clearances and space for pole attachments. These may include single phase transformer on tangent poles. Due to operational reasons, two thirds of the pole typically must be free for climbing, which restricts some pole types. Wood poles are to be inspected, evaluated for structure loading and appropriateness before giving approvals to attach.

Restricted poles for pole attachments

- Streetlight poles with existing pole attachments (including previously approved attachments) will require a re-evaluation of the integrity of the structure and a new approval from Cardston Electric Utility.

Note: Streetlight poles structure analysis is usually completed by Cardston Electric Utility's pole manufacturer. Thus, details of new and existing pole attachments, and technical details of the streetlight poles shall be obtained and gathered for evaluation. Any additional cost of evaluations will be attributed to the customer.

- Streetlight poles with 480V secondary system. Certain streetlight poles may have a 480V system. **NOTE:** This restriction applies where electric service is required and fed from streetlight poles. Electric service would be limited to 120V streetlight systems
- Streetlight poles with visible signs of rusts and dents. Rusts and dents affect the integrity of streetlight poles. Streetlight poles with rusts and dents, as verified in the field, shall be replaced when required for pole attachments.
- Streetlight poles on breakaway bases - pole attachments are not allowed. Breakaway streetlight poles are intended to improve traffic safety and are not meant to handle the additional structure loading of pole attachments. Breakaway bases are not to be replaced with standard

bases due to its intended purpose and use. These structures are also of greater risk for pole attachments based on its location.

- Direct buried streetlight poles – pole attachments are not allowed unless replaced. Direct buried streetlight poles are old standard structures and will have to be replaced when required for pole attachments. The actual condition of the portion buried underground is unknown unless verified and tested, thus, additional loading on the structure may cause the structure to fail.
- Wood poles with guying, equipment, or switching devices (corner poles, primary underground risers, secondary underground risers, three phase banked transformer poles, regulator banks, MVIs, capacitor banks), no attachments are allowed. The pole attachment will generally restrict maintenance and operations work on these normally accessed structures.
- Traffic speed sign attached on a wood riser pole not allowed. The attachment would restrict ability of workers to climb up the pole, and it encroaches on the telecommunication zone. Alternatively, and with approval, traffic and speed signs may be allowed to attach on streetlight poles.

8. Standard Attachments on Streetlight Poles

- The following attachments on streetlight poles meeting the following criteria will not require further review by Cardston Electric Utility.

Banners

- Streetlight poles: Steel pole, single davit
- Maximum size of banner: 24” x 48” (0.6m x 1.2m)
- Maximum number of banners: One (1). No additional signage or attachments on the pole.
- Maximum weight of banner: 10 lbs
- Maximum height of attachment (above arm): 18 feet (5.5m)
- Banner material: Vinyl or soft material. Banners made of steel or metal will require Engineering review and approval.
- Banner arm: spring loaded banner arms.
- Pole integrity: (to be verified in the field)
- No dents, no rusts (usually seen at the base of the pole both to the exterior and interior surfaces of the pole), or signs of damage.
- Not on break-away bases.
- Not direct buried.

9. General Requirements

- Applications to Attach on Poles
  - The customer must make an application and obtain Cardston Electric Utility approval prior to making an attachment on poles.

- Application forms should be completed and attachment details ready prior to making an application.

- Installations, modifications, and maintenance of attachments on poles.
  - The customer shall be responsible for the installation, modification, and maintenance of its attachments on poles and shall meet all applicable Codes and Regulations.
  - The customer must notify Cardston Electric Utility, by calling 403-653-5672, before any activities are undertaken or equipment is operated within seven (7) meters from Cardston Electric Utility's electric distribution system.

10. Connections, Shutdown, and Notifications for Equipment & Devices

Electric Service Connections

- Municipal Christmas lighting will normally require an electric service. The provision of electric service may be provided as follows:
  - On streetlight poles with nipple Cardston Electric Utility is to install a weatherproof receptacle, complete with service conductors inside streetlight poles. Customer to plug in approved device on the weatherproof receptacle.

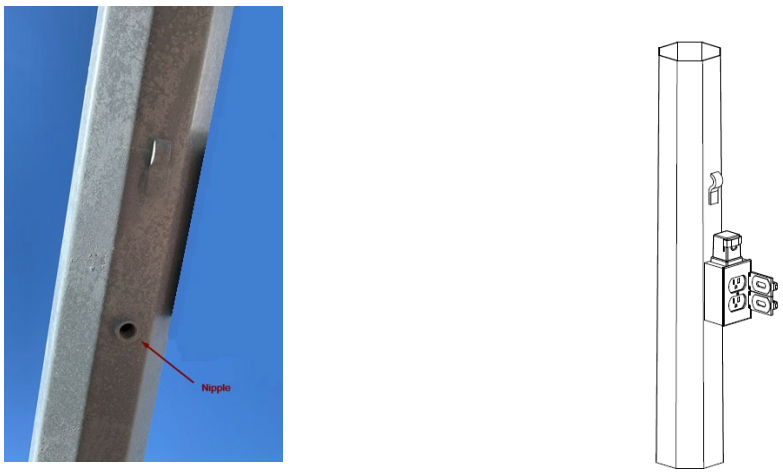

Figure 2: Streetlight poles with a nipple (left); weatherproof receptacle on streetlight poles (right)

- On streetlight poles without nipple Cardston Electric Utility to supply and install an ancillary power tap (item# 641-0405), a load center (item# 584-0320), and a weatherproof receptacle on streetlight poles. The ancillary power tap will be connected to the photocell of the luminaire (Figure 3 left). The ancillary power tap cable will be strapped to streetlight poles to connect to the line side of the load center (Figure 3 middle). Then the weatherproof receptacle will be connected to load side of the load center (Figure 3 right). The weatherproof receptacle shall be wired as a controlled receptacle (with photo eye). Customer to plug in its service conductors of approved device to the weatherproof receptacle.

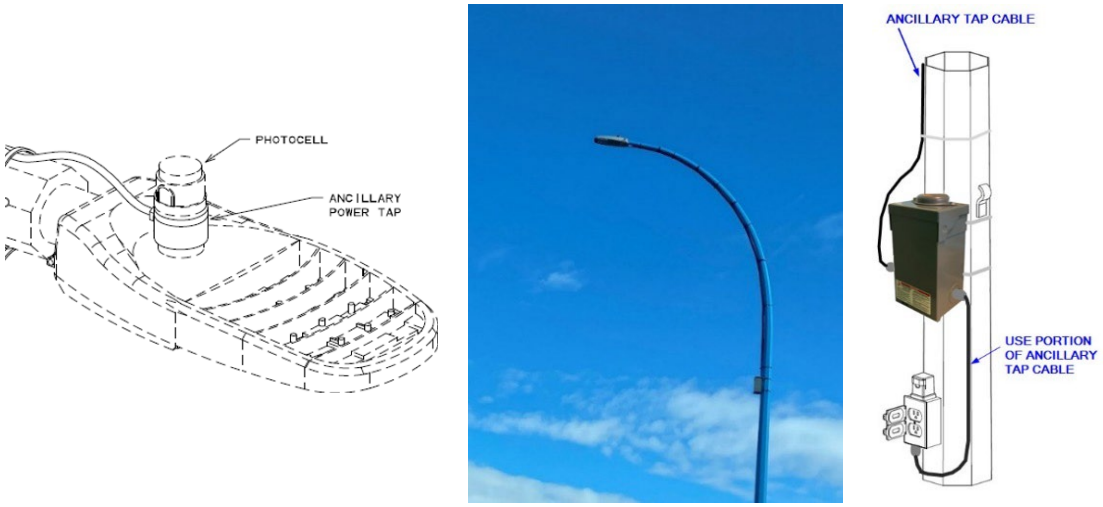

Figure 3: Christmas light servicing on streetlight poles without a nipple

- On wood poles. Cardston Electric Utility to install load center on poles complete with service conductors terminated to the secondary distribution line. In addition, Cardston Electric Utility will also install a weatherproof receptacle and terminated to the load side of the load center. The weatherproof receptacle shall be wired as a controlled receptacle (with photo eye). Customer to plugin service conductors of approved device to the weatherproof receptacle.

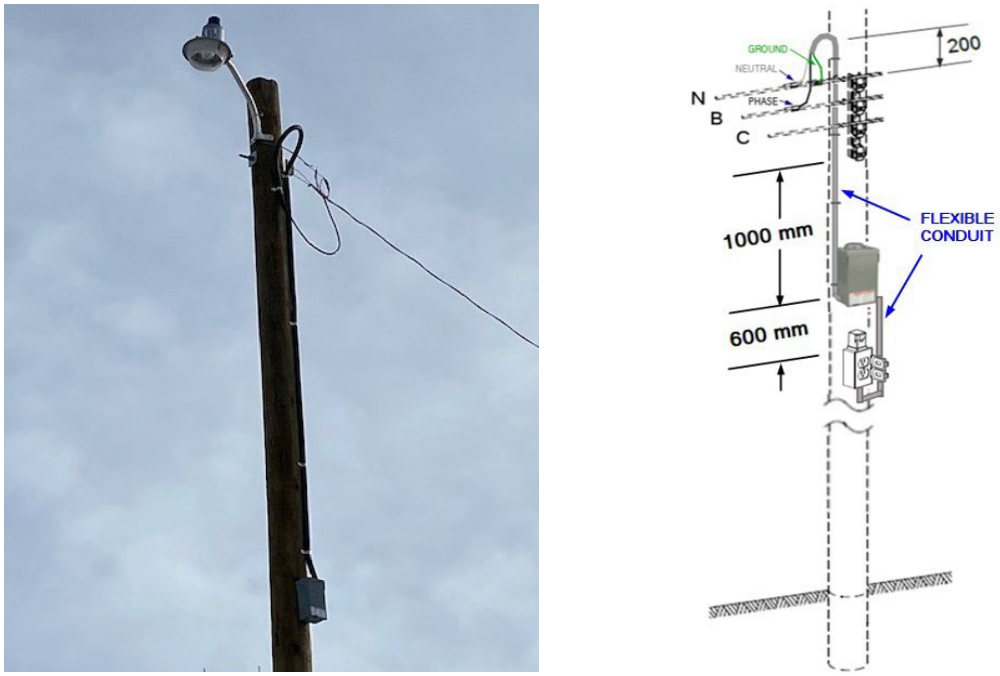

Figure 4: Christmas light servicing on wood poles

Load Center and Demarcation Point of Electric Service

- The load center must be rated for outdoors, single phase, 2Wire, 15A, 120/240V AC system.
- The demarcation point of electric service will be at the weatherproof receptacle.

Shutdown Procedures on Equipment and Devices

- A power line technician, or any worker performing work on the pole, must first turn the disconnect switch of the equipment or device, if available, to the "off" position.
- After work on the pole is complete, the power line technician, or any worker performing work on the pole, must turn the disconnect switch of the equipment or device back, if available, to the "on" position.

Customer Notification of Outage

- Pre-planned Outages (PPO) and Non-Emergency work
- During a pre-planned outage, the customer will receive an automated e-mail from Cardston Electric Utility's two days before the planned interruption date.
- The automated e-mail will contain the following information:
  - Address of the service
  - Outage date and time
  - Reasons for outage

Emergency (power down)

- Cardston Electric Utility will not notify the customer in a power down condition.

- Power loss due to a power down will typically be reported to Cardston Electric Utility through customer calls.

Back-up power devices

- Small connected devices emitting non-ionizing radio frequencies are not allowed to have back-up power (e.g., battery).

Note: A downed pole may not stop a device with backup power from operating, of which may cause hazards to utility workers and public.

Storage of pole attachments on structures removed or replaced by Cardston Electric Utility

- If a project is required by Cardston Electric Utility to remove a pole with pole attachments, the pole attachments will be removed and stored at the Cardston Electric Utility's office. In addition, Cardston Electric Utility will coordinate with the local municipal representative to pick up their devices.
- If a project is required by Cardston Electric Utility to replace a pole with pole attachments, the Cardston Electric Utility representative should coordinate with the local municipal representative to confirm if the existing pole attachment is still required and be replaced to the new structure.
- If pole attachments are no longer required, the pole attachments will be removed and stored at the Cardston Electric Utility's office. Cardston Electric Utility will coordinate with the local municipal representatives to pick up their devices.
- If pole attachments are still required, the replacement structure shall be designed to accommodate the structure loadings of the pole attachments. Cardston Electric Utility will remove the pole attachments on the old structure and store it at the Cardston Electric Utility office. Cardston Electric Utility will coordinate with the local municipal representatives to pick up their devices. After the pole is replaced, the Municipality shall be responsible to re-install the pole attachments on the new pole.

Annex A

Alberta Electrical Utility Code (AEUC), 5th Edition

This annex contains some applicable code clauses. Refer to the full AEUC for more details.

2-012 Interference with Systems

1) *No person shall interfere with, tamper with, or willfully damage electrical utility systems covered by this Code.*

2) *Electrical utility system poles and structures shall be kept free of all materials and equipment not required for the system, unless permitted by the operator of the utility system.*

3) *No person shall make attachments to electrical utility system poles and structures unless authorization has been received from the operator of the utility system.*

4) *No person shall climb electrical utility system poles or structures or make connections or disconnections to electrical utility system equipment unless the person has been authorized to do so by the operator of the utility system.*

5) *No person shall enter an electrical utility system generating station, substation, subsurface chamber, equipment room, or similar location unless that person is authorized to enter by the operator of the utility system.*

2-014 Activities near Overhead Power Lines (See Appendix B.)

1) *This Rule applies to activities near overhead powerlines and not the movement of persons, equipment, buildings, vehicles, or objects under overhead powerlines.*

2) *A person must contact the operator of the utility system before activities other than those in Subrule (1) are undertaken or equipment is operated within 7.0 meters of an energized overhead line to:*

(a) *determine the voltage of the power line; and*

(b) *establish the appropriate safe limit of approach distance listed in Table 1.*

3) *Except as provided for in Subrule (4), a person must ensure that the safe limit of approach distance, as established in Subrule (2), is maintained and that no activities are undertaken and no equipment is operated at distances less than the established safe limit of approach distance.*

4) *A person must notify the operator of the utility system before activities are undertaken or equipment is operated in the vicinity of the power line at distances less than the safe limit of*

approach distances listed in Table 1 and obtain the operator's assistance in protecting persons involved.

5) *Notwithstanding Subrules (1) through (4), Table 1 does not apply to OH&S Part 40 Utility*

- *Workers – Electrical.*

6) *A person must ensure that earth or other materials are not placed under or beside an overhead power line if doing so reduces the safe clearance to less than the Minimum Vertical Design Clearances above Ground or Rails as defined in Table 5 of this Code and the safe limit of approach distances listed in Table 1.*

7) *A person must follow the direction of the operator of the utility system in maintaining the appropriate safe clearance when conducting activities near an overhead power line.*

8) *If an activity is being carried out near the safe limits of approach distances specified in Table 1, the person completing the activity shall assign a person to act as an observer to ensure that the safe limit of approach distances will be maintained.*

9) *A person shall not excavate or perform similar operations in the vicinity of an overhead power line if it reduces the electrical and structural integrity of the power line including associated grounding equipment.*

Annex B

Transformer and Voltage Drop Calculations

- Applications of small connected devices connecting in Cardston Electric Utility's existing distribution system and meeting the criteria below, will not require an evaluation of transformer loading or voltage drop calculations:
  - Total additional load of up to 1% of the transformer's rating added to the existing secondary distribution system.
  - For example: Existing 1-ph transformer is 10 kVA, the maximum allowable load that can be added without the need to check for transformer loading and voltage drop is 90W.

    10 kVA * 1% = 0.1 kVA
    kVA * 0.9 (power factor) = 0.09kW or 90W

- Where an existing secondary distribution system (includes secondary cables and transformer) are found to be overloaded, these projects should be discussed with Cardston Electric Utility representative for evaluation prior to any additional loads to the system