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UFV STUDENT BUILDING ENJOYS A TOUCH OF STATUS

Project team delivers award-winning "central hub". P.12

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IPEX



from the **EDITOR**

ANTHONY CAPKUN

EVs today, electrified roadways tomorrow

The electrical industry is one of the most exciting places to be. Being a bit of a science geek to begin with, I love reading and hearing about research into new technologies—as well as existing tech that continues to expand—that may have a potentially significant impact in our industry and the marketplace.

Specifically, I consider possible business opportunities for electrical professionals, and then share them with you.

The slow but steady adoption of electric vehicles in Canada has led to electrical opportunities for building out the required charging infrastructure.

For example, with the goal of helping certified electricians receive training in the installation and maintenance of EV charging stations, British Columbia is providing \$50,000 through the Clean Energy Vehicle Program to subsidize course fees for participants in E2Inc's Electric Vehicle Infrastructure Training Program. (Learn more at tinyurl.com/jgsdzmy)

So that opportunity is even subsidized! But many potential EV buyers still don't like the idea of waiting around for their vehicle to charge, even when connected to a DC quick-charger. So what's the next big thing for EVs?

"Wireless power transfer is a paradigm shift in electric vehicle charging that offers the consumer an autonomous, safe, efficient and convenient option to plug-in charging," said David Smith of Oak Ridge National Laboratory, which recently proclaimed a "world's first" 20kW wireless EV charging system that achieved 90% efficiency at 3X the rate of the plug-in systems commonly used today.

Those researchers say they are already looking ahead to their next target—50kW wireless charging—which would match the power levels of commercially available plug-in quick chargers. Providing the same speed with the convenience of wireless charging could increase consumer acceptance of EVs. (Read the full story at tinyurl.com/juf4v8z)

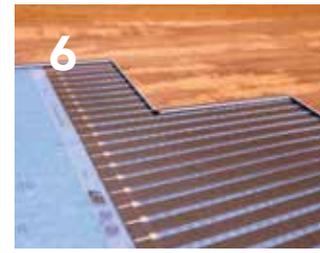
Smith explains the ultimate goal behind their wireless charging research is to create a "stepping stone toward electrified roadways, where vehicles could charge on the go".

So while the widespread creation of electrified roadways may seem years away, is it too early to start thinking about how you may fit into this new paradigm? Considering the speed with which technology advances these days, I don't think so. **EB**

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12 UFV student building enjoys a touch of Status

The new student union building on the University of Fraser Valley campus sports a double triangular overhang, ceilings and walls panelled in cedar, and windows so numerous you'd think you were in a greenhouse. But for Status Electrical Corp., work on this structure meant being on the receiving end of a Gold Award from the Vancouver Regional Construction Association.

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What's your work truck/van missing? From effortless ladder racks to two-door tonneau covers to secure shelves and drawers of every size, we discovered plenty of new products at the Work Truck Show to really deck out your vehicle.

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Hubbell Canada LP (hubbell-canada.com) reports its codes & standards manager, **Keith Rodel**, has been selected to receive CSA Group's John Jenkins Award for 2016. Congratulations! Rodel participates on numerous committees with CSA Group, Electro-Federation Canada (EFC), the Standards Council of Canada (SCC), CANENA, the National Electrical Manufacturers Association (NEMA), Underwriters Laboratories (UL) and the International Electrotechnical Commission (IEC). The John Jenkins Award is CSA's most prestigious, recognizing an individual's "distinguished service in the development, advancement and application of voluntary standards".



John Brooks has been appointed **Techspan Industries'** regional sales manager (Electrical) for the Kitchener/Waterloo and Southwestern Ontario region. He possesses 23 years of electrical industry supplier and distribution sales experience, says the company, and can be reached at john.brooks@techspan.ca or 519-404-5108. Techspan Industries has been supplying wire management products to electrical, industrial and automotive distributors across Canada since 1989.



Leviton Manufacturing of Canada Ltd has appointed **Shari English** its Network Solutions' national director. English will report to Gaby Massabni, vice-president of distribution. Leviton notes English brings over 20 years of experience in the data field and, until recently, held the position of national sales manager of DataComm at Wesco.

Anamet Canada (www.anametcanada.com) has appointed **Roney Marketing** (now led by **Brent Norrey**) as its agent for Ontario (www.roneymk.com). Anamet is a manufacturer of electrical flexible conduit and fittings based in Frankford, Ont.

Magic Lite (www.magiclite.com) has appointed **Christian Galoiu** sales engineer/quality assurance manager, and **Martin Leguerrier** national sales manager. Both will be based in Burlington, Ont.



Mick Nealon of Calgary, Alta. will have to make some space in his toolshed. The electrician (who works with New West Electric, www.newwestelectricltd.com) scooped up the grand win for the 2015 **Milwaukee Tool** Innovation Tour, receiving a \$5000 M18 Milwaukee workshop (www.milwaukeetool.ca). Congrats!



Doug Pittman has been hired as sales manager for the machine services division at **Shermco Industries** (www.shermco.com). Pittman previously worked as a product line sales manager of aftermarket variable frequency drives for Eaton, according to Shermco.

Standard Products (www.standardpro.com) has welcomed three new account managers. **Sonya Howe** joins the sales team for B.C. and Alberta. **Akashdeep Singh** (Rocky) is the new account manager for the Ontario market and **Jessica Theriault** joins the Montreal office.



Gianluca Arcari, previously head of **CSA Group's** Standards organization (www.csagroup.org), has become VP, special advisor to the CEO. His vacancy will be filled by the COO, **Magali Depras**.

SurgePure Canada (www.surgepure.ca)—a manufacturer of industrial, commercial and high-end residential surge protection—has appointed **Cascadia Sales** (www.cascadiasales.ca)—headed up by **Keith, Ryan and Chris Maguire**—as its agent for British Columbia. **EB**

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ELECTRICAL BUSINESS

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Important clarification on *approved* electric heat

The article "Electric heat can add value to clients... and your bottom line" (EB February 2016, p.22) caused a bit of a stir in electric floor-heating circles, ranging from the illegality of the product shown in the photo to claims of false allegations.

Rather than wade into fray, we contacted Ark Tsisserev—immediate past chair of the CE Code Part I committee and Gerry Lemieux—sitting member of the Section 62 technical committee—to provide us with expert guidance.

They explain:

We would not place too much emphasis on the photos in the article, as these photos always have to be reviewed in conjunction with installation requirements.

Your follow-up might just state that this article relates to the installation of "approved" (see CE Code definition "approved" below) radiant heating panels in accordance with the applicable requirements of Section 62 of the CE Code.

We do, however, have *one specific concern* regarding the following wording in the article:

The main components of an electric radiant heat system are the heating panels with the heating elements incorporated into a thin flexible film or a mesh or mat combined with a temperature sensor installed in the floor, and a GFCI thermostat on the wall for local activation and control.

It should be noted that there is no requirement in the CE Code for GFCI protection of the thermostat, but there is a requirement for ground fault protection of ungrounded conductors that supply electric heating panels or electric heating cable sets. Rule 62-116 "Ground fault protection" (see Appendix B) states:

- (1) Ground fault protection shall be provided to de-energize all normally ungrounded conductors of electric heating cable sets, heating panel sets, and fixed infrared radiant heaters of the metal-sheath glowing element type, with a ground fault setting sufficient to allow normal operation of the heater.
- (2) Notwithstanding Subrule(1), in



NEW BUSINESS ON THE LOAD SIDE OF THE JUNCTION BOX
Electric heat can add value to clients... and your bottom line / JACK BOESCH

Here is a potentially worthwhile suggestion to bring to your client when discussing a residential renovation, addition, or entirely new construction: installation of an electric radiant heating system in the floor that provides supplemental heating in a room. Indeed, this is an amenity that is quickly becoming popular among homeowners. It can add welcome value both to your clients and your bottom line.

Here are some attributes and benefits of an underfloor electric radiant heat system:

- Warm the floor with an extra bit of comfort and comfort underfoot.
- Draft free, unlike a hot air heating system.
- No noisy fans and no filters to change.
- Hypoallergenic.
- No moving parts, no maintenance.
- Because the heat is evenly distributed, there is the same amount

of comfort throughout the room wherever the mats are laid: no hot and cold spots that might be found with a hot air system or baseboard heating.

- Silent, without the whooshes of warm or cool air blowing through baseboard pipes or radiators, and no clicks or clunks of expanding pipes.
- Because the installation is hidden under the flooring, there is no negative aesthetic impact. In a new space, the underfloor heating will not interfere with the placement of doorways and windows, or with decorative window treatments.
- Can provide welcome supplemental warmth in rooms with cathedral ceilings or in lofts.
- Great option for spot heating near the kitchen sink or in the laundry area.
- The main components of an electric radiant heat system are: the heating panels with the heating elements incorporated into a thin flexible film or a

mesh or mat combined with a temperature sensor installed in the floor, and a GFCI thermostat on the wall for local activation and control. Line voltage and low-voltage systems are available. Both require connection to power in the home by a licensed electrician. Because of this requirement, the installation of the entire system can be a natural fit for electrical contractors who are already in their clients' homes performing other electrical work.

For an electrical contractor, installation can be easy and straightforward. Look for a system that comes factory-configured as a roll-out mat with wires embedded in the mat or as a heated film with leads already attached. The installation requires only rolling out the mats, running the leads to a junction box, and making the final connection.

Also, consider film systems that employ heated conductive ink strips in parallel as opposed to wire systems; the latter are wired in series, so when one wire is damaged, the entire system stops functioning. Film systems continue to operate in the same manner that parallel-wired Christmas tree lights survive a burnt out bulb here and there.

Supplemental radiant heat is especially welcome on a room-by-room basis in remodeling projects, additions and new construction. It's an attractive option in small spaces such as kitchens, bedrooms, entryways and kids' bedrooms. It is also a smart install in larger spaces such as home theaters, family rooms where toddlers often play on or close to the floor, and rooms at the far end of heating zones where a traditional air-heating system might be less effective.

LOOK FOR options that do the heavy lifting for you. Some can be installed in just minutes.

12 ELECTRICAL BUSINESS February 2016

industrial establishments where continued circuit operation is necessary for safe operation of equipment or processes, and conditions of maintenance and supervision ensure that only qualified persons will service the installed systems, ground fault detection shall be permitted in place of the requirements of Subrule(1).

- (3) Notwithstanding Subrule(1), ground fault protection shall not be required for heating cable sets and panel sets connected to a Class 1 extra-low-voltage power circuit, where (a) the Class 1 extra-low-voltage power circuit is supplied from the secondary of an isolating transformer having no direct electrical connection between the primary and secondary windings; (b) the isolating transformer is supplied from a branch circuit operating at not more than 150 volts-to-ground; and (c) the Class 1 extra-low-voltage power circuit is not grounded".

There is a *substantial difference* between GFCI of a Class A type protection and ground fault protection, and each of these types of protection is defined in the CE Code accordingly. The requirement for temperature control is shown in Rule 62-120 "Temperature control devices":

- (1) Temperature control devices rated to operate at line voltage shall have a current rating at least equal to the sum of the current ratings of the equipment they control.
- (2) Temperature control devices that can be turned automatically or manually to a marked OFF position and that either interrupt line current directly or control a contactor or similar device that interrupts line current shall open all ungrounded conductors of the controlled heating circuit when in the OFF position".

The use of "approved" equipment is paramount. It should be noted that CE Code Rule 2-024 mandates the following:

2-024 "Use of approved equipment" (see Appendix A)
Electrical equipment used in electrical installations within the jurisdiction of the inspection department shall be approved and shall be of a kind or type and rating approved for the specific purpose for which it is to be employed."

The CE Code defines "approved" (as applied to electrical equipment) as follows:

- (a) equipment that has been certified by a certification organization accredited by the Standards Council of Canada in accordance with the requirements of (i) CSA standards; or (ii) other recognized documents, where such CSA standards do not exist or are not applicable; or (b) equipment that conforms to the requirements of the regulatory authority (see Appendix B).

You should always check with your Authority Having Jurisdiction (AHJ) for the AHJ-specific criteria for installation of radiant heating panels. **EB**

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Senior's fatality nets Pro-Teck Electric "largest fine"

For faulty electrical work that left one man dead, ESA (www.esasafe.com) reports 1137749 Ontario Ltd.—dba as Pro-Teck Electric—was fined \$537,500 in a Niagara Falls, Ont., court—the largest fine in the history of electrical contractor licensing in Ontario.

NOTE: Electrical Safety Authority (ESA) doesn't want you to confuse this Niagara Falls Pro-Teck with a separate LEC in Richmond Hill with a similar name. The two are not related.

ESA explains the facts of the case: in April 2014, an elderly man fell on the floor in the bathroom of his Niagara-on-the-Lake home where Pro-Teck (a Licensed Electrical Contractor [LEC]) had installed an in-floor heating system. The man suffered 2nd- and 3rd-degree burns from the overheated floor, and eventually succumbed to his injuries in hospital.

An ESA investigation revealed the floor system's heat sensor had not been installed, and the heating system was wired to an incorrect voltage level.

Pro-Teck Electric pleaded guilty in April 2015 to various safety charges.

Nedco permanently closing its Lloydminster branch

In a letter to its suppliers, Nedco (west.nedco.ca) announced it was permanently closing its Lloydminster, Alta. branch earlier this year.

Nedco says it will continue to serve the area from its Edmonton branch, adding it will also have a representative from Westburne (also a division of Rexel Canada Electrical Inc.) "who will contact you on a regular basis to assist you with all your electrical needs".

Westburne (west.westburne.ca) has a branch in Lloydminster at 5113B 63rd Street.

Lighting Science debuts "bold new brand identity"

Lighting Science (www.lsgc.com) recently unveiled a "bold new brand identity" to "more accurately communicate the mission of the company and its products".

The brand relaunch coincides with the expansion of the company's line of "biologically tuned" LED products, including the Sleepy Baby, GoodNight and GoodDay bulbs that, according to the company, emit pre-sleep and awake & alert spectrums of light, respectively. The Rhythm Series has been relaunched as the HealthE Series.



The redesigned visuals reflect the brand's scientific heritage, including the company's R&D in creating a lighting system for NASA that regulated the circadian rhythms of astronauts on the International Space Station. The new brand identity includes a logo, a redesigned website and new packaging.



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The CHP system at Campbell's Toronto plant is officially unveiled March 31, 2016.

PHOTO R. FRANCOEUR

Campbell's stirs up own power with CHP

Campbell Company of Canada (www.campbellsoup.ca) officially unveiled its combined heat & power (CHP) system at its Toronto plant recently, in partnership with Toronto Hydro (www.torontohydro.com). The company says it's their only site in North America to boast this technology.

CHP was the next step in becoming more sustainable, said president Ana Dominguez, as now the facility can produce enough energy to power itself.

CHP is a technology that uses a natural gas-fuelled engine to drive a generator, which produces electricity and heat. The heat generates steam, which is used to cook soup. The company claims its CHP plant now supplies up to 93% of its annual steam requirements.

The power output of the generator is 4.6MW, and the steam is generated at a rate of up to 90,000 lb/hour, at 165 psi.

Toronto Hydro helped make CHP a reality by arranging \$5 million in incentive funding through the saveONenergy program. The total cost was \$12 million.

The facility remains connected to the grid and Toronto Hydro said it will continue to supply a small amount of electricity on a daily basis, as well as full power when necessary, making system repairs easier.

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Digsafe pleaded guilty; Hydro Ottawa fined \$225,000

"Hydro Ottawa does not agree with the verdict or the penalty," said the utility upon being found guilty and fined \$225,000 following a trial after one worker was killed and two others suffered injuries back in March 2012.

In the March 2012 incident, Ontario's Ministry of Labour reports a subcontractor's workers were installing new hydro poles and wires under existing energized lines. Three workers were excavating a hole when the boom of a work vehicle came within 3 metres of a powerline.

All three workers received electrical shocks, with one worker (Barry Robertson) succumbing to injuries in hospital. An MoL investigation followed.

After a trial, Hydro Ottawa Ltd. (as a constructor) was found guilty of violating three sections of the Construction Projects Regulation.

MoL adds the subcontractor (and

co-defendant) in question—Digsafe Inc. of Ottawa—already pleaded guilty in relation to the incident back in November 2013, and was ordered to pay a fine of \$125,000.

Hydro Ottawa (hydroottawa.com), meantime, says it is "reviewing its options in regards to this matter".

Alberta Electrical League offers CE Code 2015 training



David Mansfield, primary instructor. Photo from AEL Learning Expo 2016, Red Deer.

COURTESY MAGNA IV.

Alberta Electrical League (AEL) has partnered with Magna IV Engineering (magnaiv.com) to offer training on the Canadian Electrical Code, 2015 ed.

The one-day course, instructed by David Mansfield, will cover changes in the CE Code to keep you current with safety standards for the installation and maintenance of electrical equipment, specifically covering the 2015 CE Code and Electrical Installations at Oil & Gas Facilities (2013 ed.).

You will be provided with proof of attendance and a Certificate upon successful completion of a competency exam. The course is currently pending recognition by the Alberta Safety Codes Council for Safety Codes Officers and Master Electricians.

For more information, visit albertaelectricalleague.com.

5-Year licences for Ontario Contractors & Masters commence this July

Effective July 1, 2016, Ontario's Electrical Safety Authority (ESA, www.esasafe.com) is implementing 5-Year licences for Licensed Electrical Contractors (LECs) and Master Electricians (MEs), meaning you provide documentation to ESA once every five years BUT continue to pay annually.

In each of the other four years, LECs/MEs will self-declare their documentation is valid, as well as pay the annual renewal fee.

Of course, all licensees are subject to a random audit at some point in the 5-year renewal cycle. Audits may also be

conducted when ESA receives a complaint that a licence-holder is failing to meet licence requirements or does not have appropriate documentation.

If you have already been issued renewal forms for a licence expiring up to July 1, 2016, you can use those forms. Remit payment for only one year.

ESA will send further instruction with the relevant forms that are sent prior to your licence expiry date. Questions? Contact ESA.Licensing@electricalsafety.on.ca or call 877-372-7233.

Not enough of us are driving EVs, but EMC has a plan

Five years after they were introduced to the Canadian market, Electric Mobility Canada says there are close to 18,500 electric vehicles (EVs) on the road, but this is not enough.

Canada has half the number of EVs per inhabitant compared to the States, says EMC (emc-mec.ca). For them, it is time "to establish a strong national policy to bring EVs from an early adopters' market to a mass market" in Canada.

That conclusion is drawn from EMC's "National Roadmap for Accelerating the Deployment of Electric Vehicles in Canada", which recommends priority strategies and actions to increase the share of EVs in Canada.

The first measure is to raise public awareness for EVs by implementing a national resource centre and a test driving program, in conjunction with a national awareness campaign.

The second measure would include federal financial incentives to EV buyers to increase their return on investment by at least 1.5 years and make a significant impact on EV adoption.

Finally, the purchase and installation of 150 DC fast-charging stations is recommended to complete a national EV highway.

In addition, with an increasing number of EVs in car-sharing fleets, EMC says there is a need to test a "newly developed business model" within a municipality, "and to extrapolate key elements and findings to other Canadian cities".

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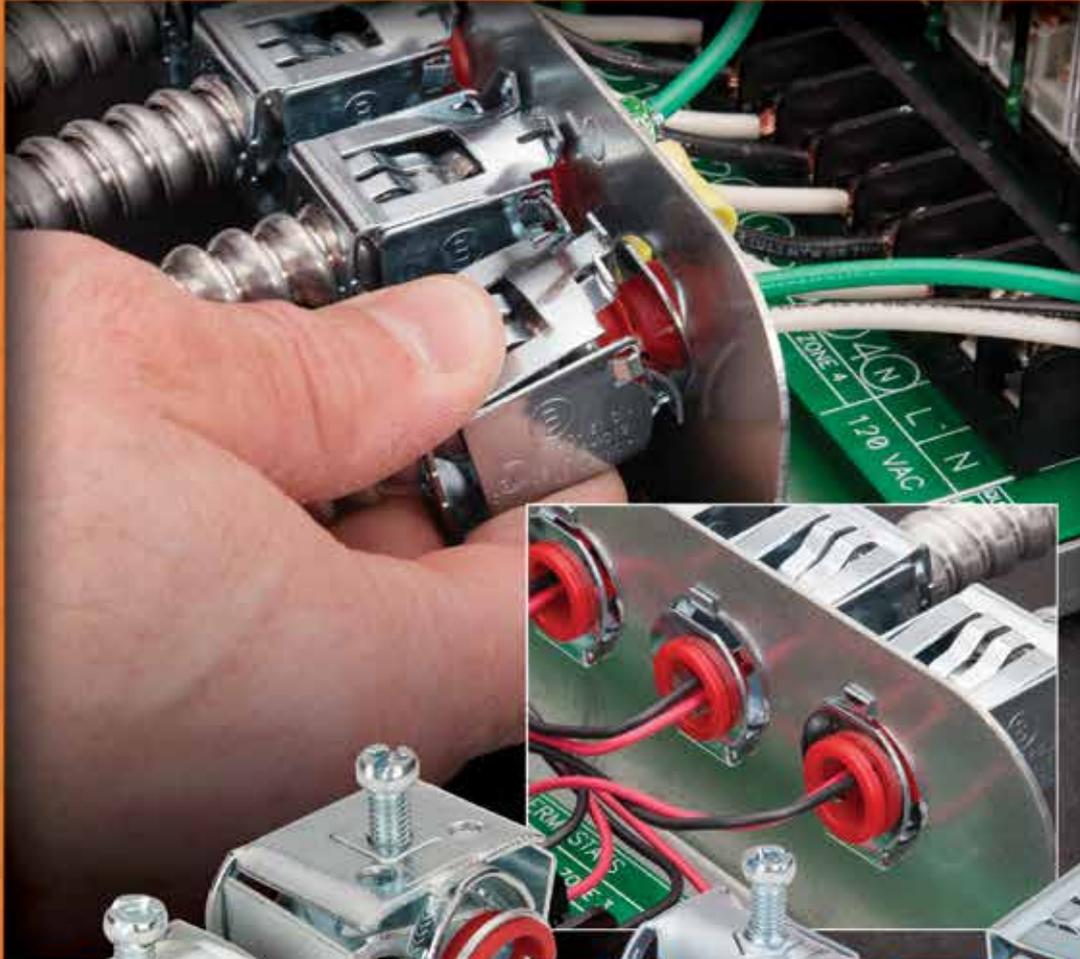
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BC Hydro awards contract for Site C turbines



PHOTO COURTESY GOVERNMENT OF B.C.

The Site C Clean Energy Project in British Columbia reached another milestone recently with the awarding of the turbines and generators contract to Voith Hydro (www.voith.com)

The contract has a value of about \$470 million, according to the province, and includes the design, supply and installation of six vertical axis, Francis-style turbines, six generators and associated equipment.

Each turbine-generator unit has an output of 250,000 hp, which is equivalent to about 600 Ford Mustang GTs at maximum power, the province notes, and at maximum discharge, all of the turbine-generator units could fill an Olympic-sized swimming pool in one second.

Voith Hydro, through the Construction Labour Relations Association, says it has negotiated a labour agreement with the Bargaining Council of British Columbia Building Trades Unions, which represents construction craft unions in B.C. The labour agreement includes participation from 10 BC Building Trades Unions for the installation of the turbines and generators for Site C.

The government notes the turbines and generators contract is included within the \$8.335-billion cost estimate for Site C.

BCSA BC Electrical Code 2015 revisions and bulletins

The 2015 BC Electrical Code Change took effect February 29, 2016. In connection with this, BC Safety Authority (safetyauthority.ca) has issued and revised several directives and information bulletins.

The new directives include:

- BC Electrical Code Section 26 (Installation of Electrical Equipment) D-EL 2016-01
- BC Electrical Code Section 2 General Rules D-EL 2016-02
- BC Electrical Code Section 6 - Services and Service Equipment D-EL 2016-05
- Determining Minimum Service or Feeder Conductor Size for Single Dwellings and Single Dwelling Units of Row Housing or Apartment and Similar Buildings D-EL

2016-06

- BC Electrical Code Section 4 - Conductors D-EL 2016-04
 - BCEC Section 76 - Temporary Wiring D-EL 2016-03
 - BC Electrical Code Section 14 - Protection and Control D-EL 2016-04
- For more, see tinyurl.com/hfr37v9.

Nova Scotia widens apprenticeship opportunities with procurement pilot

The Nova Scotia government is launching a procurement pilot to encourage businesses to hire apprentices.

The pilot was developed in partnership with the Construction Association of Nova Scotia (www.cans.ns.ca) and requires that contractors bidding on provincially funded construction projects take part.

The pilot will focus on current school construction projects only and applies to contractors whose portion of the bid equals or exceeds \$100,000. Exceptions will be made for smaller companies and those whose work doesn't fall within a designated trade.

Contractors must show proof of participation in the apprentice system to perform work on these projects. They can apply for such proof by visiting the Nova Scotia Apprenticeship Agency (www.nsapprenticeship.ca).

\$607-million Hydro One Brampton merger moves forward

With net proceeds helping fund its priority infrastructure projects, Ontario is moving forward with the merger of Hydro One Brampton (www.hydroonebrampton.com) with PowerStream, Enersource and Horizon following municipal shareholder approvals.

With the various municipal councils all voting to proceed with the merger, Ontario has executed a Share Purchase Agreement with PowerStream, Enersource and Horizon. This merger will create the second-largest electricity distributor in Ontario, says the province.

The purchasers have agreed to pay \$607 million for Hydro One Brampton. The transaction and creation of the new company are subject to post-closing adjustments and regulatory approval from the Ontario Energy Board, anticipated to occur late this year. All net revenue gains from the sale will be dedicated to the Trillium Trust, says the province, to help fund investments in transit, transportation and "other priority infrastructure." **EB**

EMC & NRCan's Energy Summit

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EFC Ontario Region Golf Day

Electro-Federation Canada
May 26, Ajax, Ont.
 Visit www.electrofed.com

ECAA Training Day

Electrical Contractors Assoc. of Alberta
May 27, Edmonton, Alta.
 Visit www.ecaa.ab.ca

EFC Annual Conference

Electro-Federation Canada
May 31-June 3, Halifax, N.S.
 Visit electrofed.com

Alberta Safety Codes Council Conference

June 1-3, Banff, Alta.
 Visit tinyurl.com/h8x8uux

Canadian Commtech West Show

June 1-2, Calgary, Alta.
 Visit www.commtechshow.com

Apprenticeship Conference

Canadian Apprenticeship Forum
June 5-7, Vancouver, B.C.
 Visit caf-fca.org

Skills Canada

June 5-8, Moncton, N.B.
 Visit skillscanada.com

Electric Utility Fleet Managers Conference

June 5-8, Williamsburg, Va.
 Visit www.eufmc.com

Philips Cables Alumni Reunion

June 11, Brockville, Ont.
 Visit phillipscablesreunion.weebly.com

EASA Convention

Electrical Apparatus Service Assoc.
June 12-14, Toronto, Ont.
 Visit www.easa.com

EB Indicates EB will be there.

Visit EBMAG.COM for an extensive list of upcoming industry events.

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Made in USA 

FIXTURE BOX

FOR ANY SIDING TYPE

Arlington's ONE-PIECE fixture box is the fastest, easiest way to install light fixtures or receptacle on siding.

- Easy to install before or after siding
- Ground clip for fixture installations; NM cable connector
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8141FGC Patented

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No extra cover to lose or store



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FOR CLASS 2 LOW VOLTAGE WIRING

LV1 for Existing Walls



Nail-on LVN1 New Construction



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We offer other low voltage brackets for specialty applications.



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View Video for LV1



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FIT SEVERAL CABLE SIZES



IN MULTIPLE SIZES

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8415 2" trade size

Catalog Number	Trade Size	Cable O.D. Min	Cable O.D. Max	Wire Bundle O.D. Min	Wire Bundle O.D. Max	Conductor size # of Conductors* (AWG/KCMIL)
8412	1"	.780	1.120	.660	1.000	6/3, 6/4, 4-3, 4-4, 2-3, 2-4, 1-3
8413	1-1/4"	1.000	1.460	.870	1.370	2-3, 2-4, 1-3, 1-4, 1/0-3, 1/0-4, 2/0-3, 2/0-4, 3/0-3
8414	1-1/2"	1.360	1.770	1.250	1.590	2/0-4, 3/0-3, 3/0-4, 4/0-3, 4/0-4, 250-3, 250-4
8415	2"	1.700	2.200	1.550	2.050	250-4, 300-4, 350-3, 350-4, 500-3
8416	2-1/2"	2.100	2.700	1.950	2.400	500-3, 500-4, 600-3, 600-4, 750-3
8417	3"	2.500	3.300	2.350	3.000	600-4, 750-3, 750-4

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FLUSH-TO-THE-WALL MOUNTING OF FLAT SCREEN TVS

Made in USA 

PLASTIC TV BOX™

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TVBU505GC POWER and LOW VOLTAGE BOX with CED130 cable entry device

for NEW WORK ...or RETROFIT

CED130 CABLE ENTRY DEVICE

DVFR2GC POWER and/or LOW VOLTAGE COMBINATION BOX

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- Plugs and connectors stay inside these Listed boxes without extending past the wall
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- Non-metallic box with paintable white trim plate
- RETROFIT Mounting wing screws pull box against wall
- Includes ground clip; optional covers available

TVBU505GC TV BOX™ For Power and Low Voltage

2-GANG

DVFR2GC IN BOX™ w/ separator for Power and/or Low Voltage



View TV BOX Video

Patented. Other patents pending.



3-GANG TVBU507GC



4-GANG TVB613GC

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Patented 

* Examples of 3- and 4-conductor cables accommodated.

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Arlington

UFV STUDENT BUILDING ENJOYS A TOUCH OF STATUS

Project team delivers award-winning “central hub” / BY RENÉE FRANCOEUR



There’s a showstopper on the University of Fraser Valley campus: the new student union building (SUB). Edgy, with its double triangular overhang, ceilings and walls panelled in cedar, and windows so numerous you’d think you were in a greenhouse, school staff says the building brings the campus together.

Similarly, key to this centre’s success was general Mierau Contractors Ltd. and Status Electrical Corp. coming together to solve layout challenges and work their magic behind the scenes.

“Students love it. It’s always busy there,” said Craig Toews, UFV’s executive director of campus planning and resource development. “We have a lot of students who live at home and drive to class, so this is a space for them and a space outside the classroom that fosters learning... There’s lots of natural light, wood finishes, a coffee shop to add to the atmosphere.”

A joint venture between the Abbotsford, B.C.-based university and its Student Union Society, the \$17.3-million facility was designed by Chernoff Thompson Architects. Construction started September 2013 and a grand opening was celebrated two years later.

Last year, both Mierau and Status won Gold Awards from the Vancouver Regional Construction Association (VRCA) for their work on the 46,700-sf SUB.

“Since construction was completed, I’ve been to several events at the centre and it is clearly evident that the facility is a beehive of activity and has created a strong central hub,” says Kevin Mierau, president.

The challenges of a student union building

Stephen Diebolt, human resources & safety manager for Status Electrical (Abbotsford, B.C.), says the job “went really well”, and the only challenges that sprung up were working with so many windows and a few design changes.

“The sole largest challenge in our opinion was the large building layout changes that occurred within the first three months of the project,” Mierau says. “These changes had an impact to all three floors and affected the electrical scope in all areas. Physical layouts were changed; in some cases, the purpose of the rooms was changed. This impacted the sequencing of work, ordering of materials, manpower requirements and co-ordination of trade interaction, too.”

Mierau goes on to note Status was a “very professional and diligent presence during construction,” and “proved themselves to be very proactive in finding challenges with enough lead time to allow solutions that allowed continued progress.”

Status had 15 crewmembers onsite during the peak construction, with zero lost time accidents.

Thanks to the abundance of windows, SUB has minimal wall space,

Diebolt explains, which meant Status “had to get creative” when it came to hiding the wiring and conduit, working with the ceiling and other interior structures. Additionally, the floors are made from Bailey Metal Products’ Comslab, a “combination of deep steel decking and a concrete cover slab that have cured together and bonded structurally”. This means drilling had to be avoided in certain areas or only done at very specific times, Diebolt notes.

Comslab is a quicker install and lower-cost foundation, Toews adds, and is compatible with all bearing systems. Base assemblies also achieve sound attenuation values up to STC 61.

Because it fits... or should

Status also had to plan for a smaller electrical room than expected, which posed its own challenges in getting everything to fit.

“It wasn’t the largest building we’d done, but it has new technologies and the school wants it done at minimal cost... but to still look beautiful and still have the electrical system compact,” Diebolt says.

Spacing challenges also arose, in part, due to the needs of the Thermenex system—the hub for thermal energy exchange throughout the building, installed in the electrical/mechanical room.

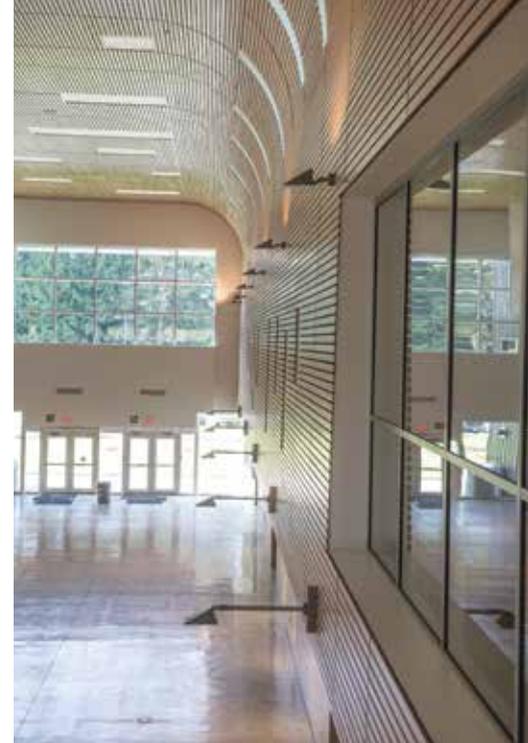
“This is a revolutionary type of heating,” Toews says. “It’s like a geo-exchange system but, rather than in the ground, it’s right in the build-

46,700

Square footage of student union building on the UFV campus

15

Status Electrical crewmembers onsite during peak construction



▲ The LEED Gold Student Union Building (SUB) officially opened last fall at the University of Fraser Valley in Abbotsford, B.C.

▲ The school and student union wanted an airy, natural feel, says UFV's Craig Toews.

ing... It reuses the building's heat and is very efficient with its controls."

A British Columbia company, Thermenex's patented thermal gradient header is a pipe with a hot end, a cold end, and a controlled thermal gradient between. It forms part of all of the building's heating and cooling sub-loops, creating a single hydronic piping system with multiple and variable temperatures. It's this header that functions as a hub for thermal energy exchange.

The TIAC SV 3.0 Thermenex also requires pumps, control valves and wiring among its components—all of which Status had to consider.

Vying for another distinction

Boasting a number of environmental elements (e.g. thermal retention, green roof, solar hot water heating), the student union building was designed to achieve LEED Gold certification from the get-go, Diebolt notes.

The electrical design did not contribute a great deal to the LEED point requirements, he adds, "because the UFV student union did not have the budget to go with the type of fixtures and control that would be required". As such, most of the fixtures are standard-type, not LED, and the lighting is controlled primarily with occupancy sensors and time clock schedules through the mechanical



▲ Status Electrical says it had 15 crewmembers onsite during peak construction.

2
Gold VRCA Awards
garnered

DDC (direct digital control) system.

"It's one thing to run power; it's another thing to be environmentally conscious about it in a tight space on a busy campus," Diebolt says. Nonetheless, SUB also sports solar panels to help out with its electricity needs.

"We had quite a bit of surplus power in a transformer in an adjacent building," Toews says. "So we had to figure out what the loads of this building were projected to be, and [SUB] was actually designed with a one-third expansion capability, so that power provision had to be built into the formula. Basically, we're drawing power from a neighbouring transformer from a previous capital investment, so it's really efficient."



▲ It was a tight fit getting everything in the small electrical room, says Status, including the thermal energy exchange system.

When it comes to LEED and energy, Toews notes the lessons learned here will be applied in UFV's next endeavour: a university *village* that connects the campus and surrounding community together in a digital hub.

"We were on time and on budget," Diebolt says. "And the trades really all pulled together. We shared delivery sites... there wasn't much room to work with for material storage. We were part of a good team."

"While we are proud of the construction of the building itself—the materials, aesthetics, functionality, efficiency—it is equally gratifying to see a building being utilized to its fullest and enjoyed by so many," adds Mierau. **EB**



LEVEL UP

ANDREW HOUSTON

Take your business & team from chaos to control

Have you ever had to run a large-scale job with a poorly structured set of plans? Or perhaps you've had to run a job without any plans at all?

I've been there, and it turned out to be a disaster. To this day, I wonder why my boss took the job in the first place. As I recall, it was a lighting job that cost the company a fortune, but not because we didn't want to do a good job or the crew was lacking in skill; the fact that no one had any clue what we were supposed to be doing before we even got started is really what created all the mayhem.

The general contractor verbally instructed us every day as to where he wanted the fixtures, changing his mind as often as a baby changes diapers. The special material required was ordered incorrectly, resulting in an 8-week lead-time. The layout changed at least three times, which ran the job more than double the estimated time; it needed 30% more material than quoted, and nobody was happy with the final product.



You need a set of plans that clearly defines the What, Who and When of how things are going to get done.

Whether you're running a job or a business, you need a set of plans that clearly defines the What, Who and When of how things are going to get done.

One of the biggest problems contractors have is that, with each job they run, a huge list of issues starts to pile up, and they don't know where to start to resolve them. These contractors spend all day acting as firefighters, putting one issue to

rest before jumping to the next. Because they're just applying bandages to problems, rather than coming up with long-term solutions via structure, order and plans, their list of issues just keeps getting longer and more complicated as time goes on.

If you don't sit down and create structure within your business and plans for your team, it could result in:

- Your team being lost and not even knowing where to start on each project.
- A team with zero accountability that cannot problem-solve on its own.
- Working more hours and losing the freedom to spend time doing the things you love.
- Having a business that isn't scalable because it's simply unable to grow beyond its current level.

Here are 5 Steps that will help you gain more control over your business:

Step 1: List all of the problems you have in your business. Get your entire team to share what isn't working for them, and have someone help you sort it out.

Step 2: Write a list of all the roles you have in your business e.g. foreman, electricians, apprentices, accounts receivable. Draw this up in a chart I've created for you called Contractor's Role Assessment Tool, which you can download at tinyurl.com/hcbvjob.

Step 3: Pick a problem, and assign it to one of the roles identified above. Do that with all the

problems on your list. This will shed light on the weakest-performing areas and roles, showing you what's causing the cracks in your business' foundation.

Step 4: Start fixing the weakest role first. Identify 2-3 improved results you want to see e.g. foreman ensures job is on schedule and in sync with what was quoted.

Step 5: Define the rules and create systems for each role. Using simple visual aids such as flowcharts, checklists, white boards and calendars generally create better outcomes.

When you have a tested and proved system in place for several weeks or months, and something goes wrong, you know who is to be held accountable. That said, you may have to tweak or change your systems over time to better complement your crew and business as they currently stand.

Having roles, results and rules laid out allows you to lead your team rather than boss them around, and keeps you from having to constantly run around resolving problems.

Looking back on that lighting project, we lacked structure, plans and order, and there was no one to lead the way. No wonder it ended in disaster!

Never forget how important it is to find the weak spots in your business and get to work creating systems that'll fix them and the issues they cause. You can take your business from chaos to control; it's all in how you lead your team and plan for a successful future. **EB**

Grade your clients

Tradie Tips with Andrew Houston

▶ "You may be surprised to learn some of the clients who you thought were As and Bs are actually Cs and Ds!" writes Andrew Houston in his April 2016 column "Kick your C&D clients to the curb". But how? In this quick episode of Tradie Tips, as in his column, Andrew discusses how to improve your business' report card by dropping your C&D-grade clients to make room for more A&B-grade ones. Visit tinyurl.com/gn85acj, where you can also download your free "Customer and Prospect Rating Matrix" tool.

Remember, visit tinyurl.com/hcbvjob to download the Contractor's Role Assessment Tool to help you start getting control of your business. If you'd like some help with the tool or just a quick chat, visit tinyurl.com/zkkpe6m to book a complimentary 30-minute chat, courtesy of your friends at Electrical Business Magazine.

Andrew Houston is the owner and founder of Profit for Contractors. He has been consulting to trades business owners for nearly a decade, helping them improve their business skills so they can achieve their personal and business goals. A graduate of George Brown College, Andrew achieved Industrial Controls Licensed Electrician as well as Electronics Engineering Technologist. Visit www.profitforcontractors.com.

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Highlights from the Work Truck Show 2016

What's your work truck/van missing? From effortless ladder racks to two-door tonneau covers to secure shelves and drawers of every size, we discovered there are plenty of new products to really deck out a vehicle at the Work Truck Show 2016, which EBMag attended earlier this year to report on all things work truck. Here is a roundup of some of the devices and systems that really caught our eye when it comes to storage options and other accessories. And be sure to visit EBMag.com for more photos from the show (tinyurl.com/j9bdqwu).

▶ Altec JEMS 4 Series is an engine's best friend

Altec Industries (www.altec.com) was showing off an update to its JEMS (Jobsite Energy Management System) line with the JEMS 4 Series targeted for utility work trucks.

"Altec has been developing and testing this product with our partner ZeroRPM," said market manager Mark Greer. "Many of our customers were actually involved in the development and configuration of this new offering."

Greer said JEMS 4—which took home the show's Green Award—enhances engine life, reduces engine maintenance (by automatically eliminating unneeded idle time), and provides significant reductions in carbon footprint.

It features lithium-ion energy, engine-off cab heating & cooling and an electrified PTO (ePTO) for hydraulic power. The ePTO is an on-demand system that conserves energy by operating only with the activation of the upper or lower controller interlock, or by engaging the hydraulic tool circuit.

The JEMS 4 S adds 300 lb to a vehicle's weight and is equipped with Altec's Idle Mitigation System, which allows the vehicle to transition automatically from engine power to JEMS power whenever parked for a long time. The series has plug-in charge capability and can also charge via the vehicle's electrical system.

To see JEMS 4 in action, check out our video at tinyurl.com/hqqrkxvk.

▶ Tucking it in: Weather Guard's everyday truck boxes

Weather Guard (www.weatherguard.com) has two new series of truck boxes coming down the pipeline for 2016. Karolina Lernacinska, associate product manager, announced the Defender boxes offer "professional but affordable protection", and will be available at the end of May.



Altec's JEMS 4 features lithium-ion energy, engine-off cab heating & cooling and an electrified PTO (ePTO) for hydraulic power.



Weather Guard's Defender boxes will be available at the end of May.



The RedArmour series are coming to market this June

There will be 24 SKUs in five categories: saddle, low-profile saddle, lo-side and hi-side boxes, and chests. This series will feature break-in resistance Level 2 and come with a 7-year warranty. Colour options are Brite (aluminum) and Black.

In June, Weather Guard will also launch

the RedArmour series for "everyday protection" suited to "weekend warriors" as well as field pros. These products will feature pushbutton locks, as well as break-in resistance Level 3 and four SKUs covering two categories: chests and saddle boxes. They will come in Brite with a 2-year warranty.



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Proportional Panel Convactor (PPC)



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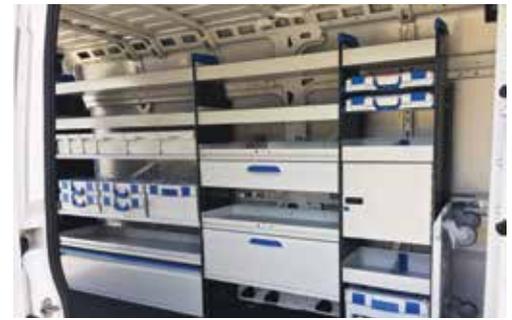


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▲ So many options with the Staxx shelves.

PHOTO COURTESY SORTIMO.

◀ The Flexx rack can handle big weight.

PHOTO COURTESY SORTIMO.

▶ Maxxing and Staxxing with Sortimo

It's even easier to keep those pesky cable caps organized and tie down the big tools with an expanded selection of storage options from **Sortimo by Knapheide** (sortimo.knapheide.com).

The company has added taller (68-in.) as well as narrower (20-in. wide) Shelf Staxx models, and introduced Flexx rack drop-down shelving with a load rating of 265 lb per shelf.

Also fresh off the assembly line: Maxx drawers. Mounted on 220-lb telescopic slides, these can be stacked side-by-side or atop one another and be positioned close to vehicle door openings for easier unloading and loading.

Protexx partitions are also new. Constructed of ABS thermoformed plastic, Sortimo says they are about half the weight of traditional steel partitions. They fit the contour of the B-pillar area of the van, which isolates the passenger area from the cargo area, and are available for the Mercedes-Benz Metris and

Sprinter, as well as the Nissan NV Cargo. Plus, they now come with sliding door versions.

The initial offering of sliding doors (due out later this year) will include the Ford Transit medium and high roofs, and the Ram ProMaster low and high roofs. Future releases will include the Sprinter and Cargo.

Take a Sortimo van tour with us at tinyurl.com/zlplpt2 and see what product managers recommend every electrical contractor should have on hand.



Ranger Design's new partition ups visibility as it's made from clear thermoformed ABS and polycarbonate. PHOTO R. FRANCOEUR.

▶ Ranger's Max View partition wins Innovation Award

Ranger Design's Max View Clear Top Composite safety partition made its debut at the WorkTruck Show and gained a plaque to boot, winning NTEA's Innovation Award for 2016.

Built from thermoformed ABS and polycarbonate, this product is "engineered to resist maximum impact," said sales manager Steve Milizia. Compared to its other models, Ranger (rangerdesign.com) says this rattle free partition is tighter-fitting for improved climate control. It also gives 180-degree rear visibility, reduces blind spots and has a contoured shape to allow full seat travel and maximum cargo floor space.

Plus, it's attached with a mounting acces-



Pierrick Olichon, left, and his team show off the 2016 high-roof ladder rack solution from Techno-Fab. PHOTO R. FRANCOEUR.

sory bar that allows for a variety of additions, such as a tool drawer.

The Max View is currently manufactured for the Ford Transit Connect, Mercedes-Benz Metris and Dodge Ram ProMaster City. See more in our video with Milizia at tinyurl.com/gu793uu.

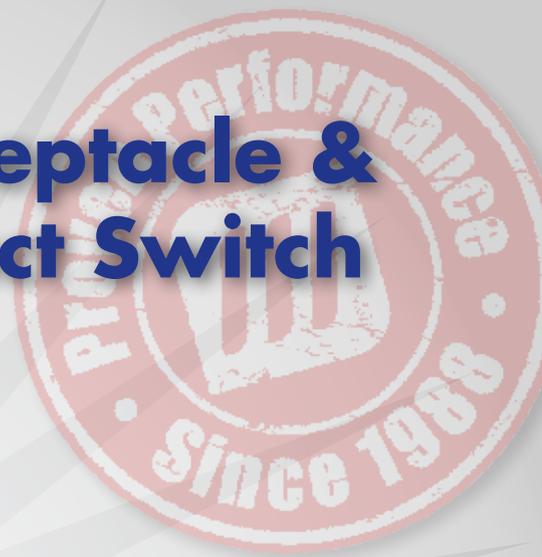
Techno-Fab swings ladders without the gas springs

We were fortunate to stumble upon Canadian company **Techno-Fab**, who showed us their new 2016 high-roof ladder rack solution (techno-fab.com).

Patent-pending, this system is made of anodized aluminum and works so smoothly and quickly, it "allows you to be more productive overall", said Pierrick Olichon, sales and business manager. He explained it operates in a single movement with 60-degree rotation—no gas spring or oil damper.

Techno-Fab is also releasing a one-size-fits-all side ladder rack and a pickup rack with 600-lb front and rear load capacity, retractable rear rack and multiple anchor points. There is no welding or drill installation for this model. **EB**

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Universal's Everline adds 347V option



Universal Lighting Technologies has broadened its Everline LED vapourtight product offering with the addition of a 347V option. This option is designed with gasketed white fiberglass housing and stainless steel mounting brackets. Outputs range from 4400 to 11500 lumens for the 4-ft product and 8500 to 21800 for the 4-ft product, with input voltage of 347VAC.

UNIVERSAL
unvlt.com

Digital Lumens LightRules app

Digital Lumens' LightRules Mobile is a way to control and manage lighting settings from a mobile device or tablet. It allows for adjustments in a range of applications and saves "significant deployment costs by eliminating the need to install multiple wall switches and keypads", Digital Lumens claims. It works with the iPhone, iPad and iTouch running iOS8 or later.



DIGITAL LUMENS
www.digitallumens.com

Smart Vision Lights LE series



Smart Vision Lights' LE series of sealed lights includes rugged IP65-rated housing, strobe and constant operation capability, and extrusion T-slot mounting. The housings with internal driver are sealed to provide drip-proof/splash-proof protection, the company adds, and the aluminum design

provides maximum heat dissipation and ventilation to allow for pressure equalization. **SMART VISION LIGHTS**
smartvisionlights.com

Spaulding Arceos ARA3

The ARA3 from Spaulding Lighting replaces a 1000W HID luminaire with over 50% energy savings, according to Spaulding, and can be mounted up to 50 ft. It comes in three lumen options with backlight control, a variety of control options, and seven standard finishes: dark bronze, black, gray, white, platinum, red and forest green. **SPAULDING**
www.spauldinglighting.com



Jesco's ML1, ML2 LEDs



The ML1, ML2 modular luminaire are a new family from Jesco Lighting Group of aimable, dimmable recessed ceiling fixtures, with one to four LED modules. ML1 incorporates a single 20W high-output, two-step MacAdam COB (chip-on-board) LED, and ML2 has a single 15W COB. **JESCO**
www.jescolighting.com

Amerlux's Cylindrix III mini LED

Amerlux claims its Cylindrix III mini LED "delivers the lowest possible beam angle" due to a patent-pending optic. This 21W Cylindrix (also referred to as the C3 mini) features a "deeply recessed" single light source, an integrated, passively-cooled heat sink, interchangeable reflector optics (15-, 25- and 40-degree beam options), and accepts a range of control accessories. **AMERLUX**
www.amerlux.com

TACKLE THE CODE CONUNDRUM IF YOU DARE!

Answers to this month's questions in June's Electrical Business.

How did you do?

3 • Master Electrician **2** • Journeyman
1 • Apprentice **0** • Plumber!/?

Compiled by Ontario's Electrical Safety Authority
www.esasafe.com

QUESTION 1

Where receptacles of type 14-50R are installed on recreational vehicle lots, the CE Code requires them to be protected by a Class A type GFCI.

- a) True
- b) False

QUESTION 2

Where conductors are used in exposed wiring and are subject to corrosive liquids or vapours in a Category 2 location, they shall be of a type with corrosion-resistant protection and be located more than ___ m horizontally from floors, decks or stairs.

- a) 1.0 m
- b) 1.5 m
- c) 2.0 m
- d) 2.5 m

QUESTION 3

Rigid main contact conductors for an electrical hoist shall be supported so that there is an air space of not less than ___ mm between conductors.

- a) 16 mm
- b) 21 mm
- c) 25 mm
- d) 35 mm

ANSWERS Electrical Business, April 2016

Question 1

Manually operated, general-use switches intended for AC systems shall have an ampere rating not less than the current rating of the load when they are installed in branch circuits supplying non-inductive loads.

- a) True.** Rule 14-510(1).

Question 2

A Class I location is:

- a) an area that has flammable vapours.** Rule 18-004(a).

Question 3

For interconnection of power production sources, means of isolation shall be provided to isolate:

- c) All sources of supply.** Rule 84-026.

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CODE file

NANSY HANNA, P.ENG.

Grounding harmonization between Sections 36 & 10

Let's explore two changes for grounding requirements in CE Code 2015 that bring Sections 36 and 10 into greater harmony.

The first change sees Section 10 align with 36 for grounding conductor materials. In recent years, the high cost of copper has led to many incidents of theft of copper conductors and station electrodes. Inevitably, the question arose as to whether materials other than copper could be used for grounding and bonding purposes. Acceptable materials other than copper were always recognized in Section 36 for grounding purposes (with some conditions) so, in CE Code 2015, Rule 10-802 was revised to recognize other acceptable materials.

Subrules 10-802(2), 36-302(2)(b), 10-602 and 2-112 require that consideration be given for materials subject to corrosive environments. For example, copper conductor in contact with aluminum is subject to galvanic action; bare aluminum conductor in contact with masonry or earth is subject to corrosion.

Precautions should be taken to ensure that deterioration from corrosion of the intended material is minimized.

Based on this condition, the grounding connection using aluminum or copper-clad

aluminum conductor (bare or insulated) is not permitted to be in direct contact with the earth or with masonry. On the other hand, the use of aluminum or copper-clad aluminum grounding conductors for a connection to metallic water pipe electrodes—or to a metal structural frame of the building—can be permitted, provided the connection is not in a corrosive environment, and the clamp or connector is approved for both the grounding conductor and electrode material(s). These clamps and connectors are required to be marked “Al/Cu”.

Subsequently, all other rules in Section 10 that referenced No. 6 AWG Cu grounding conductor are amended to include No. 4 AWG Al as the minimum size for grounding conductor. For high-voltage installations, the current-carrying rating for the other material is required to be equal to or greater than that of the copper conductor specified in Rules 36-302 to 36-310.

The second change involves Section 36 aligning with Section 10 for grounding rod electrodes. The length and diameter requirements for ground rods were removed from Rule 36-302, so the designer of the station ground electrode must verify the selected diameter of the ground rod

Precautions should be taken to ensure that deterioration from corrosion of the intended material is minimized.

3 METRES

Minimum length of grounding rod electrode

is sufficient to comply with Rule 36-304 for each installation.

The diameter may vary depending on the material chosen. The minimum actual diameter value should be used in preference to nominal value in the validation of compliance. Based on certification standard requirements in Canada, a grounding rod electrode shall not be less than 3m (10-ft) long.

Based on this change (similar to Section 10), it is permitted to install ground rods less than 19mm (3/4-in.) in diameter for a high-voltage installation. Any size/material manufactured ground rods can be used, provided they are manufactured and certified to CSA C22.2 No. 41. The ground potential rise (GPR) calculations need to be based on the actual ground rod size and material installed—not the nominal size.

For 19mm nominal ground

rods made with different material (zinc-coated and solid stainless steel), the NEMA-GR-1 standard requires the actual size range to be 19.05mm to 19.43mm; the minimum diameter for copper-clad ground rods is 17.09mm (0.673 in.).

Grounding some typical high-voltage installations—such as pad-mounted transformers with a supply voltage of 27.6/16kV—using four ground rods with 19mm diameter (nominal) and 3m long has been proved to satisfy Rule 36-304 (limits GPR to 5000V). So, for these typical installations, there are now two options: either continue using grounding rods that are 19mm diameter (nominal) and 3m long, or provide a GPR for any other arrangement or electrode size to ensure Rule 36-304 is satisfied. **EB**

Nansy Hanna is the director for Engineering & Program Development at Electrical Safety Authority (ESA) where, among other things, she is responsible for product safety, code development, improving harmonization and alternative compliance, worker safety, and aging infrastructure programs. She is a LEED-Accredited Professional and a member of CSA CE Code-Part I, Sections 24, 32, 46, 50 and 64. Nansy can be reached at nansy.hanna@electricalsafety.on.ca.

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