Technical Safety Authority of Saskatchewan



ELECTRICAL INSPECTIONS

SASKATCHEWAN INTERPRETATIONS

Effective March 1, 2025
v3.0 – Amended October 31, 2026

2024

PREFACE AND SCOPE

The Canadian Electrical Code, Part I, Twenty-Sixth Edition, as interpreted by these requirements, issued under Section 5 of *The Electrical Inspection Act, 1993*, shall govern the workmanship and all other matters pertaining to electrical equipment and the installation of electrical equipment in or upon any land, buildings, structures, and premises.

This document contains supplementary information to clarify the requirements of the 26th edition of the Canadian Electrical Code (CEC), and by their inclusion herein are adopted as requirements under Section 5 of *The Electrical Inspection Act, 1993.*

Δ New or principally changed text is indicated by the blue Delta symbol (Δ) displayed in the margin, further changes are number-coded to the Appendix of Amendments found at the end of the publication. The Acts and Regs have also been updated to reflect the new corporation and management structure.

REPORT OF ACCIDENT

The Electrical Inspection Act, 1993 c.E-6.3 s.27 requires:

"Where an accident involving an electrical installation or electrical equipment occurs and results in the death or injury of a person or in a fire or an explosion, the contractor or the contractor's agent or the owner of the electrical equipment or the owner's agent shall immediately notify the chief inspector, stating the precise location of the accident, its general nature and results.".

INVESTIGATION OF ACCIDENT

The Electrical Inspection Act, 1993 c.E-6.3 s.28 requires:

The accident site is to be preserved, "no part of any electrical plant or electrical equipment involved is to be removed or its position altered by any person", "until the written permission of an inspector has been obtained".

FOR A FIRE OR ACCIDENT INVOLVING ELECTRICAL ENERGY CAUSING INJURY OR DEATH CALL: 1-866-530-8599

Δ **AFTER HOURS REPORT AN INCIDENT USING** Report an Incident **ON THE TSASK WEBSITE**

**** Metric to imperial conversions (approximate) can be found on the last page of this document ****

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WEBSITE INFORMATION

Publications Saskatchewan: https://publications.saskatchewan.ca/#/freelaw/acts

- Electrical Inspection Act, 1993: E-6.3
- Electrical Inspection Regulations: E-6.3 R1, E-6.3 R16
- Electrical Licensing Act: E-7.2
- Electrical Licensing Regulations: E-7.2 R4

③ **TSASK:** www.tsask.ca – checkout our website to find:

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- 2024 CEC Saskatchewan Interpretations
- Approved Field Inspection Agencies and Certification Bodies
- Electrical Inspector Contact Search
- Electrical Fee Schedule
- Code for Electrical Installations at Oil & Gas Facilities
- Link to Electrical Inspection Act and Electrical Inspection Regulations

③ **SaskPower:** www.saskpower.com – checkout their website to find:

- SaskPower Electric Service Requirements
- SaskPower New Connect Process

②③ **Saskatoon Light & Power:** Saskatoon Light & Power | Saskatoon.ca – checkout their website to find:

- New or Upgraded Electrical Service
- Customer Information Guide

② **City of Swift Current Light & Power:** Light & Power | Swift Current

② **BOND NOTICE ADMINISTRATION FEES** – NOTE HAS BEEN REMOVED

UNREPORTED WORK PENALTY – ELECTRICAL INSPECTION REGULATION

The Electrical Inspection Regulations have revised the unreported work penalty, see the latest Electrical Fee Schedule for details.

ENERGIZATION STICKERS

As a reminder, energization stickers shall not be applied to any meter socket unless a paid Electrical Permit has been obtained for the service.

Failure to comply with the specific requirements listed for the application of energization stickers by the Electrical Contractor will result in fines and penalties being assessed against the contractor.

ELECTRICAL INSPECTIONS REGISTERED ELECTRICAL CONTRACTOR PROGRAM

Electrical contractors may be eligible for a 10% discount for customer electrical permits.

To improve and maintain safety and consistency of electrical installations, Electrical Inspections provides the Registered Electrical Contractor Program to electrical contractors who meet the following criteria on an annual basis:

a) Participate in a continuing education program under the umbrella of the Electrical Contractors Association of Saskatchewan (ECAS);
b) Maintain a defect ratio of four percent or below on all inspected permits (minimum of 20 inspected permits per year);
c) Have no incidents of unreported work and disclose all information related to the electrical installation/permit;
d) Take out online permits only; and
e) Correct any defects within the date of expiry and have no incidents of bond action (an incident of bond action will result in the immediate loss of status).

How does it work?

a) Beginning January 1, 2018, contractors will have their history tracked to verify that all criteria have been met;
b) Successful contractors will be notified that they have achieved registered contractor status;
c) Once a contractor has reached registered status, the 10% rebate is applied to all permits starting the following February; and
d) Contractors will be required to meet the criteria annually to remain a registered contractor and will continue to have their history tracked.

NOTE: Use of the TSASK Logo for this purpose is strictly prohibited.

Inquiries
Contact the Chief Electrical Inspector for more information.

JOURNEYMAN LICENCE (see The Electrical Licensing Act E-7.2)

8(1) Subject to Subsection (2), no person shall do any work of electrical installation unless he holds a licence.

EMPLOYER'S LICENCE (see The Electrical Licensing Act E-7.2)

23(1) No employer shall do any work of electrical installation unless he holds an employer's licence.

(2) An employer's licence may be issued to a person who employs at least one individual who holds a journeyman's licence; and is not employed by a holder of a licence other than the applicant unless the other holder holds a supply house licence;

(3) No employer shall require or permit any apprentice or other unlicensed individual to perform any work of electrical installation except as an assistant to, and under the supervision of, a journeyman.

SECTION 2 – GENERAL RULES

2-004 – PERMIT

Permit information

It is the responsibility of the contractor to ensure that the information given on the permit application is accurate and complete. Inaccurate details may result in delayed service connects.

1. Ensure the address where the work is being performed is accurate and complete. Additional information is required where a civic address is not available i.e., beaches, new subdivisions, oilfield lease sites, reserves, etc.
2. Supply work/cell contact phone number and name for the owner. Failure to provide accurate and legible information on any permit application could result in the following:
   a. An inspection fee may be charged to locate missing or inaccurate information; or
   b. The application and payment may be returned to the contractor to update missing or inaccurate information. A fine (as per the Electrical Fee Schedule) for unreported work as per *The Electrical Inspection Regulations* may be assessed for any work that is not authorized by a valid permit.

Section 16 of *The Electrical Inspection Act, 1993* and Section 7 of *The Electrical Inspection Regulations* specifies that *all permit applications must be accompanied by the appropriate fee.*

Commencement of work

Δ In accordance with Section 10 of the Electrical Inspection Regulations:

1) Work for which a permit is granted must be started within 90 days after the date of issuance.
2) If work authorized by a permit is not started within this time frame, the permit expires at the end of that period.
   - Permits may be cancelled by the contractor if work has not been started within 90 days and a refund will be issued; administration fees may apply to the refund.
   - If a permit is over 90 days old and less than one year, and work has not been started, the permit may be cancelled; and a refund issued (less applicable administration fees).
   - Permits over one year will not be refunded.

Permit expiry date

② Permits shall expire one year after the issuance of a permit. Permits shall continue to be valid beyond one year by special permission. *Supplemental permits* must be submitted within 1 year of the permit issue date. After that time, a new permit must be obtained.

2-004 – PERMITS FOR LOW VOLTAGE AND EXTRA LOW VOLTAGE INSTALLATIONS

③ All low voltage and extra low voltage installations including permanently installed string (outline, holiday, track, roofline, etc.) lighting, home automation control wiring, power over ethernet (POE), process controls, fire alarm systems, heating/cooling control wiring, control/communication cable tray and conduit systems, solar powered systems, cathodic protection and SCADA systems require permits. The Electrical Inspection Regulations (available at Publications Saskatchewan https://publications.saskatchewan.ca/#/freelaw/acts) have been amended to exempt the requirement of an electrical permit for the installation of communication cabling.

E-6.3 REG 1 - 6.1(1) In this Section:

a) "code" means the latest prescribed edition of the CEC within the meaning of subsection 5(2) of the Act;
b) "communication system" means a communication system as defined in section 0 of the code;
c) "control circuit" means a control circuit as defined in section 0 of the code;
d) "hazardous location" means a location to which section 18 of the code applies;
e) "patient care area" means an area to which section 24 of the code applies.

E-6.3 REG 1 - 6.1(2)

Subsection 16(2) of the Act does not apply to the following types of work of electrical installation:

a) the replacement of switches, receptacles, ballasts, lighting fixtures or motors, in single-family dwelling units and in non-detached dwelling units with separate entrances that are intended for the use of one family; and
b) the installation of a communication system, other than a communication system:
   i. that is located in a hazardous location;
   ii. that is located in a patient care area; or
   iii. in which control circuits operate the electrical equipment

(E.g., home automation or SCADA systems.)

Δ 1) Replacement of switches or receptacles are not exempt when connections are made to existing aluminum wiring (eg: adding pigtail connections)
2) This exemption also applies to security systems, except that permits will still be required under the following conditions:
   - security systems installed in hazardous locations;
   - security systems installed in patient care areas; or
   - security systems that have a hard-wired 120-volt supply (not a plug-in device).
3) 6.1(1) d) "hazardous location" described in Reg. 1 shall also include a location to which Sections 19 (Oil & Gas Code), 20, and 22 of the code apply.
   - Non-hazardous work in a non-hazardous environment on an oilfield site, does not require the permit selection to be hazardous.
4) The installation of the associated equipment, conduit system, etc. still requires a permit.
5) 6.1(2) Subrule a) is for replacement only without altering the existing wiring installation.

2-004 – PERMITS FOR SIGNS AND OUTLINE LIGHTING

Permits are required for the connection of all signs and outline lighting. The permit fee shall include the wiring to the sign and be as per the Electrical Fee Schedule**.** See also Section 34.

2-004 – PERMITS FOR CUSTOMER SUPPLIED EQUIPMENT

Permits are required for the connection of all customer supplied equipment and skids. The permit fee shall include the wiring to the equipment and the cost of the equipment and skids as per the Electrical Fee Schedule.

2-012 – INSPECTION REQUEST REQUIRED

For scheduling purposes, adequate notice is required for an inspection of, but not limited to, the following installations prior to concealment, operation and/or utility connection. (Note: at the discretion of the Electrical Inspector, the contractor may be requested to be present)

Δ a) Services
- Services 400 amps and under (see 6-200);
- Services over 400 amps (require pre-energization inspection sticker);
- Three-phase pad-mounted transformers with attached metering;

b) Feeders over 400 amps;
c) Medical/health care facilities that contain patient care areas, prior to closing in of walls;
d) High voltage installations, including grounding;
e) Energy production such as solar or wind generation, battery storage systems;
f) Buildings housing livestock or poultry;
g) High voltage neon signs and outline lighting;
h) Sewage lift and sewage/water treatment facilities;
i) Irrigation systems;
j) Marinas;
Δ k) Generator systems over 12 KW; or
l) Other areas and facilities with restricted access.

NOTE:
- To facilitate the inspection of the installations, permit number, plan review number, and contractor photos can be attached to the permit in the Permit System or available at the time of the inspection to show the wiring installation, grounding connection, bonding of equipment, and installation of the equipment.

③ 2-014 – PLANS AND SPECIFICATIONS

Δ Notice Regarding Submission Requirements:
All submissions to Electrical Plans Review must include the information required by Code Rule 2-014 of the current Saskatchewan Interpretations.

② Incomplete or excessive documentation will not be accepted and will cause unnecessary delays and additional costs to your submission.

② Plans Review is only valid in the code cycle in which it was reviewed. The inspection will be based on the CEC in effect on the date the permit is issued. Any exception may require a deviation as per CEC rule 2-030.

For the latest Bulletins and Saskatchewan Interpretations, visit **www.tsask.ca.**

1) One set of construction electrical plans and specifications, as required by Section 19 of *The Electrical Inspection Act, 1993* or as requested by the Electrical Inspections department, shall be submitted to, and reviewed by, the Electrical Inspections department for:

   a) Main service and or feeders where ampacity is over 400A;
   b) All renewable energy system installations;
② c) Sewage lift and treatment facilities;
   d) Medical/health care facilities as indicated by the current edition of the Z32 Standard, including identification of the patient care areas (See Section 24 in the Saskatchewan Interpretations for definitions);
   e) Installations covered by Sections 18, 19 (Oil & Gas Code - excluding single oil well sites < 1000V), 20, and 22 (Note – Reclassification of areas must be performed by a professional engineer complete with an assessment report and stamped drawings);
   f) High voltage services and feeders;
   g) Irrigation systems;
   h) Marinas, wharves, docking facilities, fixed/floating piers and boathouses;
③ i) Generator systems over 12 KW;
   j) EV charging 200 amps and larger (including load calculations); or
   k) Any other installation as deemed necessary by the Electrical Inspections department (e.g., large renovations of public buildings).

2) Submissions shall include the following information:
   a) Submitter (consultant/contractor/client) contact information:
      1. Company name
      2. Mailing address
      3. Phone number
      4. Email address
   b) Project name, construction site address and/or land location.
   c) Clear scope of the work.
   d) Clear identification of existing, new, and future parts of the project.
   e) Electrical plans which shall include the following:
      1. Detailed site plan;

2. An overall single line diagram(SLD) complete with:
   A. Main service ampacity, voltage and phase;
   B. Main and feeder conductor types and sizes including installation method i.e., underground (as per the D Tables and Diagrams), conduit, free air, bundled or raceway;
   C. Panel schedules indicating current and voltage ratings;
   D. Breaker/fuse sizes;
   E. Conductor material (copper or aluminum);
   F. Maximum short circuit current available at main service;
   G. Transformer ratings, primary and secondary overcurrent protection devices and conductor sizes; and
   H. Grounding and bonding details;
3. Hazardous area classification drawings, which shall include the auto ignition temperature (AIT) of the hazardous product present at the site;
4. Patient care areas (clearly identify the different patient care levels);
5. Calculated loads;
6. Cable schedule;
7. Cablebus;
8. Electrical equipment layout;
9. Voltage drop calculation for services and feeders; and
10. Documentation verifying the requirements of 2-306(3) have been met for all overcurrent protective devices rated 1200 Amps or higher (reduction of arc fault clearing times and documentation thereof)

Δ

f) For high voltage (over 1000Vac) installations, in addition to the applicable items in (e), the following information shall be submitted:
   1. Electrical equipment arrangement complete with elevation, profile views, and physical arrangement of the electrical equipment including dimensions which clearly indicate the electrical, physical, & work clearances, and relative locations of the equipment;
   2. Ground potential rise (GPR) study (in absence of actual frozen test data, a fall of potential test will be required);
   3. Fencing arrangement and details (see 36-312);
   4. Grounding and bonding details (including impedance grounding wiring details);
   5. Provisions for metering equipment; and
   6. Other design information and documents as requested by Electrical Inspections.

②

③ g) Plans submission for a renewable energy system shall include, but not be limited to:
   1. manufacturer specifications or data sheets for racking systems, PV modules, DC combiners, inverters, rapid shutdown, etc.;
   2. a detailed site plan showing the relative locations of all electrical equipment including the length of all feeders and any applicable voltage drop calculations; and
   3. an overall single line diagram shall contain the following:
      A. All electrical equipment (new and existing) and where this equipment connects to any electrical systems on the property such as PV array, DC combiner, inverter, disconnect, breaker/fuse, panel, etc.
      B. All specific wiring and installation methods for the entire electrical installation (i.e., copper or aluminum conductors, PVC conduit, EMT, ACWU or TECK cables, underground, indoor/outdoor location, etc.)

C. All grounding and bonding details of any new electrical equipment.
D. The interactive point of connection as applicable in Rule 64-112 shall be shown. For example, if the connection is on the load side of the service disconnecting means such as a panelboard, splitter or other distribution equipment, provide equipment amperage rating, utility source breaker and the renewable energy system input breaker ratings.

4. Solar array details required are:
   A. The maximum photovoltaic source circuit voltage as calculated by Rule 64-202 (N/A for micro-inverters, optimizers);
   B. The rated short-circuit current (N/A for micro-inverters);
   C. The rated operating current and voltage;
   D. The type and number of PV modules connected in each series string;
   E. The specific wiring methods for the solar array as applicable in CEC Rules 64-210, 64-212, & 64-220; and
   F. For rapid shutdown initiation devices, placards indicating equipment locations as per the local fire department (see Appendix M).

h) Plans submission for irrigation systems shall include, but not be limited to:
1. Services;
2. Pump electrical data;
3. Pump controllers;
4. Cable sizes and distances;
5. Approval from AHJ for use in navigable waters;
6. Buoy requirements; and
7. Application for Deviation
8. Pump type and/or location (submersible, shore-mount, float-mount, etc.

Δ

i) Plans submission for marinas, wharves, docking facilities, fixed/floating piers and boathouses shall include, but not be limited to:
1. Service size;
2. Demand calculation;
3. Single Line Drawing (including conductor size, type & distance, ground fault, and grounding & bonding details);
4. Electrical equipment specifications;

Δ 3) Submit plans via GEIS Electrical Plans Submission Portal

4) Plans review fees will be as per the current TSASK Electrical Fee Schedule.

② 5) ** Duplicate note removed, see second paragraph at top of heading re: Incomplete or excessive documentation**

NOTES:

1. The electrical contractor shall ensure that the plans have been submitted to Electrical Inspections.
2. The electrical contractor shall ensure that any main service and/or feeder conductor/cable changes made during construction, be submitted on an updated SLD to Electrical Inspections for addition to the GEIS database for review by the Local Inspector.
3. The electrical contractor shall ensure that any substantial changes made during construction be re-submitted to Electrical Inspections for review.
4. Each electrical contractor, for a complex industrial installation, shall ensure that plans are submitted covering the portion of the installation they are responsible for including the permit number and project designation/name/number, etc.
5. Where plans have not been submitted and reviewed by Electrical Inspections, service energization may be denied.
6. Plans are entered in the queue and reviewed in the order they are received. Submissions missing any required information will be moved back into the queue.
7. Electrical plans should be submitted prior to construction or at least 6 weeks prior to the required pre-inspection and the service energization. The standard turnaround time for the review process is approximately four to six (4 to 6) weeks. For high voltage submissions, the review process is approximately six to eight (6 to 8) weeks. The review process timeline may be longer depending on the number of submissions received.
8. Upon completion of review, the Plans Review letter will be issued to the submitter.
9. NOTE – A copy of the Plans Review letter should be made available at the time of the inspection.
10. Contractor/designer/engineer shall ensure that the customer has a utility interconnection agreement with the utility.
11. Contractor/designer/engineer shall ensure that the customer has a utility letter of acceptance for the installation of closed transition transfer switches as per Rule 84-002.
12. Where an emergency power supply is installed to supply power to life safety systems as defined in Rule 46-002, a selective coordination report will be required to be submitted to Electrical Inspections as per 46-208.
13. ② All wiring between the point of common coupling (renewable connection point) and the utility supply shall comply with the requirements of the CEC.

2-022 – RENOVATION OF EXISTING INSTALLATIONS (reconnect, fires, floods, renovations)

Connection or reconnection **(see 10-102 & 84-002)**

② Prior to a service being reconnected, a permit must be issued, and the electrical inspector must be notified (as per 2-012 and 6-200) for services that were previously disconnected (due to fires, floods, renovation, etc.) for a pre-energization inspection. An Electrical Contractor must ensure it is being energized in a safe state.

Δ A permit is required, and within 30 days, the service shall be made to comply with the requirements of the current edition of the Canadian Electrical Code where the service:

- has been disconnected for more than twelve (12) months;
- has been damaged due to a fire or flood; or
- requires reconnection due to an upgrade, alteration, or repair (e.g., main breaker failure).

NOTES:

- Installation of a meter mounted transfer switch device shall require verification of the service grounding and bonding.
- Wooden masts will not be accepted when a permit is required for a service alteration or upgrade.
- When a service is being altered or upgraded, round meter bases shall be replaced due to the inability to effectively terminate and ground the neutral.
- A pre-inspection and plans may also be required in accordance with 2-012 and 2-014.
- All meter sockets shall be securely mounted which may require a fixed wood backing minimum 19mm thickness, at least the same width as the meter socket, and pressure treated or cladded for protection.
- Δ When replacing a service, it is the contractor's responsibility to ensure branch circuit integrity (i.e., GFCI protection ahead of altered 2-wire circuits, circuit insulation, etc.).

Flood procedures.

When restoring power to a flood damaged premises, there are several conditions to be aware of and processes to comply with. When electrical equipment is exposed to water, corrosion is enhanced rapidly. The equipment may look safe on the outside, but it can be extremely dangerous to reuse. **The Local Electrical Inspector must be notified before reconnection.**

1. Circuits and equipment that were subjected to the flood must be disconnected and isolated before power can be restored.
2. If the service (panelboard, etc.) has been exposed to water, it must be replaced or completely disassembled and cleaned (re-approval by manufacturer required after reassembly). All the submerged or deluged breakers must be replaced and destroyed.
3. When service equipment is replaced, the entire service must be installed to meet the current CEC.
4. All meter sockets must be securely mounted.
5. Grounding must be checked and if repairs are required, they must meet the requirements of the current CEC. Ground clamps should be cleaned or replaced.
6. All submerged or deluged conductors, cables, equipment, receptacles, switches, etc. must be replaced and the damaged material destroyed.
7. Conduit systems that have been flooded shall be cleaned and a bond wire shall be installed with the new conductors or replaced.
8. Furnaces and water heaters must be checked over by a qualified gas contractor.
9. All repair/replacement work due to the flood must meet the current CEC.
10. Anything that is added must be installed to meet the current CEC.
11. Any damaged equipment intended to be re-energized for temporary use until new equipment can be installed must be tested, a monitoring plan put in place and the Inspector shall be brought in for consultation prior to acceptance.

Δ Electrical systems exposed to fire.

When a building has had a fire, and the panelboard and equipment have been exposed to smoke and/or water.

1. If the panelboard has not been damaged by heat etc. it may be thoroughly cleaned and reused (recertification required or a letter of acceptance from manufacturer after reassembly).
2. All breakers, receptacles, switches, lighting, and heating fixtures that have been exposed to smoke and/or water must be replaced, and the old ones destroyed. When it comes to plugs, switches and lights where you can see soot on the equipment they must be replaced. Breakers are much more difficult to see so if they have been exposed to smoke or soot, they must be replaced.
3. Any wiring that may have been exposed to flames or heat in excess of its maximum temperature rating must be replaced.
4. All repair/replacement work due to the fire must meet the current CEC.
5. Anything that is added must be installed to meet the current CEC.
6. Any damaged equipment intended to be re-energized for temporary use until new equipment can be installed must be tested, a monitoring plan put in place and the Inspector shall be brought in for consultation prior to acceptance.

Δ Electrical systems exposed to a lightning strike.

1. Any parts of an electrical system that might have seen a lightning strike must be reported to the Inspections department.
2. Inspections will be looking for a dielectric insulation test or megger test of each circuit affected by a lightning strike to ensure it is safe to keep in service.
3. All repair/replacement work due to the lightning strike must be installed to meet the current CEC.
4. Anything that is added must be installed to meet the current CEC.
5. When the service equipment is being replaced the whole service must be installed to meet the current CEC.

Δ Renovating existing installations excluding flood or fire.

Where during renovation, the walls are opened or if cabinetry is removed/replaced, then every effort shall be made to ensure that the electrical wiring and circuitry for all outlets are installed to meet the current CEC. Electrical Inspections shall be consulted for clarification on what is required specifically to satisfy this policy.

When adding loads such as: air conditioners, hot tubs, EV chargers, etc. it will be the contractor's responsibility to ensure load calculations have been performed as the Local Electrical Inspector may require supporting documentation.

2-024 – USE OF APPROVED EQUIPMENT

(see also: Field Inspection Agencies and Certification Bodies publication)

All electrical equipment shall be approved as per Rule 2-024 and Appendix B note with the exception as per Rule 16-222.

Labels are required for manufactured homes and movable equipment wired under a Saskatchewan electrical permit.

Skids and movable equipment that have been wired off site shall have a suitable, weatherproof (if required) label affixed to the electrical panel or skid. The label shall include the Saskatchewan electrical contractor's name, the permit number that was issued for the installation, and the date.

Manufactured homes [ready to move homes (RTM)] shall have a label affixed to the electrical panelboard or the inside of the kitchen cabinet. The label shall include the Saskatchewan electrical contractor's name, the permit number that was issued for the installation, and the date. If you require labels, please contact your Local Electrical Inspector.

Equipment approval certification

All electrical equipment requires an overall approval from a Saskatchewan recognized certification body prior to being sold, displayed, advertised, electrically connected or reconnected. This includes locally manufactured products, used or rebuilt equipment, solar powered generating units used for temporary construction power or lighting, and may also include mobile homes, and RTM's. For a complete list of approved certification bodies and certification marks, please visit the TSASK website at www.tsask.ca.

Field inspection certification

For a list of current recognized field certification labels for the Province of Saskatchewan, contact Electrical Inspections at our toll-free number 1-866-530-8599, or visit us online at www.tsask.ca.
2024_Field_Inspection_and_Certification_Agencies.pdf

Field inspection / Field evaluation reports

Field inspection reports on skids or movable equipment shall become part of the equipment and shall be made available on request. The report shall remain with the equipment.

2-024 – USE OF APPROVED EQUIPMENT – EXCEPTIONS

There may be occasions where certification standards do not exist for approval of electrical equipment. A deviation shall be applied for in accordance with Rule 2-030.

Liquid-filled Transformers

In the specific situation of liquid-filled transformers, certification organizations have yet to identify a demand for developing a product certification program around this electrical equipment. Consequently, certified liquid-filled transformers are not available.

Conditions

Owners/users required to use liquid-filled transformers are permitted to deviate from Rule 2-024 of the CEC provided they meet the following conditions:

1. Manufacturing standards

    a) Manufactured to Canadian standards

    Liquid-filled transformers are acceptable when the manufacturer declares that they have manufactured, inspected, and tested the transformer to the requirements of the appropriate and current Canadian standards. These standards include, but not limited, to:

    - CAN/CSA-C2.1 Single Phase and Three Phase Distribution Transformers
    - CAN/CSA-C88-16 Power Transformers and Reactors
    - CAN/CSA-C227.3-06(R17) Low Profile, Single Phase, Dead Front Pad-mounted, Distribution Transformers
    - CAN/CSA-C227.4-06(R17) Three Phase, Dead Front Pad-mounted, Distribution Transformers

    b) Manufactured to other than Canadian standards

    - Where liquid-filled transformers are manufactured to other than Canadian standards, the manufacturer must declare that the product has equivalent safety performance as one manufactured to Canadian standards. Alternatively, a Professional Engineer may evaluate and accept the product standard to which the liquid-filled transformer was manufactured if it compares favorably with the appropriate Canadian standards concerning safety performance.

2. Product identification

    In addition to meeting the requirements of Rule 2-100 of the CEC, the liquid-filled transformer must identify the standard to which it was manufactured. The following documentation of appropriate marking must also accompany the product:

    a) a manufacturer's declaration stating that they have manufactured the product to one or more appropriate Canadian standards; or

    b) when manufactured to other than Canadian standards:

    i) a manufacturer's declaration that the product has equivalent safety performance as one manufactured to the appropriate Canadian standards; or

    ii) a Professional Engineer's evaluation report indicating the product as having equivalent safety performance as one manufactured to appropriate Canadian standards.

3. Maintenance

    The owner of the equipment shall ensure the product is maintained to industry standards and manufacturer's specifications.

High Voltage (HV) Downhole Electrical Submersible Pumps (ESPs)

Manufacturers, distributors, owners, and installers of ESPs and associated down-hole cables shall be permitted to deviate from Rule 2-024 of the Canadian Electrical Code provided they meet the following conditions:

Conditions

1. Manufacturing standards

    a) Manufactured to North American Standards:

    ESP's and/or associated down hole cables are acceptable when the manufacturer declares that they have manufactured, inspected, and tested the ESPs and/or associated down-hole cables to the requirements of the appropriate and current standards. These standards include but are not limited to:

    - IEEE 252 Standard Test Procedure for Polyphase Induction Motors having Liquid in the Magnetic Gap.
    - IEEE 1017 Recommended Practice for Field Testing Electric Submersible Pump Cable.
    - IEEE 1018 Recommended Practice for specifying Electric Submersible Pump Cable Ethylene-Propylene Rubber Insulation.
    - IEEE 1019 Recommended Practice for specifying Electric Submersible Pump Cable Polypropylene Rubber Insulation.
    - Manufactured to Other than North American Standards:

    Where ESPs and/or associated down-hole cables are manufactured to other than North American standards, the manufacturer must declare that the product has equivalent safety performance as one manufactured to North American standards. Alternatively, a licensed engineering professional may evaluate and accept the product standard to which the ESP's and/or associated down-hole cables were manufactured to, if it compares favourably with the appropriate North American standards concerning safety performance.

2. Product Identification

    The following documentation for ESPs and associated down-hole cables must be readily accessible:

    - A manufacturer's declaration stating that the product meets industry recognized standards; and
    - Specification sheets stating the product's electrical ratings and characteristics.

3. Additional Requirements
    - The installation is bonded to ground in accordance with Section 10;
    - Proper overcurrent and overload protection must be provided in accordance with the CEC, Part 1; and
    - All above ground components associated with the installations meet the requirements of the CEC Part 1.

2-030 – DEVIATION OR POSTPONEMENT

Requests for special permission shall be made in writing to the Chief Electrical Inspector, giving all details pertaining to the requests. If acceptable, permission pertaining to that installation only will be confirmed in writing.

Δ

2-034 – APPLICATION OF CODE REQUIREMENTS (see Appendix B)

Electrical equipment not covered by the CEC cannot be used to meet the requirements of the CEC. E.g., Utility f-cabinet breakers cannot be used as overcurrent or disconnecting means required by the CEC. (see also 10-208(1)(a))

2-100 – MARKING OF EQUIPMENT

Δ 1)(n) Oilfield & irrigation installations: Labelling of equipment is required by the Canadian Electrical Code. The disconnects for oil well or irrigation sites shall have the correct land location displayed where each distinct site is located. Where there are multiple disconnects in one location; controllers must be labelled as to what they control and where they are fed from, and all underground cables must be labelled where they are fed from, or feed to. See Oil & Gas Code 19-052(4).

1)(n) Farmyards, much like oil wells and irrigation, have potential for complexity in underground feeders/services installation. As such, cable labelling is required for underground cables leaving F-cabinets and splitters. Labelling should indicate which building or equipment the cabling feeds.

②③ 3) When using an oversized VFD and wanting to use a smaller feeder to the VFD, the feeder cable must have a disconnect with proper overcurrent protection. The documentation of the motor must be accessible at the VFD and updated when the motor is changed.

4) Where feeders or branch circuits are added, removed, or modified at an existing panelboard, the existing panel schedule and labelling shall be updated with the information as per 2-100 Subrule 3).

2-106 – REBUILT EQUIPMENT

Retrofit kits and installation requirements

With the application of energy efficiency programs in Saskatchewan, high efficiency lighting technologies and various lighting retrofit kits are popular. There are several options for retrofitting standard tubular fluorescent luminaries, with more energy efficient lamps.

The retrofit of luminaries and signs may be accepted under the original certification when the following conditions apply:

- The work is covered by an electrical permit;
- The replacement equipment bears the mark of a recognized certification agency; or
- The replacement equipment is rated for the application and draws no more power than the original equipment.

Please note that in all cases, each retrofitted luminaire or sign must be provided with a label containing the following information:

- Voltage;
- Amperage;
- Date of install;
- Installed by (contractor name);
- Permit number, and
- Over 150 V to ground on the socket for double ended lamps, a label shall be installed stating, ***Caution - De-energize prior to changing tubes.***

Some retrofit options are:

- Fluorescent retrofit kit – consists of fluorescent tube and electronic ballast that is an integral part of the device.
- LED retrofit kit – consists of an LED retrofit tube and the LED driver components that are remote from (not an integral part of) the device.
- LED retrofit kit with integral driver – consists of an LED tube and the LED driver components that are an integral part of the device.

Retrofit kits specified above require a luminaire conversion and usually involve replacing the lamp, rewiring the luminaire and in some cases, replacing an existing ballast with an LED driver, or directly connecting the lamp to the supply circuit.

Although there are differences in installation of various retrofit kits, for all of them it is very important to consider that the retrofit kits are certified as assemblies to appropriate Canadian standard(s).

Hazardous location luminaires

Hazardous location luminaire certifications investigate all components to ensure they are not or will not become an ignition source. Electrical Inspections requires that hazardous location luminaire retrofit kits be certified to the appropriate standard.

Field modifications to hazardous location luminaires including internal wiring re-work bypassing existing ballast and wiring directly to the socket with phase voltage, shall be field certified by an approved certification body.

2-200 – PROTECTION OF EQUIPMENT

8-400 Commercial automobile receptacles & 8-500 Electric Vehicle charging stations

To prevent damage by vehicles, receptacles shall be protected by one of the following or other equivalent means:

a. approved manufactured flexible impact resistant pedestals;
b. where mechanical protection is not utilized, the receptacles and conduit shall be installed on structures of adequate strength, such as fences, or walls and the receptacles and conduit shall be installed no less than 750 mm above finished grade;
c. a reinforced concrete post with a dimension of not less than 300 mm may be used and shall be installed to a height of not less than 750 mm and to a depth of not less than 750 mm below grade. The receptacles and conduit shall be installed on the face of the post not exposed to vehicular damage. The receptacles may, if desired, be installed on the face of the post exposed to vehicles provided the conduit and outlet box are installed within the post. Mounting height of the receptacles shall not be less than 750 mm above finished grade. As an alternate to the concrete post, a treated wooden post of minimum 150 mm x 150 mm may be used; or bollards or permanently installed curb stops, mounted 1.2 m from the center of the curb stop to the pedestal or receptacle, for drive in parking locations and placed in front of the receptacles to prevent vehicles from damaging receptacle pedestals, shall be accepted as mechanical protection.

Conductors for wiring of these receptacles shall have insulation or covering suitable for installation and use at temperatures down to -40°C except for conductors approved for and installed underground.

A separate bonding conductor is required in metal raceway as per Rule 10-610(1)(c) & 12-1414.

2-300 – GENERAL REQUIREMENTS FOR MAINTENANCE AND OPERATION

Currently there is a concern with free standing services falling over from a lack of support and services not being adequately protected against weather. Free standing services shall meet the following minimum requirements with all posts set to a minimum depth of 750 mm and additional support to deal with any cantilever forces placed upon the structure.

a) 100 A – 200 A services shall be supported on a minimum of 2 pressure treated 100 mm x 100 mm posts with a 21 mm pressure treated backing.
b) 300 A – 800 A services shall be supported on a minimum of 3 pressure treated 150 mm x 150 mm posts with a 21 mm pressure treated backing.
c) 1000 A and larger - same as (b) and shall have additional support as required.

Outdoor services shall require substantial weather resistant construction.

②③ 2-306 – SHOCK AND ARC FLASH PROTECTION (see Appendix B)

When installing overcurrent devices 1200A and higher:

- provide means to reduce arc fault clearing time (professionally designed/manufactured)
- appropriate labelling shall be required as per Z462
- instructions shall be readily available on site for qualified personnel and Electrical Inspections

2-328 – ELECTRICAL EQUIPMENT NEAR FLAMMABLE GAS EQUIPMENT

③ The clearance around gas regulator relief vents to arc-producing electrical equipment shall be 0.9 m for natural gas and 1.5 m for propane (as per CSA B149.1).

NOTES:

- This clearance is a spherical radius.
- Revenue meters, hot tub and air-conditioning disconnects are examples of arc-producing electrical equipment.

2-400 – ENCLOSURES, BOXES, TYPE DESIGNATIONS, AND USE (see Appendix B)

When entering equipment being used outdoors, weatherproof connectors shall be the only acceptable method of entry to ensure the integrity of the installation.

SECTION 4 – CONDUCTORS

Δ D8 TABLES WITH 75° CALCULATIONS

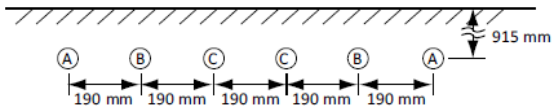


Table D8A

Allowable copper conductor ampacities for cables rated not more than 5000 V and unshielded for the installation configurations of Diagram D8

(see Rule 4-004.)

Size,AWG	1/phase, Detail 1		2/phase, Detail 2		2/phase, Detail 3		4/phase, Detail 4		4/phase, Detail 5		6/phase, Detail 6		6/phase, Detail 7	
or Kcmil	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃
1 / 0	315	279	269	238	288	255	204	181	221	196	171	152	186	165
2/ 0	357	316	304	269	326	289	230	204	249	221	192	170	209	185
3/ 0	405	359	343	304	369	327	259	229	281	249	217	192	236	209
4/ 0	458	406	388	344	418	370	292	259	317	281	244	216	265	235
250	499	442	422	374	454	402	317	281	344	305	265	235	289	256
300	550	487	464	411	500	443	348	308	378	335	291	258	317	281
350	597	529	503	446	543	481	376	333	409	362	314	278	342	303
400	642	569	540	478	582	516	403	357	439	389	336	298	366	324
500	721	639	605	536	654	579	451	400	491	435	375	332	409	362
600	790	700	662	587	716	634	493	437	536	475	410	363	447	396
750	885	784	740	656	801	710	549	486	598	530	457	405	498	441
900	972	861	810	718	877	777	599	531	653	579	498	441	543	481
1000	1020	904	850	753	921	816	629	557	686	608	522	462	570	505
1250	1132	1003	941	834	1020	904	694	615	757	671	576	510	629	557
1500	1227	1087	1017	901	1104	978	749	664	817	724	621	550	678	601
1750	1308	1159	1083	960	1176	1042	796	705	869	770	659	584	720	638
2000	1376	1219	1138	1008	1236	1095	835	740	911	807	691	612	755	669

Table D8B

Allowable aluminum conductor ampacities for cables rated not more than 5000 V and unshielded for the installation configurations of Diagram D8

(see Rule 4-004.)

Size,AWG	1/phase, Detail 1		2/phase, Detail 2		2/phase, Detail 3		4/phase, Detail 4		4/phase, Detail 5		6/phase, Detail 6		6/phase, Detail 7	
or Kcmil	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃
1 / 0	244	216	208	184	223	198	158	140	172	152	133	118	144	128
2/ 0	276	245	236	209	253	224	179	159	194	172	150	133	163	144
3/ 0	313	277	266	236	286	253	201	178	218	193	169	150	183	162
4/ 0	356	315	302	268	325	288	227	201	247	219	190	168	207	183
250	387	343	328	291	353	313	247	219	268	237	206	183	225	199
300	427	378	361	320	389	345	271	240	294	260	226	200	247	219
350	464	411	391	346	422	374	293	260	319	283	245	217	267	237
400	498	441	420	372	453	401	314	278	342	303	262	232	286	253
500	561	497	472	418	509	451	352	312	383	339	293	260	320	284
600	617	547	518	459	559	495	386	342	420	372	321	284	350	310
750	694	615	581	515	628	556	432	383	470	416	359	318	392	347
900	764	677	638	565	691	612	473	419	515	456	393	348	429	380
1000	807	715	673	596	729	646	498	441	543	481	414	367	452	400
1250	906	803	753	667	817	724	556	493	606	537	461	408	503	446
1500	992	879	822	728	893	791	605	536	661	586	502	445	548	486
1750	1068	946	884	783	960	851	649	575	709	628	538	477	588	521
2000	1134	1005	937	830	1018	902	687	609	751	665	569	504	622	551

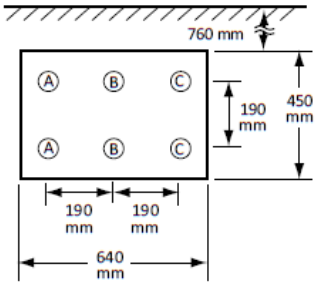
Δ D9 TABLES WITH 75° CALCULATIONS

Table D9A

Allowable copper conductor ampacities for cables rated not more than 5000 V and unshielded for the installation configurations of Diagram D9

(see Rule 4-004.)

Size,AWG or Kcmil	1/phase, Detail 1		2/phase, Detail 2		4/phase, Detail 3		6/phase, Detail 4	
	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃
1 / 0	258	229	221	196	181	160	165	146
2/ 0	293	260	250	222	205	182	186	165
3/ 0	333	295	283	251	231	205	210	186
4/ 0	378	335	321	284	261	231	237	210
250	414	367	351	311	285	253	258	229
300	458	406	387	343	313	277	284	252
350	499	442	420	372	339	300	307	272
400	537	476	451	400	364	323	329	291
500	607	538	507	449	408	361	369	327
600	669	593	558	494	447	396	404	358
750	754	668	626	555	500	443	451	400
900	832	737	687	609	547	485	492	436
1000	875	775	722	640	574	509	517	458
1250	978	867	803	711	635	563	572	507
1500	1065	944	870	771	687	609	617	547
1750	1140	1010	928	822	731	648	656	581
2000	1203	1066	976	865	767	680	689	610



OR

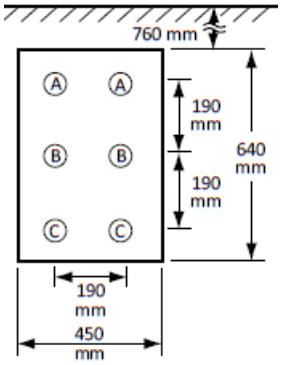


Table D9B

Allowable aluminum conductor ampacities for cables rated not more than 5000 V and unshielded for the installation configurations of Diagram D9

(see Rule 4-004.)

Size,AWG or Kcmil	1/phase, Detail 1		2/phase, Detail 2		4/phase, Detail 3		6/phase, Detail 4	
	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃
1 / 0	199	176	171	152	141	125	128	113
2/ 0	226	200	194	172	159	141	145	128
3/ 0	257	228	219	194	179	159	163	144
4/ 0	293	260	249	221	203	180	184	163
250	321	284	272	241	221	196	201	178
300	355	315	300	266	243	215	221	196
350	386	342	326	289	264	234	239	212
400	416	369	351	311	283	251	256	227
500	471	417	395	350	318	282	288	255
600	521	462	435	385	350	310	316	280
750	590	523	491	435	392	347	354	314
900	652	578	540	478	431	382	388	344
1000	690	611	570	505	454	402	409	362
1250	783	694	643	570	509	451	458	406
1500	861	763	703	623	555	492	499	442
1750	930	824	757	671	596	528	536	475
2000	991	878	804	712	632	560	567	502

Δ D10 TABLES WITH 75° CALCULATIONS

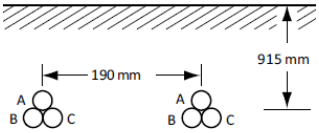


Table D10A

Allowable copper conductor ampacities for cables rated not more than 5000 V and unshielded for the installation configurations of Diagram D10

(see Rule 4-004.)

Size,AWG	1/phase, Detail 1		2/phase, Detail 2		3/phase, Detail 3		4/phase, Detail 4		5/phase, Detail 5		6/phase, Detail 6	
or Kcmil	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃
1 / 0	262	232	221	196	195	173	181	160	170	151	163	144
2/ 0	298	264	250	222	220	195	205	182	192	170	184	163
3/ 0	337	299	282	250	248	220	230	204	216	191	207	183
4/ 0	382	338	319	283	280	248	260	230	244	216	233	206
250	418	370	348	308	306	271	283	251	265	235	253	224
300	462	409	382	338	336	298	310	275	291	258	278	246
350	500	443	413	366	362	321	335	297	314	278	300	266
400	538	477	443	392	388	344	358	317	336	298	320	284
500	602	533	494	438	432	383	398	353	373	330	356	315
600	658	583	538	477	470	416	433	384	405	359	387	343
750	731	648	595	527	518	459	478	424	447	396	426	377
900	795	704	643	570	560	496	515	456	481	426	458	406
1000	827	733	669	593	582	516	535	474	500	443	476	422
1250	907	804	728	645	632	560	581	515	542	480	516	457
1500	966	856	772	684	670	594	615	545	574	509	546	484
1750	1017	901	809	717	702	622	643	570	600	532	571	506
2000	1060	939	840	744	728	645	667	591	622	551	591	524

Table D10B

Allowable aluminum conductor ampacities for cables rated not more than 5000 V and unshielded for the installation configurations of Diagram D10

(see Rule 4-004.)

Size,AWG	1/phase, Detail 1		2/phase, Detail 2		3/phase, Detail 3		4/phase, Detail 4		5/phase, Detail 5		6/phase, Detail 6	
or Kcmil	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃
1 / 0	203	180	172	152	152	135	141	125	132	117	127	113
2/ 0	230	204	193	171	171	152	159	141	149	132	143	127
3/ 0	261	231	219	194	193	171	179	159	168	149	161	143
4/ 0	298	264	249	221	219	194	203	180	190	168	182	161
250	324	287	270	239	238	211	220	195	207	183	197	175
300	359	318	298	264	262	232	242	214	227	201	217	192
350	390	346	323	286	284	252	262	232	246	218	235	208
400	419	371	347	307	304	269	281	249	263	233	251	222
500	473	419	389	345	340	301	314	278	294	260	281	249
600	522	462	428	379	374	331	345	306	323	286	308	273
750	586	519	478	424	417	369	384	340	359	318	342	303
900	643	570	522	462	455	403	418	370	391	346	373	330
1000	677	600	548	486	477	423	439	389	410	363	391	346
1250	757	671	608	539	528	468	485	430	453	401	431	382
1500	819	726	655	580	568	503	521	462	487	431	463	410
1750	873	773	695	616	602	533	552	489	515	456	490	434
2000	917	812	727	644	630	558	577	511	538	477	512	454

Δ D11 TABLES WITH 75° CALCULATIONS

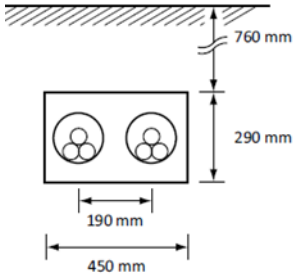


Table D11A
Allowable copper conductor ampacities for cables rated not more than 5000 V and unshielded for the installation configurations of Diagram D11
(see Rule 4-004.)

Size,AWG or Kcmil	1/phase, Detail 1		2/phase, Detail 2		3/phase, Detail 3		4/phase, Detail 4		5/phase, Detail 5		6/phase, Detail 6		8/phase, Detail 8	
	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃
1 / 0	205	182	185	164	169	150	158	140	147	130	139	123	130	115
2/ 0	233	206	210	186	192	170	179	159	166	147	157	139	147	130
3/ 0	266	236	239	212	218	193	202	179	188	167	178	158	166	147
4/ 0	303	268	271	240	247	219	229	203	212	188	201	178	187	166
250	335	297	298	264	271	240	251	222	232	206	219	194	204	181
300	370	328	329	291	298	264	276	245	255	226	241	214	224	198
350	403	357	357	316	323	286	299	265	276	245	261	231	242	214
400	434	385	384	340	347	307	320	284	295	261	279	247	259	229
500	489	433	430	381	388	344	357	316	329	291	310	275	288	255
600	539	478	472	418	424	376	390	346	359	318	339	300	314	278
750	601	532	524	464	470	416	431	382	397	352	374	331	346	307
900	655	580	569	504	509	451	466	413	428	379	403	357	373	330
1000	683	605	593	525	530	470	485	430	445	394	419	371	388	344
1250	752	666	649	575	578	512	528	468	484	429	455	403	421	373
1500	804	712	691	612	614	544	561	497	513	455	482	427	445	394
1750	847	750	726	643	644	571	587	520	537	476	504	447	466	413
2000	901	798	744	659	659	584	601	532	549	486	515	456	476	422

Table D11B
Allowable aluminum conductor ampacities for cables rated not more than 5000 V and unshielded for the installation configurations of Diagram D11
(see Rule 4-004.)

Size,AWG or Kcmil	1/phase, Detail 1		2/phase, Detail 2		3/phase, Detail 3		4/phase, Detail 4		5/phase, Detail 5		6/phase, Detail 6		8/phase, Detail 8	
	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃	90 ℃	75 ℃
1 / 0	157	139	143	127	131	116	122	108	114	101	108	96	101	89
2/ 0	179	159	162	144	148	131	138	122	129	114	122	108	114	101
3/ 0	205	182	184	163	168	149	157	139	146	129	138	122	129	114
4/ 0	235	208	210	186	192	170	178	158	165	146	156	138	146	129
250	258	229	231	205	210	186	195	173	180	159	171	152	159	141
300	286	253	255	226	232	206	215	190	199	176	188	167	175	155
350	312	276	278	246	252	223	233	206	215	190	204	181	189	167
400	337	299	299	265	271	240	250	222	231	205	218	193	203	180
500	382	338	337	299	305	270	281	249	259	229	245	217	227	201
600	424	376	373	330	336	298	309	274	285	253	269	238	249	221
750	478	424	419	371	376	333	346	307	318	282	300	266	278	246
900	527	467	459	407	412	365	378	335	347	307	327	290	303	268
1000	555	492	483	428	433	384	397	352	364	323	343	304	318	282
1250	626	555	541	479	482	427	441	391	404	358	380	337	351	311
1500	679	602	585	518	520	461	475	421	435	385	409	362	377	334
1750	724	641	621	550	552	489	503	446	461	408	432	383	399	354
2000	777	688	646	572	573	508	522	462	477	423	448	397	413	366

Δ 4-004 – AMPACITY OF WIRES AND CABLES (see Appendix B)

Notes have been removed.

③ 4-006 – TEMPERATURE LIMITATIONS (see Appendix B)

Notes have been removed.

4-008 – INDUCED VOLTAGES AND CURRENTS IN METAL ARMOUR OR SHEATHS OF SINGLE CONDUCTOR CABLES (see Appendix B)

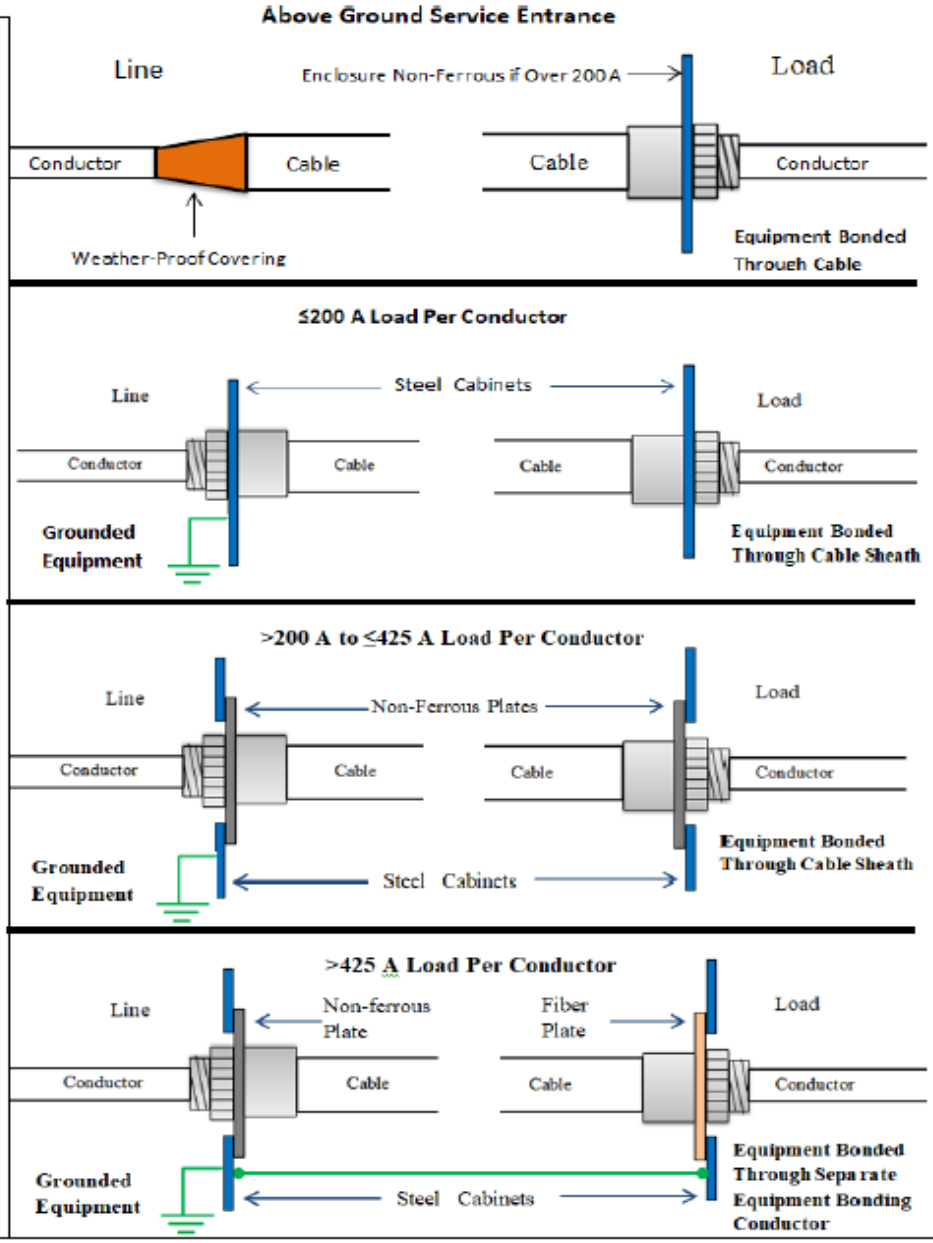
Where sheath currents are likely to cause insulation of the conductors to be subjected to temperatures in excess of the insulation ratings, the cables shall be:

a) derated to 70% of the cable ampacity,

b) derated in accordance with manufacturers recommendations and 2-030,

c) Installed in a manner that prevents the flow of sheath currents.

Includes the use of non-ferrous metals when encircling the conductors to deal with the magnetic and hysteresis effects, i.e. clamps, straps, connectors, KO's...



1c TECK90 w/ concentric bond conductor, 1c ACWU90 w/concentric bond conductor, 1c CORFLEX RA90 w/ continuous corrugated welded aluminum sheath armour. These bonding paths shall all be treated the same as far as bonding or isolating requirements. For 5KV and above, see Table D17 Conditions of use or manufacturers recommendations.

Above 425 A or whenever a single bonding conductor is installed, it should be installed as per manufacturers recommendations.

Figure 4-2

4-022 – INSTALLATION OF IDENTIFIED CONDUCTORS (see Appendix B)

4-022(1) Where a service, feeder or branch circuit requires an identified conductor, it shall be installed.

4-022(2) The neutral conductor shall be installed at each switch controlling permanently installed luminaires at a branch circuit outlet.

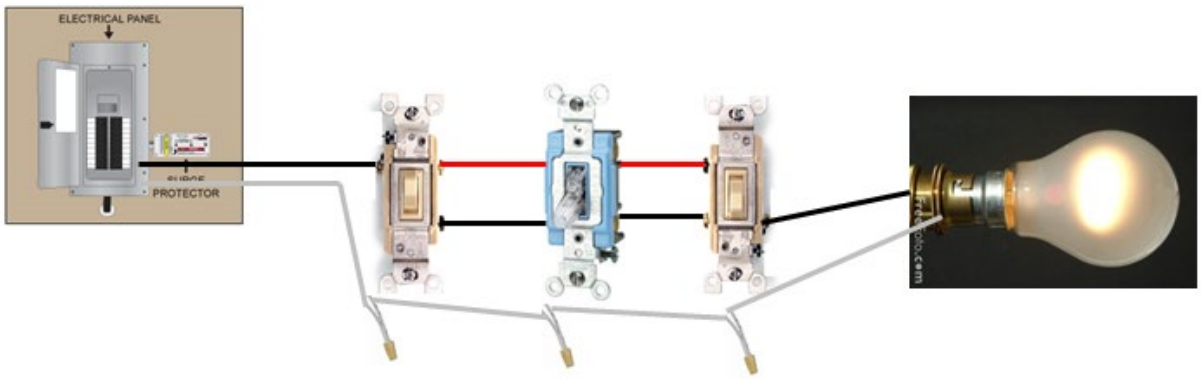


Figure 4-3

4-032(3) – IDENTIFICATION OF INSULATED CONDUCTORS

Unless specified elsewhere in the code, colour coding of branch circuit conductors and service conductors are not a mandatory requirement. This rule states that where colour coding is required, the colours shall be red, black, and blue. The utility electric service requirements may specify where conductors must be colour coded (splitter box or CT metering). If CT metering is used after the main disconnect, then colour coding must be used to that point.

SECTION 6 – SERVICES AND SERVICE EQUIPMENT

6-104 – NUMBER OF CONSUMER'S SERVICES PERMITTED IN OR ON A BUILDING

The maximum number of consumer services from a single supply service is four. **The contractor must confirm the installation with the local utility and meet utility requirements prior to construction.**

NOTE: If two supply services are permitted, then they will require a label at each service, stating that there are two services and the location of each.

6-112 – SUPPORT FOR THE ATTACHMENT OF OVERHEAD SUPPLY OR CONSUMER'S SERVICE CONDUCTORS OR CABLES (see Appendix B)

6-112(3) - For the purpose of this rule 'ground normally accessible to pedestrians' includes patios and decks.

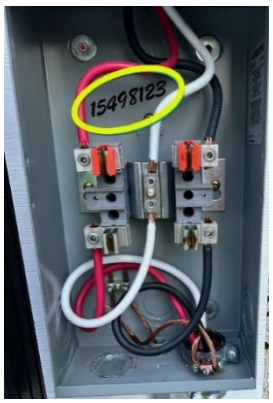
6-112(5) Appendix B - note states (as per CSA 22.2 No.82) an acceptable manner for mast support is one where three (3) support clamps are used, of these, the upper most is required to be a complete through-bolt assembly consisting of a minimum 12 mm bolt, nut, and washer, and an insulated point of connection.

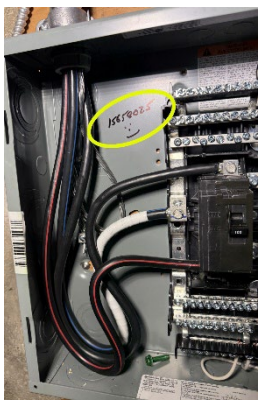
③ As an alternative to the "through-bolt" requirement**, with the permission of the Local Electrical Inspector**, other methods of secure attachment may be considered. Other methods shall only be considered when it is impractical or impossible to install the normal through-bolt support. Must be an insulated point of connection.

Δ③ 6-200 – SERVICE EQUIPMENT – MANDATORY INSPECTION

Service inspection requests are mandatory prior to being energized. To facilitate the safe installation of services, the contractor is required to arrange an inspection of all services prior to being energized. Contractors shall write the permit number in a permanent and visible location inside the meter socket and service entrance compartment of panel. Contractors shall attach a picture of the service (meter socket interior, completed service entrance compartment of panel, etc.) to their permit as well. Please Note: Without Inspector contact and/or picture prior to energization, the Inspections Department will reserve the right to demand the contractor arrange an inspection. An administrative penalty may be applied. (see 2-012)







6-200(1) – SERVICE EQUIPMENT – SINGLE BREAKER SERVICE EQUIPMENT

Each consumer's service shall be provided with a single service box, except where a panelboard can employ no more than two single-pole breakers, one two-pole breaker, or one three-pole breaker and is service entrance rated.

6-200(2) – SERVICE EQUIPMENT – DUAL-LUG METER SOCKETS (see 6-104)

200 A dual-lug meter sockets, 400 A or 600 A customer service termination equipment (CSTE) cabinets may be installed where a customer wants multiple consumer services and is acceptable to the utility. The subdivision of the consumer services can be accomplished within the dual-lug meter socket or CSTE cabinet provided that the total current rating of the consumer service disconnects does not exceed the ampere rating of the meter socket or CSTE cabinet.

③ Note has been removed.

6-206 – CONSUMER'S SERVICE EQUIPMENT LOCATION

6-206(1)(a) - Electric Service Requirements

Contractor must ensure the service meets utility service requirements prior to energization. Contractor shall enquire at relevant utility provider. Online resources are:

- SaskPower Electric Service Requirements can be found online at www.saskpower.com or call SaskPower at 1-888-757-6937.
- ③ Saskatoon Light & Power Customer Information Guide can be found online at www.saskatoon.ca/SLP or call Saskatoon Light & Power at 1-306-975-2414
- City of Swift Current - Use SaskPower Electric Service Requirements.

6-206(1)(c) - Panels

Thermally insulated walls are considered an undesirable location for recessing of panelboards.

Panelboards shall be installed in the building being served and the length of unfused service conductors shall not exceed six (6) conduit meters. Where the service box or other consumer's service equipment is located beyond six (6) conduit meters from the point where unfused service conductors enter the building, the conductors shall be run in threaded rigid metal conduit for the entire length inside the building.

NOTE: Metallic service conduits or service cables with metallic armor require a bonding bushing in the main service to assure continuity of the raceway or sheath. See 10-604 - assuring bonding continuity at service equipment.

6-206(3) - Service disconnect

The service disconnecting means shall be service entrance rated and permitted to be placed on the outside of the building or on a pole, provided it is rated for the location and protected from damage in accordance with the CEC requirements.

② Any sites serviced by an f-cabinet require the conductors to terminate on a service entrance rated disconnect. This includes single oil sites or a string of wells (except for low voltage sites e.g., 12-volt DC). The feeder conductors shall also include a bond conductor sized to Table 16, to safely conduct any fault current back to the source and to ensure the safe operation of the overcurrent devices.

NOTES:

- An oilfield well controller shall not be considered a service disconnect unless service entrance rated.
- The SaskPower supplied farm service center (f-cabinet) breaker shall not be considered as overcurrent protection for the service or cables.
- 480-Volt utility service meter cabinets shall only be operated by Utility Personnel. (i.e., Oilfield, Irrigation Pivots, etc.)

6-208 – CONSUMER'S SERVICE CONDUCTORS LOCATION – UNDER HOUSE TRAILER/MOBILE HOMES

Service conductors installed underneath a house trailer/mobile home must be approved for the location and supported to the underside of the mobile home or buried. Unarmored service conductors must be installed in a raceway from the point where they issue from the earth and include a bond as per Section 10.

For the purposes of 6-206(1)(c), the 6 m rule does not apply to a crawl space below a mobile home.

6-212 – WIRING SPACE IN ENCLOSURES

Where a service disconnecting means is not equipped with a barrier between the line and load side, the conductors shall enter the service box as close as possible to the line terminals and not come into contact with, or cross conductors connected to the load terminals.

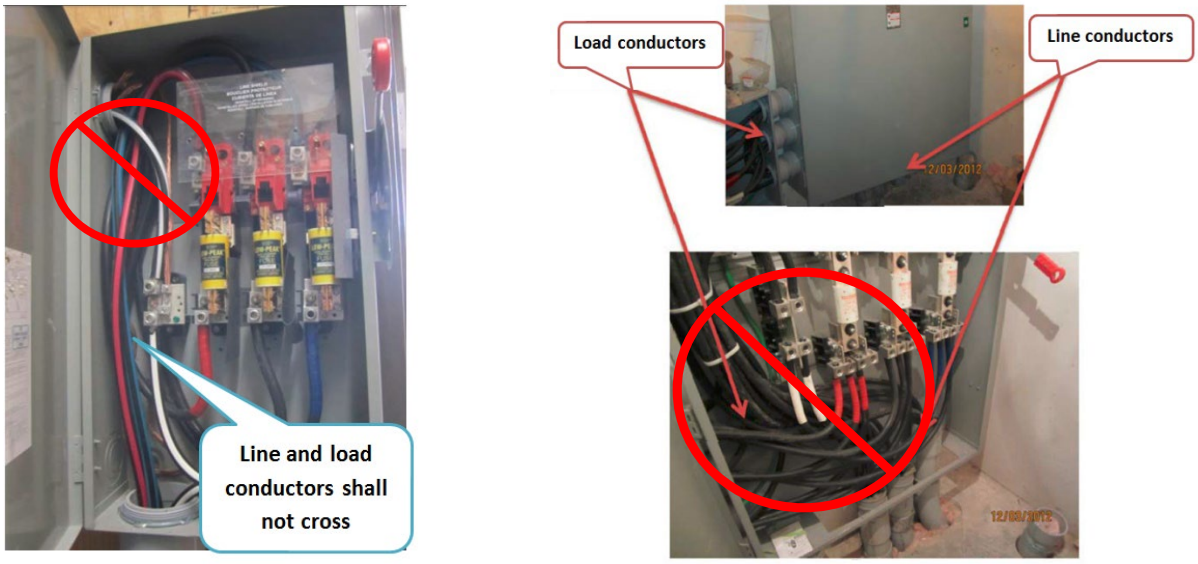


Figure 6-1

NOTE:
The bonding conductor for water line, gas line etc. shall not be taken out of the main disconnect area of a combination breaker panel.

6-300 – INSTALLATION OF UNDERGROUND CONSUMER'S SERVICE CONDUCTORS

Caution must be taken by the electrical contractor when installing a customer-owned underground service from the meter socket to the panelboard location.

The consumer's underground cable must be installed tight to the basement wall anywhere within 1.5 m of the meter socket location. This will help to prevent the cable from being damaged when the utility trenches in their underground service cable from the pole or pedestal to the socket. Once the cable is past the 1.5 m distance, it may then be installed out away from the basement wall. Cables without mechanical protection shall be in 150mm of sand or in a conduit to protect it from damage and settling during back fill.

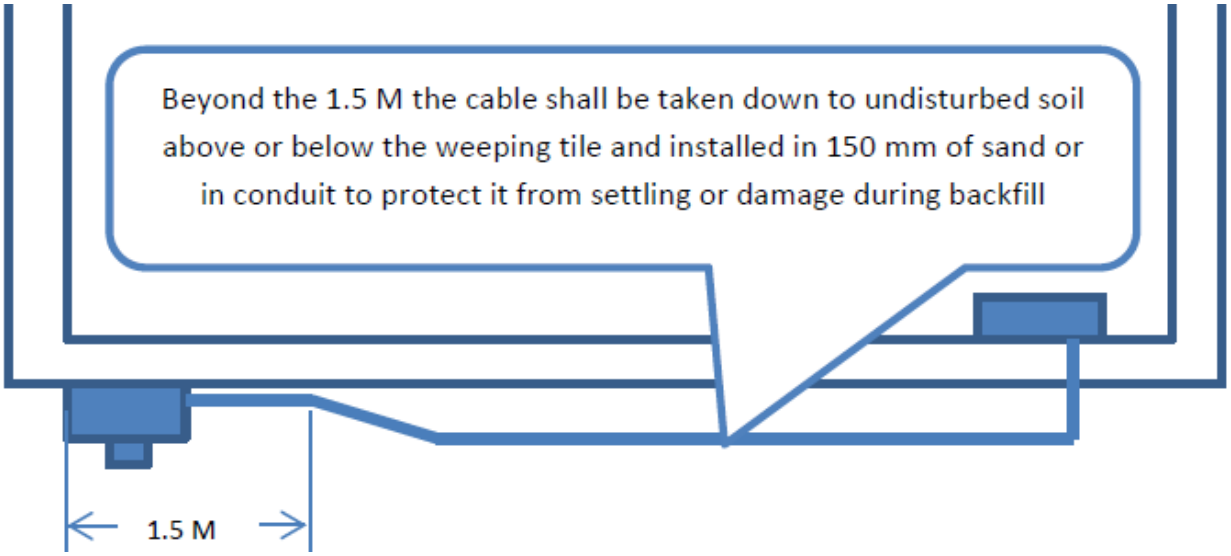


Figure 6-2

As per 12-012 (12) & (13), the installation will also require frost sleeves at both ends and marking tape must be installed in the cable trench.

Underground service entrance cable as described in Table 19 shall be allowed to be supplied from a branch circuit overcurrent device when used as an underground feeder. The bare conductor (USEB) cannot be used as a neutral unless effectively isolated. USEI and USEB require mechanical protection installed where exposed above ground.

6-312 – CONDENSATION IN CONSUMER'S SERVICE RACEWAY

It is recommended that the sealing be performed on the warm side to prevent condensation build-up in the conduit. Conduit may be sealed on both the warm and the cold side.

6-404 – ENCLOSURES FOR INSTRUMENT TRANSFORMERS

Where required for metering only, the neutral must be brought into the CT cabinet, sized and terminated to meet metering requirements as per local utility service requirements. Consult utility.

Δ 6-408(1)(f) – LOCATION OF METERS (see also 2-328)

As per utility service requirements:

Furnace, water heater, air exchanger, dryer and similar exhaust vents shall not be installed directly above, directly below, or within 1 m horizontally of a meter socket. These would be considered undesirable locations as per CEC.

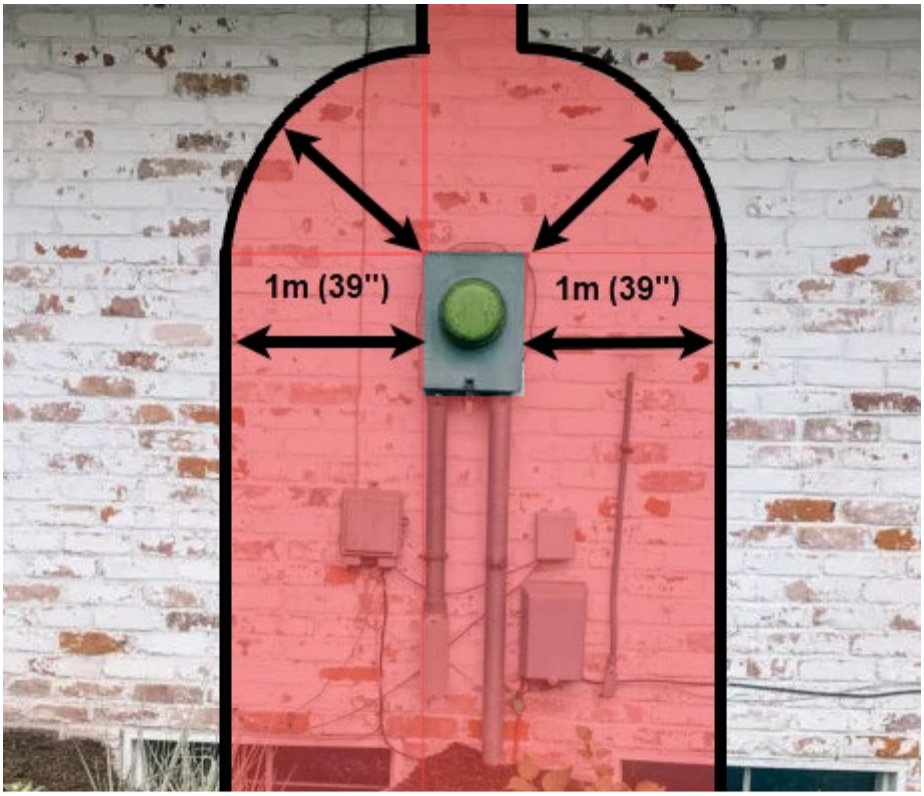


Figure 6-3

SECTION 8 – CIRCUIT LOADING AND DEMAND FACTORS

Δ 8-102 – VOLTAGE DROP

Precautions must be taken to prevent any services or branch circuits from exceeding 5% voltage drop from the utility to the end use, with no feeder or branch circuit exceeding 3%. The calculation of voltage drop on services and branch circuits is based on the connected load, or 80% of the overcurrent device for unknown loads. See CEC Rule 8-102, Table D-3 and Handbook for clarification and examples.

Voltage Drop Calculators (apps or websites) may be acceptable for deriving calculations however it is the sole discretion of the local Electrical Inspector if they agree with the numbers provided and have the ability to request evidence as they see fit.

Table D3 has been modified, including having the formula for voltage drop calculation displayed 4 ways so one does not have to worry about performing the formula permutation as in the past.

For conductor operating temperatures of 75°C:

1) Voltage drop for a known conductor size can be calculated from the Table using the following formula:

   $VD=(K \times f \times I \times L)/1000$

2) When the conductor size is not known, the maximum K factor can be calculated using the following formula:

   $K \leq (VD \times 1000)/(I \times L \times f)$

3) When the conductor size is known, the maximum cable length can be calculated using the following formula:

   $L \leq ((VD \times 1000)/(I \times K \times f))$

4) The percent voltage drop, VD%, is calculated using the following formula:

   $VD\% = (VD/V) \times 100$

Where:
V = connected load voltage at source
VD = voltage difference between the source and the load expressed in volts
K = Table voltage drop factor in ohms per circuit kilometre
f = voltage drop factor based on the electrical system and circuit identified in the Voltage Drop Factor Table
I = load current, A
L = length of the circuit conductors, m

Notes:
The voltage drop factor (f above) must be obtained from the Table in note 2) that accompanies Table D3.
To determine the voltage drop for conductors having 60 °C and 90 °C operating temperatures, multiply the K value by 0.95 and 1.05, respectively.

Be sure to review and utilize all the notes for Table D3 as required.

Table D4 has been removed: the ability to perform voltage drop for DC circuits is included in the material in Table D3.

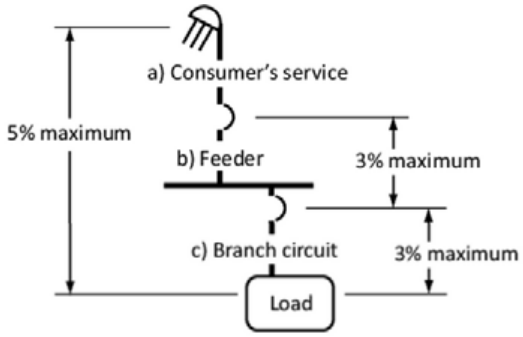


Figure 8-1

8-104 – MAXIMUM CIRCUIT LOADING (see Appendix B)

1. Where single conductor cables are used, they are permitted to be smaller in size due to the installation methods. Where they rise to terminate on a breaker, the heating in the enclosure can exceed the rating of the conductor. This is the reason that the single conductor cables need to be derated further.
2. Where a fused switch or circuit breaker is marked for continuous operation at 80% or 100% the rating of the respective cables will also change as per the CEC requirements. The continuous load as determined from the calculated load shall not exceed the continuous operation marking on the fused switch or circuit breaker. The continuous load may however be less due to the allowable ampacities of the conductors and the deration required by this rule.
3. Where the maximum continuous load allowed on a fused switch or circuit breaker as determined from Rule 8-104 (5) & (6) is less than the continuous operating marking of the fused switch or circuit breaker, a permanent, legible caution label shall be installed adjacent to the fused switch or circuit breaker to indicate the maximum continuous load permitted.
4. Installation or addition of a vehicle charging system shall not exceed the building feeder or service loading requirements. See also 8-500 (2).

Labels shall be in accordance with 2-100.

8-104(3)(a) – Water heaters

Water heaters are considered continuous loads and, therefore, the circuit conductor and the overcurrent device shall be loaded to a maximum of 80%. Example - if the water heater is rated at 3000 watts on 240 V (12.5 A), 62-114(7) will allow a #14 AWG conductor and a 20 A breaker.

8-106 – USE OF DEMAND FACTORS

8-106(10) is to be used where electric vehicle supply equipment loads are controlled by an electric vehicle energy management system (EVEMS).

8-106(11) is to be used where the system monitors the service and feeders and controls the electric vehicle supply equipment loads in accordance with 8-500. Then the demand load for the electric vehicle equipment is not required to be considered in determining the calculated load.

NOTES:

- The 5% rule for conductor selection has been deleted. Please refer to 14-104 to assist in selection of overcurrent protection in relation to the conductor ampacity rating based on the calculated load.
- Unless allowed by other rules of this code the conductors must be rated for the ampacity of the O/C protection.
- Labelling requirements as per 2-100.
- Δ Table 38 – Electric vehicle supply equipment demand factors has been removed from the CEC.

SECTION 10 – GROUNDING AND BONDING

10-000 – SCOPE

Grounding and bonding installations shall conform to the drawings provided by the Electrical Inspections department Interpretations Figures 10-1 to 10-8. The Appendix B drawings may be followed with special permission.

10-004 – SPECIAL TERMINOLOGY

- Equipotentiality — the state in which conductive parts are at a substantially equal electric potential.
- Grounding — a permanent and continuous conductive path to the earth with sufficient ampacity to carry any fault current liable to be imposed on it, and of a sufficiently low impedance to limit the voltage rise above ground and to facilitate the operation of the protective devices in the circuit.
- Bonding — a low impedance path obtained by permanently joining all non-current-carrying metal parts to ensure electrical continuity and having the capacity to conduct safely any current likely to be imposed on it.
- Grounded conductor — in an electrical system, the conductor that is intentionally grounded.
- System bonding jumper — a connection between the point of an electrical system to be solidly grounded and the non-current-carrying conductive parts of that electrical system.
- Single point system grounding – is the connection of the system neutral or grounded system conductor to a ground electrode at one point only. This connection shall be made as close to the source as possible.

10-100 & 10-500 – CURRENT OVER GROUNDING AND BONDING CONDUCTORS

For the purposes of Rules 10-100 & 10-500, the term ‘objectionable passage of current’ shall be defined as “any current that flows over conductors for which they were not intended and/or designed to accommodate, such as neutral current over bonding and/or grounding conductors, or neutral current over metallic piping”. Caution shall be exercised to prevent this situation from occurring.

Municipal water line replacement programs
Where municipalities are upgrading the water systems, any neutral currents flowing on the water lines from faulty system grounding may result in a shock hazard. All residences fed from any transformers showing signs of neutral current on the water lines, need to have their utility systems checked, grounding systems upgraded and repaired to create a safe installation prior to water line replacement.

10-102 – GROUNDING ELECTRODES

Underground metallic water lines shall not be used as a grounding electrode. Any existing ground connection to the water line shall be removed when upgrading services. A tag stating **'WARNING POSSIBLE SHOCK HAZARD'** shall be installed at the water meter. Please contact your Local Inspector for tags as required. See Figure 10-1:

Δ



Figure 10-1

10-108 – LIGHTNING PROTECTION SYSTEM DOWN CONDUCTORS AND GROUNDING ELECTRODES (see Appendices B & G)

Recommended practices for the installation of a lightning protection system, including lightning rods, interconnecting conductors, and ground electrodes, are given in CAN/CSA-B72. Other national and international industry-recognized standards on lightning protection may also be available.

As per Rule 12-016 where lightning down conductors are installed, electrical wiring shall, where practicable, be kept at least 2 m from such conductors and installed at or below ground level in accordance with Rule 10-104.

NOTE: Lightning protection system installations are to be installed by a licensed contractor and require an electrical permit.

10-112 – MATERIAL FOR GROUNDING CONDUCTORS (see Appendix B)

Bare aluminum shall not be installed in corrosive locations such as direct earth burial or masonry.

10-116(1) – INSTALLATION OF GROUNDING CONDUCTORS

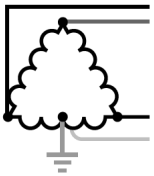
The grounding connection shall be electrically continuous throughout its length. This can be accomplished through approved split bolts, lugs, etc.

Δ 10-208(1)(a) – CONDUCTOR OF AN AC SYSTEM TO BE GROUNDED – (see Appendix B)

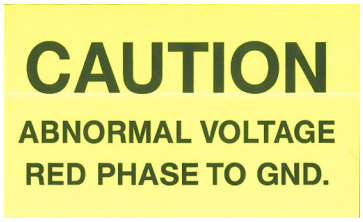
Services fed from a utility f-cabinet shall require: service conductors including a bond conductor, a connection of the service cable's neutral and bond conductor to the identified conductor in the f-cabinet, and a grounding electrode connected to the bond system at each service location.

Δ 10-208(1)(e) – CONDUCTOR OF AN AC SYSTEM TO BE GROUNDED – High-leg delta services (see Appendix B)

High-Leg Delta services (bastard leg) as shown in 10-208 Appendix B Figure B10-3 (fifth drawing) and described in rule 10-208 (1)(e) are a solidly grounded system found in older community downtown cores but are being replaced as systems are updated. Note: 4-032(4) and 4-032(5) of the CEC also clarify marking and identification requirements for these systems.



Multi-phase systems in which the midpoint of one phase is used to create a single-phase 3-wire system — the identified conductor



Caution stickers can be obtained from your local Electrical Inspector or from TSASK Office.

10-210 – GROUNDING CONNECTIONS FOR SOLIDLY GROUNDED AC SYSTEMS SUPPLIED BY THE SUPPLY AUTHORITY (see Appendix B)

1) To meet the intent of 10-002 in establishing equipotentiality between bonded equipment and the nearby surfaces of the earth, there shall be an electrode installed and grounding conductor connected to the non-current carrying parts of electrical equipment at all facilities, buildings, or structures supplied with electrical panels or sub-panels. See Figure 10-2.

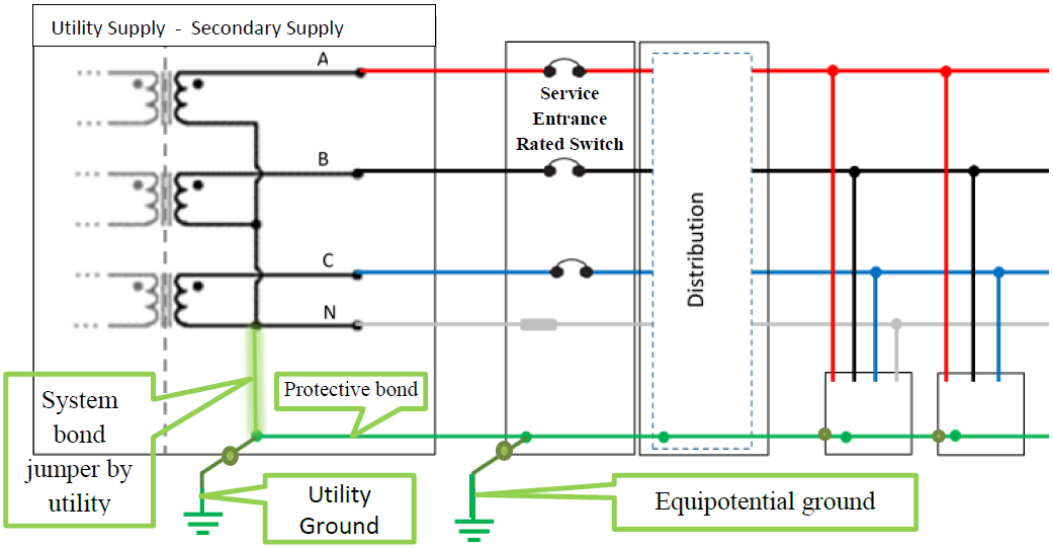
2) Customer owned service conductors supplied and installed by the electrical contractor shall include a separate neutral, where required, and bonding conductors.. The neutral conductor, where required, shall be insulated, and remain isolated beyond the connection to the source. See Figure 10-2.

3) Where separate neutral and bonding conductors are not installed, the neutral/grounded system conductor shall be connected to ground either directly to the facility electrode or through the system bonding jumper. This connection shall be made at the first point of attachment or connection of the supply service conductors.

4) This connection shall be made at only one point and the neutral conductor shall be insulated and isolated from the grounding & bonding systems, metallic equipment, and metallic surfaces beyond this connection. See Figure 10-4, 10-5 & 10-5a.

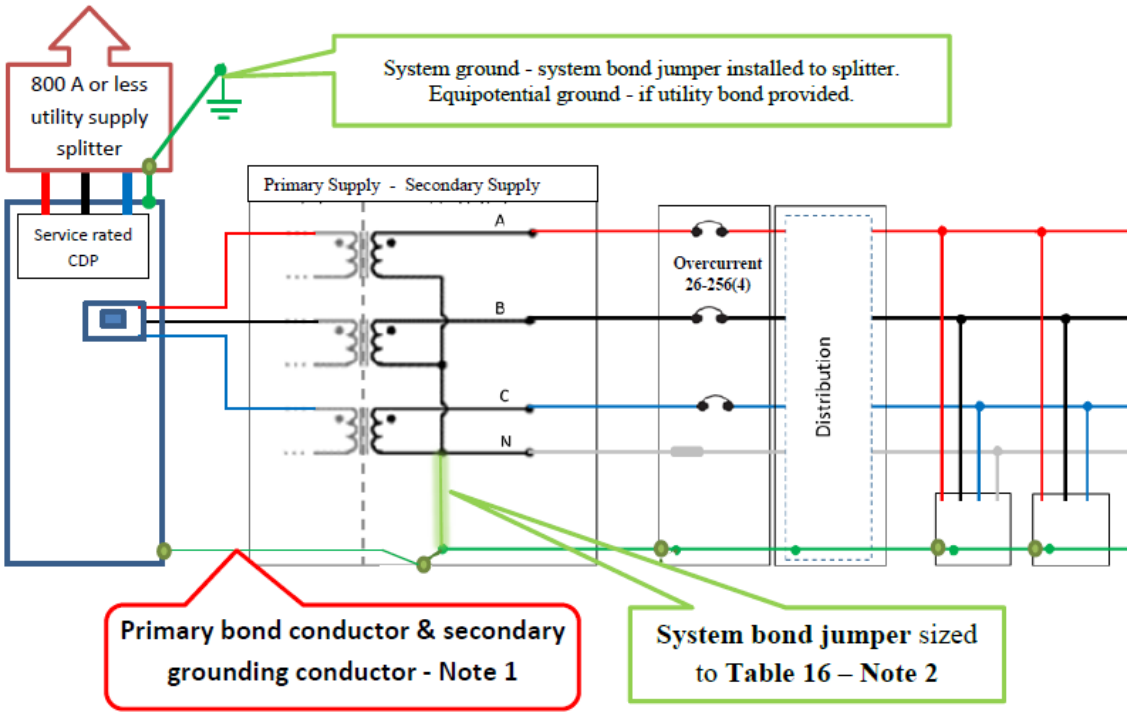
5) For overhead services, the neutral conductor shall be insulated, and the grounding connection shall be made at the meter socket. Point of connection shall be insulated. See Figure 10-4.

6) Where a neutral conductor is not required (there are no neutral loads being served), a bonding conductor shall be installed to facilitate the fault return. The supply authority may require a neutral conductor to satisfy the metering requirements.



NOTE: Utility owned transformer is grounded, and the system bond jumper is installed in accordance with utility standard, the protective bond is sized as per Table 16 based on the ungrounded conductor ampacity per 10-614(2) and is carried with the main conductors to the service entrance switch. All other equipment grounding is for the purpose of establishing an equipotential plane.

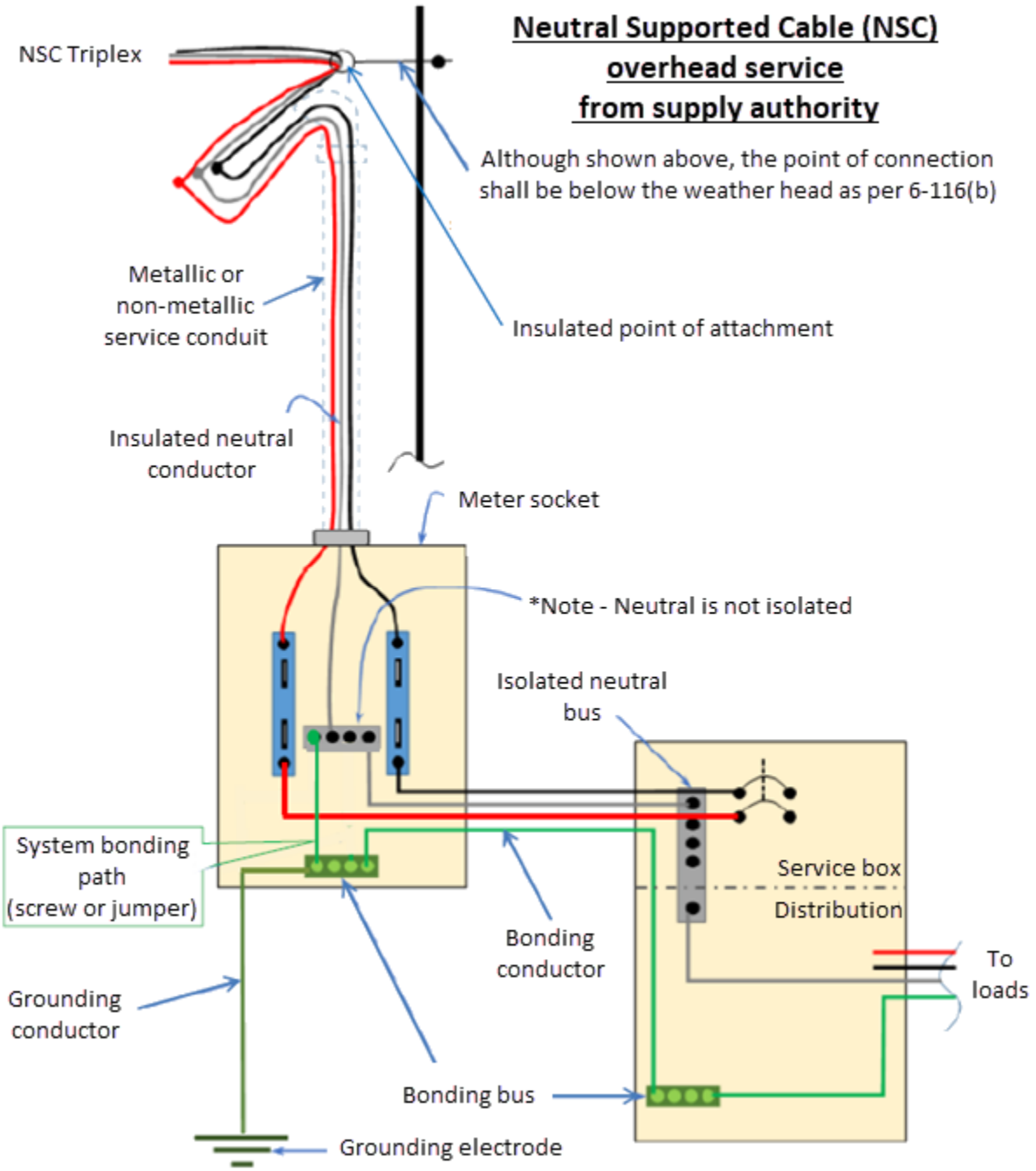
Figure 10-2



NOTE 1: The bond conductor run with the primary feeder for a separately derived system is sized sufficiently to also function as the secondary ground per 10-212(2).

NOTE 2: The system bond jumper per 10-614 App B must be sized to the secondary of the transformer based on the current from primary overcurrent device rating multiplied by the primary to secondary voltage ratio.

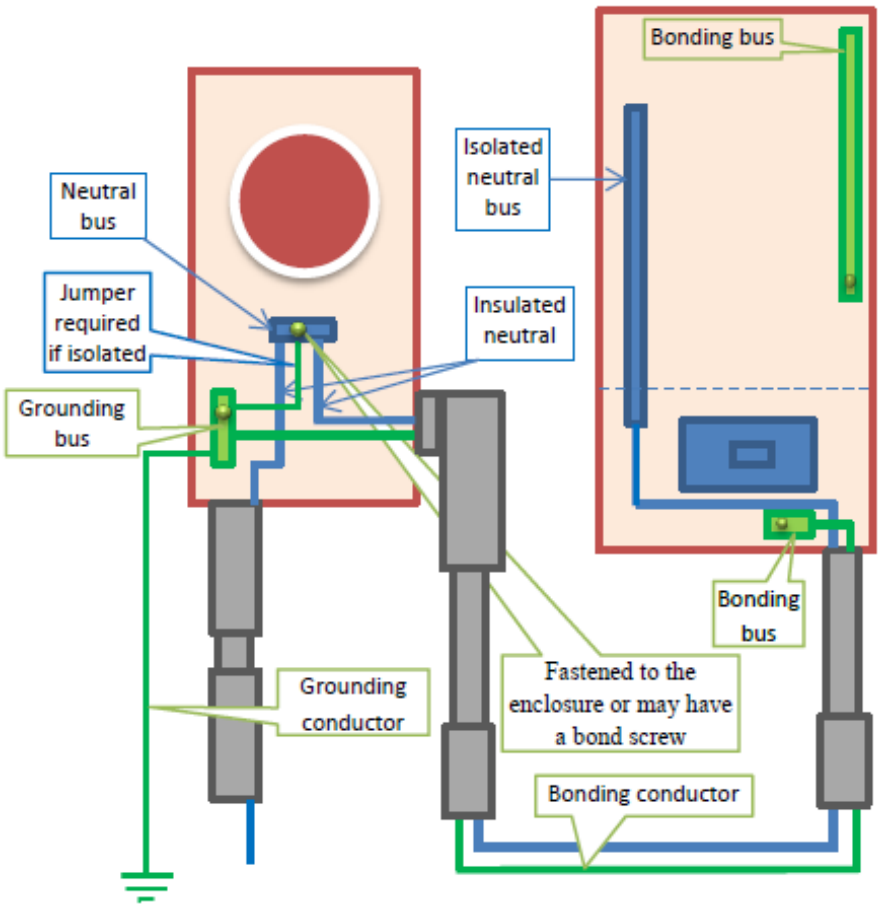
Figure 10-3



NOTE: This wiring method shall be used for overhead services, the neutral supported cable shall be isolated from the point of connection with an insulator and the customer service neutral shall be insulated in the service raceways and mast. Follow manufacturers' instructions regarding system bonding connection.

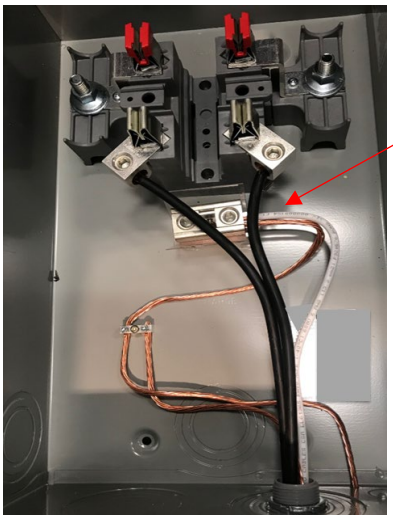
Δ

Figure 10-4



NOTE: This is the current method when the utility does not supply an underground bond conductor. The neutral is re-grounded at the customer meter and isolated beyond that point.

Figure 10-5



NOTE: This installation must have the neutral grounded in the meter socket. If installed with an isolated neutral bus in the meter socket it must have a system bonding jumper installed.

Figure 10-5a

10-212(3) – GROUNDING CONNECTIONS FOR SOLIDLY GROUNDED SEPARATELY DERIVED SYSTEMS

The bonding conductor in the primary feed to a transformer enclosure will meet the requirements of the grounding conductor for the transformer.

The system bonding jumper (see 10-004 & 10-614 App B) shall be sized as per Table 16 based on the secondary current of the transformer which is determined by the primary overcurrent protection device rating multiplied by the primary to secondary voltage ratio and connected to the enclosure to satisfy the requirement for the secondary fault return current and the grounding requirement.
See Figure 10-3 and the 3 Phase Dry Core Transformer Tables.

10-302(2)&(3) – USE – IMPEDANCE GROUNDED SYSTEM (see Appendix B)

Impedance grounded systems require the grounding circuit to be electrically continuous and monitored. This includes the connections from the X0 through the impedance device and the impedance system bonding jumper to the grounding conductor connection. See Figure 10-6.

The integrity of the impedance grounding system shall be monitored with an audible or visual alarm, shall be visible to persons monitoring the status of the system and labeled:

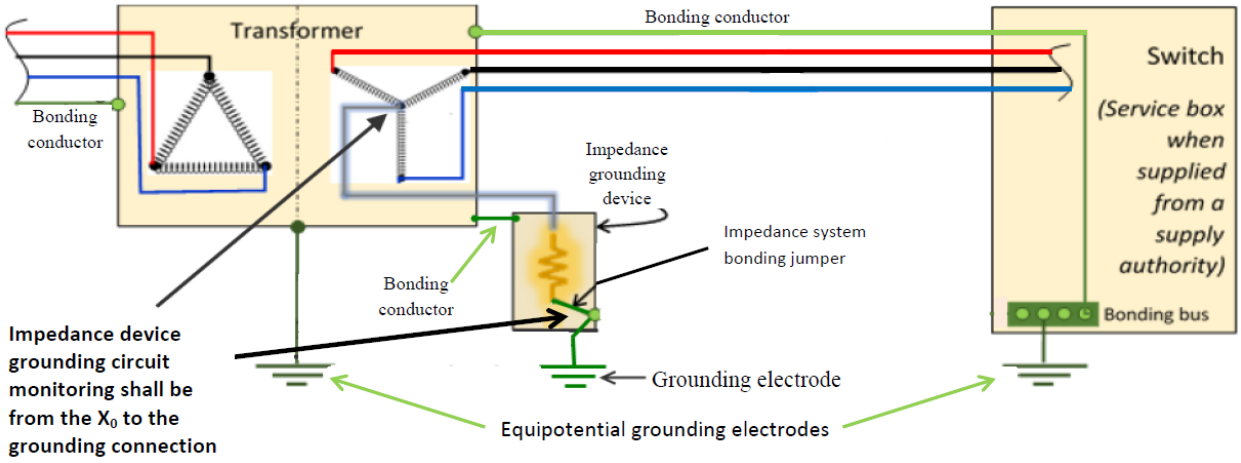
'CONTACT _____ IF THE SYSTEM IS IN ALARM'. See Table 17.

10-308 – CONDUCTORS USED WITH IMPEDANCE GROUNDING DEVICES (see Appendix B)

Where the system is not serving neutral loads, the conductor connecting the impedance grounding device to the neutral point of the system source shall meet the requirements of this Rule and shall not be installed to the main switchgear, unless otherwise required for metering purposes or installation to the impedance grounding device. This neutral shall not be distributed and shall be labelled at each termination point to indicate "NOT FOR NEUTRAL LOADS".

Impedance grounded systems are not solidly grounded systems. The conductor from the transformer/source to the impedance device must take the most direct route and is not required to enter the main service disconnect. This Rule provides several conditions that must be met regarding this conductor. The minimum conductor size is now #12 AWG copper or #10 AWG aluminum conductors.

The path from the neutral point through the impedance grounding device to the system grounding electrode shall be electrically continuous and monitored as per 10-302 and Table 17. See Figure 10-6.



The impedance grounded circuit shall be monitored from the X_0 to the connection to the grounding electrode.

Figure 10-6

10-400 – UNGROUNDED SYSTEMS

Ground fault indication activated by a ground fault shall be visible to persons monitoring the status of the system and labeled 'CONTACT _____ IF LIGHT IS OUT OR SYSTEM IS IN ALARM'.

Regardless of other monitoring systems being implemented, each installation shall have fault indication lights and/or audible alarm. Installation conditions may dictate that both systems may be required (i.e., site conditions, noise levels, etc.).

10-604 – BONDING CONTINUITY FOR SERVICE EQUIPMENT

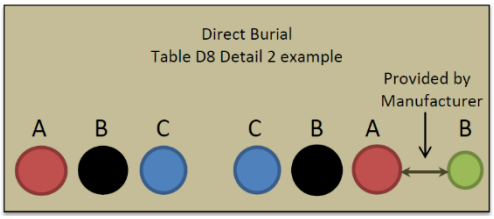
1) The bonding continuity for service equipment shall be assured by bonding means prescribed in Rule 10-610.
2) Standard locknuts serving as the bonding means for metal raceway, metal sheath, or cable armour connecting to service equipment shall be supplemented by bonding bushings with a bonding conductor connecting to a bonding bus within the enclosure
    a) at both ends where the metal raceway, metal sheath, or cable armour serves as the bonding means between service equipment; or
    b) at one end where
        i) a bonding conductor is run with circuit conductors; or
        ii) the termination to service equipment is only at one end.
3) Notwithstanding Subrule 2), bonding bushings shall not be required for cable assemblies incorporating an internal bonding conductor in continuous contact with the cable armour, provided that the internal bonding conductor extends from the cable and connects to the service equipment.

10-616 – SIZE OF SYSTEM BONDING JUMPER OR BONDING CONDUCTOR (see Appendix B)

1) The size of a field-installed system bonding jumper shall not be less than that determined by the application of Table 16 based on the ampere rating or setting of the overcurrent device protecting the ungrounded conductors.
2) The size of the bonding conductor installed in accordance with Rule 10-604 at service equipment shall not be less than that determined by the application of Table 16 based on the allowable ampacity of the largest ungrounded conductor. See Figure 10-2 & 10-7.
3) The size of a field-installed bonding conductor installed at other than service equipment shall not be less than that determined by the application of Table 16 based on:
    a. the overcurrent device protecting the ungrounded conductors; or
    b. the allowable ampacity of the largest ungrounded conductor for installations where the size of the circuit conductors is increased to compensate for voltage drop. See Figure 10-7.
4) The size of a field-installed bonding conductor installed with each group of parallel conductors run in separate raceways or cables, shall be in accordance with Subrule (3) divided by the number of groups of parallel conductors. See Figure 10-7.
5) Notwithstanding Subrules (2), (3) and (4), the bonding conductor shall not be required to be larger than the current-carrying conductors.
6) A metal raceway that is permitted to be used as a bonding conductor shall be considered to meet the requirements of this rule.
7) A bonding means that is integral to a cable assembly shall be considered to meet the requirements of this rule.



Bonding conductor required in each raceway for parallel conductor installations.



Direct burial parallel conductor installations may require multiple bonds, or a single bond sized to Table 16 and installed **as per manufacturer's instructions.**

Figure 10-7

10-700 – EQUIPOTENTIAL BONDING OF NON-ELECTRICAL EQUIPMENT (see Appendix B)

The metal parts of structures that livestock access shall be bonded as per 10-616(3) and shall include a connection to a grounding electrode at each location to provide an equipotential plane. This shall include irrigation platforms, irrigation gangways, buildings housing livestock, metal watering bowls, and structures supplied with electricity within the areas accessible to livestock.

Bonding of temporary/portable tents, railings, trusses, and other structures

Where temporary or portable structures are installed and power cords are in contact with conductive apparatus, the apparatus shall be bonded to ground, or the power circuits shall be Class A type GFCI protected.

10-700(c) – Replacement of furnaces

When a furnace or similar piece of equipment is being replaced, the electrical contractor is responsible for bonding the gas line as required by the CEC. The branch circuit cable, providing it has an internal bond conductor as per Rule 10-610 and the low voltage thermostat cable, does not require replacement. See 26-806(1)(5)(6)(7). *Caution: Some new furnaces require 20-amp circuits.*

Δ

10-700(c) – Bonding corrugated stainless-steel tubing (CSST)

New note in Appendix B: When bonding a CSST component of a gas piping system, refer to the manufacturer's instructions.

10-702 – EQUIPOTENTIAL BONDING INSTALLATION

Δ 3) When non-electrical equipment is being bonded (metal water, waste, and gas lines), bonding can be accomplished by permanent conductive connection to non-current carrying conductive parts of electrical equipment as long as the electrical equipment is connected to a permanent electrical circuit that incorporates a bond conductor, and the equipment (electrical and non-electrical) are associated with each other.

SECTION 12 – WIRING METHODS

12-012 – UNDERGROUND INSTALLATIONS (see Appendix B)

Δ 12-012 (2) – Conductor depth; Table 53 vs. Tables D8 – D11 & Tables D17A - D17L

When using Tables D8 – D11 or Tables D17A - D17L to determine conductor ampacity: where the depth of conductors specified in Tables D8 – D11 or Tables D17A - D17L is less than the depth requirements of Table 53, the depths of Table 53 shall apply. For example, if the minimum cover requirement from Table 53 when installing a 600 V directly buried single conductor armoured cable is only 450 mm, but the selected ampacity of this cable is based on the value of Table D8 in accordance with Diagram D8, then the minimum depth of installation of such armoured cable could be reduced to 450 mm, but it could not exceed 915 mm, as specified in Diagram D8. If it were to exceed 915 mm, IEEE 835 calculation would be required to find the ampacity.

12-012 (13) – Movement due to settlement or frost

All underground raceways or cables subject to movement require provisions to be made to prevent damage to the conductors or the electrical equipment. The intent of this Rule is to avoid damage to the raceway or cable (during settlement/frost). Attention shall be made to rodent access as well as the movement of the cable in relation to the terminations during the settling or movement due to frost. This may include the use of frost boxes, slip sleeves, cable loop with an expansion joint, or other acceptable method.

12-012(16) – Burial of conductors in proximity to gas lines

Utility gas lines:

Electrical wiring shall be installed as per the Utility requirements (e.g., SaskEnergy).

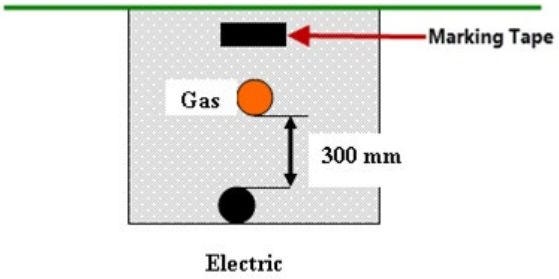
"The trench for natural gas must be at least 1 metre from the electrical trench."

Link to: SaskEnergy – Getting the Site Ready for Service

Customer owned gas lines as per B149.1:

③ Electrical wiring may be installed in the same trench as customer-owned propane or natural gas lines provided the conductors are placed at a greater depth and a separation of at least 300 mm of earth between the piping and conductor.

Customer owned propane or natural gas lines refers to customer lines supplying customer premises.



12-022 – CABLES OR RACEWAYS IN ROOF DECKING SYSTEMS (Q Decking)

Raceways or cables installed in or on roofing systems using screws or other penetrating fasteners, shall not be installed above the metal roofing pan (Q decking) (#1) and only installed below the roofing pan (Q decking) (#2 & #3) after substantial installation of the roofing has been completed. This does not apply to concrete flooring installations poured over Q decking. See Figure 12-1.

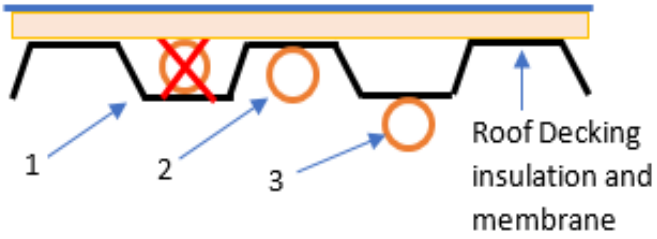


Figure 12-1

Δ 12-116(5) & (6) & 12-406(4) – FINE-STRAND CONDUCTORS (including DLO cables) (see Appendix B)

Fine-strand conductors including DLO cables shall terminate in connectors identified for use with fine-strand conductors or in standard connectors with the use of ferrules.

C22.2 No. 65 requires that connectors tested for use with conductors more finely stranded than class C indicate the conductor class or classes and the number of strands permitted. This marking may appear on the connector, a unit container, or an information sheet packed with the connector unit pack. DLO cable is an example of a more finely stranded wire than Class C and therefore the connectors must adhere to the marking or labelling requirement for use.

Ferrules described in 12-116 and 12-406 must be certified to C22.2 No. 291 and C22.2 No. 342.

12-120 – SUPPORTING OF CONDUCTORS (see Appendix B)

12-120(1) – Horizontal – Permanently installed cables and conduits supplying motors, pumps, pressure switches or any other electrical equipment shall be supported as required by Section 12. Cables and conduits where exposed and subject to damage must be supported off the ground by an approved method such as cable tray, strut, etc. Cables must be supported within 300 mm of any junction box (this includes oil wells). When installing cables, ensure that there is no stress on the connectors from the weight of the cable.

Δ 12-200 – OPEN WIRING RULES

In a renovation where walls or ceilings are being opened, open wiring shall be replaced. Connections to other systems to refeed existing installations shall be through connections in a junction box and bonded by the requirements of Section 10. GFCI protection may be required as per Rule 26-702(2).

Δ 12-318 – OVERHEAD INSTALLATIONS

Neutral supported cable must be supported at intervals of 10 meters or less when final attachment is to a mobile home, relocatable structure, or similar; and at intervals of 40 meters or less for any other structure. Minimum sag shall be as per Table 72 or calculated as per manufacturers' recommendations.

12-514 – PROTECTION OF CABLES IN NON-CONCEALED LOCATIONS

Cables run in non-concealed locations, the upper or lower faces of rafters, on the lower faces of ceiling joists, less than 1.5 m above the floor or on the open face of wall studs, shall be protected by installing running boards, guard strips or other means of adequate protection. E.g., 19mm x 38mm
See Figure 12-2.

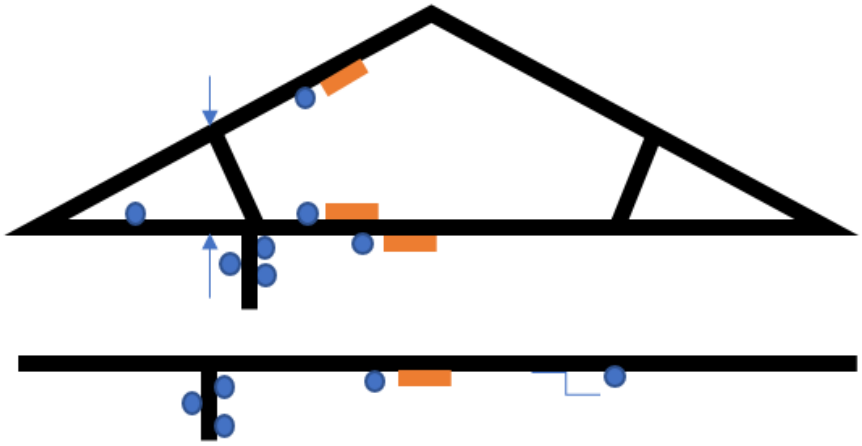


Figure 12-2

Δ 12-608 – CONTINUITY OF ARMOURED CABLE

Armoured cables shall have mechanical continuity throughout their run and must be mechanically secured to the equipment to which it is attached.

Armoured cables shall have electrical continuity throughout their run and must be electrically secured to the equipment to which it is attached, except when the enclosure at the final point of termination is non-metallic, a bond bushing is installed at the supply end (electrical connection between the armour and bonding system), and the equipment at the final termination uses cable's internal bonding conductor.

12-610 – TERMINATING ARMOURED CABLE (see Appendix B) (see also 2-400)

ACWU or other metallic armoured cables without an inner protective jacket shall incorporate an anti-short or other approved protective device.

Δ 12-910(4) – CONDUCTORS AND CABLES IN CONDUIT AND TUBING (see Appendix B)

Tables 6A to 6K provide the area of a single or group of stranded or solid conductors of one size in mm^2. Table 8 provides the maximum conduit fill percentage based on the number of conductors. Table 9A to 9G provide the internal diameter and maximum fill for various conduits and tubes.

See tables below for common examples of installations using the same conductors in a conduit or tube.

12-910 - TABLES

RW90XLPE 600 volt

Conductor Size	Raceway Type and Size											
	Electrical metallic tubing (EMT)			Rigid metal conduit			Flexible metal conduit			Rigid PVC conduit		
	16 mm	21 mm	27 mm	16 mm	21 mm	27 mm	16 mm	21 mm	27 mm	16 mm	21 mm	27 mm
#14 AWG*	9	16	27	10	18	29	10	17	26	8	15	26
#12 AWG*	7	13	21	8	14	22	7	13	20	6	12	20
#10 AWG*	5	9	16	6	10	17	5	10	15	5	9	15
#8 AWG	2	4	7	2	5	8	2	4	7	1	4	7
#6 AWG	1	3	5	1	3	6	1	3	5	1	3	5

Conductor Size	Raceway Type and Size								
	Metallic liquid-tight flexible conduit			Non-metallic liquid-tight flexible conduit			Electrical non-metallic tubing		
	16 mm	21 mm	27 mm	16 mm	21 mm	27 mm	16 mm	21 mm	27 mm
#14 AWG*	10	17	28	9	16	27	8	15	25
#12 AWG*	7	13	21	7	13	21	6	12	20
#10 AWG*	5	10	16	5	9	15	5	9	15
#8 AWG	2	4	7	2	4	7	1	4	7
#6 AWG	1	3	5	1	3	5	1	3	5

***Solid conductors**

T90 NYLON

Conductor Size	Raceway Type and Size											
	Electrical metallic tubing (EMT)			Rigid metal conduit			Flexible metal conduit			Rigid PVC conduit		
	16 mm	21 mm	27 mm	16 mm	21 mm	27 mm	16 mm	21 mm	27 mm	16 mm	21 mm	27 mm
#14 AWG*	14	25	40	15	26	43	15	25	38	12	23	38
#12 AWG*	10	18	30	11	19	32	11	18	28	9	17	28
#10 AWG*	6	11	18	7	12	20	6	11	17	5	10	17
#8 AWG	3	5	9	3	5	9	3	5	8	2	5	8
#6 AWG	1	4	6	1	4	7	1	4	6	1	3	6

Conductor Size	Raceway Type and Size								
	Metallic liquid-tight flexible conduit			Non-metallic liquid-tight flexible conduit			Electrical non-metallic tubing		
	16 mm	21 mm	27 mm	16 mm	21 mm	27 mm	16 mm	21 mm	27 mm
#14 AWG*	14	25	41	14	24	40	12	23	38
#12 AWG*	11	19	30	10	18	29	9	17	28
#10 AWG*	6	11	19	6	11	18	5	10	17
#8 AWG	3	5	9	3	5	8	2	5	8
#6 AWG	1	4	6	1	4	6	1	3	6

***Solid conductors**

12-1118 – EXPANSION JOINTS (see Appendix B)

PVC conduit shall be installed as per manufacturer's specifications and the CEC. For example, assuming a temperature change of 70 ^{0}C, this would mean a minimum of one expansion joint or more may be required depending on the maximum range of the expansion joint. See Rule 12-1012.

Rules 12-1012, 12-1118, 12-1214 and Appendix B notes

Conduits shall be installed as per manufacturer's specifications and the CEC. The formula to determine if excessive expansion requires mitigation is as follows:

$$E_T = L_R \bullet T_C \bullet C_E$$

Where:

E_T is the total expansion in mm.
L_R is the length of the run in meters
T_C is the temperature change in ^{0}C, and
C_E is the coefficient of linear expansion as per the Table B12-4 in Appendix B

NOTE:

- The total expansion of the length of the run shall be determined if there are expansion concerns.

Example:

For a 20 m run of rigid PVC conduit when the minimum expected temperature is -40°C and the maximum expected temperature is 30°C, the total expansion is:

E_T= 20 m x (40 + 30) x 0.0520 = 73 mm.
This exceeds the maximum allowed of 45 mm. Therefore, depending on the travel of the expansion joint, one or more would be required.

12-1404 – RESTRICTIONS ON USE – EMT

EMT shall not be used in carwash bay areas due to salt and chemical contaminants. See 22-200(1).

12-1414 – PROVISION FOR BONDING CONTINUITY – EMT

Bonding conductors are required for EMT installations in the following uses:

(a) concrete or masonry slabs in contact with the earth;
(b) a wet location; or
(c) outdoor locations.

SECTION 14 – PROTECTION AND CONTROL

Δ 14-100(2) – LOADING CABLES (see Appendix B)

Note has been removed.

14-104(1) – ADJUSTABLE OVERCURRENT DEVICES (see Appendix B)

a) Where the cable ampacity is less than the maximum rating of the adjustable overcurrent (OC) protection devices, the trip settings for the OC protection device shall be documented and on-site for the inspection;

b) The adjustable OC protection devices, including fused disconnecting switches, shall be labelled with a lamacoid plate indicating maximum fuse size or amp trip (AT) following the cable ampacity as per Rule 4-004, lamacoid shall read "**Max _____ A; Do Not Adjust**"; and

c) This shall apply to service, feeder and/or branch circuit conductors.

14-114 – APPLICATION OF SUPPLEMENTARY PROTECTORS (see Appendix B)

Electrical Inspectors have encountered supplemental protectors being used as overcurrent devices in industrial control panels and other electrical applications. As a reminder to industry and per Rule 14-114, supplementary overcurrent protection shall not be used as a substitute for branch circuit overcurrent devices or in place of branch circuit protective devices to protect a circuit.

SECTION 16 – CLASS 1 AND CLASS 2 CIRCUITS

16-008 – HAZARDOUS LOCATIONS

Extra low-voltage power circuits installed in hazardous locations on oilfield sites (i.e., solar and 12-volt equipment) must be installed in accordance with the applicable rules of Section 18.

SECTION 18 – HAZARDOUS LOCATIONS

18-002 – SPECIAL TERMINOLOGY (see Appendix B)

Δ **Explosion seal (ES) —** a seal that

a) when installed at a cable or conduit entry to an explosion-proof, flameproof "d", or flameproof "db", enclosure, prevents the ignition of an explosive gas atmosphere outside the enclosure;

b) when installed in a conduit, prevents the passage of an explosion from one portion of the conduit system to another; and

c) minimizes the passage of flammable fluids at atmospheric pressure.

Δ **FLAMMABLE FLUID MIGRATION SEAL (FM)** — a seal that is only intended to prevent the passage of flammable fluid at atmospheric pressure. A flammable fluid migration seal is not intended to prevent the transmission of an explosion or of flammable fluids under pressure. While explosion seals can meet this definition (see the Note to Rule 18-072), other methods using compounds such as silicone or duct seal are also suitable, provided that they are installed in a manner that will prevent migration of flammable fluids at atmospheric pressure.

18-004 – CLASSIFICATION OF HAZARDOUS LOCATIONS (see Appendices B, J, and L)

Hazardous area classification or reclassification as per CEC Appendix L shall be carried out and documented by qualified persons and shall be authenticated by the person assuming responsibility (Professional Engineer).

Installations as described within the scope of Sections 18, 19, 20 & 22 shall be the minimum permissible classification unless reclassified by a Professional Engineer.

Area classifications or reclassifications complete with an assessment report and stamped drawings shall be provided to the Electrical Inspections department.

For selection of equipment refer to Table 18.

Micro-breweries and alcohol distilleries

Micro-breweries and alcohol distilleries contain several hazardous locations. Plans and hazardous location classifications shall be provided to the Electrical Inspections department prior to construction.

③ 18-006 – AMMONIA COMPRESSOR ROOMS (see Appendices B and L)

When ammonia is used in a refrigerant system, the room shall be considered a Zone 2 hazardous location unless the room is constructed to a **Class T machinery room** as specified in the *CSA standard B52 Mechanical Refrigeration Code.*

An engineered stamped drawing or letter shall be provided to Electrical Inspections as per 2-014 of the Saskatchewan Interpretations (also see: Technical Safety Authority of Saskatchewan Boiler and Pressure Vessel Department)

18-008 – LOCATIONS CONTAINING AN EXPLOSIVE DUST ATMOSPHERE (see Appendices B and L)

All grain handling systems are classified Zone 20 locations. The bag handling areas are a Zone 22 location when suitably cutoff from the main handling area. See Figures 18-1 to 18-3. The location may be reclassified as per Rule 18-004. See Appendix E (of these Interpretations) for dust free room requirements.

Bio diesel and canola crushing plants

As per Rule 18-008 of the CEC, canola crushing is a Zone 20 location, and all wiring must meet the minimum CEC requirements for the installation. Canola storage and product transferring would fall under the same area classification.

In the process of creating bio diesel, an additive must be added. If that product is methanol or another volatile additive, a hazard arises. The process must be classified or reclassified as per Rule 18-004. Storage of methanol is under the same area classification. Bio diesel storage is the same as regular diesel and must also meet all other provincial codes and rules.

Δ Woodworking facilities

The CEC classifies these areas as Zone 22 locations. Areas may be reclassified by a Professional Engineer. The following wiring methods may be permitted where a housekeeping plan and adequate dust collection equipment is installed:

a. Panelboards, controllers, etc. shall be dust tight or in dust tight enclosures.
b. Wall surface wiring shall be threaded rigid, EMT (with rain-tight connectors) or TECK cable with dust tight TECK connectors.
c. Ceiling surface wiring may be ordinary location wiring methods.
d. Boxes shall comply with Rule 18-252(2).
e. Concealed wiring may be type AC or NM cable.
f. Concealed boxes and fittings may be ordinary type.
g. Switch and receptacle covers shall be of the weatherproof type.
h. Where duplex receptacles are used, a separate self-closing cover will be required for each section of the receptacle.
i. General purpose fluorescent or LED lighting fixtures may be installed:
    i. directly on the ceiling; or
    ii. suspended and provided with dust shields to prevent the accumulation of dust.

The area is deemed to have a housekeeping plan and adequate dust collection when all surfaces have no more than 1.75 mm of dust accumulation (about the thickness of a nickel).

Note: For the purposes of this rule, non-commercial, residential garages and shops **may** not be considered woodworking facilities and **may** be considered an ordinary location.

18-008 – HAZARDOUS AREA CLASSIFICATION – GRAIN ELEVATOR

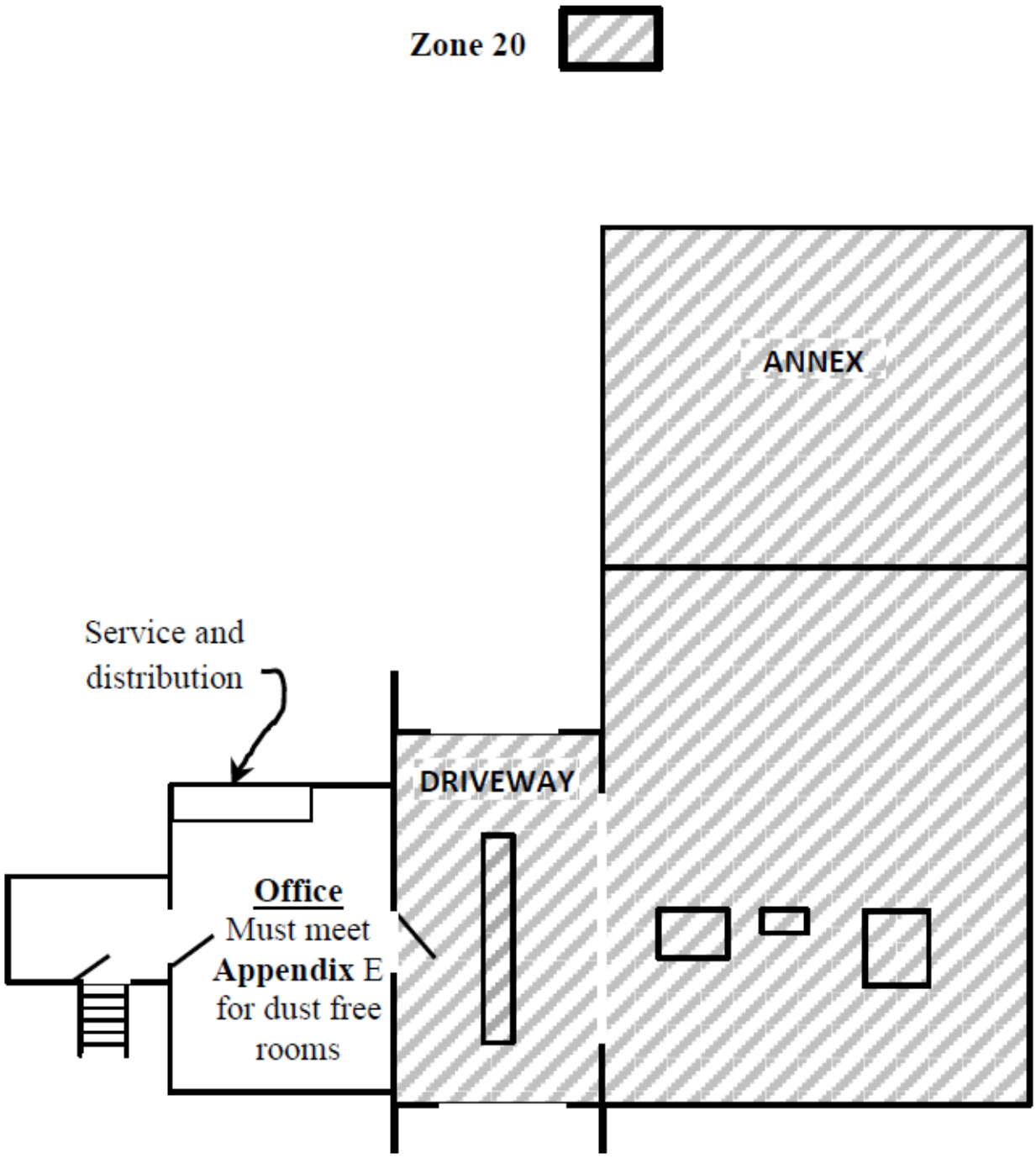


Figure 18-1

18-008 – HAZARDOUS AREA CLASSIFICATION – SEED CLEANING PLANT

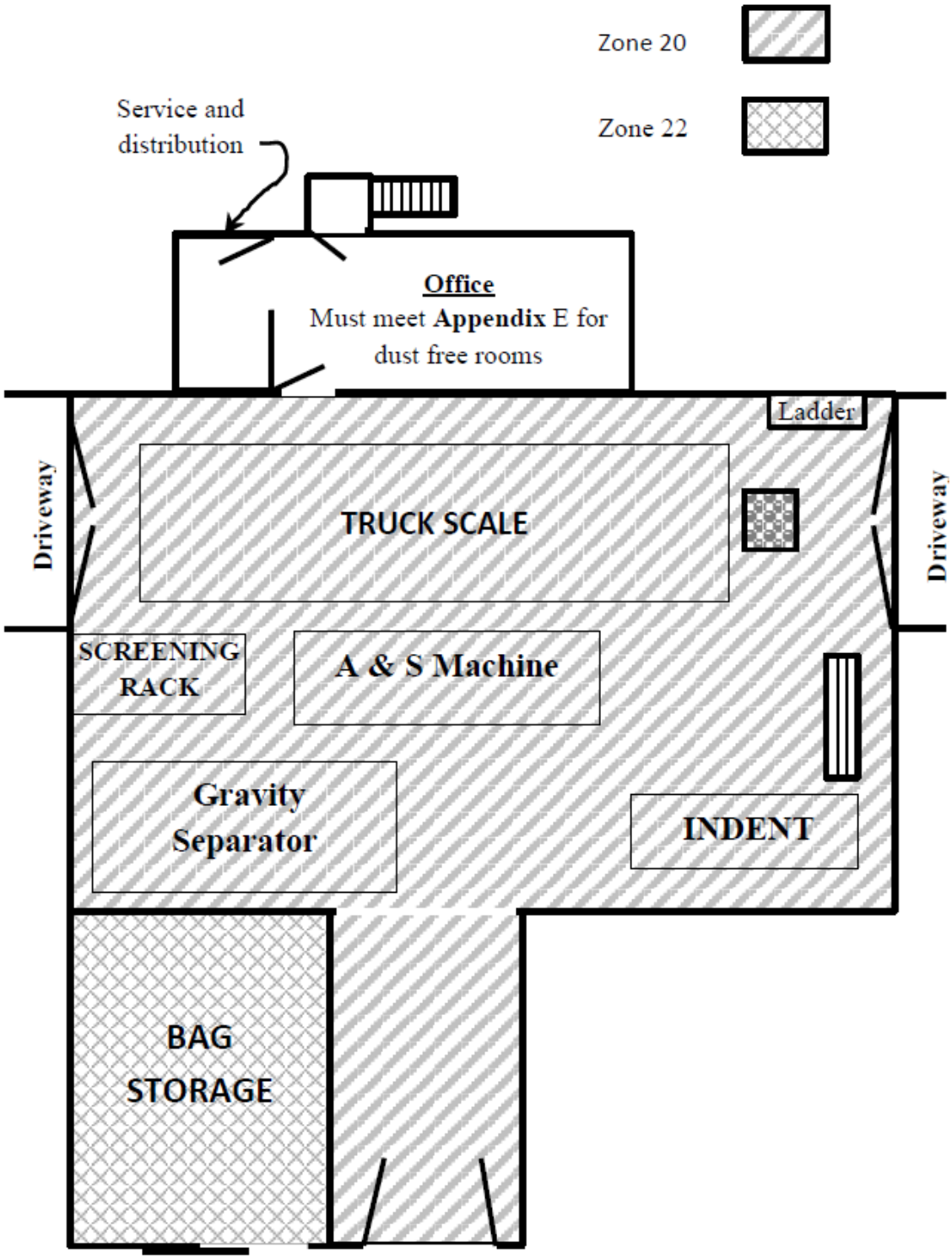


Figure 18-2

18-008 – HAZARDOUS AREA CLASSIFICATION – FEED MILL FLOOR PLAN

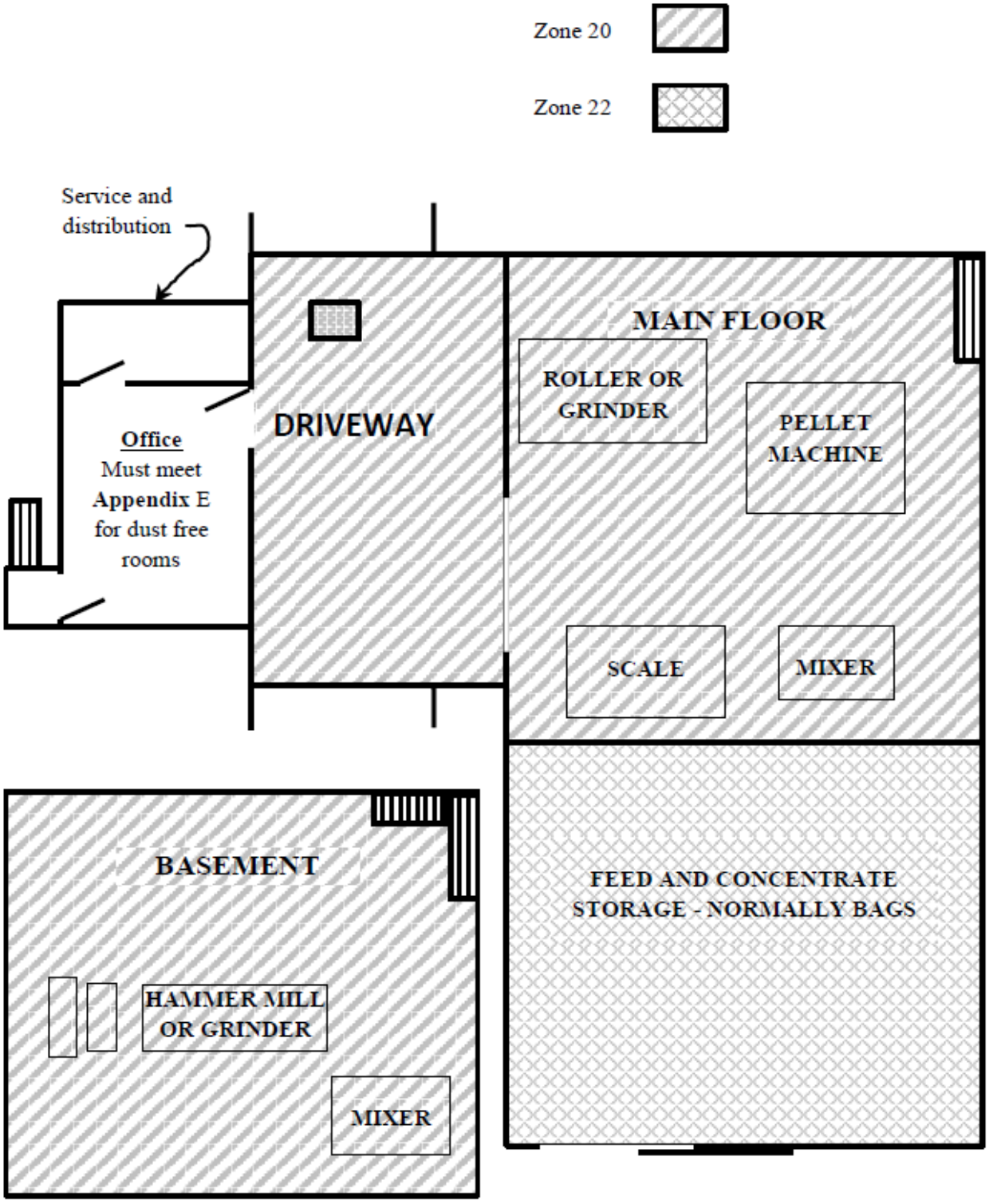


Figure 18-3

18-050 – ELECTRICAL EQUIPMENT (see Appendices B, and J)

Selection of equipment for hazardous locations shall be in accordance with Table 18.

18-052 – MARKING OF EQUIPMENT

CSA has adopted the IEC standard for equipment protection levels (EPL's**)** as a requirement for marking on equipment in hazardous locations. This marking system will now appear on new hazardous location equipment. See CEC Table 18 for more information.

18-066 – INTRINSICALLY SAFE AND NON-INCENDIVE ELECTRICAL EQUIPMENT AND WIRING (see Appendix B)

Where an intrinsically safe electrical system or non-incendive field wiring circuit is installed in a hazardous location, a descriptive systems document shall be available on site to the Electrical Inspector and the systems shall be installed and maintained in accordance with this document.

18-070 – COMBUSTIBLE GAS DETECTION (see Appendices B and H)

The intent of this Rule is **not** to declassify an area; it is only to be used where suitable equipment approved for the area is not available with proper classification for a hazardous area.

E.G., - General equipment to be installed in a Zone 2 location
- Zone 2 equipment to be installed in a Zone 1 location

Δ 18-104, 18-154 – SEALING ZONE 1 & 2

Zones 1 & 2 CONDUIT Sealing Diagram

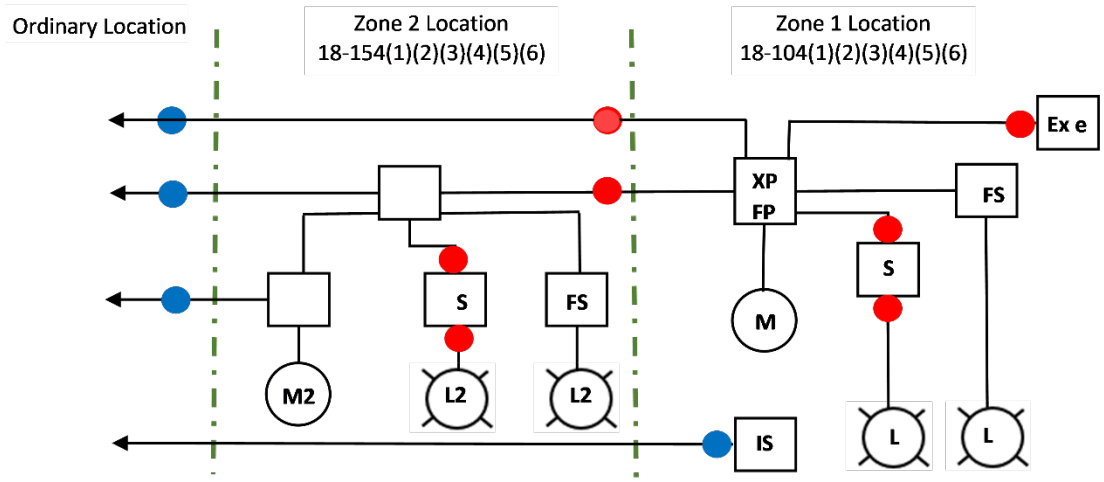


Figure 18-4

Zones 1 & 2 CABLE Sealing Diagram

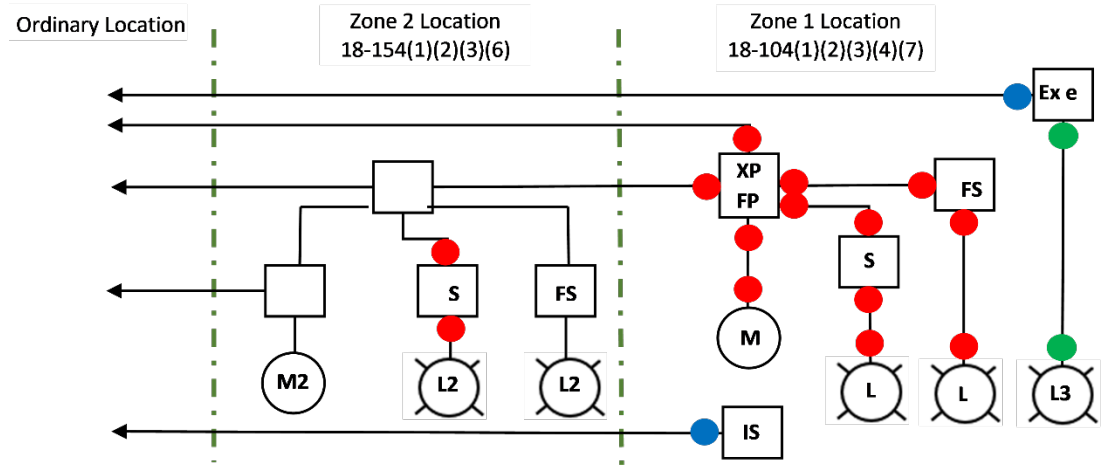


Figure 18-5

Legend

- M — Explosion-Proof Motor (CSA C22.2 No. 145) CEC Rule 18-106 and Table 18
- M2 — Open or Non-Explosion Proof motor non-Arcing and Sparking CEC Rule 18-150 (2)(e)(i) & (ii) and Table 18
- L — Explosion-Proof Luminaire (CSA C22.2 No. 137) CEC Rule 18-108 and Table 18
- L2 — Zone 2 Luminaire protected by guards or location CEC Rule 18-156 and Table 18
- L3 — Ex 'e' Luminaire (C22.2 No. 60079-7)
- Junction Box
- S — Non- Sealed switch
- FS — Factory Sealed switch
- Ex e — Increased Safety Ex 'e' enclosure 18-104(6)
- XP FP — Explosionproof or Flameproof enclosure
- IS — Intrinsically safe or non-incendive 18-066(5)
- Ex 'e' cable gland CEC Rule 18-104 & 18-154
- Explosion Seal (ES) CEC Rule 18-104 & 18-154
- Flammable Fluid Seal (FFM) CEC Rule 18-104 & 18-154

Δ **Flammable Fluid Migration Seals**

18-104(7) – A cable entering or leaving a Zone 1 location must be sealed with a 'flammable fluid migration seal' where it first terminates in the hazardous location regardless of the type of box it enters. See Figure 18-5

18-154(5) – A conduit entering or leaving a Zone 2 location must be sealed with a 'flammable fluid migration seal' where it first enters or leaves the hazardous location with no box, coupling or fitting between the seal and the point at which the conduit leaves the area. See Figure 18-4

② 18-152 & 18-252 – WIRING METHODS, ZONE 2 & ZONE 22

Liquid tight metal flexible conduit and connectors shall be marked "Heavy Duty".

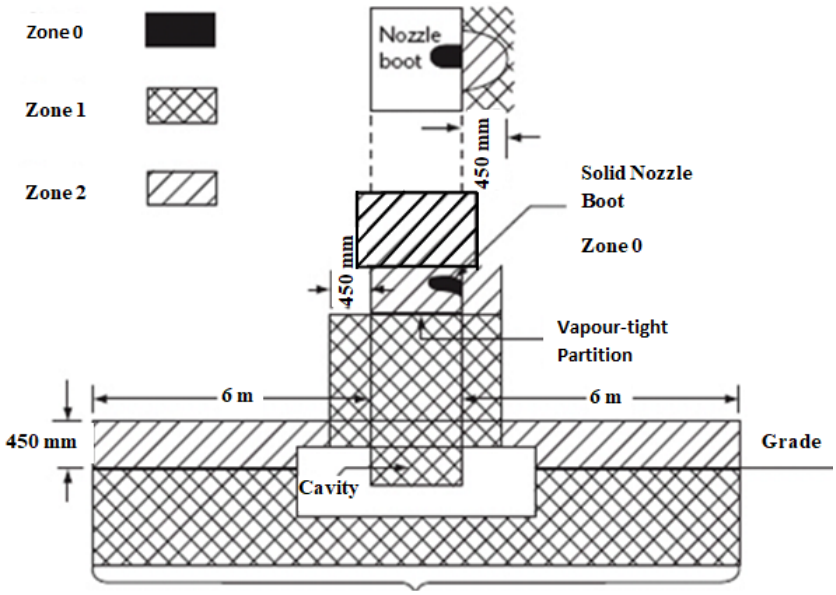
18-250 – EQUIPMENT, ZONE 22 LOCATIONS

TEAO fan motors mounted in the air flow and TEFC motors that meet the requirements of Table 18 and do not in normal service have ignition-capable hot surfaces or produce incendive arcs or sparks will be permitted in Zone 22 locations and grain handling facilities re-classified as Zone 22.

NOTE: Internal thermistor leads should be connected.

SECTION 20 – FLAMMABLE LIQUID AND GAS DISPENSING AND SERVICE STATIONS, GARAGES, BULK STORAGE PLANTS, FINISHING PROCESSES AND AIRCRAFT HANGARS

20-004 – HAZARDOUS AREAS – ISLAND GAS PUMP



Any conduits leaving the hazardous area where the electrical wiring emerge from the ground shall meet the sealing requirements of Section 18 and 20

Figure 20-1

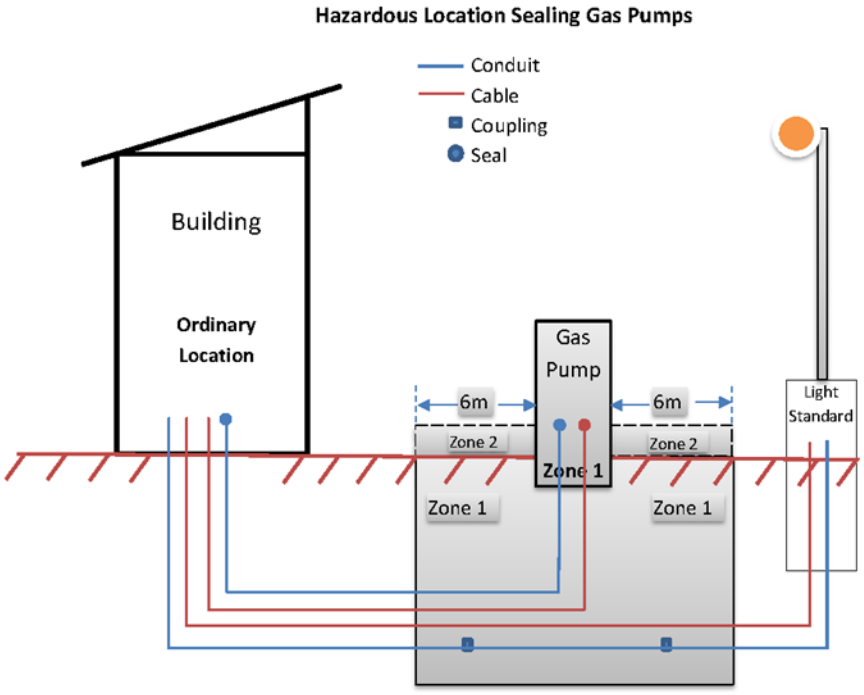


Figure 20-2

Cables and conduits that run through the Zone 1 area need to meet the wiring methods and sealing requirements of Section 18 whether they are associated with the pump or not.

Δ

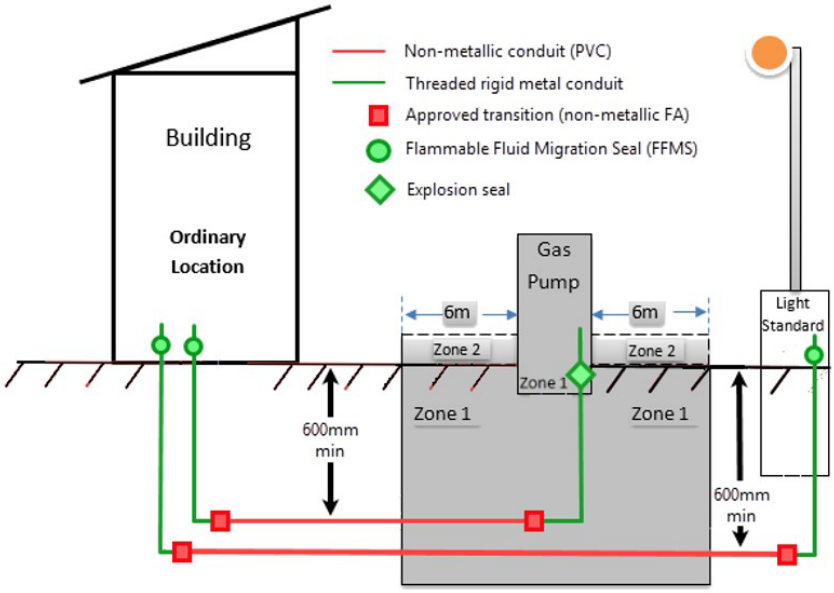


Figure 20-3

Non-metallic conduit allowed underground beneath Zone 1 and Zone 2 locations as per 20-004(11)

20-102(1) – HAZARDOUS AREAS – COMMERCIAL REPAIR GARAGES

All adjacent rooms not suitably cut off with a 50 mm barrier are classified as hazardous up to 50 mm above the parking floor.

20-102(2) & (3) – CLARIFICATION OF PITS OR DEPRESSIONS BELOW FLOOR LEVEL

For the purpose of Rule 20-102(2), a floor below grade is defined as: any area where daily work and storage of product takes place (i.e., vehicle service area, storage areas, etc.).

For the purpose of Rule 20-102(3), a pit is defined as: any area below grade where every day work does not take place (i.e., sump pit, etc.).

20-200 – BULK STORAGE PLANTS – ANHYDROUS AMMONIA

Anhydrous ammonia is considered a volatile liquid which is flammable in a gaseous state, as such, wiring shall be in accordance with Rules 20-202 to 20-212, regardless of the aggregate capacity of the tank.

20-300 – FINISHING PROCESSES

We are starting to see the use of “water-base” or “waterborne” paints in automotive and other finishing processes. While the base coat may be “water-base” or “waterborne” other components of the paint are flammable and therefore Section 20 still applies.

Applies to areas where:

- paints, lacquers or other flammable finishes and fiberglass processes are regularly or frequently applied by spraying, dipping, brushing or by other means;
- volatile flammable solvents or thinners are used; or
- readily ignitable deposits or residues from such paints, lacquers or finishes may occur.

20-302 – HAZARDOUS LOCATIONS – PAINT MIXING ROOMS

All paint mixing rooms are classified Zone 1 locations unless it can be proven that all the products involved are non-flammable.

SECTION 22 – LOCATIONS IN WHICH CORROSIVE LIQUIDS, VAPOURS OR EXCESSIVE MOISTURE ARE LIKELY TO BE PRESENT

22-002 – CATEGORY DEFINITIONS (Appendix B)

Greenhouses, grow-ops, and freezers are considered a Category 1 location. EMT with wet location fittings will be permitted. The area classification may be reduced to a standard location if ventilation and humidity controls are present. See Rule 12-1414 provisions for bonding using EMT for Category 1 locations. All walk-in coolers are standard locations.

22-108 – WIRING DEVICES AND CONNECTORS

Enclosures, receptacles, inlets, attachment plugs and covers installed in a Category 1 or Category 2 location, shall be constructed for the Category, protected whether a plug is inserted or not (In-Use covers), selected in accordance with engineering / manufactures specifications or Table 65 and may also require ingress protection.

Receptacles shall be weather resistant (WR) rated for Category 1 or corrosion resistance (yellow) rated for Category 2.

22-200(1) – WIRING METHOD IN CATEGORY 1 LOCATIONS

Car wash - Car washes are classified as Category 1 locations. All wiring methods and equipment must be approved for wet locations. EMT shall not be used in car wash bay areas due to salt and chemical contaminants. See 12-1404.

22-202 – WIRING METHOD IN CATEGORY 2 LOCATIONS

Granular fertilizer storage - All electrical equipment and wiring installed for bulk granular fertilizer storage buildings, bins, load and unload equipment, distribution chutes and augers and surrounding exterior areas, subject to corrosion under normal operation of the equipment from a combination of the fertilizer dust and humidity/moisture, must be approved for the location in accordance with Rule 2-116. Non-essential equipment shall not be installed in handling or processing areas.

Raceways may be PVC, or other non-corrosive material, with fittings and enclosure entries of such design as to not constitute dissimilar metals in contact with each other, and to exclude dust.
TECK 90 cable with non-corrosive fittings shall be permitted to be installed at bulk fertilizer storage structures.

Equipotential grounding and bonding conductors shall be of copper or equivalent and insulated where exposed to corrosion. Any terminations shall be protected from corrosion by an approved sealant or epoxy paint.

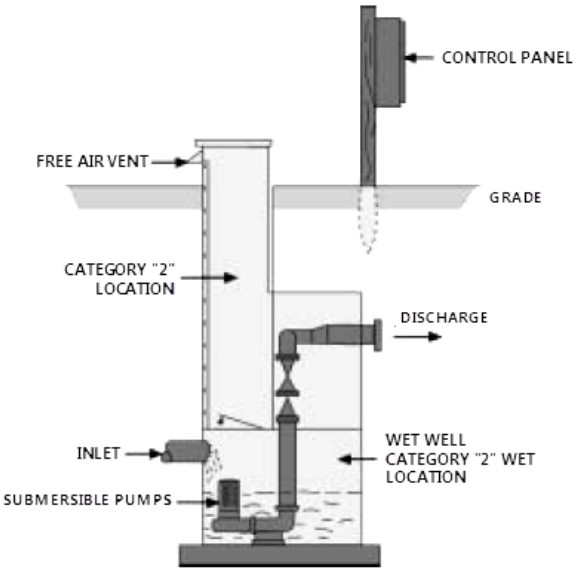
SEWAGE LIFT AND TREATMENT PLANTS

22-704 – CLASSIFICATION OF AREAS

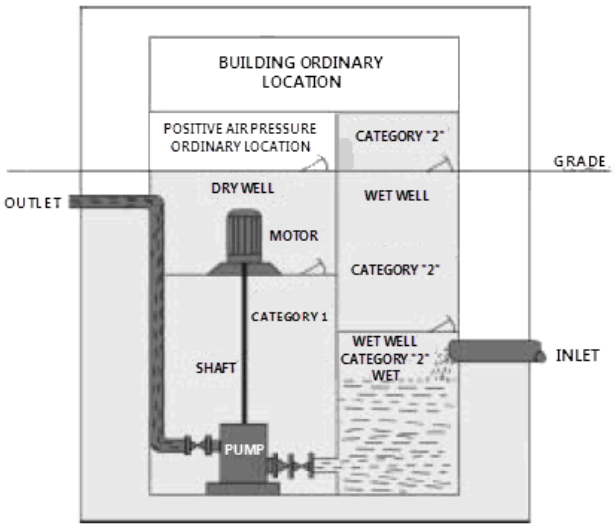
Sewage Lift & Handling

The following chart shows the classification of various locations in sewage lift and treatment plants		
Location	**Condition**	**Classification**
Wet Wells	With adequate continuous positive pressure ventilation	Zone 2, Category 2
All below-ground dry-well location	Suitably cut off from sewage gas location	Category 1
All locations	Sewage gas is present in explosive concentrations	Zone 1, Category 2
All locations	Suitably cut off from a Category 2 location and not classified as a Category 1 location.	Ordinary location
All locations	Not suitably cut off from a Category 2 location but with adequate continuous positive pressure ventilation.	Ordinary location
Below-ground dry well locations	With adequate heating and adequate continuous positive pressure ventilation	Ordinary location

Typical Sewage Lift Station (self-contained) Figure 22-1



Building - Ordinary Location Figure 22-2



FARM BUILDINGS HOUSING LIVESTOCK

22-804 – CLASSIFICATION OF AREAS

Wiring in buildings housing livestock, as defined in 22-802, shall be for Category 1 and Category 2 locations. Areas suitably cut-off may be considered dry locations.

22-806 – ELECTRICAL EQUIPMENT, LUMINAIRES, AND RECEPTACLES (see Appendix B)

Other than electrical equipment exempted under subrule (1), all receptacles must be weather resistant (WR) and/or corrosion resistant (Yellow), luminaires, and other equipment in accordance with 22-102 & 22-104.

22-808 -WIRING METHODS (see Appendix B)

The wiring methods shall be of the type listed in Table 19.

- PVC conduit along with PVC boxes, straps and approved expansion joints as required. Wire within the conduit must be approved for a wet location, or for a damp location if the barn is equipped with adequate humidity control;
- TECK 90 cable along with approved connectors, non-corrosive boxes, and straps; or
- Non-metallic sheath cable except in any location where it may be susceptible to damage by rodents.

NOTES:

- All screws used for the mounting of equipment, raceways etc. must be corrosion resistant.
- Non-metallic sheath cable cannot be run inside the walls, ceiling/attics or any other concealed space in a barn, office, tack room or similar area attached to or within the barn unless provided with mechanical protection.
- When non-metallic sheath cable passes through a location where it may be exposed to rodents, it must have mechanical protection (rigid steel, rigid non-metallic conduit, etc.) when:
  - Installed in exposed locations within 300 mm above any horizontal surface; or
  - Installed in exposed locations on the sides of floor joists or other structural members less than 100 mm below the upper surface.
- Aluminum conductors and AC90 (BX, ACWU) cables are not approved in buildings housing livestock.
- Non-metallic sheathed cable is not approved for installation in a continuous raceway system.
- When an office, tack room, riding arena, sales arena or similar room is attached or within the barn, the wiring methods shall be the same as the rest of the building. If the office, tack room, etc. is suitably cutoff from the barn by vapour tight walls, ceiling, floor, a sealed door and sealed raceways, normal equipment and wiring methods (i.e., panelboards, lighting, etc.) may be installed in the interior of this room (surface mounted, not recessed within the ceiling or walls). These are the minimum requirements, for more mitigation options see CEC Appendix B – 22-802.

SECTION 24 – PATIENT CARE AREAS

Δ DEFINITIONS – HEALTH CARE FACILITIES

Health care facility definitions (Class A, B, and C) can be located in CEC Handbook. Additional resources can be found in CSA Z32.

24-002 – Special terminology

Basic care area — a patient care area where body contact between a patient and medical electrical equipment is neither frequent nor usual.

Intermediate care area — a patient care area in which body contact between a patient and medical electrical equipment is frequent or normal.

Critical care area — a patient care area that is an anaesthetizing location, or in which cardiac contact between a patient and medical electrical equipment is frequent or normal.

24-002 – DEFINING PATIENT CARE AREAS/ENVIRONMENTS

Contractors need to be aware of the determination of patient care areas and provide this information to the Electrical Inspector prior to commencing work. Plans shall be submitted with indication of different patient care levels (basic, intermediate, or critical), patient care environments and branch circuit wiring details.

A rough-in inspection shall be booked prior to closing in of walls. See 2-012.

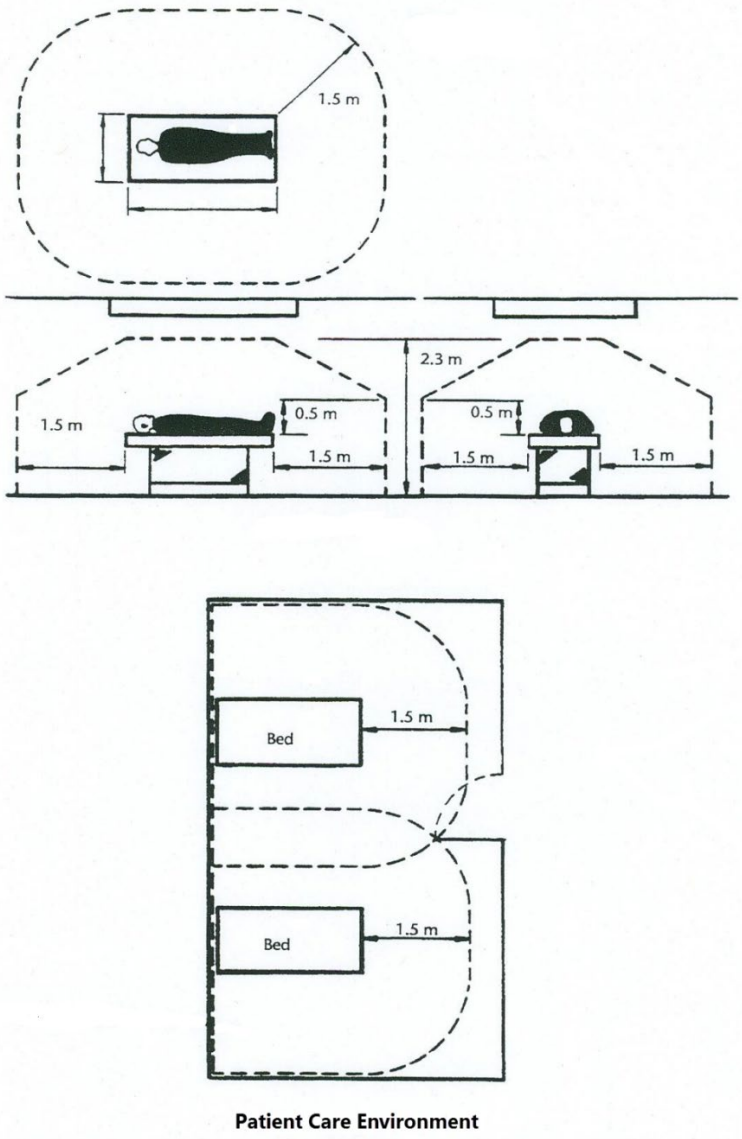
Patient care areas are defined by the CAN/CSA-Z32 standard and include, but are not limited to, walk-in medical clinics, dental clinics, chiropractic clinics, massage/physiotherapy, optometrists, and others. This means that the specific rooms of a clinic in which treatment is given may be required to be wired in accordance with Section 24 methods.

The health region, clinic or hospital administrators are the personnel who will determine the area use for their facilities.

PATIENT CARE ENVIRONMENT DIAGRAM

CAN/CSA-Z32-Patient Care Environment

A zone in a patient care area that has been preselected for the accommodation of a patient bed, table, or other supporting mechanism, and for the accommodation of equipment involved in patient treatment and which includes space within the room 1.5 meters beyond the perimeter of the bed in its normal location and to within 2.3 meters of the floor. The patient environment is a zone fixed to the supporting mechanism and does not move with the patient as the patient moves through the health care facilities.



Patient Care Environment

Δ 24-104(9) – CIRCUITS IN BASIC CARE AREAS

All branch circuits supplying loads within patient care environments must be 2-wire circuits unless the branch circuit supplies multi-phase equipment.

Δ 24-108(8) – RECEPTACLES IN BASIC CARE AREAS

All 5-15R and 5-20R receptacles installed in areas intended primarily for the provision of diagnosis, therapy, or care to children (as designated by the health care facility administration) shall be tamper-resistant and marked as such. An exception is allowed for receptacles conforming to 26-706(2).

SECTION 26 – INSTALLATION OF ELECTRICAL EQUIPMENT

Single phase transformer full load current in amperes

kVA	120v	240v	480v	600v	2400v	4160v	14400v
2	16.7	8.3	4.2	3.3	0.83	0.48	0.14
3	25	12.5	6.3	5.0	1.25	0.73	0.21
5	41.7	20.8	10.4	8.3	2.08	1.2	0.35
7.5	62.5	31.3	15.6	12.5	3.13	1.8	0.52
10	83.3	41.7	20.8	16.7	4.17	2.4	0.69
15	125	62.5	31.3	25.0	6.25	3.6	1.04
20	167	83.3	41.7	33.3	8.33	4.8	1.39
25	208	104	52.1	41.7	10.4	6.0	1.74
30	250	125	62.5	50.0	12.5	7.2	2.08
37.5	313	156	78.0	62.5	15.6	9.0	2.61
50	417	208	104	83.3	20.8	12	3.47
75	625	313	156	125	31.3	18	5.21
100	833	417	208	167	41.7	24	6.94
167	1391	695	347	278	69.6	40.1	11.6
200	1667	833	417	333	83.3	48.1	13.9
250	2083	1041	520	416	104	60.1	17.4
333	2115	1387	693	555	138	80	23.1
500	4167	2083	1042	833	208	120	34.7
750	6250	3125	1563	1250	313	180	52.1
1000	8333	4167	2083	1667	417	240	69.4

KVA = Voltage (Current) / 1000

Three phase transformer full load current in amperes

kVA	208v	240v	480v	600v	2400v	4160v	13800v	14400v
3	8.3	7.2	3.6	2.9	0.72	0.42	0.126	0.120
6	16.6	14.4	7.2	5.8	1.46	0.82	0.251	0.241
9	25	21.7	10.8	8.7	2.17	1.25	0.377	0.361
15	41.7	36.1	18.2	14.5	3.61	2.09	0.628	0.601
30	83.4	72.3	36.1	28.9	7.23	4.17	1.26	1.202
45	125	108	54.2	43.4	10.8	6.26	1.88	1.805
50	139	120	60.2	48.2	12	6.96	2.09	2
75	208	181	90.3	72.3	18.1	10.4	3.14	3.005
112.5	313	271	135	108	27.1	15.7	4.71	4.51
150	417	361	181	145	36.1	20.9	6.28	60.1
200	556	482	241	193	48.2	27.8	8.37	8.02
225	625	542	271	217	54.2	31.3	9.41	9.025
300	834	723	361	289	72.3	41.7	12.55	12.02
450	1249	1083	541	433	108	62.5	18.83	18.04
500	1390	1204	602	482	120	69.6	20.92	20.07
750	2082	1804	902	722	180	104	31.38	30.07
1000	2776	2406	1203	962	241	139	41.84	40.09
1500	4164	3608	1804	1443	361	208	62.76	60.14
2000	5552	4811	2406	1925	481	278	83.67	80.19

KVA = 1.73 (Voltage) (Current) / 1000
26-254 & 26-256 - 3 phase dry-core transformer tables

26-254 & 26-256: 3 phase dry-core transformer tables

Based on 125% of the primary rated current (FLA)
Without Secondary Protection
Step-down transformers with primary overcurrent only

3 Phase Dry-type Transformers rated 750 V or less-Rule 26-254 & 26-256												
	600 Volt primary							480 Volt secondary			
KVA	FLA	125% of FLA	75 ° * Cond.	#1 Max. O/C Breaker Size	#1 Max. O/C Fuse Size	Equip. Rating Breaker	Equip. Rating Fuse	FLA	125% of FLA	75 ° * Cond.	#2 System Bond Jumper
4.5	4.33526	5.41908	14	15	5	30	30	5.41908	6.77384	14	14
9	8.67052	10.8382	14	15	10	30	30	10.8382	13.5477	14	14
15	14.4509	18.0636	14	15	15	30	30	18.0636	22.5795	12	14
22.5	21.6763	27.0954	10	25	25	30	30	27.0954	33.8692	10	10
30	28.9017	36.1272	8	35	35	60	60	36.1272	45.159	8	10
45	43.3526	54.1908	6	50	50	60	60	54.1908	67.7384	4	8
75	72.2543	90.3179	3	90	90	100	100	90.3179	112.897	2	6
100	96.3391	120.424	1	100	110	100	200	120.424	150.53	2/0	6
112.5	108.382	135.477	1/0	125	125	200	200	135.477	169.346	2/0	6
150	144.509	180.636	3/0	175	175	200	200	180.636	225.795	4/0	6
200	192.678	240.848	250	225	225	400	400	240.848	301.06	350	4
225	216.763	270.954	300	250	250	400	400	270.954	338.692	500	3
300	289.017	361.272	500	350	350	400	400	361.272	451.59	2 x 4/0	2

3 Phase Dry-type Transformers rated 750 V or less-Rule 26-254 & 26-256											
	600 Volt primary							208 Volt secondary			
KVA	FLA	125% of FLA	75 ° * Cond.	#1 Max. O/C Breaker Size	#1 Max. O/C Fuse Size	Equip. Rating Breaker	Equip. Rating Fuse	FLA	125% of FLA	75 ° * Cond.	#2 System Bond Jumper
4.5	4.33526	5.41908	14	15	5	30	30	12.5056	15.6319	14	14
9	8.67052	10.8382	14	15	10	30	30	25.0111	31.2639	10	10
15	14.4509	18.0636	14	15	15	30	30	41.6852	52.1065	6	10
22.5	21.6763	27.0954	10	25	25	30	30	62.5278	78.1597	4	8
30	28.9017	36.1272	8	35	35	60	60	83.3704	104.213	2	6
45	43.3526	54.1908	6	50	50	60	60	125.056	156.319	2/0	6
75	72.2543	90.3179	3	90	90	100	100	208.426	260.532	300	4
100	96.3391	120.424	1	100	100	100	200	277.901	347.377	500	4
112.5	108.382	135.477	1/0	125	125	200	200	312.639	390.799	600	3
150	144.509	180.636	3/0	175	175	200	200	416.852	521.065	2 x 300	2
200	192.678	240.848	250	225	225	400	400	555.803	694.753	2 x 500	1/0
225	216.763	270.954	300	250	250	400	400	625.278	781.597	2 x 600	1/0
300	289.017	361.272	500	350	350	400	400	833.704	1042.13	4 x 300	3/0

Turns Ratio
600 / 480 = 1.25
480 / 208 = 2.30
600 / 208 = 2.88

Amperes =(KVA x 1000) / (Volts x √3)

Volts x √3
600 x 1.732051 = 1039.23
480 x 1.732051 = 831.38
208 x 1.732051 = 360.27

Based on 125% of the primary rated current (FLA)

Without Secondary Protection

Step-down transformers with primary overcurrent only

3 Phase Dry-type Transformers rated 750 V or less-Rule 26-254 & 26-256											
	480 Volt primary							208 Volt secondary			
KVA	FLA	125% of FLA	75 ° * Cond.	#1 Max. O/C Breaker Size	#1 Max. O/C Fuse Size	Equip. Rating Breaker	Equip. Rating Fuse	FLA	125% of FLA	75 ° * Cond.	#2 System Bond Jumper
4.5	5.41908	6.77384	14	15	6	30	30	12.5056	15.6319	14	14
9	10.8382	13.5477	14	15	13	30	30	25.0111	31.2639	10	10
15	18.0636	22.5795	12	20	20	30	30	41.6852	52.1065	6	10
22.5	27.0954	33.8692	10	30	30	30	30	62.5278	78.1597	4	8
30	36.1272	45.159	8	40	40	60	60	83.3704	104.09	2	8
45	54.1908	67.7384	4	60	60	60	60	125.056	156.319	2/0	6
75	90.3179	112.897	2	100	100	100	200	208.426	260.532	300	4
100	120.424	150.53	2/0	150	150	200	200	277.901	347.377	500	3
112.5	135.477	169.346	2/0	150	150	200	200	312.639	390.799	600	3
150	180.636	225.795	4/0	225	225	400	400	416.852	521.065	2 x 300	1
200	240.848	301.06	350	300	300	400	400	555.803	694.753	2 x 500	1/0
225	270.954	338.692	500	300	300	400	400	625.278	781.597	2 x 600	1/0
300	361.272	451.59	2 x 4/0	400	400	400	600	833.704	1042.13	4 x 300	2/0

note #1: O/C protection sized not to exceed 125% of the transformer primary FLA.
#2: The system bonding jumper shall be sized as per Rule 10-614(3)(a)&(5) (Table 16). See App "B" Based on Table 16, Col. 1 using primary O/C size multiplied by the turns ratio.
***: All conductors are copper.**

Example:

30 Kva, 600 volt to 120/208 delta/wye transformer.

Primary

(30 Kva x 1000) / (600 x √3)
30000 / 1039.23
28.87 amps

28.87 amps x 125%
36.09 amps

Secondary:

(30 Kva x 1000) / (208 x √3)
30000 / 360.27
83.27 amps

83.27 amps x 125%
104.09 amps

This can be installed with a minimum #10 awg conductor on a 35 amp breaker (60 amp equipment) or 35 amp fuse (60 amp equipment) without secondary overcurrent protection because when multiplied by the turns ratio the amperage is not in excess of the secondary value.

Example:

35 amp (for breaker) x 2.88 = 100.8 amps or 35 amp (for fuse) x 2.88 = 100.8 amps.
This value does not exceed the calculated ampacity of 104.09 amps for the secondary.
The value of the secondary overcurrent does not exceed 104.09 amps so therefore secondary overcurrent protection is not required.

If the primary overcurrent (FLA x 125%=36.127 amps) is adjusted to the next common size as allowed by 26-256(3) then a 40 amp breaker (60 amp equipment) or a 40 amp fuse (60 amp equipment) could be used but secondary overcurrent protection would be required because when multiplied by the turns ratio the amperage is in excess of the secondary value.

Example:

40 amp (for breaker) x 2.88 = 115.2 amps or 40 amp (for fuse) x 2.88 = 115.2 amps.
This value exceeds the calculated ampacity of 104.09 amps for the secondary.
The value of the secondary overcurrent does exceed 104.09 amps so therefore secondary overcurrent protection rated at 104.09 amps or less is required.

26-256 – CONDUCTOR SIZE FOR TRANSFORMERS – LIMITING CURRENT OUTPUT (CHOKING) OF A DRY-TYPE TRANSFORMER

If the secondary conductors or equipment connected to the secondary of the transformer are less than 1.25 x the transformer's rated secondary current, but equal to or greater than the primary overcurrent (OC) multiplied by the transformers turns ratio, secondary OC protection is not required.

The primary OC device shall be labelled to indicate the maximum rating of the OC protection.

26-600 – LOCATION OF PANELBOARDS (see Appendix G)

In a retrofit where an existing service is upgraded at the same location, the new panelboard need not be lowered. If the location is otherwise undesirable, reference 6-206(1)(c), the new panelboard shall be made to comply with the current CEC.

Panelboards shall not be enclosed in thermally insulated walls.

In all new installations in dwelling units, with the exception of the main breaker or disconnect switch, no branch circuit overcurrent device shall be located at a height greater than 1.7 m above the finished floor.

26-656 – BRANCH CIRCUITS FOR SINGLE DWELLINGS

At least one dedicated separate circuit is required for all outdoor receptacles. More than one dedicated circuit may be installed for outdoor receptacles, but there shall be no interconnection of indoor and outdoor receptacles. This does not include the receptacles on balconies of apartment buildings.

Smoke detectors and CO detectors installed during the sub-division of a dwelling unit should, where possible, be fed from a lighting circuit in a common area.

26-658 – ARC FAULT PROTECTION OF BRANCH CIRCUITS FOR DWELLING UNITS

Combination arc fault protection as defined in Rule 26-658 is required for all branch circuits in new construction or renovations/additions of dwelling units except for:

- Bathroom receptacles within 1 m of the wash basin;
- Refrigerator receptacles (includes a separate circuit labeled as fridge or freezer in another location i.e., basement, garage, etc.);
- Kitchen counter receptacles;
- Island receptacles;
- Peninsula receptacles;
- A single receptacle for a sump pump, septic pump, central heating and/or related equipment that does not supply any other receptacles; or
- A dedicated receptacle on a separate circuit wired as per Section 24 for home dialysis equipment, as an example, will require the receptacle to be clearly labelled as to its purpose.

NOTES:

- A dwelling unit with permanently installed cooking facilities (i.e., gas or electric range, cooktop) is deemed to have a cooking facility and thus requires arc fault protection.
- An “outlet branch circuit type combination arc fault circuit interrupter” may be used (instead of an AFCI breaker).
- Where a branch circuit feeds receptacles (rated 125 volt, 20 amps or less) that are associated with but outside the dwelling unit such as in a yard, accessory building, or detached garage, AFCI protection is not required.
- Combination arc fault protection refers to the ability of the breaker to monitor both series and parallel arcs.
- Non-combination arc fault breakers do not have parallel and series protection and may only be used for replacement and not for new installations.
- Dual AFCI / GFCI breakers provide ground fault protection and combination arc fault protection.

26-704 – PROTECTION OF RECEPTACLES BY A GFCI OF THE CLASS A TYPE (see Appendix B)

All 5-15R or 5-20R receptacles installed outdoors and within 2.5m of the finished grade shall be protected by a GFCI of the Class A type. All decks, patios, and surfaces accessible to foot traffic shall be considered finished grade.

Parking lot and commercial building receptacles are no longer exempted from protection.

A single receptacle for a septic pump out is exempt.

In accordance with the manufacturer’s instructions, when a receptacle is required for an indoor or outdoor wheelchair or mobility lift, it shall be a single receptacle connected to a separate circuit and shall not be arc fault or ground fault protected.

Finished Grade Level – Shall include walking surfaces such as, but not limited to, decks and balconies.

26-706 – TAMPER-RESISTANT RECEPTACLES (see Appendix B)(also see 24-108(8))

All receptacles of CSA configuration 5-15R and 5-20R shall be tamper-resistant (TR) and shall be so marked, when installed in childcare facilities, guest rooms and guest suites of hotels and motels and dwelling units.

For pre-schools and elementary education facilities, receptacles shall be required to be tamper-resistant (TR) when installed in:

- The shared areas in joint facilities which may be accessed by children up to elementary school age shall also require tamper resistant receptacles.
- Portable classrooms shall be built with TR receptacles if attached to or intended for an elementary school.
- Relocated portable classrooms shall be dealt with on a case-by-case basis. However, if the wiring requires maintenance due to wear and tear, the receptacles shall be made to comply.

NOTES:

- This shall include all receptacles installed on or in buildings or structures associated with the residential occupancy (i.e., garages, sheds, carports, etc.).
- Please check with the Electrical Inspection department if further clarification is required.

26-710 – RECEPTACLES FOR MAINTENANCE OF EQUIPMENT ON ROOFTOPS (see Appendix B)

A receptacle is required, for maintenance purposes, on all commercial or industrial buildings that have rooftop electrical equipment such as RTU's, ventilation, etc. This receptacle shall be:

- protected by a GFCI of the class "A" type;
- supplied by a separate branch circuit that does not supply any other outlets or equipment;
- CSA configuration 5-20R;
- located within 7.5 m of rooftop equipment;
- at least 750 mm off finished roof; and
- protected from mechanical damage.

A receptacle that is an integral part of the rooftop unit, supplied by a separate circuit as per Rule 26-710, meets the intent of this rule.

Replacement of a rooftop unit will not require an upgrade to meet the intent of this rule.

26-720 – GENERAL – RECEPTACLES INSTALLED IN CUPBOARDS (see Appendices B & G)

Receptacles installed in drawers for appliances such as USB chargers, hair dryers, curling irons, food processors, etc. **shall be approved as part of the assembly and power shall be disconnected from the receptacle as soon as the drawer begins to close.** The circuit shall be AFCI protected and if located within 1.5 m of a sink, bathtub or shower stall it shall be GFCI protected. Receptacles shall be tamper-resistant (TR).

26-722 – RECEPTACLES FOR DWELLING UNITS – KITCHEN RECEPTACLES (see also 2-022)

At least one receptacle installed at each permanently fixed island counter space with a continuous long dimension of 600 mm or greater and a short dimension of 300 mm or greater.

At least one receptacle installed at each peninsular counter space with a continuous long dimension of 600 mm or greater and a short dimension of 300 mm or greater.

Continuous counter space excluding sinks or cooktops

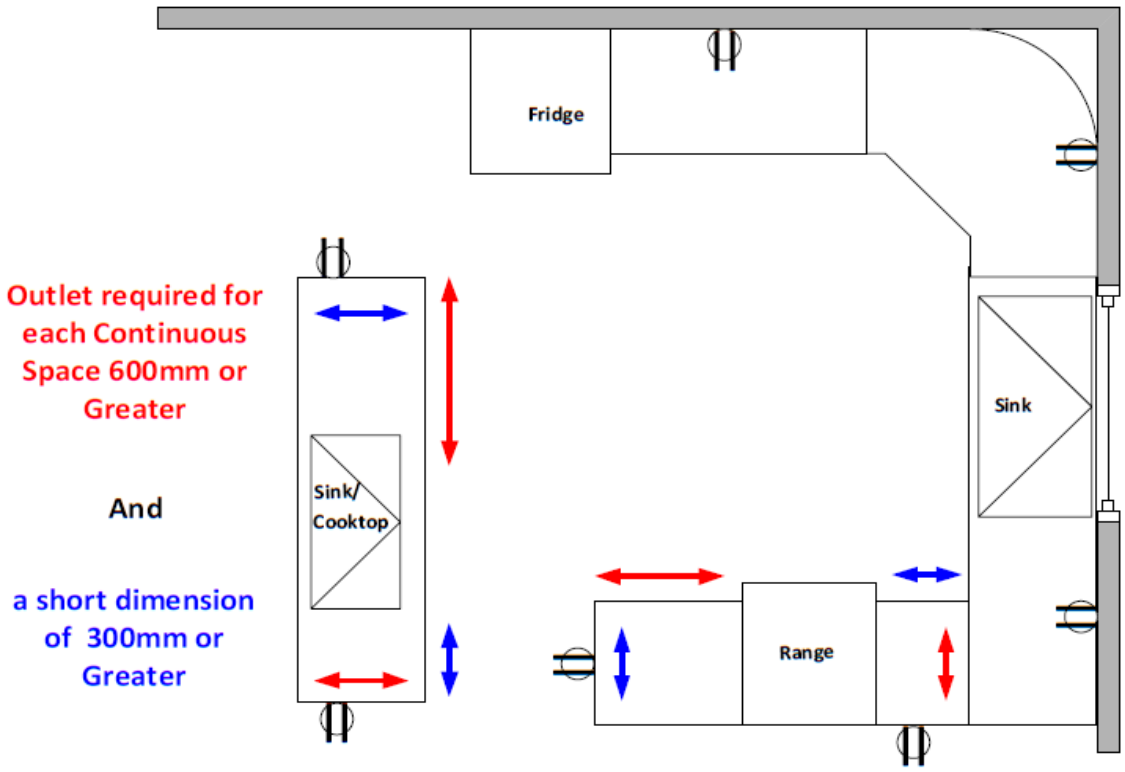
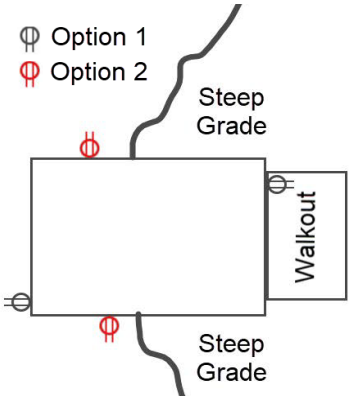


Figure 26-1

Δ 26-724 – OUTDOOR AND GARAGE RECEPTACLES FOR SINGLE DWELLINGS – OUTDOOR RECEPTACLES

All single dwellings must have at least 1 outdoor receptacle. All single dwellings with a continuous grade-level perimeter of more than 20 m must have at least 2 duplex receptacles readily accessible from ground level. Receptacles must be located on opposite walls when there are opposite walls {1)a)}, and on adjacent walls separated by at least half the width of the longest side if there are no opposite walls {1)b)}.

26-724 1)a)



26-724 1)b)

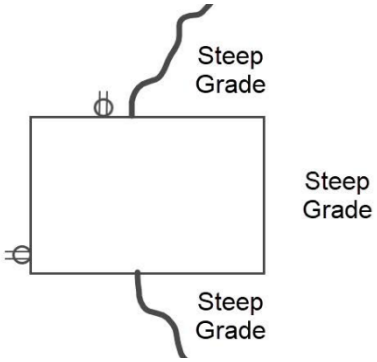


Figure 26-2

26-806 – HEATING EQUIPMENT RATED 117KW OR LESS (see Appendix B)

(1)(5)(6)(7) - Gas furnaces

The furnace shall be provided with a dedicated circuit. The disconnect shall be located as required by the CEC. Garage unit heaters must also meet all these requirements and provide a point of disconnect without passing in front of the furnace. See also Rule 10-700.

(1)(2)(3)(4)(5) – Central Heating Unit (used as primary heating source)

The central heating unit and associated circulation pumps, when cord connected, shall be fed from a separate circuit exempted from 26-656 (AFCI) and shall use single receptacles labelled for boiler use only.

26-956 – SUBMERSIBLE PUMPS INSTALLED IN BODIES OF WATER

Electrical Installations MUST be maintained by a Saskatchewan Licensed Electrical Contractor. All equipment shall be approved to an acceptable Canadian Standard.

Electrical Inspections shall be notified, and a permit submitted yearly, regarding pump installations in or on bodies of water where the voltage exceeds 150 volts-to-ground.

Pumps installed in or on bodies of water shall be provided with GFCI protection set at not greater than 10ma for an operating time of 2.7s regardless of the location of the motor.

The area around the submersible pump, pump motor, or pump platform shall be protected from public access by isolation and so marked with a buoy.

Buoys should meet the Private Buoys Regulations and be installed as per the Navigable Waters Act.

Pump controllers and cables installed on shore shall be protected by fencing or other acceptable means if they are susceptible to damage from animals in accordance with 2-200.

Signage marked “DANGER _____ VOLT PUMP” shall be visible from land and water, at the controller structure facing the water and at access points to the platforms.

Plans must be submitted for review prior to application for deviation in accordance with 2-014 (g).

Deviation is required as per 2-030. Application must include approval documentation from the AHJ for navigable water systems and the plans review letter.

SECTION 28 – MOTORS AND GENERATORS

28-104(1) – MOTOR SUPPLY CONDUCTOR INSULATION TEMPERATURE RATING AND AMPACITY (see Appendix B)

Supply conductors to a motor connection box shall have an insulation temperature rating equal to or greater than that required by Table 37 (i.e., heating circulating pumps, automotive car lifts, etc.) unless the motor is otherwise marked.

28-110(1) – FEEDER CONDUCTORS

Aeration Fan Services - for the supply of motors shall be sized in accordance with Section 28 of the CEC.

The service calculation is based on the total number of fans permanently wired into the electrical panel. The motor disconnect shall be installed within sight of and within 9 m of the motor or be lockable at the source. If receptacles are installed to plug in portable fans, then the service may be calculated by the number of fans to be utilized at one time.

28-300 – OVERLOAD PROTECTION REQUIRED

Caution shall be used when connecting bin fans.

Thermistors do not provide overload protection. The leads labelled as thermostat are the thermistor.

All motors exceeding 1 hp shall indicate that they have overload protection installed or have suitable overload protection field installed at the time of installation.

28-604(1) – LOCATION OF DISCONNECTING MEANS

Lock off devices shall be an approved device designed for the disconnecting means.

SECTION 32 – FIRE ALARMS AND FIRE PUMPS

INSTALLATION OF SMOKE ALARMS AND CARBON MONOXIDE (CO) ALARMS IN DWELLING UNITS

For the purpose of the building code requirements:

- New construction of residential units shall be provided with interconnected smoke alarms & CO alarms wired as per Section 32 and located as required by the Saskatchewan Amendments of the National Building Code (NBC) 2015 which can be found in the Appendix of The Uniform Building and Accessibility Standards Regulations (U-1.2 REG 5) available at www.qp.gov.sk.ca.

SECTION 34 – SIGNS AND OUTLINE LIGHTING

34-000 – SCOPE – SIGNS AND OUTLINE LIGHTING

Signs

Δ Each sign shall have at least one label with the electrical ratings and certification mark readily accessible without the use of tools as per C22.2 No. 207-M89 and visible from the ground. For multi letter/symbol signs, all letters must have a label, with at least one visible from the ground.

For Retrofits to LED see Rule 2-106.

Permits

Permit fees for signs shall include the wiring to the sign and are as per the Electrical Fee Schedule. For LED retrofits and outline lighting, the permit fees shall reflect the labour and material required for the installation

34-106 – LOCATION – LED DRIVER

LED drivers shall be installed in an accessible location as per Rule 2-312 when installed in attics, bulkheads, or similar locations.

SECTION 36 – HIGH VOLTAGE INSTALLATIONS

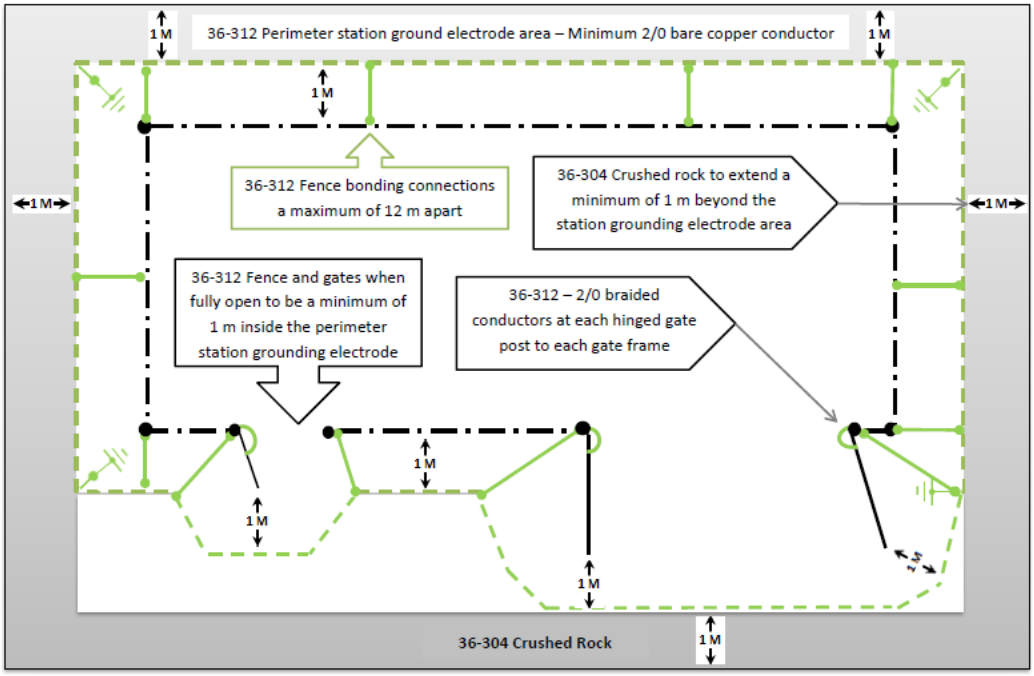
36-004 – GUARDING

Δ **Minimum approach distances from exposed energized electrical conductors (Sask OH&S Regs 2020)**

Risk Factor		Column 1	Column 2	Column 3
Voltage Phase to Phase (kV)	Voltage to Ground (kV)	Non-electrical Workers, Material, Equipment (Metres)	Qualified Electrical Workers (Metres)	Vehicles and Load (Metres)
230	133	6.1	1.4	1.83
138	79.8	4.6	1	1.22
72	41.6	4.6	0.6	0.8
25	14.4	3	0.3	0.6
15	8.6	3	0.3	0.6
4.16	2.4	3	0.15	0.6
0.75	0.75	3	0.15	0.6

Table 36-1

36-312 – GROUNDING OF METALLIC FENCE ENCLOSURES OF OUTDOOR STATIONS



36-302 – **Minimum** 4 driven ground rods
Grounding grid engineered as per 36-304 Appendix B and Standard CEA 249 D 541
Table 51 and 52 may require more ground rods

Figure 36-1

SECTION 62 – FIXED ELECTRICAL SPACE AND SURFACE HEATING SYSTEMS

③ 62-114 – OVERCURRENT PROTECTION AND GROUPING (see Appendix B)

Notes and Table have been removed.

62-130 – HEATER CONTROLS INSTALLED IN PROXIMITY TO SINKS, TUBS, OR SHOWER STALLS

1. A manually operable control for an electric heater in a bathroom is to be located at least 1 m from the bathtub or shower stall.
2. If 1 m is not practicable, it is permitted to be located not less than 500 mm from a bathtub or shower stall, provided it is:
   a) protected by a ground fault circuit interrupter of the Class A type; or
   b) supplied by a Class 2 circuit operating at not more than 42.4 V peak or DC.

62-132 – HEATING DEVICES INSTALLED IN PROXIMITY TO SINKS, TUBS, OR SHOWER STALLS

Δ Heating devices i.e., baseboard heaters, hot water heaters, etc. installed less than 1m from a tub, shower or sink shall be protected by a Class A type GFCI. Reference Figure B62-0 in Appendix B of the CEC.

62-200 – ELECTRIC SPACE HEATING (see Appendix B)

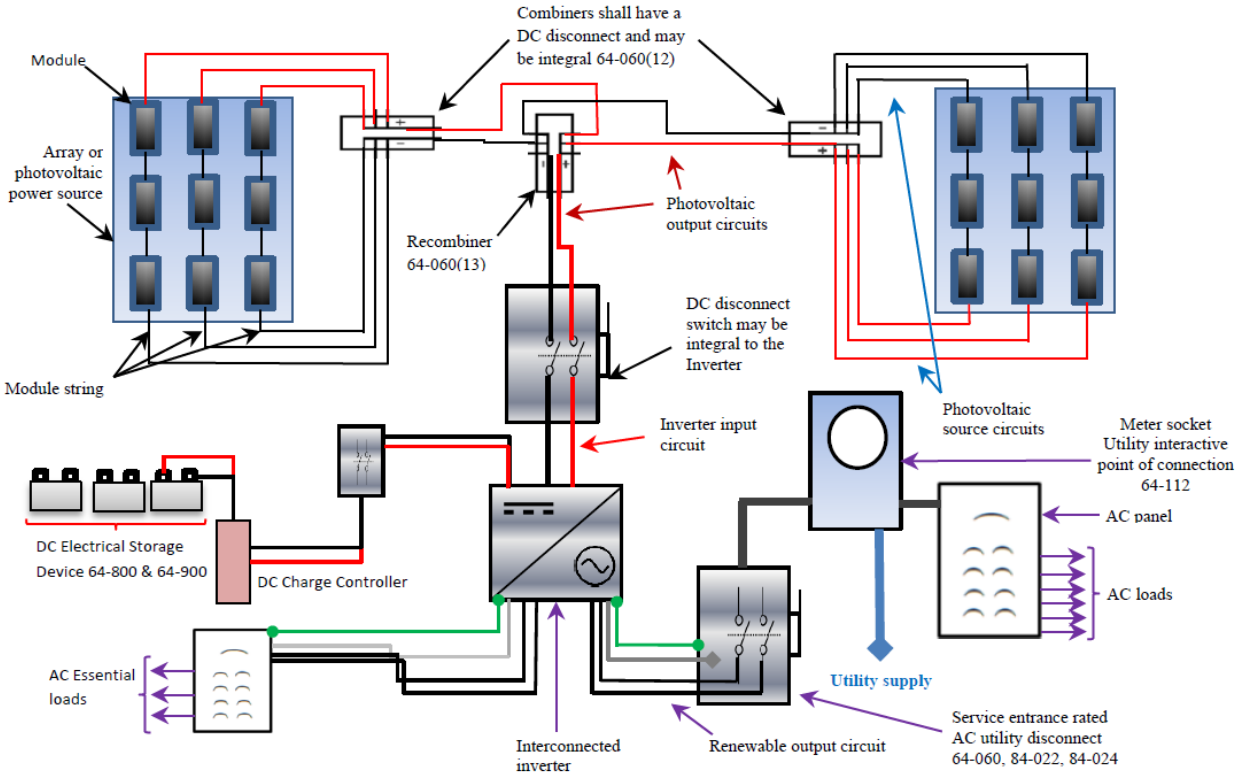
Table 67 has been added to the code to provide installation clearance requirements for space heating systems i.e., in-floor systems, baseboard heaters, etc. Receptacles shall not be installed within 1.2 m of
Δ surface mounted electric heaters. Always follow manufacturer's instructions. See also drawing B62-3.

SECTION 64 – RENEWABLE ENERGY SYSTEMS

NOTE: Rules for marking, warning notices and Diagrams - see Appendix M

64-002 – SPECIAL TERMINOLOGY

In this section, please refer to the attached diagram for terminology and components of a DC interconnected system with recombiners.



Interconnected System with Recombiner, Essential Power and Energy Storage

Figure 64-1

64-058 – OVERCURRENT PROTECTION – ALL RENEWABLE ENERGY SYSTEMS

Where circuit conductors are connected to more than one source, all overcurrent devices shall be located in such a way that they provide overcurrent protection from all sources.

Overcurrent devices marked or approved only for AC use shall not be used in DC circuits.

Circuit breakers that are marked “Line” and “Load” have been evaluated for connection only in the direction marked.

NOTE: To facilitate the inspection of the installation, contractor photos can be attached to the permit in the Permit System or made available on site to show the wiring installation, bonding of the racking, and installation of the equipment.

Δ 64-060 – DISCONNECTING MEANS (see also 84-022, 84-024 & Appendix M)

(1)(c) The disconnecting means for DC circuits shall be marked for the purpose.

(2) The disconnecting means shall simultaneously disconnect all ungrounded conductors of a renewable energy system, energy storage system, or energy production system.

(2)(a) The disconnecting means shall be installed in accordance with section 84.

(5) The disconnecting means shall be installed as close as practicable to where the ungrounded conductors enter the building, unless the building is exclusively used for the energy production system.

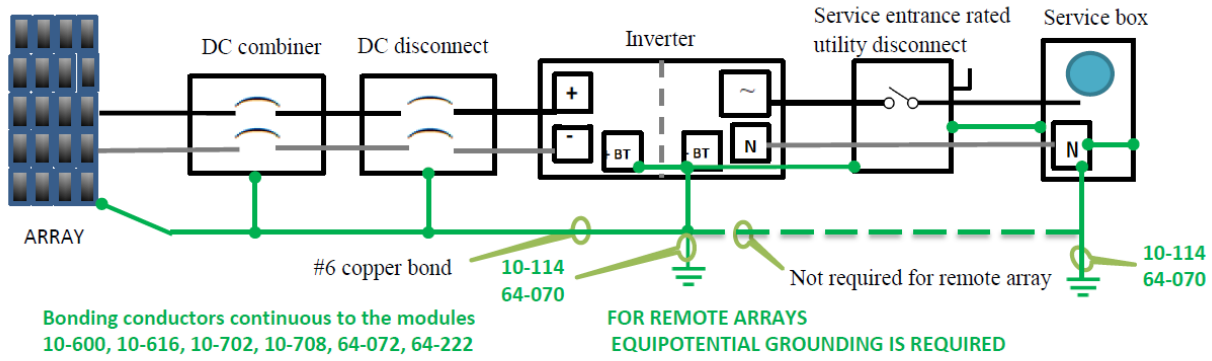
64-064 – WIRING METHODS

(1) Insulated conductors for DC renewable energy sources, between the array and the interactive inverter, installed inside a building or structure, must be contained in metallic raceways, metallic enclosures or cables which are metal-sheathed or metal armoured.

64-068 – UNGROUNDED RENEWABLE ENERGY POWER SYSTEMS

Renewable energy systems are permitted to operate with ungrounded source and supply circuits if the system complies with the following:

- All source and supply conductors must have overcurrent protection (positive and negative conductors) except as per 64-214(1);
- Inverters or charge controllers must be suitable for the purpose;
- The system must be provided with ground fault protection; and
- A suitable warning must be installed at each junction box, disconnect or any other device where these circuits can be exposed during service. See Appendix M.

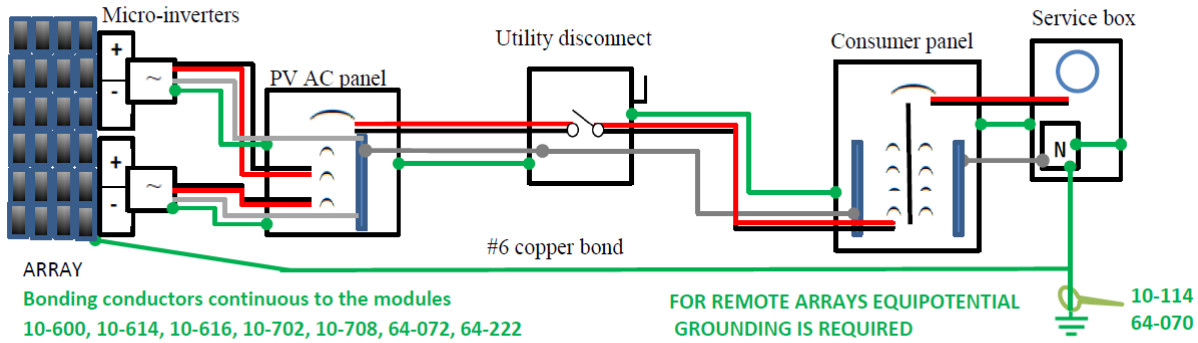


Ungrounded solar photovoltaic power source

Figure 64-2

Legend

BT – equipment bonding terminals



Solar Photovoltaic Power Source with Micro-Inverters

Figure 64-3

64-076 – WARNING NOTICE AND DIAGRAMS (see Appendices B & M)

Buildings and structures with both Utility and a renewable energy system shall have a permanent placard posted on or near the utility service box indicating the interconnected systems, energy storage systems, generator back-up and the locations of the equipment and their disconnects through the use of warning notices and diagrams (placards) permanently installed in accordance with requirements of this section. See also 64-218, 64-902, Appendix M.

Addition of new systems to an existing installation shall require a new and updated placard to include all renewable systems, energy storage systems and generators.

64-110 – UNBALANCED INTERCONNECTIONS – INVERTERS

Single phase inverters shall not be connected to a three-phase utility system unless:

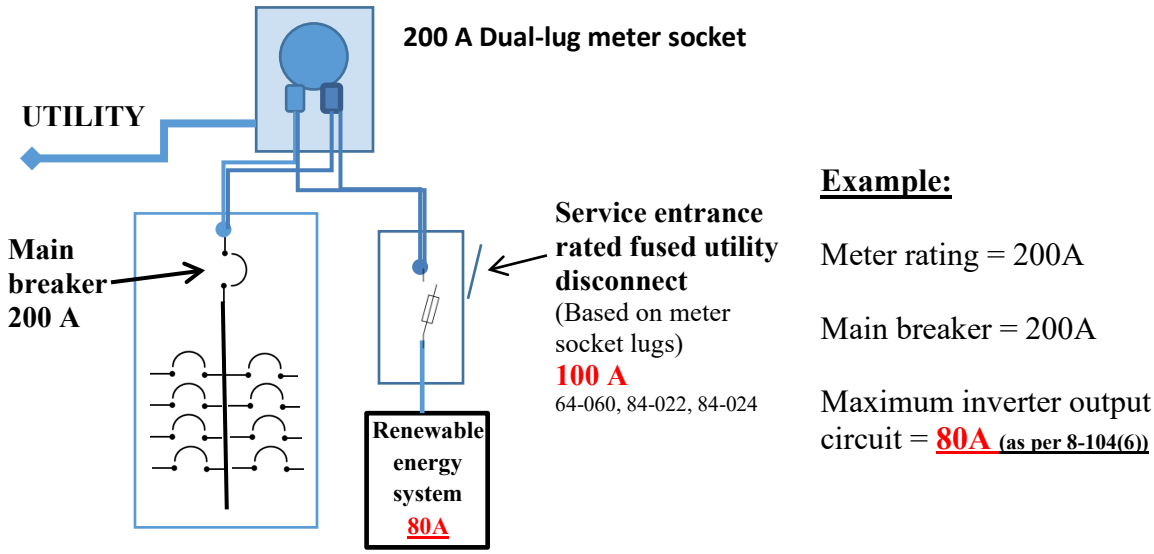
- The inverters used are certified as utility interconnected and approved for use in three-phase systems;
- The single-phase inverters are designed such that under normal operating conditions the resulting three-phase system voltages are balanced within the limits of the supply authority;
- The installation complies with Rules 84-008 and 84-018;
- Confirmation that the installation is acceptable to the supply authority; and
- The installation meets the inverter manufacturer's requirements.

64-112 – INTERACTIVE POINT OF CONNECTION – INVERTERS

(1) The output of an interactive inverter shall be connected to the supply authority system in accordance with Section 84.

(2) The output of an interactive inverter is allowed to be connected to the line side of the service disconnecting means at a dual lug meter socket or other source(s). See figure 64-4.

Δ ②

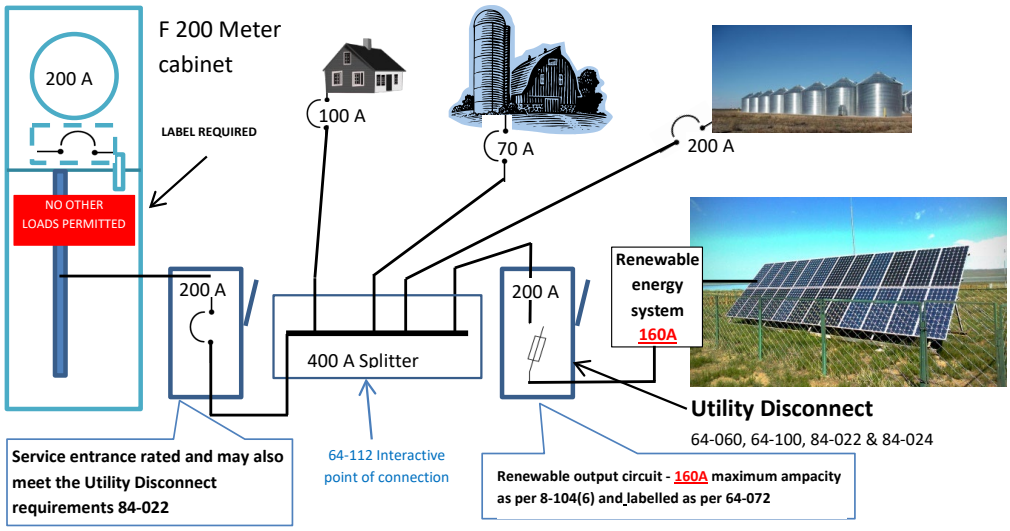


Supply Side Connection - example

Figure 64-4

(3) The output of an interactive inverter is allowed to be connected to the load side of the service disconnecting means provided that each source interconnection is made at a dedicated circuit breaker or fused disconnecting means. This point of connection shall be positioned at the opposite (load) end of the panelboard, busbar or conductor from the input feeder location or main circuit breaker location. See figure 64-5, 64-6, 64-8, & 64-9.

Δ
②



Interactive point of connection - example

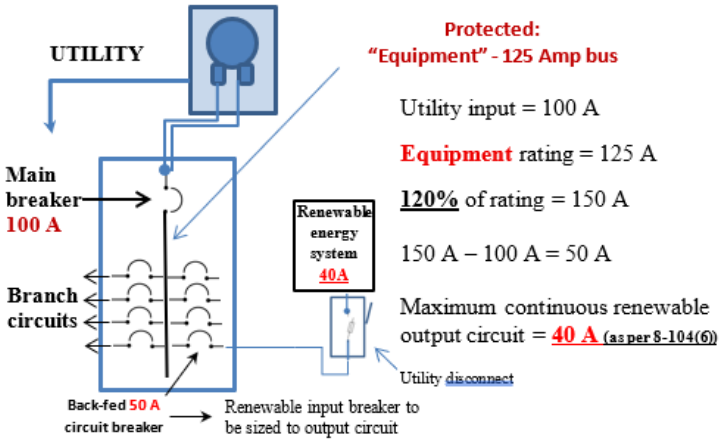
The sum of all renewable energy overcurrent devices must not exceed the rating of the consumer's service

Figure 64-5

Non-dwelling units

(4)(e) The sum of the overcurrent devices supplying power to equipment or conductor is allowed to exceed the rating of the equipment or conductor to a maximum of 120%. See figures 64-6, and Table 64-1.

Δ
②



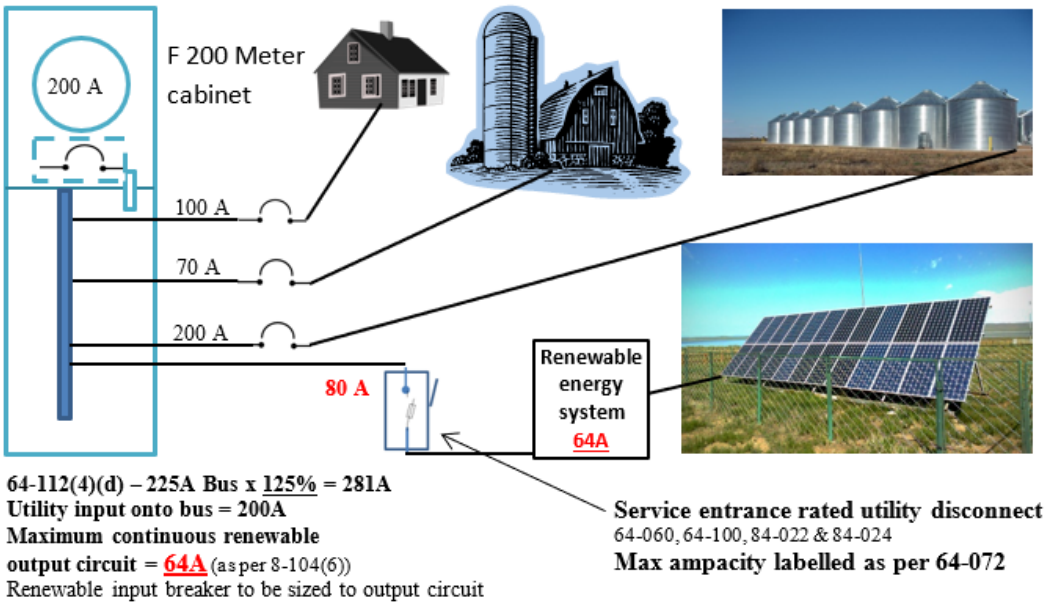
Load side connection – non-dwelling unit - example
100 Amp panel with 125 Amp bus

Figure 64-6

Dwelling units

(4)(f) The sum of the overcurrent devices supplying power to equipment or conductor is allowed to exceed the rating of the equipment or conductor to a maximum of 125%. See figures 64-7, 64-8, 64-9 and Table 64-1.

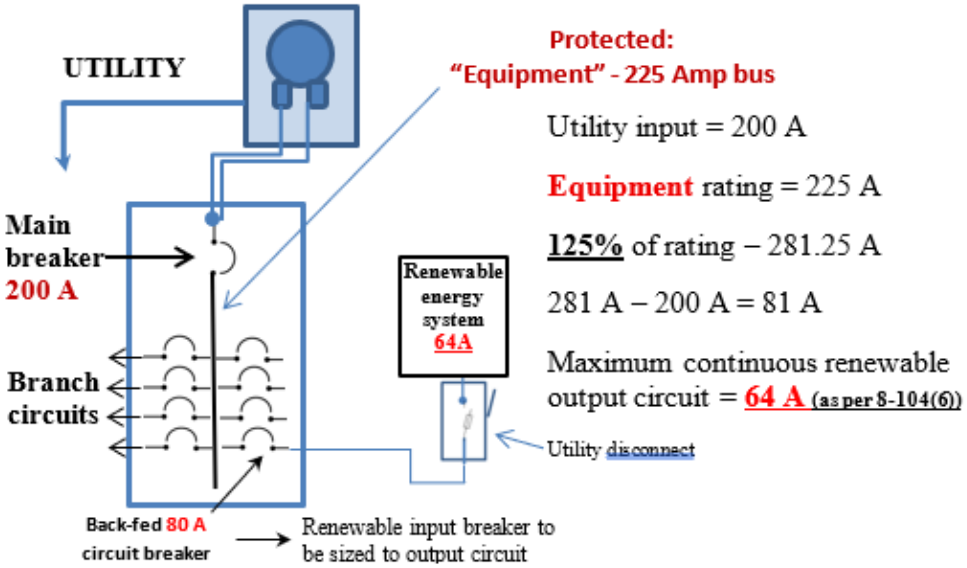
Δ ②



F200 Farm/Acreage installation - example

Figure 64-7

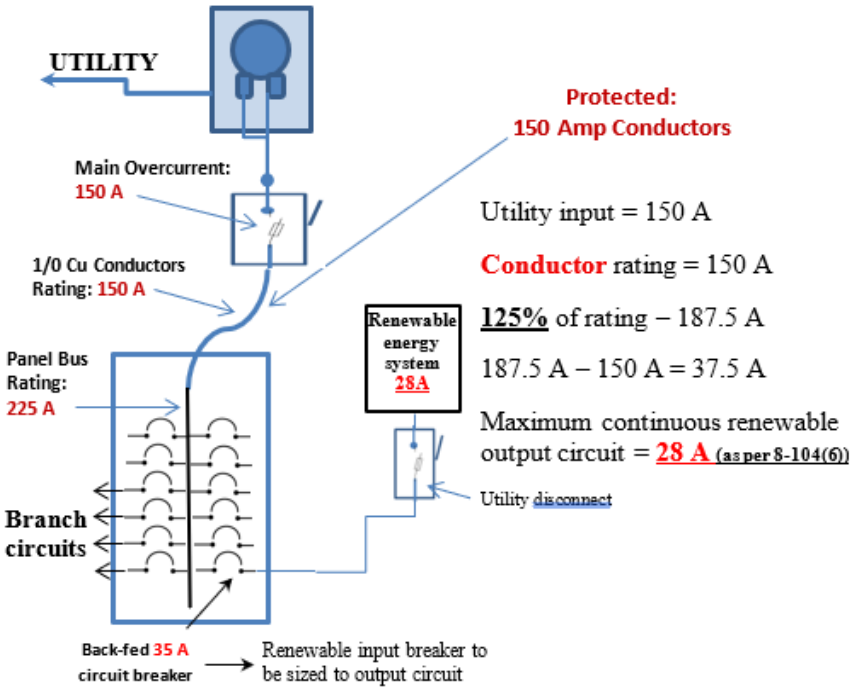
Δ ②



Load side connection – dwelling unit - example
200 Amp panel with 225 Amp bus

Figure 64-8

②



Load side connection – dwelling unit - example
200 Amp panel with 225 Amp bus BUT 150 Amp conductors

Figure 64-9

②

Equipment (A)	Case	Allowed (A)	Main OCPD (A)	Avail Breaker (A)	Inverter Cont (A)
100	120% (non-dwelling)	120	100	20	16
	125% (dwelling)	125	100	25	20
125	120% (non-dwelling)	150	100	50	40
	120% (non-dwelling)	150	**125**	25	20
	125% (dwelling)	156.25	100	55	44
	125% (dwelling)	156.25	**125**	30	24
200	120% (non-dwelling)	240	200	40	32
	125% (dwelling)	250	200	50	40
225	120% (non-dwelling)	270	200	70	56
	125% (dwelling)	281.25	200	80	64
400	120% (non-dwelling)	480	400	80	64
	125% (dwelling)	500	400	100	80
600	120% (non-dwelling)	720	600	120	96
	125% (dwelling)	750	600	150	120
800	120% (non-dwelling)	960	800	160	128
	125% (dwelling)	1000	800	200	160

Table 64-1

② NOTE: Terms such as switchboard, panelboard, distribution equipment, busbar, etc. have been replaced throughout Rule 64-112 by the more general terms equipment and conductor. Busbars are generally an integral part of such equipment and are included in their nameplate ratings. Conductors are generally field installed to connect these types of equipment together. The intent of Rule 64-112 is to ensure that equipment and conductors are not overloaded by the combined interconnected sources when the combined overcurrent devices of the sources exceed equipment rating.

64-202 – VOLTAGE OF SOLAR PHOTOVOLTAIC SYSTEMS

1) The maximum photovoltaic source and output circuit voltage shall be the rated open circuit voltage (V_{oc}) of the photovoltaic power source X 125%; or

2) The source and circuit output voltage (V_{MPC}) may be calculated using the open circuit voltage (V_{oc}) of the photovoltaic power source, the difference between 25 °C and the lowest expected daily minimum temperature (T_m) (available from Environment Canada "Canadian Climate Norms") and the voltage temperature coefficient (T_k) as specified by the manufacturer.

$$V_{MPC} _____ = V_{oc} \times [1+(T_m - 25) \times T_k]$$

Calculation of V_{MPC}

	V_{MPC}	=	V_{OC}	x	(1+ ((	T_M	- 25) x	T_K	(% / °C)))
Step 1	V_{MPC}	=	45.8	x	(1+ ((	-23.2	- 25) x	-0.31	(% / °C)))
Step 2	V_{MPC}	=	45.8	x	(1+ ((	-23.2	- 25) x	-0.0031	))
Step 3	V_{MPC}	=	45.8	x	(1+ (	-48.2	x	-0.0031	)
Step 4	V_{MPC}	=	45.8	x	(1+	0.1494	)		
Step 5	V_{MPC}	=	45.8	x	1.1494				
Step 6	V_{MPC}	=	52.6434	Volts					
	TOTAL	=	947.582	Volts					

V_{OC}	=	45.8	Volts
T_M	=	-23.2	°C
T_K	=	-0.31	%
# of panels	=	18	

Note: Input information into blue cells only.

3) The photovoltaic source and output circuits for installations in or on a dwelling unit shall be permitted to have a voltage not exceeding 600V DC.

4) The voltages of solar photovoltaic systems may exceed 750V DC but not more than 1500 V DC and shall not be required to meet the requirements of 36-204, 36-208 & 36-214 provided they are maintained by qualified persons, are inaccessible to the public, and labelled "DANGER _____V DC". See Appendix M.

64-210 – WIRING METHOD

(2) & (3) Where the source and output circuits operate at a maximum system voltage greater than 30V, the wiring is deemed inaccessible to the public and not readily accessible if it is:

- contained in a raceway;
- contained behind metal screening or guarding with holes not exceeding 13mm x 13mm;
- elevated 3 m or more above grade level; or
- located within a fenced enclosure in accordance with Rule 26-304, 26-312, and 26-314

(4) Conductors and cables shall be mechanically protected and supported as per this rule throughout the run;

(5) Rodent protection is required on all insulated conductors or cables, with the exception of armoured cables or MI cables, installed on or above a building by enclosing them in material such as approved raceways, expanded metal, solid metal, metal screening (maximum 13 mm x 13 mm holes) or other acceptable protection.

(7) RPV conductors shall be permitted for the module interconnections if they are contained in a raceway;

(9) Types RPV and RPVU conductors installed inside a building or structure shall be contained in a metallic raceway. See 64-064.

NOTES:

- For rodent protection, module level arc fault protection must be part of the module and listed in the module manufacturers' installation instructions.
- ③ Without manufacturer's approval, modules shall not be drilled into (e.g. mounting of rodent protection).

64-212 – INSULATED CONDUCTOR MARKING OR COLOUR CODING

RPVU or RPV conductors shall be coloured red for positive, black for negative or permanent surface printing of the polarity on the insulated conductors. TECK 90 cables may be field marked in a permanent manner (heat shrink).

64-214 – OVERCURRENT PROTECTION FOR APPARATUS AND CONDUCTORS

Maximum photovoltaic source circuit short-circuit-current (Isc) is equal to the sum of the short circuit current for all the source circuits connected in parallel minus the short circuit current for one of the photovoltaic source circuits.

If the photovoltaic source circuit short-circuit-current (Isc) (sum of all parallel strings minus one string) exceeds the maximum series fuse rating (reverse current rating) (typically 15A or 20A) or the ampacity of the source circuit conductor, then OC protection will be required on each ungrounded conductor.

E.g., String I_{SC} = 9.5A x 3(strings) = 28.5 – 9.5 = 19A x 125% = 23.75A; DC fusing is required for 15A or 20A series fuse rating.

Where the value specified in Subrule 2) does not correspond to the standard rating of an overcurrent device, the next higher standard rating shall be permitted. For a two-wire ungrounded system, the overcurrent protection may be located in one source or output conductor only but must be in the same polarity for the entire system.

DC overcurrent devices shall be accessible and grouped where practicable.

NOTE:

- AC overcurrent protective devices must be readily accessible. See Rule 14-106.

64-216 – PHOTOVOLTAIC DC ARC-FAULT PROTECTION – SOLAR PHOTOVOLTAIC SYSTEMS

Photovoltaic systems with a DC source or output circuit system voltage of 80V or greater, shall be DC arc-fault protected or provided with equivalent protection.

For photovoltaic systems not mounted on or above a building, (ground mounted systems) other than those buildings constructed for the sole purpose of housing solar equipment, where the conductors are installed in metallic raceways, metallic armoured cable, totally enclosed trays, or direct buried, and when complying with ongoing ground cover and vegetation control to mitigate the possibility of fire spread, a deviation of the DC arc-fault requirement may be requested as per 2-030.

A signed letter of understanding of the vegetation control requirement will be required from the installation owner.

64-218 – PHOTOVOLTAIC RAPID SHUTDOWN

A photovoltaic system rapid shutdown device shall be provided for a photovoltaic system installed on buildings or structures where the photovoltaic source or output insulated conductors or cables installed on or in buildings are more than 1 m from the photovoltaic array.

The rapid shut down initiating device, for single dwelling units, shall be located at the utility meter location.

For other than single dwelling units, one initiating device shall be at the utility meter location and a second initiating device at the permanent access to the building roof or within sight of and 9 m of the array.

If the utility disconnect serves a dual function as a rapid shutdown, it shall be labeled as such. (E.g., systems using micro-inverters or optimizers.).

Placards indicating the system is equipped with rapid shutdown, shall be located at the supply authority meter location and the consumer's service equipment location. The location of these placards (or additional placards) on buildings without exterior metering may require discussion with the local fire department i.e., near the gas meters, water standpipe, service splitter, fire annunciation panel, etc. See also 64-902.

64-802 – VENTILATION OF BATTERY ROOMS OR AREAS (see Appendix B)

Rooms or areas that contain batteries that vent hydrogen to the atmosphere shall be adequately ventilated and not subjected to temperatures in excess of 45 °C or less than the freezing point of the electrolyte in accordance with manufacturer's instructions.

64-804 – INSTALLATION (see Appendix B)

Batteries installed in residential dwelling units shall not be connected with an output voltage exceeding 50V dc and must be guarded to prevent accidental contact by persons or objects.

64-902 – MARKING

Any building or structure containing energy storage systems shall have a placard to indicate the location of the energy storage system and the disconnecting means. See also 64-076, Appendix M.

Δ 64-926 – SEPARATION FROM BUILDING EXPOSURES AND EGRESS FROM BUILDINGS (see appendices B & G)

Energy storage system batteries located outdoors cannot be located within 3 m of a means of egress or within 1.5 m of windows, ventilation, operable openings, or doors, except for vehicular assess doors.

Should the energy storage system be ANSI/CAN/UL 9540A compliant, it can be installed to manufacturers specifications regarding separation distances.

Be aware the National Building Code of Canada considers a means of egress to be exits, and access to exits.

Δ 64-1000 – ENERGY STORAGE SYSTEMS UTILIZING BATTERIES (GENERAL)

Rules 64-1002 to 64-1004 apply to energy storage systems utilizing batteries with a storage capacity exceeding 1 kWh.

Δ 64-1002 – INSTALLATION REQUIREMENTS OF ENERGY STORAGE SYSTEMS

Unless installed in an electrical equipment vault, energy storage systems with batteries cannot be located 23 m above grade, or below lowest level of egress.

Δ 64-1100 – LOCATION AND SEPARATION OF ENERGY STORAGE SYSTEMS AT RESIDENTIAL OCCUPANCIES

Rules in 64-1100 apply to energy storage systems for dwellings and residential occupancies.

SECTION 68 – POOLS, TUBS AND SPAS

68-000 – SCOPE

A pool shall be deemed to include:

- permanently installed and storable swimming pools;
- hydromassage bathtubs;
- spas and hot tubs;
- wading pools;
- baptismal pools;
- decorative pools; and
- splash pads.

68-054 – OVERHEAD WIRING – UTILITY CONDUCTORS OVER POOLS

Electric utilities may not permit open service conductors to be located directly over a pool, hot tub, or spa.

NOTE:

- A structure that will adequately provide a permanent barrier between overhead conductors and the hot tub shall be acceptable as protection from overhead lines crossing above a hot tub and if the structure is metal and within 1.5 m of the hot tub, it shall be bonded to ground.

68-056 – UNDERGROUND WIRING – UTILITY CONDUCTORS UNDER POOLS

Electric utilities may not permit service conductors to be located directly under a pool, hot tub, or spa.

NOTE:

- If locating or relocating a pool, hot tub, or spa, ensure it is not located directly over a Utility gas line. Contact Gas Utility for further information.

Δ 68-058 – POOL BONDING

Pool bonding must be copper and no smaller than #6 AWG. Pool deck rebar must be grounded at least 4 times, equally spaced around the perimeter. If a copper grid is being installed, it must be in a 300 mm by 300 mm network of #6 AWG bare copper that extends at least 1.5 m beyond the perimeter of the pool, buried 100 to 150 mm deep.

Unless accessed from a non-conductive surface and installed on a non-conductive surface, a spa or hot tub requires a minimum #6 AWG bare copper ring installed around its perimeter at a depth of 100 mm to 150 mm, spaced 450 mm to 600 mm from the outer edge of the tub/spa contour. See CEC Appendix B for a list of non-conductive materials.

Δ 68-072 – DISCONNECTING MEANS FOR POOL PUMPS, SPAS, AND HOT TUBS

Permanent outdoor pool pumps, spas, and hot tubs require outdoor, readily accessible disconnecting means that must be lockable when not within sight of the equipment it is a disconnect for. Like all other electrical equipment, the disconnect cannot be within 1.5 m of the inside walls of the pool, spa or hot tub, unless it is behind a permanent barrier preventing contact by a person in the pool, spa or hot tub.

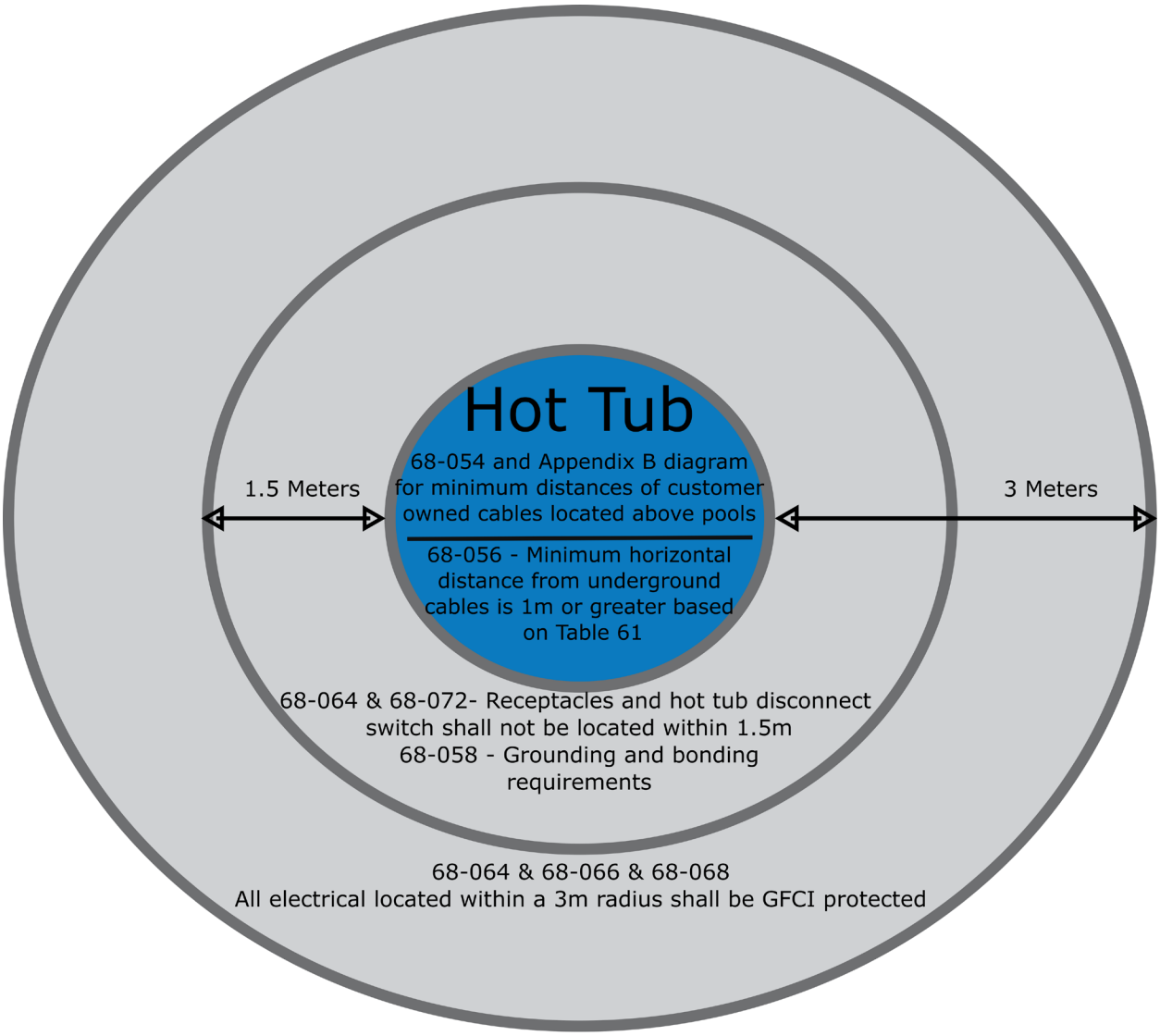
68-308 – OTHER ELECTRICAL EQUIPMENT

No other (unrelated) equipment is to be fed from a circuit feeding a hydro massage bathtub. Access must be provided to all electrical equipment including the pump motor.

See Rule 2-122 - Minimum 400 mm x 400 mm access panel.

SECTION 68 – POOL DIAGRAMS

②



68-068 - The location of field installed GFCI devices associated with these rules shall not be closer than 3m and located so facilitating testing requirements can occur.

68-072 - Disconnecting means shall be readily accessible, located outdoors when the equipment is outdoors, lockable if not in sight of the equipment, and not located within 1.5m of the hot tub.

Contact the utility for their specific requirements, as many do not permit pools to be installed beneath or above their cables.

Figure 68-1

Things you should know before installing a swimming pool

A pool is deemed to include:

- Permanently installed and storable swimming pools;
- Spas, hot tubs;
- Wading Pools, baptismal pools;
- Decorative pools;
- Splash pads.

Permanently installed swimming pool - means a pool constructed in such a manner that it cannot be disassembled for storage.

Storable swimming pool - means a pool constructed in such a manner that it may be readily disassembled for storage and reassembled to its original integrity.

Spa, or hot tub - means a pool or tub designed for the immersion of persons in heated water circulated in a closed system incorporating a filter, heater, pump and with or without a motor-driven blower but not intended to be filled and drained with each use.

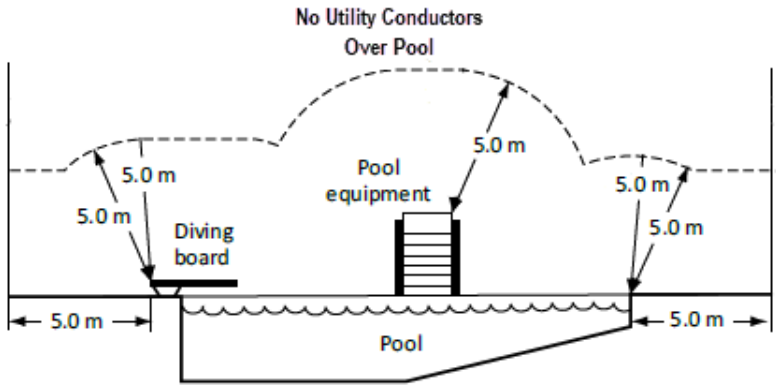
Decorative pool or baptismal pool - means a pool that could be used as a wading pool or the immersion of persons, that is larger than 1.5 m in any dimension, and that is readily accessible to the public.

Overhead wiring (includes overhead telephone, cable TV and power conductors)

Customer owned overhead wiring including insulated communication conductors, communication antenna distribution conductors, and neutral supported cables not exceeding 750 V shall be permitted to be located over a pool, diving structure, slide, observation stand, tower, or platform, providing there is a vertically clearance of 5 m above the pool and/or pool equipment. This also includes the area extending *5* m horizontally from the pool edge, and 5 m measured radially.

Utilities do not permit any service conductors to be located directly over a swimming pool or hot tub.

Utility service conductors not exceeding 750V may be located adjacent to a pool or hot tub provided there is at least 5 m measured radially from the edge of the pool, hot tub, and diving or play structure. 7.5 m for conductors 750V and above. (See figure to the right)



Underground wiring (includes underground telephone, cable TV and power utility service cables)

The horizontal separation between the inside walls of an in-ground pool or splash pad and underground conductors, except for bonding conductors or conductors supplying electrical equipment associated with the pool and protected by a ground fault circuit interrupter, shall not be less than:

Δ

Type of Installation	*Conductors Buried Directly in earth*		*Conductors in non-conducting Ducts*	
Communications conductors	*1.5 m*		*1 m*	
Power Conductors: 0 - 750 V 751 - 15,000 V 15,001 - 28,000 V	*CEC t-61* *1.5 m* *3.0 m* *6.0 m*	*SaskPower t 2-2* *2.0 m* *2.0 m* *6.0 m*	*CEC 68-056* *1.0 m* *2.0 m* *2.0 m*	

Table 68-1

Receptacles (wall plugs)

Receptacles shall not be located within 1.5 m of the inside walls of a pool.

Receptacles located between 1.5 m and 3 m of the inside walls of a pool shall be protected by a ground fault circuit interrupter outside of the 3m distance.

Ground fault circuit interrupters shall not be installed closer than 3m to the pool water unless the ground fault circuit interrupter is an integral part of an approved factory-built spa or hot tub and is located behind a barrier that will prevent the occupant of the tub from contacting the device.

Other electrical equipment (air conditioning equipment, pumps, etc.)

Electrical equipment located within 3 m of the inside walls of the pool and not suitably separated from the pool area by a fence, wall, or other permanent barrier, shall be protected by a ground fault circuit interrupter.

Electrical utility meter

A swimming pool or hot tub shall not be located within 3 m of the electrical utility meter unless it is suitably separated from the pool area by a fence, wall or other permanent barrier that provides no less than 1 m clearance about the electric meter. (Metal poles used for pool servicing can present a shock hazard, to persons working in the pool area, contacting the electric service equipment)

Lighting

Lighting installed below, or within 3 m of the pool surface or walls, and not suitably separated from the pool area by a fence, wall, or other permanent barrier shall be electrically protected by a ground fault circuit interrupter.

Standards or supports for lighting shall not be installed within 3 m of the inside walls of a swimming pool unless a ground fault circuit interrupter protects such lighting.

Bonding to ground

Pool reinforcing steel and the pool shell shall be bonded at four equally spaced points around the pool. All metallic components associated with the pool and metallic fences within 1.5 m of the pool shall be bonded to ground by a copper conductor.

SECTION 70 – ELECTRICAL REQUIREMENTS FOR FACTORY-BUILT RELOCATABLE STRUCTURES AND NON-RELOCATABLE STRUCTURES

Tiny Homes

A Tiny Home is a dwelling unit built on a flatbed trailer designed for the use of a single family and built to be relocated.

Permits will be required for the service connection of Tiny Homes.

Unless approved by a certification agency, these dwelling units shall be wired to the CEC requirements. Permits are required by a licensed electrical contractor for the wiring of a tiny home. RTM labels shall be installed to identify the contractor and permit number under which the tiny home was wired.

Δ Relocatable Structures

Structures, e-houses, modules, shipping-containers (sea can) are not considered “electrical equipment”. Given that, an electrical permit from a Saskatchewan licensed electrical contractor is required for the interconnecting wiring. Also see TSASK Information Paper on the TSASK website.

SECTION 72 – MOBILE HOME AND RECREATIONAL VEHICLE PARKS

72-102(2) – CALCULATED LOAD FOR SERVICE AND FEEDERS

72-102(2), (3), (4), Table 71

Campground service calculation Example A

A campground has 30 sites. 10 of the sites have a pedestal with a 50 A, 240 V receptacle and a 30 A, 120 V receptacle. 20 of the sites have a pedestal with a 30 A, 120 V receptacle and a 20 A, 120 V receptacle. Panel A is protected by a 100 A breaker (rated at 80%) and serves the shower building. Panelboard B is protected by a 100 A breaker (rated at 100%) and serves site lighting, etc.
What size 120/240 V service is required?

Panelboard 'A' =	[(100 A x 240 V) x .80]	=	19,200 watts
Panelboard 'B' =	[(100 A x 240 V) x 1]	=	24,000 watts
1-9th sites at 50A =	9 x 12,000	=	108,000 watts
10th site at 50A =	[(1 x 12,000) x .80]	=	9,600 watts
11th - 15th sites at 30A =	[(5 x 3,600) x .90]	=	16,200 watts
16th - 30th sites at 30A =	[(15 x 3,600) x .80]	=	43,200 watts
	Total watts	=	220,200 watts
	220,200 ÷ 240 V	=	917.5 Amps

This campground would require a 1200 Amp 120/240V service with an 80% rated main breaker.

72-102(2), (3), (4), Table 71

Campground service calculation Example B

A campground has 40 sites. 14 of the sites have a pedestal with a 50A, 208V single phase receptacle and a 30A, 120V receptacle. 17 of the sites have a pedestal with a 30A, 120V receptacle and a 20A, 120V receptacle. 9 of the sites have a 20A, 120V receptacle. Panel A is a 120/208V single phase panelboard with a 60A breaker (rated at 80%) and serves the shower building. Panel B is a 120/208V 3 phase panelboard protected by a 150A breaker (rated at 100%) and serves the site lighting etc.
What size 120/208V service is required?

Panelboard 'A' =	[(60 A x 208 V) x .80]	=	9,984 watts
Panelboard 'B' =	[(150 A X 208 V X 1.73) X 1]	=	53,976 watts
1-9th sites at 50A =	9 x 12,000	=	108,000 watts
10th - 14th sites at 50A =	[(5 x 12,000) x .80]	=	48,000 watts
15th site at 30A =	[(1 x 3,600) x .90]	=	3,240 watts
16th – 31st sites at 30A =	[(16 x 3600) x .80]	=	46,080 watts
32nd – 35th sites at 20A =	[(4 x 2,400) x .80]	=	7,680 watts
36th – 40th sites at 20A =	[(5 x 2,400) x .75]	=	9,000 watts
	Total Watts	=	285,960 watts
	285,960 ÷ (208 V x 1.73)	=	794.69Amps

This campground will require a 1000 Amp 120/208 V 3 phase service with an 80% rated main breaker.

SECTION 76 – TEMPORARY WIRING

76-006 – SERVICE ENTRANCE EQUIPMENT

When located in an outdoor location, these services must be of weather-proof construction.

If a temporary free-standing service persists beyond 12 months, it shall conform to the rules of 2-300 in these Interpretations.

76-016 – RECEPTACLES

All temporary service receptacles of 5-15R and 5-20R are to be ground fault protected. In use ‘extra duty’ covers will not be required on temporary construction services.

Receptacles installed in a building under construction that are part of the permanent wiring system will not require ground fault protection.

SECTION 78 – MARINE WHARVES, DOCKING FACILITIES, FIXED & FLOATING PIERS AND BOATHOUSES

78-050 – RECEPTACLES

Receptacles for use on fixed or floating piers, docking facilities, marine wharves or boat houses shall be GFCI protected and mounted above the permanent or maximum normal water level to avoid immersion.

78-052 – BRANCH CIRCUITS AND FEEDERS

GFCI protection shall be provided to de-energize all normally ungrounded conductors for distribution equipment in or on fixed or floating piers, docking facilities, marine wharves, or boat houses with a setting sufficient to allow normal operation of the equipment but in no case greater than 30 mA.

SECTION 84 – INTERCONNECTION OF ELECTRIC POWER PRODUCTION SOURCES

84-000 – SCOPE – PORTABLE GENERATORS

As with all electrical equipment, portable generators and associated equipment must be approved and carry the mark of a recognized certification agency. Although recommended in the manuals of many power take-off generators, welding cable is not an approved wiring method and will not be accepted. Recessed male receptacles shall be used as an interface to the generator. Anderson Plugs shall be permitted when installed in a junction box. Wiring methods to the interface receptacle shall meet the requirements of Section 12 for permanently installed equipment.

Generators and associated equipment, i.e., transfer switches, load bank, etc. must be installed by a licensed electrical contractor and the appropriate permit must be submitted. See 2-014.

See Appendix M for diagrams to show typical residential and farm generator installation configurations. For other installation configurations contact a licensed electrical contractor or Electrical Inspections.

Δ **Caution** – owners shall ensure that generators being interconnected with renewable systems are compatible, and administrative controls (e.g. labelling) installed as required.

84-002 – GENERAL REQUIREMENT

A closed transition transfer switch requires a Utility Interconnection Agreement before this equipment can be put into service. Please contact the utility to complete this agreement.

84-020 – DISCONNECTING MEANS – ELECTRIC POWER PRODUCTION

For interconnection of renewable energy sources, more than one disconnect may be permitted in a multiple metered unit provided they are grouped at one location.

84-022 – DISCONNECTING MEANS – SUPPLY AUTHORITY SYSTEM

The utility disconnect shall provide a single point of disconnect for the supply authority for all electric power production sources on a property.

Confirmation of acceptance is required during the interconnection agreement process. Please contact the engineering department of the respective utility prior to installation.

84-024 – DISCONNECTING MEANS – GENERAL (see Appendix M)

1 c) Have contact operation verifiable by direct visual means if required by the supply authority.

1 d) Have provision for being locked in the open position.

84-030 – WARNING NOTICE AND DIAGRAM (see Appendix M)

A single line, permanent, legible diagram of the interconnected system shall be installed in a conspicuous place at the supply authority disconnecting means and supply authority meter location.

This diagram should show the physical location of the interconnected sources, the interlocks between the switching equipment and isolation points (utility disconnect) so that personnel are able to isolate the Section being serviced. Location of the disconnect shall be approved by the supply authority and a letter of acceptance should be provided upon submission of plans for review.

See Figure B64-4 in Appendix B and Rule 64-002 Figure 64-1 for an illustration of an interconnected photovoltaic system.

② SECTION 86 – ELECTRIC VEHICLE CHARGING SYSTEMS

86-302 Connected Load

The total connected load of a branch circuit supplying electric vehicle supply equipment and the ventilation equipment permitted by 86-300 shall be considered continuous for the purpose of 8-104.

86-306 Receptacles for electric vehicle supply equipment (see Appendix B)

1) Each receptacle for the purpose of electric vehicle charging shall be labelled in a conspicuous, legible, and permanent manner, identifying it as an electric vehicle supply equipment receptacle and shall be

a) a single receptacle of CSA configuration 5-20R supplied from a 125 V branch circuit rated not less than 20 A; or

b) of the appropriate CSA configuration in accordance with Diagram 1 or 2 when supplied from a branch circuit rated at more than 125 V or more than 20 A, and capable of safely handling the continuous load as per 86-302.

2) When the receptacle referred to in Subrule 1) a) is installed outdoors and within 2.5 m of finished grade, it shall be protected with a ground fault circuit interrupter of the Class A type.

Appendix B - Rule 86-306 (1)(b)

Receptacles marked as range or dryer receptacles have been failing to handle this continuous load. EV marked receptacles shall be used for EV supply equipment.

2-035 – OIL AND GAS FIELD INSTALLATIONS

② Installations for oil and gas fields shall comply with Section 19, *Code for Electrical Installations at Oil and Gas Facilities, Sixth Edition, 2024*, as published and distributed by TSASK. It is available on our website at www.tsask.ca.

MINING INSTALLATIONS

STANDARDS APPLICATIONS

Canadian Electrical Code, Part 1 C22.1 - Safety Standards for Electrical Installations

The electrical works, facilities and plant that are on surface and are used for housing, maintenance, and processing of extracted minerals.

M421 - Use of Electricity in Mines

Supplemental to the requirements of C22.1, including the electrical works, facilities and plant that are both underground and on surface that are used in the extraction of minerals.

The Electrical Licensing Act, 1993 -c.E-7.2 s.8(1), 23(1)(2)(3)

APPROVED ELECTRICAL EQUIPMENT

- C22.1-15 2-024 - Use of Approved Equipment,
- M421 4.1.2 - Application,
- *The Electrical Inspection Act, 1993* - c.E-6.3 s.18(1)(2) - Equipment Approval

All surface and sub-surface electrical equipment requires an overall approval from a Saskatchewan recognized Certification Body prior to being electrically connected or reconnected and must bear evidence of the approval or certification. See 2-024.

2-012 – NOTIFICATION OF INSPECTION

Applies to owner's new installations of cables and/or equipment, installed by employees or contractors. See 2-012.

2-014 – PLANS AND SPECIFICATIONS

Applies to owner's new installations of cables and/or equipment, installed by employees or contractors. See 2-014.

12-402 – USE OF FLEXIBLE CORD

(3) Flexible cord shall not be used (a) as a substitute for fixed wiring (i) permanently secured to any structural member. See also M421-11. 6.2.1.1.

36-006 – WARNING NOTICE

(1) Permanent warning notice shall be placed (b) on all high voltage cables at points of access (d) on all exposed portions of all high voltage cables at a spacing not to exceed 10 m.

Δ M421-23 4.2.1.2 MINE PLANS

Plans and diagrams shall be reviewed and updated every 4 months, and shall be posted at each power skid, electrical room, substation, load break / switch, and distribution location.

M421-23 4.3.3.4 IDENTIFICATION OF PORTABLE POWER CABLES

Each cable assembly operating at a voltage above 300 V shall be labeled:

- At the distribution & source end of the cable;
- Where the cable terminates or which equipment the cable is connected to in the field; and
- At the equipment end of the cable – the overcurrent device location for the cable and its source location.

M421-23 6.3.1 CONDUCTORS

Cable supports shall have a safety factor of 5.

APPENDIX E – DUST FREE ROOMS

See rules for Appendix J for Class II and Class III Hazardous Locations and Rule 18-008, Zones 20, 21, 22 Hazardous areas for Grain Handling. Grain Elevators, Seed Cleaning Plants and Feed Mills.

NOTE: This Appendix is an informative (non-mandatory) part of this Standard.

E1 – INTRODUCTION

This Appendix covers recommended practices for the housing of electrical equipment. With respect to actual constructional requirements, it is not practical to cover all materials and methods that are or may become available and, therefore, any specific details mentioned in this Appendix are to be considered examples rather than specific requirements. The *National Building Code of Canada* or any other building code that may be in force in any particular locality should take precedence over this Appendix and should be consulted in this respect.

E2 – SCOPE

This Appendix applies to the construction of dust-free rooms built adjacent to or as part of buildings that, by the nature of their use or occupancy, are subject to accumulations of dusts that may create a fire or explosion hazard or that may be detrimental to the proper operation of electrical equipment not provided with dust-tight enclosures.

E3 – DEFINITION

The following definition applies in this Appendix:

Dust-free room — a room, building, or other area, of a size that permits the entrance of persons for operation and maintenance purposes and constructed so that the quantity of dust that can enter will not create a hazardous condition.

E4 – USE

E4.1
Dust-free rooms are intended to be used to house electrical equipment except equipment required by the latest edition of the CEC to be installed in vaults.

E4.2
Dust-free rooms should not be used for any manufacturing, processing, maintenance, storage, or other purposes except those that may be essential for the proper operation and maintenance of the electrical equipment that they house.

E5 – ENCLOSING OF ELECTRICAL EQUIPMENT

E5.1
Electrical equipment in dust-free rooms need not be of types approved for Class II locations.

E5.2
Where access to the dust-free room by unauthorized persons is permitted, the electrical equipment should be enclosed, guarded, protected, etc. as required by the latest edition of the CEC for ordinary locations.

E5.3

Where access is to unauthorized persons only, enclosures may be omitted as provided for by the latest edition of the CEC. (E.g., Section 26).

E6 – MATERIALS AND METHODS OF CONSTRUCTION

Materials used for the construction of dust-free rooms and the method of construction should fulfill the following conditions:

f) the enclosure of the room should be as impervious to the passage of dust from outside the room as is practicable;

g) the various components, walls, floors, ceilings, etc. should be capable of safely supporting the live and dead loads (including impact) to which they are liable to be subjected;

h) there should be no likelihood that dust passages will be created due to shrinkage, breaking, or cracking;

i) the completed structure should have a fire resistance rating of 1 h or better;

j) in buildings constructed of non-combustible materials, the rooms should also be constructed of non-combustible material, but in other buildings, the rooms may be constructed of combustible materials with non-combustible facing on at least the inner surfaces; and

k) if it is necessary that shafts or other rotating or sliding members be used to connect equipment outside the room with that inside, suitable means such as seals, gaskets, baffles, etc. should be provided to prevent passage of dust through the necessary openings.

E7 – FLOORS

Some acceptable floor constructions are as follows:

a) solid concrete slab of minimum thickness 75 mm and reinforced as necessary; or

b) steel joists with welded plate metal floor or concrete slabs of minimum thickness 50 mm over the joists and 22 mm Portland cement plaster on metal lath under them.

Wherever necessary, floors should be surfaced with insulating material to prevent shock hazard.

E8 – WALLS

Some acceptable wall constructions are as follows, and it is to be noted that lath and plaster on both sides must have other construction built into the wall to ensure continuance of the dust-free features, and plywood joints must be backed by studding:

a) monolithic concrete of minimum thickness 100 mm reinforced as necessary;

b) built-up masonry consisting of
   i) solid bricks of minimum thickness 95 mm;
   ii) hollow tile of minimum thickness 75 mm if plastered both sides, and 150 mm if not plastered; or
   iii) hollow concrete or cinder concrete block of minimum thickness 125 mm if plastered both sides, and 200 mm if not plastered; or

c) stud construction of 50 mm if of metal or 100 mm if of wood, faced on the outside with metal or perforated gypsum lath with 19 mm gypsum or 22 mm Portland cement plaster, faced on the inside with
   i) metal-faced laminated wood;
   ii) laminated wood with 19 mm gypsum or 22 mm Portland cement plaster on metal or perforated gypsum lath;
   iii) laminated wood with fire-resisting non-metallic facing; or

iv) sheet metal equivalent to 1.69 mm (No. 14 MSG) steel with welded or riveted locked-seam joints secured to metal studs by welding or by self-locking screws.

E9 – CEILINGS

Ceilings, if load bearing, should have the same construction as floors, but if non-load bearing, may be constructed similarly to walls with wood joists, if used, of greater depth in accordance with the span.

E10 – CUBICLE CONSTRUCTION

E10.1

Where the room is constructed as a free-standing cubicle with walls and ceiling not forming a part of and spaced away from the structure of the building proper, the walls and ceiling may be of sheet steel not less than 1.69 mm (No. 14 MSG) thick, suitably joined and reinforced as may be necessary.

E10.2

If the floor is elevated above the floor of the building proper, it may be constructed in accordance with Clause E7 and the plaster may be omitted.

E11 – DOORS

E11.1

Doors giving access to the room from dusty locations should be

l) either metal-clad or hollow metal and weather-stripped or otherwise arranged to prevent dust leakage at the edges of frames and sills; and

m) equipped with self-closers.

E11.2

If operation of the electrical equipment requires entry to the room from dusty locations, two hinged doors with a 1.5 m vestibule between them should be provided, but where entry is necessary for maintenance only, single doors may be used.

E11.3

Doors giving access to the room from a dust-free atmosphere may be of ordinary types.

E11.4

If more than one point of access to a room is provided, all but the principal one should be either securely locked or other adequate means should be used to prevent unauthorized traffic through the room.

E11.5

All doors should be provided with means whereby they can be readily unlocked and opened from the inside without the use of a removable key.

E12 – WINDOWS

E12.1

Windows facing dusty locations should have a fixed metal sash and wired glass.

E12.2

Windows in exterior walls may be arranged for opening if it is reasonably certain that the surrounding exterior area will remain sufficiently dust-free.

E13 – VENTILATION

E13.1

Ventilation by clean air should be adequate for the dissipation of heat from the electrical apparatus installed.

E13.2

If ventilation is by means of forced air circulation, the air should be forced into the room rather than exhausted out of it.

E13.3

It is recommended that the air in the room be kept at a pressure slightly above atmospheric, which will tend to blow any dust out of the room rather than have it sucked in.

E13.4

The amount of ventilating air required is difficult to specify in an empirical value because it depends on

n) the size of the room;

o) the dissipating ability of walls and ceilings;

p) the amount and nature of the electrical equipment; and

q) the temperature of the incoming air.

E13.5

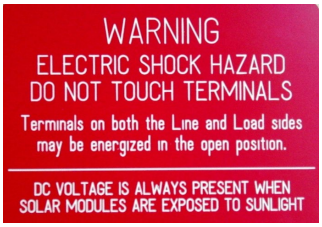
The cooling effect may be obtained by radiation alone (it the area is sufficient), by ventilation alone, or by a combination of both.

APPENDIX M – RENEWABLES MARKING, WARNING NOTICES AND DIAGRAMS

② **A warning sign for a photovoltaic system shall be legible, white letters on a red background. The word "WARNING" must be a minimum height of 9.5mm.**

64-060(1)(h) – DISCONNECTING MEANS

- All AC disconnects with 2 sources of power.







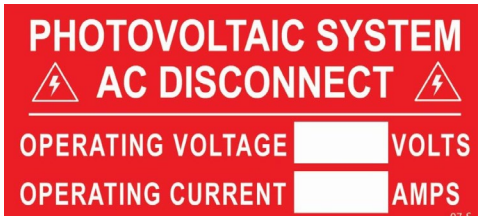
64-068(1)(b) – UNGROUNDED RENEWABLE ENERGY POWER SYSTEMS

- Ungrounded DC circuits.



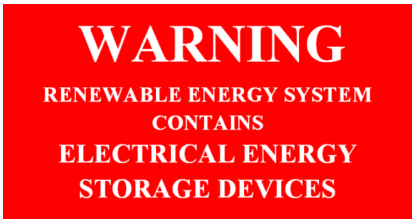
64-074(1) – MARKING

- For each interconnecting AC power source.



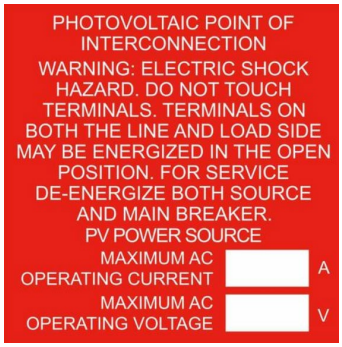
64-076(3) – WARNING NOTICE AND DIAGRAM

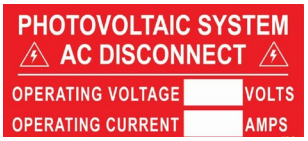
- For energy storage systems.



64-112(4)(c) – INTERACTIVE POINT OF CONNECTION

- PV input breaker in electrical panelboard.

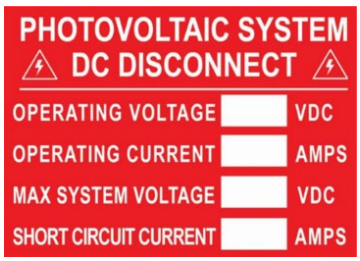






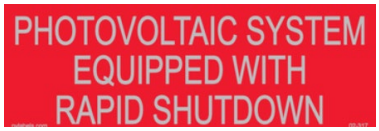
64-200(1) – MARKING

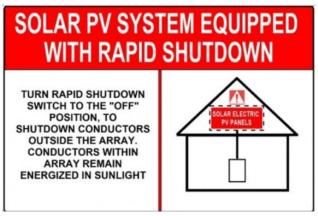
- String inverters - DC Disconnect.



64-200(2) – MARKING

- When rapid shutdown is installed labelling at the DC disconnect is required.







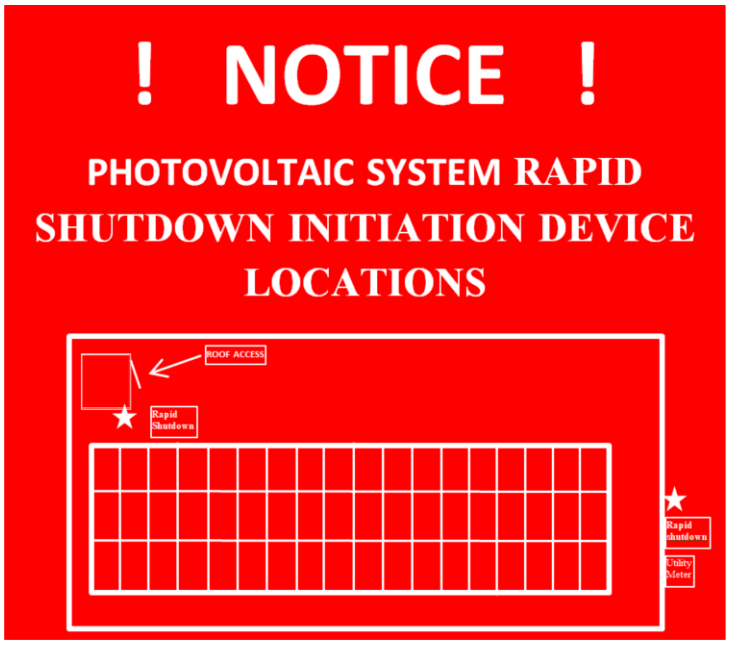
64-202(5)(c) – VOLTAGE OF SOLAR PHOTOVOLTAIC SYSTEMS

- For all DC circuits over 750 VDC.



64-218(6) – PHOTOVOLTAIC RAPID SHUTDOWN

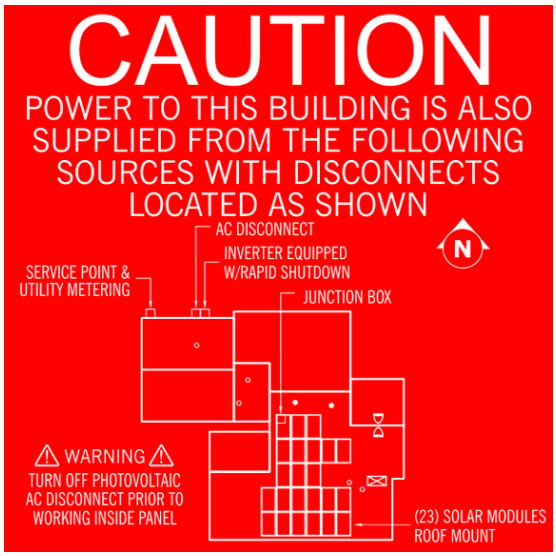
- Rapid shutdown initiation device shall be shown on the diagram of 84-030(2).



64-218(7) – PHOTOVOLTAIC RAPID SHUTDOWN

- Placards shall be located at the supply authority meter location and the consumer's service equipment location.

The location of these placards (or additional placards) on buildings without exterior metering may require discussion with the local fire department (e.g., near the gas meters, water standpipe, service splitter, fire annunciation panel).





84-030(1) – WARNING NOTICE AND DIAGRAM

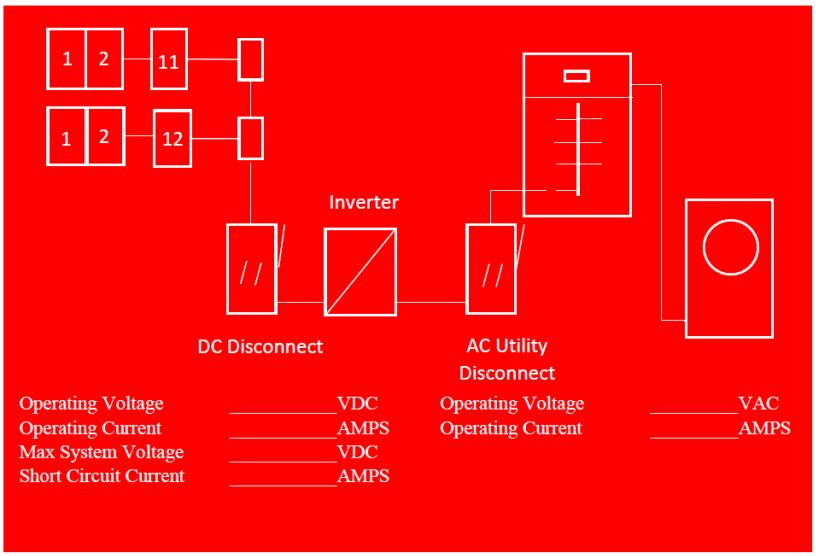
- Utility disconnect and interconnected system information at the utility disconnect and meter location.





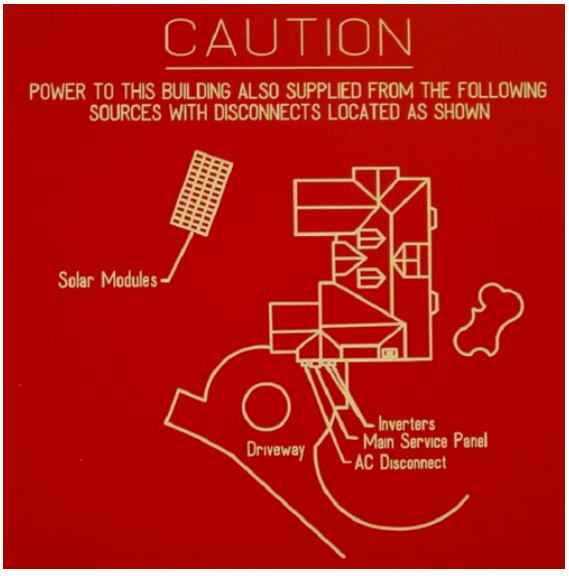
84-030(2) – WARNING NOTICE AND DIAGRAM

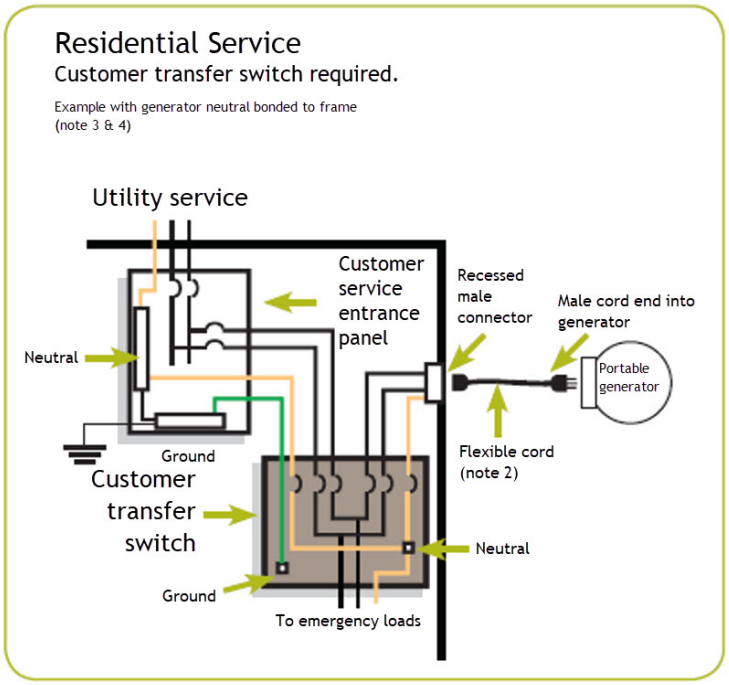
- Single-line, permanent, legible drawing of the interconnected system, and equipment locations.

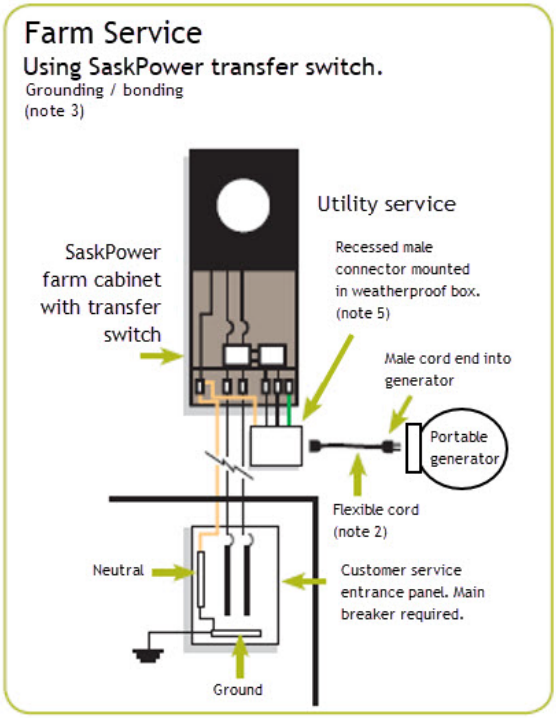


- Shall be installed at the utility disconnect and meter location.



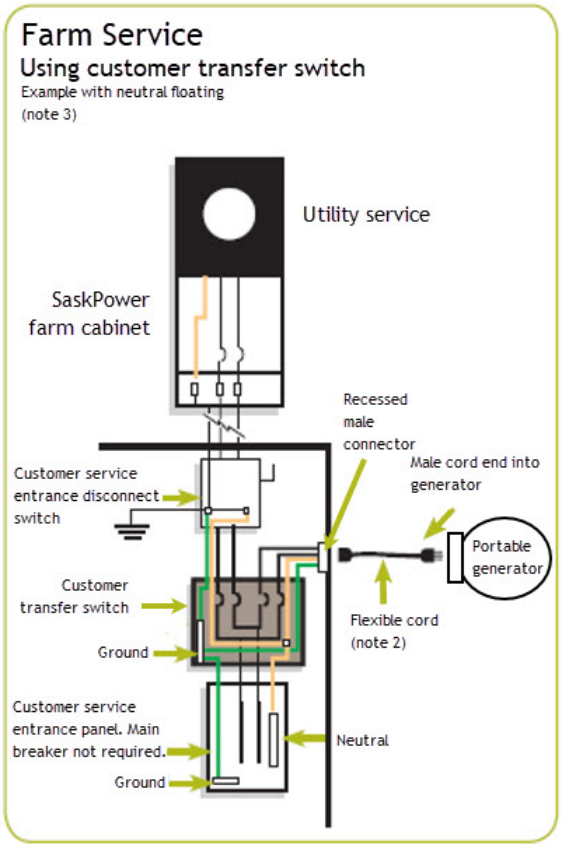






NOTES:

1. Rewiring or tampering with a generator unit voids CSA certification.
2. Conductors must be sized to match the maximum output of the generator.
3. Follow generator manufacturer's installation, grounding, and operation instructions.
4. A transfer switch must be capable of switching the neutral when the generator neutral is bonded to the frame.
5. Permission is required from your local **SaskPower District Office** to install this recessed male connector on a transformer pole.
6. A portable electric power plant that is operated at voltages exceeding 240 volts to ground or is rated in excess of 12.0 kW shall be grounded as per Section 10 of the current CEC.



PORTABLE ELECTRIC POWER PLANTS (AS PER OH&S REGULATIONS 1996)

460(1) An employer, contractor or supplier shall ensure that:

(a) a portable electric power plant that is operated at voltages exceeding 240 volts to ground or is rated in excess of 12.0 kilovolt-amperes is connected to ground in a manner approved pursuant to *The Electrical Inspection Act, 1993*; and

(b) all electrical equipment connected to an ungrounded portable electric power plant:

(i) is of the double insulated type; and

(ii) is clearly marked as being of the double insulated type or is supplied from a Class A type ground fault interrupting device.

Annex B: Request for an amendment to the rules

TO: The Electrical Code Coordinator for the Saskatchewan Electrical Interpretations

FROM:

AFFILIATION:

DATE:

RE: Request for an amendment to Rule(s)

Request (Specifically Worded):

Reason for Request:

Supporting Information:

For office use only:

Subject No. Assigned:
Completed form to be sent to: Saskatchewan Interpretations Code Coordinator – geis@tsask.ca
Submitter:

NOTES:

APPENDIX OF AMENDMENTS:

Δ March 01, 2025:

2024 CEC Changes:

1. Page 19 (2-014 – Plans and specifications – submission requirements): Added arc fault awareness/mitigation documentation.
2. Page 27 (2-034 – Application of code requirements & Farm service centers): Added note clarifying that electrical equipment not covered by the CEC cannot be used to satisfy CEC code requirements. IE. Utility breakers as overcurrent or disconnecting means. Also added specific wording pertaining to farm service centers.
3. Pages 44 & 45 (8-102 – Voltage drop): Added new description and calculation for voltage drop as per new changes in 2024 CEC.
4. Page 46 (8-106 – Use of demand factors – EV supply equipment demand factors): Note referencing "Table 38 – Electric vehicle supply equipment demand factors" has been removed as per 2024 CEC.
5. Page 57 (10-700 – Bonding CSST & 10-702 – Equipotential bonding installation): Added notes reflecting requirement of 2024 CEC.
6. Page 58 (12-012(2) – Conductor depth): Added note which clarifies depth required when utilizing Table 53 and the D Tables, as per 2024 CEC.
7. Page 59 (12-116 & 12-406 – Fine strand conductors): Added notes as per changes in 2024 CEC.
8. Page 60 (12-318 – Overhead installations & 12-608 – Continuity of armoured cables): Added requirements as per 2024 CEC for overhead installation support and sag. Note returned to Interpretations as 2024 CEC strengthened requirement for mechanical and electrical continuity.
9. Page 71 (18-104, 18-154 – Sealing Zone 1 & 2): Figure 18-4, 18-5 and Legend amended to improve quality as well as reflect the changes to 18-104 & 18-154 of 2024 CEC.
10. Page 72 (Flammable fluid migration seals re: 18-104 & 18-154): Amended note to reflect changes to 18-104 & 18-154 of 2024 CEC.
11. Page 74 (Hazardous location sealing – gas pumps): Added Figure 20-3 to clarify 2024 CEC rule change (20-004(11)) allowing non-metallic conduit under Zone 1 and Zone 2 locations.
12. Page 80 (24-104 – Circuits in basic care areas & 24-108 – Receptacles in basic care areas): Added notes reflecting requirement of 2024 CEC.
13. Page 88 (26-724 – Outdoor and garage receptacles for single dwellings – Outdoor receptacles): Added note reflecting requirement of 2024 CEC, including Figure 26-2 for visual representation.
14. Page 95 (62-132 Heating devices in proximity to sinks, tubs or shower stalls): Added reference to B62-0 as new figure in 2024 CEC.
15. Page 97 (64-060 – Disconnecting means): Amended note to reflect 2024 CEC rule numbers.
16. Page 99 to 102 (64-112 – Interactive point of connection – Inverters): Figures 64-4, 64-6, 64-7, and 64-8 amended to reflect 2024 CEC changes from "bus rating" to "equipment rating" including max renewable energy allowed.
17. Page 106 (64-926 – Separation from building exposures and egress from buildings, 64-1000 – Energy storage systems utilizing batteries, 64-1002 – Installation requirements of energy storage systems, & 64-1100 – Location and separation of energy storage systems at residential occupancies): Added notes regarding each rule to reflect requirements of 2024 CEC.
18. Page 107 (68-058 – Pool bonding): Added note to reflect requirements of 2024 CEC.
19. Page 108 (68-072 – Disconnecting means for pool pumps, spas, and hot tubs): Added note to reflect requirements of 2024 CEC

Non-CEC-related amendments:

1. Page 2 (Preface and Scope): Change from colored deltas to numbers to mark changes in subsequent changes.
    - Easier to identify changes and their timeline of implementation.

2. Page 2 (Investigation of accident): Changed after-hours procedure from “call Chief Electrical Inspector” to complete “Report and Incident” form via TSASK website.
3. Page 13 (Website Information): Added link to 2024 Saskatchewan Interpretations.
4. Page 15 (2-004 – Permit – Commencement of work): Note was re-added.
    - Re-added because it contained information not found on website.
5. Page 16 (2-004 – Permits for low voltage, etc): Added note 1) regarding permit required for replacement of switches and receptacles when connecting to existing aluminum wiring.
    - Department decision to require a permit, allowing for inspection as required.
6. Page 17 (2-012 – Inspection request required) Added wording to include all service types as “required for pre-energization inspection” including slight break-down for emphasis. Also added “Generator systems over 12kw” to the mandatory pre-energization inspection list.
    - Department decision to require pre-energization on these installations.
7. Page 18 (2-014 – Plans and specifications): Added note regarding sending plans not required for scope of work.
    - Department decision to advise plans submitters that submitting plans that are not related to the scope of electrical work (Elevation plans, structural steel plans, etc.) will cause delays in review of those plans.
8. Page 20 (2-014 – Plans and specifications – submission requirements): Added the plans requirement “Pump type and/or location” for irrigation system plans. Added requirement for plans to be submitted online via plans submission portal, including link.
    - Department decision to require pump type for inspection facilitation.
    - Online submission for plans via plans portal came into effect late 2024.
9. Page 22 (2-022 – Renovation of existing installations): added time component on remedy of permit taken to connect or reconnect installations. Added link and reference to 84-002.
    - 84-002 identifies the need to ensure proper connection of transfer switches.
    - Department requires remedy of permit to current code within 30 days of permit being taken.
10. Page 22 (2-022 – Flood Procedures): Updates to Flood Procedures.
    - In the interest of consistency and safety, the department has strengthened requirements for installations exposed to flood, fire, lightning strike, and non-disaster-related renovations.
11. Page 23 (2-022 – Electrical Systems Exposed to Fire, Lightning Strike, & Renovations Excluding Flood or Fire): Updates to Fire, Lightning strike and Non-fire/flood renovations.
    - In the interest of consistency and safety, the department has strengthened requirements for installations exposed to flood, fire, lightning strike, and non-disaster-related renovations.
12. Page 27 (2-100 – Marking of equipment): Added note clarifying requirements of labelling for oilfield and irrigation sites.
    - Required for Inspection assistance as well as electrical safety.
13. Pages 31-34 (D Tables quick references): Removed “Notes” from each table.
    - The previous notes did not add relevant clarification or information and were not necessary.
14. Page 35 (4-004 – Ampacity of wires and cables): Note has been removed.
    - Note had referenced removal of Table 39 which occurred in 2021, full removal of note, as Table 39 should no longer be in any service discussions
15. Page 38 (6-200 – Service equipment – inspection): Added the requirement for mandatory service pre-energization inspections, as well as the requirement of a picture of meter socket with permit written (legible in picture) in back of tub before energization of any service.
    - Department requirement that will ensure safety of all services, as well as no interruptions for customers.
16. Page 43 (6-408(1)(f) – Location of meters): Re-added note on location of meters in proximity to vents (furnace, dryer, etc.) including Figure 6-3
    - Departmental effort to attempt to support coordination of trades.
17. Page 48 (10-102 – Grounding electrodes): Tag example Figure 10-1 amended to current tag in use.
    - Previous interpretations had incorrect tag on display.
18. Page 49 (10-208(1)(a) – Conductor of an AC system to be grounded – Farm services & 10-208(1)(e) –

Conductor of an AC system to be grounded – High-leg delta services): Added a note to clarify grounding expectations at farm services. Added a note to assist (clarify) high-leg delta services.
- Department decision to clarify grounding of farm services to ensure safety.
- As these are rare but still a possibility, a note was added to highlight some of the pertinent codes required while building these installations.

19. Page 52 (NSC overhead supply figure 10-4): Note amended to include "Follow manufacturers' instructions regarding system bonding connection".
    - Required to allow adapting to the requirements for system bonding as required by specific manufacturers to meet their equipment certification requirements.
20. Page 59 (12-200 – Open wiring rules): Amended rule number from 12-206 to 12-200.
    - Changed rule to reflect broader scope required of open wiring.
21. Page 61 (12-910(4) – Conductors and cables in conduit and tubing): rewritten note and updated tables.
    - Note was rewritten to shorten and clarify Tables. Tables were reviewed and amended to match 2024 CEC.
22. Page 63 (14-100(2) – Loading cables): Note was removed.
    - Note was removed to eliminate improper interpretation of 14-100.
23. Page 65 (18-002 – Special terminology): Updated definitions for Explosion Seal and Flammable Fluid Migration Seal.
    - Amended to reflect definitions in CEC.
24. Page 66 (18-008 – Locations containing an explosive dust atmosphere; woodworking facilities): Major overhaul of note regarding woodworking facilities.
    - Provides clarity on the requirements for classification, reclassification, definition of adequate housekeeping, and possible relaxations.
25. Page 79: (Section 24 – Definitions): Updated definitions of healthcare facilities.
    - Previous definitions had no bearing on electrical, changes definitions to more electrically relevant definitions.
26. Page 92: (34-000 – Scope – Signs and outline lighting): Amended wording around multi letter signs and their labelling.
    - Provides clarity for multi-sign labelling visible from ground.
27. Page 93: (36-004 – Guarding): Replaced Table 36-1.
    - Replaced to reflect current Saskatchewan OH&S Regulations (2020) requirements.
28. Page 95: (62-200 – Electric space heating): Added note to utilize manufacturer's instructions.
    - Manufacturer's instructions should always be followed to achieve device safety.
29. Page 112 (Section 68 – Pool Diagrams): Replaced Table 68-1
    - Replaced to reflect revised SaskPower table clearances.
30. Page 113 (Section 70 – Electrical requirements for factory-built relocatable structures and non-relocatable structures; Relocatable Structures): Added note requiring electrical permit for interconnecting wiring.
    - Department decision to require permit and option for inspection.
31. Page 117 (84-000– Portable Generators, scope): Added caution note regarding ensuring compatibility.
    - Added to ensure safety/security of customers and utility.
32. Page 122 (Mining installations): Updates mines code reference to 2023 version.
33. Last page: Added Metric to imperial conversion chart.
    - Chart covers all metric references within this publication, and approximate imperial conversions thereof.

② **v2.0** - September 01, 2025:

2024 CEC Changes:

1. Page 30 (2-306 – Shock and arc flash protection): Added documentation and appropriate labelling required for Incident Energy Analysis as per Z462. – Delta omission only in v1.0.

Non-CEC-related amendments:

1. Page 13 (Website information): Added City of Saskatoon and City of Swift Current Light & Power contact links. – Added information for easy customer access.
2. Page 13 (Website Information): Removed note on "Bond Notice and Administration Fees". – Department decision to remove, as this information is in the Fee Schedule.
3. Page 15 (2-004 – Permit): Amended Supplemental permit submission time to 1 year from 3. – Amended to reflect how the GEIS system actually works regarding Supplemental Permits.
4. Page 18 (2-014 – Plans & Specifications): Added note indicating the potential for additional costs if submitting incomplete or excessive plans. – puts company policy into print.
5. Page 18 (2-014 – Plans & Specifications): Added note informing that plans review is valid only for the code in effect at the time. – states the requirement for a deviation if the CEC during plans review does not meet the CEC requirements at the time of inspection.
6. Page 18 (2-014 – Plans & Specifications): Added "healthcare" 1)c). – Aligns the medical facility plans requirements with the 2-012 – Inspection Request Required interpretation language.
7. Page 19 (2-014 – Plans & Specifications): Added to requirement 2)6.2); requirement of fall of potential test when frozen test data is not supplied – increases safety.
8. Page 20 (2-014 – Plans & Specifications): Removed duplicate note regarding submission of excess plans. – housekeeping, was the same note at the start of the heading.
9. Page 21 (2-014 – Plans & Specifications): added Note 13 which ensures wiring between utility supply and customer renewable connection point is not a safety hazard. – Department decision ensuring customer safety.
10. Page 21 (2-022 – Renovation of existing installations): Added reference to 2-012 and 6-200 highlighting mandatory inspection/contact with Inspector prior to energization. – Safer inspections.
11. Page 27 (2-100(3) – Marking of Equipment): added Interpretation of subrule 3) specifically regarding VFD's, associated cables, and information documentation. – Departmental decision requiring documentation to be available which informs that VFD's and their associated cables are protected properly when motors are sized differently than expected.
12. Page 40 (6-206(3)) – Service Disconnect): clarified expectations on sites fed from f-cabinets, specifically service disconnect requirements. – Department attempt to ensure uniformity.
13. Page 72 (18-152 & 18-252 – Wiring methods in Zone 2 & Zone 22): Added requirement for HD-LT Flex to utilize Heavy Duty connectors. – Department has found that there are HD connectors for LT Flex and regular connectors. If HD-LT Flex is used, it must be terminated with HD connectors.
14. Page 100 (64-112 – Interactive Point of Connection to Inverters): Amended notes on Diagrams adding reference to 8-104(6) clarifying why interactive point breakers have the max loading that is displayed.
15. Pages 99 to 102 (64-112 – Interactive Point of Connection to Inverters): Amended Figures 64-4, 64-5, 64-6, 64-7, 64-8 and added Figure 64-9, and Table 64-1. - clarify change made to 2024 CEC regarding protection of equipment and cables.
16. Page 109 (Section 68 – Pool Diagrams): New main Diagram. – Changed to improve image quality as well as clarify requirements of disconnect and GFCI protection.
17. Page 119 (Section 86 – Electric Vehicle Charging Systems): Added interpretations on the section, specifically regarding EV charging equipment receptacle. -Requirement for use of a receptacle of appropriate construction, as the use of inferior receptacles has become a hazard.
18. Page 120 (2-035 – Oil and Gas Field Installations): Update Oil & Gas Code reference to 6th Edition (2024). – Change made, as that is the most current version.
19. Page 127 (Appendix M – Renewables Marking, Warning Notices, and Diagrams): amended note regarding size of signs. – Clarified 9.5mm is the requirement for the word "Warning" only.

③ **V3.0** – October 31, 2026:

2024 CEC Changes:

none

Non-CEC-related amendments:

1. Page 13 (Website information): Removed links to specific documents on websites. – Removed to avoid broken links when documents are changed or removed.
2. Page 16 (2-004 – Permits for low voltage and extra low voltage installations): Amended. – Removed reference to specific brands of lighting to avoid promotion or shaming. Added multiple names that reflect what these installations may be sold as to consumers.
3. Pages 18-20 (2-014 – Plans and specifications): Housekeeping of document. – Revamped bullet numbering so it was a consistent format and therefore (hopefully) easier to follow.
4. Page 18 (2-014 – Plans and specifications): Added EV charging 200 amps and over as installations required for mandatory plans(and load calculation) review. – Added as they are becoming more common, and ensuring they are scrutinized adequately ensures public safety.
5. Page 19 (2-014 – Plans and specifications): Removed reference and link to "Renewable Energy Information Check Sheet. – There is no longer a check sheet itself, it has become part of the plans submission process on GEIS.
6. Page 27 (2-100 – Marking of equipment): Clarified language. – Previous wording could have been ambiguous.
7. Page 30 (2-306 – Shock and arc flash protection): Reworded. – Shifted from stipulated requirements to allow multiple means to accomplish compliance with the rule.
8. Page 30 (2-306 – Shock and arc flash protection): Amended. – Clearance distances reduced to align with gas code.
9. Page 35 (4-006 – Temperature limitations): Note removed. – Committee believes this is no longer required as this is a rule in the CEC that is well established and well known at this time and does not require explanation.
10. Page 37 (6-112 – Support for the attachment of overhead supply or consumer's service conductors or cables): Removed alternative prescribed method of support. – Not all potentially acceptable methods of support can be listed, allows greater potential possibilities to adhere to the rule, but be sure to consult Local Electrical Inspector before construction/installation.
11. Page 37 (6-200 – Service equipment – mandatory inspection): Amended. – Added the requirement to provide picture of permit number in service entrance compartment of electrical panel as a means to supplement mandatory service inspections. Required as inspection of service compartment can be a safety concern if energized. Also, added picture of example.
12. Page 38 (6-200(2) – Service equipment – dual-lug meter sockets): Note removed. – Removed note that singled-out rural installation
13. Page 38 (6-206 – Consumer service equipment location): Amended. – Updated City of Saskatoon utility provider info at their request.
14. Page 57 (12-012(16) – Burial of conductors in proximity to gas lines): Amended. – Removed note regarding use of treated plank to reduce separation distance, to align with gas code.
15. Page 64 (18-006 – Ammonia compressor rooms): Amended. – Removed reference to specific edition of CSA Standard B52 and added highlight to requirement for engineered notification as per 2-014.
16. Page 93 (62-114 – Overcurrent protection and grouping): Removed. – Department decision not to demand how electric furnaces must be wired (conductor and/or overcurrent size) due to change in how products are labelled and manufacturer's instructions.
17. Page 102 (64-210 -Wiring method): Amended. – Changed note to allow for drilling into solar modules if allowed by the manufacturer.

METRIC TO IMPERIAL CONVERSIONS (approximate)

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Metric to imperial conversions (approximate)											
Metric	-	Imperial	Metric	-	Imperial	Metric	-	Imperial	Metric	-	Imperial
9.5 mm	-	3/8"	50 mm	-	2"	450 mm	-	18"	1.5 m	-	5'
12 mm	-	1/2"	75 mm	-	3"	500 mm	-	20"	2 m	-	6'
13 mm	-	1/2"	95 mm	-	$3^{3/4}$"	600 mm	-	24"	3 m	-	10'
19 mm	-	3/4"	100 mm	-	4"	750 mm	-	30"	5 m	-	17'
21 mm	-	3/4"	125 mm	-	5"	915 mm	-	3'	6 m	-	20'
22 mm	-	3/4"	150 mm	-	6"	1 m	-	39"	7.5 m	-	25'
38 mm	-	$1^{1/2}$"	300 mm	-	12"	1.2 m	-	4'	20 m	-	65'