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May 2018
Volume 59, No. 3



Image courtesy The Cora Group

Cover: An interior rendering of evol1 in Waterloo, Ont.
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Engineering Smarter Cities

Over the past month I attended two events in Toronto hosted by firms loaded with engineering talent, and at both venues the companies were stating loud and clear that they're aiming to be leading partners in the smart cities of tomorrow.

WSP held a moderated panel discussion at the Royal Ontario Museum, part of its Future Ready roll-out tour which included prior events in Vancouver and Montreal. The firm was promoting itself as becoming a more insightful and innovative partner in developing cities of the future. A large part of the discussion focused on urban density and mobility challenges along with incorporating technology and the role artificial intelligence (AI) will play in everyone's future.

Also emphasizing the growing role of technology in smarter urban infrastructure was IBI Group's CEO Scott Stewart, speaking at the firm's annual general meeting held at its Toronto headquarters. Stewart outlined a new corporate strategic plan which leans heavily on becoming a "technology-driven design firm."

Stewart said that the role of a design practice has not fundamentally changed over the course of his career. Planning and design get involved and get paid for their work at the early stages of development, but generally they play no role in the ongoing lifecycle of the built environment.

Instead of dropping in to design projects and then moving on to the next, IBI wants to build on tools it has already developed and partner with municipalities over the long term.

IBI is focusing on technology-driven business processes internally, becoming a provider of software-as-a-service tools to outside clients, building internal teams to focus on the best uses of emerging technologies, and it's also launching its own incubator to invite start-ups to develop smart city applications and tools. This last endeavor, being called its Smart City Sandbox, will be located in Toronto.

"Technology is disrupting the entire ecosystem of cities. As a firm that has technology embedded in its DNA, (having designed some of the first intelligent transportation systems in the world) and as designers of the built form (buildings and infrastructure), we see both a need and an opportunity to create new ways to enhance the operations and the experiences of cities," said Stewart in a release issued following the event.

"We have great talent in our core business, but we also know having an open network of collaborators, with partners representing all aspects of the urban environment, is where the best solutions and ideas will come from.

"Armed with our unique domain knowledge around how cities operate, we are well-positioned to lead this exciting initiative."

Consulting engineering firms of all sizes should be evaluating how they are embracing technology to both sustain their own businesses and play the role of advisor to clients for not only the duration of the next project, but for the entire lifecycle of the developments in an increasingly connected, digital, urban environment.



Doug Picklyk

FOR PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE

CANADIAN CONSULTING engineer

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Moriyama & Teshima Architects

Rendering of The Arbour, a new mass timber project for George Brown College in Toronto.

BUILDINGS

Mass Timber Project for Toronto

George Brown College selected the design team led by Moriyama & Teshima Architects and Acton Ostry Architects to move forward with The Arbour — the College’s wood campus building on Toronto’s waterfront, Ontario’s first tall wood institutional building that will house Canada’s first Tall Wood Research Institute.

The design for The Arbour features breathing rooms — using solar chimney systems to capture and harness light and air for sustainable natural ventilation. The building design also offers flexibility of learning spaces, enabling walls to expand and contract as needed, as well as a “Made in Canada” approach using nationally-sourced mass wood components.

The winning project design team includes: Moriyama and Teshima Architects/Acton Ostry Architects (prime consultants); Fast + Epp (structural engineers); Integral Group (mechanical, electrical, lighting engineers, LEED consultant, security); Morrison Herschfield (building envelope); Stantec (civil engineer); Swallow Acoustic (acoustic engineer); GHIL Consultants (code consultants); Transsolar (environmental); CHM Fire (fire engineering); HIDI Group (audio-visual); Altus Group (costing);

Soberman (vertical transportation); and DesignAble (accessibility).

TRANSPORTATION

Toronto Finch LRT team announced



Infrastructure Ontario

Rendering of the new Finch West LRT.

Infrastructure Ontario and Metrolinx selected Mosaic Transit Group as the preferred proponent to design, build, finance and maintain the Finch West Light Rail Transit project. Leading the application are ACS Infrastructure Canada Inc., Aecon Concessions, CRH Canada Group Inc.

The design team includes: Arup Canada Inc., Dillon Consulting Limited, DPM Energy Inc., DTAH, Perkins + Will Canada Inc., and Sener SES Canada Inc.

The scope of work for the project includes 11km of new, semi-exclusive light rail transit in the northwest corner of Toronto. There will be 16 surface stops, a below-grade terminal stop at Humber College,

COMPANIES

JLR appoints leaders

J.L. Richards & Associates has elected Sarah Gore, P.Eng., as an executive director, joining the Board of 11 directors who lead the Ottawa-based employee-owned firm. Gore joined JLR in 2005, becoming an associate and manager of environmental engineering in the civil/planning department in 2016.



Sarah Gore



Matt Weaver

JLR also named Matt Weaver, P.Eng., a manager of its Sudbury office. Weaver joined JLR in 2010 as an electrical engineering intern before becoming an associate in 2017.

New Arup Associates

Following are recent Canadian appointments at Arup: Robert Feteanu, PE, an aerospace engineer in Arup’s Toronto office, leading the airport simulation and analysis group, has been named associate principal.

Newly named associates include: Jo Balmer, leader of the program and project management initiative at the Montreal office; Mei Cheong, PE, CEng, a geotechnical engineer in the Toronto office; David de Koning, P.Eng., a structural engineer in Montreal; and Marc-Paul Gauthier, CET, a senior technologist and project

manager in Toronto, leading the transportation engineering practice for Canada.

GHD opens North American headquarters in Waterloo



Ashley Wright

Conveniently timed with its parent company's 90th anniversary, global consulting engineering firm GHD held the grand opening of its new North American flagship facility in Waterloo, Ont. on March 22.

Located in Waterloo's Idea Quarter, the new facility has been developed by Australian-based GHD as part of its expanding and diversified technical services business across North America.

Over 500 people from what were previously six separate local locations are now working in the new 100,000 sq. ft. work space at 455 Phillip Street, Waterloo.

The new facility is designed to foster greater collaboration. "The move also confirms our commitment to staying in Waterloo Region and to contributing to the community here," said Steve Quigley, North American general manager, Canada.

GHD Chairman Rob Knott and CEO Ashley Wright travelled from Australia to commemorate the opening, and the company also held its annual Executive Leadership Forum at the new site.

and an underground interchange station at Toronto Transit's Finch West Subway Station.

COMPANIES

Stantec acquiring Cegertec

Stantec is enhancing its engineering positioning in Quebec with the acquisition of Saguenay-based Cegertec.

Cegertec has a 60-year history in power, industrial, building, and infrastructure engineering. The 250-person firm has a central office in Chicoutimi, with additional offices in Quebec City, Montreal and, soon, in Beauce's St-Georges.

The firm has carried out engineering and project management in Quebec, elsewhere in Canada, and in the U.S., for industrial, aluminum, mining, and power clients, as well as for levels of government.

Stantec's team in Quebec will grow to some 1,500 employees.

McIntosh Perry adds Luiz Leon & Associates

Toronto-based consulting engineering outfit McIntosh Perry continues its national growth strategy with the addition of Luiz Leon & Associates Ltd., a structural engineering firm based in Surrey, B.C.

Founded in 1995, Luiz Leon has serviced clients throughout B.C. and Calgary, undertaking projects in both the private and public sectors.

"Luiz Leon brings decades of experience and technical capability to enhance our presence in the Greater Vancouver area and British Columbia," said Gus Sarrouh, CEO, McIntosh Perry, in a company release. "The talent and reputation held by Luiz Leon is invaluable as we continue to expand our capabilities to serve clients in Western Canada."

Binnie acquires Omni Engineering

Western-Canadian civil engineering firm Binnie has acquired Omni Engineering, a Vancouver-based engineering services and consulting firm focused on municipal, industrial, and port related sectors.

Binnie, employee-owned and managed, has been operating in B.C. since 1969 engineering infrastructure solutions for a range of clients.

The firm now has offices in Burnaby, Squamish, Surrey, Prince George, Kamloops and Calgary.

AWARDS

Fast + Epp takes top prize at ACEC-BC Awards

The 2018 Lieutenant Governor's Award for Engineering Excellence, the top prize at the 29th Annual Awards for Engineering Excellence Gala hosted by the ACEC-BC, went to Fast + Epp for the Tallwood House at Brock Commons project.



Naturallywood.com, photographer: KK Law.

Fast & Epp claim top prize at ACEC-BC Awards for the Tallwood House at Brock Commons, UBC.

The 18-storey (53m) residence on the UBC campus has been recognized as the tallest mass timber hybrid building in the world.

During the Gala, held April 7 at the Westin Bayshore in Vancouver, other Awards of Excellence winners included: COWI North America, Omni Engineering, Parsons, Stantec, Tetra Tech, and WSP.

Awards of Merit went to: Ausenco, Goal Engineering, Klohn Crippen Berger, McElhanney Consulting, Stantec, Tetra Tech, Urban Systems, and WSP.

A Meritorious Achievement Award was presented to Ahmet (Met) Ulker, P.Eng., of AES Engineering Ltd., and the Young Professional Award went to Graham Lovely, P.Eng, MCW Consultants Ltd.

The 2018 Client of the Year Award went to the City of Coquitlam for setting a great example of valuing professional services that consulting engineers provide via qualification based selection.

Ontario CE Awards

Consulting Engineers of Ontario (CEO) hosted its 16th annual Awards Gala at Copper Creek Golf Club on Saturday, April 21.

In total CEO presented 11 awards. "All of the projects that were submit-



Keystone Award-winning KGS Group of Winnipeg at the ACEC-MB Awards Gala..

Julie Remillard Photography

ted are an incredible testament to our profession and to the value of consulting engineering," said CEO Chief Executive, Bruce Matthews.

McIntosh Perry Consulting Engineers Ltd. took home the top award, the Willis Chipman, for the Industrial & Mine Area Clean-Up, Phase 3: Deloro Mine Site project, transforming a contaminated site into a sustainable green space. The firm provided project management, design, contract administration and inspection services.

Awards of Excellence were presented to AECOM, C.C. Tatham & Associates Ltd., MTE Consultants and Robinson Consultants Inc.

Awards of Merit were given to DST Consulting Engineers Inc., Eramosa

Engineering Inc., Hatch, HDR Inc., R.V. Anderson Associates Limited and WSP Canada Inc.

ACEC-MB Celebrates Excellence

A crowd of 270 attended the 19th ACEC Manitoba Awards of Excellence, held April 10th at The Met in Winnipeg. Top prize, the Keystone Award, went to Winnipeg-based KGS Group for the Peter Sutherland Sr. Generating Station project, a 28-megawatt hydroelectric facility located in northeastern Ontario.

The Gala, also celebrating 40 years of ACEC Manitoba, recognized nine Awards of Excellence and six Awards of Merit across eight categories

A Lifetime Achievement award went to retired Doug Stewart, P.Eng. The Rising Star award went to Misty Klassen, P.Eng., a mechanical engineer with WSP.

And an Engineering Action award was presented to Allyson Desgroseillers, P.Eng., a senior associate environmental engineer with Wood and a past-president of ACEC-MB.

Awards of Excellence and Merit went to: AECOM (Water, Transportation), Dillon (Transportation), Hatch (Energy), KGS Group (Energy, Buildings, Water, Transportation), SMS Engineering (Buildings), SNC Lavalin (Industrial), Stantec (Environment, Transportation), TetraTech (Water, Small Project), and Wood (Infrastructure).

CCE



Willis Chipman Award-winning team from McIntosh Perry Consulting Engineers. (l-r) Phil Whelan, Bob Gordanifar, Tomaso Marangoni, Mark Priddle, Wilson Jiang, Aron Zhao, and Michelle Gluck. (Rex Meadley — presenter).

Photo courtesy CEO



CHAIR'S MESSAGE

Sustainability in Canada's Resource Sector



Sustainable infrastructure development and the protection and conservation of our natural resource sector are considerations that have been at the forefront for the Canadian consulting engineering industry for years.

The increasing demand for more innovative sustainable solutions will only be better in the future. And this will only increase demand for the environmental expertise of the Canadian consulting engineering sector.

Solutions require the application of innovative engineering at every level. ACEC has always been committed to promoting responsible development and providing more opportunities and value to our members by actively engaging both government and our partners in the energy and resource sector through our advocacy efforts and activities. In 2017, ACEC delivered a strong message to members of the House of Commons Committee on Natural Resources to support and encourage collaboration with Canada's resource sector. While Canada's federal, provincial and territorial governments have all recognized the need for

continued development of the resource sector, progress is limited due to a lack of infrastructure, and nowhere is this more evident than in the north. Leading by example, ACEC collaborated with Senator David Tkachuk, Chair of the Senate Committee on Banking, Trade and Commerce, by co-authoring an op-ed that was published in late August supporting the development of a utility and transportation corridor. In October ACEC also hosted a panel discussion at its national leadership conference focused on a national infrastructure right-of-way across Canada's north and mid-north that would connect remote communities to vital infrastructure and increased economic opportunities.

While there are continued environmental concerns surrounding energy and resource infrastructure, consulting engineering firms are committed to working with their clients to ensure safe and environmentally responsible development. With these efforts Canadian consulting engineers are demonstrating that energy and resource sector development can not only be economically viable, but it can be socially and environmentally responsible as well.

TODD G. SMITH, P.ENG.
CHAIR, BOARD OF DIRECTORS, ACEC-CANADA

MESSAGE DU PRÉSIDENT DU CONSEIL

La durabilité dans le secteur canadien des ressources

Depuis des années, le développement durable des infrastructures et la protection et la conservation de notre secteur des ressources naturelles sont au premier plan des préoccupations de l'industrie canadienne du génie-conseil.

La demande croissante pour des solutions durables plus novatrices ne fera que se renforcer à l'avenir. L'expertise environnementale du secteur canadien du génie-conseil sera donc de plus en plus sollicitée.

Les solutions nécessitent des méthodes de génie novatrices à tous les niveaux. L'AFGC a toujours été résolue à promouvoir un développement responsable et à offrir plus de possibilités et de valeur ajoutée à ses membres. Pour ce faire, nous mobilisons le gouvernement et nos partenaires du secteur de l'énergie et des ressources par l'entremise de notre travail et de nos activités de représentation. En 2017, l'AFGC a transmis aux membres du Comité permanent des ressources naturelles de la Chambre des communes un message fort quant à la nécessité d'appuyer et de favoriser la collaboration avec le secteur canadien des ressources naturelles. Tous les gouvernements du Canada - fédéral, provinciaux et territoriaux — ont admis que le secteur des ressources doit se développer de manière continue, mais les progrès sont limités car les infrastructures ne sont pas suf-

fisantes, et nulle part n'est-ce plus évident que dans le nord. Prêchant par l'exemple, l'AFGC a signé avec le sénateur David Tkachuk, président du Comité sénatorial permanent des banques et du commerce, une lettre d'opinion défendant la construction d'un corridor de transport et de services publics. Cette lettre a été publiée au mois d'août dernier. En octobre, lors de son congrès national du leadership, l'AFGC a également organisé un panel sur l'établissement d'une emprise pour les infrastructures nationales dans le nord et le nord proche. Cette emprise pourrait relier des collectivités isolées à des infrastructures essentielles et multiplier les débouchés économiques.

Bien que l'infrastructure dans le secteur de l'énergie et des ressources suscite toujours des préoccupations environnementales, les firmes de génie-conseil sont résolues à travailler avec leurs clients pour veiller à un développement sécuritaire et responsable sur le plan de l'environnement. Grâce à ces efforts, les ingénieurs-conseils canadiens montrent que le développement du secteur de l'énergie et des ressources ne doit pas seulement être viable sur le plan économique, il doit aussi être responsable dans une perspective sociale et environnementale.

TODD G. SMITH, P.ENG.
PRÉSIDENT, CONSEIL D'ADMINISTRATION, AFG-CANADA



IN DISCUSSION

with

ACEC

Minister, we've been watching with great anticipation and interest the bilateral agreements for Phase 2 of your infrastructure program. Can you give us an idea of the process by which the federal infrastructure money will be distributed to the municipalities?

Through the 2016 and 2017 budgets, our government committed to investing \$186 billion in the infrastructure that Canadian communities want and need. A significant portion of this funding is being delivered through long-term agreements with provinces and territories and focuses on public transit, green infrastructure, community, culture and recreation infrastructure, and investments in rural and northern communities. In short, we're investing in making our communities

In Discussion with ACEC is a series of informal conversations with Federal Government decision makers who have an impact on the consulting engineering sector.

During these interviews, ACEC-Canada President and CEO John Gamble delves into the government's policies and programs to gain a first-hand understanding of its long-term vision on the issues and challenges that touch the sector. The following is a brief Q&A with the Honourable Amarjeet Sohi, Minister of Infrastructure and Communities, with an update on the government's infrastructure plan.

great places to call home.

I'm very pleased to share that we have completed the negotiations for bilateral agreements with a majority

of provinces and territories. These agreements will provide the long-term, predictable infrastructure funding that our provincial, territorial, municipal, Indigenous and community partners have been asking for. It will allow them to plan and budget for their infrastructure investments knowing that the federal government has funding in place to support their priorities.

Under these agreements, local governments submit project applications to their provincial or territorial government, who review and then prioritize projects to Infrastructure Canada. Once a project is approved, federal funding is available right away and it flows when local partners submit their claims, often well after construction is underway.



Minister of Infrastructure and Communities, the Honourable Amarjeet Sohi participates in a fireside chat with ACEC President and CEO John Gamble at the ACEC national leadership conference, October 2017.



How do you see Bill C-69 and the changes to the environmental assessment act affecting projects financed under your infrastructure program?

Bill C-69 puts in place better rules to protect our environment and waterways, rebuild public trust, and respect Indigenous rights. It will help create conditions for clean economic growth and ensure that good projects can go ahead, while creating jobs and opportunities for the middle class and those working hard to join it. It will ensure that projects are held to a high standard — because that’s what Canadians expect and deserve.

Importantly, Bill C-69 creates certainty for investors and companies that good projects can move forward. Better rules will lead to more timely and predictable project reviews, and will encourage investment in Canada’s natural resources sectors.

Projects funded by Infrastructure Canada have always been subject to appropriate environmental assessments. This legislation does not significantly impact how we will approve and fund projects. Better rules will restore confidence in the government’s ability to protect the environment, all the while ensuring that good projects can move forward in a responsible, timely, and transparent way.

I understand the Smart Cities Challenge is well underway.

Can you provide an update on how the Challenge will roll out?

It’s an exciting time for the Smart Cities Challenge. The application period for the first round of the Challenge closed on April 24th and our independent jury of experts is busy reviewing the submissions. Applicants were asked to identify a problem their community faces and broadly describe how they will address the issue using data and connected technologies.

Later this spring we will announce a list of 20 finalist communities, each of which will receive \$250,000 to develop their final proposal. Applicants are encouraged to work in partnership with industry experts, local stakeholders, and residents to put together a full business case for their final proposal, which will be submitted to the jury next winter.

The winners in each category will be announced in spring of 2019 and receive funding to fully implement their ideas.

When you addressed our conference in the fall, you spoke about the Canada Infrastructure Bank and the opportunities it will create for infrastructure investment in Canada. What’s happening with the Bank now and what are the next steps?

Our government understands that Canada is facing a significant infrastructure deficit which affects prosperity, economic growth, and quality of



The Honourable Amarjeet Sohi discussing infrastructure development in Canada at the ACEC national leadership conference, October 2017.

life in communities across the country. That’s why we are investing \$35 billion through the Canada Infrastructure Bank, an optional new tool that communities can use to help build transformational infrastructure projects. By leveraging federal funds to attract private sector investment, we will build more infrastructure from coast-to-coast-to-coast and create the strong and inclusive communities Canadians want to live in.

I’m pleased to report that the Bank is now operational and is able to receive and review potential projects. A Board and Chair have been appointed, and the new CEO will be announced very shortly. We look forward to hearing recommendations from them in the coming months.

To view more of our In Discussion with ACEC series, please visit www.acec.ca/indiscussion.



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- CYBER SECURITY RISKS
- THE STRUGGLE FOR TOP TALENT & GENDER DIVERSITY
- POLITICIZATION OF INFRASTRUCTURE - WHAT IS THE SOLUTION?

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A view of the structure supporting the solar farm.

All photos courtesy Mohawk College

The first net zero institutional education facility of its kind in Canada opens this fall for students at Mohawk College in Hamilton, Ont.

By Doug Picklyk

JOYCE CENTRE FOR PARTNERSHIP & INNOVATION

In the fall of 2016 Mohawk College in Hamilton, Ont. began breaking ground on the new Joyce Centre for Partnership & Innovation, a 96,000-sq.-ft. five-storey net zero building project that was secured with \$20 million from the federal government's post-secondary institutions Strategic Investment Fund, a fund established to modernize and improve the environmental sustainability of college and university campuses across the country.

"We had a very ambitious project," explains Tony Cupido, P.Eng., the chief building and facilities officer at the College and the lead representative for the client on this project.

Cupido previously led nearby McMaster University through several

LEED projects including the first LEED Gold facility of any university or college in Ontario, back in 2009.

"When you look at the energy intensity of that building at McMaster, it's five times what this one will be," remarks Cupido. "Reaching this intensity is a combination of improved design, improved materials and improved performance of materials."

The net zero Joyce Centre, slated to achieve substantial completion by June, will consume as much energy annually as the photovoltaic (PV) panels located on it and on the rooftops of adjacent sites will generate.

Energy Intensity Target

Planning for the net zero project began in early 2016 led by architects

from McCallum Sather and B+H Architects. The team of engineers assembled to work on the project included RDH (energy modeling), Mantecon Partners (structural), TMP-The Mitchell Partnership (mechanical), and Mulvey & Banani (electrical, security).

"There was a high focus on net zero by the entire team," says Cupido, "and that really hadn't been done on a large scale like this before in this area."

The team produced a Basis of Design document, outlining the overall concept of the building and all of the specific features. "It's an important document, because it lays out a roadmap for us as an owner," says Cupido. "It tells us what all of these people are going to do and how they are going to do it. Their approach and methodology is all laid out."

Early in the process the team established an annual energy use intensity (EUI) target, ultimately ending up at around 73 equivalent kWh/m²/year for the building, and RDH then began the energy modeling to determine solutions for heating and cooling the building that would achieve the target.

Envelope

To keep energy demand low the building envelope needed to be well designed. The facility uses a triple-glazed curtainwall system with an R-value around R-8 and an insulated precast sandwich panel system with an



The solar farm feeding the facility is located on wing-shaped structures above the building and on adjacent building roofs



Tony Cupido, P.Eng., chief building and facilities officer Mohawk College, with one of many project awards.

R-value approaching R-30. The ratio of glazing to panels sits around 35% : 65%, providing an overall combined window/wall R-value of at least R-10.

The roofs is designed to an R-40 performance.

Mechanical

The Mohawk campus uses centralized heating for its various buildings, but the new Joyce Centre sits independent. The building will use variable refrigerant flow (VRF) heat pumps coupled to a geexchange well field. The 28 geothermal wells required drilling down 600 feet through shale, each one taking a day to complete.

The geothermal system will extract heat from the building in the summer, and in the colder months extract heat from the earth as a heating source.

The heat pumps, operating in zones, will help with heating or cooling different parts of the building.

A dedicated outdoor air system with heat recovery separates the ventilation from heating and cooling.

There is also a solar thermal hot water system providing domestic hot water and heating for the building.

Potable water use reduction also includes the use of ultra-low flush urinals, low flow faucets, and also rooftop rainwater harvesting for toilet/urinal flushing and irrigation requirements.

Electrical

The solar farm feeding the building will provide 653 kW DC power, translating to 500 kW AC through inverters, says Cupido. That should be enough run the Centre.

“One of the biggest challenges we had was a roof capacity issue,” says Cupido. Fortunately, some of the existing flat roofs on campus adjacent to the new Centre required replacing, so the College installed a lightweight insulated concrete system on the roofs freeing up capacity for the PV systems.

Structural Steel

The building superstructure is structural steel, and the solar farm spans across the building on wing-shaped structures supported by a combination of structural steel and supports from the solar panel fabricator.

EllisDon was the general contractor on the project, and Walters Group provided design assist on the structural steel elements. Walters became

involved from the preliminary stages. “They had hardly figured out what it would look like and how it would work before we got to work on it,” says Walters’ project manager Kevin McElhone. “We became involved in the design/assist process to help our customer get what they needed as quickly as possible.”

Building automation

To restrict energy usage modern controls and system automation systems are in place. It’s what Cupido calls, “Brutally efficient.”

The HVAC is demand responsive, with CO₂ sensors adjusting ventilation when the facility is occupied.

Lighting controls reduce output when daylight is available, and occupancy sensors will turn off lights in vacant rooms. “When you leave a room the lights won’t go off in five minutes, they will go off in five seconds or less,” says Cupido, adding that it has to be that highly reactive to keep the energy use to a minimum.

Joyce Centre for Partnership & Innovation, Mohawk College, Hamilton, Ont.

| | |
|-------------------------------|--------------------------------|
| Owner: | Mohawk College |
| Architects: | B+H Architects/McCallum Sather |
| Contractor: | EllisDon Corp. |
| Energy consultant: | RDH Building Science |
| Structural consultant: | Mantecon Partners |
| Mechanical consultant: | The Mitchell Partnership (TMP) |
| Electrical, security: | Mulvey & Banani |
| Structural Steel: | Walters Group |



Nearing substantial completion, the project has been 2½ years in the making.

Zero Carbon Project

The College is participating in the Canada Green Building Council Zero Carbon Building pilot program, with the Joyce Centre being one of 16 projects across the country. “The program

will help us understand what the carbon impact of a new buildings like this is, what issues need to be resolved, what types of standards should be met, and what type of designation should ultimately be achieved.

“And also, from a learning perspective, how does one go about this and what is the protocol to obtain some type of a designation under the Zero Carbon Building initiative.”

Already the project was named the sustainable project of the year by the Ontario Sustainable Energy Assoc.

Final Tally

“We believe this has been a successful project. The proof will come out of the final installation details, training, commissioning all of the components, and then how we manage it as an organization,” says Cupido.

“No one has built a building like this, and no one has operated a building like this, yet. So we have our own challenges of getting the right team here. We believe we have that foundation ready, but there’s still some work to do.” **CCE**



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A net-positive office building in Waterloo, Ont. optimizes both passive and active energy sustainability features.



A three-storey green wall in the atrium aids in the air quality of the collaboration space.

By Doug Picklyk

This past April a 100,000 sq. ft. three-storey office building that's still under construction was awarded a Zero Carbon Building – Design certification from the Canada Green Building Council, the first site anywhere to receive the designation.

The new structure, called evolv1, is being developed by the Cora Group in the Idea Quarter of Waterloo, Ont., where new and established tech companies are sprouting up and creating a true hub for innovation.

The evolv1, modeled to be not only a net-zero but a net-positive building, is demonstrating innovations of its own, proving a commercial developer-led project can achieve the highest in sustainability achievements.

The Beginning

Richard Williams, architect and principal with Stantec, became involved with this project at its feasibility stage in April 2016. The Cora Group, together with Sustainable Waterloo Region (a local not for profit) needed to determine if a multi-tenant, class-A office building built to a net-positive standard would be commercially practical.

“It needed to be economically viable and ultimately replicable so they could justify continuing to build projects of this type in a normal multi-tenant leasing environment,”



evolv1

says Williams.

Stantec worked with a multi-stakeholder group including representatives from The David Johnston Research & Technology Park (University of Waterloo) adjacent to where the building is located, along with the lead tenant, EY.

Using a Stantec-developed parametric modeling program, the firm incorporated multiple inputs including building envelope and system components - both mechanical and electrical - to work through what characteristics the building would need in order to achieve a net positive energy result.

An integrated Stantec team, incorporating architecture and all of the engineering disciplines, a sustainability team, energy modeling and landscape architects were all involved in the project.

“When you're using parametric modeling, a lot of the aspects really reside within the different engineering expertise, so you need to have that expertise at the table, otherwise it's just guess work,” says Williams.

Structure and Envelope

Structural steel makes up the core of the building. “From a development standpoint, it is the economical way to go,” says Williams. “Steel allows the building to be erected much more quickly.” The recyclable nature of steel also lends well to the sustainability story of the project.

Optimizing passive systems, which includes the building envelope (cladding and glazing) and exterior sun shading to reduce solar gain while maximizing daylight to reduce the need for lighting, is an energy-saving solution for high-performance sustainable buildings.

The cladding for evolv1 is a high performance aluminum composite panel system. “Within the wall system the keys are having a healthy amount of insulation, and then making the envelope air tight through a really good air barrier system,” notes Williams.

The building envelope was optimized for an R-30 wall and an R-40 roof, which was part of the parametric modeling.

“We're below 40% glazing, that tends to be around a



Glazing on the north side allows maximum daylight exposure. Bottom: South-facing windows features shading to reduce high summer sun solar gain, while east and west sides have vertical shading for year-round relief.

break point where if you're over 40% you're causing your glazing to have performance that becomes uneconomical."

The glazing is positioned to maximize value to the tenants. "We have vertical sun shades on the east and west sides which help with some of the solar heat gain as the sun is moving around the building," says Williams.

With respect to the integrated approach, the selection process of the glazing involved extensive discussions between architecture and the mechanical team.

"We were looking at about a dozen types of glazing at one point," recalls Kaid Al-Ani, P.Eng., principal and mechanical engineer with Stantec.

From a mechanical point of view, they looked at what effect each glazing type would have on the size of HVAC equipment required, while the energy counterparts were modelling the building with the parametric model.

"It was a process of elimination," says Al-Ani, "With the involvement of the client as well, because there is an aesthetic consideration that had to be factored in."

Mechanical

The mechanical system is a variable refrigerant flow (VRF) tied to a geothermal system. Al-Ani explains how the efficiency of the VRF system comes from its ability to move energy around, taking heat from one side of the building and moving it to the other when required.

Ventilation is handled with a dedicated outdoor air sys-

tem, utilizing energy recovery from exhaust air preconditioning the air coming into the building. The installation of CO₂ monitoring in the building helps moderate the amount of outdoor air required.

Another passive integration factor is using the south end of the building as a solar wall, where instead of the insulated panels an air space is left behind the first layer of metal cladding allowing heat to build up, preheating incoming ventilation air during cold weather seasons.

"We have a mechanism in our system that's able—based on outdoor conditions—to automatically determine if the solar wall is required," says Al-Ani. "When we go into the cooling season we completely bypass the solar wall."

By using the geothermal solution for heating/cooling, there is no gas consumed for the normal operation of the building. The only source of gas to the building is for an emergency generator to operate the fire pump, a requirement for the sprinkler system.

"We did consider initially using a battery for the generator, but a generator requires a lot of torque at start up, and there just isn't a battery technology today that would be able to provide that sort of start up power," says Al-Ani. "Who knows, in the future that technology may be possible."

From an electrical standpoint, evolvl uses digital addressable lighting interface controlled LED lighting. And for the plumbing systems, the site collects rainwater for flushing toilets and urinals.

Green wall

The building has a three-storey green wall within its collaborative atrium space. "We have a dedicated HVAC system that conditions the atrium," notes Al-Ani, explaining that air gets pulled up the green wall and through to the return air tapping into the humidification qualities and distributing it throughout the atrium. The process lowers the burden on the active humidification systems.

Solar energy

The building's roof is covered with 700kW photovoltaic



Renderings courtesy The Cora Group

panels (PVs) with additional PVs installed as canopies over a portion of the parkade. Annually, the net electricity being generated through the PVs will exceed what the building requires.

Excess energy produced will feed back into the grid. “Basically, because we’re just one small building, the grid becomes our energy partner and storage,” notes Williams. “That’s really how small individual developments like this can participate in terms of energy sharing.

“Ultimately we’re looking to the future where there will be larger micro grids across much broader development areas and other types of energy storage systems that can work across a campus scale or community scale. That’s one of the next frontiers.”

Tenants

Part of the parametric modeling included profiling what the tenants’ energy usage will be like. The team worked with the developer to understand the typical tenant profile, density of people, electricity requirements and more.

“In the end, if we were able to control the tenancy, like you can in some other types of buildings where the owner is going to occupy the building, we could have probably gotten our energy efficiency even tighter, but here we had

to still allow a tolerance for tenants that we don’t know,” says Williams.

A tenant guidelines manual has been produced to show tenants how they can best maintain the building’s level of efficiency without restricting their activities.

One of the cornerstones of the project is to have the ability to be able to replicate this building and show the industry what is possible. The evol1 project has already garnered attention with its Zero Carbon Initiative certification, and as one of 16 pilot projects in the CaGBC’s Zero Carbon program it’s certain to attract more interest from other developers seeking to gain insights into building energy neutral office spaces. **CCE**

evol1, Waterloo, Ont.

| | |
|---------------------------------------|--|
| Owner: | The Cora Group |
| Architect: | Stantec |
| Sustainability consultant: | Stantec |
| Civil, electrical, mechanical: | Stantec |
| Contractor: | Melloul-Blamey Construction |
| Other: | Stecho Electric (electrical system – design assistance); Conestoga Electric (mechanical systems – design assistance) |

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BRIDGES IN NATURE

Creative, cost-effective engineering used for two pedestrian suspension bridges along the Sea to Sky Trail.

By Klohn Crippen Berger

The Resort Municipality of Whistler (RMOW) is a naturally beautiful community situated within the shared traditional territories of the Squamish and Lil'wat Nations. Known worldwide as a winter skiing destination, the area is truly a 12-month-a-year destination for adventurers seeking outdoor pursuits.

Klohn Crippen Berger (KCB) was selected to provide design and construction management services to RMOW for two pedestrian suspension bridges over the Cheakamus River.

The new bridges form part of a vast recreational trail network. The Municipality was operating with strict budget limits, but it desired unique attractive bridges to complement the wilderness sites.

Sea to Sky

The new Sea to Sky Bridge was built to replace a deteriorated log stringer forestry bridge that was closed to the public due to safety concerns. KCB developed a 55m-long suspension bridge design for the crossing. The main cables for the bridge are anchored into bedrock using drilled-in pairs of rock anchors for each cable.

Top: the Train Wreck Bridge, a 36m-long catenary cable suspension bridge.

Right: the Sea to Sky Bridge replaced a decommissioned forestry bridge, pictured to the left.

At the Sea to Sky Bridge site, an existing forestry road reduced the space available to construct the south-end bridge abutment; and bedrock for anchoring the bridge cables was irregular and unreliable. The south abutment was originally designed with micropiles down to bedrock. During construction, shallower bedrock was located near by, so KCB worked with the contractor to develop value-engineering solutions that allowed the bridge to be founded on spread footings by shifting its position slightly, simplifying the construction and reducing the bridge cost.

The initial concept also had a common suspension bridge configuration with equal height vertical towers, but the final solution was an asymmetric suspension bridge with a shorter south tower. Both towers are inclined backwards to allow for a steeper backstay angle for the main cables, enabling

them to be anchored closer to the ends of the bridge.

This change created room for the forestry road to remain in service and ensured that the cables could be anchored into competent bedrock.

The deck is constructed using rough cedar planks carried by steel crossbeams and cable hangers. Additional cables are strung along the bridge to act as a railing system. The new bridge forms a key link in the 180-km long, multi-use Sea to Sky Trail

Train Wreck

The second bridge, known as the Train Wreck Bridge, allows safe access to one of Whistler's popular attractions, a historic train derailment site featuring graffiti-covered train cars.

For years, the only access to the site was by a dangerous route along CN Rail tracks. The client wanted a bridge to connect the site to the Sea to Sky



Photos courtesy Klohn Crippen Berger

Trail and other popular hiking and biking routes in the region.

The solution is a 36m-long catenary cable suspension bridge with four main catenary cables. The cables connect to anchor frames at each end that are custom fabricated steel shapes designed in the form of locomotive wheels.

The bridge site is very remote, making access for regular construction equipment impossible. KCB designed the bridge abutments using light steel components to facilitate assembly without heavy equipment. The rock anchors used to secure the abutments and anchor the bridge cables were sized such that they could be installed using a mini air-track drill and air compressor that were small enough to be helicoptered to the site.

The wheel-shaped approaches serve as structural supports and architectural elements. The wheels

were analyzed using two structural analysis programs to efficiently design the thickness and dimensions of the wheel spokes and strut.

A tension strut, designed to look like a strut between locomotive wheels, connects the anchor frames to a single 63mm-diameter rock anchor, transferring the loads to the bedrock behind. Rough cedar was selected for the decking, invoking railway ties.

Both bridge designs are a combination of engineering efficiency and aesthetic design, and show that pedestrian bridges can be beautiful and economical.

Sustainable solutions

The client's sustainability objectives were considered in all aspects of the project. The final bridges both have small footprints, minimizing the amount of tree clearing required at the sites. Trees that were felled were

recycled to build new approaches.

Natural, renewable materials were used wherever possible, like the locally-sourced rough-cut cedar on both decks. Elsewhere, galvanized steel was used to ensure a long design life.

As the bridges cross the environmentally-sensitive Cheakamus River at two locations, minimizing impact on the river and its habitat was also a key consideration. The abutments were set well outside of the river channel so as not to affect the river flow or cause scour of the riverbanks. Significant effort was made to eliminate the need for concrete poured in the vicinity of the river. Instead, rock anchors and built-up steel abutments were used.

Overall, the bridges contribute to, enhance, and enrich the existing habitat. They demonstrate environmental responsibility and stewardship, and they serve within an educational environment for visitors and locals. **CCE**

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ENERGY NEUTRAL WASTEWATER SERVICES



Mads Warming of Danfoss at the energy-neutral Marselisborg wastewater treatment plant in Aarhus, Denmark. Photo: courtesy Danfoss

Municipalities around the world are rethinking the way wastewater is managed, and by incorporating energy-saving efficiencies combined with the power generating potential within this waste stream they're driving down costs for citizens while providing an essential service.

In November 2017, water services professionals from across North America and Europe gathered in Toronto to share innovations and smart approaches to elevating the effectiveness of the water industry.

World Water-Tech North America, a two-day conference held in conjunction with Ontario Water Innovation Week, featured multiple emerging technologies, with one specific session focusing on energy and resource recovery opportunities in wastewater facility design and operations.

Called "A New Paradigm for Utilities," the session included a case study of a Danish wastewater plant that operates energy neutral along with presentations on technologies and processes that can move more facilities on to that same net-zero reality for these typically high-energy consuming operations.



Panel discussion, "A New Paradigm for Utilities," (l-r): Adam Krantz (moderator); Claus Moller Pedersen, Aarhus Vand; Mads Warming, Danfoss; Pat Whalen, Luminutra; and Jeff Peters, Suez.

Danish design - energy neutral water cycle

Claus Moller Pedersen, chief project officer with Aarhus Vand (a public utility company owned by the municipality of Aarhus in Denmark), spoke about how his company has successfully flipped the traditional high-cost formula at its Marselisborg wastewater treatment plant. The facility actually generates more energy than it consumes.

Pedersen opened the "New Paradigm" session with a review of his plant, which services a portion of Aarhus, the second-largest city in Denmark.

Charting a period of 26 years (1990 to 2016), he illustrated the plant's declining power consumption and increasing power production history. The plant uses an anaerobic digestion system to treat the waste sludge, turning that resource into biogas to fuel a combined heat and power (CHP) system. And over a number of years the facility has been incorporating energy-saving efficiencies, including sensor-driven process control (a supervisory control and data acquisition "SCADA" system) along with some 290 variable frequency drive (VFD) pumps and blowers installed in the catchment area including water and wastewater pumping and wastewater treatment.

Since early 2011 the facility has been operating energy neutral, and now produces more than double the energy it consumes, with enough surplus to cover the energy required to provide drinking water to its 200,000 citizens.

The plant sends excess heat to the local district heating system and surplus electricity to the grid. Biosolids extracted from its digester are also hauled off to support the agriculture industry.

Based on this success, the region is now seeking to develop the world's most resource-efficient wastewater treatment plant, calling it Marselisborg ReWater.

Engineering efficiency

Also speaking at the event was Mads Warming, global director, water and wastewater with Danfoss. Having worked with



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From the beginning it was always us.
Then suddenly, I was alone.
Gliding out on the ice, my legs were
shaking. My heart was broken.
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always did. Thousands watched...
except the one I wanted most.
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were there. Almost as much
as I wish you were here.

Joannie

Joannie Rochette
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the Marselisborg facility, Warming notes that the systems used in Aarhus can be adopted in both existing facilities and when building new.

“Once you understand the processes, it should be relatively easy for a plant to replicate what has been done in Denmark,” he says. The Aarhus plant is creating an energy neutral cycle without requiring additional solar or wind power—it’s all generated from the carbon they are extracting from the household waste.

“What I see around the globe is a tremendous focus on only the energy production,” says Warming. “What people forget is that these guys started with reducing their energy consumption first, both on the drinking water side and wastewater.”



Courtesy/ReThink Events

“We are taking the biggest asset for these water services companies, which is the concrete and all of the pipe they have in the network, and we make that more intelligent.”

Mads Warming, Danfoss

He points to the installation of four essential elements that can drive down energy use at water facilities: the sensors and the smart process control software systems, the VFD technology, and efficient pumps and blowers.

“We are taking the biggest asset for these water services companies, which is the concrete and all of the pipe they have in the network, and we make that more intelligent. That’s the bottom line,” says Warming.

Optimizing processes

Globally the water services industry is a high-energy consumer. A report published by the International Energy Agency (IEA) in 2016 identified that roughly 120 million tonnes of oil equivalent (Mtoe) of energy was used worldwide by the water sector in 2014. About 60% is consumed in the form of electricity—a global demand of around 820 terawatt-hours (or 4% of global electricity consumption, almost equal to the demand for the entire country of Russia).

The largest share of water-related electricity consumption (42%) is used for wastewater treatment. And within wastewater plants, about 50% of energy is consumed in secondary treatment to satisfy the aeration required in the biological process.

At the Toronto conference, Jeff Peters, product manager with Suez, shared details of two technologies for optimizing wastewater facility operations.

In the early stages of the process Peters promotes using advanced anaerobic digestion technology to maximize energy recovery in digestion/biogas production. By pre-conditioning the solids before digestion, facilities are able to optimize the conditions for digestion, increasing the conversion of the solids to biogas.

While removing more solids early in the process also reduces the energy required to push oxygen into that secondary biological treatment process, Peters also highlighted MBR (or membrane bioreactor) technology that greatly reduces the energy requirement for secondary, or biological, phase of wastewater treatment.

Also promoting alternatives to optimize wastewater treatment was Pat Whalen of Luminultra Canada, a New

Brunswick company that concentrates on the microbiology aspects of water treatment. Whalen also focused on reducing solids early in the wastewater treatment process to lower energy demand in the biological process.

“Typically plants will carry a lot more solids in these processes than they really need,” said Whalen. “When you carry more solids than you need the mass transfer efficiency of the oxygen going into the water goes down, and when the efficiency goes down the power required to get the oxygen into the water goes up.”

He says he’s seen 10 to 20% electricity savings from plants that are able to better control their activated sludge process.

Gradual adoption

According to Warming, the greatest challenge to optimizing wastewater treatment plants worldwide—moving them from a cost centre to a profit centre—is inertia.

Using the Aarhus model as an example, the 2016 IAE report estimates that global electricity production from sewage sludge is around 6 TWh, or only 4% of worldwide municipal wastewater sector electricity demand.

Several wastewater treatment facilities in the U.S. are on board. A plant in Gresham, Oregon was the first in the U.S. to become energy neutral by co-mingling outside organic waste streams from restaurants with its sludge to enhance its biogas production. DC Water in Washington DC has the world’s largest thermal hydrolysis advanced anaerobic digestion facility using biogas in its CHP plant. And the Stickney Water Reclamation Plant in Chicago, the largest in the world, plans to become energy neutral by 2023.

While utility companies tend to be risk averse, the results globally show that wastewater facilities are sitting on a lot of opportunity.

Warming says there is about four-times more energy in wastewater than the energy we need to use to treat it. “The potential is massive.”



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Calculating a LIEN AMOUNT

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The purpose of the Ontario *Construction Lien Act* (the Act) (soon to be the *Construction Act*), among other things, is to secure payment of amounts properly due to those who contribute services and materials to an improvement to land.¹

In *HMI Construction Inc. v. Index Energy Mills Road Corp.*, the Divisional Court provided a guide to lien claimants to assist them to properly determine the lien amount. The decision, in effect, provides a guide that can be used to protect a lien claimant from the cost consequences that may arise under section 35 of the Act (Exaggerated or False Lien Claims).

Background

In December 2012, HMI Construction Inc. (HMI) entered into a fixed price contract with the owner/defendant, Index Energy Mills Road Corp. (Index Energy) in connection with a construction retrofit and replacement project at an energy production facility.

A dispute arose between the parties. In May 2015, notices of default were issued to HMI and the contract was terminated by Index Energy on or about July 28, 2015. HMI registered two construction liens against the project totalling \$32,807,468.11.

Index Energy brought a motion for an order pursuant to section 47 of the Act to discharge the HMI liens, or in the alternative, to post reduced security to vacate the liens pursuant to section 44 of the Act.

On a motion to discharge or to post reduced security, the owner (Index Energy) bears the onus of establishing that the amount set forth in the claim for lien is excessive.²

At the motion, Index Energy successfully argued that HMI had no reasonable prospect of being able to prove a lien amount in excess of \$13,872,154.86, plus HST. The lien amounts were reduced and security to vacate under section 44 of the Act was to be posted accordingly.

The motion judge explained the method used to calculate the HMI lien as follows. In calculating its lien amount, HMI took its total costs (labour, material equipment and amounts claimed by subcontractors) and added a 10% markup for profit (notwithstanding that profit was already accounted for in its fixed-price contract). HMI then deducted the amounts paid by Index Energy, with the remaining balance forming the sum of HMI's lien claim.

The motion judge held that, by using the "costs plus" approach HMI miscalculated its lien amount. The motion judge explained that using the "costs plus" approach in the face of a fixed-price contract for services, duplicated the claim for profits which was already accounted for in the

agreed-upon price under the contract.

HMI appealed the decision.

The Divisional Court Speaks

On appeal, the Divisional Court considered both a jurisdictional issue and a substantive issue regarding a reduction of the HMI liens. The scope of this article is limited to a review of the substantive merits of the appeal, particularly, whether the motion judge had erred by reducing the security required to vacate the HMI liens.

In upholding the decision of the motion judge, the Divisional Court confirmed that in a fixed price contract scenario, the price of the work is measured by the milestones for payment under the contract rather than the costs incurred by the lien claimant.

The Divisional Court explained that where a fixed price is in place, a contractor cannot claim extra charges for work already included (original scope work) in its claim for lien in the absence of approved change orders. Doing so would negate the very risk that a contractor assumed when it entered into a fixed price contract.

The Divisional Court's decision indicates that in calculating a lien, a contractor should separate its claim into silos for, among other things, contract work, approved outstanding extras and unapproved outstanding extras. At paragraph 18, the Divisional Court applied a formulaic guide to calculating the lien amount, as follows:

- i. contract accounting;
- ii. plus, extras (with amounts claimed for each extra, including the basis on which those claims were calculated);
- iii. less, credits for contract work not done;
- iv. less, acknowledged deficiencies (if any);
- v. plus, any other claims (such as delay costs).

Ultimately, HMI was fortunate that the motion judge did not exercise discretion to order costs against HMI pursuant to s. 35 of the Act, or perhaps more drastic, to discharge the liens entirely.

In light of the foregoing, we encourage lien claimants to exercise diligence and caution in determining the quantum of their lien claims.

CCE

Pietro Palleschi is an Associate with Miller Thomson LLP, ppalleschi@millerthomson.com

1. *HMI Construction Inc. v. Index Energy Mills Road Corp.*, 2017 ONSC 4075 (Div. Ct.) at para. 9 and *Construction Lien Act*, R.S.O. 1990, c C.30, s. 14(1).
2. *1246789 Ontario Inc. v. Sterling* (1999), 46 O.R. (3d) 72 (S.C.J.) at para. 21.

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Scot Pump has expanded its line of stamped 304 stainless steel pumps with NPT connections to include nine new ANSI flanged centerline discharge models. The new 320-328 series covers up to 385 gpm and 275 ft of head.

www.scotpump.com



U.S.-based Lochinvar and European-based EC POWER are partnering to launch a cogeneration product in North America. The fuel-efficient cogen systems produce heat for hot water and electricity to reduce consumption from external sources. The systems are designed to provide a 2 1/2 to 5-year payback. The product is slated

for launch in January 2019.

www.lochinvar.com

Cleaver-Brooks is the first to earn AHRI certification for its ClearFire-LC (CFLC) 12,000 MBTU/hr hydronic condensing boiler, and second to earn certification for a 10,000 MBTU/hr hydronic condensing model. Both models earned a combustion efficiency rating of 94.5% and a thermal efficiency rating of 94.5%.

cleaverbrooks.com



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TOA Canada Corp. has released its AM-CF1, a professional steerable microphone array with integrated stereo soundbar—a new audio system for conference rooms which incorporates digital signal processing and two-way active speakers. The system's proprietary microphone technology complements the latest in video conferencing systems.

www.toacanada.com

FIRE

Victaulic launched its FireLock IGS Style V9 sprinkler coupling and line of FireLock IGS grooved sprinklers, the fire industry's first installation-ready sprinkler that is UL-listed and FM-approved. Created to replace threads on both outlets and sprinklers, this mechanical connection redefines sprinkler system design and installation in exposed applications.

www.victaulic.com



Daikin Applied has started year-long Innovation Roadshow across North America showcasing its HVAC tech-

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Mentoring, Women & Engineering

Engineering continues to be a male dominated industry with a sobering number of women in executive-level positions. Karen Sobel, regional managing director, Canada and U.S. East, with WorleyParsons, is based in Calgary, and along with her senior leadership role she is also active in supporting and encouraging women to reach greater heights in their careers.

We asked Sobel to share her experiences and thoughts on mentoring and promoting women in the engineering industry.

Last September you participated as a volunteer mentor in a six-month program sponsored by the Province of Alberta that matched women with mentors. How was that experience and what was the outcome?

I was fortunate to be part of this pilot program, initiated by Minister Stephanie McLean, to support the advancement of women into senior roles. It was unique in that the mentors and mentees represented different industries.

For example, my mentee comes from the Data and Computer industry, whereas I work in Engineering and Project Delivery. The Ministry of Status of Women provided a roadmap to help us define what we hoped to achieve. In the first six months of our mentorship, my mentee and I have defined areas of strengths and interest for my mentee, discussed longer term career aspirations and worked to expand her professional network. She and I have agreed to extend our relationship for another six months as we still have some work to do to achieve other goals.

We recently attended a celebration and wrap up breakfast hosted by Minister McLean, who received positive feedback from the participants. As an

added benefit of the breakfast, I was able to grow my network of phenomenal women!

You recently moderated a panel on the topic of managing multi-generational teams at the Leadership Conference for Women in Energy held in Toronto. What key theme emerged from that discussion? Did mentoring come up in the conversation?

Interestingly, reverse mentoring came up in the panel discussion – how the younger generation can help the baby boomers in a number of ways from technology to learning how to engage millennials.

There was a common thread throughout the discussion around understanding our own biases, which is obviously relevant to more than just multi-generational teams.

We discussed the dangers of assumptions and the importance of being open to other people's ideas and opinions.

We talked about building trust and respect, holding people accountable and believing in the value of diversity.

I think we managed to debunk some of the myths about the various generations. At the end of the day, everyone comes to work to do a good job and find new opportunities to grow and advance their careers.

Do you see mentoring by women as critical for more women progressing in the engineering industry?

It can be daunting to enter any career where you are seen as a minority. I don't think the mentor necessarily needs to be female as long as the mentor is able to provide the advice and support needed to progress the mentee.

To do this means the mentor needs to have an appreciation of the situa-



tions the mentee faces.

The most useful thing that can be done to progress women in the engineering industry is to welcome women and their different perspectives. Make them feel comfortable as part of the team – this includes things like equal opportunity and equal pay, but it is also about the small stuff such as letting a woman own her idea (don't take it away!) and making sure she has a seat at the table.

I have seen progress in the number of women in the engineering industry, but we can still do better.

Did you have a professional mentor, if so how did it help?

I have had a number of mentors throughout my career. Mentors have helped me in several ways: supporting me when my capability was questioned, identifying great career opportunities, navigating sticky situations, and providing general career advice.

How can engineering become more inclusive of women at all levels of leadership?

As Nike says, "Just do it". It has been my experience that when we give people challenging opportunities, they generally step up to the plate and succeed. However, men are given stretch opportunities more readily than women.

The more we can push women into leadership roles (without waiting until they are 110% qualified), the more women leaders we will have. Soon, we won't have to worry about being inclusive as women will just be part of the team.

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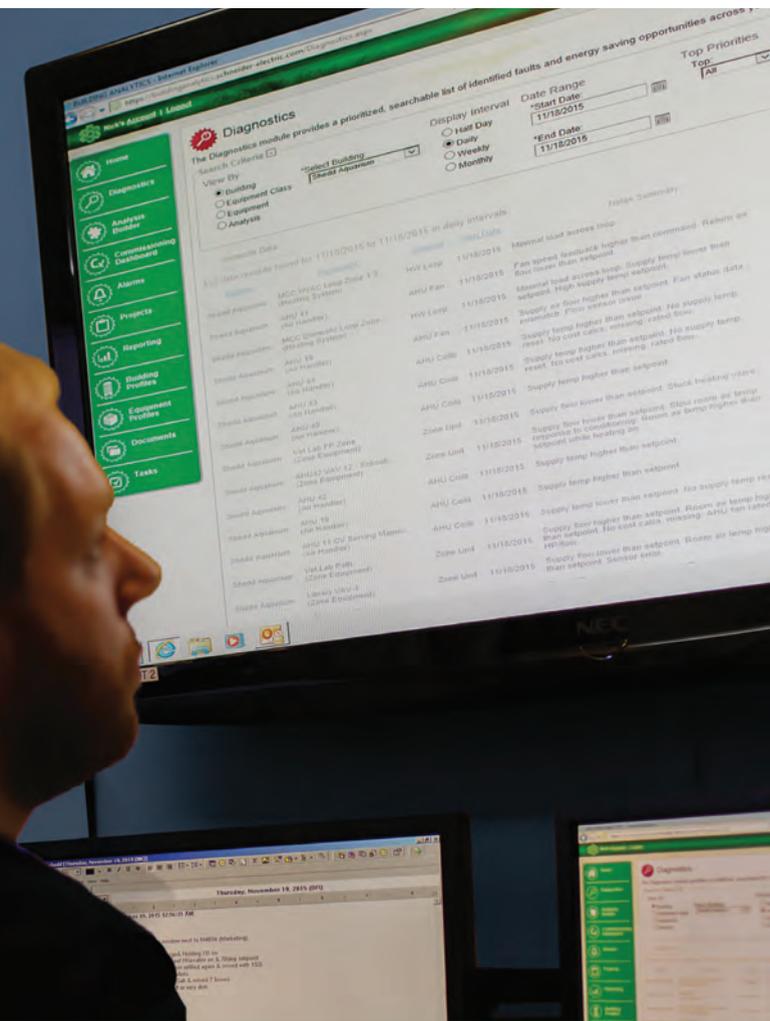
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