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ASSOCIATION OF ONTARIO

Volume 49 • Number 1 • Winter 2011



Economic Forecast

Lien Act Amendments

Change Order Protocol

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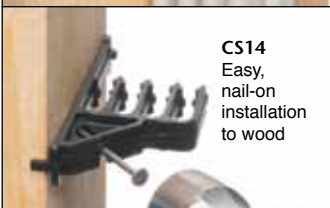
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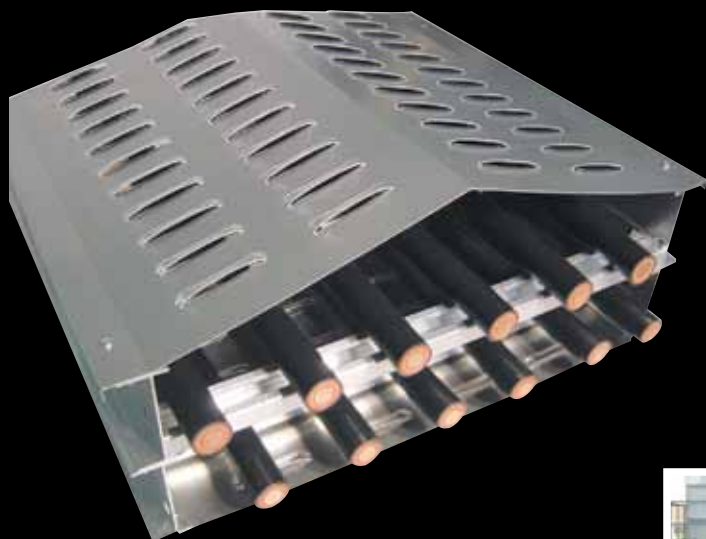
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On The Cover: Delegates of the 2nd Annual CFAE Conference visit the Mircom facility (see story page 30).

The Ontario Electrical Contractor is published quarterly for:

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ELECTRICAL CONTRACTORS
ASSOCIATION OF ONTARIO

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*The Ontario Electrical Contractor is the official publication of
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is to provide information and editorial comment on issues
that are relevant to the electrical contracting industry.*

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Published by:

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Toronto, ON M2N 6P4

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John Raeppe

The President's Remarks

The theme of this first issue of 2011 is devoted to the economic outlook for the year ahead and matters related to the financial concerns of electrical contractors.

On the economics front, Katherine Jacobs and Rishi Sondhi of the Ontario Construction Secretariat examine the prospects for industrial, commercial and institutional construction in 2011. Working from recent scenario-based models developed by the Construction Sector Council, Jacobs and Sondhi predict that construction will "hold its own" in the midst of a slowing Ontario economy. Look for improved conditions in the commercial sector as we ride the infrastructure wave through 2011.

So, there's work out there... but at what price and will I get paid in full? As the fundamentals of the economy change, these questions are the new reality of electrical contracting and are at the top of the Association agenda.

Change orders are among the most talked about issues at the ECAO boardroom table. Recently the ECAO directors adopted and agreed to promote the new Change Order Protocol, created by a working committee of the Toronto electrical, mechanical and sheet metal contractors associations and the Toronto Construction Association. We have taken the unusual step of printing the Protocol here in its entirety because it represents a high level consensus of the major parties involved in the change order process and promotes industry dialogue about bringing fairness and reason to the costing and pricing of change orders. ECAO is recommending the Protocol to its 13 area ECAs and is soliciting the support of the Canadian Electrical Contractors Association (CECA) to promote the Protocol nationally as a companion to its *Change Order Users Guide*.

In his case study, "When the Going Gets Tough...", Professor Awad Hanna describes an industrial project where changes piled up at four times the normal rate triggering many of the costly factors described in the Change Order Protocol. The electrical contractor's ability to identify and account for these costs in arbitration eventually leads

to a happy ending validating the real world application of consensus documents like the Protocol.

The Construction Lien Act (CLA) is one of a few levers available to contractors to enforce payment. Thanks in part to the efforts of ECAO over the past five years, Ontario's CLA has finally been amended to re-apply lien protection to industrial work. The new definition of "Improvement" in the CLA clarifies many of the issues raised by the infamous *Kennedy Electric* case. Dan Leduc of Ogilvy Renault LLP comments on the Kennedy amendment and other improvements arising from passage of the *Open for Business Act* in October, 2010.

There is still a lot of work to do to modernize the CLA and improve the rights of contractors to get paid in full for fulfilling their contracts. David Zurawel from the Council of Ontario Construction Associations (COCA) writes about some of the next steps in CLA reform as well as introduces a new option – Prompt Payment legislation. American jurisdictions, like Massachusetts, have enacted such legislation which forces timely payment and deals with prickly issues such as "pay when/if paid" clauses.

In putting this edition of *The Ontario Electrical Contractor* together, I have learned that the interests of contractors across the trades are aligned on the issue of getting paid. But there is no single silver bullet that is going to solve all our problems. Neither is there any one organization that can succeed alone. ECAO learned that lesson during the five year push to address the *Kennedy* case. We must form and strengthen alliances; keep pushing on all fronts if we wish to change the payment culture of our industry. For its part, ECAO will continue to work directly and in partnership with likeminded organizations in an effort to realize positive change for our members and colleagues.

Your comments or questions regarding any of the matters published in *The Ontario Electrical Contractor* are always welcome and may be directed to me at ecao@ecao.org. I look forward to hearing from you.

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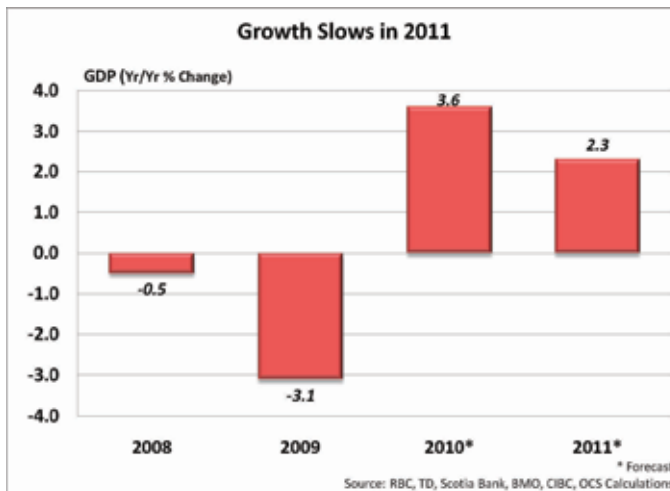
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Ontario's 2011 Economic and Construction Outlook:

Holding our Own, Strong Activity on the Horizon

By Katherine Jacobs and Rishi Sondhi

After posting growth likely north of three per cent in 2010, Ontario's economy is poised for a significant slowdown in 2011. The average estimate of major forecasters in Ontario reveals that growth is expected to slow to 2.3 per cent. There are a multitude of culprits responsible for the probable decline.

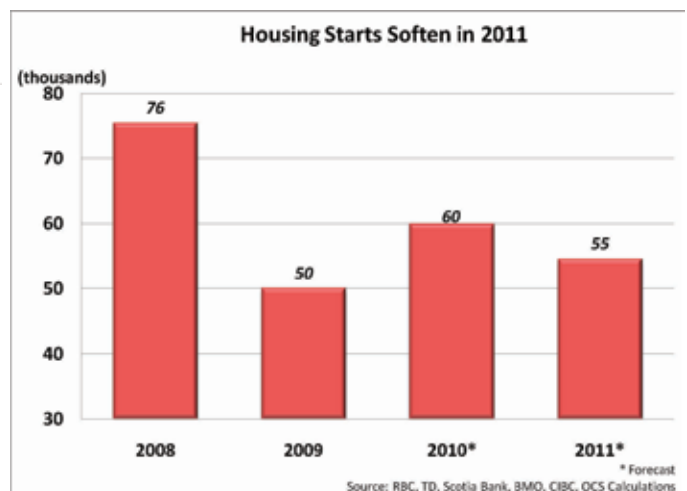


Firstly, a lofty Canadian dollar - which is expected to trade at or above parity in 2011 - coupled with an uneven and moderate U.S. recovery will weigh on export growth, though it's still expected to be positive. Meanwhile, the strong dollar will encourage import activity, meaning that net trade (exports - imports) will be a drag on growth.

Secondly, governments must also address their growing deficits and improve their fiscal position. Consequently, the provincial government is expected to ratchet down spending in 2011. In their mid-year fiscal review, the provincial government indicated that they expected program spending to drop 2.4 per cent in the 2011/2012 fiscal year. The slowing in government spending is also apparent

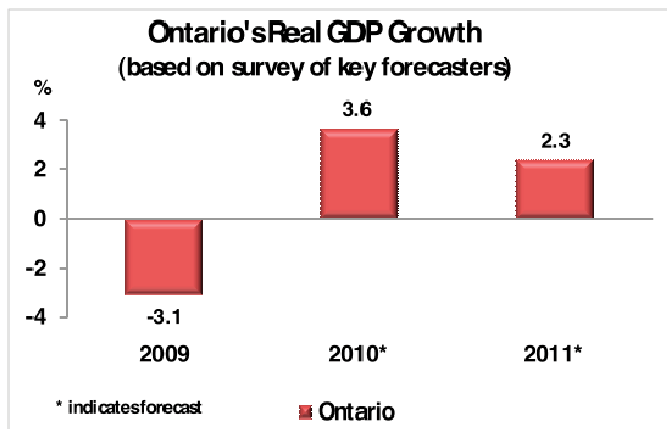
when one looks at Ontario's Economic Accounts. Their tabulations reveal that government spending on capital advanced by 1.1 per cent in the second quarter of 2010, a significant slowing from the seven per cent pace registered in the prior five quarters. This moderation in government spending is another factor which will weigh on growth.

Finally, housing starts have moderated in the second half of 2010 from the lofty levels seen at the beginning of 2010. Analysts have reasoned that over the first half of 2010, rock-bottom interest rates, the introduction of new mortgage rules and the impending introduction of the HST encouraged purchasers and builders to "bring forward" activity which likely would have taken place in the second half of 2010. As a result, the pent-up demand that was generated during the recession has been exhausted and activity has slowed significantly in the latter part of 2010. This slowing trend is expected to continue into 2011, in tandem with the slowing economy.

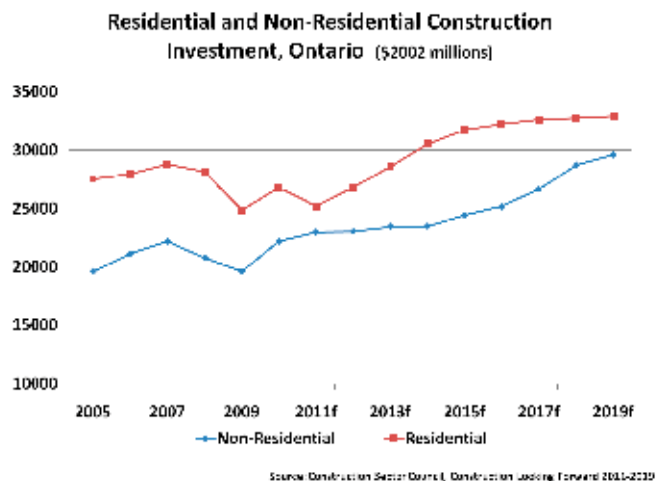


Construction Continues to Hold Its Own

As we look back at 2009 and 2010, construction was spared most of the hardship of the economic recession. Although some trades and regions experienced declines in activity over the past two years, many were kept busy with the infrastructure stimulus projects building roads, bridges, hospitals, schools, water treatment facilities and community centres. Construction employment dropped from peak levels in 2008 by approximately 30,000 jobs in 2009. However, this decline was short-lived and many of those jobs came back in 2010.



The Construction Sector Council has recently finalized its 2011 scenario-based forecast to assess future labour market conditions. In consultation with the Ontario LMI Committee, the CSC anticipates a decline in residential investment in 2011 before growth resumes again in 2012. On the non-residential side, modest growth is anticipated in 2011 as the economic recovery continues to take hold.

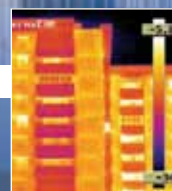
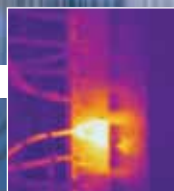


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Industrial Sector

Construction investment in Ontario's industrial sector is expected to increase in 2011 from the extremely depressed levels observed in 2009 and 2010. The crisis which gripped the "Detroit 3" automakers (General Motors, Chrysler and Ford) in the midst of the recession in 2009 led to a significant drop in automotive production and sales. Given Ontario's reliance on automotive demand from the United States, it is little wonder why the industrial sector dropped as precipitously as it did. In 2010 however, there has been a tentative recovery in the automotive sector. Case-in-point, Canadian passenger car sales were up 14 per cent year-over-year in November. Meanwhile, North American automotive production totalled 12.3 million units from January to November of 2010 after a meagre 8.5 million units were produced in 2009.

That Chrysler and General Motors have both indicated that they expect to payback government bailout loans earlier than expected suggests that the automotive sector is in the process of healing and as such, further recovery in this sector will likely take place in 2011, providing support to manufacturing activity and building.

More broadly, manufacturing activity is expected to increase in 2011, in tandem with an increase in exports brought upon by continued recovery in the U.S. economy; this should provide another crutch to industrial activity and construction.

Commercial Sector

Real commercial investment is also projected to increase in 2011 and through 2019. In addition to keeping up with population growth and economic activity, there are a number of other factors behind expected commercial growth. Firstly, despite a few modest tightening moves by the Bank of Canada, interest rates are still very low. Secondly, credit conditions at major lenders have been easing, meaning that it is becoming easier to obtain financing for projects. Continued economic growth should also provide support to commercial building. Additionally, Toronto is hosting the 2015 Pan-Am games and as a result will be building a soccer stadium, an aquatics centre and a velodrome.

Office vacancy rates have settled at 9.4 per cent in the third quarter of 2010. Vacancy

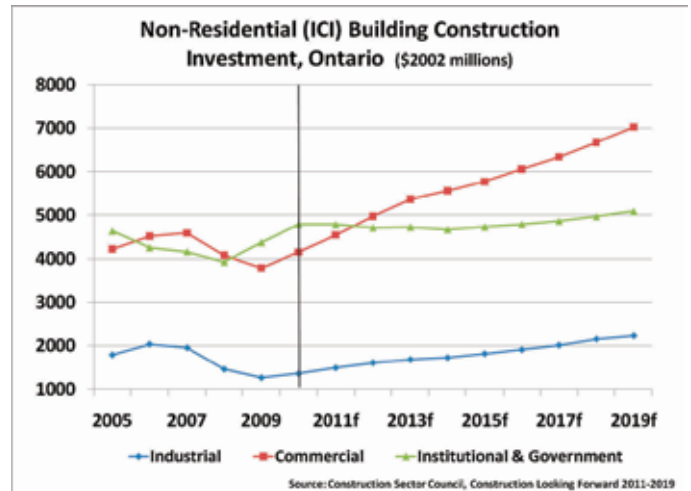
rates of around 9.0 per cent have historically been associated with increased building. Furthermore, demand for office space has been rebounding as of 2009 Q3, thanks in part to Canada's strong financial system which remained relatively intact during the great recession.

Other commercial sectors such as retail and hotel building should also see a cyclical pickup in activity, though the latter will likely be weighed on by a high dollar and only moderate U.S. recovery.

Institutional Sector

Institutional investment will likely decline somewhat in 2011 as stimulus projects that were "pulled forward" to meet the original March 31, 2011 federal deadline come off the books. Furthermore, the provincial government is going to be reining in spending, which will weigh on this sector. Of special note is the fact that the original infrastructure stimulus deadline has been extended to October 31 to facilitate the completion of some 940 projects - comprising 24 per cent of the total - that were in danger of missing the original target. This extension will ensure that many projects still getting off the ground will reach completion.

Longer-term, immigration and demographic factors (i.e. the aging population) will cause a resumption of institutional investment in the latter half of the decade.



Engineering Sector

Engineering investment is expected to post a moderate gain in 2011 on the back of a multitude of energy and ongoing infrastructure projects (roads, highways, bridges, transit, water/wastewater). Because some of these projects receive significant funding from the private sector, the risk of pullback in activity is lessened when the government reduces spending.

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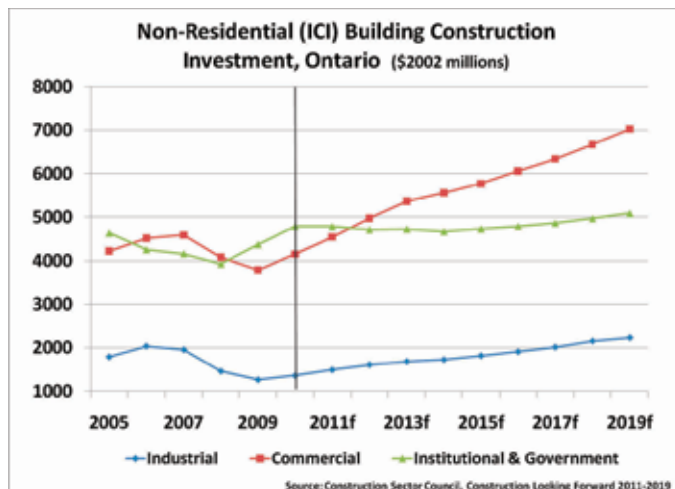
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The utility sector has significant projects planned over the next several years and later in the decade the expansion of nuclear facilities will play a significant role in construction activity. Northern Ontario's economy may be poised to receive a significant lift from the "ring of fire" as prospects for numerous mining projects are firmed up in the coming years.



Ontario's construction industry will continue to hold its own through 2011 as the economic recovery continues to take hold. Infrastructure projects will form the backbone of construction activity, but the industry can look forward to improving opportunities in the commercial sector and very modest growth in industrial activity. Labour market conditions are anticipated to be balanced throughout 2011, but going forward major projects will create market pressures at peak periods across select regions. According to the Construction Sector Council forecast, age and demographics will continue to dominate the horizon and construction will continue to need to recruit new workers to meeting its ongoing labour requirements.

Katherine Jacobs, Director of Research & Analysis
Rishi Sondhi, Construction Information Coordinator
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By Dan Leduc

Bill 68 and Changes to the Lien Act

The Other *Kennedy* Tragedy

Not to belittle the tragic demise of John F. Kennedy more than 47 years ago, the Ontario construction industry, and in particular, the electrical contracting sector, had its own ‘Kennedy Tragedy’ in the early part of the last decade. Many of you will recall the long legal road travelled by Kennedy Electric and Cassidy Industrial Contractors which had liens against Dana Canada Corporation for the design and installation of an assembly line in a Ford truck plant. The work consisted of building and testing a 100,000-square-foot, 500,000-ton assembly line consisting of 100 mezzanines and 165 platforms which were bolted into a building especially designed to house it. The work was done in Oakville and Mississauga and then disassembled, moved to St. Mary’s, Ontario and reassembled there. Notwithstanding this massive and apparent industrial scope of work and the fact that holdbacks were taken and so on, Justice Killeen of the Ontario Superior Court ruled that the assembly line did not fall within the definition of an ‘improvement’ in the *Construction Lien Act* by finding that the assembly line was portable. That decision was later upheld by the Divisional Court and then the Court of Appeal.

In an effort to address what to many appeared to be an obvious misapplication of the scope of Ontario’s lien legislation, the ECAO, along with other stakeholders, urged the Ontario Government to make changes to the *Construction Lien Act* that would ensure that the type of scope of work performed by Kennedy Electric would be lienable.

The result was the Ontario Government’s Bill 68, titled *An Act to promote Ontario as open for business by amending or repealing certain Acts* (who picks these titles – was Ontario ‘closed for business’ at one time?). Bill 68 involves a series of amendments in respect

of a number of statutes. Our focus here is on the changes to the *Construction Lien Act*. Those changes include:

- The definition of “improvement” is expanded;
- The requirement to publish notice of the intended registration of a condominium;
- An affidavit of verification is no longer required for a claim for lien to be valid;
- Cross-examination on claim for a lien; and
- Changes to sheltered liens.

The only one of the foregoing changes that is currently in effect is the changes to the definition of ‘improvement.’ The others are awaiting final assent from the Government.

Definition of “Improvement”

The definition of “improvement” has been changed to include the installation of industrial, mechanical, electrical or other equipment on the land which is essential to the normal or intended use of the land, building, structure or works. This will have an important impact on the application of the *Act* for equipment suppliers who may now claim liens if they meet the lien requirements. As noted, this amendment is in force.

Some might suggest that the words ‘essential’ and ‘normal use’ have some potential to be ambiguous and open the door to Owners to say that the work performed was not ‘essential in the normal or intended use of the land, building, structure or works.’ However, I prefer to look at it this way: how much of the work performed by

the electrical contracting industry in Ontario is 'non-essential'? Who hires electrical contractors to do 'non-essential' work? How much of the work performed by electrical contractors is related to various code requirements thus making it 'essential for the normal use of a building' to, for example, obtain occupancy. Is a fire alarm system essential for the normal operation of a building? At first you might think not – it sits there doing little in respect of the actual workings of that particular building – but it is essential for normal operations of any building given that it is a code requirement.

As an example, after the *Kennedy* decision, I actually believed that a supplier of generators would have no lien rights because, akin to the work *Kennedy* did, a generator could be moved from one location to another although typically bolted on a concrete pad attached to the building or structure in question. With these changes, I am relatively certain that the supply of a generator, as an example, would now be lienable. If a generator is not 'essential' to the normal use of a building, then why have it installed? Who goes to the effort and expense of having a non-essential generator installed?

Suffice to say that the new ambit of scope in the new definition of 'improvement' would have captured *Kennedy* Electric's scope and should serve to widen the applicability of the *Construction Lien Act* to the electrical industry, and most notably for suppliers to that industry.

Notice of Intention to Register a Condominium

This amendment will require an owner of land that will be registered with a condominium declaration to publish a notice of the intended registration in a construction trade newspaper between five and 15 days, excluding Saturdays and holidays, before the description is submitted for approval. The notice must include the owner's name and address, a description of the land including lot and plan numbers, and, if it is believed a contractor did work on the condominium in the preceding 90 days, a list with the contractor's name and address. This amendment is not yet in force.

This amendment provides contractors with the ability to place a lien on the condominium land before the condominium declaration is registered, after which time a lien would have to be placed on the common elements of the condominium.

Affidavit of Verification

A claim for a lien must be verified by an affidavit sworn by the person claiming the lien. This verifies the lien as part of the lien preservation process. Because of the electronic registration of land titles documents, affidavits will no longer be required to verify a claim for a lien after this amendment comes into force. So there will be no need to actually have an affidavit sworn as part of the lien registration process.

Cross-examination on Claim for a Lien

The following people can be cross-examined about a claim for a lien at any time, regardless of whether or not an action has been commenced: a lien claimant; an agent or assignee of the lien claimant; and a trustee of the workers' trust fund. This amendment is not yet in force, but it will replace the similarly worded section 40

of the *Act*. So even though you did not make an affidavit, you can still be cross-examined on your lien.

Sheltered Liens

A lien claimant who has a sheltered lien under a court action will be able to continue the action to enforce the sheltered lien, even if the lien it is sheltered under is vacated by court order. This amendment will allow courts to more easily vacate liens, while at the same time protecting the rights of claimants with sheltered liens. This amendment is not yet in force.

All in all, when you look at each change, they each are meant to better serve those who wish to pursue lien rights. There are no amendments that make the lien legislation more appealing to owners. I am not one to predict the future especially when it comes to Courts and the interpretation of statutes; however, I think these amendments to the *Construction Lien Act* are welcomed changes that should better serve Ontario's electrical contracting industry.

Dan Leduc is a partner in the law firm of Ogilvy Renault LLP, an associate member of the ECAO. He is co-chair of Ogilvy Renault's Construction, Engineering and Infrastructure Law Practice Group and may be reached at 613.780.1536 or at djleduc@ogilvyrenault.com.

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Construction Lien Act reforms highlight lots of unfinished work still to do; and perhaps a new option

By David Zurawel

After more than 20 years of political and bureaucratic “Demosclerosis,” 2010 was finally the year of measurable progress, albeit limited measureable progress, for reform to the *Construction Lien Act* (CLA).

Ontario’s industrial, commercial, institutional (ICI) and heavy civil construction industry mounted a united and concerted advocacy and lobbying campaign in the early wake of the 2007 election. The objective was to place reform of the *Construction Lien Act* on Attorney General Chris Bentley and the government of Ontario’s policy agenda. At the heart of a package of industry proposed amendments lay three imperatives to restore equity and fairness for construction in Ontario:

- 1) timely release of holdback funds;
- 2) assurance of contractor liens rights; and,
- 3) a change in the definition of “improvement” to address the issue of liens relevant to the Kennedy Electric decision.

Earlier this year the government passed into law Bill 68, the *Open for Business Act*, 2010, an omnibus bill containing more than 100 reforms from 10 ministries. As part of this legislation were amendments to the *Construction Lien Act*:

- re-enacting the definition of “improvement;”
- adding a new section 33.1, providing for owners of land intended to be registered in accordance with the *Condominium Act, 1998* to publish notice of the intention to register in a construction trade newspaper; and,
- including an amendment to remove the requirement to verify a claim for lien by affidavit.

These changes are important because they represent the first amendments to the Act in 20 years. Yet, they are important because they also demonstrate to our industry that the government, despite our best efforts to date, does not see the compelling logic to make the legislative

changes necessary to restore the original intent of the Act, and to restore equity to Ontario’s construction industry. Changes must still be made requiring the timely payment of holdback funds and ensuring the rights of contractors to lien for unpaid monies for completed services and supply of goods.

While the law demands that 10 per cent of the value of all construction projects be held back to ensure proper and timely completion of projects, it does not equally compel the release of these funds. Our industry views this as a fundamentally inequitable statute that must be and can be easily corrected. The *Construction Lien Act* must at the very least be changed to state that upon completion of project work that holdback monies SHALL be released from the current MAY be released. This fine distinction in language is conservatively keeping hundreds of millions of dollars in holdback monies from the honest and hardworking people who earn them. The simple question that demands answering is

that if someone has done the work, then why does someone else have their money?

The Ministry of the Attorney General is currently accepting stakeholder feedback on the two outstanding proposals of release of hold back funds and the rights to lien, plus an additional proposal that would amend the Act to allow for the deemed division of contracted services of an architect into two phases: the supply of services up to and including the start of an improvement and then the supply of services thereafter. This consultation will permit interested parties to make submissions to the government through to February 28, 2011. Those parties interested in providing feedback into this consultation are invited to so do through the ECAO or through the Council of Ontario Construction Associations.

While it is significant that the Ministry of the Attorney General is accepting comment on these proposals it is equally significant to note what is not part of this exercise. There is no indication of what is to happen to the information collected as part of this consultation, or if it will be shared among the interested parties. In fact, there has been no indication of which stakeholder groups are participating in this process. Most importantly, there is no indication of what the government is going to do once it has a decision to make on whether it will further amend the *Construction Lien Act*. Certainly for Ontario's construction industry these issues are too important not to receive a comprehensive analysis by Ministry of the Attorney General staff and then a sharing and discussion of that analysis with those parties that participated in this consultation process. It is the intention of COCA, working with its industry partners, to clarify the next steps to this process and to insist on a full and comprehensive discussion with interested stakeholders as to what steps the government will take next to rectify the current glaring deficiencies of these statutes.

The industry's clear need for an equitable, predictable and consistent payment process for contractors has led COCA to examine the efforts of the National Trade Contractors Coalition of Canada

(NTCCC) to bring into reality prompt payment legislation in Ontario. Where the *Construction Lien Act* focuses on the failure to pay after work has been completed, prompt payment legislation instead stipulates from the outset of a project legislated strict timelines for payment of construction contractors to combat the all too common practice of late payment. In recent years the construction industries in numerous jurisdictions including the United States, United Kingdom and Australia have adopted such legislation for both private and public projects.

Driven by the all-too-common construction industry practice of late and/or poor payment practices, prompt payment legislation represents what is believed to be a viable solution ensuring payment for prime (general) and subcontractors alike by providing strict timelines for payment, prescribing a rate of interest that can be charged for late payment and including mechanisms to ensure that contractors

are able to collect monies owed in an effective manner.

Given the realities of the new post-recession economy it would seem to be only prudent for Ontario's construction industry to tackle and rollback its well entrenched problems with payment. Through prompt payment legislation our industry can create an upfront culture of timely payment and an amended *Construction Lien Act* can ensure the timely release of owed funds for completed work all the while protecting contractor's rights to lien for non-payment of completed work. There are no excuses in a 21st century economy for Ontario businesses not to realize their maximum potential because of lack of payment for goods and services already provided.

David Zurawel is Vice President of Policy and Government Relations with the Council of Ontario Construction Associations and may be contacted at dzurawel@coca.on.ca.

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When the Going Gets Tough...

By Dr. Awad Hanna, P.E

Many times construction projects take longer to complete and require a larger budget than was originally planned. Many factors can be contributed to the increased duration and cost of a project. But who is responsible for such delays? Is it the electrical contractor, due to poor labor productivity? Or is it the owner, due to poor site management and policies?

In this case study where the author acted as an expert witness defending the electrical contractor, an electrical contractor in Toronto had been in business since 1964. Their geographical work area included parts of Hamilton, Ontario. The contractor became aware of a two-phase project in West Virginia, undertaken by a global industrial owner. The owner had contracted the contractor before, when it was known under a different name. The contractor passed on bidding in Phase I, but prepared a bid on Phase II, which consisted of electrical installation and instrumentation on additions and renovations on an industrial site.

After meeting with officials from the contractor, the owner and engineer/construction manager awarded the

contractor the bid for the approximate amount of \$640,000. The contractor commenced work at the beginning of 1998. The bid contract indicated the project was to be completed by the end of June of that year. Immediately after being awarded the bid, the contractor's manager was asked if he had any concerns about the project. "I have two," he said, "price and material." Regarding the price, he was told their bid was very, very competitive and close to other bids. He was also reassured that material delivery wouldn't be an issue, as the engineering firm/construction manager entered a blanket order arrangement with a local electrical supplier for all owner-furnished materials and all materials would be delivered to the job site within 24 hours of notification.

Owner-furnished materials

Early on in the project, it became evident that this blanket order was simply not working. The construction manager assured the contractor that all cable tray and fittings were on the job site as early as mid January, but three weeks after beginning the project, the contractor was still awaiting such materials. The contractor

was also told all lighting fixtures would be on site when they began the project; the fixtures arrived a month later. As a result, the contractors began using some material from their own inventory to keep the job moving. Representatives for the engineering firm were informed of this and told the contractor that the problem had been solved, but throughout the duration of the project the material shortage issue was never solved. Eventually the contractor asked the owner for permission to buy materials from other suppliers but was denied. A review of the material delivery showed that it took an average of 20 days for ordered materials to arrive on site.

Change order impact

It became clear to the contractor that the engineers' original design was flawed. A total of 1,000 field deviation reports throughout the duration of the project resulted in extra work orders; the electrical contractor generated 250 of these reports. The mechanical contractor for the job experienced an extreme number of piping changes. Approximately 30 per cent of the piping system was reworked or redesigned. Since the electrical contractor follows the

mechanical contractor, these changes led to the electrical contractor having to work out of sequence and leave some tasks unfinished while focusing on others.

The high amount of change orders and the project management's poor coordination between trades people led to overcrowding on the job site. Studies have consistently shown normal amount of change to be around 5 to 10 per cent of the original contract, yet 36 per cent of this project underwent change orders. Soon more and more workers of all trades were needed. Labor density reached a peak of 104 workers in 9,600 square feet of work space (or 92 square feet per worker). The job site became cluttered and disorganized. The contractor had, in their estimate, planned a peak of 20 workers; that peak turned out to be 34 workers. Scheduling, the responsibility of the engineers, was poor and delays were common. The slow material delivery times only compounded the over-manning problem.

In addition, 15 separate chemical spills resulted in fume release and evacuations of the job site. These frequent chemical spills resulted in decreased morale and attitude of the workers and interrupted the rhythm and flow of the project. After being informed of the problem, the owner told its contractors that the problem had been resolved and did not follow the procedure they had set in the case of fume release, making workers uneasy due to health concerns.

Consequences

In the end, the poor site management was devastating to the contractor. An estimated 24-week project duration turned out to take 36 weeks. They utilized double the estimated man-hours, including nearly 1,500 hours of overtime. These figures were not standard for the contractor. During the same time period, using the same management staff, the same estimator, even the same workers, the contractor performed another electrical/instrumentation job. That job was bid at 14,000 man-hours and came in at 14,500 man-hours. The contractor couldn't find any evidence that they had been accused of holding the project up; during the latter part of the job there had been no pressure by the owner to finish the job, while the pressure was immense at the beginning of the job.

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As soon as the contractor realized they were going to incur increased costs from the extended duration of the job, the contractor presented a request for an equitable contract adjustment to the owner and engineers. In the request, the forecasted damage to the contractor was \$300,000. The request was not received well; upon seeing the request, the president of the owner company told the contractor's CEO, "You'll need to bring suit to get this kind of money." So the contractor did.

In their claim, the contractor blamed the owner and engineer/construction manager for the losses incurred as a result of high per cent change. Incomplete, vague construction plans and specifications caused some productivity losses. The fume releases contributed to a poor working environment, an environment that the owner was contractually bound to avoid. The piping redesign and rework led to delays in the contractor's work. The large amount of change orders resulted in overmanning, trade

stacking and a disorganized work sequence. The failure of the owner to deliver materials on time caused many unproductive hours.

Officials from the contractor approached the defendants about reaching a settlement in the case, but none was reached. The owner claimed the contractor was to blame for the incurred losses. They said the contractor's bid was low, nearly \$350,000 lower than the next bidder. The owner said the contractor should have coordinated work between trades people and taken trade orders into account on their bid and that the contract relieved them of damage liability. They said chemical fumes should be expected when working near chemical plants. Binding arbitration ruled in favor of the electrical contractor in the amount of \$351,000.

Lessons learned

Much can be taken out of this case study. The owner took a risk by agreeing to furnish all materials. In the end, this is a risk not worth the overhead it may save the owner; furnishing of materials is best left up to the contractor. The delays caused by the failure of timely material delivery cost the electrical contractor, and ultimately, the owner, much in lost productivity and damages. Accurate engineering is needed at the outset of a project in order to minimize change orders and keep the job running as scheduled. Contractors should adjust their bid to reflect risky aspects of a job. In this case, there were many risks present, such as the owner furnishing materials, the poor contract document, and working on operating units.

A major issue at the arbitration hearing was that of fraud. Remember the contractor's manager who was told their bid was "very, very competitive?" The owner claimed the contractor's bid was nearly \$350,000 lower than the next bidder and denied telling the contractor their bid was competitive. If the contractor had documented the minutes of their original meeting at the awarding of the bid, their claim would have been more concrete than "your word against my word."

Awad Hanna is a professor of construction engineering and management at the University of Wisconsin-Madison. He may be reached at ashanna@wisc.edu.

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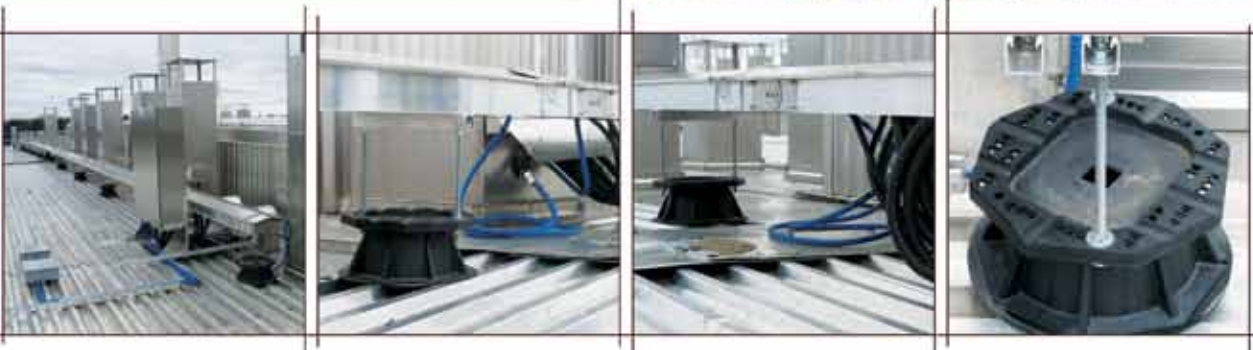
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Change Order Protocol

The following “Change Order Protocol” was developed by the Toronto Construction Association, the Greater Toronto Electrical Contractors Association, the Mechanical Contractors Association of Toronto and the Toronto Sheet Metal Contractors Association.

Introduction

Changes in the scope of work on a project have become an inevitable part of the construction process. The size and number of changes on a particular project can significantly alter the cost of the project. If handled improperly, changes can also lead to disputes and even litigation between the various parties on a project. The purpose of this Change Order Protocol is to provide a fair and reasonable process for the costing and pricing of change orders.

Guiding Principles

- Changes in the scope of work may be inevitable; however a greater effort to diminish the volume of contract changes on construction projects is strongly encouraged.
- When changes become necessary, change orders should have a 30 days maximum turnaround. Contractors should submit an appropriately prepared quotation within 15 days and owners should approve/reject within 15 days.
- Change Orders should be fairly and reasonably priced and payment of approved changes should conform to contract terms.
- Contractors are entitled to overhead and profit.
- Reasonable disclosure of costs is encouraged, while excessive requests can be counter-productive, cause delays, and give rise to additional costs.
- If it is necessary to issue a Change Directive in advance of approval pricing and all related approvals, this formal

direction to proceed should not diminish the urgency to negotiate a final change order price.

- The parties should be proactive in resolving disputes, and every effort should be made to ensure that these disputes will not impact the balance of the project.
- Statutory holdbacks are a legal requirement; additional holdbacks are redundant and lead to avoidable disputes.

Change Directive

According to General Condition 6.3 of the CCDC2 Standard Prime Contract when an owner requires a change in the work, and;

- the change is urgently required and it would not be expedient to reach agreement on the price, or
- there has been a failure of the parties to agree on a price the Owner may issue a Change Directive.

Upon receipt of a Change Directive, the Contractor must proceed promptly with the change on a cost plus basis as per CCDC2 general condition Article 6.3.

Prior to executing any work relating to a Change Directive the owner will advise as to the method of validation of man hours spent and materials and equipment used. The owner will designate his representative who is authorized to approve the hours shown on the time sheets and the related materials and equipment used to perform the work. The contractor will be able to bill for the approved labour, material, equipment and other expenses incurred under the change directive on the monthly progress bill.

Supplementary instructions such as Site Instructions, Field Orders, or Stop Work Orders, are not Change Directives.

After a Change Directive has been issued, both parties must expeditiously continue efforts to achieve agreement on the price of

the change, and then record this agreement in a Change Order.

Change Order

A Change Order is used when the Owner and Contractor agree on a price and the changes in scope of work and schedule.

Labour Rate*

The Labour Rate is the actual fully burdened cost per hour of labour consumed. It consists of but is not limited to the following:

- Base Rate
- Vacation/Stat Pay
- Union Deductions
- Legislated Burdens
- EHT
- WSIB
- EI
- CPP
- RST on H/W
- Expendable Small Tools
- Additional Unionized Charges
- Finance Payroll
- Rest Breaks
- Idle Time
- Safety
- Job Box Talks
- WHMIS
- Fall Protection
- Personal Protective Equipment
- Committees
- Labour Warranties
- Parking

** Labour Rate is on a journeyman basis. The lower productivity rate for apprentices is offset by the hourly rate.*

Manhours Calculation

In absence of agreed to pre-authorized rates and units, it is strongly recommended that industry standard Labour Units are used

in calculating labour units required to complete a change notice. Each change may have a variety of non-typical or abnormal factors that will require adjustments. Factors that should be considered include:

- Site Conditions – Inadequate lighting and Housekeeping
- Clean up
- Material Handling – Unloading, Storing, Moving
- Scheduling
- Time Keeping
- Mobilization and Demobilization
- Labour Warranties (if not included in labour rate)
- Estimating
- Fabrication Drafting
- Measuring
- Printing
- Record Drawings and As Built
- Interference Drawings
- LEED Requirements
- Garbage Sorting, Tagging, Disposing
- Installation Height – Installations above 10 feet require extra equipment and men.
- Multi Storey Factor – Labour adjustment must be made for taller buildings to reflect the rate of productivity loss.
- Environment Conditions – Extreme weather conditions either heat, humidity or cold may result in productivity loss. (Dust, restricted access, occupied premises, remote areas.....)
- Availability of Personnel – When an adequate supply of personnel is not available, the loss of productivity must be taken into account.
- Stacking of the Trades – A change order may require many trades to perform their work concurrently and in a limited work area resulting in productivity losses.
- Abnormal Work Schedule – Deviations from a normal work schedule will have an impact on labour productivity and required supervision.
- Crew Size Inefficiency – Changes may require the use of larger than planned workforces.

Labour units shall be derived from the NECA Manual of Labour Units*, MCAA

Labour Estimating Manual*, SMACNA Manual* and other such standardized trade units that may exist. It is understood that mitigating circumstances may exist that impact such standardized units.

**On a journeyman basis.*

Labour Supervision

Labour Supervision is the costs of providing direction and supervision on projects. It includes:

- Foremen
- General Foremen

Project Supervision

Project Supervision is the cost arising from the coordination and management of a project. It includes:

- Superintendent
- Project Coordinator
- Project Manager

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CHANGE ORDER PROTOCOL

FACTORS AFFECTING PRODUCTIVITY

There is a need to discuss the adverse effects on labour productivity resulting from causes beyond the direct control of the contractor.

A study of these productivity factors may be helpful in preparing original estimates and change orders. The individual items and titles proposed, cover a description of conditions without necessarily including each detailed condition that may be involved. The values are a percentage to add onto labour hours of the change.

The factors listed are intended to serve as a reference only. Individual cases could prove to be too high or too low.

	Percentage of Loss if Condition:		
	Minor	Average	Severe
1. STACKING OF TRADES: Operations take place within physically limited space with other contractors. Results in congestion of personnel, inability to locate tools conveniently, increased loss of tools, additional safety hazards and increased visitors. Optimum crew size cannot be utilized.	10%	20%	30%
2. MORALE AND ATTITUDE: Excessive hazard, competition for overtime, over-inspection, multiple contract changes and rework, disruption of labour rhythm and scheduling, poor site conditions, etc.	5%	10%	15%
3. REASSIGNMENT OF MANPOWER: Loss occurs with move-on, move-off workers because of unexpected changes, excessive changes, or demand made to expedite or reschedule completion of certain work phases. Preparation not possible for orderly change.	5%	10%	15%
4. CREW SIZE INEFFICIENCY: Additional workers to existing crews “breaks up” original team effort, affect labour rhythm. Applies to basic contract hours also.	10%	20%	30%
5. CONCURRENT OPERATIONS: Stacking of this contractor’s own force. Effect of adding operation to already planned sequence of operations. Unless gradual and controlled implementation of additional operations made, factor will apply to all remaining and proposed contract hours.	5%	15%	25%
6. DILUTION OF SUPERVISION: Applies to both basic contract and proposed change. Supervision must be diverted to (a) analyze and plan change, (b) stop and replan affected work, (c) take off, order and expedite material and equipment, (d) incorporate change into schedule, (e) instruct foreman and journeyman, (f) supervise work in progress, and (g) revise punch lists, testing and start-up requirements.	10%	15%	25%
7. LEARNING CURVE: Period of orientation in order to become familiar with changed condition. If new workers are added to project, effects more severe as they learn tool locations, work procedures, etc. Turnover of crew.	5%	15%	30%
8. ERRORS AND OMISSIONS: Increases in errors and omissions because changes usually performed on crash basis, out of sequence or cause dilution of supervision or any other negative factors.	1%	3%	6%
9. BENEFICIAL OCCUPANCY: Working over, around or in close proximity to owner’s personnel or production equipment. Also badging, noise limitations, dust and special safety requirements and access restrictions because of owner. Using premises by owner prior to contract completion.	15%	25%	40%
10. JOINT OCCUPANCY: Change causes work to be performed while facility occupied by other trades and not anticipated under original bid.	5%	12%	20%
11. SITE ACCESS: Interferences with convenient access to work areas, door man-lift management or large and congested worksites.	5%	12%	30%
12. LOGISTICS: Owner furnished materials and problems of dealing with his storehouse people, no control over material flow to work areas. Also contract changes causing problems of procurement and delivery of materials and rehandling of substituted materials at site.	10%	25%	50%
13. FATIGUE: Unusual physical exertion. If on change order work and workers return to base contract work, effects also affect performance on base contract.	8%	10%	12%
14. RIPPLE: Changes in other trades’ work affecting our work such as alteration of our schedule. A solution is to request, at first job meeting, that all change notices/bulletins be sent to our Contract Manager.	10%	15%	20%
15. OVERTIME: Lowers work output and efficiency through physical fatigue and poor mental attitude.	10%	15%	20%
16. SEASON AND WEATHER CHANGE: Either very hot or very cold weather.	10%	20%	30%

Material

Material cost must be fair to both parties and mutually agreed upon.

The price will include possible loss due to price escalation, waste, damage, vandalism, theft, plus all applicable freight and taxes.

The price will be based on Trade published prices like Allpri\$er and Trade Service and adjusted for the specific project conditions.

Shop Expenses

Those expenses associated with the operations and maintenance of fabrication facilities.

The major cost categories are the following.

- Facilities
- Shop Equipment
- Operating Costs

Job Costs/Expenses

Job Costs/Expenses are all costs necessary for the performance of a contract that cannot be tied directly to the material, labour or subcontractors costs.

- Equipment
- Equipment Rental
- Site Facilities
- Freight Rates
- Storage
- Permits
- Inspection
- Direct Room and Board
- Travel Allowance
- Parking (if not in labour rate)
- Bonding
- Site Clerical
- Security
- Consumables
- Insurance
- Other

Impact Costs

Impact Costs refer to the effect that Change Orders have on the rest of the project.

Liquidated Damages

Liquidated damages are a pre-determined sum agreed to in a contract that is recoverable if specific conditions, such as schedule, of that contract are not met. Change Orders may effect and even nullify liquidated damages clauses contained in contracts.

Overhead

Overhead expenses are administrative expenses of a business which cannot be allocated to any specific project, but are necessary for the business to operate.

- Home office rental, maintenance, utilities, and expenses
- Home office equipment, furniture, and supplies
- Property taxes, business licenses, and auto insurance
- Dues and subscriptions
- Postage and courier (non-job related)
- Advertising and telephone
- Legal and accounting fees
- Sales and marketing
- President's salary and benefits
- Sales force salary and benefits
- Dispatcher's salary and benefits

- Purchaser's salary and benefits (Estimating only)
- Clerical staff salary and benefits
- Estimators' salary and benefits (except for Change Orders)

Profit

Profit is to compensate for risk, effort and return on investment.

Acknowledgement

The Associations would like to acknowledge the contribution and participation of the following members of the Change Order Protocol Task Force: Maurizio Ballardin, OMC Mechanical, Bill Beaton, Dunview Sheet Metal, Don Evans, Adelt Mechanical, Burney Grist, Grist Mechanical, Pete Lawson, H.H. Angus, Mike Loughry, H.H. Angus, Giovanni Marcelli, Accubid Systems, Jeff Murva, CB Richard Ellis, Brian McCabe, Mechanical Contractors Association of Toronto, John Mollenhauer, Toronto Construction Association, Bob O'Donnell, Greater Toronto Electrical Contractors Association, Wayne Peterson, Toronto Sheet Metal Contractors Association, Al Prowse, H. Griffiths Co. Ltd., Albert Salvatore, Sprint Insight, Paul Sheridan, Plan Group and Dennis Thanasse, Eastern Construction.

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037: GFCI PROTECTION

What a GFCI does

While a GFCI does provide personnel protection, it does not protect equipment or circuit conductors. No device or policy provides complete protection from shock. The GFCI is one part of a larger protection plan that involves grounding conductors, double-insulated tools, and attention to potential hazards. A GFCI will not protect you from:

- Line to line faults. For example, you grab Phase A with one hand and Phase B with the other.
- Line to neutral faults. For example, you grab a hot with one hand and a neutral with the other.

You do not need a ground for a GFCI to work. A GFCI receptacle uses a current transformer to measure current in the hot and current in the neutral. When the difference in current flow between the hot and neutral exceeds a certain value, the device assumes the difference is due to a fault to ground. That value is 4 to 6 mA. This value is on the threshold of the “let go” current. The GFCI, if undamaged, will interrupt the circuit. Because it does this in about 1/40th of a second, it should easily prevent electrocution. If the GFCI is damaged, however, it may not do this. Most GFCIs in use today will still provide power, even if a unit no longer provides GFCI protection. Power transients, such as those from lightning, can damage a GFCI.

Devices that incorporate GFCI protection include panel-mounted breakers, receptacles, and portable cords. New GFCI protection products arrive on the market all the time.

When and where you must use a GFCI

If you don't have an assured equipment grounding conductor program in place, you must use GFCI devices on your construction site. These other “must use” notes assume you don't have an assured equipment grounding system.

- You must use a GFCI for all temporary wiring.
- You must use a GFCI when doing work outdoors, even if power comes from a permanent receptacle inside the building.
- You must use a GFCI with all portable cords.
- You must use a GFCI when working near water, such as a pool or fountain.

GFCI wiring

Every GFCI device comes with wiring instructions. GFCI receptacles are normally marked with LOAD and LINE designations.

You must connect the upstream wiring (from the supply panel) to the LINE side, and any subsequent downstream receptacles to the LOAD side. If you reverse these connections, the GFCI probably will not work correctly, if at all.

Proper connection to the hot, neutral, and ground is critical. A common mistake is connecting the ground wire to the neutral wire and the neutral wire to the ground. Another mistake is swapping the hot and neutral.

Never ground the neutral at any point other than the supply ground. For the whole electrical system, you should have one point (usually at the service) where the neutral and ground are connected. A neutral-ground bond on the load side creates a ground loop.

Do not pigtail the hots or neutrals – follow the manufacturer's instructions precisely.

How to ensure the GFCI is protecting you

Always test the GFCI before first use on a shift. To test it, push the “test” button to simulate a ground fault. Then, verify that the GFCI has cut the power off. Push the “reset” button to determine that it restored power.

Don't use a single-pole GFCI unit on multiwire circuits. Doing so simply prevents proper operation.

If a GFCI provides nuisance trips, locate the GFCI closer to the load if on a long run (e.g. 250 feet), rather than replacing it with a non-GFCI. If the unit is on a short run or it still nuisance trips after relocation, try replacing the unit. If the problem persists, look for wiring errors or wiring damage.

If a GFCI trips, always test it before using it again.

Demonstration

Have a crew member explain which terminal is for hot and which is for neutral. Have another crew member demonstrate what to do before first use.

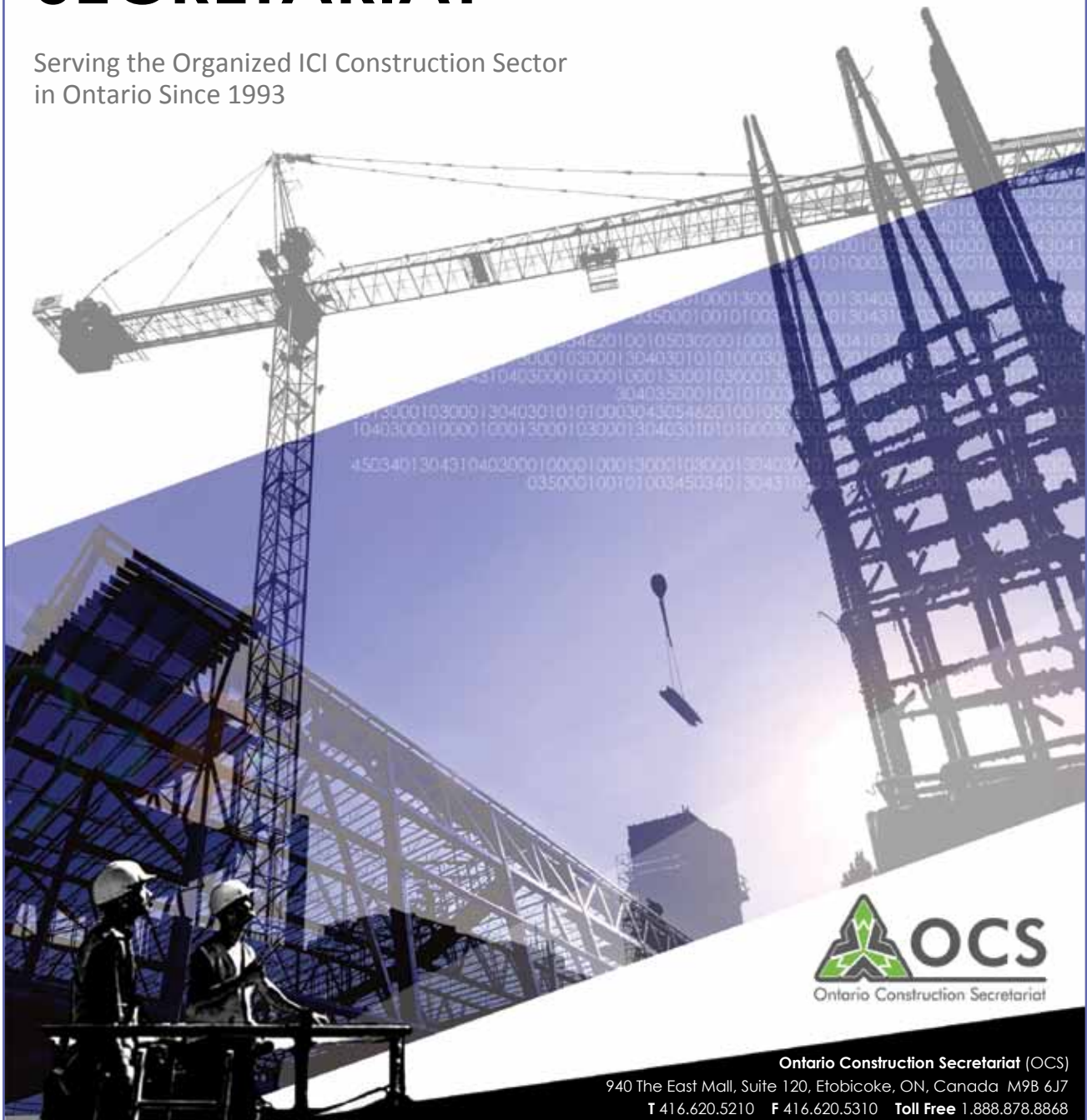
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“Training for the Future”

JEPP Holds Its 2nd Annual CFAE Instructors Conference

The Joint Electrical Promotion Plan's Certified Fire Alarm Electrician (CFAE) Steering Committee is pleased to report that the 2nd Annual CFAE Instructors Conference was held at the Crowne Plaza Toronto Airport Hotel on October 15 to 17. This year the conference was open to instructors as well as shop assistants to participate in the 3-day conference. The theme was “Training for the Future” and it resonated with each delegate as the speakers presented in-depth information and educational applications that could be applied to their field of work, and more importantly in their classrooms.

The conference began Friday evening, with an Opening Reception which gave all delegates who travelled from across Ontario an opportunity to get acquainted. After a warm welcome delivered by Mr. Fred Black, Chairman of the Steering Committee, the hotel provided a delicious variety of food stations for delegates to enjoy. The dialogue between peers and colleagues made for a winning platform for a successful evening. A table top display of old fire alarm devices, such as the Ticker-Tape Annunciator from the Old King Edward Hotel, was available for the duration of the conference.

This year's program provided valuable information for everyone involved. David Sylvester, Senior Life Safety Systems Speciality at Morrison Hershfield presented on Life Safety System Training for the Net-Generation and how business leaders are looking for new attitudes, therefore looking outside the company for fresh ideas rather than burrowing inside the “silo.” He talked about how communication has become more and more interactive and that the global generation that is impacting institutions with new ideas will make today's products and technology that much more advanced. Michael Nolan, President of Friesen, Kaye and Associates was



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well received as he provided a more hands-on approach, providing delegates with an interactive workshop on instructor excellence. His workshop incorporated learning principals providing a focus on common outcomes for both the instructors and their learners and how to convert that information successfully. Topics included:

- Integrate the principles of adult learning into course delivery;
- Deliver training so that participants are motivated to learn;
- Test for understanding using questioning techniques;
- Respond to questions using four different methods; and
- Identify effective verbal and non-verbal communications skills.

Delegates were split up into groups to work on activities on how they can apply their skills in their classrooms.

Each speaker had the specific expertise required for giving informed, insightful, thought-provoking presentations, as well as being able to contribute meaningfully to the debates and discussions in question. All in all, it was a hard-hitting program with both knowledgeable presenters and informative topics.

Mircom Group, located in Vaughan, Ontario, opened its state of the art facility over the weekend, providing an inside look at its plant and where some of their product that is used in the field is manufactured. Tony Falbo, President and CEO, Russ Harding, GTA Branch Manager, and various department heads were on hand to welcome the group.

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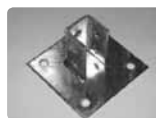
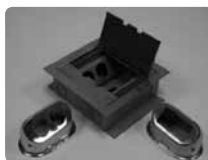


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safety industry with corporate roots dating back to the 1960s. They design, develop and manufacture life safety systems and technologies and are proud to stamp their products (and their services) "Made in North America." Each department head split up the group taking them through the plant, answering their many questions and giving them a view of how their product is made and distributed worldwide.

A very enjoyable evening was had by all who attended the final dinner where the Crowne Plaza Toronto Airport displayed their culinary skills. No formal list of toasts was prepared but an entertaining scheme of amusement was about to unfold as Joe De Ciantis introduced Rob Pue, Yuk Yuk comedian, who gave a rib-tickling performance. It did not take long for Rob to have the group roaring with laughter, as periodically throughout the night he sparked up dialogue with delegates. It was a spectacular laughter filled evening.



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Sunday morning the plenary session began with opening remarks by Susan Boorman, ECAO Human Resources Manager, and Fred Black. Instructors were allowed to voice their concerns and opinions on potential future and/or current projects or topics. This kind of interaction is what makes the CFAE conference such an important tool for the instructors and their staff. Overall, the participants deemed the conference a huge success.

Last but not least, the CFAE Steering Committee and the Joint Electrical Promotion Plan would like to acknowledge this year's conference sponsors, namely: the Joint Electrical Promotion Plan, ECAO, IBEW Training and Education, Adcoa Holdings Inc., the Electrical Safety Authority, MPH Graphics, Northern Display and Mircom Technologies. Thank you for your financial contributions and endless support.



CFAE CORNER



CFAE Corner

If you or your company perform inspections, tests, repairs, replacements or alterations on Fire Alarm Systems your workers' qualifications must comply with Ontario Regulation 213/07, Division C, Subsection 1.2.1., "Qualifications and Responsibilities of Persons Performing Work on Fire Alarm Systems." This is located on pages 287 and 288 of the *Ontario Fire Code*.

However, the exception to this rule at present is: If the work in question is being performed under

a Building Permit, then workers, who do not have a CFAE or are not under the supervision of one, but do have a valid 309A or 309D Ontario Electrician's License, may perform the installation or alteration. In this case the testing and verification shall be done by the manufacturer and/or a specified third party verifier either of which must possess a CFAE or CFAA accreditation.

In either of the above cases, an ESA inspection permit must be taken out.

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Taking a Picture of What's on Your PC Screen

In Windows, you can capture information on the screen following a process similar to taking a picture. It's technically called a screen dump, where dump is an ancient computer term for copying raw information from one place to another.



Pressing the Print Screen key takes a snapshot of the desktop. Click! All that graphical information — whatever you see —

is saved as a graphics image in the Windows Clipboard. You can then paste the image into any program that can swallow graphical images, such as Windows Paint or Microsoft Word.

To see how this process works, follow these steps:

1. Press the Print Screen key (on some keyboards, the Print Screen key is labeled PrtSc).
2. Start the Windows Paint program. Find it on the Start panel by choosing Programs > Accessories > Paint.
3. Choose Edit > Paste in the Paint program.

The desktop image is pasted into the Paint program, ready for editing, saving to disk, or printing and framing.

To print the image after it's been pasted, simply use the program's File > Print command.

You cannot capture a frame from a DVD movie by using the Print Screen key.



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Volume 49 • Number 1
Winter 2011

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