

Bulletin 2-11-24
Plans and specifications
Rule 2-010

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(1) Requirements for plan submittal – general

Rule 2-010 of the Ontario Electrical Safety Code contains the requirements for the submittal of plans to ESA's Plan Review Department:

- (1) Electrical work on any electrical installation shall not commence, until plans have been submitted and examined by the Electrical Safety Authority where the electrical installation involves:
 - (a) a three phase consumer service or stand by generation, equal to or in excess of 400 A circuit capacity; (see **Note 1**);
 - (b) a single-phase consumer service or stand by generation equal to or in excess of 600 A; (see **Note 1**);
 - (c) a feeder greater than 1000 amp;
 - (d) an emergency power supply for life safety systems as per Section 46, excluding unit equipment;
 - (e) any installations involving electric-power-generating equipment or energy storage systems, with a rating in excess of 10 kW (Micro Size Exempt) as defined by the Ontario Energy Board, and operating in parallel with a supply authority system; or
 - (f) any installation operating in excess of 750 V, excluding
 - (i) installations of pole lines exclusively within the scope of Section 75; or
 - (ii) that portion of an underground installation between a supply authority owned transformer and the related supply authority owned switch; or
 - (iii) replacement of electrical equipment as permitted by Subrule 2) c).
- (2) Plans need not be submitted for
 - (a) maintenance/ repair work;
 - (b) temporary installations, and work within the scope of Section 76, for equipment operating at not more than 750 V phase-to-phase or not more than 1000 A; or
 - (c) the replacement of electrical equipment, provided that: (See **Topic 1(a)**)
 - (i) equipment electrical characteristics are the same as the existing equipment characteristics; and
 - (ii) the existing installation meets the requirements of this Code.

Note 1

When plans and specifications are required to be submitted for Single Family Dwellings and residential Installations:

- (i) Plans and specifications are required for the consumer's service and distribution equipment only.
- (ii) Information on branch circuits or utilization equipment is not required.

(a) Electrical characteristics of equipment

Questions have been raised as to what "electrical characteristics" are considered when determining if a plan review submission is required for the replacement of electrical equipment. For high voltage equipment, the following questions and answers may be used as guidelines:

Question 1

When replacing a high voltage transformer, what electrical characteristics of the new transformer must be the same as the existing in order to be exempt from a plan review submission?

Answer 1

kVA rating, primary and secondary voltages, transformer type (dry, ONAN, KNAF etc), impedance (*).

(*) If the impedance of the new transformer is the same or higher than the existing transformer and all other electrical characteristics are the same, plan review submission is not required.

Question 2

When replacing a high voltage switch, either pole mounted or metal enclosed, what electrical characteristics of the new switch must be the same as the existing in order to be exempt from a plan review submission?

Answer 2

Voltage, amperage, withstand rating (*), type (pole mounted, open, metal enclosed etc)

(*) If the withstand rating of the new switch is the same or higher than existing and all other electrical characteristics are the same, plan review submission is not required.

(b) Energy storage systems (ESS)

With the installation of energy storage systems (ESS) becoming more common, there is confusion as to when the presence of an ESS triggers a Plan Review submittal. ESS are now defined in Section 64 as systems that store energy for later use when needed. As such, it is important to recognize that these systems have the ability to function in the same manner as a stand by generator.

Where an electrical installation includes an ESS, the electrical design shall be submitted for ESA review when the ESS operates:

- in parallel with the supply authority and is in excess of 10kW per Subrule 1) e);
- as a standalone system with a circuit capacity as stated in Subrule 1) a) and b) (considered to be stand by generation); or
- as an emergency power supply for life safety systems per Subrule 1) d).

(2) Requirements for plan submittal for overhead systems (outside the scope of Section 75)

If a given design exceeds the limitation of Section 75, plans are required to be submitted for review. The submitted design shall conform to the current edition of CSA C22.3 No. 1 “Overhead Systems”, and be stamped and signed by a professional engineer licensed to operate in the province of Ontario.

Section 75 is limited to maximum system voltage of 50,000 volts phase to phase.

Sags and tension Tables address No. 3/0 AWG ACSR maximum.

Specifications for maximum span, framing and class of pole are based on maximum No. 3/0 AWG ACSR conductor.

Examples of when a plan submission is required for overhead systems

The following are some examples of overhead system designs that are not within the scope of Section 75, and plans are required to be submitted to the Plan Review Department for review.

- The nominal voltage exceeds 50,000 volts
- The weight of installed equipment on a pole exceeds Table 103
- The ACSR conductor exceeds No. 3/0 AWG
- The conductor sags & tensions ruling span exceeds 75 m, as permitted by Table 112
- All conductor spans exceeding 90 m
- The neutral supported cable exceeds 2-No. 4/0 AWG Poly AL. & 1-No. 3/0 AWG Bare ACSR or 3-No. 3/0 AWG AL 600V & 1-No. 1/0 AWG Bare ACSR distribution circuits utilizing spun buss
- Platform mounted transformers

(3) Plan review requirements for PV Solar installations

Background

Rule 2-010 1) d) states a plan review is required for installations involving electric-power-generating equipment, with a rating in excess of 10 kW (Micro size) as defined by the OEB, and operating in parallel with a supply authority system.

Question 3

Is a plan review required if the inverter nameplate capacity exceeds 10 kW but is programmed to export a maximum of 8kW to the supply authority?

Answer 3

Yes.

Question 4

Does the inclusion of storage batteries with an electric-power-generator operating in parallel with the supply authority change the plan review requirements?

Answer 4

No.

Question 5

Is plan review required for multiple sources of renewable energy and/or energy storage systems installed at the same time that have a combined capacity exceeding 10 kW and operate in parallel with the supply authority?

Answer 5

Yes

Direction

When multiple systems are installed at the same time, the combined size of the installation will determine if submission to plan review is required.

Example

An 8 kW solar and a 5 kW energy storage system (ESS) installed at the same time would be required to be submitted as the combined total of 13 kW exceeds the exemption in Rule 2-010 1) e) of 10 kW.

(4) Who is responsible for submitting plans?

The person responsible for the plan design shall file with the Electrical Safety Authority complete wiring plans and specifications relating to the proposed work, and pays the Plan Review fees as prescribed by the Electrical Safety Authority. If the plan designer is not the person who files an application for Plan Review, the person who files the plans will be responsible for all aspects of the Plan Review.

(5) Information required

To aid in the Plan Review process, the “Plan Review Submission Form & Checklist” has been developed and is required with all submissions. The form and checklist is a two page document, in which the submitter provides the minimum information required for a Plan Review. Additional information is encouraged but failure to provide this additional information will not delay the Plan Review process. The form and checklist can be found at the following http://www.esasafe.com/assets/files/esasafe/pdf/Plan_Review/Submittal_Form.pdf along with the detailed instructions for completion of the form and checklist. (See **Note 2**)

Note 2

If the form and checklist is not complete or the information submitted does not match the form and checklist, the submitter will be given 10 business days to submit the required information. If the information is not received in the Plan Review Office within this period, the submittal will be rejected. Once a submittal is rejected it will be discarded.

(a) Information required for Ground Fault Protection

In addition to Section 1 “Ground Fault Protection Information” in Check List document, where ground fault protection is required and multiple sources of power exist and to ensure the overall GFP scheme will meet OESC requirements, a ground fault schematic shall be provided identifying the following information, as per Rule 14-102 and the Appendix B note:

- Where neutrals are installed
- Where the neutral is grounded and/or bonded to equipment enclosure
- Type of ground fault sensing methods utilized
- Where Ground Fault Current Transformers are located and how they are connected
- A brief description of how the design considers all sources (see **Note 3**)

Note 3

It is the responsibility of the Designer/ Installer to provide evidence to the Inspector that the Ground Fault Protection Scheme functions properly as per the OESC.

(6) Supply Authority (Local Distribution Company) Requirements

Prior to planning an installation, the supply authority should be consulted for their conditions of service and any special requirements for connection to their distribution system.

(7) Supply Authority (Local Distribution Company) Equipment

The Ontario Electrical Safety Code does not apply to equipment and wiring that is part of the Supply Service (as defined in Section 0). Where the Supply Authority (Local Distribution Company) has provided assurance that they own and control the equipment, the Electrical Safety Authority will not apply the Ontario Electrical Safety Code to that equipment. This equipment is part of the LDC infrastructure, and subject to the Electrical Distribution Safety Regulation 22/04.

(8) Where to submit the plans?

Please submit one copy of the plans for review to:
Electrical Safety Authority
Plan Review Department, Registration Desk
400 Sheldon Drive, Unit 11
Cambridge, Ontario
N1T 2H9

Telephone Number:	Fax Number:
1-800-746-6480	1-800-957-2738
519-624-3564	519-624-3570

All required data should be submitted as a complete package, by one submitter where possible to facilitate the plan review and timely report. Please refer to esasafe.com for more information on “*Acceptable Methods for Plan Review Submissions*”

The fee for plan review is as per ESA’s fee guide.

The inspector in the field gives final approval of the installation.