

SAFETY CODES SERVICES BULLETIN

DATE: June 2021

SUBJECT: ELECTRICAL SERVICES
Potential for Overloading of Electrical Services for Residential Buildings

BACKGROUND:

Recent demands from residential landowners for the newest technologies have shown that these systems may pose a problem with existing electrical services. As we add to these existing electrical systems, there is a huge potential to see these services become overloaded. Unless these new electrical loads are calculated and considered before the start of the work, there is an increased chance the new device may overload the existing service panel, which would lead to an unsafe condition and pose a fire hazard to the occupants of the building. Even the installation of a new air conditioner may result in the existing electrical service becoming overloaded and require a service upgrade.

Safety Codes Services has also become aware that there are some new 100amp services being installed that may not even provide the safety factors needed to comply with the current Canadian Electrical Codes and services are being overloaded.

As a result, this Bulletin has been prepared to provide clarity on roles and responsibilities of Electrical Contractors to ensure compliance with the *Safety Codes Act* and its regulations.

CODE REVIEW AND ANALYSIS:

Safety Codes Act (“Act”)

Interpretation

1(1) In this *Act*,

(h) “Contractor” means a person or organization that does or undertakes to do, either for the person’s or organization’s own use or benefit or for that of another, whether or not for the purposes of gain, any process or activity to which this *Act* applies;

(j) “design” includes plans, diagrams, drawings and specifications depicting the arrangement and operation of any thing, process or activity to which this *Act* applies

(v) “owner” includes a lessee, a person in charge, a person who has care and control and a person who holds out that the person has the powers and authority of ownership or who for the time being exercises the powers and authority of ownership;

Part 1 - Responsibilities

Owners Care and Control

5) The owner of any thing, process or activity to which this *Act* applies shall ensure that it meets the requirements of this *Act*, that the thing is maintained as required by the regulations and that when the process or activity is undertaken it is done in a safe manner.

Design Duties

6) A person who creates, alters, has care and control of or owns a design or offers a design for use by others shall ensure that the design complies with this *Act* and that it is submitted for review or registered if required by this *Act*, and if the design is deregistered.

Contractors Duties

8) A Contractor who undertakes construction, operation or maintenance of or builds or installs any thing to which this *Act* applies shall ensure that this *Act* is complied with.

Permit Regulation Alberta Regulation 204/2007

Part 1 – Permits

Permit Required

3(1) Subject to subsection (2), a person shall not start any undertaking for which a Permit is required under this Regulation unless a Permit has been issued.

Electrical Permit

8(1) A Permit in the Electrical discipline is required to install, alter or add to an electrical system.

Part 2 – Permit Administration

20) An application for a Permit and any information required to be included with the application must be submitted in a form and in a manner satisfactory to the Permit Issuer and the application must

(e) describe the undertaking, including information, satisfactory to the Permit Issuer, regarding the technical nature and extent of the undertaking,

(i)(iii) include any further information that the Permit Issuer considers necessary, including the provision of documentation required to verify information provided by the applicant.

2019 NBC-AE

Section 9.34 Electrical Facilities

9.34.1.1. Standard for Electrical Installations

1) Electrical installations, including the service capacity of the installation and the number and distribution of circuits and receptacles, shall conform to the Electrical Code Regulation made pursuant to the *Safety Codes Act*.

Canadian Electrical Code, Part 1, 24th Edition (CEC)

Rule 8-106 Use of demand factors in any case other than a service calculated in accordance with Rules 8-200 and 8-202, where the design of an installation is based on requirements in excess of those given in this Section, the service and feeder capacities shall be increased accordingly.

(8) Where additional loads are to be added to an existing service or feeder, the augmented load shall be permitted to be calculated by adding the sum of the additional loads, with demand factors as permitted by this Code, to the maximum demand load of the existing installation as measured over the most recent 12-month period, but the new calculated load shall be subject to Rule 8-104 (5) and (6).

(9) For loads other than those calculated in accordance with Rules 8-200 and 8-202, feeder and service load calculations shall be permitted to be based on demonstrated loads, provided that such calculations are performed by a qualified person, as determined by the regulatory authority having jurisdiction.

8-200 Single dwellings

(1) The calculated load for the service or feeder supplying a single dwelling shall be based on the greater of Item (a) or (b)

- (a)(i) a basic load of 5000W for the first 90m² of living area (see Rule 8-110); plus
- (ii) an additional 1000W for each 90m² or portion thereof in excess of 90m²; plus
- (iii) any electric space-heating loads provided for with demand factors as permitted in Section 62 plus any air-conditioning loads with a demand factor of 100%, subject to Rule 8-106(3); plus
- (iv) any electric range load provided for as follows: 6000W for a single range plus 40% of any amount by which the rating of the range exceeds 12kW; plus
- (v) any electric tankless water heaters or electric water heaters for steamers, swimming pools, hot tubs, or spas with a demand factor of 100%; plus
- (vi) except as permitted by Rule 8-106(11), any electric vehicle supply equipment loads with a demand factor of 100%; plus
- (vii) any loads provided for that have a rating in excess of 1500W, in addition to those outlined in Items (i) to (vi), at
 - (A) 25% of the rating of each load, if an electric range has been provided for; or
 - (B) 100% of the combined load up to 6000W, plus 25% of the combined load that exceeds 6000W, if an electric range has not been provided for; or
- (b)(i) 24000W where the floor area, exclusive of the basement floor area, is 80m² or more; or
- (ii) 14400 W where the floor area, exclusive of the basement floor area, is less than 80m².

(2) The calculated load for the consumer's service or feeder conductors supplying two or more dwelling units of row housing shall be based on

- (a) the calculated load in the dwelling unit, as determined in accordance with Sub rule (1), excluding any electric space-heating loads and any air-conditioning loads, with application of demand factors to the calculated loads as required by Rule 8-202(3)(a)(i) to (v); plus
- (b) the requirements of Rule 8-202(3) (b) to (e) notwithstanding Rule 86-302, the total load calculated in accordance with either Sub rule (1) or (2) shall not be considered to be a continuous load for application of Rule 8-104;
- (c) if air conditioning is used, the sum of all the air-conditioning loads shall be added, with a demand factor of 100%, to the load determined in accordance with Items (a) and (b), subject to Rule 8-106(3);
- (d) except as permitted by Rule 8-106(11), any electric vehicle supply equipment loads not located in dwelling units shall be added with a demand factor as specified in Table 38; and
- (e) in addition, any lighting, heating, and power loads not located in dwelling units shall be added with a demand factor of 75%.

(3) Notwithstanding Rule 86-302, the total load calculated in accordance with either Sub rule (1) or (2) shall not be considered to be a continuous load for application of Rule 8-104.

(4) The ampacity of feeder conductors from a service supplying loads not located in dwelling units shall be not less than the rating of the equipment installed with demand factors as permitted by this Code.

COMPLIANCE MONITORING:

A Safety Codes Officer (SCO) shall carry out compliance monitoring in accordance with the City of Medicine Hat Quality Management Plan. The SCO shall complete a site inspection and identify all observed deficiencies including any condition where the work is incomplete or does not comply with the *Safety Codes Act* or an associated Code or Regulation. Where, in the opinion of the SCO, an unsafe condition exists related to the electrical service loading, the SCO shall demand evidence from the Permit holder that the design of the electrical services comply with the Canadian Electrical Code.

INTERPRETATION:

This Bulletin is **effective immediately** for all current projects where the undertaking on a valid Electrical Permit includes the installation of a new electrical service or alteration to existing services. When requested by an Electrical Safety Codes Officer, a Permit holder shall submit the required electrical design load calculations forthwith.

[Click here for Electrical Inspection Load Calculation Worksheet \(PDF\)](#)

Where an Electrical Contractor has determined that the existing service to a building does not comply with the Canadian Electrical Code as a result of the proposed additions, they shall contact the utility provider regarding options to upgrade the services prior to submitting the electrical Permit application for the project. To ensure that the project can be completed in a timely manner and on budget, the Electrical Contractor shall be responsible for contacting the Utility Provider and ensure the correct service size is installed.

To better ensure future compliance with the *Safety Codes Act* and the Canadian Electrical Code, effective **September 1, 2021**, all Electrical Contractors shall submit the required information deemed necessary by an Electrical Safety Codes Officer to ensure compliance with the Canadian Electrical Code in force at the time of the Permit application for any Residential Single-Family Dwelling, Duplex, House with Secondary or Backyard Suite.

New Construction – Prior to the issuance of the Electrical Permit for a new Single-Family Dwelling or a House with a Secondary Suite, the Permit applicant shall include electrical load calculations based on the design of the proposed electrical service for the building. The Electrical Contractor shall ensure the correct service size is installed by the Utility Provider.

Temporary Service – A temporary service may be installed under a separate Permit to accommodate the start of new construction until adequate electrical services can be provided to the parcel.

Alteration, Renovations and Service Upgrades – Prior to the issuance of an electrical Permit for a service upgrade, alteration or renovations to an existing Single-Family Dwelling or House with a Secondary Suite, the Permit applicant shall include load calculations based on the existing electrical service and any proposed additions to the electrical system. When the existing service is not rated for the additional electrical load, the Electrical Contractor shall contact the Utility Provider and determine if the service can be upgraded. A separate Permit may be required to upgrade the service prior to the installation of any new electrical services.