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Electrical Business

SEPTEMBER 2010

A new revolution is on page 5.

Lost in (confined) space!

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The phenomenon of invisible electrical injury is real; its sufferers are real.

The Road to Recovery... from invisible electrical injury

We're all familiar with the horrific tragedy of electrical burn victims, but what about victims of invisible electrical injury, whose injury may also be life-changing and traumatic? To whom can they turn?

I am very pleased to announce EBMag has **gone live** with an important video production we've been working on called: "The Road to Recovery: Researching & Treating Invisible Electrical Injury at St. John's Rehab".

Earlier this year, in cooperation with sister publication Canadian Occupational Safety (www.cos-mag.com), EBMag visited St. John's Rehab and sat down with its chief medical officer, Dr. Joel Fish—as well as physiotherapist Vera Fung and occupational therapist Barb Panturescu—to learn more about the important work they do in the realm of invisible electrical injury.

At this point you may be asking yourself: "What the heck is invisible electrical injury?".

The victims of invisible electrical injury usually ask themselves the same thing, only it's more along the lines of: "What the heck is wrong with me?". You see, these victims don't display any obvious symptoms in or on their bodies. Instead, they'll get shocked at work one day, shake it off, and keep working; then, after several weeks, they'll start getting very tired early in the day, or they'll lose muscle strength very quickly over the course of their shift, or they'll start getting lost on the drive to work—a place they've been going to for months, even years.

But, looking at them, you wouldn't say anything was wrong with them. In fact, you might even be tempted to accuse them of *faking* these symptoms.

And while that might be true of some people, the phenomenon of invisible electrical injury is real; its sufferers are real; and bona fide medical experts like Dr. Fish affirm that it's real. This is why he and his team have devoted themselves to the study of the illness—to understand the underlying mechanisms, and to do something about treatment.

But I don't want to let the cat out of the bag: I really encourage you to watch this video. Go to our website, www.EBMag.com, and visit the Videos page, or simply type this link into your browser: bit.ly/bjdlMh. "The Road to Recovery" is among the most popular videos right now, and rightly so. Although it's not a feature-length movie, it is nonetheless an important documentary about a very real and misunderstood problem in our electrical industry.

After watching, encourage others to watch it as well. The better educated we are about invisible electrical injury, the better we can take care of ourselves, our comrades and employees. EB

On the cover and page 8

Lost in *(confined)* space!

Roundtable on confined space management

EBMag's sister magazine, Canadian Occupational Safety, hosted a roundtable on confined space, which was attended by occupational health and safety experts from across Canada, and they get into CSA's new standard, Z1006 "Management of Work in Confined Spaces".

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Independent operator the main basis for underground economy in Ontario

Independent operators are the basis of more than 80% of the underground economy in Ontario's construction industry. According to a report just published by the Ontario Construction Secretariat, the annual estimated revenue losses to the WSIB, tax system, Canada Pension Plan and EI system from underground practices in Ontario's construction industry from 2007 to 2009 was in the order of $1.4 billion to $2.4 billion.

Entitled "Underground Economy in Construction Costs Us All," the report asserts that—notwithstanding increases in enforcement by Canada Revenue Agency, the Ontario government and Workplace Safety and Insurance Board (WSIB)—underground practices remain a serious challenge for the construction industry in Ontario.

In the construction industry, the most important enabler of underground practices is the ability of contractors to improperly style their workers as 'independent operators' (i.e. subcontractors), says the report, rather than as employees. Construction employers who characterize their work force as 'independent operators' evade their obligations to provide WSIB coverage, and to make Canada Pension Plan (CPP) and Employment Insurance (EI) contributions.

Equally important, employers are not required to issue earnings statements (T-4 slips) to so-called independent operators. In turn, this sets the scene for widespread under-reporting of earnings. There can be no solution to reining in the underground economy which does not tackle the independent operator problem.

Three indirect indicators point to a continuation, or further embedding, of underground practices in Ontario's construction industry, continues the report. First, the share of independent operators in the employed construction labour force rose in 2009 to 22.2% from 19.7% in the prior year. Though lower than the peak of 24.2% in 1999, the trend is moving in the wrong direction.

Second, the ratio of cash-to-purchases by households increased sharply in 2009. The implication is that the 'cash economy' also increased in size.

Third, spending on residential renovations increased significantly. This sector accounts for around half of the underground economy in Ontario's construction industry.

The report recognizes that important efforts have been made by CRA, the Ontario government and WSIB to step up their enforcement efforts. This has had a positive impact. While the underground economy is still a major challenge for the construction industry, OCS' estimates suggest that the share of construction work that is carried out using underground practices has probably levelled off.

Enforcement appears to have stemmed the flow of new entrants into the underground economy, though it has not yet had a significant impact on those who already operate there. There is a risk that the introduction of the HST will cause an increase in the amount of underground activity. This is not anticipated to be a significant effect as it will chiefly apply to cash-based transactions in the residential renovation sector where the practice is already widespread.

The primary effect of the introduction of the HST on revenue losses will be to increase the amount of tax revenue that is lost from transactions that are already conducted on an underground basis. Had the HST been in effect, the losses to the provincial government would have been about $290-$375 million, the report concludes.

One of the most significant statutory changes is Bill 119, claims the report, which will extend mandatory WSIB coverage to independent operators and most executive officers. However, Bill 119 will not take effect until 2012. Consequently the impact of Bill 119 is not evident in these estimates of underground activity.

Bill 119 will have a significant impact, if it is effectively implemented, especially on the underground economy in the ICI sector. The ICI construction industry—and especially the unionized ICI construction industry—has a strong interest in ensuring effective implementation of Bill 119, says the report.

Bill 119's impact on the residential renovation sector may be diminished owing to a provision that exempts homeowners from requiring proof of WSIB coverage and also exempts them from liability for unpaid WSIB premiums related to work done on their premises.

The Ontario Construction Secretariat speaks for the unionized ICI (institutional, commercial and industrial) construction industry in Ontario. You'll find them online at www.iciconstruction.com, where you can also find the full report.

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CCAB BPA WORLDWIDE BUSINESS

Electric heating ban proposal withdrawn

Earlier we reported that EEMAC (Electrical Equipment Manufacturers Assoc. of Canada, www.electrofed.com)—along with its Electric Heating Section—had created a North American Electric Heating Coalition comprising over 15 companies whose goal was to stop the International Energy Conservation Code (IECC) Committee from banning the use of electric heating.

Led by EEMAC, the coalition countered the proposal, and the International Energy Conservation Code Committee recently withdrew their proposed change. Booyah!

The implication of this code change would have eliminated future markets for such equipment, resulting in untold millions of dollars in lost sales opportunities for our industry, explains EEMAC.

"We thank all members who banded together to help override proposed changes to the code," said Wayne Edwards, EEMAC's VP. "Although we have achieved a victory at this point, the EEMAC-led coalition will continue to communicate and educate members of IECC as to why this will be a positive step for all moving forward. Working together, we can continue to develop and foster energy conservation in the North American market place."

What are you doing for Hungry for Change 2010?

The 2010 Hungry for Change campaign is off and running. We're inviting our industry members to hold fundraising events that connect feeding our employees and customers at BBQs, etc. and raise money to feed children at the same time.

Here's who's doing something: Westburne Quebec raised $5175 (20,700 school lunches) in its golf tournament at Mirabel, Le Victorien golf club. "We are very proud of this event! It was a fun day and great cause to rally around. Everyone pitched in, happy to be part of something so meaningful," said Benoit Laramee, Westburne Quebec.

Donations last year were over $300,000. This year we're also adding an "Executive Cookbook" to the effort. Executives are invited to send in a recipe, along with a photo and description. The cost to participate is only $500 (to cover production costs) and we've got 29 people signed up so far. Let us know if you'd like to be part of our effort.

Driven by volunteers from Canada's Electrical Industry, Hungry for Change is an ongoing campaign that will provide fun opportunities to get together with friends while raising funds for vulnerable children around the world, including Canada.

When you help Hungry for Change (Canadian Feed the Children), you fund nutrition programs for vulnerable children—not just in some far-off African village, but *right here at home* in Canada! And

because Hungry for Change is volunteer-driven, 94% of the funds raised go directly to programs.

However you choose to get involved, you join Canada's electrical industry in making a world of difference. To be a part of this amazing industry-led campaign, visit tinyurl.com/2bx5xqu to visit the website to learn more, get useful templates and forms, donate and register your event.

Schneider and Parkeon to develop electric vehicle charging system

Schneider Electric (www.schneider-electric.com) and Parkeon (www.parkeon.com) will work together to develop an electric vehicle (EV) charging system, integrating energy management and pay-by-space technology. The partners will create a commercial and technical offer for pilots on EVs and related charging infrastructures in Europe and North America starting this year.

"Through this partnership, Schneider Electric reaffirms its ambition to offer simple, efficient and accessible charging solutions for future electric vehicle users," explained Frédéric Abbal, president, Schneider Electric (France). "This collaboration [...] is the best way to rapidly develop the electrical vehicle market."

In public infrastructure, the issues of parking management and charging for EVs are directly connected, says Schneider. The solutions are initially aimed at on-/off-street parking and other similar applications. Schneider will bring its expertise in energy management while Parkeon lends its skills in urban mobility, transit, parking and payment solutions.

The projects managed within this partnership will enable both organizations to develop solutions and be ready to start installing on street and parking infrastructure for EV charging in 2011.

Southwire acquiring Tappan Wire and Cable

Southwire Co. (www.southwire.com) has purchased New York-based Tappan Wire & Cable Inc., which supplies the electronics, signal/control and industrial markets with cables for security and access control, coax video, fire alarm, plenums, category, home automation, etc. (Tappan also makes a variety of specialty and custom electronics cables.)

Southwire says this acquisition is a natural progression; the addition of telecom and electronic cables "solidifies Southwire's position as an industry-leading manufacturer of portable cord products, while also adding to Southwire's ability to offer differentiated, custom products that provide value-added benefits to end users".

"Current Tappan customers can expect the same level of service and product availability they are accustomed to receiving," said Darren Krych, president of Tappan Wire and Cable. EB

IED recognizes top-of-class members and suppliers

At the recent IED (Independent Electrical Distributors Limited Partnership II, (www.ied.ca) annual general meeting in Jasper, Alta., top-of-class members and suppliers were honoured for their commitments to business excellence, and to each other. Congratulations to the following:

- Member who supported the greatest number of IED approved suppliers: Gimpel Electric Supply Ltd.
- Member who showed the greatest increase in purchases: Robertson Electric Wholesale Ltd.
- Member who best utilized the IED Marketing programs: EECOL Electric
- Marketing Partner of the Year: Osram Sylvania Ltd.
- Canlyte Distributor of the Year: EECOL Electric (Saskatchewan & Manitoba)
- Cooper Connection General Growth & Performance Award: Eddy Group Ltd.
- Hubbell Distributor of the Year: Eddy Group Ltd.
- IPEX Distributor of the Year: Robertson Electric Wholesale Ltd.
- Leviton Greatest Sales Increase: Paul Wolf Electric & Lighting
- Liteline Sail Away Contest: Diversified Ventures, Parrline Electric and Paul Wolf Electric & Lighting
- Ouellet Greatest Sales Increase: Eddy Group Ltd.
- Panduit Overall Support & Year-over-Year Growth: Robertson Electric Wholesale Ltd.
- Royal Pipe Distributor Partner: Dubo Electrique
- Sylvania Partner of the Year: Western Equipment Ltd.
- Thomas & Betts Signature Service Champion Award: Dubo Electrique
- IED General Partners' Award of Excellence: Tom Crist
- Tom Torokvei Award: Alain Lanthier
- IED Supplier of the Year Award: Thomas & Betts (Commercial)

Visit tinyurl.com/299yrm4 for photos from the event.

Milos Jancik

Harald Henze, chair of **Electro-Federation Canada** (EFC, www.electrofed.com), issued a letter to EFC official representatives stating that **Milos Jancik** will step down as president & CEO of EFC at the end of the year. In the weeks ahead, the EFC board will conduct an executive search to identify the new president who will lead EFC in 2011. All applications and nominations should be submitted to any member of the executive committee of the board of directors.

Eaton Corp.'s (www.eatonelectrical.ca) **Jeff Krakowiak** has been named vice-president and general manager-Canada for its Electrical Sector Americas Region effective August 15. He will report to **Rich Stinson,** president, Power Distribution Division. Meantime, **Steve Boccadoro** has been named to succeed Krakowiak as senior vice president-sales & marketing, also effective August 15.

Jeff Krakowiak

Steve Boccadoro

"In his five years with Eaton, Jeff has contributed greatly to developing the sales and marketing activities within the company," said Sandy Cutler, Eaton chair and CEO. "As we wish Jeff well in his newest Eaton endeavour we are looking forward to having Steve join the team."

Krakowiak joined Eaton in 2005 from Visteon and previously worked for Ford Motor Company. Prior to his most recent role, he served Eaton as the Automotive Group's director of sales for the Ford account worldwide. He will be located in Burlington, Ont.

Krakowiak holds a bachelor's degree in electrical engineering and a master's degree in business administration from the University of Michigan. He also holds a Master of Science in mechanical engineering from Purdue University in Indiana.

Alan Taaffe

Schneider Electric has appointed **Alan Taaffe** to manager, marketing and business development of the new Buildings business in Canada (www.schneider-electric.ca). In his new role, Taaffe is responsible for marketing and strategic programs related to Building Automation and Security. He recently served as manager of marketing and business development for Commercial Construction for Schneider Electric Canada. Taaffe has an extensive background in marketing, logistics, training and customer support, says the company. EB

Lost in (confined) space!

Roundtable on confined space management

Mari-Len De Guzman

What do Toronto's Rogers Centre, a farm and an ocean vessel have in common? Confined space.

Perhaps the biggest problem involving work in confined space is the failure of both the employer and worker to identify a work environment as such. As far as occupational safety is concerned, confined space varies in different industries. Whether it's a 200-sf boiler room or the basement of the 11-acre Rogers Centre in Toronto, confined spaces come in different shapes and sizes, and it's important to be able to identify and assess each of them before any work is performed.

Without proper identification and determination of all hazards associated with a confined space, working in it could be an accident waiting to happen.

Canadian Occupational Safety [EBMag sister publication] hosted a roundtable on confined space attended by occupational health and safety experts from across Canada: Lisa Bolton, lawyer at Sherrard Kuzz LLP; Ron O'Neil, director at Fall Protection Group Inc.; Wagish Yajaman, a consultant and occupational hygiene specialist with the Industrial Accident Prevention Association (IAPA, now part of IHSA, Infrastructure Health and Safety Association); Tim Morrison, president of Safety Scope Inc.; Peter Gilmour, regional prevention manager for WorkSafe BC; Stan Rodriguez, director of health, safety and environment at IPEX Management Inc.; and Gabriel Mansour, a provincial coordinator with the Ontario Ministry of Labour.

Identifying a confined space

"StatsCan said there are about 65 to 75 thousand companies in Canada that are affected by confined space, and that ranges from cement plants,

bakeries, pharmacies and telecoms," said Morrison. "Some of these workplaces are fully aware that they are dealing with confined space hazards and have control policies and programs in place to deal with those hazards."

But it's those companies that do face confined space risks, but are unaware of them, that are worrisome, the panel agreed.

For example, manure pits found in farms pose confined space hazards, but people working there may not necessarily know these risks, nor have the knowledge required to work safely in or around them. An all-too-common scenario in a number of manure pit tragedies is the involvement of multiple victims; one goes in and gets injured, and a coworker or family member climbs in after them to attempt a rescue, only to succumb to the same hazard.

Another concern is an increasingly mobile workforce, said Bolton. "As legal counsel, I fairly frequently see situations where employers really don't appreciate that a workplace can move around where the workers are. So if they may have a plant or a facility that they in their own mind consider to be the workplace, but they forget that they may have service workers going around and they may be in confined spaces that aren't necessarily physically on the employer's property."

Oxymoron

What constitutes a "confined space" in the occupational safety sense? The Ministry of Labour's Mansour said the phrase connotes high risk, meaning an area that is "confining because of the physical characteristics, the contents inside, and the content that must have generated the work activity."

Mansour added the complexity of managing work in confined spaces led the ministry to revamp its confined space regulations to include all the various components associated with it, including risk assessment, training, rescue and entry permits. "So I think, hopefully, the new regulation has covered a lot more ground with the guide of consult, Ministry of Labour and other partners, and will help larger and smaller employers to be able to comply with the regulation."

Confined space applies to so many different workplaces and industries that it's a challenge to nail down one common definition, said Morrison. And the difficulty only increases for companies that have a mobile workforce that moves across different provinces. "It's like military intelligence. It's an oxymoron; the two words don't go together."

Even with the recent development and launch of the first Canada-wide standard on the management of work in confined space (CSA Z1006), the technical working committee, he recalled, spent many days just discussing the definition. "I think this is a struggle to most companies who are used to a stationary workplace... everyone's got examples of the moving, roving workplace and people don't recognize the danger."

Morrison, along with four other members of the roundtable panel—Wagish Yajaman, Stan Rodriguez, Gabriel Mansour and Peter Gilmour—were part of CSA's technical working committee that developed the Z1006 standard, which defines confined space as a workspace that: "is fully or partially enclosed; is not designed or intended for continuous human occupancy; and has limited or restricted access or egress, or an internal configuration, that can complicate first aid, evacuation, rescue or other emergency response services".

Failure to recognize a confined space also leads to failure to conduct comprehensive risk assessments, which is an essential element in managing work in confined space. Without risk assessment, companies cannot implement effective controls to address confined space hazards, said WorkSafe BC's Peter Gilmour.

"I think it's important to note that confined spaces include a full spectrum of hazards, and all of them seem to be amplified because of the spaces," Gilmour said. "Some of the hazards are a bit more obvious than others... but sometimes they are not so obvious, which I believe leads to a failure to classify a place as a confined space."

There is one common characteristic of a confined space that is easy to recognize, however, and that is restricted access and egress that tend to complicate rescue, he added.

Identifying whether an area is a confined space should be done by a competent individual, said IAPA's Yajaman. Z1006 offers guidance on choosing the appropriate person for the job.

"The standard actually takes a closer look at who should actually be doing that (risk assessment) and addressing it appropriately, instead of looking at a narrow perspective of, 'Is it just atmospheric hazard or are there more potential hazards that need to be looked at as well?'," said Yajaman.

Common ground

Legal requirements pertaining to confined spaces also vary between jurisdictions, which is especially challenging for companies that have operations in multiple provinces. This is why a comprehensive standard makes a lot of sense.

In developing the standard, the Z1006 technical committee held meetings across Canada to look at the various legal and regulatory components each jurisdiction had on confined space in an effort to make a standard that is as comprehensive as possible. Morrison said the diversity and differences among these jurisdictions was a real challenge.

"I don't think they are really going to solve those differences, but what we [have got to] look at is what are the commonalities. And the commonalities are: the definition... to recognize that your are going to get into trouble and, secondly, what the standard really focuses on is the risk assessment," said Morrison.

Differences are also evident in provincial and federal legislation, said Yajaman. "I think this is where the standard comes in with respect to trying to transcend what the legislative requirements are and put it into best practices when somebody goes in [a confined space] so that they come out safely at the end of the day."

Gilmour said the intent is for all jurisdictions in Canada to "harmonize" legislation on confined space based on one standard.

"Whether that happens in the next five or 10 years, I'm not prepared to prognosticate, but that would be very nice."

It's important to recognize, however, that regulations always take precedence over standards and companies are required to comply with regulatory changes in various jurisdictions.

"I think we need to caution people that just because it complies with the standard, it doesn't mean you're going to comply with regulations in every province. Certainly, there are some in Ontario and Quebec and in BC where the bar is a little bit higher," said Rodriguez, whose company operates various plants across the country and is, therefore, subject to different legislative requirements. He said his firm is "pleased to see the development" of the Z1006 standard.

As in any other occupational health and safety hazards, training is key to preventing confined space accidents. And just as it was a challenge dealing with differences in the legal requirements in jurisdictions across Canada, said Morrison, training seems to be "all over the map" when it comes to confined space training services.

"A lot of people don't do competent-person training; they don't get to play with the toys. Some go for gas monitor training and some people don't even see a gas monitor, which is appalling that it could happen that way, but it's true," he said.

Standardizing the approach to training on confined space is another objective of Z1006. Morrison said the ultimate goal is to develop a certified training program for confined space that will be implemented nationally. Whether it happens sooner rather

than later is another question.

O'Neil agreed, noting that occupational health and safety in Canada is largely governed provincially, which makes standardization a challenging feat.

"Currently, our nation truly allows for any kind of training delivered by anyone, under any circumstance, to anyone, with any standard. And the [Z1006] standard notwithstanding, we will continue in our lifetime to have this problem," explained O'Neil. "Any of the good initiatives that we might see with one province, their neighbouring province might not even be on the radar."

Some provinces are moving toward consolidation, though. In Alberta, for instance, O'Neil said there is a provincial database that keeps track of all safety trainings that workers in the province have undergone. The recent amalgamation of safety associations in Ontario, as well as the trend of consolidation among construction associations in B.C. may be a step in that direction as well, he adds.

"There is no question, training is a real core element and, as Gabe [Mansour] was saying, the maintenance of it is just as crucial. I think that people in Peter's [Gilmour] shoes should really convince the provinces to have some harmonization. CSA can be a vehicle, but it can't be the exclusive vehicle," O'Neil said.

Training

Panelists noted that while training is absolutely essential to prevention, confined space accidents have, in the past, occurred among trained personnel as well.

Yajaman said this is because in a confined space, one is always dealing with dynamics. "When you create a policy or a procedure, it's a dynamic document because the spaces can change. And a lot of people figure that once you create a policy, they don't realize that it needs to be updated; same with training, with the individuals who are going into these spaces, to keep it fresh in their minds."

To make such policies and programs work, however, there needs to be commitment, confidence and culture in the workplace, said the panelists.

"The other important element is the commitment of the workplace and the confidence of the workplace," Mansour said. "You can have the best procedures, you can have all the mechanical stuff in place, but you have to have the confidence to be able to have the procedures go really effective, and you have to have the commitment from workers and employers to go through with it if it happens."

Another factor is culture, Rodriguez added. While people often know better, they don't always do the right thing. One of the reasons could be behaviour-modelling, where leaders are not exhibiting good examples for workers to emulate; another may be the workplace itself. These factors affect people's decision-making process, particularly with regard to health and safety.

"I think we all know we need better standards and more consistency, but an important message for organizations who are having people who do these things, they need to remember in the meantime it's their obligation to be duly diligent in how they make decisions on who will be doing the training and how you are going to validate confidence," Rodriguez said.

Z1006 requires an assessment of the training needs of workers and external service providers involved in confined space work including the competencies required for each role (i.e. entry supervisor, entry worker and trainer), reviews of previous training and experience, and the need for refresher training.

The various types of confined space skills training outlined in the CSA standard include: entry supervisor, attendant training, air supply system attendant, entrant, emergency response team leader, dispatcher, rescue system operator/helper, rescuer and First Aid/CPR responder. The standard also covers guidelines for establishing competence of the instructors.

Rescue

As mentioned above, confined space accidents often involve multiple victims. In fact, more than 60% of confined space-related fatalities involve would-be rescuers or colleagues. Without the necessary training and appropriate rescue plan, could things end any other way?

This why having a rescue or emergency response plan is an essential component of a comprehensive confined space risk management program, panelists agreed. As Gilmour put it: "The time to find out whether your breathing apparatus doesn't fit through the manhole is not the time of the rescue".

Practicing your rescue plan is vital, Morrison added. This can be accomplished through regular drills. Try simulating a confined space incident by putting a mannequin inside the hazard area and pulling them out based on the emergency response plan. Practicing the plan twice a year is what Z1006 prescribes.

Yajaman related a previous experience with a client: "I will see companies who will have the policies and equipment, but they never do the drills or they don't practise. In their policy it said they had a gas monitor. Well, that policy was from another company and they didn't change it... and when I asked to see their monitor, they looked around to see if they had one. Having something good on paper is one thing, but actually knowing how it works and making sure it works in real life is another matter altogether".

One more reason to practise, said Gilmour, is the fact that there is no generic rescue when it comes to confined space. Every rescue is very specific to a particular confined space.

Developments in, and the declining cost of, technology have helped manage risks in confined spaces, said O'Neil. "You can have some really strong enforcement of great plans on the prevention side and rescue side, and there are some amazing advancements with thermal imaging, wireless, etc... and with awareness, we can have some strong prevention safeguards with technologies."

Technology can also be used to replace human intervention as much as possible, Bolton said. The ability to perform work in a confined space using technology without the need for a worker to actually get into the confined space and be exposed to the hazards goes a long way in preventing accidents. EB

Mari-Len De Guzman is the editor of EBMag sister publication, Canadian Occupational Safety.

BEST PRACTICES
for underfloor cable management

Stephen L. Porach

Modern data centres contain large quantities of electrical and communications cables. The organization and support of these cables can significantly affect the day-to-day operation of the data centre, as well as its ability to change and grow over its lifetime. Designers make many important decisions as they plan the data centre. They must answer questions such as:

- What type of services will the data centre provide?
- How will I power the equipment?
- How can I efficiently cool the data centre and keep air flow consistent?

A cable organization plan must also be created for the enormous amount of cables that serve as the veins and arteries of the data centre. The basic function of the data centre requires proper equipment connections and proper pathways for both power and low-voltage cabling. Good cable organization ensures optimal performance and simplifies cable maintenance, reducing downtime. All cables should be supported in cable tray that is run overhead, above the equipment or under the raised floor. This article addresses the routing of cable pathway beneath a raised floor.

Design of cable pathways

The following basic principles should be followed when determining how and where to route the cable pathways:

- Separation of telecom from power cables to minimize signal interference.
- Routing of pathways to minimize the obstruction to air flow.
- Adherence to American National Standards Institute (ANSI), Telecommunications Industry Association (TIA) and Electronic Industries Alliance (EIA) standards.
- Use of pathways classified by Underwriters Laboratories (cUL).
- Compliance with the Canadian Electrical Code (CEC).

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Schneider Electric

Figure 1

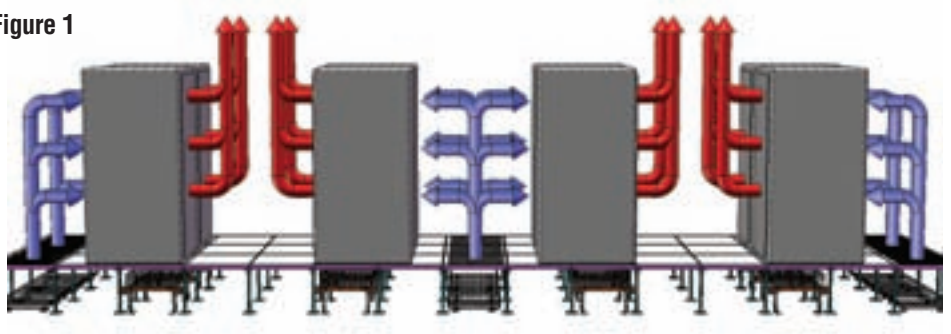


Figure 1 shows a common data centre layout with hot and cold aisles. The cable pathways shown indicate typical pathways for power and communications cables. Communications cables are run just below the raised floor and to the rear of the equipment cabinet, in the hot aisle. Power cables are run close to the structural floor in cable tray located in the cold aisle, underneath perforated floor tiles. Arranging the cables in this way provides horizontal separation by allocating different rows of tiles in the main aisles for power and telecom cabling, and also provides vertical separation.

Another benefit to placing communications cables just below the raised floor is easy access to these cables for maintenance. ANSI/TIA/EIA-942 indicates that the top of the tray should be no greater than 0.75 in. (20 mm) below the floor. Placement of the power cables close to the structural floor in the cold aisle allows air to flow freely through the perforated tiles above.

Choice of cable trays

The most common type of cable support found in data centres is wire basket cable tray. It is sturdy enough to support large cable quantities, and its open structure provides adequate cable ventilation and will not block air flow. As per the ANSI/TIA/EIA-942 standard, cable tray should have a maximum loading depth of 6 in. (150 mm).

Deeper cable trays can adversely affect cable manageability and administration. When more than 6 in. of cable depth is required, trays should be installed in multiple layers to provide additional capacity. Since many data centres do not start at full capacity, cable tray systems are frequently designed to accommodate growth.

Often, the initial installation is a single layer, and further layers of cable tray are installed as the data centre infrastructure grows. When the initial cabling is not expected to be accessed after installation, a complete cable tray structure may be installed over the initial one. When regular access to the initial cabling is required, though, then a cantilever system can be installed over the existing cables. See ANSI/TIA-569-B for further cable tray design considerations.

Cable tray installation

In an ideal situation, the cable tray system should not affix itself to the raised floor. A support system that is independent from the floor structure eliminates unnecessary load and strain on the flooring grid. When possible, there are advantages to installing the cable tray prior to the installation of the raised floor, including reduced labour time and a shorter project construction timeline. Installers will frequently choose the length of the tray pieces installed. Congested floor subspace and raised floor stringers often require the tray to be only 2-ft long.

However, when these obstructions are not in place, the installation of 4-ft or even 10-ft sections can reduce installation time. In addition, longer lengths require fewer supports and result in lower material costs.

Fiber and copper cabling in cable trays, and other jointly used pathways, should be separated to improve data centre administration and operation, and to minimize damage to smaller-diameter fiber cables. Cable trays should be sized to accommodate various media, and dividers should be used as necessary.

The tray system should be flexible enough to be adjusted onsite to avoid the many unforeseen obstructions that can be found under the raised floor, such as chilled water pipe. As a rule of thumb, changes in the vertical height of the tray should be limited to a 1-in. change in vertical per 1 ft of horizontal.

Grounding

Metallic cable tray should be bonded to the data centre grounding infrastructure per the requirements of ANSI/TIA/EIA-942. The most common method of grounding is to run a ground wire with the cable tray and bond it to each section of the tray. The wire itself must also be bonded to the raised floor ground. All ground components and bonding methods should be UL approved per ANSI-J-STD-607-A.

Post-installation procedures

Designing, selecting, installing and grounding cable tray properly allows the equipment in the data centre to function at its best. An important final step is to create ongoing cable management procedures to be followed and updated throughout the lifespan of the data centre. Proper procedures will simplify changes, increase efficiencies and reduce downtime. EB

Stephen L. Porach, P.Eng., RCDD, is a senior sales engineer with Cooper B-Line, whose products are used in a variety of settings for the commercial, industrial, utility and OEM markets. Visit www.cooperbline.com.

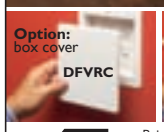
INDOOR IN BOX™

For New or Old work

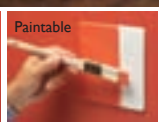
RECESSED ELECTRICAL BOX

For new or old work indoors, recessed IN BOX electrical box allows you to place furniture and countertop items (coffee makers, etc) close to the wall.

- Non-metallic with paintable trim plate
- Plugs stay inside – don't extend past the wall
- One, two, three, four-gang for power or low voltage

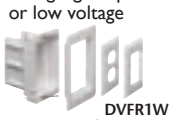


Option: box cover **DFVRC**



Paintable

Patented/Other patents pending



DVFR1W Single-gang

DVFR2W 2-gang w/ separator

Arlington

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READY TO INSTALL LISTED, 1-PIECE UNIT FIXTURE BOX

for SUSPENDED CEILINGS

NEW!

Mounts fixtures securely to ceiling grid

Save! $4.00 EA in labor with similar costs for materials vs Multi-piece Assemblies

Arlington's all-metal, one-piece fixture box ships ready to install on a 24" suspended ceiling grid – no assembly required!

Arlington's **one-piece** FS420SCL not only saves time and money, but is ***tested, listed to hold up to 50 lbs.*** as required by the 2008 NEC.

No more guesswork

Compare our one-piece fixture box with *untested, separate* components assembled in the field. A multi-piece installation using a separate bracket and box with a wire attached is an unknown that is *not tested or listed* for support.

- Position box anywhere along the bracket
- Costs less than field-assembled components
- Acceptable for use in environmental air handling spaces

FS420SCL Patents pending

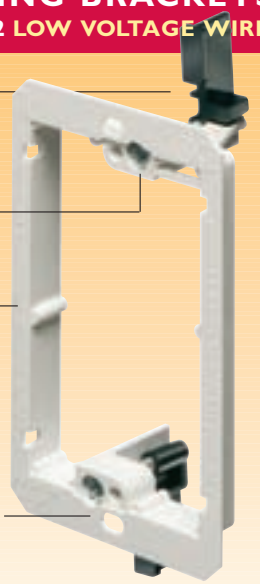
Arlington

Scranton, PA 18517 • 800/233-4717 • www.arlnew.com/420

NEW STYLE!

MOUNTING BRACKETS

Just for **CLASS 2 LOW VOLTAGE WIRING**



"Wings" hold bracket secure when mounting screws are tightened

Recessed Screw Hole and **Thin Front Lip** seat wall plate flush with wall

Oval Hole allows final shifting, straightening of device

Arlington's non-metallic mounting brackets offer the best way to install class 2 wiring – and seat wall plates flush with the mounting surface.

We now offer a single-gang, low profile mounting bracket...LV1LP.

It makes quick work of installations using 1/2" or 5/8" drywall installed on cast concrete or concrete block walls with furring strips.

In multiple sizes, for existing construction, our low-voltage non-metallic mounting brackets...

- Adjust to fit 1/4" to 1" drywall, wallboard, etc.
- Install faster – cost less than metal

Single-gang **LV1**

2-gang **LV2**

3-gang **LV3**

4-gang **LV4**

Patented. Other patents pending

Arlington

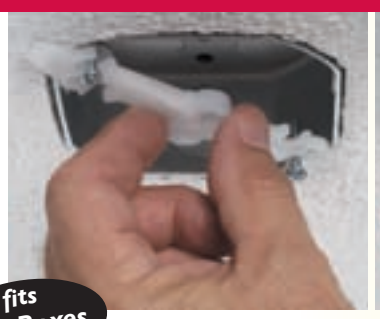
800/233-4717 • www.arlingtonlowvoltage.com

NEAT COVER UP

BOX COVER for UNUSED FAN/FIXTURE BOXES

Our non-metallic **CP3540** Box Cover is the neatest way to cover unused fan/fixture boxes – pan boxes too! – and poorly cut drywall.

The bracket has 'A' and 'B' openings for use on flat or uneven ceilings. Attach the bracket to the box with #8 or #10 screws, backing them out just far enough to slip the bracket on.



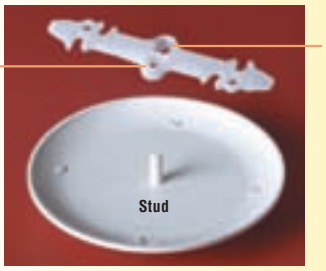
fits Pan Boxes too!

CP3540 Box Cover

- ***No visible screws on the ceiling plate***
- ***Fits 3.5" or 4" round or octagonal boxes***
- ***Non-metallic***
- ***Textured, paintable***

'B' for uneven or textured ceilings

Thread stud into opening until tight



'A' for flat ceilings

Push stud into opening to seat cover

Versatile Bracket Design

Arlington

800/233-4717 • www.aifittings.com

Patented. Other patents pending

ANYBODY™

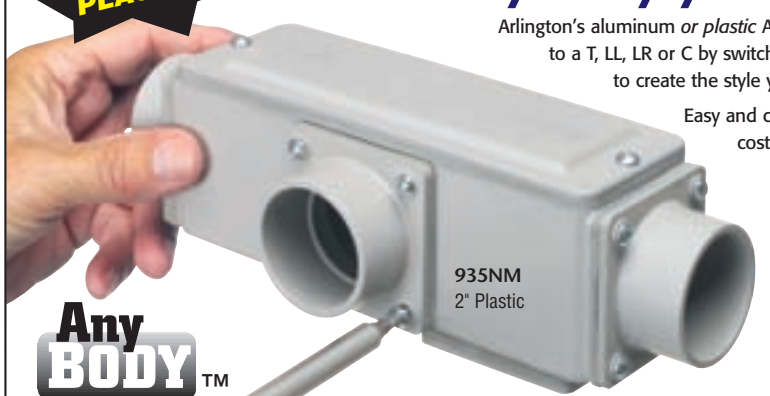
SHIPS AS AN LB but...

METAL & PLASTIC!

It's any body you want it to be!

Arlington's aluminum *or plastic* AnyBODY™ ships as an LB, but converts to a T, LL, LR or C by switching the covers and threaded flanges to create the style you need.

Easy and convenient, it saves you the hassle, space, cost of stocking five different conduit bodies.



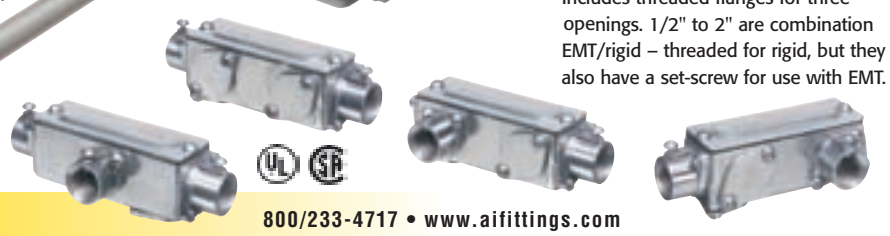
935NM 2" Plastic

Competitively priced with LBs – ***NO EXTRA COST for the normally more expensive T*** - UL/CSA Listed.

Plastic 1/2" to 4"
Includes three flanges w/ glue-in pipe joint.

Aluminum 1/2" to 4"
Includes threaded flanges for three openings. 1/2" to 2" are combination EMT/rigid – threaded for rigid, but they also have a set-screw for use with EMT.

Any BODY™



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Epcor spokesperson Michelle St-Amand (left) presents a photo of the late Tim Hamilton to his mother, Julie Hamilton, during the official launch of Alberta's first Powerline Safety Day.

NAIT students conduct a Crane & Hoist demonstration at the NAIT Training Centre in Nisku to launch Alberta's first Powerline Safety Day.

Epcor spokesperson Michelle St-Amand holds a press conference to launch Alberta's first Powerline Safety Day.

"WHERE'S THE LINE?"

Alberta launches first Powerline Safety Day

Jeff Morrow

Alberta's first Powerline Safety Day kicked off in May at the NAIT (Northern Alberta Institute of Technology) Training Centre in Nisku to coincide with the annual North American Occupational Safety and Health Week (NAOSH).

It proves the power of partnering, said Epcor spokesperson Michelle St-Amand, who highlighted the success rate of five-year-old Joint Utility Safety Team (JUST) safety awareness campaign entitled "Where's the Line?".

She says there has been a 31% reduction in the rate of powerline contact with workers since JUST began airing its hard-hitting messages through newspaper and radio ads in 2007—particular with the high-risk male group aged between 18-50 years.

"There's still a long way to go," St-Amand said, "but this new partnership with NAOSH organizers will help us reach our goals."

JUST, which includes committee members from AltaLink, ATCO Electric, ENMAX, EPCOR and FortisAlberta, also has support from the provincial Government.

"This is a very special day in recognizing how important this issue is," said powerline safety advocate Julie Hamilton. "It proves the benefits that can occur from working together."

Hamilton directs the Tim Hamilton Endowment Fund in honour of her 19-year-old son who was killed in a powerline incident in 1992 while setting up outdoor tents for a Calgary-based catering company.

She said Tim's employer knew of the electrical dangers surrounding the site, but did not post warnings to workers or establish a safety plan. A second victim, and friend of Tim's, spent weeks in a Calgary Hospital Burn Unit with severe electrical injuries.

"This initiative should be a wake-up call to employers who should go beyond corporate politics to protect their workers," said Hamilton.

According to JUST, three Albertans risk their lives each day while working around overhead and underground powerlines.

"We are proud to support JUST's initiative," said Ron Davis, Alberta's NAOSH representative. "We encourage industries to always be proactive about workplace safety, and that includes powerline safety; it's usually low on the list and may, at best, be offered once a year." NAOSH Week is an annual event organized by the Canadian Society of Safety Engineering committed to promoting health and safety.

As part of the Powerline Safety Day launch, a crane and hoist safety demonstration was held to promote JUST's "7 Metre Safe" message.

"Safety training is fundamental to NAIT's programs and to the future well-being of our students," states Lorne Strachan, associate chair, Steel Construction and Hoisting of NAIT. "We can't stress safety enough." EB

Dave Smith

Slips, trips, falls, etc. CAN happen to you... believe it!

Some safety presentations are an uphill battle as you try to engage your audience; it's hard to turn the subject of "Slips, Trips and Falls" into a "sexy" presentation. After all, there is nothing complex about the subject, and it's really difficult to get your audience to believe it could happen to them.

Yet the aftermath of a slip, trip, fall or something similarly simple can be devastating, and most of us know someone who has suffered one.

My friend Garth, for example, has had his left arm in a bandage for the last three weeks; he was using a chop saw and reached in front of the blade while it was still spinning, slicing his forearm.

A lot of you are thinking, "Hmm, that was pretty stupid: I would never do anything like that!", but Garth has spent his life working around tools and heavy equipment. This guy is careful, cautious, rational and experienced. Had someone warned him at the beginning of the job to be careful of the blade, he would have looked at them as though they were insane: he knew the risks. Heck, he could have taught the course! He just never really believed it could happen to him.

Luckily, Garth will be fine. Had the blade sunk just a little deeper, he would have damaged his tendons, very likely ruining the skills of a fine hockey player.

Dawson is a guy I've known for over 40 years. This is a man of amazing strength: one-handed push-ups were a breeze for him. He slipped in his bathroom four months ago and cracked several cervical vertebrae, losing control of his hands forever. He may have muscles like iron, but his neck is still just bone.

Two years ago, my ex's nephew came over a hill on his snow machine and made a hard landing on his tailbone, cracking his lower back. That was the end of the 20-year career he knew, and he was forced to take a different job with much poorer pay and benefits. (You'd be amazed to discover how poorly you're insured when your injury is outside of work!) So while he can still work, he walks on his toes with a strange backward lean, and wears diapers because some of the nerves he damaged control his bladder.

One thing that no instructor, trainer, supervisor, etc., can do is *make you believe it could happen to you.* All we can do is give you the information. It's up to you to make that leap of faith. And until you do, you are a danger to yourself.

Even when you do make that leap of faith, all it takes is one momentary lapse of judgement and you're on the ground. I have investigated enough accidents, taught enough courses and talked to enough victims to know how easy it is. And despite knowing how vulnerable we are and the importance of being careful, I also recently had a close call.

For the last month I have been climbing in and out of a semi trailer we are setting up as a mobile electrical training lab. Three days ago, just as I was about to climb back down a step ladder, someone came along and "borrowed" it without telling me. At that moment, my son said something and I turned my head back just as I took my first step. My right ankle slipped and turned and, by the grace of God, my foot stopped on the lower edge of the precipice. One more inch and this 58-year-old body would have hit the ground with a sickening thud. I was lucky.

It's hard enough trying to protect yourself let alone your workers. When I met Kevin, one of the first stories he told me was when, as a production supervisor, he had a painter under him who always "forgot" to use his fall restraint. Kevin had lectured him on this matter over the course of two years. One day, the painter again stepped out of the man-basket just to reach an extra inch.

The painter survived the 20-foot fall, but his brain damage is permanent—as is his wheelchair.

Afterward, Kevin's manager sat him down and explained he wanted Kevin to be more demanding. Sure, his crew may call him a jerk every day for the rest of his working career, but they would go home safe, and Kevin would not have any more invalids on his conscience.

The manager was right on both counts: some of Kevin's crew did think he became a jerk, but Kevin also retired 20 years later with no more invalids on his conscience.

If you care about yourself and others, the first step is simple: you have to believe.

Until next time, be ready, be careful and be safe©. EB

Canada Training Group has been providing consulting services to industry since 1980; At www.canada-training-group.ca, you will find this article (and others) available to you. Feel free to use them to support your own safety program and other initiatives.

Visit **EBMag.com** and click Calendar to see an extensive list of upcoming events.

You may have noticed this VIDEO ICON (the movie camera) in the pages of *Electrical Business* and wondered what it's all about. Wonder no more! When you see the VIDEO ICON next to an item in the magazine, it means there is an associated video on our website. Be sure to check it out!
Visit www.EBMag.com and click VIDEOS.

CUEE (Canadian Utilities Equipment & Engineering) Show
September 14-15, Mississauga, Ont.
Visit www.cuee.ca

BCEA Softball Tournament (family fun event)
British Columbia Electrical Association
September 18, Langley, B.C.
Visit www.bcea.bc.ca

S&D (Ontario Region) Golf Day
Supply & Distribution Council
September 20, Ajax, Ont.
Visit www.electrofed.com

CANEW — Canadian Airports National Electrical Workshop
Canadian Airports Electrical Association
September 20-24, Victoria, B.C.
Visit www.canew.ca

EEMAC Industrial Speaker Presentation
Electrical Equipment Manufacturers Association of Canada
September 21, Mississauga, Ont.
Visit www.electrofed.com

EFC Economic Forecast Seminar
Electro-Federation Canada
September 23, Brampton, Ont.
Visit www.electrofed.com

IIDEX/Neocon
September 22-25, Toronto, Ont.
Visit www.iidexneocon.com

IES Annual Street and Area Lighting Conference
Illuminating Engineering Society
September 26-29, Huntington Beach, Calif.
Visit www.ies.org/salc

NECA Convention & Trade Show
National Electrical Contractors Association
October 2-5, Boston, Mass.
Visit www.necaconvention.org

SmartGridComm: 1st IEEE Intíl Conference on Smart Grid Communications
IEEE ComSoc (Communications Society)
October 4-6, Gaithersburg, Md.
Visit www.ieee-smartgridcomm.org

CFAE Fire Alarm Instructors Conference
October 15-17, Toronto, Ont.
Visit EBMag.com's online calendar to download Registration form

IEC National Convention & Electric Expo
Independent Electrical Contractors
October 26-29, Phoenix, Ariz.
Visit www.ieci.org

IES Annual Conference
Illuminating Engineering Society
November 7-9, Toronto, Ont.
Visit www.ies.org/AC

SMMA Fall Technical Conference
The Motor & Motion Association
November 9-11, St. Louis, Mo.
Visit www.smma.org

APPrO 2010
Association of Power Producers of Ontario
November 16-17, Toronto, Ont.
Visit conference.appro.org/conference2010

2nd Annual Smart Grid Summit
November 30-December 1, Toronto, Ont.
Visit www.smartgridsummit.ca

Construct Canada
December 1-3, Toronto, Ont.
Visit www.constructcanada.com

CanSIA Solar Conference
Canadian Solar Industries Association
December 6-7, Toronto, Ont.
Visit www.cansia.ca

PowerGen International
December 14-16, Orlando, Fla.
Visit www.power-gen.com

QUALITY • SERVICE • VALUE • INNOVATION
Southwire
60TH ANNIVERSARY
1950 2010

1912 Born in Carroll County, GA

1935 Graduates Georgia Tech with an honors B.S. in Mechanical Engineering

1937 At age 25, awarded $118,000 REA contract to build 108 miles of power lines. Two years later, hangs 3,500 miles of REA power lines, ranking second in nation in miles strung

1950 **Founds Southwire Company**

1953 Develops and patents continuous casting method for aluminum rod

1962 Receives President John F. Kennedy's "E" for Export Award for export relations with 17 countries

1963 Revolutionizes wiremaking industry by developing and patenting continuous casting method for copper rod. 90% of all electrical wire and cable is made using patented Southwire Continuous Rod (SCR®) method

1964 Receives American Success Story Award

1967 Issued first of 20 patents received during career

1968 Develops and patents aluminum alloy AA-8176 as triple e™ aluminum alloy. NEC establishes AA-8000 series aluminum alloy as the standard for aluminum building wire

Negotiates $142 million industrial revenue bond, the largest in the history of Wall Street

1971 Builds South's first electrolytic copper refinery in Carrollton, GA

1973 Named a "Giant of the Electric Century" by *Electrical World* magazine

1977 Receives Golden Plate Award, American Academy of Achievement

"I believe in doing what one man can"

Roy Richards

After 60 years, we continue to strive to do what he did.

At Southwire Canada we're proud of our founder , Roy Richards, a pioneer in the electrical industr y since 1950. T oday, as one of North America' s largest wire and cable providers, we continue his legacy of innovation and share his belief in delivering value to our customers. With distribution centers and sales offi ces strategically positioned throughout Canada, Southwire Canada offers a broad range of wire, cable and cord products including NoLube® SIMpull RW90™ and SIMpull T90™, AIW™ Brand cord products, Romex® NMD90, industrial power cables, Maxis™ tools and much more. To learn more about our products, our community involvement and our vision for a sustainable Southwire, please visit us on the web at www.southwire.com.

Southwire® CANADA

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1984 — Named Man of the Year of the copper industry by the Copper Club

1985 — Passes away at age 73. Baton passes to Roy Richards, Jr. Family members still remain active on board

1986 — Awarded the Mordica Memorial Award by the Wire Association International for a lifetime of achievement to the wire industry

1992 — The D.B. Cofer Technology Center opens, providing a home for innovations in wire and cable design, metallurgy and plastics compounding

2000 — In partnership with the Oak Ridge National Laboratory, the U.S. Department of Energy, and others, Southwire develops superconductor power cable technology and throws the switch on the first real-world application of superconductors

2002 — Introduces color-coded residential building wire

Family names Stu Thorn President & CEO

2004 — Introduces revolutionary SIM Technology® that leads to development of ROMEX® SIMpull® and NoLube® SIMpull T90™ wire

Acquires Alflex and begins developing next generation MC$^{AP®}$ cable. Launches MC^{AP} and HCF MC$^{AP®}$-Type MC cable in 2005

2006 — Acquires Cable Tech in Stouffville, Canada, becoming largest supplier of wire and cable in North America

Acquires Essex Electrical Products, including state-of-the-art manufacturing plant

2007 — Opens a Distribution Centre in Mississauga, Ontario, the first for Southwire in Canada to service the Canadian market.

2009 — Acquires Maxis™

Announces corporate sustainability goals

2010 — Introduces NoLube® SIMpull RW90™ in Canada

Acquires assets of AIW creating one offering -Southwire AIW™ Cord Brand Products

Acquires Tappan Wire & Cable Inc.

PRESENT — Southwire holds over 480 patents and supplies 135 of North America's top power companies. Southwire electrical building wire powers office buildings, malls, sports arenas and more across North America

Lighting a new path to Toronto



These products won Gold, Silver and Bronze at last year's Light Canada as part of Osram Sylvania's LED Icon Design Challenge. What will happen at this year's Light Canada? Visit www.iidexneocon.com.

Light Canada at IIDEX/NeoCon 2010

IIDEX/NeoCon Canada returns to Toronto this September (22-25 for the Conference, 23-24 for the Expo), and while its mandate is to serve the interests of the interior design, architectural, facility management, real estate development and business communities, the real kicker of the event for EBMag is the Light Canada facet of the show.

And whereas Lightfair International is arguably the premier lighting event for North America, Light Canada is—as its name applies—the premier lighting event for us.

In partnership with the Illuminating Engineering Society (IES-Toronto Section), Light Canada will showcase the latest in interior, exterior, commercial and architectural lighting products, plus lamps and lighting controls over 5000 sf of exposition space. With over 100 Canadian and international exhibitors, Light Canada will deliver not only cutting-edge design solutions, but will also showcase the monumental advances in sustainable lighting, LED technology, new materials and advances in lighting design.

Rounding out Light Canada, IES Toronto and IIDEX will offer a CEU/LC-accredited seminar stream developed by industry experts covering all aspects of lighting design, applications, technology and case studies. The Light Canada seminar stream ensures seminar attendees are up-to-date on the latest lighting education on lighting design, engineering and technology.

Besides the education sessions, you'll meet with top suppliers on the exhibition floor; if memory serves, some of the names from years past include Visioneering, Venture, Acuity Brands, Philips, Osram Sylvania, CRS Electronics, Cristal Controls, Hubbell Canada LP, Standard Products and Stanpro.

If lighting is remotely your thing—either because you design it, work with it, install it, spec it... whatever—Light Canada is the place to be this September at the Direct Energy Centre on the grounds of Exhibition Place. For more information, visit www.iidexneocon.com. And remember: EBMag will be there! EB

TRAILER SWAY CONTROL††

BECAUSE ONLY YOUR AIR FRESHENER SHOULD SWING AROUND

Best-In-Class 24,400 lbs. towing† with Advanced Trailer Sway Control. Standard.††

THE NEW SUPER DUTY

6,520 lbs. payload◊

390 horsepower‡

735 LB FT of torque‡

24,400 lbs. towing†

BUILT Ford TOUGH

Standard Gas or available Diesel engine. Vehicle may be shown with optional equipment. † Best in class towing up to 24,400 lbs. on F-450 when properly equipped with 5th wheel/goose neck. Class is Full-size Pickups over 8500 lbs. GVWR vs. 2010 competitive models. †† Standard on Single Rear Wheel models only. Remember that even advanced technology cannot overcome the laws of physics. It's always possible to lose control of a vehicle due to inappropriate driver input for the conditions. ◊Maximum payload of 6,520 lbs. (2,957 kg) on F-350 DRW Regular Cab 4x2 when properly equipped. Class is Full-size Pickups over 8500 lbs. GVWR vs. 2010 competitive models. ‡Max horsepower & torque based on Super Duty Diesel engine.

VANS are literally

FROM COMPACT TO FULL-SIZE-PLUS

Gerry Malloy

Perhaps the most common vehicle cast in movie roles is the ubiquitous white van. It has become the symbol of the tradesman—and for good reason. It is, literally, the jack-of-all-trades vehicle that serves as everything from basic transportation, to office-on-the-go, to mobile workshop and warehouse.

On the surface, it may seem that your choice in vans has diminished in recent years—and there has been some reduction in availability of traditional models—but there has also been an offsetting increase in alternatives to that traditional van and even more are on the horizon. So, in fact, the range of choice available is greater than ever before.

In addition to the variety of models available, there is an ever-expanding choice of fuel alternatives and even hybrid and electric powertrains—if not now, soon. And, of course, the aftermarket is replete with everything from shelving and racking systems to customize the cargo area to your needs to complete customized bodywork to increase the volume of that area and adapt it to your specific needs.

We can't address all the permutations and combinations of van variations that are or soon will be available in this small space. But we can give you an overview of what's out there and what's coming.

FULL-SIZE VANS

This is where the white-van stereotype begins and it's the category that accounts for the bulk of the market. There haven't been a lot of major changes in the vehicles offered in recent years, although incremental changes to improve safety, fuel economy and emissions are ongoing and the number of amenities available continues to increase. There has also been one major change in where you can buy one of the primary players.

Here's a brief look at what's available and what's new:

Ford E-Series

Long the best-seller in the full-size category, Ford's E-Series vans mark their 50th anniversary in 2011. They are available in E-150, E-250 Super Duty and E-350 Super Duty models and both regular and extended-length configurations.

Engine choices include both 4.6-litre and 5.8-litre V-8s and, in E-350 Super Duty models, a torque-monster 6.8-litre V-10. The two larger engines are available with CNG and LPG fuel capability. Both V-8s are coupled to 4-speed automatic transmissions, while a 5-speed automatic is available the 5.8-litre and standard with the V-10.

Among the E-Series' many work-enhancing features is a flexible rear-door system that permits doors to be held open at 105 degrees and opened to 178 degrees with a simple push. Available technologies include Ford Work Solutions (which includes an in-dash computer; Tool Link, a Radio-Frequency Identification (RFID) asset-tracking system; and Crew Chief, a fleet telematics and diagnostics system), Ford's SYNC voice-activated communications and entertainment system and a Sirius satellite radio.

Other available options include a Reverse Sensing System, a Rear Camera system and optional user-defined switches on the dashboard with a corresponding wiring harness to enable add-ons such as auxiliary lighting.

Standard safety equipment includes Ford's AdvanceTrac skid control system with Roll Stability Control.

Chevrolet Express / GMC Savana

General Motors' Chevrolet Express and GMC Savana are twins under the skin. Light-duty 1500 models come only in regular wheelbase form, while 2500 and 3500 models are available in both regular and extended-length configurations.

A wide range of engine choices is offered, with a 4.3-litre V-6 standard in base 1500 models and a 4.8 litre V-8 in base 2500s and 3500s. Optional in 1500s is a 5.3-litre V-8, while the upgraded powerplant in the HD models is a 6.0 litre V-8. Also available in the HDs is GM's 6.6-litre Duramax diesel. All 1500s are fitted with a four-speed automatic transmissions; all 2500s and 3500s get a 6-speed automatic. Unique to the class is the availability of all-wheel-drive, with a standard 5.3-litre V-8.

GM has also announced that it will offer Compressed Natural Gas (CNG) fuelled versions of the 6.0-litre V-8 equipped Express and Savana beginning this fall.

Among the GM twins' available features are a left-hand-side hinged entry/load door for increased accessibility and remote-release side panels and special lighting for work-load capability. Newly available for 2011 are audio options that include a USB port and XM Satellite Radio, Bluetooth connectivity for cell phones and standard OnStar with 6-months connectivity.

jacks-of-all-trades

THE CHOICE IS GREATER THAN EVER BEFORE

Mercedes-Benz sprinter

When it arrived on the market as a Dodge, the Sprinter set a new standard for full-size vans. It was bigger than its conventional competitors, but also more expensive. Built by Mercedes-Benz/Freightliner, however, with a standard diesel engine, it promised extended operating life that made its lifetime cost attractive and it became an immediate success.

With Daimler's sale of Chrysler and Fiat's subsequent takeover, the working relationship between the companies soured, the result of which is that the Dodge Sprinter is no longer offered. But the Sprinter is still available – it's just that the vendor is now Mercedes-Benz.

The Sprinter cargo van is offered in two wheelbases (3.7 and 4.3 m), and three lengths: standard, long and extra long (5.9, 6.9 and 7.3 m). It is also available with two different roof heights (1.65 m and1.94 m). Best-in-class load space ranges from 9.0 to 15.5 cubic metres.

A single engine is offered – a 3.0-litre Mercedes-Benz BlueTEC V6 turbo-diesel with a maximum output of 188 hp and 325 lb-ft of torque. It is coupled to a 5-speed automatic transmission.

The Sprinter features a standard right-side sliding door, and to maximize flexibility, an optional left-side sliding door is also available. Both side and rear doors feature openings to match the corresponding roof height.

An extensive list of standard equipment includes remote control central locking, and Adaptive ESP skid-control system.

Nissan NV

It's not available yet, but Nissan plans to enter the market late this year with an all-new van called the NV that the company says will be "a breakthrough in commercial van design." It will be built in Mississippi, on Nissan's full-size pickup truck chassis.

The NV will be available in three models: NV1500, NV2500 HD and NV3500 HD, and in two roof configurations – Standard Roof and High Roof. High Roof models will allow most users to walk and stand in the cargo area.

Two engine choices will be offered – a 4.0-litre V-6 and a 5.6-litre V-8, both mated to a 5-speed automatic transmission.

Nissan promises exceptional utility, thanks to a long, wide cargo floor, square-top wheelwell housings and nearly vertical sidewalls. Along with maximizing cargo space, the sidewalls accommodate after-market storage systems without excessive modification. The cargo area features a full-length inner panel to prevent cargo from denting the vehicle's outer skin. There are also multiple weld-nut attachment points for mounting shelving and racks.

Other features include a passenger seat with a segment-exclusive fold-down feature that creates a convenient worktable. Storage spaces include a wide overhead console, available with High Roof models.

VAN ALTERNATIVES

If you don't really need the space of a full-size van, there are several smaller alternatives available. Here's a quick overview:

Chevrolet HHR Panel

While it is not a van per se, Chevrolet's HHR Panel harkens back to the days of the pickup-based panel trucks that previously fulfilled the functions of the vans we know today. The HHR is derived from a compact crossover vehicle, not a pickup, which means it may be too small for some applications but just right for others.

It is powered by a 2.2-litre Ecotec four-cylinder engine driving the front wheels through a 5-speed manual transmission (automatic optional).

The HHR panel comes with bucket seats up front, including a flat-folding passenger seat, a flat load floor behind and 1775 L of available cargo volume. Available options include such niceties as power heated seats and sunroof, a premium audio system, Bluetooth cell-phone connectivity, roof-mounted side rails, running boards, aluminum wheels and a host of other dress-up items.

Stabilitrak electronic stability control and Traction Control are standard.

Ford Transit Connect

A newcomer to North America in 2010, the Ford Transit Connect has been a staple on the European commercial market for decades. The current version, built in Turkey and introduced in Europe in 2003, has been fully adapted for our market and was an instant hit from the day it was introduced here, fulfilling an obvious need for a small commercial vehicle that had previously gone unmet.

Named the North American Truck of the Year for 2010, the Transit Connect is built on a dedicated front-wheel-drive commercial vehicle platform to meet and exceed the needs of small business owners and entrepreneurs. For North American sales, the powertrain was upgraded to include a Duratec 2.0-litre four-cylinder engine and a four-speed automatic overdrive transaxle.

An all-electric version is scheduled for production in 2011.

Transit Connect is available as a cargo van with no windows in the sliding side doors, combined with rear cargo door privacy glass or a as a panel van with no side or rear cargo area windows. A fully-windowed wagon with folding second-row seating is also available for the small business owner that uses the vehicle for carrying cargo for business and for family during off-hours.

Bulkheads, racks, bins and other upfits can be mixed, matched and configured to suit many specific commercial applications and needs. Transit Connect is also offered with a wide range of upfitted cargo management options, similar to those available in the Ford E-Series – including Ford Work Solutions.

It won't be the right choice for every application but it will be just right for some. EB

Is the **electrical industry** sparking your interest?

EBMag's got your guide to Canadian institutions offering electrical programs and related training

Gillian Marsh

In the electrical trade, training and education are especially important because, without them, it could be more than just your interest that's being sparked. Which is why in this, our Training & Education issue, it felt only natural to reintroduce our Academic Round-up. This year we included Canadian institutions offering programs and apprenticeships in all levels of education: from universities to colleges, to specialized institutes and French commissions. For more detail on any of the programs, visit the schools directly.

ALBERTA

Grande Prairie Regional College
10726-106 Avenue
Grande Prairie, AB T8V 4C4
(780) 539-2911
www.gprc.ab.ca
- Electrician/Power Systems Technician
- Power Engineering

Keyano College
8115 Franklin Avenue
Fort McMurray, AB T9H 2H7
(780) 791-4800
www.keyano.ca
- Electrician Apprenticeship
- Construction Administration

Lakeland College
5707 College Drive
Vermilion, AB T9X 1K5
(780) 853-8463
www.lakelandcollege.ca
- Electrician Apprenticeship
- Power Engineering Certificate

Lethbridge College
3000 College Drive South
Lethbridge, AB T1K 1L6
(403) 320-3200
www.lethbridgecollege.ab.ca
- Electrician Apprenticeship
- Wind Turbine Technician
- Workplace Safety Training Courses

Medicine Hat College
299 College Drive SE
Medicine Hat, AB T1A 3Y6
(403) 529-3811
www.mhc.ab.ca
- Electrician Apprenticeship
- Power Engineering Technology

Northern Alberta Institute of Technology
11762 – 106 Street
Edmonton, AB T5G 2R1
(780) 471-6248
www.nait.ca
- Electrical Engineering Technology
- Electrical Apprenticeship
- Electrical Testing Technician
- Power Lineman Apprenticeship
- Power Systems Electrician Apprenticeship
- Electrician
- Power Engineering
- Power Engineering Technology

Red Deer College
100 College Boulevard
P.O. Box 5005
Red Deer, AB T4N 5H5
(403) 342-3300
www.rdc.ab.ca
- Electrician Apprenticeship
- Pre-trade Electrical Certificate

Southern Alberta Institute of Technology (SAIT)
1301 16th Avenue NW
Calgary, AB T2M 0L4
(403) 284-7248
www.sait.ca
- Electrician Apprenticeship
- Electric Motor Systems Technician Apprenticeship
- Power System Electrician Apprenticeship
- Electrical Engineering Technology
- Power Engineering Technology
- Pre-Employment Electrician

University of Alberta
Edmonton, AB T6G 2M7
(780) 492-3113
www.ualberta.ca
- Electrical Engineering

University of Calgary
2500 University Drive NW
Calgary, AB T2N 1N4
(403) 220-5732
www.ucalgary.ca
- Electrical Engineering

ATLANTIC CANADA

Academy Canada
37-45 Harding Road
St. John's, NL A1C 5R4
(709) 722-9151
www.academycanada.com
- Electrical Apprenticeship (Construction/Industrial)

Acadia University
Wolfville, NS B4P 2R6
(902) 585-1206
www.acadiau.ca
- Electrical Engineering

Cape Breton University
1250 Grand Lake Road
Sydney, NS B1P 6L2
(902) 563-1368
www.cbu.ca
- Engineering Technology

College of the North Atlantic
P.O. Box 1693
St. John's, NL A1C 5P7
1-888-982-2268
www.cna.nl.ca
- Electrical Engineering Technology
- Powerline Technician (Trades)

Dalhousie University
Halifax, NS B3H 4H6
(902) 494-2450
www.dal.ca
- Electrical Engineering

Holland College
140 Weymouth Street
Charlottetown, PE C1A 4Z1
(902) 629-4217
www.hollandcollege.com
- Electrical Technology
- Electromechanical Technology
- Wind Turbine Technician

New Brunswick Community College
1234 Mountain Road
Moncton, NB E1C 8H9
1-800-376-5353
www.nbcc.ca
- Electrical Certificate
- Electrical Engineering Technology

Nova Scotia Community College
226 Reeves Street
Port Hawkesbury, NS B9A 2A2
(902) 625-2380
www.nscc.ca
- Electrical Certificate (Construction & Industrial)
- Electrical Diploma (Construction & Industrial)
- Electro Mechanical Technician
- Energy Sustainability Engineering Technology
- Electrical Engineering Technology
- Power Engineering Technology

Université de Moncton
18, avenue Antonine-Maillet
Moncton, NB E1A 3E9
(506) 858-4000
www.umoncton.ca
- Génie électrique

University of New Brunswick
3 Bailey Drive, P.O. Box 4400
Fredericton, NB E3B 5A3
(506) 458-7719
www.unbf.ca
- Electrical Engineering (also available at Saint John campus)

BRITISH COLUMBIA

British Columbia Institute of Technology
3700 Willingdon Avenue
Burnaby, BC V5G 3H2
604-434-5734
www.bcit.ca
- Electrical Engineering
- Electrical and Computer Engineering (Automation, Electrical Power)
- Electrical Apprenticeship
- Electrical Foundation

Camosun College
3100 Foul Bay Road
Victoria, BC V8P 5J2
(250) 370-7555
www.camosun.ca
- Electrical Foundation
- Electrical Engineering Bridge Program

College of New Caledonia
3330 22nd Avenue
Prince George, BC V2N 1P8
(250) 562-2131
www.cnc.bc.ca
- Electrical Foundation
- Electrical Apprenticeship
- Power Engineering

Electrical Industry Training Institute
Unit C, 12330 – 88th Avenue,
Surrey, BC V3W 3J6
1-604-590-8911
www.eiti.bc.ca
- Powerline Worker Apprenticeship
- Journeyman
- Other Electrical Utility Training Programs

Fairleigh Dickinson University
842 Cambie Street
Vancouver, BC V6B 2P6
(604) 682-8112
www.fdu.edu
- Electrical Engineering
- Electrical Engineering Technology

Kwantlen Polytechnic University
12666-72nd Avenue
Surrey, BC V3W2M8
(604) 599-2100
www.kwantlen.bc.ca
- Electrical Apprenticeship
- Power Line Technician

North Island College
1685 South Dogwood Street
Campbell River, BC V9W 8C1
(800) 715-0914
www.nic.bc.ca
- Electrician Apprenticeship
- Electrical Foundation

Northern Lights College
Fort St. John Campus
Box 1000, 9820-120 Avenue,
Fort St. John, BC V1J 6K1
(250) 785-6981
- Electrician Apprenticeship
- Electrician Foundation Trades Training
- Power Engineering and Gas Processing

Okanagan College
2552 10th Ave NE (TCH)
Salmon Arm, BC V1E 2S4
(250) 862-5457
www.okanagan.bc.ca
- Electrician Pre-Apprenticeship

Selkirk College KSA Campus
606 Victoria Street
Nelson, BC V1L 4K9
(250) 352-2821
www.selkirk.ca
- Electrician Apprenticeship
- Electrical Entry
- Electrical Foundation

Thompson Rivers University
900 McGill Road
P.O. Box 3010
Kamloops, BC V2C 5N3
(250) 828-5000
www.tru.ca
- Construction Electrician
- Electrician Apprenticeship
- Electrical Trade Entry Certificate

University of British Columbia
2329 West Mall
Vancouver, BC V6T 1Z4
(604) 822-2211
www.ubc.ca
- Electrical Engineering

University of Victoria
3800 Finnerty Road
Victoria, BC V8P 5C2
(250) 721-7211
www.uvic.ca
- Electrical Engineering

University of the Fraser Valley
33844 King Road
Abbotsford, BC V2S 7M8
(604) 504-7441
www.ufv.ca
- Electrical Work
- Electrical Work Apprenticeship

Vancouver Island University
900 Fifth Street
Nanaimo, BC V9R 5S5
1-888-920-2221
www.viu.ca
- Electrical Apprenticeship

MANITOBA

Assiniboine Community College
1430 Victoria Ave East
Brandon, MB R7A 2A9
1-800-862-6307
public.assiniboine.net
- Construction Electrician
- Construction Electrician Apprenticeship
- Power Engineering

Red River College
2055 Notre Dame Avenue
Winnipeg, MB R3H 0J9
(204) 632-3960
www.rrc.mb.ca
- Electrical Engineering Technology
- Electrical Engineering Technology Integrated
- Electrical Five-Month
- English for Apprenticeship & Trades
- Power Engineering
- Power Engineering Technology
- Outdoor Power Equipment Technician

University College of the North
436 – 7th Street East
P.O. Box 3000
The Pas, MB R9A 1M7
(204) 627-8500
www.ucn.ca/ics
• Basic Electrical
• Electrical/Electronic Technology

University of Manitoba
Winnipeg, MB R3T 2N2
(204) 474-8880
www.umanitoba.ca
• Electrical Engineering

Winnipeg Technical College
130 Henlow Bay
Winnipeg, MB R3Y 1G4
(204) 989-6500
www.wtc.mb.ca
• Electrical Applications

ONTARIO

Algonquin College
1385 Woodroffe Avenue
Ottawa, ON K2G 1V8
613-727-0002
www.algonquincollege.com
• Electrician Apprenticeship (Construction/Maintenance)
• Electrical Engineering Technology
• Electro-Mechanical Engineering Technician (Robotics)

Cambrian College
1400 Barrydowne Road
Sudbury, ON P3A 3V8
(705) 566-8101
www.cambriancollege.ca
• Electrical Engineering Technician (Industrial)
• Electrical Engineering Technology (Industrial)
• Electrical Techniques
• Powerline Technician

Canadore College
100 College Drive, P.O. Box 5001
North Bay, ON P1B 8K9
(705) 474-7600
www.canadorec.on.ca
• Electrical Techniques

Carleton University
1125 Colonel By Drive
Ottawa, ON K1S 5B6
(613) 520-7400
www.carleton.ca
• Electrical Engineering

Centennial College
P.O. Box 361, Station A
Toronto, ON M1K 5E9
(416) 289-5300
www.centennialcollege.ca
• Electric Apprenticeship
• Electro-Mechanical Engineering Technician/Technology
• Energy Systems Engineering Technician/Technology

Collège Boréal
21, boulevard Lasalle
Sudbury, ON P3A 6B1
(705) 560-6673
www.borealc.on.ca
• Techniques du génie électrique
• Technologie du génie électrique
• Technologie du génie électronique - industriel

Conestoga College
299 Doon Valley Drive
Kitchener, ON N2G 4M4
(519) 748-5220
www.conestogac.on.ca
• Electrical Engineering Technician
• Electrical Engineering Technology
• Electrical Technician (Industrial)
• Electrician Apprenticeship (Industrial)
• Electrician Construction & Maintenance Apprenticeship
• Construction Techniques (Electrical and HVAC)

Confederation College
1450 Nakina Drive
P.O. Box 398
Thunder Bay, ON P7C 4W1
(807) 475-6110
www.confederationc.on.ca
• Electrical Construction & Maintenance Apprenticeship
• Electrical Engineering Technology (Computer Control)

Durham College
2000 Simcoe Street North
Oshawa, ON L1H 7K4
(905) 721-2000
www.durhamcollege.ca
• Electrical Technician (Instrumentation and Control)
• Electrician (Construction and Maintenance Apprenticeship)
• Electrician (Industrial Apprenticeship)
• Electro-Mechanical Engineering Technology
• Motive Power Technician (Service and Management)

Electrical College of Canada
91 Friuli Court, Unit 3
Woodbridge, ON L4L 7H2
(905) 264-1412
www.electricalcollege.ca
• General Workshops
• Apprenticeship Workshops

Fanshawe College
1001 Fanshawe College Boulevard
London, ON N5Y 5R6
(519) 452-4430
www.fanshawec.ca
• Electrical Engineering Technician or Technology (Accelerated)
• Electrical Techniques

Fleming College
599 Brealey Drive
Peterborough, ON K9J 7B1
(705) 749-5530
www.flemingc.on.ca
• Electrical Engineering Technician
• Electrical Power Generation Technician
• Electrical Techniques
• Electrician Apprenticeship (Basic, Intermediate & Advanced)

George Brown College
P.O. Box 1015, Station B
Toronto, ON M5T 2T9
(416) 415-2000
www.georgebrown.ca
• Electro-mechanical Engineering Technician

Georgian College
1 Georgian Drive
Barrie, ON L4M 3X9
(705) 728-1968
www.georgianc.on.ca
• Electrical Engineering (Automated Systems)
• Electrical Engineering Technician (Power)

Humber College
205 Humber College Boulevard
Toronto, ON M9W 5L7
(416) 675-3111
www.humber.ca
• Electrician Apprenticeship (Industrial)
• Electrician Apprenticeship (Construction & Maintenance)
• Electrical Engineering Technology (Control Systems)
• Electromechanical Engineering Technology (Automation and Robotics)
• Sustainable Energy & Building Technology

La Cité collégiale
801, promenade de l'Aviation
Ottawa, ON K1K 4R3
(613) 742-2483
www.lacitec.on.ca
• D'Apprentissage Electricien (Construction et Entretien)
• Techniques du Genie Electronique
• Technologie du Genie Electronique

Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1
(807) 343-8110
www.lakeheadu.ca
• Control Engineering
• Electrical Engineering
• Electrical & Computer Engineering

Lambton College
1457 London Road
Sarnia, ON N7S 6K4
(519) 542-7751
www.lambton.on.ca
• Alternative Energy Engineering Technology
• Construction Maintenance Electrician Apprenticeship (Basic, Intermediate & Advanced)
• Electrical Techniques

Loyalist College
Wallbridge-Loyalist Road, P.O. Box 4200
Belleville, ON K8N 5B9
(613) 969-1913
www.loyalistcollege.com
• Electrical Techniques
• Electrical Engineering Technician (Industrial)

Mohawk College
P.O. Box 2034
Hamilton, ON L8N 3T2
(905) 575-1212
www.mohawkcollege.ca
• Electrician Apprenticeship (Construction & Maintenance)
• Electrical Engineering Technology (Power or Control)
• Energy Systems Engineering Technology (Clean & Renewable Energy)

Niagara College
300 Woodlawn Road
Welland, ON L3C 7L3
(905) 735-2211
www.niagaracollege.ca
• Electrical Engineering Technician
• Electrical Engineering Technology

Northern College
4715 Highway 101 East
South Porcupine, ON P0N 1H0
(705) 235-3211
www.northernc.on.ca
• Electrical Engineering Technician
• Electrical Engineering Technology

Pre-Apprenticeship Training Institute
10 Kodiak Crescent Unit 100
Toronto, ON M3J 3G5
(416) 638-4111
www.patinstitute.ca
• Construction and Maintenance Electrician Pre-Apprenticeship
• Combined Electrician and Network Cabling Program

Queen's University
99 University Avenue
Kingston, ON K7L 3N6
(613) 533-2000
www.queensu.ca
• Electrical Engineering

Royal Military College of Canada
13 General Crerar Crest
Kingston, ON K7K 7B4
(613) 541-6000 ext 3760
www.rmc.ca
• Electrical Engineering

Ryerson University
350 Victoria Street
Toronto, ON M5B 2K3
(416) 979-5000
www.ryerson.ca
• Electrical Engineering

Sault College
443 Northern Avenue
Sault Ste. Marie, ON P6A 5L3
(705) 759-2554
www.saultcollege.ca
• Electrical Engineering Technician (Power Generation)
• Electrical Engineering Technician/Technology (Process Automation)
• Electrical Engineering Technician (Process Automation & Trades)
• Pre-Trades and Technology

Seneca College
1750 Finch Ave. East
Toronto, OM M2J 2X5
(416) 491-5050
www.senecac.on.ca
• Electro Mechanical Design
• Electronics Engineering Technology – Control Systems

Sheridan Institute of Technology & Advanced Learning
407 Iroquois Shore Road
Oakville, ON L6H 1M3
(905) 845-9430
www1.sheridaninstitute.ca
• Electrician (Pre-Trades)
• Electronics Engineering Technician - Technology
• Electromechanical Engineering Technician - Technology

St. Clair College
2000 Talbot Road West
Windsor, ON N9A 6S4
(519) 966-1656
www.stclaircollege.ca
• Electrical Techniques
• Electronics Engineering Technology (Industrial Automation)
• Electrician Apprenticeship (Construction & Maintenance)
• Electrician Apprenticeship (Industrial)

St. Lawrence College
100 Portsmouth Avenue
Kingston, ON K7L 5A6
(613) 544-5400
www.sl.on.ca
• Electrical Engineering Technician
• Electrician Apprenticeship (Construction & Maintenance)
• Energy Systems Engineering Technician/ Technology
• Wind Turbine Technician/Industrial Electrician Apprenticeship

University of Ontario Institute of Technology
2000 Simcoe St. North
Oshawa, ON L1H 7K4
(905) 721-8668
www.uoit.ca
• Electrical and Computer Engineering (Doctoral, Master's, Bachelor)
• Electrical Engineering
• Electrical Engineering and Management
• Energy Systems Engineering

University of Ottawa
75 Laurier Avenue East
Ottawa, ON K1N 6N5
(613) 562-5700
www.uottawa.ca
• Electrical Engineering
• Electrical Engineering Management

University of Toronto
27 King's College Circle
Toronto, ON M5S 1A1
(416) 978-2011
www.utoronto.ca
• Electrical Engineering
• Sustainable Energy

University of Waterloo
200 University Avenue West
Waterloo, ON N2L 3G1
(519) 888-4567
www.uwaterloo.ca
• Electrical Engineering

University of Western Ontario
1151 Richmond Street
London, ON N6A 3K7
(519) 661-2111
www.uwo.ca
• Electrical Engineering

University of Windsor
401 Sunset Avenue
Windsor, ON N9B 3P4
(519) 253-3000
www.uwindsor.ca
• Electrical Engineering
• Electrical Engineering Certificate

SASKATCHEWAN

Carlton Trail Regional College
Box 459, 108-6th Avenue East
Watrous, SK S0K 4T0
(306) 946-2094
www.ctrc.sk.ca
• Electrician

Cumberland College
400 Burns Ave. E.
Melfort, SK S0E 1A0
(306) 752-2786
www.cumberlandcollege.sk.ca
• Power Engineering
• Electrician Certificate

Great Plains College (Prairie West Regional College)
Box 700, 701 Dominion Street
Biggar, SK S0K 0M0
(306) 948-3363
www.greatplainscollege.ca
• Electrician
(Applied Certificate)
• Power Engineering
• Wind Turbine Technician

North West Regional College
10702 Diefenbaker Dr.
N. Battleford, SK S9A 4A8
(306) 937-5100
www.nwrc.sk.ca
• Electrician

Northlands College
Box 1000
Air Ronge, SK S0J 3G0
(306) 425-4480
www.northlandscollege.sk.ca
• Mine Training: Electrician

Saskatchewan Institute of Applied Science & Technology (SIAST)
400 – 119 4th Avenue South
Saskatoon, SK S7K 5X2
(306) 933-7331
www.siast.sk.ca
• Electrician Applied Certificate
• Electrician Apprenticeship
• Power Engineering Technician
• Power Engineering Technology

Southeast Regional College
Box 2003
Weyburn, SK S2H 2Z9
(306) 848-2505
www.southeastcollege.org
• Electrician Certificate
• Power Engineering Technician

University of Saskatchewan
105 Administration Place
Saskatoon, SK S7N 5A2
(306) 966-5788
www.usask.ca
• Electrical Engineering

QUEBEC

Aviron Québec, Collège Technique
270, boul. Charest Est
Quebec, QC G1K 3H1
(418) 529-1321
www.avironquebec.com
• Électricité

Commission Scolaire de Kamouraska – Rivière-du-Loup
464, rue Lafontaine
Rivière-du-Loup, QC G5R 3Z5
(416) 862-8201
web.cskamloup.qc.ca
• Électricité
• Électroméchanique de systèmes automatisés

Commission Scolaire de L'Estuaire
771, boulevard Joliet
Baie-Corneau, QC G5C 1P3
(418) 589-0806
www.csestuaire.qc.ca
• Électricité
• Électroméchanique de systèmes automatisés

Commission Scolaire de Laval
955, boulevard Saint-Martin Ouest Laval, QC H7S 1M5
(450) 662-7000
www.cslaval.qc.ca
• Électricité de construction
• Électricité (Nouvelle version)

Commission Scolaire de Montréal (CSDM)
3737, rue Sherbrooke Est
Montréal, QC H1X 3B3
(514) 596-6000
www.csdm.qc.ca
• Électricité de construction
• Électromécanique de systèmes automatisés
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Kids shown futures in the trades

OCS wraps up Future Building 2010

More than 5000 young people attended Future Building 2010 at the Careport Centre in Hamilton, Ont., to explore career options in the construction sector.

The kids received one-on-one instruction from successful professionals currently employed in the construction sector. These volunteers appreciate the value of hands-on exposure and help open the minds of thousands of youth as they share their personal career journeys with tomorrow's builders, employers and entrepreneurs.

Through hands-on activities and asking questions, this annual three-day career exposition allows youth to explore opportunities in the construction industry. Over 20 trades were represented, and professionals and apprentices from associated organizations demonstrated their respective trades through hands-on activities.

This event is sponsored in partnership with the Ontario Construction Secretariat (OCS) and Employment Ontario.

OCS (www.iciconstruction.com) was established in 1993 under provincial legislation to represent the collective interests of the organized building trades unions and their signatory contractors in the industrial, commercial and institutional (ICI) construction industry. Together with its labour-management-government partners, OCS works to enhance Ontario's unionized ICI construction industry by developing relationships, facilitating dialogue, providing value-added research, disseminating information and promoting the value of unionized ICI construction. EB

Stephen Tatrallyay, LLB

Court broadens owners' tendering rights... again

The Court of Appeal for Ontario has once again managed to avoid giving a straight answer to the question: What is a breach of the fairness rules of tender, and how is one to be dealt with?

In the case Bot v HMQ in right of Ontario (Ministry of Transportation), the court found itself engaged in a question as to whether a conforming tender had, in fact, been made and, if not, whether the unsuccessful party had a right to object—and how.

Under the Judicial Review Procedure Act RSO 1990 c. J-1, some parties involved in tendering cases with the Government of Ontario have a right to object regarding a Crown Decision to Divisional Court—an intermediate court consisting of three judges of the Ontario Court of Justice. This procedure was adopted by Bot Construction in a case involving roadwork in which Thomas Cavanagh Construction had been the successful bidder.

The objection was based on Cavanagh's failure to include in its bid the value of imported steel. There was one very small part of the work which required steel that was not available anywhere in Canada—only from the United States. Bot's contention was that Cavanagh's failure to include this information invalidated their tender and made it non-conforming. A number of side-issues arose during the process of the appeal.

Bot first argued that Divisional Court erred in concluding it had jurisdiction to review the government's decision at all. In the circumstances of the case, the court decided it was not necessary to answer that question, because it was not necessary for resolving the case.

On learning from Bot that there was a problem, MTO conducted an inquiry. Cavanagh said that its bid was legitimate: it only intended to use Canadian steel in the project. American rolled steel, called for in the design, could be eliminated by adopting a Canadian welded-steel approach, which would meet MTO standards for structural strength and performance.

The amount of American steel required in the original design was small, both in the abstract and in terms of the overall size of the project. There was an explicit Crown policy favouring the use of Canadian steel wherever possible. Lastly, in view of the sums involved, had Cavanagh declared it would use American steel and adjusted its price accordingly, it would have had no impact on Cavanagh's position as low bidder.

Bot also argued that Divisional Court had applied the wrong test to determine whether the Cavanagh bid was non-conforming. Divisional Court had agreed that the standard was not a high one, but that Cavanagh had—in any event—been unable to meet it with reference to the total absence of rolled steel, only manufactured offshore.

The Court of Appeal accepted the analysis as to the standard of proof, but had a very different view of its application. On finding that MTO had conducted a thorough investigation of the Cavanagh bid once notified of the problem, and that the analysis used in that investigation was in the legitimate interest of MTO (as opposed to either of the bidders), the court held that any duty of fairness which had been owed to Bot by MTO had been met.

Although some specialized boards appointed by the government are given complete deference as to their views on their areas of expertise (the Labour Relations Board is a good example), there was no such guideline in this case. However, Divisional Court had come to the conclusion that:

> Ministry Personnel who select bids are highly experienced in the road construction specification and in the public tender process [...] They have considerable experience in the application of the administrative Directive and the application of the Steel Policy. The ministry determination of the bid process or bid compliance is inextricably intertwined with the facts.

The Court of Appeal held that, after a legitimate review of a complaint by MTO officials, the MTO decision must be considered reasonable and, therefore, unimpeachable by the courts. EB

Notes

- Bot Construction Ltd., Bot Holdings Ltd., Bot Construction Canada Ltd. et al v Her Majesty the Queen in right of Ontario (Ministry of Transportation); Thomas Cavanagh Construction Ltd. (Respondant).
- 2009 ONCA 879 decision of the Court of Appeal for Ontario (MacPherson, Cronk and Sharpe JJA) released Dec. 11 2009.

Stephen Tatrallyay is certified by the Law Society as a specialist in Construction Law, and has been president of the Canadian College of Construction Lawyers (CCCL) and both the National and Ontario branches of the Construction Law Section of the Bar Association. He practices in Stratford, Ont., and can be reached at (519) 271-6360 or statrallyay@rogers.com.

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Cooper Lighting McGraw-Edison Ventus outdoor LED area luminaire

Cooper Lighting's McGraw-Edison Ventus is a new outdoor LED area luminaire that, boasts the company, offers "unmatched optical performance and versatility with superior light quality". Incorporating Cooper's patent-pending modular LightBAR technology and patented AccuLED Optics system, the luminaires' application-specific design allows lumen and energy output to be customized to fulfil the needs of the outdoor space; this, says Cooper, eliminates wasted energy, obtrusive spill light and

overlighting. Ventus features die-cast and extruded aluminum construction, and a design that allows for passive cooling and natural cleaning of the extruded heat sink.
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GE Tetra AL10 LED System

GE launched its Tetra AL10 LED System to replace fluorescent and halogen lighting in retail or architectural applications. The low-profile modular fixture can be used under selves and coves, or be used as for accent and task lighting. According to the release, the Tetra AL10 reduces energy consumption by up to 40% compared to T5 fluorescent systems. The system offers a color-rending index of 93 and ANSI bin colour temperature consistency of 2700K, 3000K, and 4000K—says GE. It also includes lens options in 60-, 90- or 120-clear and 120-degree soft beam patterns. The Tetra is fully dimmable, has a voltage of 12VDC, and uses a remote driver and multiple modules. It consumes 4.5 watts per foot (14.8W/m) to run for 50,000 hours.
GE LIGHTING
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Appleton Mercmaster enclosed and gasketed LED luminaire

Appleton introduced its alternative to HID and high-intensity fluorescent lighting with its Mercmaster enclosed and gasketed LED luminaire. The Mercmaster features a compact, low-profile and is rated by the NEC as Class I, Division 2, and Class I, Zone 2. The suggested applications by the release are hazardous and non-hazardous locations in oil refineries, pulp and paper mills, foundries, general manufacturing plants, and marinas. All exposed hardware is stainless steel.
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ADVERTISER INDEX

Les Stoch, P.Eng.

Rule 10-812 Grounding Conductor Size

CEC Rule 10-812 specifies minimum grounding conductor sizes for low-voltage electrical systems up to 750 volts. This Rule was revised in latest CEC iteration (2009), so let's look at some of its complexities.

Subrule 1 tells us that, when the electrical system grounding electrode is a continuous metallic public water system (or other interconnected electrode systems that may provide multiple ground fault current paths back to the source), the minimum grounding conductor size must be selected from Table 17. Subrule 2 says the minimum grounding conductor size for other types of grounding electrodes must not be smaller that No. 6 AWG.

Appendix B explains the minimum grounding conductor size for a solidly grounded electrical system need not be larger than No. 6 AWG, as most of the ground fault current will be carried back to the source by the grounded circuit conductor (service neutral).

Appendix B also says that when a continuous underground public metallic water system (or other low-impedance system) is used as the grounding electrode—or that the source and electrical service grounding electrodes are interconnected—the minimum grounding conductor size must be selected from Table 17, since a sizable portion of the ground fault current will be carried by the grounding conductor.

So how do you interpret Rule 10-812?

- When your electrical system grounding electrode is a metallic water system, use Table 17.
- When both the electrical utility's transformer and your electrical service are grounded to the same grounding electrode (or separate interconnected grounding electrodes) use Table 17.
- When the electrical utility's transformer and your electrical service are grounded to separate grounding electrodes (other than a metallic water system), the system grounding conductor need not be larger than No. 6 AWG.

But a note of caution: when the building is supplied by a metallic water system that *is not* being used as the electrical system grounding electrode, the water system will need to be bonded to your electrical system grounding electrode (rods, plate, etc.). Therefore, a low-impedance return path is established and you still need to use Table 17.

All well and good, but this rule is also a bit of a head scratcher. What if your building has 5000-amp electrical service equipment? Will the minimum No. 6 AWG grounding conductor size be heavy enough to safely carry the available ground fault current? Even though most ground fault current is expected to return along the system neutral, the portion flowing back along other paths may be sufficient to burn off the system grounding conductor in an electrical service of this size.

Truth be told, I'm struggling with the technical justification for the revised rule. We know the impedance of the ground fault path consists of resistance and inductive reactance. Previously, testing has provided conclusive proof the lowest impedance fault paths are always closest to the current-carrying conductors. Magnetic fields produced by the circuit conductors will force fault current along the path closest to the circuit conductors (the system neutral). Other paths further from the circuit conductors (such as a metallic water system or interconnected grounding electrodes)—even though they may have low resistances—will usually have higher total impedances and, therefore, will only be expected to carry a much smaller portion of the fault current.

Play it safe. Always use Table 17. EB

Les Stoch is president of L. Stoch & Associates, specialists in quality management/engineering services. He is a member of PEO, OEL and IAEI, and develops and delivers electrical code and technical workshops for Dalhousie University. He also developed the Master Electrician training program and exam (Ontario) for the Electrical Contractor Registration Agency. Visit L. Stoch & Associates online at www.lstoch.ca.

Questions and answers compiled by the Electrical Safety Authority | VISIT WWW.ESASAFE.COM

Tackle The Code Conundrum... if you dare

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

How did you do with the last quiz? Are you a...

Master Electrician ? (3 of 3)
Journeyman ? (2 of 3)
Apprentice ? (1 of 3)
Plumber ?! *(0 of 3)*

Question 1

[___] is a flexible polymeric sleeve intended to enclose luminous tube sign GTO cable operating at not more than 7500 volts-to-ground and intended to be installed within an approved raceway.

Question 2

Conductors in the high voltage circuits of X-ray equipment shall be of the [___] type.

a) Shockproof
b) TC
c) RW
d) Multi-conductor

Question 3

Where a surface extension is made from an existing outlet of concealed wiring, a [___] shall be mounted over the original box and electrically and mechanically secured to it.

a) Plaster ring
b) Blank cover
c) Concrete ring
d) Box or an extension ring

Answers to Code Conundrum Electrical Business August 2010

Q-1: A dry-type transformer suitable for installation in an ordinary location shall be permitted to be installed within a spray booth for connection to the high-voltage leads of fixed electrostatic spraying equipment.

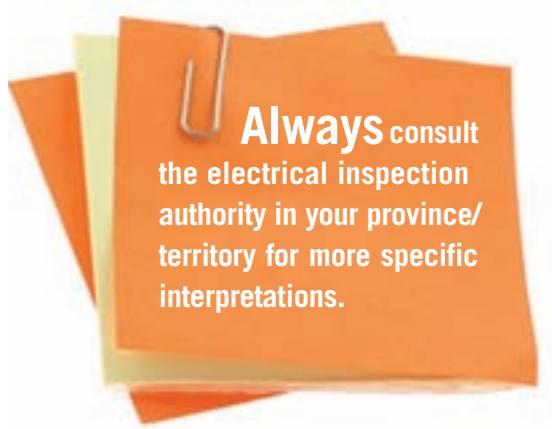
b) False. Subrule 20-408(a).

Q-2: High-voltage type TC cables shall not be installed in the same cable tray with low-voltage conductors, except where they are separated by ___ .

A barrier of sheet metal not less than 1.34-mm thick (No. 16 MSG). Subrule 36-100(3).

Q-3: Plug fuses and fuse holders shall not be used in circuits exceeding 125 V between conductors

b) False. Rule 14-202 permits the use of plug fuses and fuse holders in circuits supplied from a system having a grounded neutral and having no conductor operating at more than 150 volts-to- ground.



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