



MINUTES OF THE ANNUAL TECHNICAL CONFERENCE – FEBRUARY 5, 2021

A. Called to Order and Chairman's Address

The meeting was called to order by the Conference Chairman Larry Cantelo at 8:30 a.m. The Chairman welcomed all delegates and guests to the 25th Annual Technical Conference of the Electrical Inspectors Association of Alberta (EIAA). All attendees were thanked for their participation due to the unforeseen challenges due to COVID 19 and thanks specifically to Safety Codes Council and Katie Pfalzgraff for helping us host the event online.

It was announced that the EIAA Annual General Meeting will be held immediately following the conference.

B. Safety Codes Council Update

Kris Schmaltz, Administrator for the Master Electricians Program was introduced and welcomed to the conference.

A presentation was shown on screen on what's new at the Council. (Attached)

C. Master Electricians Working Group Update

Glen Hedderick provided an on-screen presentation on behalf of the Master Electricians Advisory Committee. (Attached)

D. Farm Services Working Group

Glen Hedderick provided an on-screen presentation on behalf of the Electrical Sub Council (Attached)

E. CE CODE Working Group

Glen Hedderick provided an on-screen presentation on behalf of Scott Basinger (Attached)

F. Provincial Electrical Administrator Update

Clarence Cormier, Electrical Administrator, was welcomed and provided presentation on screen.



G. Electrical Sub-council (ESC) Update

Gerry Wiles, ESC Chair, was introduced and provided an on-screen presentation. (Attached)

H. AEUC Working Group

Brian Townsend, Chair of the Alberta Electrical Utility Code Working Group was introduced and provided an on-screen presentation. (Attached)

I. Hazardous Locations Working Group

Does not exist anymore

J. Technical Agenda Items

Clark Redden led the agenda items submitted for discussion.

2021-02: 2018 CE Code 2-024 Medium Voltage Terminations

Question/enquiry:

This submission topic is intended for discussion for equipment installed under section 36 In general, to meet 2-024 and our electrical code regulation, there has to be equipment standards in place in Appendix A and Certification bodies / inspection bodies that are willing to use them for approval. If not, then an SCO could ask for engineering involvement under a variance. In essence the province is asking SCO's to sign off on engineering reports for unapproved equipment under rule 2-030 rather than introducing a province wide variance for uncertified or approved equipment.

Background information was included in the conference package.

Recommendation from proponent: Province Wide Variance

DECISION: Should be a site specific variance and accepted through an engineer
The matter was deemed as discussion only at this time. No further action was assigned.

2021-03: 2018 CE Code 10-100 Objectionable passage of current over a grounding conductor

Question/enquiry:

This rule states "there shall be no objectionable passage of current over a grounding conductor".



Based on the current installations in Alberta this rule cannot be met. How are jurisdictions dealing with or interpreting this? Based on discussion on this topic, how do we move forward?

Background information was included in the conference package.

Recommendation from proponent: Submit a rule change to Part one to expand on this rule where single point grounding is not used to allow for some (how much?) current on the grounding conductor or recommend change the way we install services in Alberta.

DECISION:

Scenario 1 - Single Point grounding would be the ultimate situation however until Utilities allows this there is really no real guaranteed solution.

Scenario 2 – There are different options as to how to meet the requirements.

Ken Hood has agreed to send a proposal to Part 1.

2021-04: 2018 CE Code 16-300 – 16-350 Power over Ethernet

Question/inquiry:

1. Who can install?
2. Rules for installation (wiring methods)? Section 16 does not provide provision for wiring methods for POE. Cat 5e/6 is not listed in Section 12 would this be non-metallic sheathed cable?
3. If ran in a raceway, how is pipe fill determined?
4. How are the various jurisdictions dealing with this?

Background information was included in the conference package.

Recommendation from proponent: For information only - For Discussion

DECISION: The matter was deemed as discussion only at this time. Larry Cantelo to provide some information on an article he has prepared. (which is attached)

Section 12 Standata was referred to

2021-05: 2018 CE Code 2-024 Use of Approved Equipment; 2-026 Powers of Rejection; 4-006 Temperature Limitations

Question/enquiry:

This agenda item is to raise awareness of a new Hot Tub control enclosure (underneath hot tubs) with higher than usual conductor requirements for connection to these control enclosures.

There is a requirement for “only copper conductors rated at least 105°C but sized on the basis of 60° ampacity”.



Background information was included in the conference package.

Recommendation from proponent: Carefully review the conditions for conductor connections to this product in the installation instructions. These conditions are repeated on the cover of the control panel. Ensure 105°C rated conductors are installed for at least 1.2 m from the terminals, with ampacity chosen from the 60°C column. This insulated conductor is not readily available; installers may need to go to specialty cable suppliers.

DECISION: For Information only - The matter was deemed as discussion only at this time.

- Andrew Pottier was going to provide information in regards to the picture for reference.
- ECS was identified as one supplier where the 105 degree cable was available

Freezers in the Kitchen and Arcfault requirements

Clarence Cormier verified the Standata was meant strictly for a Freezer in the Kitchen and not other locations in the home.

Section 26 Standata was referred to

2021-06: 2018 CE Code 10-708 Equipotential bonding conductor size

Question/enquiry:

Can a person run a #10AWG bonding conductor in the walls where it is concealed & has mechanical protection provided by location?

Background information was included in the conference package.

Recommendation from proponent: For discussion

DECISION: Michael Chledowski will send a proposal to Part 1

2021-07: 2018 CE Code 4-032 (4) & (5)

Question/enquiry:

High leg services. Some are still around, and awareness seems low, as they are very old and rare systems. How are AHJs handling this issue when they arise? The code seems a bit cryptic on this. Do either of these subrules define an open delta system?

Has anyone seen a panel that is built like this?

Will a 3 phase panel with no neutral bus in the consumer compartment, with a single phase panel pulled from the three phase panel be acceptable? From a splitter?

Background information was included in the conference package.



Recommendation from proponent: For discussion and awareness.

DECISION: The matter was deemed as discussion only at this time. No further action was assigned.

2021-08: 2018 CE CODE 4-004 (7) & 12-900 Auxiliary Gutters

Question/enquiry:

1. Can it be confirmed that a long metal enclosure placed within a couple of meters above a panel is considered an Auxiliary gutter not a wireway.
2. What de-rating factor is to be used when more than 30 conductors are installed? I.e. If an auxiliary gutter contains 50 conductors, Using Table 5c what Factor is to be used?
A) 50-30 = 20 conductors. Table 5c – 7-24 conductors 0.7 correction factor or
B) 50 conductors. Table 5c – 43 conductors and up 0.5 correction factor.
3. Engineers and contractors have been asking if metal barriers can be used to make compartments to section off sections of an auxiliary gutter to maintain no more than 30 conductors. Can barriers be used to achieve this? If so, are there any specifics to how this is accomplished. I.e. does the barrier have to be tight fitting or can there be air gaps between the barrier and walls of the gutter. Does the barrier have to have a certain thickness, etc.?

Background information was included in the conference package.

Recommendation from proponent:

Provide clarification on what an auxiliary gutter is as there is some confusion between the differences of an auxiliary gutters and wireways.

Provide clarification on how de-rations are to be done on auxiliary gutters.

DECISION:

Question 1 - an auxiliary gutter and wireway definitions verify what they are and this type of installation wouldn't fall under either

Question 2 – the amount of current carrying conductors is what you use to derate

Question 3 - an auxiliary gutter and wireway definitions verify what they are

The matter was deemed as discussion and information only at this time. Larry Cantelo and Jeremy Waterfield to work together for a proposal to Part 1 for an interpretation.

2021-01: 2021 CE CODE Section 18 and Seals



Question/enquiry:

Major changes in Section 18 Hazardous Locations, specifically “Seals” and high level summary of a few other major changes.

Background information was included in the conference package.

Recommendation from proponent: Update on Changes coming in new code

DECISION: The matter was deemed as discussion only at this time. No further action was assigned. Tim Driscoll presentation attached

K. Old Business/Agenda items

2020 unfinished business

2020-08: Rule 26-254 (3) & Rule 26-256 (4)

Question/enquiry: Transformer calculation with only primary over current device. There is an easy way to calculate primary and secondary conductor size.

Background information was included in the conference package.

Recommendation from proponent: Make a submission to CE Code Part 1 to add a new Rule 26-254(3) that would read: Where a value not exceeding 125% of the rated primary current of the transformer as specified in Sub rule 1) does not correspond to the standard rating of the overcurrent device, the next higher standard rating shall be permitted, provided that the secondary conductor in amperes is not less than the overcurrent rating in amperes multiplied by the ratio of the primary to the secondary voltage.

DECISION: It was suggested that this is already address in sub-rule 2 and that perhaps just further clarity is needed in Appendix B. Ken Skitch, City of Calgary Electrical Inspection will make a submission to CE Code Part I. [Skitch]

Further information relating to this topic is available in an article published by Steve Douglas in the IAEI Magazine—<https://iaeimagazine.org/magazine/features/transformer-conductors-and-overcurrent-protection/>

2021 update- CE code has modified this rule in the 2021 code as follows.

26-256 Conductor size for transformers (see Appendix B)

4) Where the transformer overcurrent protection is more than 125% of the rated



primary or secondary current in accordance with Rule 26-250 1) or 2) or 26-254 3), the primary and secondary conductors connected to the transformer shall be protected in accordance with Rules 14-100 and 14-104.

DECISION: This subject can now be considered closed

2020-11: CE Code 10-612

Question/enquiry: We should discuss this rule – which we no longer call. It is being modified next code cycle.

Background information was included in the conference package.

Background information:

10-612 Bonding conductor connection to electrical equipment

- 5) In the case of metal-enclosed systems where bonding is provided by the metal enclosure, and a device attached to the enclosure has a bonding terminal, a bonding conductor shall be installed to bond the device to the enclosure.
- 6) A bonding conductor connection to the bonding terminal of a device shall be installed such that disconnection or removal of the device will not interfere with, or interrupt, the continuity of the bonding conductor.

Subrule 5 was discussed by the Electrical Sub-Council, and a request for a Province wide variance has been submitted for this rule.

Recommendation from proponent: This rule will be modified for the next CE Code and the request for STANDATA outlining this issue will go forward to AMA to cover installations under the 2018 CE Code.

DECISION: It was reported that this has already been submitted to AMA for consideration and no further action was assigned.

2021 update – update to the 2021 CE code has been updated –

Subrule 10-612(5) has been modified with subrule 5 being deleted and a new appendix B item added to the 2020 code

~~10-612-(5) In the case of metal-enclosed systems where bonding is provided by the metal enclosure, and a device attached to the enclosure has a bonding terminal, a bonding conductor shall be installed to bond the device to the enclosure.~~

New note Rule 10-612 3)

CSA C22.2 No. 42 *General use receptacles, attachment plugs and similar wiring devices*, requires that receptacles be connected directly to a bonding conductor. For some other devices, such as switches, the bonding connection is permitted to be made via the mounting screws to the device enclosure. CSA C22.2 No. 18.2



Nonmetallic Outlet Boxes requires that the mounting screw termination point of a device enclosure be electrically connected to a bonding means within the nonmetallic device enclosure. Installers should consult the manufacturers instructions for proper installation of wiring devices.

DECISION: This subject can now be considered closed

2019 unfinished business

2019-02: Section 18

Question(s): Excerpts of a proposed change to Part 1 were provided. Should similar wording be put into a STANDATA now vs waiting for the next code cycle?

A proposal has been submitted for Appendix B Section 18 to clarify “Factory Sealed” or “Seal Not Required”. The CSA Standards are updated, and the term Seal Not Required is being removed from the marking requirements. However, existing approved equipment may still have this marking. Rationale was provided regarding the need for a secondary seal for conduit installations.

The CE Code 2021 accepted proposed change is to add the following to the Appendix B note for Rules 18-104 and 18-154 after the 1st paragraph:

Some equipment may include markings such as “FACTORY SEALED” or “SEAL NOT REQUIRED” as permitted by CSA Standard C22.2 No. 30 *Explosion-proof enclosures for use in Class I hazardous locations*. These terms apply to conduit installations only.

The markings “FACTORY SEALED” or “SEAL NOT REQUIRED” are used interchangeably and indicate that the termination enclosure for the equipment is isolated from ignition capable components by an internal factory seal or that the equipment incorporates devices that have been assessed as to not produce arcs, sparks, or high temperatures.

Equipment marked “FACTORY SEALED” or “SEAL NOT REQUIRED” in Zone 1 applications

- For conduit installations, an explosion seal is not required.
- For cable installations an explosion seal is required.

Equipment marked “FACTORY SEALED” or “SEAL NOT REQUIRED” in Zone 2 applications

Because equipment that is not ignition capable [see 18-150 2) a)], and terminations housed in non-hazardous location enclosures [see 18-150 2) c)] are permitted in Zone 2



locations an explosion seal for conduit or cable is not required per 18-154 1) and 4) respectively.

DECISION: It was agreed that this will be brought to the Electrical Sub-Council for consideration of an Information Bulletin STANDATA to mirror the wording that will be included in Appendix B of the CE Code 2021.

2020 update: It was reported that this is still with the ESC. It was further clarified that the proposed wording into the 2021 CE Code was accepted and will be included in the upcoming code. Standata is expected for guidance in the interim.

2021 update: A Standata will not be issued as this information is now available in the 2021 CE Code

This subject could now be considered as closed

2019-07: Table 5D Current Rating Correction Factors Clarification

Question(s): Part 1: Table 5D covers up to six (6) cables horizontally in ventilated and ladder-type cable trays, what if there are more than six (6) cables, what is the correction factor?

Part 2: Table 5D shows current rating correction factors where spacings are maintained. Is this in reference to 4-004(8)?

Part 3: Table 5D indicates it is current rating correction factors 'where spacings are maintained' in ventilated and ladder-type cable trays' yet there is correction factors listed for two (2) layers of cables. How can you install two layers of cables with 25-100% spacing? Doesn't the second layer contact the first layer?

An in-depth discussion was held regarding the submission. Consensus was reached that this be referred to the ESC.

DECISION: The submitter will provide further details and recommendations for consideration by the Electrical Sub-Council.

C22.1-18 Rule 4-004 and Table 5D

Table 5D shows the current rating correction factors where spacings are maintained for insulated conductors or cables laid horizontally in ventilated and ladder-type cable trays, up to a maximum of six.

What are the current rating correction factors where insulated conductors/cable spacings are maintained in ventilated and ladder-type cable trays where there are more than 6 insulated conductors or cables?



I request that the wording in rule 4-004 and Table 5D be changed to indicated the current rating correction factors where spacing is maintained where there are more than 6 insulated conductors/cables laid horizontally in ventilated and ladder-type cable trays.... Trent Tavson

2020 ACTION—Trent Tavson emailed the additional details and recommendations for consideration by the Electrical Sub-Council to Ken Forbes, EIAA Secretary for further follow up. [Forbes]

2021 update Ken Hood has submitted this item to the ESC. No further updates at this time but is at the Electrical Sub-Council

2019-11: CE Code 10-210 Grounding connections for solidly grounded ac systems supplied by the supply authority (see Appendix B)

Question(s): Where do we ground the identified conductor at each outbuilding on a farm site?

It was reported that 10-208(2) has been removed from CE Code 2018 and there is now confusion regarding where to ground each outbuilding. An in-depth discussion was held, and clarification was provided regarding the removal of this Rule in 2018. An overview was provided regarding the practices of various utilities and demarcation. It was noted that there is no definitive answer as this could be managed in several different ways depending on where the consumer service is. It was clarified that a working group is looking at demarcation and it was suggested their work be completed before making any recommendations. It was suggested that this work be supported.

DECISION: Michael Chledowski will work on a submission to the ESC for consideration of issuing a STANDATA for clarification. [Chledowski]

It was proposed that as an organization, EIAA go on record to support one single point grounding, as a result of the deletion of Rule 10-208(2) from the CE Code 2018 and that this support be submitted to the ESC and the CECWG/AEUC Working Group on demarcation. This proposal was supported with 26 in favour and 3 opposed.

DECISION: This proposal will be brought forward to the ESC.

2020 update: Chledowski to make submission to ESC in 2020

2021 update: ESC has passed information received from the working group on farm services on to AMA requesting a draft Standata on this subject matter. This is currently in progress.

2017 unfinished business

AG 2017-03



Code or regulation number: CE Code 64-112 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.”

2017 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.



2018 update: Question 1 remains unresolved

Question 2 is resolved in 2018 CE Code with (d) revised to add the words overcurrent devices in source circuits.

- c) notwithstanding Section 14, 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 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 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

2019 update: No change from 2018 update

2020 UPDATE—Part I SN 4564 is still being reviewed, but issues currently being addressed by industry. Note from Steve Douglas- industry changes will have a 100% amp rated breaker available. The matter remains outstanding.

2021 update: Rule 64-112 has been updated in the 2021 CE Code as follows

64-112 (e) notwithstanding Items c) and d), the sum of the ampere rating of the overcurrent devices shall be permitted to exceed the rating of the busbar or conductor where means are provided to limit the input and output current of the interconnected systems to ensure the busbar or conductor cannot be overloaded.

This subject could now be considered as closed

AG 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.

2017 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.

2018 update: There has been no change in any of the rules in 2018 CE Code. Reason – unknown.

2019 update: Subject 4184 is still with section 6 subcommittee

2020 update: This is expected to be voted on at CE Code part one Feb 2020

2020 ACTION— This is expected to be voted on at CE Code part one Feb 2020.

2021 update: Rules 6-300 and 6-310 have been revised in the 2021 CE Code as follows

6-300 Installation of underground consumer's service conductors

- 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 12-102 3); or
 - b) a single- or multi-conductor cable for service entrance use below ground in accordance with Rule 12-102 3), provided that
 - i) the installation is in accordance with Rule 12-012.
- 2) Raceways entering a building and forming part of an underground service shall be sealed and shall
 - a) enter the building above ground where practicable;
 - b) be suitably drained; or
 - c) be installed in such a way that moisture and gas will not enter the building.
- 3) Consumer's service conduit connected to an underground supply system shall be sealed with a suitable compound to prevent the entrance of moisture or gases.

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

- Consumer's service conductors shall be without joints between the point of connection and the service box or equivalent consumer's service equipment, except that a splice or joint shall be permitted where
- a) a conductor transition is made to meet the requirements of Rule 4-006 or Rule 8-102.; or
 - b) it is made by means of
 - i) a clamp, lug, or bolted connection in a meter mounting device or by means of a connector designed for the purpose at the service head if exposed wiring is used in accordance with Rule 6-302 2); or
 - ii) a joint underground in accordance with Rule 12-112 5), where such a joint is required to repair damage to the original installation

This subject could now be considered as closed



AG 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?

2017 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.

2018 update: No information

2019 update: No information

2020 update: Ken Forbes to submit to ESC

2021 update at Electrical Sub-Council and formal request coming

2016 unfinished business

2016-07: CE Code 2015 – 4-004 – this agenda item is dealing with underground installation configurations in the Diagrams (such as D11) and the corresponding cable ampacity tables. There are numerous questions surrounding the diagrams, in particular are these meant to be concrete encased? This is still with the Electrical Sub-council.

2018 update – this item remains at the Electrical Sub Council working group. Note that no changes are in the 2018 CE Code and no clarification of the drawing has been provided. However there are multiple references and examples throughout the code book that indicate these are not concrete duct banks but direct buried raceways.



2019 update – this item remains at the Electrical Sub Council working group. Note that no changes are in the 2018 CE Code and no clarification of the drawing has been provided. However there are multiple references and examples throughout the code book that indicate these are not concrete duct banks but direct buried raceways. What is really important for using the diagrams and associated ampacity tables - if the installation is not in accordance with the assumptions given and the Appendix B diagram configurations, IEEE 835 ampacity

2020 UPDATE—The matter is still under review and being worked on by the CECWG.

2021 update: the matter is still under review and being worked on by the CECWG

L. Other Business and Adjournment

February 11th & 12th 2022 is the tentative date for next years Conference.

Paul Chang and Larry Cantelo to do a presentation at the end of March for Electrical Inspectors and subsequent Building Codes.

The meeting was adjourned on Friday, February 5, 2021 at 1:40 pm.



EIAA

ELECTRICAL INSPECTORS ASSOCIATION OF ALBERTA 2004

