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January/February 2021  
Volume 62, No. 1



Photo courtesy WSP Canada  
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## features

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Can entire communities, rather than just individuals, be tested for the presence of the novel coronavirus? Across Canada, active screening of wastewater has provided an answer to this very issue.

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### *Redeveloping Toronto's Guildwood GO Station*

This recent project involved enhancing accessibility, creating a stronger visual identity within a growing neighbourhood and increasing flexibility to accommodate future track expansions and electrification.

By Chris Voit

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**Next issue:**  
Energy-efficient  
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## on topic

### LEGAL

In the wake of *Chandos Construction Ltd v Deloitte Restructuring Inc*, Charles W. Bois, Rachel Haack and Kayla Romanow of Miller Thomson discuss how to draft construction contracts to avoid the anti-deprivation rule.

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## Better buildings

The Better Buildings Podcast, in case you haven't run across it yet, is *Canadian Consulting Engineer's* first-ever venture into podcasting. I hope you'll give it a listen. Dubbed 'Canada's conversation about opportunities for improvement in the built environment,' it's a monthly series of audio interviews that sets out to address a wide variety of topics and subtopics, one at a time.

By way of example, we started the series in November with our pilot episode, 'Commissioning for the Building Envelope,' for which I spoke with David Heska, director of Southwestern Ontario building sciences for WSP Canada. We discussed why building commissioning (Cx) services are becoming increasingly popular for both new projects and retrofits of existing facilities and what that could mean for today's consulting engineers in terms of adding value to their services.

In December, shortly before the holidays, we released our second episode, 'Damping Systems for High-rise Buildings.' I interviewed Trevor Haskett, senior technical director of RWDI's Motioneering business, about how these systems can work to reduce the vibration effects of wind and pedestrian excitation and, again, provide a 'value add' for owners and tenants.

In January, our third episode focused on 'Resilient Buildings for Climate Change.' I spoke with Andrée Iffrig, sustainability strategist for Dialog, about how building guidelines and codes are catching up with the need for greater resiliency and what this will mean for Canada's consulting engineers in the future.

If you haven't listened to these initial episodes yet, please note you can still access them online at [www.canadianconsultingengineer.com/podcasts](http://www.canadianconsultingengineer.com/podcasts). And by the time you read this, we should be well on our way to developing the fourth and fifth episodes.

The podcast's horizons are wide open, as we embrace this new way to hear from and share a diversity of voices across—and adjacent to—Canada's consulting engineering sector, discussing any and all of the various tools, technologies and techniques, large and small, that can make for better buildings.

While we do already have a 'wish list' of subjects we hope to tackle in the coming months, I should emphasize we are equally open to your input. When you hear the phrase, 'better buildings,' what comes to mind for you? As a professional engineer yourself, what have you been doing to enhance your building projects within the Canadian market? Would you like to share those stories with us and our audience?

If so, please don't hesitate to reach out directly to me, as we would greatly appreciate your involvement. My email address is listed below.

Peter Saunders  
[psaunders@ccemag.com](mailto:psaunders@ccemag.com)



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### CANADIAN CONSULTING ENGINEER

is published 6 times per year  
by Annex Business Media

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Toronto, ON M2H 3R1  
Tel: (416) 442-5600

Fax: (416) 510-6875 or (416) 442-2191

**EDITORIAL PURPOSE:** *Canadian Consulting Engineer* magazine covers innovative engineering projects, news and business information for professional engineers engaged in private consulting practice. The editors assume no liability for the accuracy of the text or its fitness for any particular purpose.

**SUBSCRIPTIONS:** Canada, 1 year \$66.00, 2 years \$106.00. Single copy \$8.50 Cdn + taxes. (HST 86717 2652 RT0001). United States \$150.00 (CAD). Foreign \$172.00 (CAD).

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**ISSN: 0712-4996 (print), ISSN: 1923-3337 (digital)**

**POSTAL INFORMATION:** Publications Mail Agreement No. 40065710. Return undeliverable Canadian addresses to Circulation Dept., Canadian Consulting Engineer, 111 Gordon Baker Road, Suite 400, Toronto, ON M2H 3R1.

**PRIVACY:** From time to time we make our subscription list available to select companies and organizations whose product or service may interest you. If you do not wish your contact information to be made available, please contact us. Tel: 1-800-668-2374, fax: 416-510-6875 or 416-442-2191, e-mail: [vmoore@annexbusinessmedia.com](mailto:vmoore@annexbusinessmedia.com), mail to: Privacy Officer, 111 Gordon Baker Road, Suite 400, Toronto, ON M2H 3R1.

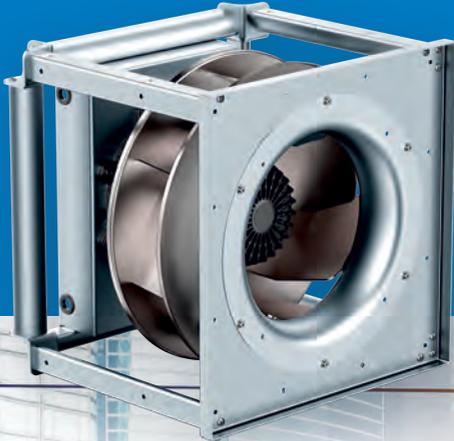
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ebm-papst develops fans that help deliver clean air in commercial and industrial air-conditioning and ventilation systems. Our high efficiency EC solutions optimize airflow and help maintain high air quality, all while keeping operating costs at a minimum. Whether in new construction or retrofits, these fans will help you breathe easier.

For more information, please contact: [sales@us.ebmpapst.com](mailto:sales@us.ebmpapst.com)



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## ebmpapst

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### High-pressure fans

There are many situations in which fans have to work at high pressure, including complex air distribution networks or air ducts that have to fit in tight false ceilings and naturally need to have small cross sections. This is also the case for air handling units (AHUs) for hospitals that, in addition to the complex air ducting, have HEPA filtration to maintain their required air quality levels. Steam and droplet separators with many pipe bends cause high pressure losses and call for corresponding performance from the fans used in them.

### Expanded portfolio

ebm-papst has expanded its product portfolio, now supplying reliable centrifugal fans with proven EC external rotor design for applications that have to overcome high pressures to achieve optimum air flow. Impeller sizes 630, 560, 400 and 355 are available now.



Photo courtesy CCPPP

**CCPPP presents 2020 P3 Awards**

In November, the Canadian Council for Public-Private Partnerships (CCPPP) presented the 2020 National Awards for Innovation and Excellence in Public-Private Partnerships (P3s) in a virtual ceremony to five infrastructure projects across the country:

**Service Delivery Gold Award:  
Ion LRT, Stage 1**

This 19-km light-rail transit (LRT) system (pictured) opened in 2019 in Kitchener and Waterloo, Ont. After more than a year of service, the GrandLinq consortium behind the project—which includes consulting engineering firm AECOM—continues to improve the system’s monthly operating performance, beating the targets in its contract with the Regional Municipality of Waterloo.

**Infrastructure Gold Award:  
Regina Bypass**

Opened in 2019, the Regina Bypass is the largest transportation infrastructure project in Saskatchewan’s history—and its single largest job creator. The \$1.88-billion project was a P3 between the provincial ministry of highways and infrastructure, SaskBuilds and Regina Bypass Partners, a consortium comprising Graham Construction, Parsons Canada, Carmacks Enterprises and Vinci Canada. The project’s 12 interchanges, 60 km of four-lane highway, 55 km of new service roads, Highway 6 twinning and (first for the province) roundabouts have already resulted in a marked reduction in collisions.

**Project Development Gold Award:  
ESAP/ESM Project**

The \$1.8-billion Energy Services Acquisition Program (ESAP) and Energy Service Modernization (ESM) initiative represents a Public Works and Government Services Canada (PWGSC) P3 with Innovate Energy (comprising Engie Services Canada, PCL Constructors Canada, PCL Investments Canada and Black & McDonald). Set to reach substantial completion in 2025, the project will modernize five energy plant locations that heat and cool 80-plus buildings in Ottawa, including Parliament, to reduce operating costs, energy consumption and emissions. There is potential to expand this system to other buildings in the Capital Region.

**Project Delivery Silver Award (tie):  
Corner Brook Acute Care Hospital**

A new 164-bed regional hospital is the largest capital project ever planned in Newfoundland and Labrador. The P3 model involves the provincial government, the Western Regional Health Authority and the Corner Brook Health Partnership, comprising Plenary Group, PCL Constructors Canada, Marco Services and Johnson Controls Canada.

**Project Development Silver Award (tie): Highway 104 Sutherlands River to Antigonish Twinning**

The twinning of this stretch of roadway, from Antigonish, N.S., to the boundary with New Brunswick, is the first highway P3 project in Nova Scotia in more than 20 years. As it reached financial close this spring in the midst of the pandemic, considerable flexibility and co-operation were needed from bank lenders, bond underwriters and purchasers, which ensured no negative impact on overall project duration. The province’s department of transportation and infrastructure renewal is working with Dexter Nova Alliance (DNA), comprising Dexter Construction, Nova Construction, BBG and Municipal Enterprises.

**PEOPLE**

**SNC-Lavalin**

SNC-Lavalin promoted **Dale Clarke** from EVP to president of infrastructure services. He reports to president/CEO Ian



Dale Clarke

L. Edwards and is responsible for growing the firm’s infrastructure operation and maintenance (O&M), power, grid, industrial, construction and project management businesses.

**Smith + Andersen**

Smith + Andersen promoted Toronto-based **Peter Kastelic**, P.Eng., to senior associate and Toronto-based **Edmund Ho**, P.Eng., and Ottawa-based **Adrienne Mitani**, P.Eng., to associates. All three are certified by the Canada Green Building Council (CaGBC) as Leadership in Energy and Environmental Design (LEED) Green Associates.

**HDR**

HDR promoted **Erin Slayton**, P.E., to transportation program management director and appointed **Ben Pierce**



Erin Slayton

director of its new mobility and operational technology services initiative, which helps clients with connected and automated vehicles, transportation system management, tolling, zero-emission/electrified transportation and other technology integration solutions.



Ben Pierce



CHAIR'S MESSAGE

## Moving ACEC's strategic priorities forward



As we reflect on an unprecedented year and all that we have accomplished in its wake, we now look ahead to the role that ACEC, our members and our industry will play in the ongoing COVID-19 response and recovery phase. To ensure our industry is best positioned to aid in these efforts, we will

continue to support our members into the 'next normal' that lies ahead.

I am honoured to lead this effort as the Chair of the ACEC Board of Directors for the 2020-2021 term and look forward to steering us into the new year as we continue to implement our strategic plan. ACEC's mission is to promote a business environment that recognizes and rewards our members' expertise and their contributions to society. To fulfil this mission, our strategic plan focuses on four priorities: *advocating for members; profile building; providing value to members; and increasing diversity.*

ACEC works diligently at *advocating for members* to achieve a more favourable public policy and business climate for consulting engineering companies. We do this by influencing the federal government and collaborating with national stakeholders on a host of issues to help ensure that Canada remains competitive and prosperous. As we continue to monitor and respond to the federal government on industry issues impacting the sector, we will update our members on important government policies and programs.

I encourage you to support our advocacy efforts by participating in the Parliamentary Partners program. This initiative leverages local connections through meetings between members and their Members of Parliament. With the program now offered in a virtual format, it is even easier to participate.

Increasing the stature and influence of our member firms by showcasing the impact of their contributions to Canada's social, economic and environmental quality of life is an essential aspect of our *profile building* priority. The Canadian Consulting Engineering Awards, which showcase the year's best projects by member firms, make ACEC one of the highest profile industry associations in Canada. These achievements are showcased through the media with features in *Canadian Consulting Engineer* and press releases we develop, along with our month-long #20DaysOfExcellence in Engineering social media campaign

showcasing a different award-winning project each day. We look forward to celebrating these achievements virtually in 2021.

Creating opportunities for our members to develop, participate in and utilize programs and services to support their business needs is the pillar of our *providing value to members* priority. Along with keeping members informed of industry trends, offering knowledge opportunities and providing helpful standard contracts and agreements, we work directly with members, soliciting their input and supporting them on industry issues. We will continue to work with the Provincial and Territorial Member Organizations to deliver these opportunities to our members in the coming year.

ACEC expanded its strategic priorities to include *increasing diversity* and has committed itself to concrete action toward diversity and inclusion of gender, backgrounds, perspectives and expertise within the association's leadership. Our goal is to also promote the need for and the benefits of diversity and inclusion in decision-making throughout the consulting engineering sector. To date, ACEC has amended its bylaws and board policy to ensure up-to-date and inclusive language that removes institutional barriers to increasing diversity. When considering candidates for the board and executive committees, the mandate of the nominating committee expressly makes diversity an objective throughout the process. ACEC is also endorsing '30 by 30,' an Engineers Canada initiative with the goal of raising the percentage of newly licensed engineers who are women to 30% by the year 2030. An ACEC Board member and the Chair of the ACEC Young Professionals Network represents ACEC as its '30 by 30' Champion.

During my time serving on the ACEC Board, I have witnessed the progress we have made over the years pertaining to the above noted priorities. Outlined in the next few pages are the accomplishments of the ACEC staff under the guidance of our dedicated Board of Directors over the last year. Based on the work of ACEC's dedicated team in service of our members and in support of our industry during this time, I know that we are well positioned to face future challenges. The Board and I are confident that ACEC is prepared for the year ahead and we are very optimistic for the long-term success and contributions of our members for the benefit of the communities we serve together.

ANTHONY KARAKATSANIS, P.ENG.  
CHAIR, BOARD OF DIRECTORS, ACEC-CANADA



# YEAR IN REVIEW

## A LOOK BACK ON 2020

**W**hen speaking of 2020, it is impossible not to consider the impact of COVID-19 on our industry, our communities and all of Canada. This retrospective offers a snapshot of the advocacy activities that shaped ACEC's response and its efforts to support the consulting engineering industry through the crisis.

### March 2020

As the country went into lockdown, ACEC quickly recognized the need for action. Outreach was made to the federal government and stakeholder partners to discuss possible policy responses to assist businesses to ensure both their immediate and long-term survival. ACEC also had specific discussions with Infrastructure Canada to share the main messages being made to the government in the initial weeks of the crisis. These included:

- that planning, design, construction and operation of important infrastructure are essential services nationwide.
- that infrastructure in general and the consulting engineering sector in particular are critical to Canada's resilience to and recovery from crisis.
- that our industry has significant capacity to work remotely to ensure the health and safety of employees and adherence to the government's social distancing requirements.
- that designing will need to start six months to two years before there are shovels in the ground should the government decide to drive stimulus through infrastructure.
- that the federal government should continue implementing its infrastructure plans and encourage provinces and municipalities to stay the course on infrastructure.

During these discussions, ACEC also suggested that in the longer term, to facilitate the recovery, accelerating/re-profiling some of the infrastructure investments from the later years of the program into the next two or three years could result in a more even distribution of investments over the remainder of the program.

As well as its own outreach, ACEC collaborated closely with the Canadian Chamber of Commerce and over 60 other business associations that make up the Canadian Business Reliance Network, participating in a joint statement of support for national efforts to protect jobs. While ACEC was pleased that many of these recommendations were addressed in the economic relief programs announced by the end of March and into April, there were

concerns over the eligibility periods of the Canada Emergency Wage Subsidy (CEWS) program. In response, ACEC corresponded with the Minister of Finance and the Minister of Small Business to outline specific recommendations to address these concerns.

### April 2020

ACEC communicated with the Minister of Infrastructure and Communities to extend our assistance and stress the important role and expertise our industry could play in assisting the government with its economic recovery plan. The letter also raised many of the recommendations made to Minister Morneau and Minister Ng regarding the eligibility periods of the CEWS.

### May 2020

ACEC was invited to participate in the Construction Industry Roundtable convened by the federal government. This gathering of stakeholders was one of the key requests ACEC made to the Minister of Infrastructure and Communities in its April outreach. It brought together stakeholder groups in the infrastructure and construction industry, as well as various labour and construction organizations. Elected officials, political staff and senior civil servants from Public Services and Procurement Canada (PSPC), Infrastructure Canada and Employment and Social Development Canada (ESDC) also participated.

The meeting allowed for open discussion and dialogue on potential ways forward for the construction industry during and after the COVID-19 crisis. It also allowed supporting industry organizations to provide clarity and certainty on how sectors like ours are ready and able to support major infrastructure projects. ACEC President & CEO John Gamble and Vice President Martine Proulx stressed that the effectiveness of infrastructure investments depends on a robust and sustained project pipeline, thus allowing all project partners - owners, designers and constructors, labour and supply chains - to retain expertise and capacity and allocate their resources effectively.

This was an opportunity for ACEC to further establish itself as an important stakeholder to the government. The Parliamentary Secretaries were very receptive to the points raised by industry participants and welcomed the opportunity for further dialogue in the near future through



ongoing meetings and discussions. ACEC is pleased to have been at the table at the subsequent meetings, as this will be an important forum to ensure the voice of the industry is heard and considered.

### **June 2020**

Throughout the month of June, ACEC continued to communicate with leadership within the federal government and with key stakeholder partners. ACEC joined with other leaders of the Canadian construction industry in support of temporary sick pay coverage during the COVID-19 pandemic within a letter to the Prime Minister. In a joint letter with the Canadian Construction Association (CCA) and the Canadian Council for Public-Private Partnerships (CCPPP) to the Prime Minister, ACEC also reiterated the need for economic stimulus and the importance of moving infrastructure projects forward during and beyond the crisis. ACEC also took part in a public consultation on the CEWS to help inform potential changes to the program to maximize employment and meet the needs of both employers and employees.

### **July and August 2020**

ACEC invited Andy Fillmore, MP and Parliamentary Secretary to the Minister of Infrastructure and Communities, to an exclusive digital townhall with the ACEC board and CEOs of several member firms. This hour-long interactive discussion explored how the consulting engineering sector could help navigate the COVID-19 crisis and contribute to Canada's economic recovery.

To strengthen and amplify our advocacy initiatives, ACEC continued to participate in targeted coalition-building and push for more comprehensive economic recovery measures. With some of its stakeholder partners, ACEC looked to harmonize industry efforts through the Building For Recovery coalition, which seeks to stabilize Canada's construction sector, invest in Canadian infrastructure over the long-term and create inclusive training and employment. The group collaborated through the summer and into early fall to create a grassroots advocacy plan around three core pillars: resources for communities, jobs for workers and improving quality of life.

As part of direct efforts to shape policy, ACEC submitted its 2021 Federal Budget Recommendations to the fed-

eral government to spur economic recovery and growth. In particular, ACEC's submission highlighted the need for investments that enable: economic prosperity and a stable recovery; procurement best practices to achieve quality and innovation; the reinstatement of the National Guide to Sustainable Municipal Infrastructure; the harmonization of federal and provincial approvals; and the implementation of a national corridor to accommodate multiple infrastructure assets.

### **September 2020**

The September 23 Speech from the Throne focused largely on the protection and restoration of the physical, societal and economic health of Canadians. To continue promoting the importance of infrastructure investments being timely and balanced between "social" and "economic" infrastructure, ACEC conducted targeted advocacy outreach to moderate, "pro-business" Liberal Members of Parliament (MPs). The meetings generated positive response and ACEC continued to meet with key stakeholders within the Liberal caucus to ensure its key messages continued to permeate the government's economic response.

### **October 2020**

For its October virtual annual general meeting, ACEC hosted the Honourable Catherine McKenna, Minister of Infrastructure and Communities. This was an opportunity to continue to build on the strong relationship developed with the Minister and her office. During her address and subsequent Q&A, Minister McKenna shared the government's vision and plans for infrastructure investment moving forward.

As a direct component of our government relations strategy, the ACEC Parliamentary Partners program was relaunched. While ACEC's direct advocacy efforts have strengthened its position with the MPs, meaningful connections at the local level are critical to further grow political power. As COVID-19 has forced many Parliamentarians to place an even higher priority on the concerns of businesses in their local communities, this is the right move to enhance our grassroots advocacy during this tumultuous time.

ACEC's Parliamentary Partners program directly engages members in ACEC's advocacy efforts to demonstrate the effects of government decisions on projects in com-

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**Association of Consulting Engineering Companies – Canada (ACEC-Canada), Tel: (613) 236-0569, [info@acec.ca](mailto:info@acec.ca), [www.acec.ca](http://www.acec.ca). ACEC Member Organizations: Association of Consulting Engineering Companies – British Columbia, Association of Consulting Engineering Companies – Yukon, Consulting Engineers of Alberta, Association of Consulting Engineering Companies – Northwest Territories, Association of Consulting Engineering Companies – Saskatchewan, Association of Consulting Engineering Companies – Manitoba, Association of Consulting Engineering Companies – Ontario, Association des firmes de génie-conseil – Québec, Association of Consulting Engineering Companies – New Brunswick, Consulting Engineers of Nova Scotia, Association of Consulting Engineering Companies – Prince Edward Island, Association of Consulting Engineering Companies – Newfoundland & Labrador.**



munities from coast-to-coast-to-coast. Unlike our Parliament Hill Day, where participants need to be in Ottawa, the program allows the association to leverage ACEC members' local connections in their ridings and communities. Through engaging them in advocacy on an ongoing basis, ACEC creates a pool of experienced "citizen lobbyists" on behalf of the industry. We have connected with dozens of our members to ask for their industry expertise and their participation in this important program. We received positive responses and scheduled several meetings for end of November and beginning of December.

#### November 2020

The Minister of Finance tabled the long-awaited Fall Economic Statement in the House of Commons, which provided a comprehensive

overview of Canada's fiscal position and presented new details on COVID-related relief measures. It also reaffirmed the government's commitment from the Speech from the Throne to continue supporting the economy and the hardest-hit businesses through this crisis. Minister Freeland indicated her government would pursue these activities while laying the groundwork for the post-pandemic stimulus and their long-term priorities, such as pharmacare, national affordable child care and addressing climate change.

ACEC was encouraged that the federal government is developing a plan to help Canada build back better through the investment up to \$100 billion in stimulus over the next three fiscal years. While it is anticipated that infrastructure investments will continue to be a significant element of the

proposed stimulus plan, few details were released with the statement. However, the government is expected to prioritize investments that support a green and sustainable economy and that result in demonstrable benefits to communities. While ACEC supports such investments, we will continue to encourage the government to also make investments that will rebuild and grow the economy so that its recovery plan is financially viable. ACEC is also looking forward to details on the government's role in continuing to help municipalities invest in traditional, core infrastructure and close the infrastructure deficit.

#### December 2020

ACEC has previously made its priorities for the economic recovery known to the federal government directly to the Prime Minister and his cabinet, as well as through consultations for the 2021 federal budget. ACEC continued its efforts to have its key messages recognized and implemented in the stimulus program announced in the government's economic statement by reaching out to the Clerk of the Finance Committee to request an opportunity to appear before the Committee on behalf of our industry. In light of the hundreds of requests the clerk received, outreach was also conducted with individual Committee members, requesting individual meetings with each.

#### Looking Ahead

In the coming weeks and months, ACEC will continue educating Ministers, Parliamentarians and senior bureaucrats on the important role infrastructure plays in driving the economy and improving the environmental and social quality of life of Canadians. ACEC looks forward to working with the federal government on following through on its commitments and to help ensure that its programs are efficient and effective.

## Digital agility: A new way for engineering firms to get ahead



By Rhys Morgan, Partner, RSM Canada | [rsmcanada.com](http://rsmcanada.com)

**D**igital agility is critical to establishing and maintaining a competitive advantage. By strategically using technologies to complement their workforces, companies can enhance revenue growth and productivity across five areas:

**Business operations.** Automated reporting, project management and resource allocation tools free employees to perform more value-added tasks.

**Employee enablement.** Employees want an innovative environment that provides tools to support business improvement and training. That also means embracing the ability to work from anywhere and using technology to facilitate it.

**Client engagement.** Clients are demanding enhanced service offerings, project transparency, collaboration and timely information.

**Stable and secure technology.** Networked systems, often providing client access, must be easy to use but also secure.

**Data analytics.** Information tools are rich sources of insights to identify opportunities and help resolve problem areas sooner.

Digital agility calls not just for investing in new technology, but also embedding technology into the business' strategy for responding to change.

# CALL FOR ENTRIES

## CANADA'S MOST PRESTIGIOUS AWARDS FOR ENGINEERING PROJECTS

The Canadian Consulting Engineering Awards / Prix Canadiens du Génie-Conseil are given annually to projects that demonstrate a high quality of engineering, imagination and innovation.

Now in their 53<sup>rd</sup> year, the awards are the most prestigious mark of recognition for consulting engineers in Canada.

This is a joint program of the Association of Consulting Engineering Companies – Canada (ACEC), l'Association des firmes de génie-conseil – Canada (AFGC) and *Canadian Consulting Engineer* magazine.

The awards are an unequalled opportunity to gain recognition for your firm and your employees. The list of winners is publicized nationwide, the projects are published in the September/October issue of *Canadian Consulting Engineer* magazine and ACEC's award-winning #20DaysOfExcellence campaign provides additional visibility.

The awards are presented in October.

**Entries are invited in English or French.**

### FOR MORE DETAILS

See "Information & Entry Forms" at  
[www.canadianconsultingengineer.com](http://www.canadianconsultingengineer.com)

## CATEGORIES

### TECHNICAL

**A.** Buildings **B.** Transportation **C.** Water Resources  
**D.** Environmental Remediation **E.** Natural Resources,  
Mining, Industry, Energy **F.** Special Projects

### NON-TECHNICAL

**G.** Project Management **H.** International **I.** Community  
Outreach & In-House Initiatives

## 20 AWARDS & FIVE SPECIAL AWARDS!

Twenty Awards of Excellence will be designated by the jury. Of these projects, up to five could also earn additional recognition with a Special Award.

The Special Awards are:

- Schreyer Award (Prix Schreyer). This is the highest honour and is presented annually to the best technical entry.
- Tree for Life Award (Prix Un Arbre à Aimer). The award is given annually to a project that demonstrates outstanding environmental stewardship.
- Ambassador Award (Prix Ambassadeur). Presented to a project constructed or executed outside Canada that best showcases Canadian engineering expertise.
- Engineering a Better Canada Award (Prix de l'ingénierie pour un Canada meilleur). Presented to a project that best showcases how engineering enhances the social, economic or cultural quality of life of Canadians.
- Outreach Award (Prix Rayonnement). Presented for a company's role in donating their time and/or services for the benefit of a community or group either in Canada or on the international stage.

## DEADLINES

### STAGE 1 – TUESDAY, MARCH 16

Notice of Intention to Enter

Entry Fee \$375.00 + HST due (non-refundable)

### STAGE 2 – WEDNESDAY, APRIL 14



## QUESTIONS?

Contact Peter Saunders, Editor, Canadian Consulting Engineer,  
tel. 416-510-5119, e-mail [psaunders@ccemag.com](mailto:psaunders@ccemag.com)

# Screening Wastewater for COVID-19

New research across Canada can yield helpful results.

By Peter Saunders

Among the many challenges of the global COVID-19 pandemic has been tracing the paths of its spread. People can catch the disease—and unwittingly pass it on to those around them—weeks before they notice the symptoms. And those symptoms can vary widely from person to person, such that many of the infected may never even know they are infected, while others suffer terribly.

As such, community spread has proven a significant threat. That raises the question: can entire communities—rather than individuals—be tested for the presence of the novel coronavirus?

One increasingly positive answer to this question, as it turns out, has involved screening wastewater.

## A cross-Canada effort

In New Brunswick, for example, Fredericton-based biotech company LuminUltra announced in October it had filed a patent for “the first complete, rapid and on-site COVID-19 wastewater testing solution,” with the aim of making non-invasive assessments of community health more accessible in Canada and around the world.

In Ontario, by early November, the provincial government was investing \$12 million in wastewater testing to



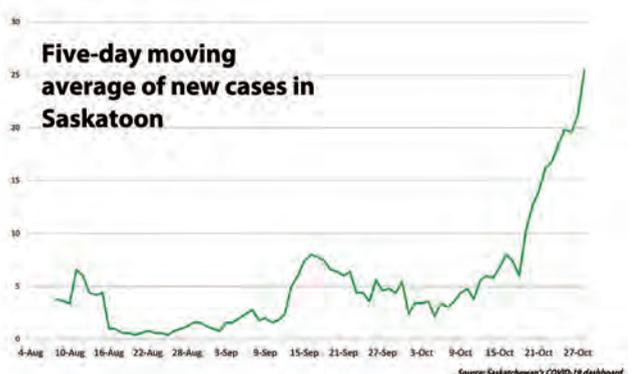
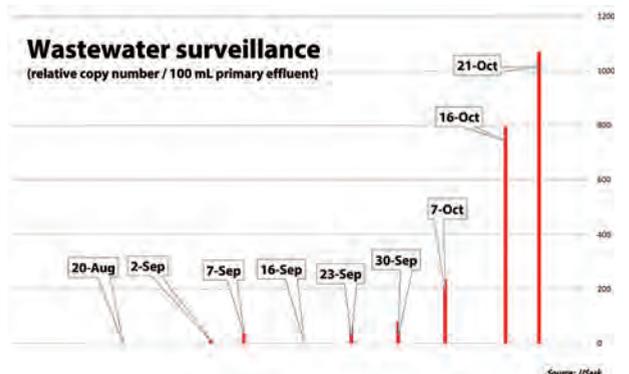
support early detection and identification of COVID-19 outbreaks, following up on the Oshawa-based University of Ontario Institute of Technology’s (Ontario Tech University’s) involvement in the testing of samples of untreated sewage from water pollution control plants. Among the contributors to that project was Markham-based consulting firm Cole Engineering Group.

In Saskatchewan, too, researchers at Saskatoon’s University of Saskatchewan (USask) worked with the municipal government and the Saskatchewan Health Authority (SHA) to develop an early warning system by sampling and testing the city’s wastewater for the SARS-CoV-2 virus.

And in Nova Scotia, in an example of how such efforts can yield direct results, a rapid COVID-19 testing clinic popped up in Wolfville in late November after researcher working with LuminUltra had found traces of the virus in local wastewater.

## Simplifying the process

LuminUltra’s patent application followed collaborative research with Nova Scotia’s Dalhousie University and Hali-



In Saskatoon, wastewater testing predicted increases in daily case counts.

Top photo: Creative Wonder / stock.adobe.com  
Inset photo courtesy Ontario Tech University

fax Water. Scientists assessed samples to help refine and improve their processes. Through this work, they developed an RNA extraction and concentration process that eliminated the need for additional, complicated equipment. This greatly simplified the process from sample collection to accurate and consistent results.

“The idea of wastewater surveillance testing has been advocated by researchers around the world since the onset of the COVID-19 pandemic,” explains Pat Whalen, president and CEO of LuminUltra. “Until now, it has been complicated, expensive and time-consuming, meaning the potentially life-saving technique was reserved for niche subgroups under the watchful eye of researchers. We have been determined to make this surveillance tool more accessible to communities everywhere.”

Much as in-person testing has been accelerated, so too has wastewater testing. LuminUltra’s system reportedly examines multiple samples on-site within 90 minutes, compared to other scenarios around the world where mailed-in samples take days or weeks of specialized laboratory expertise to analyze.

As the company points out—and has been borne out by stubbornly high daily case numbers—North America simply does not have the capacity or resources to control the spread of COVID-19 through clinical testing alone. Testing surfaces, air and water is more efficient than testing individuals and, as per the example of Wolfville, can help pinpoint where further resources should be directed to test individuals.

### A look into the future

The presence of the SARS-CoV-2 pathogen can be detected in waste from infected individuals, including those who are asymptomatic or pre-symptomatic. The goal, as Ontario Tech University puts it, is to find ‘hot spots’ as early as possible, providing warning in advance of locals showing symptoms, for the purpose of addressing and even preventing

outbreaks. USask found changes to the total amount of virus circulating in Saskatoon’s wastewater occurred about one week ahead of changes indicated by case counts at the city’s COVID testing centres.

“Wastewater testing has been shown to lead to early identification of the virus before it is known in a

clinical context,” says Dr. Amina Stoddart at Dalhousie. “Public health leaders around the world have validated it is a powerful tool in the fight against the pandemic.”

“We can also predict when outbreaks are declining, which will help planning for pandemic recovery,” says USask ecotoxicologist John Giesy. **CCE**

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# Redeveloping Toronto's GUILDWOOD GO Station

A busy train station catches up with present and future needs.

By Chris Voit

Guildwood GO Station, established in 1977, served a few thousand rail passengers annually before the growth of its surrounding neighbourhoods and of local GO commuter travel. Amid the area's development and population growth, service demand expanded until the station was serving nearly 250,000 passengers a year, which led to a need for redevelopment.

Completed in 2019, the Toronto project involved enhancing accessibility, creating a stronger visual identity and increasing flexibility to accommodate future track expansions and electrification. Working with Kenaidan Contracting, WSP provided tunnel design, installation methods and sustainable features to target LEED Silver certification while meeting the needs of the owner, Metrolinx.

## Installing tunnels

The existing tunnels at the station were dark, narrow, leaky and not fully compliant with the requirements of the *Accessibility for Ontarians with Disabilities Act* (AODA). The project involved establishing two new, accessible tunnels to enhance safety and visibility.



Precast tunnel segments were assembled outside the rail corridor prior to installation.

As the Lakeshore East corridor's rail lines through the station remained live throughout the redevelopment, constructing the tunnels involved the installation of 330 temporary caissons (chambers), requiring nearly 300 m of temporary shoring, during evenings and weekends to avoid service interruptions. Once the shoring was complete, concrete tunnels were installed during two 53-hour periods over two weekends, when train traffic was shut down on two of the three rail lines.

WSP proposed various installation methods to Metrolinx, including jack and slide, open cut with rail trestle support system and open cut crane and assembly. While Metrolinx had previously used the crane and assembly in an open cut trench, reviewing the options led to an agreement to use jack and slide, given the site conditions.

Thus, precast tunnels were preassembled outside the rail corridor and pushed into place using the jack and slide method—a first for Metrolinx and, since then, successfully implemented for other projects.

This methodology provided a number of advantages. First, it allowed the tunnel segments to be assembled and post-tensioned together prior to the 53-hour weekend shutdown, thus reducing the activities that needed to happen within that window. Second, waterproofing was also pre-installed, again reducing activities during the weekend shutdown. Lastly, it avoided the need for a large crane on an already congested site to hoist the precast segments into place.

Once the construction of the precast tunnel sections was completed after the two weekends, the tracks were fully reinstated to all commuter, intercity passenger and freight traffic, allowing regular operations to proceed.

The tunnels also provide a clear opening to the roof of the platform canopy at stairways and elevators, allowing significantly more natural light in than at any other Metrolinx station. This provides the feeling of very short tunnels, rather than one long 'solid box' tunnel with access



The project involved establishing new, accessible tunnels to enhance safety and visibility.

to platforms branching off. Additionally, the redeveloped Guildwood GO Station features Metrolinx's first green roofs over the tunnel entrance structures, the utility building and the station building lower roof.

### Design challenges

The greatest complexities included designing for train loads and ensuring the station could remain fully operational throughout construction. The existing train right of way is elevated over the north and south parking lot. To design and provision for a future fourth rail, while minimizing parking losses, large retaining structures were required.

On the north side of the tracks, a 4.5-m tall retaining wall was designed to accommodate the train loading and more than 40 parking spaces. In the middle section of the north side, a cast-in-place utility building was constructed that also functioned as a retaining structure. And on the west end of the north side, the station building was built into the berm, with rooms below the berm serving as washrooms and utility spaces, while also retaining future train loads from the fourth track.

Elaborate staging was essential in ensuring the all of the station's platforms could remain operational throughout construction, as did the old station building until the new, much larger one was commissioned. In the end, only about 3% of the parking spaces were lost.



The project marked Metrolinx's first use of the jack and slide method for tunnel installation.

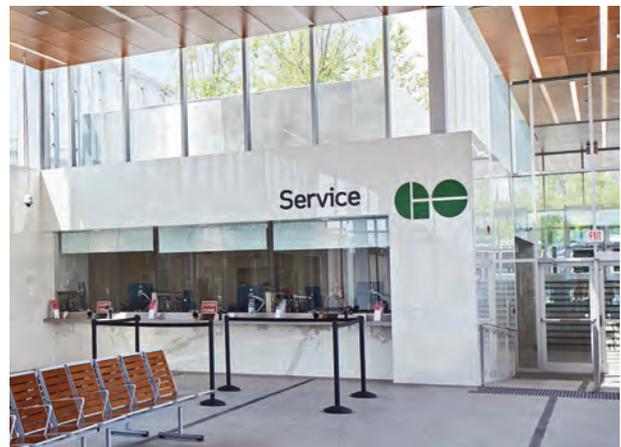
### Environmental measures

The station is going through certification for LEED Silver certification, based in part on the following aspects:

#### Improved water quality

Previously, any rain runoff from the station was funneled into the local storm system, with no quality or quantity control. Two major elements were added to assist with these issues.

On the platform, nearly full-length canopies capture rainwater and convey it to a storm detention system, preventing it from landing in the right of way and washing down to the parking lots, where it could pick up contaminants. Oil grit separators (OGSs) partially pretreat the water as it flows off-site at a sustainable rate. The setup provides a large area for the water to infiltrate the ground, recharging the local aquifer.



The redeveloped station also features Metrolinx's first green roofs, as visible above the service counter.

#### Reduced energy consumption

Another first for Metrolinx is the use of stainless steel boilers for snow melt systems on the platforms. Previously, cast steel boilers were used, which are far more energy-intensive. The new boilers can also fluctuate the number of burners needed, helping to reduce energy consumption further.

#### Removal of lead paint and toxins

The old station building's waiting area for passengers contained lead paint and other toxins. It was demolished for the redevelopment. The new station building is bright, with a large, temperature-conditioned waiting area.

### Economic benefits

The previous station and grounds were run down. With the redevelopment has come new interest in the area. Two condominium developments have begun site plan approval and design; one on the northeast corner of the property, the other just across Kingston Road. The updated station will continue to help spur development in the neighbourhood.

CCE

Chris Voit is a director with WSP Canada.



Land surveyor Willis Chipman founded his private practice in 1881.

# A Long Legacy of **ENGINEERING**

Full-service engineering comes full circle  
in Brockville, Ont.

By Charles Melchers

The recently announced merger of IN Engineering with Collett Surveying marks a return of full-service engineering services to Brockville, Ont., and the surrounding area. The combined firm now operates as IN Engineering + Surveying.

Founded in 2018 by Andrew F. Melchers, P.Eng., IN is one of the newest engineering firms in the area. By contrast, Collett Surveying, purchased by Brent Collett in 1996, is one of the oldest continuously run survey-

ing operations in the region, tracing its origins back to 1881, when it was founded by land surveyor Willis Chipman, a professional engineer who left his mark on the history of Canada across a storied career.

Chipman would later sell his practice to Lieutenant Colonel Bryce J. Saunders, who would go on to partner with Thomas Henry Wiggins, each making contributions to the history of Canada in their own rights.

Canada at the turn of the 20<sup>th</sup>

century would have been an exciting place for a surveyor or contracting engineer, as new provincial governments were being formed under the auspices of joining Confederation and the federal government of Sir Wilfred Laurier was implementing an ambitious immigration agenda to settle the west.

To suggest the landscape was changing rapidly is an understatement. Surveyors and engineers were plotting and building the future of the country. The following information is largely drawn from the records of the Association of Ontario Land Surveyors (AOLS).

## **Willis Chipman (1855-1929)**

Born near present-day Elgin, Ont., Chipman completed public school in Athens, Ont., before moving to Montreal for high school. He graduated from that city's McGill University in 1876 with first-rank honours in civil and mechanical engineering.

In 1881, Chipman published a paper titled, 'How To Do It: Some Suggestions On House Sanitation,' for Ontario's executive health officers. It was ahead of its time for Canada, describing city planners and engi-

neers working in close collaboration with public health officials, emphasizing wider use of water closets (WCs) and plumbing fixtures and arguing for conditions that would avoid the propagation of epidemics.

That same year, Chipman founded his private practice in Brockville as a land surveyor and civil engineer. He went on to become the town engineer and prepare the plan for Brockville in 1883 and 1884, quickly establishing himself as a leading designer of water and sewer works. In fact, his designs were used to construct sewer works across much of Ontario, including Cornwall, Pembroke, Gananoque, Arnprior, Renfrew and Lindsay.

Chipman was a founding member of AOLS, serving as its first secretary treasurer from 1886 to 1890, vice-president (VP) in 1895 and president in 1896. As his contributions to the association grew, he sold his practice in 1891 and moved to Toronto in 1894. And in 1923, he became president of the Ontario Association of Engineers.

In 2003, Consulting Engineers of Ontario (CEO)—more recently rebranded as the Association of Consulting Engineering Companies – Ontario (ACEC-Ontario)—created the Willis Chipman Award in recognition of his contributions to the field.

Each year, this award celebrates consulting engineering firms' knowledge, skill, expertise and contributions to Ontario's economic, social and environmental well-being.

To further commemorate him, IN's main office building is named after Willis.

### **Bryce J. Saunders (1860 – 1926)**

As mentioned, Chipman sold his practice to Saunders. Born near present-day Lyndhurst, Ont., Saunders qualified as a land surveyor in 1884 and engineer in 1886. Like his predecessor, he became Brockville's town engineer, from 1892 to 1896.

Saunders was a military man. At 10 years old, he was a drummer boy in a small unit that defended Brockville against potential Fenian raids. As an adult, he served with the Dominion Land Surveyors Intelligence Corps, deployed in 1888 during the North West Rebellion. It was the first unit anywhere in the British Empire ever to be designated as an intelligence corps.

Leading up to the First World War, he was Captain of the Canadian Mounted Rifles in Edmonton and promoted to Major in the 19<sup>th</sup> Alberta Dragoons. After volunteering to serve in the First World War, he returned to

Canada in 1919 to retire with the rank of Lieutenant Colonel.

All the while, he had continued his non-military career. In 1897, for example, Ontario's government commissioned him to survey its boundary with Manitoba. He went on to become deputy minister of public works for the Northwest Territories and then relocated his private practice to Edmonton shortly before Alberta joined Confederation.

With his passing in 1926, Saunders' remains were escorted by the Royal Canadian Mounted Police (RCMP) and local militia officers. His funeral was described with the "befitting dignity of a military ceremony."

### **Passing on the practice**

The private practice founded by Chipman and furthered by Saunders was passed along to Thomas Henry Wiggins, who advanced similar principles of home water and sewer systems to continue improving the living conditions of residents in communities across eastern Ontario. From there, the firm operated continuously, offering surveying services.

Following its purchase by Collett in 1996 and the merger in 2020, IN's offices now hold the records of prominent surveyors and their associated registration numbers, including Willis Chipman (181), John Harrison Moore (260), William Verner Taylor (306), Samuel Barber Code (349), Andrew Wellington Gray (549), Raymond Frank Mucklestone (613), Martin Herman Kaldeway (1249) and William Brent Collett (1641).

As IN sets out to establish itself as a leading full-service engineering firm for the area, it can look back on its rich history and be reminded of how earlier surveyors and engineers plotted and built the future of Canada. CCE

*Charles Melcher, brother to IN Engineering founder and president Andrew Melchers, was raised in Lyn, Ont., just outside Brockville, and is a self-professed student of history.*



The Chipman Centre in Brockville pays tribute to Willis, whose descendants reunited in the town in 2018.

# Retrofitting HEALTH-CARE FACILITIES

There are a number of ways to improve performance.

By Peter Saunders

Few buildings were as directly affected in 2020 by the global COVID-19 pandemic as hospitals. Early in the year, health-care professionals scrambled to prepare their facilities to accept waves of patients suffering to wildly varying degrees from a little-understood new disease. They donned personal protective equipment (PPE) and reprioritized triage procedures, while struggling to prevent their workplaces from becoming hubs of outbreaks themselves.

Many of the changes were not new

ideas per se, so much as they were hurriedly transformed from the ideas of pandemic planning into the realities of pandemic response. Moreover, existing trends in the evolution of hospitals accelerated their pace of adoption.

## Digital hospitals

By way of example, business consulting firm Frost & Sullivan suggested COVID-19 sparked a boom in ‘smart’ technologies to enhance patient care and improve staff efficiency and pro-



East Kootenay Regional Hospital is a current example of energy-efficient retrofitting.

ductivity in today’s ‘digital hospitals.’ Care professionals turned to such tools as robotics, remote health monitoring and artificial intelligence (AI) to help address the difficulties of containing the virus and accommodating a massive influx of patients. And given the gains that were seen as a result, the firm predicts the adoption of such technologies will rise further in the next two to three years.

“Digital hospitals address limitations of traditional providers, such as centralized care delivery, closed systems and a reactive approach through decentralized care, interoperable systems and outcome-driven and proactive approaches,” says Neeraj Nitin Jadhav, technical insights senior research analyst for Frost & Sullivan. “To improve patients’ satisfaction levels at every step of care delivery during their stay in the facility, digital hospitals are using technologies like hospital navigation, intelligent imaging platforms, medical robots, remote patient monitoring tools, medication management applications, communication tools, electronic health record (EHR) applications and clinical deci-



Image courtesy Frost & Sullivan



Photo Frost &amp; Sullivan/Johnson Controls

sion support solutions.”

Along with such digital tools come physical changes to the buildings themselves.

“Digital hospital operators need to focus on internal architecture, especially staff workstations and patient rooms that follow evidence-based design (EBD), as these are the areas where clinical decisions are made and care is provided, respectively,” says Jadhav. “Additionally, decentralized health-care staff workstations outside patient rooms can allow staff to be closer to the point of care, rather than a centralized area that increases travel distance.”

Among the technologies Frost & Sullivan says present the strongest prospects for hospitals are the following:

- Patient tracking to manage traffic flow, treatment progress, discharge and other hospital processes.
- EHR system implementation, with corresponding staff training, which can not only improve care, but also address health disparities in the local population.
- AI for supply chain management, using algorithms to process data from various departments to identify trends and provide insights.

## HVAC

Another key factor in preventing the spread of COVID-19 is adequate ventilation, given how many superspreader events in 2020 involved people sharing the same airspace. ASHRAE, for its part, responded to the pandemic with a host of recommendations in this area, including many for the health-care sector.

One was to increase filtration levels where possible, speeding up fans and increasing the frequency of variable-frequency drives (VFDs). In some cases, ASHRAE recommended MERV-13 and MERV-14 filters could be retrofitted to existing systems to better filter particles. And for systems that already have MERV-14 to MERV-16 levels of filtration, recirculation could reduce the contaminant levels similarly to the approach of increasing the percentage of outside air being brought in.

Relative humidity (RH) of 40% to 60% is recommended to reduce infection spread. Such levels are difficult to achieve in a Canadian winter without causing other health problems through increased condensation from outward vapour pressure. There was a window of opportunity before winter,

however, to add more humidifiers.

For the new Jim Pattison Children’s Hospital in Saskatoon (see *Canadian Consulting Engineer*, October/November 2020, page 28), Daniels Wingerak Engineering designed mechanical systems to enable a 100% fresh air ‘pandemic mode,’ using the building automation system (BAS). This feature was of course implemented in early 2020 in response to COVID-19, allowing its design to be tested in a real-world crisis situation.

Such approaches could become more common for new and retrofitted hospitals in the future, given the lessons of 2020. At the same time, however, there will be concerns about their potential to increase energy consumption.

## Energy efficiency

British Columbia’s Interior Health is currently providing an example of how to improve energy efficiency for hospitals. The health authority recently partnered with Johnson Controls to install new infrastructure at East Kootenay Regional Hospital.

The upgrades, which also support the provincial CleanBC plan to expand the ‘clean energy’ industry, include LED lighting, occupancy controls, solar walls, pre-heating remediation, retro-commissioning, building envelope updates, variable air volume (VAV) systems and demand controlled ventilation (DCV). Through an energy performance contract (EPC), the costs of these upgrades are compensated through guaranteed utility and operational savings over a 15-year-plus payback agreement.

“Our experience with EPCs allows us to align our services to Interior Health’s energy-saving mission,” Andrew Nartey, an account executive with Johnson Controls, which will continue to work with the authority and the hospital’s administrators throughout the contract’s term to ensure the reduction targets are met. **CCE**



# Drafting Construction Contracts to Avoid the Anti-deprivation Rule

By Charles W. Bois, Rachel Haack and Kayla Romanow

In *Chandos Construction Ltd v Deloitte Restructuring Inc*, the majority of the Supreme Court of Canada (SCC) reaffirmed the common-law anti-deprivation rule in Canada. This rule voids contractual terms that apply upon a party's insolvency and bankruptcy if the clause removes value from an insolvent person's estate that would otherwise have been available for the insolvent person's creditors. Anyone entering construction contracts should avoid provisions that may trigger the anti-deprivation rule—and need to understand, if they are already in a contract, they may not be enforceable.

Despite the anti-deprivation rule, however, there are contractual provisions that can be used to protect par-

ties if their contracting counterpart becomes insolvent or bankrupt.

## Factual background

Chandos Construction was a general contractor that entered a subcontract with Capital Steel. The subcontract provided in the event of Capital Steel's insolvency or bankruptcy, that company would forfeit 10% of the contract price to Chandos "as a fee for the inconvenience of completing the work using alternate means and/or for monitoring the work during the warranty period."

Capital Steel filed an assignment in bankruptcy prior to completing the subcontract work. Chandos argued it was entitled to rely on the insolvency clause and set-off 10% of the sub-

contract price as a fee. The trustee in bankruptcy for Capital Steel, *i.e.* Deloitte Restructuring, applied to the Alberta Court of Queen's Bench to determine whether or not the insolvency clause was valid.

## Trial and appellate judgments

The court found the insolvency clause was valid because it was not an attempt to avoid the effect of bankruptcy laws. The majority of the Alberta Court of Appeal reversed this decision, however, finding the clause to be invalid, based on the anti-deprivation rule.

The SCC agreed the clause violated the rule and was void. The court articulated a two-part test for invalidating a contractual provision based on the anti-deprivation rule, as follows.

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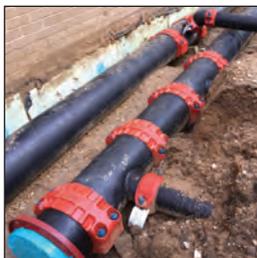


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1. The relevant clause must be triggered by an event of insolvency or bankruptcy.
2. Its effect must be to remove value from the insolvent's estate.

The SCC stated the test for the anti-deprivation rule was effects-based, meaning the ultimate effect of the clause should be examined in assessing the above criteria.

The SCC affirmed set-off is generally allowed during the bankruptcy of a contracting party due to section 97(3) of the *Bankruptcy and Insolvency Act*. Set-off reduces the value of assets that are transferred to the insolvent's estate, but only applies to enforceable debts or claims. Since the anti-deprivation rule voided the insolvency clause, Chandos was unable to apply set-off against Capital Steel for the 10% amount.

### Key takeaways

The decision urges parties entering construction contracts to avoid clauses that are triggered by insolvency or bankruptcy and that remove value from the insolvent party's estate, since these clauses are invalid and unenforceable. Some contractual terms that are prohibited by the anti-deprivation rule include clauses where (a) a party forfeits some or all of the contract price due to their insolvency or bankruptcy or (b) fees, charges or other amounts are payable solely upon insolvency or bankruptcy.

Other terms can be used to pro-

tect a party in the event of insolvency or bankruptcy by their contractual counterpart. Any clause triggered by events other than bankruptcy or insolvency are valid, for example, including penalties that arise upon default of the contract.

Contracting parties can consider using clauses where property is removed from the insolvent party's estate, but no value is eliminated from that estate. The anti-deprivation rule does not apply if a third party's assets are forfeited upon bankruptcy or insolvency, for example, since this term would not reduce the value of the insolvent party's estate.

Additionally, parties may be able to modify their security interests or enter a credit default swap agreement (amending the nature or type of security) upon the insolvency or bankruptcy of their contractual counterpart without offending the anti-deprivation rule, provided these clauses do not increase the amount of security held over the insolvent party.

Parties can also protect themselves in the event of an insolvency or bankruptcy by their contractual counterparts by taking security, acquiring insurance or requiring third-party guarantees when the contract is executed. Before entering a security agreement, they should verify whether or not any creditors already have priority charges against the assets that comprise the security. In the case of guarantees, suitable guarantors may include a parent company, directors or officers of the

contracting party. A guarantee causes the guarantor to become personally liable for the debts or contractual breaches of the subcontractor.

Suppliers and subcontractors can require a labour and materials payment bond at the time of entering a contract. This bond guarantees they are paid for the work and materials they supply, up to a specified amount.

Additionally, parties may require a performance bond, which provides payment up to a specified amount if the contractor is unable to complete the project work or is in default of the construction contract. For the greatest project security (but usually at an additional cost to the price of the work), a contractor would have both a labour and materials payment bond and a performance bond in place for at least 50% of the value of the contract.

In conclusion, when entering construction contracts, parties should consider contacting legal counsel to ensure the contracts are drafted with enforceable terms that do not offend the anti-deprivation rule. And when drafting contracts, they should also be sure to consider if they are appropriately protected should their counterparty become bankrupt or insolvent. **CCE**

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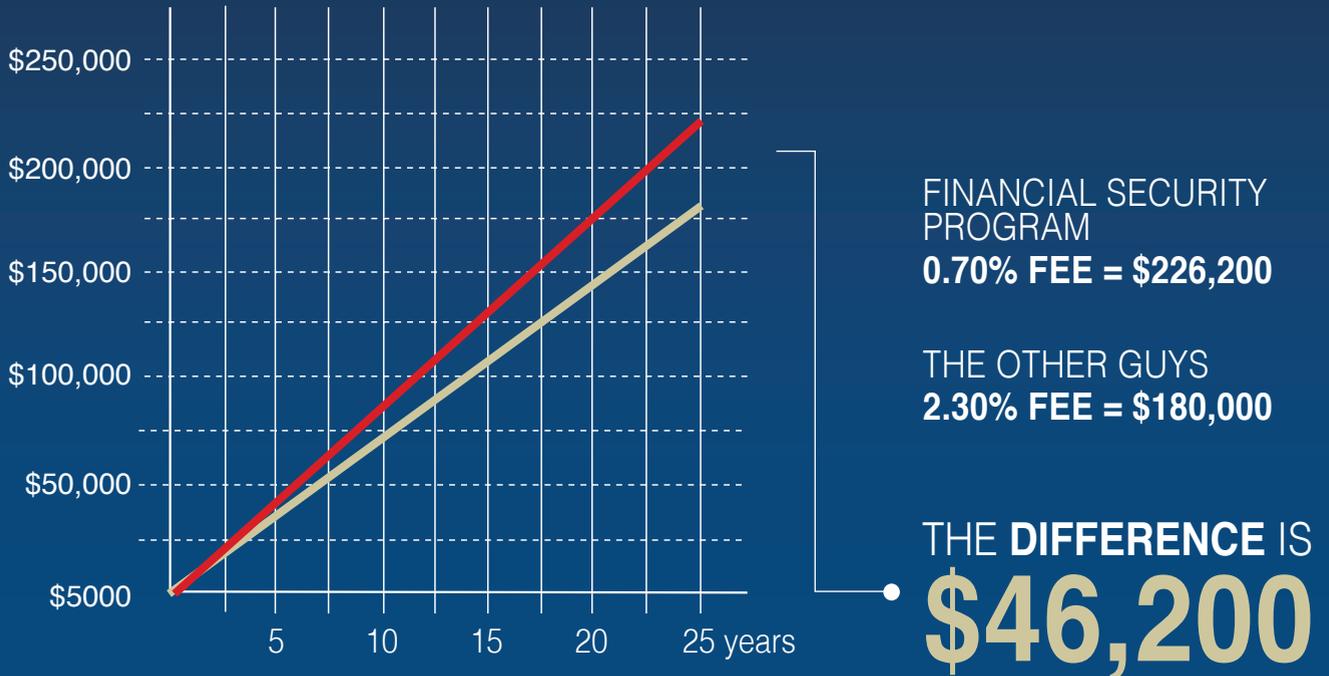
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