2017 annual Technical Conference

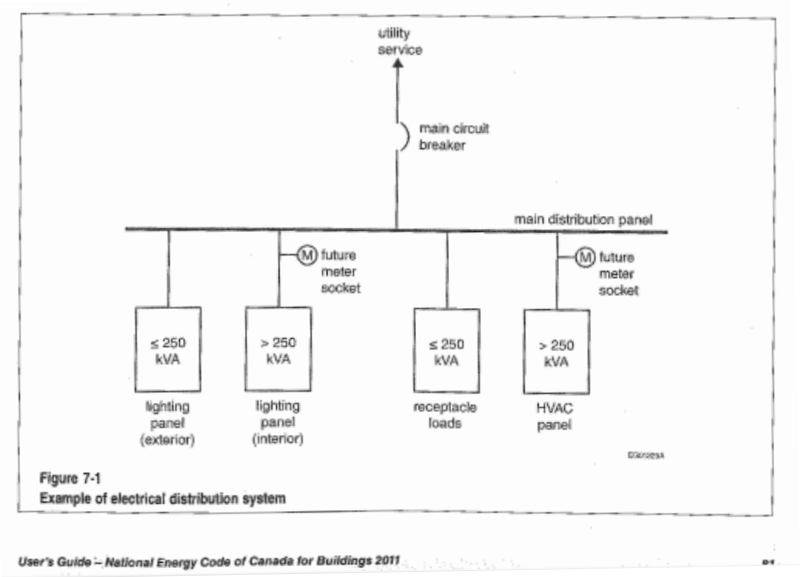
Agenda Item: **2017-01**

Code or regulation number: **NECB 7.2.1.1 (1) Monitoring Electrical Distribution System:**

Electrical distribution systems whose load-carrying capacity is rated > 250 kVA shall be designed to facilitate the installation of means to monitor energy consumption of HVAC systems, interior and exterior lighting.

Question/enquiry: National Energy Code of Canada for Buildings (NECB) has a rule for monitoring energy consumption. For application of the 250 kVA threshold, what does the NECB consider an "electrical distribution system" – does the 250 kVA apply to the main service or does it apply to each portion of a system over 250 kVA dedicated to equipment required to have provision for monitoring? The NECB user guide diagram seems to imply the second scenario. I would interpret application of the rule to mean 250 kVA would apply to the size of the service.

Background information: *Conversion note - 250 KVA 3 phase = 694A @ 208V; 240A @ 600 V*



Conferernce Conclusion:

This requirement does not apply to the size of a service but applies to a specific part of the system – lighting inside, lighting outside and HVAC. When the scale of the project is large enough for this monitoring provision to be installed, you will most likely see the distibution system configured to only carry loads in each of these 3 catagories as shown in figure 7-1 (above), rather than mixing loads in panelboards like we see today. Some engineering firms are already laying out their systems in this way. For information only.

Agenda Item: **2017-02**

Code or regulation number: **CE Code 84-022; 84-024**

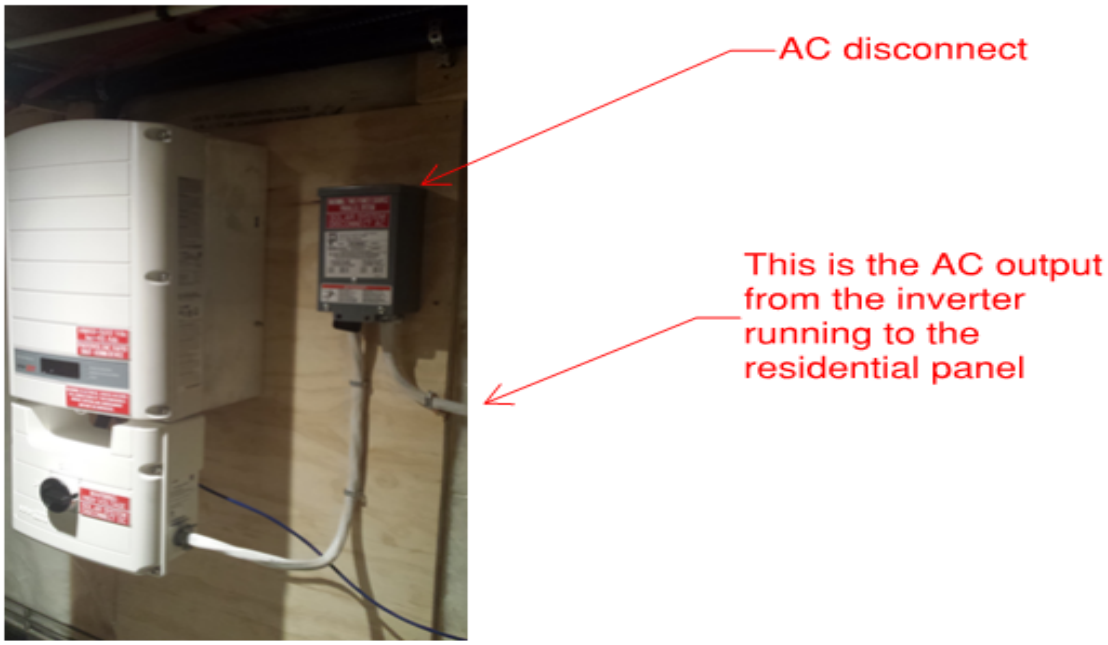
Question: Installers are placing an AC disconnect between a Solar PV inverter and the house panel input breaker. Is this a requirement?

Recommendation:

Unless it were a specific requirement of the Utility (Wires Owner) this device seems to be an unnecessary complication and expense. For the ability to meet the lock off requirements for isolating the solar PV from the utility:

1) place a lock off device on the ac input breaker
2) use the main service entrance breaker on the panel as the lock off. The main breaker typically has capability of being locked off (not all panels have this but most do). See note in appendix B for rule 84-022 (which requires the disconnect). The note indicates “the main service box, or the equivalent, is normally used to provide this function”.

Background information:



84-022 Disconnecting means — Supply authority system (see Appendix B)
Disconnecting means shall be provided to disconnect simultaneously all the electric power production sources from the supply authority system.

Apx B Rule 84-022
The supply authority disconnecting means is intended to allow the supply authority a single point of access to simultaneously isolate one or more electric power production sources on the premises. The main service box, or the equivalent, is normally used to provide this function.

84-024 Disconnecting means — General (see Appendix B)
(1) Disconnecting means shall
(a) be capable of being energized from both sides;
(b) plainly indicate whether it is in the open or closed position;
(c) have contact operation verifiable by direct visible means if required by the supply authority;
(d) have provision for being locked in the open position;
(e) conform to Sections 14, 28, and 36 if it includes an overcurrent device;
(f) be capable of being opened at rated load;
(g) be capable of being closed with safety to the operator with a fault on the system;
(h) disconnect all ungrounded conductors of the circuit simultaneously;
(i) bear a warning to the effect that inside parts can be energized when the disconnecting means is open; and
(j) be readily accessible

Apx B Rule 84-024
In some circumstances, the supply authority may use the provisions of Rule 84-002 to require that the disconnecting means have “contact operation verifiable by direct visible means”. This is a common worker-safety feature used by supply authority workers to provide added assurance that the circuit is open before work is initiated. Where inverters approved for interconnection are used, the anti-islanding feature automatically isolates the generation equipment from the supply authority upon loss of supply authority voltage, so that having “contact operation verifiable by visible means” may not be required. CSA C22.2 No. 107.1, Clause 15 applies to utility-interconnected inverters and requires the inverter to automatically cease to deliver ac power to the utility in accordance with an anti-islanding test, within the time in Table 16 and after the output V and frequency of the utility source are adjusted to each condition in Table 16. Utility abandonment of the interface disconnect switch would require the utility to rely entirely on the inverter to be fail-safe under normal operation and component fault mode re-energizing a dead utility bus. A small generator can magnetize a single-phase distribution transformer when the transformer is disconnected from the primary conductor.

Conference Conclusion:

It was clarified that if provisions for disconnect can be achieved by another means such as a lock off device on the AC input breaker or the service breaker as per Appendix B notes for Rule 84-022. This additional AC disconnect (as shown in the photo) is not required unless this is a specification in the interconnection agreement with the utility. No further action was recommended.

Agenda Item: 2017-03

Code or regulation number: CE Code 62-112 Utility-interactive point of connection

Question/enquiry:

1) This rule needs to be revised. It does not seem to consider other rules of the code, specifically 80% continuous load rating of the typical input AC breaker. This unnecessarily limits the amount of solar PV energy that can be installed on the load side of the service.
2) Current wording of 64-112(4)(d) has wrong and confusing wording. Current wording would not allow solar to be installed in a house with the current wording unless you had an oversized panel in the house. (It is missing some key words and sounds like it is talking about any breakers, not just source circuit breakers).

Recommendation(s) based on 2 separate submissions:

1) Reword the rule so the % limits are applied to the sum of the main overcurrent device + the rated output of the inverter (not the size of the main breaker + the size of the PV input breaker). Note the NEC uses this method.

Reword to read “notwithstanding Section 14, for a dwelling unit, the sum of the main overcurrent device plus the rated output of the inverter(s) shall be permitted to exceed the busbar or conductor rating to a maximum of 125% of the rating of the busbar or conductor.”

2) Reword the rule to read (d) notwithstanding Section 14, for a dwelling unit, the sum of the ampere ratings of the overcurrent devices in source circuits supplying power to a busbar or conductor shall be permitted to exceed the busbar or conductor rating to a maximum of 125% of the rating of the busbar or conductor.

Perhaps both issues could be dealt with by a combination:

Reword to read “notwithstanding Section 14, for a dwelling unit, the sum of the main overcurrent device plus the rated output of the inverter supplying power to a busbar or conductor shall be permitted to exceed the busbar or conductor rating to a maximum of 125% of the rating of the busbar or conductor.”

Background information:

64-112 Utility-interactive point of connection

(4) Where distribution equipment such as switchboards or panelboards located on the premises is supplied simultaneously by a primary power source and one or more utility-interactive inverters and where the distribution equipment connected as permitted by Subrule (3) is capable of supplying multiple branch circuits or feeders, or both, provisions for interconnection between the primary power supply source and the utility-interactive inverter(s) shall comply with the following conditions:

(a) each source interconnection shall be made at a dedicated circuit breaker or fusible disconnecting means;

(b) each panelboard, busbar, or conductor supplied by the multiple sources in the interactive system shall be provided with

(i) suitable warning signs adjacent to each source disconnecting means to indicate that all of the disconnecting means must be opened to ensure complete de-energization of the equipment in accordance with Rule 14-414;

(ii) the point of connection positioned at the opposite (load) end from the input feeder location or main circuit location, where the panelboard is rated less than the sum of the ampere ratings of all overcurrent devices in source circuits supplying the panelboard; and

(iii) a permanent warning label at the distribution equipment to indicate that the overcurrent device shall not be relocated;

(c) notwithstanding Section 14, the sum of the ampere ratings of overcurrent devices in source circuits supplying power to a busbar or conductor shall be permitted to exceed the busbar or conductor rating to a maximum of 120% of the rating of the busbar or conductor;

(d) notwithstanding Section 14, for a dwelling unit, the sum of the ampere ratings of the overcurrent devices shall be permitted to exceed the busbar or conductor rating to a maximum of 125% of the rating of the busbar or conductor; and

(e) except as provided for in Subrule (5), the interconnection point shall be made on the line side of all ground fault protection equipment.

Residential Example - 100 A panel with a 125 A rated busbar:

- the maximum allowable breaker size would be 125 x 1.25 = 156.25 A total. With a 100 A main breaker this would allow 56.25A resulting in a 50A PV breaker as the largest allowable common trade size.
- problem is a 50A breaker is only rated for an 80% continuous load so the maximum inverter output on a 50 A breaker would only be allowed to be 40 A.
- In a 10 kW system (not out of the ordinary for a single family dwelling) the inverter output is rated 41.66 A, so you cannot use the 50 A breaker, you would need to go up to 60 A, but that is not allowed by the rule.
- so this system has an output much less than the additional 56.25A load that could potentially put the busbar at risk but cannot be fed through a breaker sized for the application due to limits on the breaker load.
- The breaker is really acting mainly as a switch, its role as an overcurrent device is limited.

Conference Conclusion: It was reported that this is being reviewed by the Electrical Sub-Council's Canadian Electrical Code Working Group (CECWG) and it is believed that Rule 64-112 (4)(d) is missing the words "source circuit". This recommendation for a proposed change to Part 1 is being recommended to the ESC.

Agenda Item: **2017-04**

Code or regulation number: Exit Signs 2015 CE Code 46-400 (1) (2)
Unit Equipment - 46-304

Questions: **Exit Sign Circuit Configuration**:

1. **Does an exit sign always need to be on a dedicated circuit and what other equipment is allowed to be on the exit sign circuit?**
2. **When does emergency lighting (including that for exit signs) need to come on – when power fails in an area or when the power fails in the building?**
3. **Is Figure 46-4 in the Handbook correct?**

There are conflicting interpretations surrounding the installation of stand-alone Exit Signs and combination exit/emergency light units.

WHAT CATEGORY DOES THE PIECE OF EQUIPMENT FALL INTO?

EXIT SIGN

UNIT EQUIPMENT

UNIT EQUIPMENT

Question 1 - Does an exit sign always need to be on a dedicated circuit and what other electrical equipment is allowed on the exit sign circuit?

Background information question 1:

Exit signs

46-400 Exit signs (see Appendices B and G)

(1) Where exit signs are connected to an electrical circuit, that circuit shall be used for no other purpose.

(2) Notwithstanding Subrule (1), exit signs shall be permitted to be connected to a circuit supplying emergency lighting in the area where these exit signs are installed.

(3) Exit signs in Subrules (1) and (2) shall be illuminated by an emergency power supply where emergency lighting is required by the *National Building Code of Canada*.

Δ (4) The circuitry serving luminaires used to illuminate exit signs that are not connected to an electrical circuit shall comply with Subrules (1) to (3), as required by the *National Building Code of Canada*.

This question cannot be looked at in isolation without considering what is in (and what is not) in the Alberta Building Code.

3.4.5.1. Exit Signs

5) The circuitry serving lighting for externally and internally illuminated *exit* signs shall

a) serve no equipment other than emergency equipment, and

b) be connected to an emergency power supply as described in Article 3.2.7.4.

The following is from CSA 2015 CE Code training materials:

Rule 46-400(4) – New

Subrule 46-400 (4) states that the circuitry serving luminaires used to illuminate exit signs that are not connected to an electrical circuit shall comply with Subrules (1) to (3), as required by the National Building Code of Canada.

Location requirements for exit signs are set out in the NBCC. Rule 46-400 covers only their connection to a power supply. Rule 46 -400 also covers connection of circuits supplying lighting in the area where externally illuminated exit signs are installed in accordance with the NBCC requirements.

If an exit sign is required by the NBCC and is electrically illuminated, Subrule (1) requires that the power for the exit sign be provided by a branch circuit that supplies only other exit signs.

Subrule (2) exempts the circuit supplying only exit signs to allow it to supply emergency lighting in the area where the exit signs are located.

However, in an area where exit signs are installed and where emergency lighting is required by the NBCC or local building codes, Subrule (3) requires that exit signs must be also be illuminated by an emergency power supply. This ensures that the exit sign is provided with a minimum illumination whenever the emergency lighting is energized.

RESEARCH SUMMARY:

- ABC rule 3.4.5.1 (5) indicates that that "the circuitry serving lighting for externally and internally illuminated exit signs shall serve no equipment other than emergency equipment". As such, Building Code exit sign circuits are dedicated but we are allowed to share the circuit with emergency lighting or perhaps other equipment that is defined as "Emergency Equipment" in the ABC.
- CE Code 46-400 (1) – requires that the power supply for the exit sign is provided from a branch circuit that is used for no other purpose – a dedicated circuit for exit signs only.
- However, 46-400 (2) waives the dedicated circuit requirement under specific conditions - the exit sign may also be supplied from a circuit that supplies emergency lighting in the "area" where the exit signs are installed. Unit equipment fits into the category of emergency lighting, so a circuit supplying unit equipment could also supply exit signs.
- Another exemption under 46-400 (2) - in order to meet the requirements of 46-304 (4) for unit equipment to activate when the normal lighting in the area fails, the normal lighting circuit serving that area will typically feed or control the unit equipment. This would allow that normal lighting circuit to supply unit equipment and exit signs, as long as they are all in the same area.
- 46-400 (2) would allow you to provide a dedicated circuit from an emergency generator fed panelboard that feeds both exit signs and luminaires functioning as emergency lighting.
- Would a night light circuit qualify as normal lighting in the area? Depends on the circuit configuration and how the night lights are fed. Some AHJ's indicate that if it is a dedicated night light circuit, it would not be classified as normal lighting. If the night light happened to be fed off the same circuit as the normal lighting in the area, it could be considered as acceptable. This scenario may get complicated with energy management control that will not allow night lights to run at all times.
- The note in Appendix B cautions that the circuit supplying both emergency lighting and exit signs should not be controlled by a switch, time clock, or other means.
- National Energy Code for Buildings 2011 - 4.2.2.1 (4) indicates the requirements for automatic interior lighting shut off does not apply to lighting required where automatic shut-off would endanger the safety or security of its occupants, such as exit signs and other emergency equipment (Note there are other exemptions).

Other notable ABC 2015 circuit requirements for exit signs:

- 3.4.5.1 (3) (4) Exit signs, both internally and externally illuminated must be continuously illuminated. This has changed – previous code version indicated exit signs were to be illuminated when the building was occupied. This means no switching, timers, photocells, daylight harvesting controls. It could possibly be on failsafe occupancy sensors for energy management purposes but typically that is not practical.
- 3.4.5.1 (5) requires connection of an emergency power supply to the luminaire that is providing illumination for both internally and externally illuminated signs. This requirement is also reflected in new CE Code rule 46-400(4). *This requirement is creating significant controversy for installation of photoluminescent exit signs. Apparently a Standata is under development. See article Application and installation requirements for exits signs: what, why and how. IAEI Magazine March-April 2013.*

QUESTION 2: when does emergency lighting (including that for exit signs) need to come on – when power fails in an area or in the building?

Background information question 2:

CE Code rules:

Unit equipment

46-300 Unit equipment (see Appendix B)

Rules 46-302 to 46-306 apply to individual unit equipment for emergency lighting only.

AMA Note: The term "Unit Equipment" not used in the Alberta Building Code

46-304 Supply connections

(4) Unit equipment shall be installed in such a manner that it will be automatically actuated upon failure of the power supply to the normal lighting in the area covered by that unit equipment.

ABC Rules:

3.2.7.3. Emergency Lighting

1) Unless it can be shown to be unnecessary, emergency lighting shall be provided to an average level of illumination not less than 10 lx at floor or tread level in

5) Lighting required in Sentence (1) shall be designed to be automatically activated when the electric lighting in the affected area is interrupted.

This is not in the OBC or NBC

3.2.7.4. Emergency Power for Lighting

1) An emergency power supply shall be

a) provided to maintain the emergency lighting required by this Subsection from a power source such as batteries or generators that will continue to supply power in the event that the regular power supply to the *building* is interrupted, and

9.9.12.3. Emergency Lighting

1) Unless it can be shown to be unnecessary, emergency lighting shall be provided in

a) *exits*,
b) principal routes providing *access to exit* in an open *floor area*,
c) corridors used by the public,
d) underground *walkways*, and
e) *public corridors*.

(See Appendix A.)

2) Emergency lighting required in Sentence (1) shall be provided from a source of energy separate from the electrical supply for the *building*.

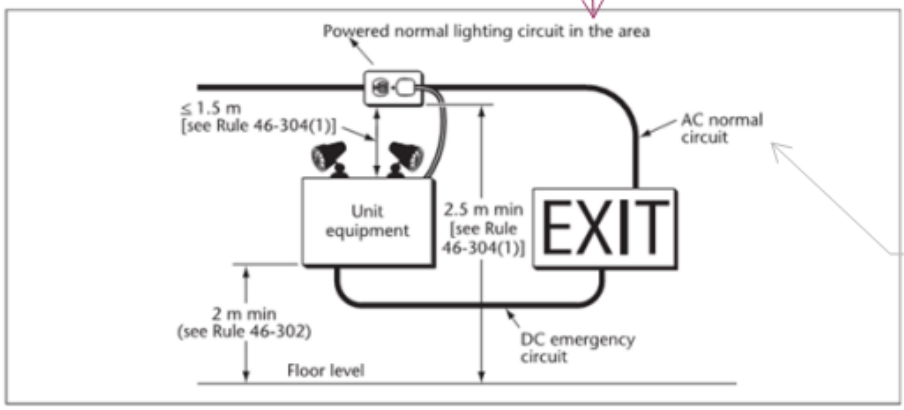
3) Lighting required in Sentence (1) shall be designed to be automatically actuated for a period of at least 30 min when the electric lighting in the affected area is interrupted.

RESEARCH SUMMARY:

- Both codes indicate emergency lighting must be activated when lighting in the affected area is interrupted. This would suggest when battery power (unit equipment) is used, it must be on or controlled by the circuit that also serves the lighting in that area.
- From AMA Safety Services - sentence 3.2.7.3.(5) requires the emergency lights in the affected area to be automatically activated should the regular functioning lighting source be interrupted, but does not specify how the system is to be designed. It is our understanding that emergency lighting equipped with battery back-up will illuminate upon power failure being a branch circuit ~~or~~ AND when the regular power supply of the building is interrupted. Post conference comment – confirmed with AMA this means that emergency lighting must come on when either fail – branch circuit or building power.
- From AMA Safety Services Clause 3.2.7.4.(1).(a). speaks to the emergency power supply for the operation of the emergency lighting in the building should the regular power source be interrupted and provides the options of battery or generator emergency backup power source.
- From BCSA - Unit equipment must be installed in such a manner that it will be automatically activated upon failure of a phase, feeder, branch circuit or power supply to the normal lighting. In other words, emergency lighting is required to energize when the failure of any of these occurs.
- A dedicated circuit is not specified. This allows flexibility in design, especially if lighting and unit equipment are different voltage. Unit equipment must activate when normal lighting covered by the unit in the affected area fails. CE Code 46-304 (4), ABC 3.2.7.3 (5)
- From Ontario ESA (in reference to this unit equipment scenario for Part 3 buildings). Activation of unit equipment upon failure of normal lighting covered by the unit equipment is not always practical in areas such as large retail areas, a gymnasium in a school or a manufacturing area in a factory. In these areas most of the circuits could fail and the light levels would be such that persons within could safely exit the building. For buildings or large areas separated by firewalls, within the scope of Part 3 of the Building Code, the phrase "the failure of the power supply to the normal lighting in the area covered by unit equipment" is interpreted to mean failure of the regular power supply to the building. ~~An acceptable method to satisfy the requirement is to supply the unit equipment from a branch circuit in the panel supplying the lighting~~. Post conference - This is not an acceptable solution with unit equipment.
- It would be reasonable to conclude that if the emergency lighting is supplied by battery (unit equipment) it is to come on when the lighting in the affected area fails with special consideration given to very large areas in Part 3 buildings. If the power supply is provided by a generator, it is to come on when the power to the building fails.

QUESTION 3: Is figure 46-4 in the handbook correct?

This indicates the unit equipment and the exit sign are supplied by the same circuit with the normal lighting in the area.



46-400 (1) says exit signs are to be on a dedicated circuit.

However, the requirement for a dedicated exit sign circuit is waived by (2) when the exit sign is connected to a circuit supplying emergency lighting in the same area where the exit signs are installed. (this includes unit equipment)

Figure 46-4
Connection to Unit Equipment

Subrule (4) requires that unit equipment be installed so that it automatically provides illumination to an area when there is a loss of power to normal lighting in that area. For example, unit equipment installed in a corridor must be activated by a loss of power to the normal lighting in the corridor and provide emergency lighting there. Typically, this is accomplished by connecting the receptacle that supplies the unit equipment to the circuit that supplies normal lighting in the area, so that the unit equipment detects the de-energizing of the circuit and operates to provide emergency lighting. If the normal lighting operates at 347 V and the unit equipment is plugged into a receptacle operating at 120 V, voltage sensing relays or similar equipment can be used to comply with Rule 46-208.

Conference Conclusion – note some additional information is included in this conclusion that was confirmed after the conference.

Question 1 - Does an exit sign always need to be on a dedicated circuit? No – but there are conditions where the circuits can be shared with emergency lighting and normal lighting.

QUESTION 2: when does emergency lighting (including that for exit signs) need to come on, when power fails in an area or in the building? When supplied by unit equipment (battery) failure of power means a power failure right down to the lighting branch circuit serving the lighting in that area.

Question 3 - Is figure 46-4 in the handbook correct? YES

The CECWG is also reviewing this same topic and may be presenting recommendations to the ESC at their next meeting including a recommendation for a Standata. Don Bradshaw will summarize the discussion from both the CECWG (which has several diagrams and different connection scenarios) and the EIAA conference together with recommendations that will be distributed to all members.

Agenda Item: 2017-05

Code or regulation number: CE Code 32-102 (1) (2)

Question: Do wiring method rules from Section 12 for NMSC when installing FAS cable for Fire Alarms? What cable types fall under the category of NMSC – there is no definition in the CE Code (but there is in NEC)

Recommendation: Installation should fully follow the rules for NMSC when installing FAS for fire alarms – junction boxes, connectors, support etc and not be treated as low voltage wiring just strung all over the place with open splices.

Background Information:

32-102 Wiring method

(1) All conductors of a fire alarm system shall be
- (a) installed in metal raceway of the totally enclosed type;
- (b) incorporated in a cable having a metal armour or sheath;
- (c) installed in rigid non-metallic conduit; or
- (d) installed in electrical non-metallic tubing, where embedded in at least 50 mm of masonry or poured concrete.

(2) Notwithstanding Subrule (1), conductors installed in buildings of combustible construction in accordance with the Rules of Section 12 shall be permitted to be
- (a) non-metallic-sheathed cable;
- (b) fire alarm and signal cable; or
- (c) installed in a totally enclosed non-metallic raceway.

32-102 indicates wiring methods allowed in combustible construction. It indicates these wiring methods are acceptable as long as the installation follows the rules laid out in section 12. Section 12 has rules for installation of non-metallic raceways and for NMSC. It has no requirements for how FAS is installed. There are no rules in section 12 that specifically govern the installation of FAS. Table 19 has NMSC and FAS listed with different trade designations, so FAS does not appear to fall into the classification of non-metallic sheathed cable.

Conference conclusion: After review of the question and code requirements, EIAA considers that FAS falls under the classification of non-metallic sheathed cable. The installation must follow all the section 12-500 series of rules for installation of NMSC when installing FAS for fire alarms including junction boxes, connectors, support, etc. This item was considered closed and no further action was recommended.

Agenda Item: **2017-06**

Code or regulation number: **CE Code 26-710 General Receptacles for residential occupancies**

Question: Are receptacles installed in a residential occupancy required to be only 5-15/20R configuration and no other configurations are acceptable?

For example can you install a L5-15R (twist lock) receptacle in a residential occupancy? Some are interpreting rule (b) to mean only 15/20R configuration receptacles can be installed anywhere in a residential occupancy.

Recommendation: for discussion

Background Information:

Receptacles for residential occupancies

26-710 General (see Appendices B and G)

This Rule applies to receptacles for all residential occupancies (including dwelling units and single dwellings) as follows:

(a) for the purposes of this Rule, "finished wall" means any wall finished to within 450 mm of the floor with drywall, wood panelling, or like material;

(b) for the purposes of this Rule, all receptacles shall be CSA configuration 5-15R or 5-20R (see Diagram 1);

Conference Conclusion:

After a review of the rule, it was believed that 5-15R or 5-20R is strictly relative to the general requirements for receptacles in residential occupancies. It is believed that other receptacles can be installed provided all other rules are followed that would apply to that type of receptacle. It was also noted that this issue has been discussed by the CECWG with a recommendation that is being brought forward to the ESC.

Agenda Item: **2017-07**

Code or regulation number: **CE Code 26-710 (n) GFCI protection of residential receptacles**

Question: Does rule 26-710 (n) require that any receptacle required outdoors (< 2.5 m above grade) in a residential occupancy be GFCI protected or does this protection only need to be applied to receptacles installed for the purposes of rules governing residential receptacles (5-15R and 5-20R). For example would be required to GFCI protect a 125 V 30 A RV receptacle attached to the house?

Recommendation: for discussion

Background Information:

Receptacles for residential occupancies

26-710 General (see Appendices B and G)

(n) except for automobile heater receptacles provided in conformance with Rule 8-400, all receptacles installed outdoors and within 2.5 m of finished grade shall be protected with a ground fault circuit interrupter of the Class A type; and

Apx B:

Rule 26-710(n)

It is the intent of this Subrule that all receptacles of residential occupancies installed outdoors and within 2.5 m of finished grade be protected by a Class A GFCI. This includes receptacles located on buildings or structures associated with the residential occupancy, such as garages, carports, sheds, and receptacles on posts or fences, etc.

While its use is not precluded in such applications, this Rule is not intended to apply to receptacles located in parking lots of apartments that are installed solely for use as automobile heater receptacles.

Conference conclusion:

The vast majority of EIAA in attendance agreed that GFCI protection would not be required for a 125 V 30 A RV receptacle attached to the house. As was discussed with receptacle types, it was believed that GFCI protection is relative to the general requirements for receptacles in residential occupancies and not applied to each and every receptacle installed outdoors. GFI protection would be required when other rules of the code apply and for the conditions of installation. One example is for a swimming pool. No further action was recommended.

Agenda Item: **2017-08**

Code or regulation number: **CE Code 26-700(5); 12-3000(10)**

Question: – for residential construction, do these rules require use of a specific floor box assembly or can we still use regular outlet boxes as long as we use an approved cover?

Also see 12-3002 for floor box cover.
26-700(5) says receptacles installed in floors shall be enclosed in floor boxes

Recommendation: for discussion

Background Information:

Example - Arlington Industries Product

Receptacles

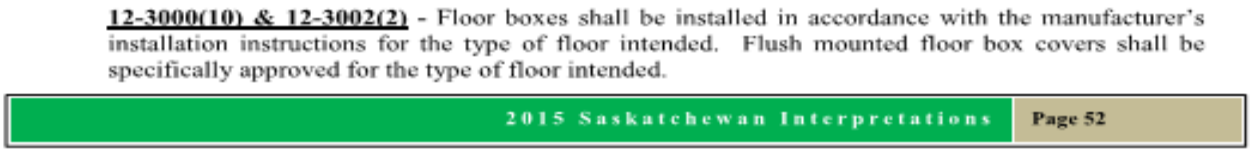
26-700 General (see Appendix B)

(5) Receptacles located in floors shall be enclosed in floor boxes.

Installations of boxes, cabinets, outlets, and terminal fittings

12-3000 Outlet boxes (see Appendix B)

Δ (10) Floor boxes shall be installed in accordance with the manufacturer's installation instructions for the type of floor intended.



BCSA Electrical Code Change manual – 12-3000 (10) – "floor box installations must be performed according to the floor box manufacturer's installation instructions."

NEC requires floor outlets to be part of an approved assembly consisting of a metal box, gasket seal and a strong cover plate with a moisture-proof cover

314.27 Outlet Boxes.
(B) Floor Boxes. Boxes listed specifically for this application shall be used for receptacles located in the floor.

UL White Book 2012:

NONMETALLIC OUTLET BOXES (QCMZ)
FLOOR BOXES
Floor boxes designed for floor installation as covered in ANSI/NFPA 70, National Electrical Code (NEC), are provided with covers and gaskets to exclude surface water and sweeping compounds that might be present in floor cleaning operations. Covers with gaskets may be shipped separately from the boxes. Both products are provided with installation instructions. Those boxes intended for installation in concrete floors are frequently provided with leveling screws, threaded hubs, or both and are provided with a marking on the carton to identify boxes of this type such as, Floor Box Cover or Floor Box, Concrete Tight as appropriate. Floor boxes may be provided with wiring devices.

Conference Conclusion:
It was agreed that an entire assembly must be used. An approved cover needs to be used with the corresponding approved floor box and that a regular outlet box with an approved cover would not be acceptable unless the manufacturer's installation instructions indicate that specific box may be used in an approved combination. No further action was recommended.

Agenda Item: **2017-09**

Code or regulation number: **CE Code 24-104**

Question: **Would like to know the proper wiring method along with a wiring diagram of how the bonding requirement is to be met using conduit installations and cable installations in patient care areas.**

Recommendation: none

Background Information:

24-104 Bonding to ground in basic care areas (see Appendix B)

(1) Bonding conductors shall be insulated unless they are
- (a) installed in non-metallic conduit; or
- (b) incorporated into a cable assembly that is constructed in such a manner that contact between any metal shield or armour, if it is present, and a bare bonding conductor is not possible.

(2) All receptacles and other permanently connected equipment shall be bonded to ground by copper equipment bonding conductors, sized in accordance with Table 16A or 16B as applicable, but in no case smaller than No. 12 AWG, and run in accordance with Rule 10-808 or run with the circuit conductors in accordance with the following:
- (a) each multi-wire branch circuit shall be provided with its own equipment bonding conductor;
- (b) except as permitted by Items (c) and (d), each 2-wire branch circuit supplying a receptacle in a patient care environment shall be provided with its own equipment bonding conductor;
- (c) when the receptacles in a patient care environment are supplied from two 2-wire branch circuits in the same raceway, a single equipment bonding conductor shall be permitted to be shared by the two circuits; or
- (d) when receptacles intended for a pair of adjacent patient care environments are supplied by three 2-wire branch circuits and one of the circuits is intended to be shared by both environments, the three circuits shall be permitted to share two equipment bonding conductors.

(3) Utilization equipment bonding conductors required by Subrules (2), (6), and (7) shall terminate either at the panelboard supplying the branch circuits to the patient care environment from which they arise or on a separately installed busbar that is bonded to that panelboard.

For devices wired with cable c/w a bare bond and an insulated bond.

For this wiring method the bare bonding conductor stops at the box bonding screw. The insulated bonding conductor runs directly to the green bond screw on the device.

The frame of the receptacle will effectively tie together the two bonding conductors at the device end.

For devices wired with metallic raceway with only an insulated bond.

The green insulated bond runs directly to the device bond screw. The raceway bonding occurs with the metallic raceway. The frame of the receptacle will effectively tie together the two bonding methods at the device end

At the panel end:

All bonding conductors tie to the panel (that supplies the patient care environment) bonding strip or at a separately installed busbar that is bonded to that panelboard

These configurations at the receptacle end also make Z32 testing more efficient as the bonding conductor can be independently tested by just separating the device from the outlet box.

Conference conclusion:

After reviewing all documentation, the following was agreed to:

1. For devices wired with cable c/w a bare bond and an insulated bond. For this wiring method, the bare bonding conductor stops at the box bonding screw. The insulated bonding conductor runs directly to the green bond screw on the device or as an option, you could also tie the insulated bond to the box then continue to the device bonding screw. The frame of the receptacle will effectively tie together the two bonding conductors at the device end.
2. For devices wired with metallic raceway with only an insulated bond. The green insulated bond runs directly to the device bond screw. The raceway bonding occurs with the metallic raceway. The frame of the receptacle will effectively tie together the two bonding methods at the device end.
3. At the panel end: All bonding conductors tie to the panel (that supplies the patient care area) bonding strip or at a separately installed busbar that is bonded to that panelboard.

No further action was recommended.

Agenda Item: 2017-10

Code or regulation number: CE Code 12-012, Standata

Question:

1. Is NMWU allowed to be mechanically protected by installing an appropriate poly pipe.
2. Can I run NMWU in a properly sized Rigid PVC conduit?
3. I install Styrofoam insulation above. Is it suitable as mechanical protection? (as per 12-012 (3) e)

Standata is not clear as to what can be used for mechanical protection

Recommendation: for discussion. Interesting to note that Apx B allows water pipe as mechanical protection to reduce the depth of burial. Often this has been interpreted as applying instead to (4) to allow the direct burial wire or cable to be run without the screened sand or screened earth. PVC conduit is widely used for this application.

Background Information:

ELECTRICAL SAFETY
Information Bulletin STANDATA

January 2016 CEC-12 [rev-7]
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CANADIAN ELECTRICAL CODE

SUBJECT: Section 12 – Wiring Methods

Rule 12-012 Underground Installations

Mechanical Protection for Direct Buried Conductors

The Appendix B Note on Rule 12-012 indicates that polyethylene water pipe in conformance with CSA Standard B137.1, Polyethylene Pipe for Cold Water Services is considered acceptable for mechanical protection of conductors or cables used for direct earth burial.

Although acceptable for mechanical protection of conductors or cables installed underground, this material is not approved as a wiring material and should not be installed as a raceway inside buildings.

Protection of Conductors and Cables

A review of Rule 12-012(5) indicates that it is intended to apply to cables other than armoured cable, mineral-insulated cable and aluminum-sheathed cable. Requirements for mechanical protection of these cables are stipulated in Rules 12-604 and 12-710 (see comments on Rule 12-604 below).

12-012 Underground installations (see Appendices B and I)

(1) Direct buried conductors, cables, or raceways shall be installed to meet the minimum cover requirements of Table 53.

(2) The minimum cover requirements shall be permitted to be reduced by 150 mm where mechanical protection is placed in the trench over the underground installation.

(3) Mechanical protection shall consist of one of the following and, when in flat form, shall be wide enough to extend at least 50 mm beyond the conductors, cables, or raceways on each side:
- (a) treated planking at least 38 mm thick;
- (b) poured concrete at least 50 mm thick;
- (c) concrete slabs at least 50 mm thick;
- (d) concrete encasement at least 50 mm thick; or
- (e) other suitable material.

(4) Direct buried conductors or cables shall be installed so that they run adjacent to each other and do not cross over each other and with a layer of screened sand with a maximum particle size of 4.75 mm or screened earth at least 75 mm deep both above and below the conductors.

(5) Where conductors or cables rise for terminations or splices or where access is otherwise required, they shall be protected from mechanical damage by location or by rigid conduit terminated vertically in the trench and including a bushing or bell end fitting, or other acceptable protection, at the bottom end from 300 mm above the bottom of the trench to at least 2 m above finished grade, and beyond that as may be required by other Rules of the Code, and with sufficient slack provided in the conductors at the bottom end of the conduit so that the conductors enter the conduit from a vertical position.

Apx B

Rule 12-012

Wooden planks, when buried in the ground, should be treated with a solution of pentachlorophenol or other suitable material as recommended by a manufacturer of wood preservatives. The use of creosote as a wood preservative in such installations is not recommended because it is known to damage rubber and thermoplastic insulations and acts as a catalyst in the corrosion of lead.

If polyethylene water pipe is used for mechanical protection for conductors and cables for direct earth burial under Subrule (3)(e), pipe in conformance with CSA B137.1 is considered acceptable.

Conference Conclusion:

After reviewing all documentation, the following was agreed to:

1) Is NMWU allowed to be mechanically protected by installing an appropriate poly pipe.
- Yes, appropriate poly pipe is an acceptable mechanical protection for the underground section of the run, but not for above grade. The minimum cover (depth of burial) must still match that for the conductors or cables and not for depth of burial for raceways.

2) Can I run NMWU in a properly sized Rigid PVC conduit?
- Yes, you can run NMWU in a properly size Rigid PVC conduit.

3) I install Styrofoam insulation above. Is it suitable as mechanical protection? (as per 12-012 (3) e)
- No, Styrofoam insulation is not suitable mechanical protection.

No further action was recommended.

Agenda Item: 2017-11

Code or regulation number: CE Code 12-012 (13) Underground Installations

Question: Customer service gas lines in a trench with electrical – why does the Standata recommend separation when other Provinces mandate this based on this rule. Same should apply to 4 party service trenches common in residential construction.

Recommendation: for discussion

Background Information:

12-012 Underground installations (see Appendices B and I)

(13) For installations not covered by the foregoing requirements of this Rule, the requirements of CAN/CSA-C22.3 No. 7, or the applicable standard, whichever is more stringent, shall apply.

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CEC-6 [rev-6]
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Electrical Conductors and Gas Services in the Same Trench

The Electrical Code does not establish specific requirements for installing Electrical Conductors in the same trench as gas-lines. Gas services installed by gas utilities are subject to requirements administered by the Rural Utilities Branch of Alberta Agriculture and Forestry. If you wish to install electrical conductors in the same trench as a gas service, consult the local gas utility for advice.

Gas sub-service lines (i.e., house to garage) are an owner responsibility under the gas code regulation and when electrical conductors are installed in the same trench, it is recommended that the two systems be separated by 300mm of well tamped earth or a 50mm treated plank.

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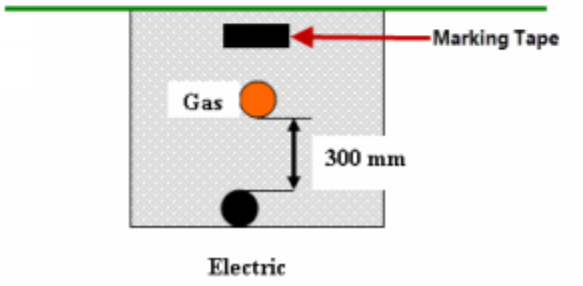
Electrical Inspections

12-012 - Burial of Conductors in Proximity to Gas Lines

Electrical wiring shall not be installed within 600 mm of a utility natural gas line.

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 or 150 mm if a treated plank is installed between the piping and conductor.

Customer owned propane or natural gas lines refers to customer lines supplying customer premises. Customer owned propane or natural gas lines are to be buried at a minimum of 381 mm (15 in.) and, if subject to vehicular traffic, a minimum of 600 mm.



Ontario Electrical Safety Code – **Bulletins**

Question 12
Is a gas pipe permitted to be installed in the same trench as electrical wiring supplying pool equipment?

Answer 12
Yes, provided that the electrical wiring and the gas piping are separated by at least 300 mm (12") horizontally within the trench. (Rule 12-012 and CSA Standard C22.3 No. 7 for Underground Systems)

Conference Conclusion:

Although it was recognized that an Interpretation Bulletin STANDATA cannot mandate something that is not already in the code (the reason for the term “should” instead of “shall”), the matter will be brought forward to the Electrical Sub-council for further discussion regarding any potential revisions to the STANDATA and the contents of CE Code Part 3 6.1.11 Table 2 and how it relates to these installations.

2017 Annual Technical Conference

Agenda Item: 2017-12

Code or regulation number: CE Code 8-102 Voltage Drop

Question:

The Canadian Electrical Code recognizes cable transitions for the purpose of temperature of terminations but does not provide guidance for terminating cables exceeding the size of terminations when oversized for voltage drop.

(so you can splice for temperature termination issues but you cannot if you are installing larger cables to deal with voltage drop)

Recommendation:

It is recommended the Electrical Sub-Council review this concern with the intent to seek amendments recognizing cable transitions for voltage drop purposes in Rules 6-300(1)(b)(ii)(B), 6-310(c) and 12-108(2)(a) of the Canadian Electrical Code Part I. There is a need to legitimize field practices.

Background information:

These rules are the examples of where splices are restricted. All give an ability to splice “oversized” cables for temperature terminations, but none give the ability to splice for oversized cables installed for voltage drop.

Wiring methods

6-300 Installation of underground consumer’s service conductors (see Appendix I)

(1) Except where a deviation has been allowed in accordance with Rule 2-030, consumer’s service conductors that are located underground shall be

- (a) installed in rigid conduit, or electrical non-metallic tubing permitted only for the underground portion of the tubing run, and be of a type for use in wet locations in accordance with Rule 4-008(1); or
- (b) a single- or multi-conductor cable for service entrance use below ground in accordance with Rule 4-008(1), provided that
  - (i) the installation is in accordance with Rule 12-012; and
  - (ii) the cable is without splice or joint except
    - (A) in metering equipment located on the line side of the service box; or
    - (B) where a cable transition is made to meet the requirements of Rule 4-006.

6-310 Use of joints in consumer's service neutral conductors

The neutral or identified conductor of a consumer's service shall be without joints between the point of connection and the service box or equivalent consumer's service equipment, except that a joint shall be permitted where it is made

(a) by means of a clamp or bolted connection in a meter mounting device or at the service head if exposed wiring is used in accordance with Rule 6-302(2);

(b) by a joint underground in accordance with Rule 12-112(5), where such a joint is required to repair damage to the original installation or to accommodate a pole or service relocation; or

(c) where a cable transition is made to meet the requirements of Rule 4-006.

12-108 Conductors in parallel (see Appendix B)

(1) Ungrounded and grounded circuit conductors of similar conductivity in sizes No. 1/0 AWG and larger, copper or aluminum, shall be permitted to be installed in parallel sets provided that each parallel phase or grounded conductor set is individually comprised of conductors that are
   (a) free of splices throughout the total length;
   (b) the same circular mil area;
   (c) the same type of insulation;
   (d) terminated in the same manner;
   (e) the same conductor material; and
   (f) the same length.

(2) Notwithstanding Subrule (1)(a), a single splice per conductor shall be permitted
   (a) to meet the requirements of Rule 4-006; and
   (b) where spliced in the same manner.

Conference Conclusion:

It was clarified that this item has been forward to CE Code Part 1 for a Request for Interpretation (Subject 4184). This item was deferred until a response is received. It is understood that there has been progress to deal with this under Section 6, but no word of progress in Section 12 for conductors in parallel.

Agenda Item: 2017-13

Code or regulation number: Rule 6-200 CE Code October 2013 Standata

Question:

200 ampere 120/240 Volt service is supplied from a utility disconnect mounted on a farm service pole. The service requires 2 sets of 4/0 AL USEB cables for voltage drop. A transition is required to accommodate terminations in the 200 ampere main breaker in the building.

The contractor intends to install a splitter at the building, or use a wireway to solidly splice, conductors terminating in the service main breaker. The conductors are to be sized to meet 4-006 temperature limitations. The installation meets the requirements of Rule 14-100(g) CE Code.

Question: Is this installation acceptable without a separate disconnect at or near the pole?

Recommendation:

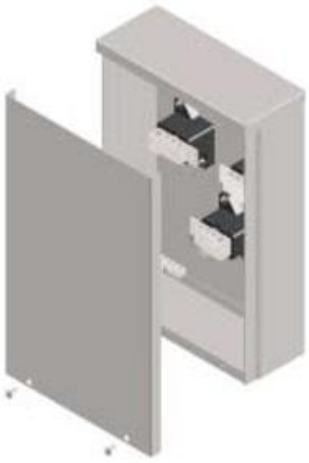
I recommend this installation be considered acceptable. I would like to see a general discussion on application of Rule 6-200 on farms and acreages for the purpose of uniform interpretation. I also recommend submission of this concern to the Electrical Sub-Council to review the EIAA Conference recommendation. Utilities across the Province are using breakers providing different types of protection for these services.

Background information:

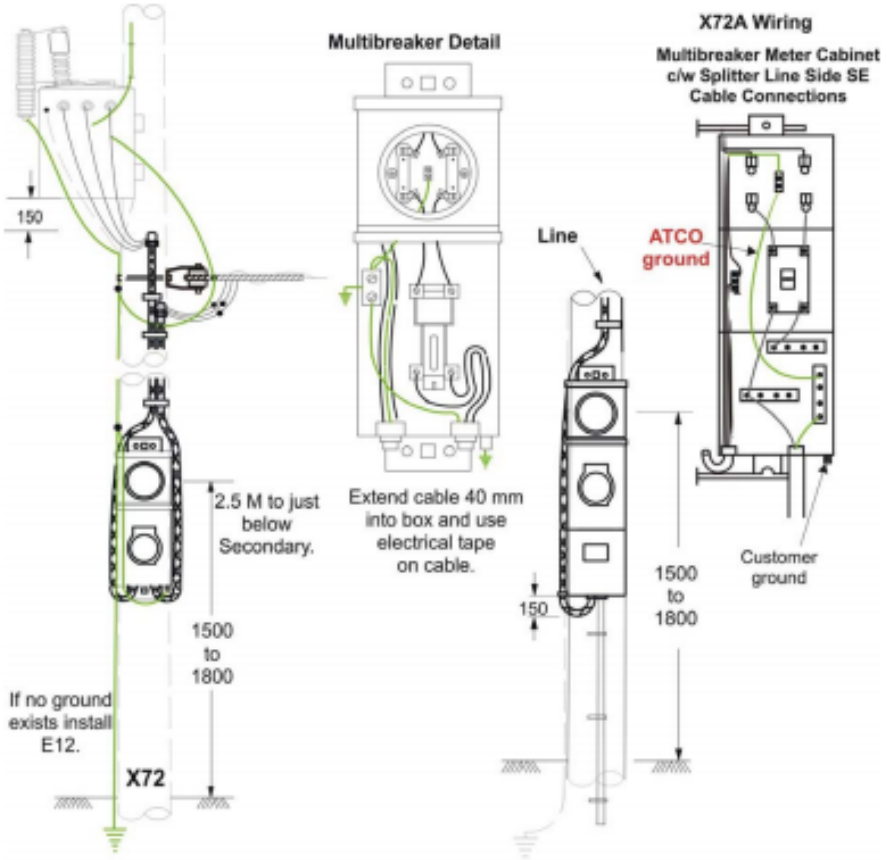
Splitter Boxes Type 3R

Features & Benefits

- EEMAC/CEMA Type 3R Enclosure (Weatherproof)
- Lift-off cover
- Cu/Al lugging with main and six secondaries
- Designed for pole or wall mounting
- Galvanized steel construction
- Non-painted finish
- Higher amperage available
- Custom sizes available (consult factory)



Farm Type Metering



Dimensions in mm

X72 May 2009

Notes:

1. With the company's approval, the REA Customer may install the main breaker and meter socket on their residence or other building and the REA would own the facilities up to the meter.
2. Meter can be raised to prevent cattle rubbing.

Revised Dec-09

ELECTRICAL SAFETY
Information Bulletin

STANDATA

January 2016

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CANADIAN ELECTRICAL CODE

SUBJECT: Section 6 – Services and Service Equipment

Rule 6-200 Service Equipment

Service Equipment

Equipment approved as switchgear, industrial control equipment, or distribution panelboards may not incorporate the features necessary to comply with the definition of "service box" contained in the Canadian Electrical Code. To be acceptable for this purpose, equipment should be constructed in conformance with the applicable requirements of the CSA Standards.

.....

In some jurisdictions in Alberta, single family farms with services up to 200 A have been permitted to use the utility-owned equipment as the consumer service disconnect. This has led to inconsistent application of Code requirements in the province. It is now recognized that the previously permitted installation is not compliant with the Canadian Electrical Code requirement for consumers' services. Utility-owned equipment such as the commonly-used "economizer/totalizer" for farm services typically does not comply with the definition of "service box" and, therefore, cannot be considered to be acceptable as a consumer service disconnect. Moving forward, several code-compliant installation methods exist and should provide sufficient flexibility for all services for farms under 200 A. The installation of the utility-owned equipment is not restricted under the requirements of the CE Code and the installation of an "economizer/totalizer" is not prevented by this information bulletin. However, this piece of equipment cannot be considered to be the consumer's service disconnect required by Rule 6-200(1). Users are reminded to consider Sections 6 and 10 requirements when planning the consumer's service for a single family farm up to 200 A.

Conference Conclusion:

An in-depth discussion was held on the question. Although it was initially recommended that the installation be considered acceptable, it was suggested this question be forwarded to the Electrical Sub Council for further discussion.

Agenda Item: **2017-14**

Code or regulation number: 2-310 Entrance to and exit from working space for residential occupancies

Question: Residential access to get to the electrical panel in ever decreasing sizes of mechanical rooms. Rather than referring to the building code we need a hard number (750 mm) in the Electrical Code

Recommendation: for discussion Building Inspectors won't call it typically so Electrical will

Background Information:

Note – ESCO's have the right to make this call. It is an electrical code requirement for egress. It is only the dimensions that are coming out of the building code.

Note – Gas code has an article for accessibility to appliances c/w dimensions in CSA B149 rule 4.14.1 so there is precedence for this type of requirement for a specific measurement when it comes to egress or access outside the building code.

2015 CE Code:

2-310 Entrance to, and exit from, working space (see Appendices B and G)

(1) Each room containing electrical equipment and each working space around equipment shall have unobstructed means of egress in compliance with the *National Building Code of Canada*.

2014 ABC:

3.3.1.23. Obstructions

1) No obstruction shall be permitted in any *occupancy* that would restrict the width of a normal *means of egress* from any part of a *floor area* to less than 750 mm unless an alternative *means of egress* is provided adjacent to, accessible from, and plainly visible from the obstructed *means of egress*. (See Appendix A.)

9.9.5.5. Obstructions in Means of Egress

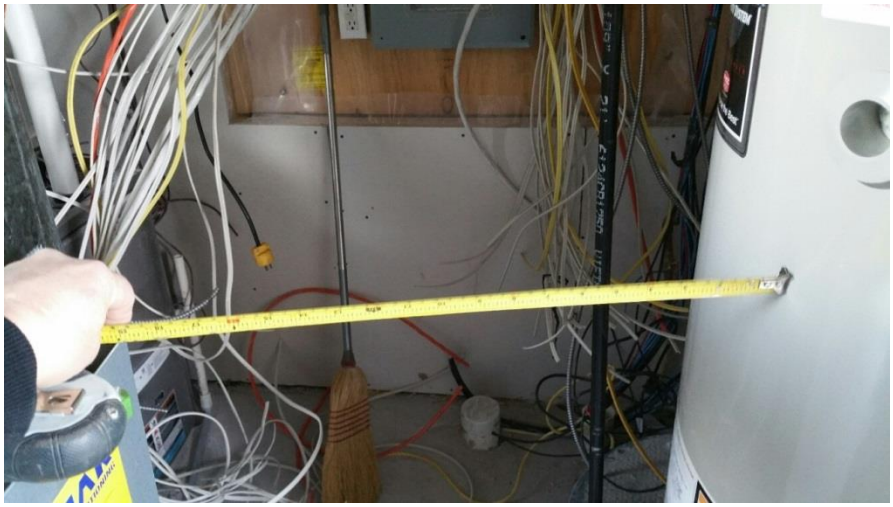
1) No obstructions such as posts or turnstiles shall be placed so as to restrict the width of a required *means of egress* from a *floor area* or part of a *floor area* to less than 750 mm unless an alternate unobstructed *means of egress* is provided adjacent to and plainly visible from the restricted egress.

9.9.5. Obstructions and Hazards in Means of Egress

9.9.5.1. Application

1) This Subsection applies to obstructions and hazards in every *means of egress* except those within a *dwelling unit* or serving not more than one *dwelling unit*.

Note – this exception does not have an equivalent in Part 3



Conference Conclusion:

An in-depth discussion was held on the issue and it was believed that Electrical SCOs have the right to make the call. Although the 750 mm width dimensions come from the building code, it is an electrical code requirement for access to equipment. An ESCO can use rule 2-312 (Accessibility for Maintenance) which requires passageways shall be kept clear of obstruction and arranged to give persons ready access. It would be reasonable to use the dimensional width of 750 mm from the ABC as minimum egress width. No further action was recommended.

Agenda Item: **2017-15**

Code or regulation number: **CE Code 2-100 Marking of Equipment**

Question: What standard of marking are you accepting?

Recommendation: The bar needs to be raised for marking of equipment, particularly breakers in residential panelboards. Use of “General” and “lights and receptacles” to describe circuits needs to be replaced with a more specific identification, particularly for circuits requiring AFCI protection.

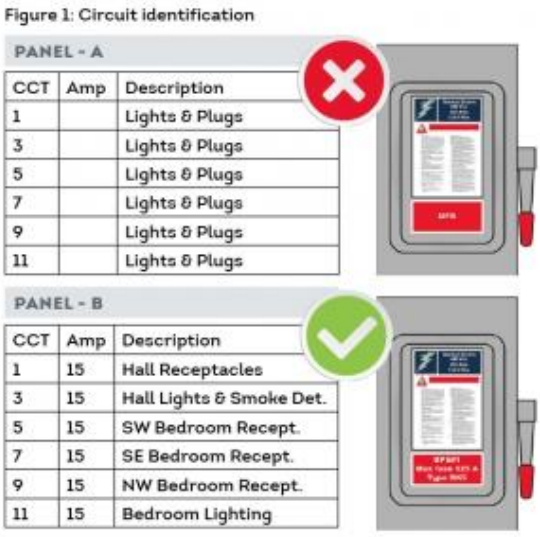
Background Information:

This article is from the July 2016 edition of Electrical Business Magazine.

CE Code Rule 2-100 “Marking of equipment“

July 07, 2016 By Nansy Hanna

Figure 1: Circuit identification



PANEL - A

CCT	Amp	Description
1		Lights & Plugs
3		Lights & Plugs
5		Lights & Plugs
7		Lights & Plugs
9		Lights & Plugs
11		Lights & Plugs

PANEL - B

CCT	Amp	Description
1	15	Hall Receptacles
3	15	Hall Lights & Smoke Det.
5	15	SW Bedroom Recept.
7	15	SE Bedroom Recept.
9	15	NW Bedroom Recept.
11	15	Bedroom Lighting

Figure 1

Equipment marking contributes to the safety of electrical installations by identifying switches and breakers so that circuits can be de-energized, allowing for the timely and accurate identification of circuits so that loads are not inadvertently de-energized; and providing workers with the means to de-energize circuits more conveniently, reducing the likelihood that a worker will engage in unsafe work practices.

And yet, over the past year, our inspectors identified more than 4000 defects related to the marking of electrical equipment.

All circuits in electrical installations should be described accurately with as few words as practical. For example, it is not acceptable to only mark circuits as “lights” and “plugs”. The room number(s) where the circuit is present should be provided, for example; or, for residential installations, a description of the area to which the circuit supplies, such as basement, living/dining room or bedroom (Figure 1). Particular circuits need to be properly identified, such as stove, washer, dryer, microwave, dishwasher, outside receptacle.

The CE Code requires distribution points, circuit breakers, fuses and switches to be marked in a conspicuous location and in a legible manner to indicate which portion of the installation they protect or control. Additionally, where specific fuse types are required (e.g. Type P, Type D, HRC Form 1), the fuse type shall be shown with the permitted maximum fuse rating.

A key requirement contained in Rule 2-100 for marking electrical equipment addresses concerns regarding the safe use and operation of installations by requiring “other markings necessary to ensure safe and proper operation” as indicated in Subrule (m).

This Subrule, however, is rarely applied because of its vagueness, so let’s consider an application of this Subrule with other markings that can increase safety. A good example relates to new Rule 4-004(23), where service conductors for a single dwelling are permitted to be reduced based on the calculated load. In a 100A single-dwelling service, for instance, #4 AWG copper conductor is permitted to be installed as a service conductor based on an 89A calculated load.

Were the panel marked with a warning “Caution! 89A Maximum Load”, would it increase safety? Yes, because it would alert the consumer to consider the loading capabilities of the service before adding considerable loads, such as hot tubs or electric vehicle charging stations.

Generally, the requirements contained within Rule 2-100 “Marking of equipment” help support compliance with other CE Code requirements with regard to the proper use and maintenance of an electrical installation, as they provide individuals with valuable information regarding the characteristics of an installation.

Conference Conclusion:

It was recommended that there is definitely an opportunity to raise the bar relative to appropriate markings on all electrical systems but in particular for breakers in residential panelboards. Use of “General” and “lights and receptacles” to describe circuits needs to be replaced with a more specific identification, particularly for circuits requiring AFCI protection. SCO’s can work with the contractors to improve marking with no further action required.

Agenda Item: **2017-16**

Code or regulation number: **ABC 9.36 Energy Efficiency**

Question:

Do buildings constructed to the prescriptive requirements of this ABC section need to have plastic gasketed boxes rather than steel boxes with poly hats?

Can non-metallic boxes be hung by running a screw through the box side or top or must they be supported only by the moulded hanger brackets?

Recommendation: for information

Background Information:

9.36.2.10. Construction of Air Barrier Details

5) Where the *air barrier system* consists of flexible sheet material, all joints shall be
a) lapped not less than 50 mm,
b) sealed (see Appendix A), and
c) structurally supported.

additional requirement

7) Penetrations by electrical wiring, outlets, switches or recessed light fixtures through the plane of airtightness shall be constructed airtight
a) where the component is designed to provide a seal against air leakage, by sealing the component to the air barrier material (see Appendix A), or
b) where the component is not designed to provide a seal against air leakage, by covering the component with an air barrier material and sealing it to the adjacent air barrier material.

Make sure they are installed using only the hanger brackets not screws through the boxes

Conference Conclusion:

This issue was circulated for information and discussion. It was noted that for non-metallic boxes the factory hanger brackets must be used, with no screws through the boxes used to mount the box. That would put holes in an air tight product and not support the box as intended by the manufacturer. Rule 30-302 (6) indicates rigid PVC boxes are not to be used for the support of luminaires unless marked. It was noted that there are no ratings or markings on non-metallic boxes for use with luminaires, and non-metallic boxes we are seeing are not made of rigid PVC. No further action was recommended.

Agenda Item: **2017-17**

Code or regulation number: **ABC Part 7 commercial kitchen requirements**

Question: Where do the rules for lighting (particularly covering lamps) in commercial kitchens come from?

Recommendation: for information

Background Information:

ABC 2006

7.5.1.7. Lighting

1) Lighting outlets with fixtures shall be installed to provide illumination not less than 550 lx in areas of a *food establishment* where food is prepared or utensils are cleaned.

2) Lighting outlets with fixtures shall be installed to provide illumination not less than 330 lx in all areas of a *food establishment* other than those referred to in Sentence (1).

3) Light fixtures serving areas where food is prepared or processed shall be constructed or located to prevent contamination of food by broken glass in the event that a bulb or tube breaks.

ABC 2014 has removed these and now references other regulations:

Part 7
Plumbing Services and Health

7.4.1. Food Establishments

7.4.1.1. General

1) In addition to the requirements of this Code, a *food establishment* shall be designed and constructed to be capable of meeting the requirements of the food regulations made pursuant to the Public Health Act.

The Public Health Act has 2 regulations:

- Alberta Food Regulation
- Alberta Food Retail & Food Services Code.

Alberta Food Regulation:

Commercial Food Establishments, General construction requirements: “equipped with lighting that is adequate in intensity to enable the sanitary operation and maintenance of the food handling areas”

Alberta Food Retail & Food Services Code

2.2 General Premises Design and Construction Specifications

2.7 Lighting

a) Lighting and lighting fixtures should be designed to prevent accumulation of dirt and be easily cleanable.

b) Food establishment should be supplied with sufficient artificial light to ensure the safe and sanitary production of food, and facilitate cleaning of the premises. Unless otherwise specified, the minimum lighting intensities should be:

i) 110 lux (at a distance of 89 cm (3 ft.) above the floor) in walk-in coolers, dry food storage areas, and in all other areas and rooms during periods of cleaning;

ii) 220 lux (at a distance of 89 cm (3 ft.) above the floor) in areas where fresh produce or packaged foods are sold or offered for consumption; areas used for handwashing, warewashing, and equipment and utensil storage; and in toilet rooms; and

iii) 540 lux at the surface where a food handler is working with unpackaged potentially hazardous food or with food utensils and equipment such as knives, slicers, grinders or saws where employee/worker safety is a factor.

c) Except as otherwise specified, lighting fixtures should be shielded with shatterproof coverings in areas where there is exposed food, equipment, utensils, linens or unwrapped single-service and single-use articles. Shielded lighting is not necessary in areas used only for storing food in unopened packages if:

i) the integrity of the food packages cannot be affected by broken glass falling onto them; and

ii) the food packages are capable of being cleaned of debris from broken glass before the packages are opened.

d) Infrared or other heat lamps should be protected against breakage by a shield surrounding and extending beyond the bulb so that only the face of the bulb is exposed.

Rationale
Adequate lighting promotes cleanliness by facilitating the identification of unclean areas. Shielding of lights to prevent the contamination of food from glass fragments in the event of breakage is an essential public health protection measure.

Conference Conclusion:

It was noted that the requirements that were listed in ABC 2006 have been removed and other regulations are now referenced in the ABC 2014. The Public Health Act has 2 regulations – Alberta Food Regulation and Alberta Food Retail & Food Service Code that explains how commercial cooking facilities are to be constructed. This was provided as information and no further action was recommended.

Agenda Item: 2017-18

INFORMATION - Recall underway for improperly marked cover plates

The yellow packaged Vista cover is identical to a blue packaged Ortech product as both have identical construction and have the same patent numbers molded into them. The only thing different is the Vista product has a sticker on the front that indicates it as EXTRA DUTY. A request for investigation into the extra duty marking on this product was submitted with UL in 2016. On Jan.16, 2017 a phone call was received from UL indicating it has been confirmed that this product not only is never been approved to carry the extra duty marking, it also failed the testing that would allow it to carry that mark.

From the manufacturer's website – "Notice for Extra Duty Weatherproof Cover: The weather proof cover plate is not authorized to bear the "Extra Duty" rating so if you bought any of our Extra Duty Weatherproof Covers during the year of 2016, please stop using them and contact us"…..

Conference Conclusion:

This was circulated as information.