APRIL 2018

On-Site

CANADA'S CONSTRUCTION MAGAZINE

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VOLUME 63, NO.3/ APRIL 2018

On-Site

CANADA'S CONSTRUCTION MAGAZINE

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features

COVER PHOTO: COURTESY OF HYUNDAI

And now for the good news...

We've been overwhelmed with a lot of bad news lately. If it's not yet another mass shooting, it's soaring gas prices in Vancouver, or Ontario politicians dropping like flies in the wake of inappropriate behaviour.

Hell, even the weather in March did little to perk me up. St. Patrick's Day temporarily brightened my spirits... until that unfortunate run-in with a Leprechaun.

Serenity now!

That's why I was overjoyed to see the bullish outlook for the Ontario construction industry based on the Ontario Construction Secretariat's (OCS) 2018 Contractor Survey (see story, Pg. 13).

Almost a third of all contractors in the province expect to conduct more business this year than they did in 2017, while only 16 per cent are anticipating less business. The rates are fairly similar across the province, but contractors in the Eastern and Southwestern regions are particularly optimistic, with 34 per cent in each region predicting a boost in business.

Nearly two in five contractors think that construction activity as a whole will rise in the province. The engineering/civil sector has the rosiest outlook according to contractors, with nearly one half pegging an increase in this area of the industry. That sector is followed by institutional and high-rise residential, each with 39 per cent of respondents forecasting an increase in those sectors.

Clearly, contractors are beginning to realize how vital the adoption of new technologies is to their future. Just over seven out of every 10 respondents stated that this is important; over a quarter believing that technology is very important to their company's future. Interestingly, the main motivator that will drive contractors to adopt new technologies is meeting the demands of their clients. At 39 per cent, this is far and away the main reason contractors will invest in technology.

However, the money to invest in these emerging technologies is going to have to come from somewhere, and currently only 13 per cent of contractors indicated they have a budget dedicated to this. That number will need to rise significantly to address what seems to be a disconnect in what contractors generally understand is important and what they are ready to invest in.

What's holding them back? The cost or budget restrictions (34 per cent), unclear return on investment (25 per cent) and training requirements (24 per cent) are the top three barriers to adoption of new technologies for contractors.

Clearly, a shift in thinking is necessary to get the industry on board with what's coming, and the investment in time and training that will be required to get there. And a big part of that must come from the technology vendors themselves, who -- as these results suggest — may need to do a better job of selling the long-term benefits of their solutions.

But the good news is, many contractors are projecting a better year in 2018, and those rosier results may breed an environment that's more conducive to embracing the tools and technologies of tomorrow's contractors.

So from where I sit, that looks like a half-filled glass.

Finally, we'd like to extend our congratulations to On-Site's Jacob Stoller for winning a Shingo award for his book *The Lean CEO*.

Rob Blackstien / *Interim Editor*
rblackstien@annexbusinessmedia.com

MEET OUR CONTRIBUTORS FOR THIS ISSUE

JACOB STOLLER / Principal, StollerStrategies

On what's possible with AR:
"Workers will be able to talk — through interfaces like Apple Siri or Google Smart Speaker — with automated smart agents that 'know' who the worker is, and what information is needed to do the job correctly."

NATE HENDLEY / Freelance writer and author

On the recent innovations from manufacturers of wheel loaders:
"Telematics technology, enhanced visibility, ergonomics and cameras with warning systems are all top of mind for companies that make wheel loaders."

BARRIE NGEH / Account executive, Aon Risk Solutions

On the importance of soft costs:
"Soft costs are exposures for both the contractor and owner alike, which if faced with an insured peril will immediately affect both entities' balance sheet, if not readily addressed."

DIRK LAUDAN / Partner, Borden Ladner Gervais
LINDSEY VON BLOEDAU / Associate lawyer, Borden Ladner Gervais

On L&M bond holders:
"As result of this decision, obligees of L&M bonds should seriously consider whether they have a duty to inform potential claimants of the existence of the bond."

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INDUSTRY>NEWS

New CCA chair focused on diversity and representation

Zey Emir has been appointed chair of the 2018 Canadian Construction Association (CCA) board of directors. She will take over the position from Chris McNally, director of C & M McNally Engineering.

Emir is president of Revay and Associates Limited, a dispute resolution and project management provider to the construction industry in Canada and internationally.

After she joined the CCA board in 2009, Emir chaired the Manufacturers, Suppliers and Services Council and has been the vice-chair of the Standard Practices Committee. She joined the CCA executive in 2010 and is a past board member of the Canadian Construction Innovations.

In her address during the CCA annual general meeting, Emir discussed her priorities for her term at the association, which turns 100 this year.

"In the coming year, we will be reviewing the governance of the CCA in order to improve our effectiveness and maximize our efficiency leading into the next 100 years," said Emir. "This includes being open to diversity and representation that reflects our industry. I believe that having more women, more diversity, provides fresh ideas, different insight and points of view that will strengthen our association."

Emir has over 25 years of experience specializing in construction claims and dispute resolution as well as contracting strategies. She has been recognized as an expert witness in court by arbitration panels and dispute resolution boards in the areas of delay, productivity and the quantification of damages.

Emir has also developed and presented training programs for the construction industry and is a frequent lecturer at several universities.

SOURCE: CANADIAN CONSTRUCTION ASSOCIATION

Champlain Bridge project to be finished by December

Montreal's new Champlain Bridge, which will connect Nuns' Island and Brossard, is underway, with 65 per cent of work completed since fall 2017. The remaining 35 per cent is expected to be complete by December 2018.

Infrastructure Canada participated in the first construction update of 2018 with its private partner, Signature on the St. Lawrence (SSL), and the Jacques Cartier and Champlain Bridges Incorporated (JCCBI), which is responsible for managing the existing Champlain Bridge.

"I am satisfied with the progress of the work since last fall and happy to see that the new Champlain Bridge is taking form more and more each day in plain sight of Montrealers," said Amarjeet Sohi, federal minister of infrastructure and communities.

Rendering of the new Champlain Bridge from below deck

"Our priority since the outset of the project has been to deliver a quality bridge in a timely manner without compromising the health and safety of workers and users."

Erection of the main span, which crosses St. Lawrence Seaway, is progressing with the first segment supported by cables currently being installed. Additionally, 17 of the 37 piers caps are erected and more than 100 of the 600 box-girder segments have been installed.

In order to meet the construction goals in 2018, SSL has put in place additional measures, including an increased work force on site and extra shifts. The federal government has also asked JCCBI to allow the current bridge to remain open to traffic until summer 2019.

SOURCE: INFRASTRUCTURE CANADA

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Ontario contractors predict a busy 2018 in OCS survey

Ontario's contractors expect a busy year, according to the Ontario Construction Secretariat's (OCS) 2018 Contractor Survey.

Compared to last year, 32 per cent of respondents forecast a busy 2018, and 83 per cent expect to conduct more or the same amount of business in 2018.

Still, despite a positive outlook, the province's contractors entered 2018 with slightly less optimism compared to this time last year.

"Both the Canadian and Ontario economies are moving into a period of transition and the outlook for the construction sector is currently bright but will be shifting," said Peter Hall, vice president and chief economist for Export Development Canada.

The 2018 Contractor Survey is released as part of the 18th Annual State of the Industry and Outlook Conference, held on March 8 at the Metro Toronto Convention Centre. The half-day event explored the theme "Technology and Innovation: Changing the Way We Build."

According to regional data from the survey, over a third of contractors in each of the province's regions forecast an increase in business in 2018.

In both the Southwest and Eastern regions, 34 per cent of contractors are optimistic of added business, followed by Central Ontario (33 per cent) and the Greater Toronto Area (32 per cent).

The only region to show a drop in business confidence for 2018 is Northern Ontario, where just 22 per cent expect more business in 2018 and nearly a quarter forecast less work.

A sector analysis reveals strong optimism in the engineering sector, with 47 per cent of contractors predicting increased activity, followed by 39 per cent of contractors in the institutional and high-rise residential sectors.

Ontario's commercial and industrial sectors are less optimistic with 35 per cent and 27 per cent, respectively, expecting increased activity.

Labour market issues topped the list of contractors' concerns, along with recruitment of skilled workers and an aging workforce.

Narrowing in on contractors' perceptions of new technologies in the construction industry, the survey revealed that almost three-quarters believe new technology is important to the future of their business.

The top three technologies identified by contractors as having both a high likelihood of adoption and high impact on business are: jobsite data collection, advanced building materials and automated technology.

SOURCE: ONTARIO CONSTRUCTION SECRETARIAT

OCS
Ontario Construction Secretariat

KNOWLEDGE TO BUILD ON

Plenary PCL Justice selected for B.C. law court project

Plenary PCL Justice has been selected as the preferred proponent for the $150 million Abbotsford, B.C. law courts project – the province's first new courthouse in 20 years.

Plenary PCL Justice includes:

- Plenary Group (Canada) (project co lead and equity provider)
- PCL Investment Canada (equity provider)
- PCL Constructors Westcoast (design-builder)
- WZMH Architects (architect)
- Smith + Andersen (IMIT consultant)
- Johnson Controls Canada LP (service provider)

"Plenary is excited about the opportunity to work with the Ministry of Citizens' Services and the Ministry of the Attorney General, alongside our partners PCL and Johnson Controls, to help improve access to judicial services in Abbotsford – one of B.C.'s fastest-growing regions," said Brian Budden, president and CEO of Plenary.

The 14-room law court facility will include Provincial and Supreme courts and space for all necessary justice partners. The project is estimated to provide opportunities for over 1,000 local workers and will also provide opportunities for registered apprentices to be on site, according to the province.

Construction is expected to begin in summer 2018 with project completion anticipated in 2021.

SOURCE: PLENARY GROUP

Graham begins pre-construction planning for Edmonton's Groat Road Bridge

Pre-construction planning is underway for the $46 million Groat Road Bridge rehabilitation project in Edmonton. The contract was awarded to Graham in February.

PHOTO COURTESY CITY OF EDMONTON

Groat Road Bridges and Road Renewal Project aims to extend the service life of the bridge for another 50 years.

About 300 metres in length, the bridge runs over the North Saskatchewan River. It was originally constructed in 1955 and previously rehabilitated in 1989.

Graham will also rehabilitate the Emily Murphy Park Road Bridge to the south of the river and the Victoria Park Bridge to the North of the river.

The company will also carry out a roadworks optimization program adjacent to all three bridges.

An overhead gantry crane will be used to complete the bulk of the superstructure demolition and reconstruction. This methodology aims to reduce the project's overall environmental impact, cost and schedule, when compared to a conventional river-berm access method.

Construction is expected to start in April, and the city aims for the project to reach completion in 2020.

SOURCE: GRAHAM CONSTRUCTION

Ontario to widen Highway 401 from Mississauga to Milton

Ontario has requested proposals from pre-qualified teams to design, build and finance 18 kilometres of Highway 401 in Mississauga, Ont. and Milton, Ont.

The stretch of highway from Credit River in Mississauga to Region Road 25 in Milton will be widened to improve traffic flow.

Average daily traffic for Highway 401 in those regions is approximately 118,000 to 175,000 vehicles, according to the provincial government.

The successful bidder will be announced in 2019. The prequalified groups are:

- Blackbird Infrastructure Group, including Dufferin Construction Company, Ferrovial Agroman Canada, Klohn Crippen Berger and TD Securities;
- LINK401, including Dragados Canada, Brennan Infrastructures, Bot Infrastructure, WSP Canada Group Limited, ACS Infrastructure Canada and Stonebridge Financial Corporation; and
- West Corridor Constructors, including Aecon Infrastructure Management, Amico Design Build, Parsons and National Bank Financial.

The project is being delivered under Infrastructure Ontario's Alternative Financing and Procurement model, which transfers risk associated with design, construction and financing to the private sector.

"This stretch of highway is one of the busiest in the province and is vital to the movement of people and goods in Ontario and the United States," said Minister of Transportation Kathryn McGarry. "Adding new lanes will keep traffic moving so businesses can get their products to market and people can get where they need to be sooner."

In 2017/18, Ontario is committing more than $2.5 billion to repair and expand provincial highways and bridges across the province.

SOURCE: GOVERNMENT OF ONTARIO

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INDUSTRY NEWS

EllisDon awarded $73M Toronto bus terminal contract

Infrastructure Ontario and Metrolinx have awarded a $73 million contract to EllisDon Infrastructure Transit (EDIT) to design, build and finance a bus terminal project.

The Kipling Bus Terminal, located along the Milton Corridor in the City of Toronto, requires upgrades to accommodate the province's planned $2.31 billion expansion to the GO Transit Rail network.

Members of the EDIT team include:

- EllisDon Capital, developer;
- EllisDon Design-Build, constructor;
- Strasman Architects, NAK Design Strategies and WSP Canada, designer; and
- EllisDon Capital, financial advisor.

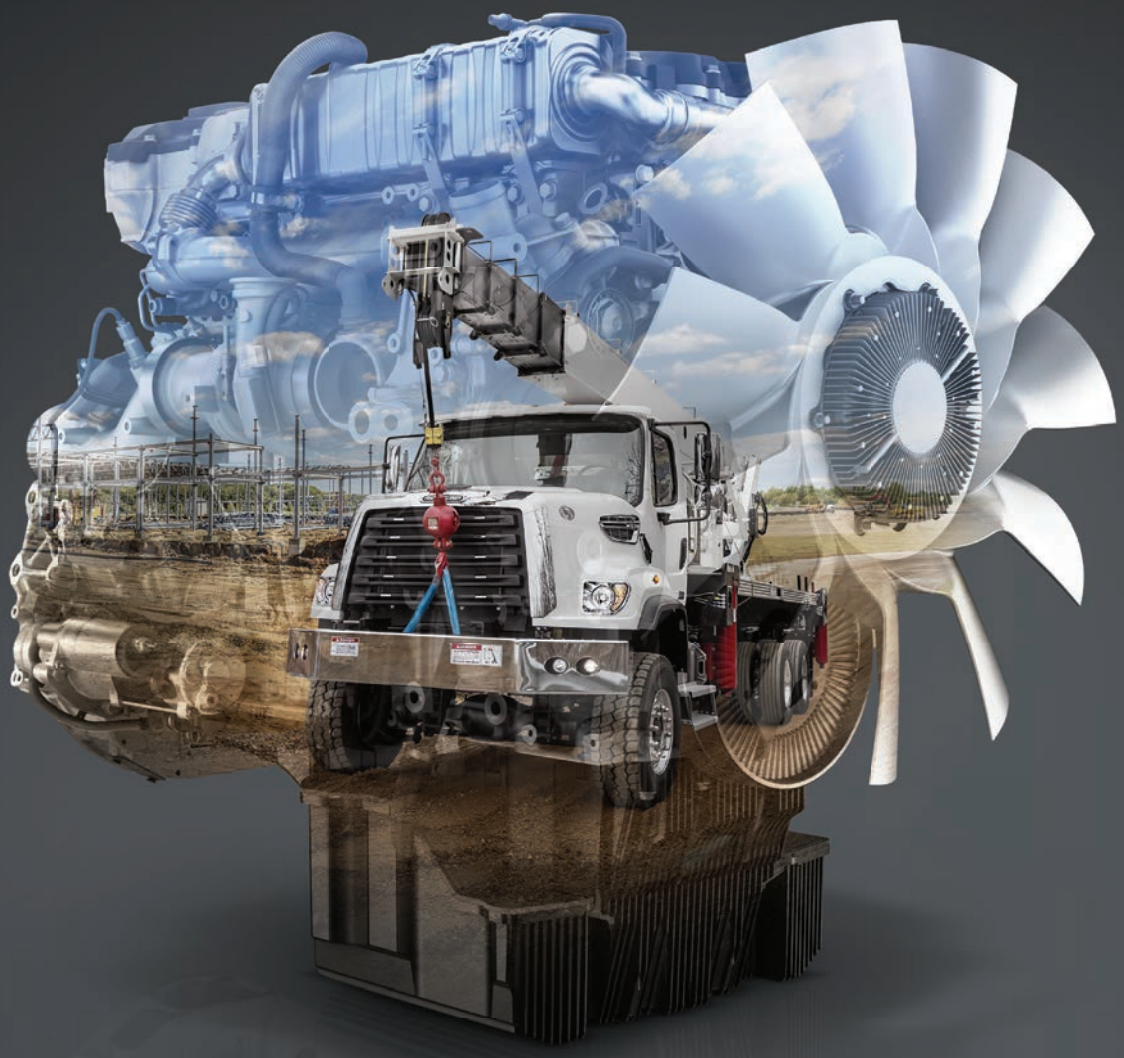
The scope of work for the Kipling Bus Terminal project includes:

- An elevated pedestrian bridge to connect the new entrance/ancillary building to the new bus terminal building and rail platforms;
- A new pedestrian underground tunnel to connect the new entrance/ancillary building to the new bus terminal building and from the new bus terminal building to the existing TTC pedestrian tunnel and pedestrian pick up and drop off building;
- A new bus terminal building for MiWay and GO Transit operations;
- Renovations to the existing Kipling GO station building and existing TTC pedestrian pick-up and drop off building;
- Site infrastructure upgrades including parking and improved vehicular, bicycle and pedestrian accesses; and
- The construction of a new private driveway for vehicular, bicycle and pedestrian accesses, including a new signalized intersection.

EDIT will now mobilize on-site to commence design and construction in spring 2018, with an expected substantial completion in winter 2019.

At the peak of construction, EDIT anticipates approximately 80 workers on-site, with the majority coming from the Greater Toronto Area.

SOURCE: INFRASTRUCTURE ONTARIO



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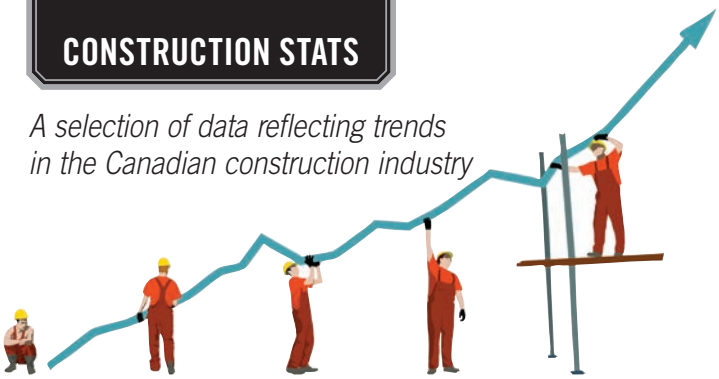
CONSTRUCTION STATS

A selection of data reflecting trends in the Canadian construction industry



Industrial capacity use

86.0%

Fourth quarter 2017

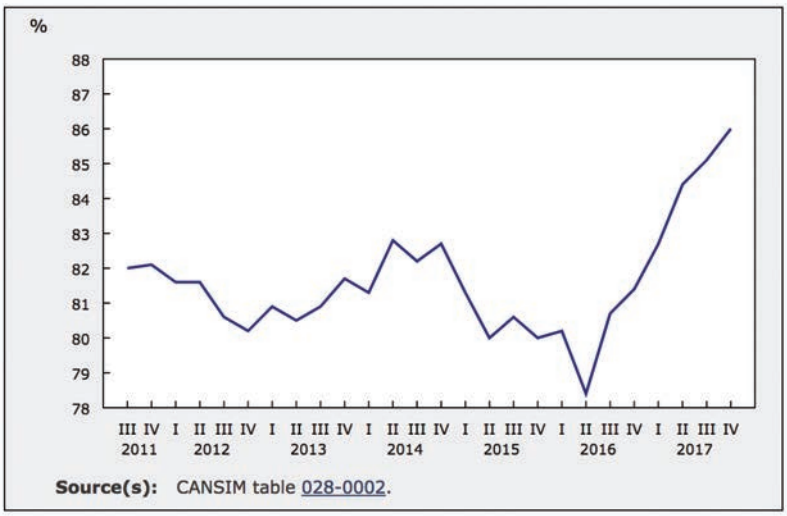
0.9 pts ↑

(quarterly change)

Source(s): CANSIM table 028-0002.

Canadian industries operated at **86.0%** of their production capacity in the fourth quarter, up from **85.1%** the previous quarter. This was the sixth consecutive quarterly increase.

The mining, quarrying, and oil and gas extraction sector and the construction sector were the main sources of the increase.



Source(s): CANSIM table 028-0002.

CONSTRUCTION AND OIL AND GAS EXTRACTION ARE THE MAIN CONTRIBUTORS TO THE INCREASE

Construction and oil and gas extraction were the main contributors to the overall increase in the capacity utilization rate in the fourth quarter.

The capacity utilization rate in construction rose for a sixth consecutive quarter, up from **89.5%** in the third quarter to **91.0%** in the fourth quarter. This gain was attributable to an overall increase in construction activity.

VALUE OF BUILDING PERMITS, BY PROVINCE AND TERRITORY (NON-RESIDENTIAL CONSTRUCTION)

	2013	2014	2015	2016	2017
	Non-residential construction permits				
	$ millions				
Canada	**32,431.4**	**33,940.5**	**31,790.1**	**30,762.1**	**35,565.6**
Newfoundland and Labrador	287.5	404.0	215.5	186.0	271.8
Prince Edward Island	111.8	78.2	80.7	83.0	103.6
Nova Scotia	391.8	415.8	378.4	372.7	502.7
New Brunswick	524.5	374.5	402.6	508.9	718.9
Quebec	6,253.2	7,286.9	5,437.0	5,560.3	6,774.1
Ontario	11,665.8	11,736.1	11,950.1	11,923.6	14,764.1
Manitoba	1,080.2	1,277.5	954.3	1,241.2	1,191.0
Saskatchewan	1,376.9	1,094.8	1,709.2	945.6	1,020.8
Alberta	7,403.4	7,425.6	6,876.7	6,270.2	5,844.9
British Columbia	3,107.9	3,729.1	3,679.9	3,391.7	4,212.4
Yukon	33.0	79.0	71.5	119.4	76.2
Northwest Territories	85.0	30.2	31.0	154.3	77.3
Nunavut	110.3	8.8	3.3	5.1	7.5

Source: Statistics Canada, CANSIM, tables 026-0003 and 026-0008, and Catalogue no 64-001-X.
Last modified: 2018-03-08.

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CONCRETE TRIES TO MAKE HEADWAY IN ATLANTIC CANADA

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IN THIS ISSUE:

UBC researchers develop earthquake-resistant concrete

A new seismic-resistant, fibre-reinforced concrete developed at the University of British Columbia will see its first real-life application this fall as part of the seismic retrofit of a Vancouver elementary school.

The material is engineered at the molecular scale to be strong, malleable, and ductile, similar to steel — capable of dramatically enhancing the earthquake resistance of a seismically vulnerable structure when applied as a thin coating on the surfaces.

Researchers subjected the material, called eco-friendly ductile cementitious composite (EDCC), to earthquake simulation tests using intensities as high as the magnitude 9.0–9.1 earthquake that struck Tohoku, Japan in 2011.

"We sprayed a number of walls with a 10 millimetre-thick layer of EDCC, which is sufficient to reinforce most interior walls against seismic shocks," says Salman Soleimani-Dashtaki, a PhD candidate in the department of civil engineering at UBC. "Then we subjected them to Tohoku-level quakes and other types and intensities of earthquakes — and we couldn't break them."

EDCC has been added as an official retrofit option in B.C's seismic retrofit program, and the team will be working with contractors in the next couple of months to upgrade Dr. Annie B. Jamieson Elementary School in Vancouver.

"This UBC-developed technology has far-reaching impact and could save the lives of not only British Columbians, but citizens throughout the world," said Advanced Education, Skills and Training Minister Melanie Mark. "The earthquake-resistant concrete is a great example of how applied research at our public universities is developing the next generation of agents of change. The innovation and entrepreneurship being advanced at all of our post-secondary institutions is leading to cutting-edge technologies and helping to create a dynamic, modern B.C. economy that benefits all of us."

EDCC combines cement with polymer-based fibres, flyash and other industrial additives, making it highly sustainable, according to UBC civil engineering professor Nemy Banthia, who supervised the work.

EDD-reinforced wall ready for testing. (UBC)

"By replacing nearly 70 per cent of cement with flyash, an industrial byproduct, we can reduce the amount of cement used," said Banthia. "This is quite an urgent requirement as one tonne of cement production releases almost a tonne of carbon dioxide into the atmosphere, and the cement industry produces close to seven per cent of global greenhouse gas emissions."

The research was funded by the UBC-hosted Canada-India Research Centre of Excellence IC-IMPACTS, which promotes research collaboration between Canada and India. IC-IMPACTS will make EDCC available to retrofit a school in Roorkee in Uttarakhand, a highly seismic area in northern India.

"This technology is gaining significant attention in India and will provide our Canadian companies a strong competitive edge in the growing global infrastructure market," added Banthia, who also serves as IC-IMPACTS scientific director.

Other EDCC applications include resilient homes for First Nations communities, pipelines, pavements, offshore platforms, blast-resistant structures, and industrial floors.

SOURCE: UNIVERSITY OF BRITISH COLUMBIA

Concrete Ontario New Location

Concrete Ontario recently moved to its new location at 102B – 1 Prologis Blvd., Mississauga, Ont., L5W 0G2 . Reach the association by phone at: 905-564-2726.

SOURCE: RCMAO.ORG

New Joint Initiative for North American Precast Concrete Producers

The Canadian Precast/Prestressed Concrete Institute (CPCI) and the Precast/Prestressed Concrete Institute (PCI) are pleased to announce a new joint initiative for precast concrete producers who hold both CPCQA certification as well as PCI Certification, for structural and architectural precast products.

As part of this joint initiative, PCI and CPCQA auditing organizations will coordinate their unannounced visit to these plants, and perform their audits over the same time. This will help reduce the number of audit events at these plants from four to two; that means four audit days annually instead of eight. The plants will still pay the same fees for their audits to each program operator, but it is anticipated that the joint initiative will also result in savings of indirect costs of plant personnel staff time for time spent with the auditors during audits of the plants.

By joining forces and coordinating audits, PCI and CPCQA will be able to offer a more streamlined and simplified service for precast concrete producers in North America. For example, the auditors will work together to review the same plant documents, records and completed products as necessary for their audits. The auditors will also hold joint entrance and closing meetings with plant personnel.

This change will be implemented for all dual certified plants as of July 1st, 2018.

SOURCE: PCI.ORG

CarbonCure's Consortium Closes the Carbon Loop for the Cement and Concrete Industries

Calera, AL - CarbonCure Technologies (CarbonCure) has reached its next major milestone in accelerating the adoption of CO2 capture and utilization technologies for the concrete and cement industries. CarbonCure led a team of five companies to demonstrate the world's first integrated CO2 capture and utilization (CCU) from cement for concrete production in January 2018. This project built upon previous cement plant CO2 capture demonstrations and was the first project to collect cement kiln CO2 for subsequent utilization downstream in concrete production and construction.

The Global CO2 Initiative (GCI) estimates a potential $400B market opportunity for CO2 utilization products in the concrete sector alone, with the prospect of reducing 1.4 gigatonnes of annual CO2 emissions by 2030. The Cement Sustainability Initiative (CSI), a global effort by 23 major cement producers with operations in more than 100 countries who are responsible for 30% of the world's cement production, has identified that carbon capture utilization and storage (CCUS) technologies will be required to achieve 440 of the 790 megatonnes of annual CO2 reductions needed to meet the sector's greenhouse gas targets. The global CO2 reduction potential of the CarbonCure portfolio of technologies exceeds the CSI CCUS targets by contributing between 550 to 700 megatonnes of annual reductions and creating $26 billion in new net production efficiencies.

The project was an extension of Team CarbonCure's participation in the $20 million NRG COSIA Carbon XPRIZE Challenge, which incentivizes and accelerates the development of integrated CCU technologies and new markets that convert CO2 emissions from coal and natural gas power generation into valuable products. The consortium believes this project is vitally important to the industry, since it demonstrates an immediately scalable and profitable low-cost CO2 utilization solution that benefits each member of the value chain - from the cement producer through to the construction site. An integrated, scalable and cost-effective solution is essential for the industry to meet its WBCSD CSI low-carbon technology roadmap targets, while also creating value from CO2, which is typically considered a waste product.

[For more on CarbonCure, please see *On Site*, April 2017, Pg. 40]

SOURCE: CARBONCURE.COM

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Concrete roads on the EAST COAST

Can concrete be king in Atlantic Canada?

BY JILLIAN MORGAN

A stretch of Nova Scotia's Highway 101 connects the town of Mount Uniacke – about 40 kilometres North of Halifax – to the community of Ellershouse.

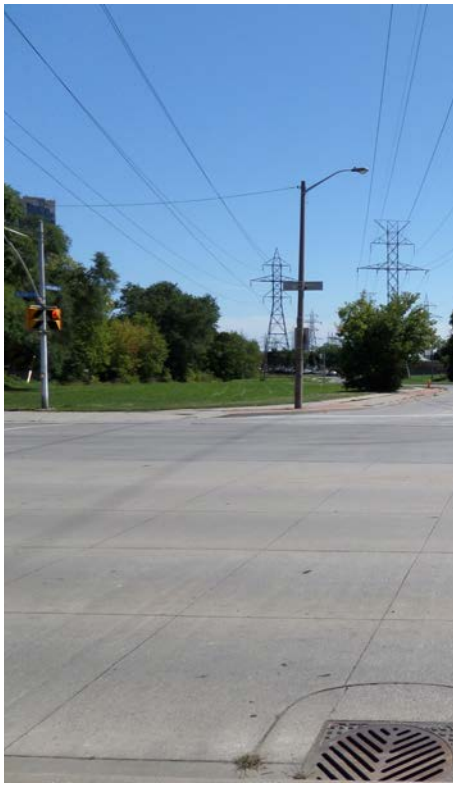
The 11-kilometre highway is one of three concrete roads in the province, tendered in 2003 as part of a $27 million project to twin 21 kilometres of the two-lane road.

St. Lawrence Cement, now LafargeHolcim, was awarded a $5.9 million contract to pave the concrete section in April 2003.

Now in its 15th year, the highway will undergo maintenance as part of the province's Five Year Highway Plan. This work will take the road to its full life expectancy of 30 to 40 years, a span two times greater than asphalt – but this isn't the only perk of concrete.

According to the Cement Association of Canada (CAC) – a national organization that promotes the use of concrete in construction – it is also resilient to harsh weather conditions, a key advantage for one of Canada's most easterly provinces.

Over a 50-year period, a concrete road requires only a third of the maintenance of an asphalt road, according to Michael McSweeney, CAC president and CEO.



Still, despite the success of Highway 101, there hasn't been another concrete road project in Nova Scotia.

"That's probably a functionality of the availability of equipment and manpower or skillset from out of province contractors," says Don Maillet, executive director of Highway Engineering and Construction for the Province of Nova Scotia.

In Nova Scotia, the department of transportation will typically put out a call for bids on major road construction projects in asphalt. Less frequently, it will call for a "national concrete alternative," which allows for both asphalt and concrete bids.

Maillet says the frequency of an alternate tender depends on the amount of major road construction the province undergoes in the run of a season. When the department does receive a concrete bid, it will perform an initial lifecycle cost analysis. This analysis accounts for the market value of asphalt pavement at the time of project closure and the design and materials of the sub-base and sub-grade.

Adding to the costs, the skillset and equipment for concrete roads has to come from out of province, which produces significant mobilization charges, says Maillet. This generally raises concrete to a higher premium – typically 10 to 20 per cent more expensive.

But a multi-million dollar investment by ready mix concrete producers and contractors will require a guarantee from the province that contracts will be awarded to concrete construction, says Jamie Reed, president of the Atlantic Concrete Association (ACA).

ACA is a not-for-profit, membership-based organization located in Halifax, with a mandate to represent the concrete industry in Atlantic Canada.

THE CHICKEN AND THE EGG

"The sticking point is the equipment to place the concrete is not owned by any company in Atlantic Canada so it's the 'chicken and egg' story," says Reed.

Specifying roads in asphalt has excluded concrete contractors from the bidding process, says McSweeney. Even more, the procurement process does not encourage competition between paving materials, which he says can lower prices and improve quality.

"This focus on initial cost is deeply flawed because it doesn't consider the long-term cost of the project, including maintenance and rehabilitation costs, where concrete is almost always significantly cheaper," says McSweeney.

McSweeney says the federal government has been willing to consider that federal infrastructure dollars undergo a "three-screen" assessment – recently adopted in Ontario's Long-Term Infrastructure Plan.

This three-screen approach should naturally lead to a procurement process that allows for competition between paving materials, he says. However, it hasn't yet been introduced in Atlantic Canada.

THE FUTURE OF CONCRETE ROADS

"The technical advancements in concrete placement and road construction (have) evolved over the last 40 years at a great pace," says Reed.

He says concrete roads offer economical benefits to concrete producers and contractors, as well as taxpayers in Atlantic Canada.

In order to increase the number of concrete roads, McSweeney says a new process that takes into account the full economic and environmental impact of construction, maintenance and rehabilitation will be necessary.

"We love the product," says Maillet. "It's done very well for us here in Nova Scotia, but I think it's a very dynamic situation."

Still, he says the province does plan on calling concrete alternative projects in the future.

"If the province is serious about more concrete highways the equipment, contractors and experienced personnel will be made available in not just Nova Scotia but all Atlantic Canada," says Reed. ☐

FAST FACTS

Switzerland-based Holcim acquired St. Lawrence Cement – a supplier of cement and concrete with construction services based in Quebec and Ontario – in 2007. It merged with Lafarge in 2015 to form LafargeHolcim.

Nova Scotia's other concrete roads are located near the town of Oxford on Highway 104 and on the Bridgetown interchange off Highway 101.

No major concrete road construction projects are in the works for Atlantic Canada, according to Reed.

The three-screen approach includes a full economic lifecycle cost assessment, a carbon assessment and a "best available solutions" assessment, which considers other approaches, technologies and designs.

FAR LEFT: The Province of Nova Scotia is responsible for maintaining the majority of all public roads – 90 per cent. PHOTO COURTESY OF THE PROVINCE OF NOVA SCOTIA

LEFT: McSweeney says the use of concrete overlays (pictured) can extend the lifespan of asphalt, concrete or composite pavements. PHOTO COURTSEY OF THE CEMENT ASSOCIATION OF CANADA

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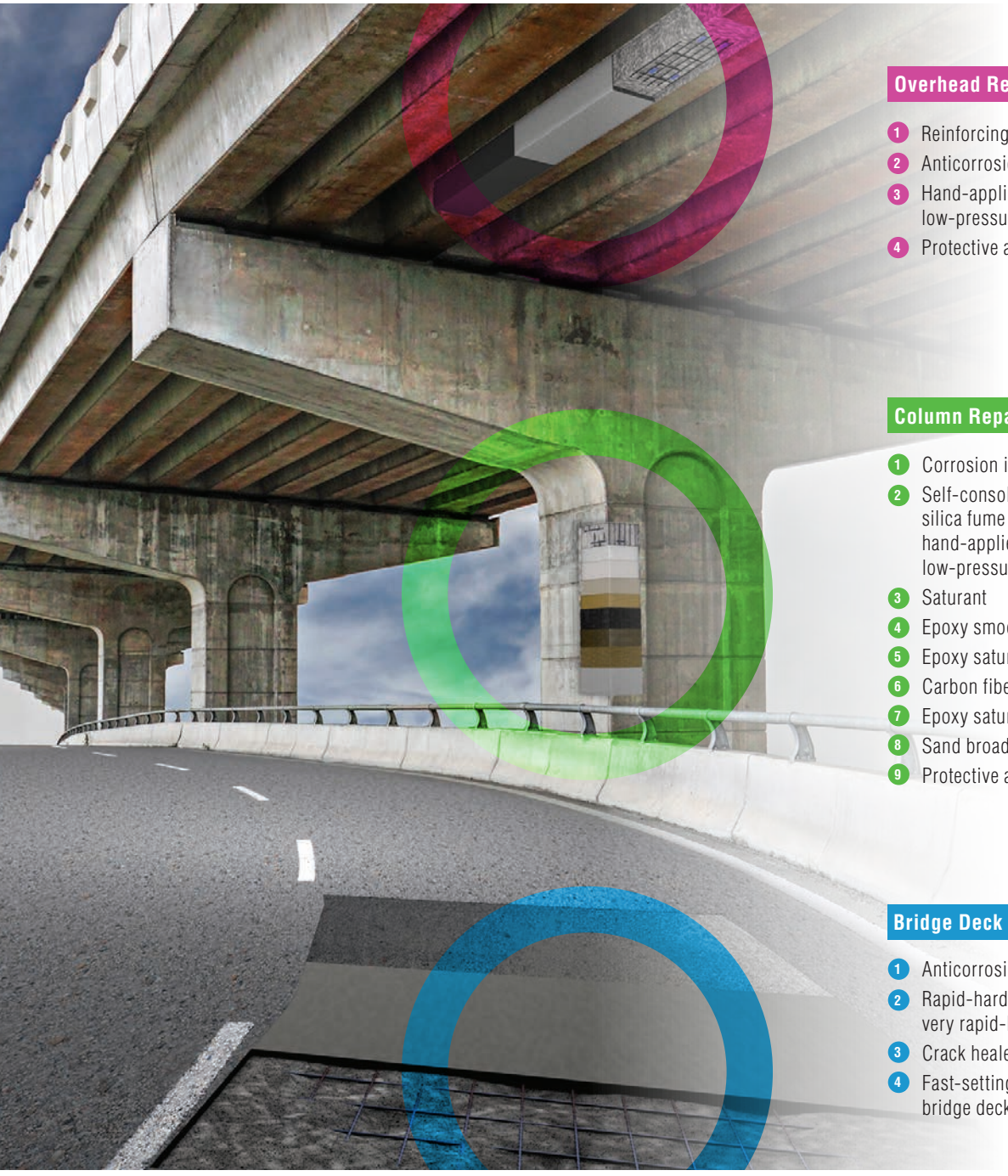

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Column Repair Solutions

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3. Saturant
4. Epoxy smoothing putty
5. Epoxy saturant
6. Carbon fiber fabric
7. Epoxy saturant
8. Sand broadcast
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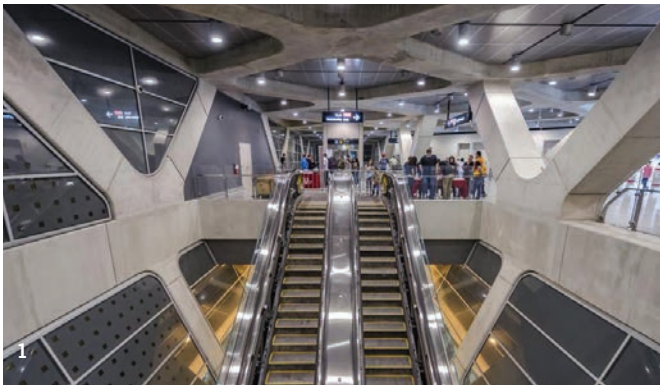
The 2017 CONCRETE ONTARIO AWARDS

The Ready Mixed Concrete Association of Ontario (Concrete Ontario) recently honoured the industry's most impressive work last year across the province. Without further ado, here are the 2017 Concrete Ontario Award winners...



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1. ARCHITECTURAL MERIT

YORK UNIVERSITY TTC SUBWAY STATION

Owner: Toronto Transit Commission
Architect of record: Adamson Associates Architects
Engineer of record: Arup Canada
General contractor: EllisDon Civil Ltd.
Forming Contractor: Avenue Building Corporation
Material supplier: St Marys CBM
Additional participants: Aluma Systems Inc.; BASF Canada Inc.; Carpenters and Allied Workers Local 27; EllisDon Research and Development Dept.; Ironworkers Local 721; LIUNA Local 183 & 506; National Concrete Accessories; and Salit Steel
Location: Toronto

2. ARCHITECTURAL HARDSCAPE

NATIONAL HOLOCAUST MONUMENT

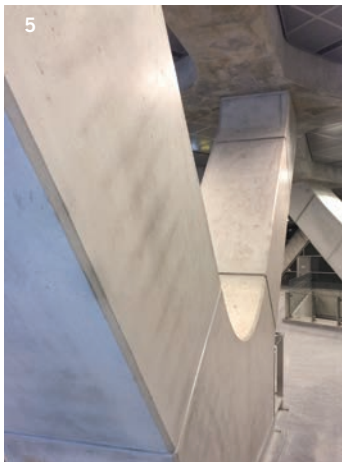
Owner: National Capital Commission
Architect of record: Studio Libeskind
Engineer of record: Read Jones Christoffersen Ltd.
General contractor: UCC Group Inc.
Material supplier: Hanson Ready Mix
Additional participants: Aluma Systems Inc.; Carpenters Union Local 93; Claude Cormier + Associes; Harris Rebar; Ironworkers Local 765; JWK Utilities & Site Services Ltd.; LIUNA Local 527; Sika Canada; and WSP Canada Inc.
Location: Ottawa

3. INFRASTRUCTURE

TIE UP WALLS RECONSTRUCTION PROGRAM

Owner: St. Lawrence Seaway Management Corporation
Architect of record: Bergmann Associates
Engineer of record: Bergmann Associates
General contractor: Dufferin Construction Company, A division of CRH Canada Group Inc.
Material suppliers: Dufferin Concrete, A division of CRH Canada Group Inc.; and DECAST Ltd.
Additional participants: Ducon Utilities; E.S. Fox Constructors; Euclid Canada; James Donn Piling Limited; LIUNA Local 837; Salit Steel
Location: Niagara-on-the-Lake


4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4. INSTITUTIONAL BUILDING

BROADVIEW PUBLIC SCHOOL

Owner: Ottawa-Carleton District School Board
Architect of record: Edward J. Cuhaci & Associates
Engineer of record: Cunliffe & Associates
General contractor: Frecon Construction Ltd.
Tilt up contractor: Tilt Wall Ontario Inc.
Material supplier: St Marys CBM
Additional participants: AGF-Raymond Rebar; BASF Canada Inc.; Carpenters Union Local 93; Carpenters Union Local 2041; LIUNA Local 527; Slavko
Location: Ottawa

5. MATERIAL DEVELOPMENT & INNOVATION

YORK UNIVERSITY TTC SUBWAY STATION

Owner: Toronto Transit Commission
Architect of record: Adamson Associates Architects
Engineer of record: Arup Canada
General contractor: EllisDon Civil Ltd.
Forming contractor: Avenue Building Corporation
Material supplier: St Marys CBM
Additional participants: Aluma Systems Inc.; BASF Canada Inc.; Carpenters and Allied Workers Local 27; EllisDon Research and Development Dept.; Ironworkers Local 721; LIUNA Local 183 & 506; National Concrete Accessories; Salit Steel
Location: Toronto

6. MID TO HIGH RISE RESIDENTIAL

222 ALBERT STREET

Owner: MNL Corner
Architect of record: ASP Design Group Inc.
Engineer of record: Rizz Engineering Inc.
General contractor/construction manager: Prica Group Construction Management Inc.
Material supplier: Stubbe's Precast Commercial Inc.
Additional participants: Sika Canada
Location: Waterloo

7. SPECIALTY CONCRETE APPLICATIONS

WESTON TUNNEL - PHASE 3 GRADE SEPARATION & JOHN ST. PEDESTRIAN BRIDGE

Owner: Metrolinx
Architect of record: Parsons Inc.
Engineer of record: AECOM
General contractor: Kenaidan Contracting Ltd.
Formwork supplier: Aluma Systems Canada Inc.
Material supplier: Ontario Redimix, A division of CRH Canada Group Inc.
Additional participants: Avertex Utility Solutions Inc.; Brascon Stainless Steel Fabricators Inc.; DTAH; E.S. Fox Limited; Euclid Canada; Global Precast Inc.; H & S Equipment; Harris Rebar; HC Matcon Inc.; Ironworkers Local 721; Lexsan Electrical Inc.; National Concrete Accessories; Obayashi Canada Ltd.; PNR Rail-Works Inc.; Rocky River Construction Limited; Technicore Underground Inc.; and Walter's Inc.
Location: Toronto

8. SPECIALTY CONCRETE PRODUCTS

NIAGARA REGION WIND FARM

Owner: Boralex Inc.
Developer: Enercon Canada Inc.
Engineer of record: WSP Canada Inc.


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General contractor: Borea Construction
Pumping contractor: Pumpcrete Corporation
Material suppliers: Rankin Construction Inc.; and Lafarge Canada Inc.
Additional participants: BASF Canada Inc.; Degrandis Pumping; LIUNA Local 837; Mammoet; Salit Steel; Stabilization Canada; and Stelcrete Industries
Location: Niagara Peninsula

9. STRUCTURAL DESIGN INNOVATION

YORK UNIVERSITY TTC SUBWAY STATION

Owner: Toronto Transit Commission
Architect of record: Adamson Associates Architects
Engineer of record: Arup Canada
General contractor: EllisDon Civil Ltd.
Forming contractor: Avenue Building Corporation
Material supplier: St Marys CBM
Additional participants: Aluma Systems Inc.; BASF Canada Inc.; Carpenters and Allied Workers Local 27; EllisDon Research and Development Dept.; Ironworkers Local 721; LIUNA Local 183 & 506; National Concrete Accessories; and Salit Steel
Location: Toronto

10. SUSTAINABLE CONCRETE CONSTRUCTION

ENVIRONMENTAL SCIENCE & CHEMISTRY BUILDING

Owner: University of Toronto Scarborough
Architect of record: Diamond Schmitt Architects
Engineer of record: Read Jones Christoffersen Ltd.
General contractor: EllisDon Corporation
Forming contractors: Avenue Building Corporation; and UCC Group Inc.
Material suppliers: St Marys CBM; and DECAST Ltd.
Additional participants: Aluma Systems Inc.; BASF Canada Inc.; Carpenters and Allied Workers Local 27; Footprint; Harris Rebar; Ironworkers Local 721; Janet Rosenberg and Studio Inc.; LIUNA Local 506; Rebar Enterprises Inc.; Smith + Andersen; and WSP Canada Inc.
Location: Scarborough

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Displacement	66.7 cc
Power Output	3.2 kW
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[1] Excluding fuel and cutting wheel.

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TEACHING AN OLD DOG New Tricks

Recent innovation to wheel loaders has brought a fresh look to the construction site workhorse

BY NATE HENDLEY

Wheel loaders are getting safer, more comfortable and more "connected" as manufacturers introduce new machines and new features. Telematics technology, enhanced visibility, ergonomics and cameras with warning systems are all top of mind for companies that make wheel loaders.

From an operator's point-of-view, some of the most striking changes in wheel loaders involve user-friendly controls and cab comfort. The latter has become a particular focus, which is understandable given the link between interior design and operator performance.

"For an operator, sitting in a seat eight (to) 10 hours a day, you want to make sure they're as comfortable as possible (so they) give maximum productivity. You're also trying to eliminate fatigue. When the operator becomes fatigued (they make) mistakes," says Eric Yeomans, Wheel Loader Product Manager at Volvo Construction Equipment.

"For a number of years, most OEMs have made machines standard with heat and air conditioning, but a lot of work has been done recently to make the ergonomics better for the operator, which improves machine safety and productivity," adds Aaron Kleingartner, Marketing Manager at Doosan Infracore North America.

This operator-focused approach to design can also involve "adding functions within the display screen — buttons or switches" for ease of use, continues Kleingartner.

Telematics technology allowing for remote machine performance monitoring is rapidly becoming a must-have feature in new wheel loaders.

"I think the industry is kind of demanding that (telematics) be standard. Our customers are asking for it. Anything the customer can do to increase productivity, machine longevity and reduce cost of ownership," says Juston Thompson, Product Specialist/Sales Training at Hyundai Construction Equipment Americas.

"The big thing I see recently is the advent of mobile-enabled devices being able to access machine information from anywhere. You don't have to be sitting at a desk to get machine information… This (trend) will only grow within the next years, as data becomes more and more important," echoes Kleingartner.

Other trends include a move towards fuel efficiency via engines that get better mileage and functions that reduce fuel consumption and idling time.

For all the hype about autonomous technology, no one expects to see self-driving wheel loaders on worksites any time soon. Engineers would face major challenges creating an autonomous wheel loader that could perform the multiple tasks such machines are capable of, or adapt to unexpected situations such as a truck or person suddenly appearing in its path.

In terms of what it is available, here's a round-up of some of the new wheel loaders and newly introduced upgrades to existing machines.

HYUNDAI

Hyundai Construction Equipment Americas recently announced some major enhancements of its HL900 series of wheel loaders.

Among other things, Hyundai said it would make All-Around View Monitoring (AAVM), a proprietary, four-camera system with Intelligent Moving Object Detection (IMOD) capability, available on new HL900 factory orders. AAVM was originally a feature on Hyundai excavators.

The IMOD function warns operators, through an alarm and flashing arrows on a seven-inch colour touchscreen in the cab, when someone or something gets too close to the wheel loader. The system can be programmed to activate warnings at two different ranges: 6.5 feet (two metres) or 22.9 feet (seven metres).

AAVM gives operators an expansive panorama of their work environment, including 2D and 3D views, a unique "bird's eye" perspective and "a full 360 degree image all the way around the machine," says Thompson.

Another recent enhancement entails an optional redesigned quick coupler that can accommodate multiple types of attachments.

The HL900 series comes standard with the company's Hi-Mate telematics solution which allows clients to remotely monitor performance including hours of operation, fuel consumption, travel time, idle time, wheel loader location, service status, etc.

For cab comfort and performance, the HL900 series offers "a tilting and telescopic steering wheel," says Thompson.

The HL900 series also features standard Bluetooth radio, a fuel-saving "eco pedal" function and "a fully pressurized and sealed cab" — an important consideration given OSHA's increasing interest in dust contamination on work sites, he adds.

JOHN DEERE

John Deere just released the 344L, latest in its L-Series of compact wheel loaders.

"It's what we call an articulation plus machine. In comparison to standard articulation, the 344L articulates 30 degrees but then adds 10 degrees of rear-view steer," says Drew Miller, Product Marketing Manager for compact wheel loaders, John Deere Construction and Forestry.

John Deere's Articulation Plus system offers greater full-turn tipping load, enhanced stability and a tighter turning radius, he adds.

"From a safety standpoint, we offer a boom lock. That's a standard safety feature for all of our loaders. It allows an operator to place a boom lock on the machine, then they can go safely under the boom and work on the machine even if they're out in the field," says Miller.

Visibility from a safety perspective was a big factor in the design of the 344L. In the new cab, they've increased the amount of glass to improve visibility for the operator, he continues.

Cab comfort has also been enhanced, with a larger cab than previous models and an optional heated air ride seat to provide lumbar support. The 344L also comes with "a three-way tilt and telescoping steering wheel," says Miller.

Other features include Rimpull control (which manages power going to the wheels to reduce tire-wear) and an optional connection to JDLink, the company's telematics system.

VOLVO

Volvo recently rolled out the H-Series 2.0 Update — a series of enhancements, improvements and "significant changes" to the company's wheel loader line, says Yeomans.

Among other things, a new transmission, working in tandem with H-Series wheel loader engines and axles, offers greater efficiency and stability. An updated OptiShift system lets users customize the

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DOOSAN

lock-up engagement of their wheel loaders. OptiShift also integrates a new torque converter and Volvo's unique Reverse-By-Braking (RBB) solution with lock-up to establish a direct drive between the transmission and engine, according to the company.

On several of its models (L150H, L180H, L220H, L260H and L350H), Volvo also introduced the next generation hydraulic system where the hydraulic pumps are disengaged when lowering the boom and dumping the bucket, increasing fuel efficiency.

A new dry P-brake (parking) and eco-pedal can boost fuel efficiency while a 10-inch rear-view camera offers "really good visibility and a rear proximity warning" function, says Yeomans.

"As you get closer to objects, you will see these lines (on a monitor) and an audible alarm goes off in the cab," he explains.

As an option, Yeomans says the H-Series offers seats that "automatically adjust to the weight of the operator" — a helpful function when different people are using the machine (or you're just coming back from lunch at the all-you-can-eat buffet).

Buckets on H-Series wheel loaders have been redesigned "to improve productivity," he adds.

Customers who buy an H-Series 2.0 Updated wheel loader can employ Active-Care Direct, a Volvo telematics service which includes fleet utilization reports and around-the-clock remote machine monitoring by company technicians.

DOOSAN

"The new DL280-5 is a model line extension that will allow us to extend our reach into a couple key applications within the construction space as well as the scrap and recycling industries," says Doosan's Kleingartner.

The DL280-5, which is scheduled for a spring release, features optional heavy duty axles that improve performance in harsh conditions and an optional wide-fin radiator that offers more efficient cooling while reducing the likelihood of clogging. The forward-neutral-reverse joystick on the DL280-5, meanwhile, has been re-designed to make it easier and more comfortable to use. Operators don't have to worry about hand fatigue and "have a better feel for the control," says Kleingartner.

The DL280-5 also has "a standard rear-view camera with separate monitor in the cab" and a telematics system that offers performance data and service status updates, he adds.

The telematics system can be accessed with "any web-enabled device" be it a smart phone, laptop or computer, says Kleingartner.

THE FUTURE

In terms of future trends, industry experts say machine control (on-board systems connected to satellite networks that can be used to assess grade, determine geographic coordinates and gather and transmit data) might be the next high-tech frontier for wheel loaders.

Machine control systems are handy for "grading… keeping track of the amount of material removed and knowing where machines are on a job-site," says Kleingartner.

Hyundai's Thompson anticipates more developments in connectivity and communication — wheel loaders "talking" and sharing data with other machines and vehicles as manufacturers continue to add innovations to a construction industry standard. ☐

Augmented Reality Brings BIM to the Jobsite

By marrying the virtual world of Building Information Modeling (BIM) with the real world of the job site, augmented reality (AR) is already having an impact on how construction work gets done. The question is, how far will the trend go?

BY JACOB STOLLER

A "geek" image is not something most construction workers would want to cultivate. Nevertheless, some experts believe that augmented reality (AR) will soon become so ubiquitous that electronic headsets such as Microsoft HoloLens or Google Glass will be as common on jobsites as tablets and cell phones.

"There won't be a worker out there that doesn't have some sort of augmented display that they wear," predicts Jason Cohen, Director of Digital Experiences at Toronto-based CAD Microsystems.

AR, also called mixed reality, allows construction workers to see elements from 3D Building Information Modeling (BIM) models superimposed on their field of vision in the physical workspace. An electrician equipped with a holographic headset, for example, can see, in *Star Wars* fashion, exactly how the planned wiring will appear when installed correctly, and what that same area will look like once the piping has been installed the following week.

When AR is fully implemented, Cohen explains, a construction jobsite will have a BIM-based digital twin that resembles the jobsite down to the exact detail. Headsets and other information collection devices will constantly update the model. If, in the above example, the pipefitter had already completed his work ahead of schedule, the electrician would be aware of that, and any possible repercussions, before arriving at the jobsite.

This won't be just about visual information; workers will be able to talk — through interfaces like Apple Siri or Google Smart Speaker — with automated smart agents that "know" who the worker is, and what information is needed to do the job correctly.

This dynamic link between the model and the jobsite has the potential to dramatically increase the value that BIM can provide for contractors. "The real power

here is that the flow of data is bi-directional in real time," says Cohen. "You're constantly providing information to help workers get their jobs done, and they're constantly sending important information to head office."

MOVING FORWARD WITH AR

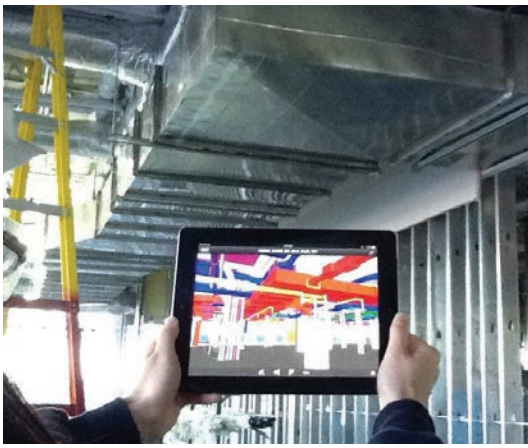
While the technology is still in early stages, AR is already present on some jobsites. "Some of this already exists," says Thomas Strong, Director, Virtual Design and Construction at Toronto-based EllisDon. "We already have the models, and we're storing them in the cloud so they're accessible in the field. We're barcoding door frames so people can find themselves in the model."

"AR is no longer futuristic," says Clint Kissoon, Chair, School of Construction Management at Toronto-based George Brown College. "Contractors have already started using it. Now it's about exposure and the ability to show where this can be appropriately used."

The school now has a specialized BIM training program, and according to Kissoon, maintains a continuous dialogue with contractors and technology firms in order to understand the world that their graduates will be facing.

Acquiring AR capability involves integrating a variety of hardware and software components, many of which are the products of recent start-ups. "There's no one-size fits all," says Joe Eichenseer, Director, Building Lifecycle Solutions at Denver-based IT integrator IMGINiT. "It depends on your intended use, or how far on the bleeding edge you want to be."

EllisDon employs holographic headsets in some situations, and in others, apps that allow a worker to hold up a tablet and, using the device's gyroscope sensor, get a sense of what an installation should look like. The firm also uses various data collection methods, including periodic laser scans using Lidar devices, and photography and video gathered through smart phones. The latter is far less expensive, but not easy to integrate into the model.



Left and above: An EllisDon construction worker uses a tablet-based Augmented Reality app to visualize an installation in 3D.

"The trick will be to capture all the data in one place, and have an artificial intelligence system go to work extracting the information out of it," says Strong. "But the technology to bring that all together isn't all there yet. So to manage the result at this point, you have to have a person assigned to that task."

Above and left: Students at George Brown's School of Construction Management employ AR to visualize drawings in 3D.

FINDING A BUSINESS CASE

Since AR is essentially an add-on to BIM, even the entry-level involves a significant investment in technology and expertise. This is particularly challenging for smaller firms.

"The larger contractors are very much aware of what it takes to at least adopt the technology," says Kissoon. "They have to, because it's becoming a very competitive market. But in the supply chain, which includes a lot of SMEs, people are struggling."

Many of the advantages of AR, such as its ability to warn of potential conflicts, only exist when all partners in the building process have inputted their plans in digital 3D format and the model is complete.

"If your model is missing the ductwork, and everyone else is coordinated in 3D, you don't have the certainty that that ductwork is going to fit," says Strong. "So you need everyone to represent their system. That's our challenge."

The most difficult part for many isn't investing in the technology or hiring people who know how to use it – it's being able to apply the requisite technical know-how to the organization's established construction management processes.

"A firm is not going to get rid of their chief estimator and put in a young graduate who might be able to do things faster by using all the latest tools," says Kissoon. "What contractors are trying to do is get a young graduate who can work alongside a more senior person, and teach them how to use the new tools. But a lot of the senior people are not in a position to be able to learn that new technology."

The key is determining how the investment will pay off. "Contractors are never going to say 'it's great to see that, let's get one,'" says Kissoon. "They want to be able to (see) what value it brings to them."

Many of the advantages, however, such as avoiding clashes and improving workflow efficiency, are hard to quantify. On the other hand, some strong use-cases are emerging.

"In some areas, like inspections, verification in the field with AR is near immediate, so showing the ROI is really quite easy," says Barry Kelly, Industry Manager, Public Works at Toronto-based GIS solutions provider Esri Canada.

"Reducing risk is huge," says Eichenseer. "If you're doing a renovation, the ability to overlay a proposed design on top of the existing structure has a lot of value. Does everything that is proposed feel like it fits? How confident are you in the design that's been handed over to you?"

AR is also being used to improve safety programs and make them more efficient – the two-way flow of information makes it easy for a safety officer to be aware of hazardous situations as they arise, and to instantly warn workers who might be in danger, or shut down a work area if necessary.

THE WAY OF THE FUTURE?

AR is expected to soon be widely deployed in areas such as healthcare, education, manufacturing and navigation, assuring that the technology will mature and prices will drop. However, AR requires a well-populated BIM database, and data collection — no matter how efficient the methods are — requires commitment from many players.

The problem is that in many cases, companies don't feel that there is enough incentive to participate. Architects and engineers, for example, complain that they aren't being paid to input all the required data to establish the model, and, as Kelly notes, models often don't get built on time, or at all.

Construction processes are also changing. In what is called the industrialization of construction, contractors are starting to pre-fabricate building components off-site in a controlled industrial environment, greatly simplifying the work that is done on-site.

"You do need to get better at managing that process of identifying problems and fixing them," says Strong, "but at the same time, getting better at building things offsite in large pieces and having them snap together will basically eliminate a lot of firefighting that has to occur on a jobsite. So we shouldn't focus too much on creating tools that make us better at reacting – I think the real focus should be on creating processes where we don't have to react to things." ☐

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CANADIAN CONSTRUCTION ASSOCIATION AWARDS

2017 CCA AWARDS

BY JILLIAN MORGAN

The Canadian Construction Association recently handed out its annual hardware for 2017, and we've got the lowdown on the winners.

TERRY BROWN
Person of the Year Award

Terry Brown says he'll need bigger shoes to follow in the footsteps of former Canadian Construction Association (CCA) Person of the Year Award winners.

The annual distinction, which recognizes leadership and excellence in the construction industry, is the association's most prestigious honour. Paul Douglas, president and CEO of PCL Construction, was the 2016 recipient.

"I am really humbled because this is an honour bestowed on me by my peers," says Brown. "That really resonates and kind of chokes me up because there's some pretty good people in the industry."

Brown is the former General Manager of Greyback Construction. He retired in 2009 after 25 years with the company.

"Terry is still a legend around the office," said Greyback president Larry Kenyon during the award ceremony, held at CCA's 100th annual conference in Banff, Alta. "He enthusiastically tackled problems and usually had fun doing it."

Brown's contributions to the industry include the revision of BC Hydro's contract documents. He also helped to draft British Columbia's Capital Asset Management Framework, used to inform public owners on procurement policy.

Brown's role in "Open, Fair and Transparent," a white paper by the British Columbia Construction Association (BCCA), earned him the BCCA Outstanding Service Award and the Queen's Diamond Jubilee medal.

Now "semi-retired," Brown is the owner of STBR Consulting in Kelowna, B.C. STBR offers consulting, project management and construction management services, as well as classroom instruction to the next generation.

In the next phase of his 40-year career, Brown hopes to influence perception of the job and pass on his knowledge to up-and-comers.

"The biggest plus for me is to be able to give back," says Brown. "If I can teach them to avoid one of the mistakes that I've made, then they're doing well in their careers."

Still, he is continuously learning.

Volunteering, participating in associations and learning all aspects of the job allow for career growth, according to Brown. He says employers who allow their staff to participate in these activities are the "unsung heroes," and equally deserving of the award.

"You'll never know it all," says Brown. "Each one of those incremental bits of knowledge advances your own personal and professional life."

For Brown, the future of the construction industry relies on a new wave of skilled workers – and the recruitment of unrepresented groups, such as Indigenous peoples, women and persons with disabilities.

"There's a tremendous opportunity for the next generation," says Brown.

BRENDAN NOBES
General Contractor Award of Recognition
Company/head office: rcs construction, Bedford, N.S.
Title: Director of major projects
Years in the industry: 25
Specialty/area of focus: Large scale CM projects
What this award means to you: *"Recognition by my peers of my efforts to better our industry… you don't need to be a big, multi-national contractor in a major centre like Toronto to make a difference."*

MAPLE REINDERS
Environmental Achievement Award of Excellence
Head Office: Mississauga, ON
Years in Business: 51
Number of employees: 350+
Specialty/area of focus: Building construction and civil/environmental construction
What this award means to you: *"Receiving this CCA Environmental Achievement award is an honour as it further establishes Maple Reinders as a leader in the environmental construction space."*

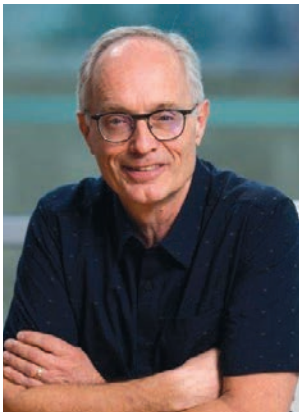
BIRD CONSTRUCTION
Environmental Achievement Award of Excellence
Head Office: Mississauga, ON
Years in Business: 98
Number of employees: 1,650
Specialty/Area of Focus: Construction/pre-construction, public-private partnership projects
What this award means to you: *"Bird is honoured to be recognized by our colleagues for our efforts delivering this important facility that adds to our expanding portfolio of environmental projects."*

GLENN ACKERLEY
Manufacturers, Suppliers and Services Award of Recognition
Title: Partner and chair
Company/head office: WeirFoulds LLP, Toronto
Years in the industry: 29
Specialty/area of focus: Construction law
What this award means to you: *"After years of representing clients from across the industry, I am proud to continue my commitment to enhancing the practice of construction law in Canada."*

PAUL SIEBEL
Community Leader Award of Excellence
Company/head office: ACL Steel, Kitchener, ON
Title: President
Years in the industry: 43
Specialty/area of focus: Structural steel fabrication
What this award means to you: *"I am honoured and privileged to be recognized by the industry for trying to better it and the community in which we live and work."*

GROUPE C. LAGANIÈRE INC.
National Safety Award of Excellence
Head office: Montreal East, QC
Years in business: 56
Number of employees: 180
Specialty/area of focus: Environmental remediation
What this award means to you: *"The time and money we invest in safety are meaningful and worth pursuing. For our field teams, it is a motivating factor as it rewards their daily efforts."*

LYSTEK
International Business Award of Excellence
Head office: Cambridge, ON
Years in business: 18
Number of employees: 32
Specialty/area of focus: Thermal hydrolysis solutions for the management of biosolids and organics
What this award means to you: *"Being recognized with this prestigious award is extremely meaningful to us. It validates our position as a pioneering leader in the rapidly expanding clean/green tech sector."*



ROSS MCLEAN
Trade Contractors Award of Recognition
Company/head office: Houle Electric, Burnaby, BC
Title: Regional Manager
Years in the industry: 49
Specialty/area of focus: Electrical trade contracting
What this award means to you: *"I really appreciate it because it's very rewarding to see the trades, which are the foundation of construction, improve and take on a stronger profile."*

THE NEWFOUNDLAND AND LABRADOR CONSTRUCTION ASSOCIATION
Gold Seal Association Award of Excellence
Head office: St. John's, NL
Founded in: 1968
Number of members: 688
Key member services: Advocacy, electronic plansroom, education/training, weekly bulletin, networking opportunities, events
What this award means to you: *"We are honoured to be awarded the Gold Seal Award of Excellence! We are pleased to support this program and promote the certification of members."*

GIL BRULOTTE
Civil Infrastructure Award
Company/head office: EllisDon Corp, Mississauga, ON
Title: Senior Vice-President, Civil Division
Years in the industry: 46
Specialty/area of focus: Civil construction for subdivision servicing, public infrastructure and oil and gas (underground utilities and roads)
What this award means to you: *"It's humbling as it recognizes how my peers valued my contribution and the volunteerism impact on helping shape the value of construction for Canadians."*

POMERLEAU
Excellence in Innovation Award
Head office: Saint-Georges, QC
Years in business: 52
Number of employees: 3,500
Specialty/area of focus: Construction, buildings, civil and infrastructure
What this award means to you: *"This award highlights our efforts to stay on the cutting edge of technological advances in the industry and help our partners to innovate and improve productivity."*

GRAND VALLEY CONSTRUCTION ASSOCIATION
Partner Association Award of Excellence
Head office: Cambridge, ON
Founded in: 1974
Number of members: 680
Key member services: Construction information from pre-bid to award stage; training and advocacy
What this award means to you: *"So proud to be recognized… for the work we do. Our team is professional, our members are engaged and our association is recognized as a leader in the industry."*

By Peter Smith and Barrie Ngeh

Critical Coverage - Impact Covers in Project Specific Insurances

Subbing for the normal author of this column, David Bowcott, are his two colleagues from Aon.

Among the most often overlooked and misunderstood coverages when insuring a construction project are soft cost and delay in start up coverages, both of which are optional but prevalent exposures for both the owner and contractor alike.

We need to first review all of the other "net income" and "time element" covers which are also available to be insured under a construction builders risk policy to fully understand exposure and amounts to be insured for each item.

Firstly, we have "Extra Expense" and "Expediting Expenses."

Extra Expense: This pays for additional costs in excess of normal operating expenses that an organization incurs to continue operations while the impaired property is being repaired or replaced post loss.

Expediting Expenses: Essentially "acceleration expenses" if in event of loss, policy will provide cover for extra costs (such as overtime, express freight, higher early prices) incurred in fast tracking repairs or replacement of a lost or damaged asset, with the intent of mitigating the overall quantum of the loss. These expenses usually are not covered under a typical insurance policy unless specifically included.

These coverages are often provided by carriers at no additional cost to the premium and added as a frill cover. However, given its importance of being able to mitigate the overall impact of an insured peril, we have seen more often than not, that the limits provided are insufficient when called up and more often than not overlooked.

Soft Costs: Thirdly, we have "soft costs," which are essentially those additional costs incurred as a result of a delay caused by a covered loss during the "construction" period. Some of the more common soft costs are interest charges on project financing, realty taxes or other assessments, advertising and promotion and additional accounting, legal, architectural, or engineering fees. (See an excerpt from a policy defining soft costs in next column.)

Soft costs can be considered recurring (i.e., interest charges on project financing and insurance premiums for the dedicated construction and performance guarantee insurance(s), etc.) and non-recurring (i.e., engineering fees). Recurring soft costs should be insured for 100 per cent of the respective annual value, whereas non-recurring soft costs are typically insured for a one time value. We usually benchmark the limit of this coverage as a percentage of their initial/aggregate value of these total costs, which is roughly 25 per cent.

> This Policy shall cover the actual loss sustained by the Insured for expenses necessarily incurred as a direct consequence of loss or damage to construction operations insured hereunder.
>
> Soft Costs typically include but are not limited to:
>
> (a) Financial Costs
> (b) Additional Interest Expense
> (c) Legal and Accounting Expenses
> (d) Leasing and Marketing Expenses
> (e) Miscellaneous Carrying Costs
> (f) Interest Income

Delay in Start-up: Lastly, we have "delay in start-up" insurance which is time element coverage for property under construction. The delayed start-up is intended to provide coverage for "future income loss" following substantial completion, which results from a delay in the completion of the construction project when the delay is caused by an insured peril. Coverage is intended to include all expenses which would be incurred and will continue in the event of claim; this also includes the "net profit" loss which would have otherwise have been earned had no loss occurred.

For the project owner, it will possibly mean a delay of the facility being put to its intended use/occupancy, so instead of earning potential revenues they are incurring additional expenses. For the contractor, this could mean an extension to the project which translates into additional carrying costs in order to have the project completed.

Loss from an insured peril may be partially managed with the appropriate use of both the "extra expense" and "expediting expenses" coverages, provided that adequate limits of insurance were procured in the first place. Depending of the severity of the loss, once the project is brought back on track and back to its pre-loss state, invariably the schedule will be 'pushed out' to rectify the loss, at which point the contractor will incur a "delay" in the project.

Soft costs are exposures for both the contractor and owner alike, which if faced with an insured peril will immediately affect both entities' balance sheet, if not readily addressed. Since the basic principal of insurance is to bring the insured back to its pre-loss state, the onus of ensuring that the margins for both entities will be achieved rests solely on the parties procuring not the cheapest cover but the best coverage to protect their interest in the first instance. ☐

Peter Smith is senior vice-president, Construction, and Barrie Ngeh is account executive, both of Aon Risk Solutions.

By Dirk Laudan and Lindsey von Bloedau


Valard Construction Ltd. v. Bird Construction Co.: The Limited Duty to Advise Potential Claimants of the Existence of an L&M Bond

The recent Supreme Court of Canada decision in *Valard Construction Ltd. v. Bird Construction Co.* could represent an important change in the law. It appears to have broadened the responsibility of owners and general contractors to disclose labour and material payment (L&M) bonds to unpaid subcontractors. Owners and general contractors benefiting from L&M bonds will have to consider carefully whether, and how, to communicate the existence of L&M payment bonds to subcontractors.

Construction lien legislation in several Canadian provinces, including Ontario and B.C., requires the owner to disclose the existence of L&M bonds, when asked. It seems the court has extended this requirement, at least in L&M bonds that use "trustee" language, and parties involved in construction projects will have be careful of these newly-recognized obligations. Looking at the applicable legislation no longer gives a complete picture of what those obligations are. The issue will become increasingly important in Ontario, and any other province that adopts the Ontario model for construction lien reform, since bonding is now mandatory in Ontario for almost all government construction work.

Valard Construction Ltd. v. Bird Construction Co. arose out of construction on an oil sands project in Alberta. The GC subcontracted certain electrical work to Langford Electric Ltd. As required by its subcontract, Langford provided the GC with an L&M bond. The bond named the GC as the obligee of the bond, and trustee for the benefit of claimants. One of Langford's sub-subcontractors was Valard.

The L&M bond was in the standard CCDC 222-2002 form. Under the bond, the general contractor as trustee held claimants' rights for them. This was intended to allow claimants rights under the bond, even though they are not parties to the bond. A claimant was required to give notice of its claim on the bond within 120 days of its last work on the project.

Valard had a valid claim for unpaid work against Langford, but it was not collectable. Valard was not aware of the existence of the L&M bond until approximately seven months after its work on the project concluded, so it could not give valid notice of its claim within the bond's 120-day time limit. The general contractor had not proactively informed Valard that the bond existed, and because Valard was unable to give notice of its bond claim in time, it lost its right to do so. Valard then sued the general contractor for breach of trust on the basis that the general contractor was legally a trustee, and had failed in its duty as such by not informing Valard of the bond.

The Court's majority decision was based on the trustee's duty to disclose the existence of the trust to possible beneficiaries, who would be unreasonably disadvantaged by a failure to disclose. The infrequent use of L&M bonds in private oil sands construction projects meant that the claimant would not necessarily have guessed it existed. It seems that this was an additional reason for proactive disclosure. That said, the Court did recognize that the obligee could not have known the identities of all potential claimants at the time that the bond was obtained. Taking that into account, the Court found that the general contractor could have satisfied its duty by posting a notice of the bond in the site trailer. Doing so would have provided notice of the bond's existence to a significant portion of potential claimants, and it would have cost the general contractor almost nothing to do so. The majority of the Court rejected the argument that the "trustee" language was just a way to give claimants a legal right to make a claim, or that the bond exists only for the benefit of the obligee.

As result of this decision, obligees of L&M bonds should seriously consider whether they have a duty to inform potential claimants of the existence of the bond. In situations when a potential beneficiary could be significantly disadvantaged, or in circumstances where L&M bonds are not common, this duty might be even more pronounced.

This article is provided for general information only and may not be relied upon as legal advice. ☐

Dirk Laudan is a partner at the law firm of Borden Ladner Gervais LLP (BLG), practicing in the areas of construction, insurance and commercial litigation and arbitration. Lindsey von Bloedau is an associate lawyer at BLG, and practicing in the area of construction litigation.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The role of lubricants in construction equipment management

By Brian Humphrey,
OEM Technical Liaison,
Petro-Canada Lubricants

The construction equipment landscape has changed over the recent years, following the introduction of API CK-4 and FA-4 engine oils and Tier IV engines to help improve fuel economy and reduce greenhouse gas emissions. In the construction industry, where equipment is expected to deliver the highest reliability, efficiency and safety even in the toughest of conditions, marginal gains in fuel economy and engine efficiency can make a real difference to a business's bottom line.

THE ROLE OF LUBRICANTS

By minimizing metal-to-metal contact between moving components, while reducing pumping and spinning losses, lubricants have the potential to improve fuel economy and enhance engine performance and protection.

For construction machinery, API CK-4 oils, which have been designed to be more robust and resistant to oxidation, offer improved resistance to aeration and increased shear stability are of particular relevance. Improved aeration control is important for off-road engines as, in some cases, more air than usual could become entrained in the engine oil. This is particularly dangerous at the bearings, where maintaining a suitable oil film is critical to protect them.

With the ability to reduce vehicle downtime – a major source of missed opportunity in construction operations – these design improvements also provide enhanced performance and greater hardware protection.

USED OIL ANALYSIS

Part of a sound maintenance regime, used oil analysis is a cost-effective process that can monitor oil condition in heavy duty equipment to discover minor mechanical problems before they become serious and expensive to fix.

The process typically involves three steps: taking a representative sample from the equipment, sending the sample to a qualified used oil analysis lab, interpreting and then acting on the results. Oil analysis is most effective when performed at regular intervals, so that a trend can be generated and used to improve the performance and efficiency of equipment.

It is highly recommended to use an oil analysis program for improving equipment efficiency and fuel consumption as well as extending drain intervals.

THE IMPACT OF TEMPERATURE

It's also important to consider the impact of climate on the performance of the engine oil as both high and low temperatures can pose a challenge. In extreme conditions, like those experienced in our colder regions, lubricant viscosity can become a cause for concern. If the temperature reaches the 'critcial' zone, the lubricant can start to stiffen or become overly viscous, resulting in the machinery being improperly lubricated in strenuous conditions. Over time, this can lead to catastrophic equipment failure.

To help prevent this, construction operations should utilize a low viscosity oil that can maintain its flow under a wider range of temperatures. Ideal for this are multi-grade, low viscosity oils - which are not too thick in cold climates and not too thin in hot environments – as they offer adequate flow to protect key engine components.

LUBRICANT SELECTION

When selecting a heavy duty lubricant, it's important to choose an oil that is designed to keep construction operations working no matter what. At Petro-Canada Lubricants, we test in the extreme to ensure that our lubricants are strong and durable, and our DURON™ Next Generation heavy-duty diesel engine oils offer a comprehensive range of products to meet any climate and operating condition. Lubricant choice should be always based on the OEM recommendations as provided in the owner's manual.

To find out more about Petro-Canada Lubricants visit lubricants.petro-canada.com or for more information on DURON™ Next Generation, please visit DURONthetougherthebetter.com.

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