

ALBERTA INNOVATORS

THE MAGAZINE OF CONSULTING ENGINEERS OF ALBERTA

SPRING 2020

SUSTAINABLE SOLUTIONS

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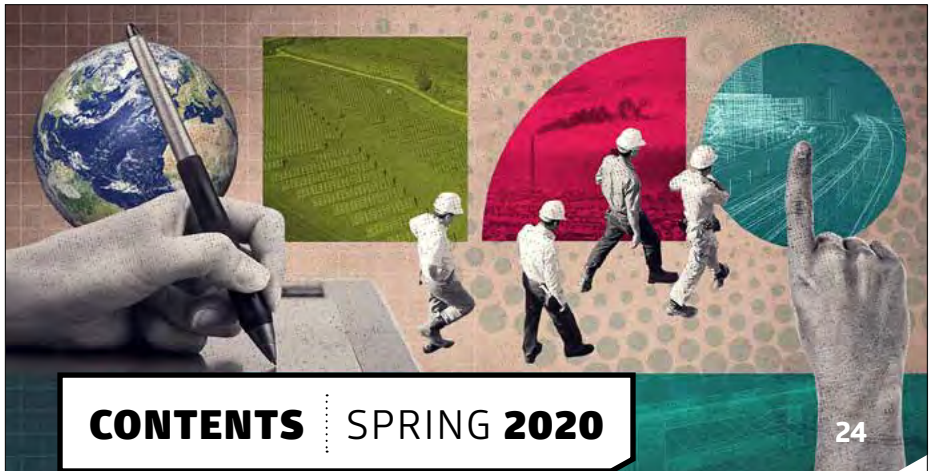
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CONTENTS SPRING 2020

24

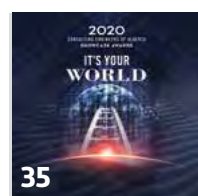
- 6 Message from the Premier
- 7 Message from the CEA President
- 9 Message from the CEA CEO
- 10 Message from the ACEC
- 11 Message from the CEA's
Young Professionals' Group
- 34 CEA Board of Directors
- 58 CEA Membership Directory
- 66 CEA Code of Ethics



20

FEATURES

- 12 THE CASE FOR DPD**
 Adopting a digital project delivery process allows consulting engineers to maximize quality and efficiency while minimizing cost.
- 20 THE EVOLUTION OF URBAN MOBILITY**
 From designing multimodal spaces to ensuring that urban roads are ready for autonomous vehicles, consulting engineers are working to keep our cities moving with the times.
- 24 DESIGNING DIFFERENTLY**
 In the face of climate change, consulting engineering firms are adopting new technologies and finding new ways to build resiliency and mitigation into their projects.
- 30 AN ACT OF SERVICE**
 Sara Anderson's commitment to engineering for the betterment of all is at the core of everything she does, from large-scale projects to her role as incoming CEA president.
- 32 CREATING HIS OWN PLAYING FIELD**
 As the chief technical officer for Tetra Tech, Darel Mesher has built a long and exciting career around his own innate curiosity and drive to innovate.
- 35 SHOWCASE AWARDS 2020**
 Excellence at work for Alberta





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The Honourable **JASON KENNEY**
Premier of Alberta



Premier of Alberta

ON BEHALF OF THE GOVERNMENT OF ALBERTA, it is my pleasure to send greetings to the readers of the 2020 *Alberta Innovators* magazine.

Alberta has always been home to remarkable visionaries and entrepreneurs who help fuel our economy and make our lives better. They help us dream and build bigger— and smarter. Unfortunately, it's been a rough few years for these folks in our province. Alberta needs to do better at attracting investment, fostering innovation and reducing the regulatory burden on job creators. In 2019, Albertans gave our government a mandate to do just that, and we are well on our way to making our province the freest and fastest-moving economy in Canada.

Consulting engineers represent a vital connection between ideas and implementation. Your problem-solving ingenuity is vital to the long-term success of a wide range of ventures, and your work helps form the core of a thriving economy. I'm grateful to the Consulting Engineers of Alberta for nurturing the kind of big-picture thinking that will move your industry, and our province, forward.

Many thanks to all the contributors, and best wishes in 2020.

A handwritten signature in blue ink that reads "Jason Kenney".

Jason Kenney,
Premier of Alberta

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Influence and Act Together: For Our Strong, Sustainable Future

WE HAVE BEEN GIVEN A tremendous opportunity through our common link, the Consulting Engineers of Alberta, to influence as a collaborative unit and create sustainable futures for our members and the clients we serve through our actions.

The CEA's strategic actions are focused on our relationships to engage in influencing sustainable outcomes. The CEA works tirelessly to build, maintain, and grow our industry relationships including construction, professional and business associations, our parent organizations, client groups, and educational



SEANSNOWDEN, P.Eng.
CEA President



establishments. Many of these partners are represented at our CEA Showcase Awards Gala and a host of other events, including provincial government roundtable meetings, social events, conferences, and committees focused on improving working relations with many client groups. It is through these interactions that relationships are formed, trust is built, and the seeds of influence are sown.

We are at a critical juncture in history here in Alberta, and the time has never been more critical than now to act together. With the recent change in provincial government to a United Conservative Party majority, and a new budget focused on fiscal restraint, it has never been more important to remain united in our approach. We all must work together with our new government to meet the objective of getting our province back on a sustainable fiscal track.

For over 40 years, Alberta's consulting engineers have been advocating for a better way to achieve best value from engineering services for our client partners. The work we do has a direct impact on construction costs as well as operational and maintenance costs, which can span decades. It is critical that the right engineers are hired for infrastructure projects based on their qualifications, not simply because they are the cheapest. This better way is called "Qualifications Based Selection," or QBS for short. QBS is a tool to help us to get our province back on track by providing valued consulting services at the right time, by the right service provider, and by providing the best long-term value to our client partners. Thirteen trial projects have been undertaken with Alberta Transportation and another two with Alberta Infrastructure, and although feedback has been positive to date, future implementation by government is uncertain.

The continued uncertainty surrounding implementation of QBS and the government's desire to achieve maximum value for dollars spent means we have an opportunity for a renewed push to get QBS implemented provincially. CEA's board and leadership team have a plan to reinvigorate our efforts to get QBS legislated provincially and are actively working on that plan to achieve real results. One element of the plan is to independently demonstrate the benefits and value of QBS that will be accomplished through an Alberta-centric study of QBS, and is currently underway at the University of Alberta.

We expect that the study will show that QBS provides clients the best value, as it has when studied in other jurisdictions. The study, which is due in spring of 2021, is expected to be a key support tool to get QBS legislated.

In closing, I want to extend my congratulations to all of the CEA Showcase Project Award winners. Your celebrated project achievements within our industry are further testament to the value that engineering consulting brings to our clients through innovations and business excellence. These achievements require strong partnerships between the project owner, contractor, consulting and sub-consulting team.

I also wish to congratulate the winner of the Lieutenant Governor's Award for Distinguished Achievement in consulting engineering. You have exhibited the strong values that consulting engineers stand for and given much of your career to the betterment of the industry.

Finally, I would like to congratulate the winner of the Harold L. Morrison Award. You and your generation are our future industry leaders and will, no doubt, influence many during your career. It is with your actions that our industry will continue to thrive.

Being Resilient in a Changing World

CONGRATULATIONS TO THE winning firms and individuals in this year's Awards program. The theme of this year's Gala Awards, "It's Your World," captures the sense that we are no longer a collection of member companies that work only on a local or regional basis. Driven by economic conditions and client needs, our member companies are working more broadly on a geographical



KEN KOZAKEWICH,
MBA, P. Eng., CEO



basis and more creatively to ensure there are innovative solutions that benefit our communities, our province, our country and the world.

The daily news continues to be filled with stories of national and global issues that increasingly have an impact in our local and provincial marketplace. Despite the wide variety of information, disinformation and misinformation that is broadcast through all forms of media, our consulting engineering businesses continue to work with clients on creative, science-based solutions on a project-by-project basis. Consulting engineers anticipate both the immediate problems as well as long-term solutions that align with the challenges that our clients may face in the future. Often solving project-related needs involves solving a broad range of issues and improving the lives of society in general.

As an example, extreme weather events are an issue not only at the local and national levels, but also globally, affecting our industry and our projects. Weather-related delays on construction, additional issues related to worker and public safety, changes in design to accommodate climate resiliency and increasing insurance costs impact how our businesses and clients operate. There is a new urgency and importance to many issues that previously seemed like distant matters to be resolved by future generations. Climate change scenarios and "eco-anxiety" create concerns within the public. As engineers we know that our industry can provide solutions to many of these issues. These challenges the world is facing provide our industry with an opportunity to improve infrastructure, stimulate economic growth and improve the safety and quality of life for society in general.

Unfortunately, no one company or industry can change our provincial,

national or global situation. History has shown that transformative change can only happen when there is collaboration within an industry and between industry, governments and educational institutions. The collective expertise that results from such collaborative efforts provides diversity of thought on what are often complex problems. Solving big-picture problems requires technical knowledge, research capabilities, political leadership and a regulatory and legislative environment that enables change.

The Consulting Engineers of Alberta provides a vehicle for industry to collaborate and drive forward changes to benefit all. It provides opportunities where we can share ideas with our client groups on how to create more resiliency in the design, operation and maintenance of infrastructure. It also provides opportunities for us to improve the resiliency of our businesses as a myriad of changes continue to occur in the society, environment, governments and fiscal realities around us. Over the past year we have updated our strategies and deepened our engagement with client groups to better reflect the needs of our membership, owners and the public. There continues to be opportunities for us, as an industry, to be part of the solution and to provide the ingenuity that will have a long-term impact both provincially, nationally and beyond - "It's Your World."

Thank you to all of our member firms that submitted projects in this year's program, and to the judges who made the difficult decisions in selecting the winners. On behalf of CEA we acknowledge your ongoing support and recognize the important contributions consulting engineers make through all of your day-to-day work in improving our communities, our province and the world.

Investing in prosperity and sustainability

ON THE HEELS OF THE

federal election, our industry enters 2020 with both opportunity and uncertainty. Significant commitments to public infrastructure investment and the Trans Mountain Pipeline are expected to continue by the federal government. But uncertainty remains around the future of other major resource projects. And of course, there is the inherent uncertainty that accompanies a minority government.

The Association of Consulting Engineering Companies - Canada (ACEC) is committed to working with the federal government and the opposition parties to create a business and regulatory climate that recognizes and rewards our sector for its contributions



LAWRENCE LUKEY, P.Eng.
Chair of the Board of Directors,
ACEC



JOHN GAMBLE, CET, P.Eng.
President & CEO, ACEC



to the social, economic and environmental quality of life in Canada. ACEC is already reaching out to Members of Parliament to introduce them to ACEC, educate them on the important role of consulting engineering companies, and offer expertise to help shape sound and informed public policy.

Here are the key messages ACEC is taking to Parliament Hill:

Prioritize investments that promote an efficient and sustainable economy

Infrastructure is an essential investment in every aspect of our quality of life; it connects and enhances communities, enables commerce and trade, and protects our environment. However, priority should be given to core infrastructure that grows the economy, creates jobs and expands the tax base, as it will make further investments in community, social and environmental infrastructure viable and sustainable.

Address regulatory burden

Each year, all levels of government introduce new laws and regulation impacting everything from labour and licensing to building permits and accessibility requirements. The federal government needs a robust cost-benefit analysis for all regulations that it enacts, to ensure that benefits exceed costs.

ACEC is watching Bill C-69 very carefully. While its objectives are sound, the current uncertainty around its regulatory burden may inadvertently discourage or delay projects that improve our economy. ACEC recommends the government convene stakeholder workshops on the impact factors listed in the Act prior to implementation to ensure mutual understanding of the requirements.

Invest strategically in infrastructure programs supported by asset management plans

Infrastructure projects do not exist in isolation. To receive the best return on investment, a coordinated and strategic

approach should be taken toward infrastructure planning and investment.

In cases where municipalities have robust and well-considered asset management plans, ACEC recommends funding based upon their plan rather than on a project-by-project basis. This approach would allow multiple strategically-related projects to be approved under a single application and create incentive for municipalities to develop and adopt such plans to guide strategic investment decisions.

Consulting engineers are part of the solution to climate change

The consulting engineering industry brings scientific knowledge and engineering practicality to tackle mitigation and adaptation and thus has a key role in climate change. For example, new designs increasingly rely on climate prediction rather than history. As a result, new projects will require more innovation, greater factors of safety and increased attention to life-cycle considerations. Consequently, projects will require more upfront investment to deal with increasing extreme weather events.

Strengthen the economy and trade with a National Infrastructure Corridor

A National Infrastructure Corridor is a pre-established, pre-approved right-of-way dedicated to accommodating multiple infrastructure assets. There is sound public policy behind the concept and ACEC urges the government to enact many of the recommendations from the 2017 report *National Corridor: Enhancing and Facilitating Commerce and Internal Trade* by the all-party Senate Committee on Banking, Trade and Commerce.

Accommodating multiple infrastructure assets within a National Corridor would require smaller geographical footprints and make it more economically viable to connect northern and remote communities to vital life-enhancing infrastructure.

Visit www.investininfrastructure.ca to learn more.

Learning to Embrace Interdependence

WE STARTED THE IDEA FOR THIS article with a conversation on Treaty 7 Territory, the traditional lands of the Blackfoot Confederacy (Kainai, Piikani and Siksika), as well as the Tsuu T'ina First Nation and the Stoney Nakoda First Nation, which sparked our thoughts surrounding the concept of interdependence. Before European contact, the First Peoples of this land understood the ideas of balance, taking and giving, sharing and receiving, and working together. For without this understanding, their collective survival and the development of Canada was threatened. Canada was formed on the basic concept of interdependence. Without the alliances created with Indigenous Nations, explorers would not have survived Canada's harsh and foreign climate, and the country would not stand as it does today. Unfortunately, throughout history, many Canadians lost the mutual respect that began with these alliances, but the importance of interdependence should not be forgotten. On the contrary, it should be emphasized as we navigate this modern era of economic uncertainty.

Indeed, this theme has been prevalent within many facets of our society, with the recognition that interdependency is key to the success of many modern sectors, including areas such as trade agreements and alliances among nations, political affairs and national governance, and industry and business, as well as in our daily lives and relationships. Without integration and collaboration, the world we know today would look very different.

We both began our professional careers as consulting engineers shortly after the U.S. housing market crash of 2008, a period of global financial crisis unparalleled in much of the world

since the Great Depression. Through this downturn, we saw the widespread implications of interdependence; how when one industry fails, the ripple effects can be felt far and wide on a global scale, affecting not only individuals, but all intertwined market sectors.

Over the next decade, we built our careers in consulting engineering. We were excited to join an industry with so many opportunities to build our technical skills and work on meaningful projects with tangible benefits to society. At the time, we did not realize how closely our futures were tied to the successes of other industries, most notably, the oil and gas sector.

In 2014, Alberta's economy was hit hard with a rapid shift in the price of oil. Although neither of us was directly working in the oil and gas sector, we were, along with most Albertans, affected by the crash that has left many yet to recover. The 2014 downturn shook this province and showed the country how tied our economy is to the rest of the world's decisions. This event continues to play out on the federal stage, resulting in the current bi-partisan struggle, leaving the country brimming with an "us against them" mentality, and dissipating the unity that should bind a nation.

Regardless of one's political views, the reality is we are all connected. Recognizing and respecting the importance of each aspect of our intricate network, we need to look for opportunities to strengthen our country and stand united to overcome challenges for the betterment of society and our environment. Already within our early careers, these two historic events have shaped who we are as engineers, consultants and citizens. We can look back at these events and acknowledge that, in part, a failure to understand and acknowledge interdependence has led to damage,



APARNA KRISHAN
YP Director



LAURA CRESWELL
YP Director

stress, heartache and pain within our communities and in our nation.

While cohesive unity may be the goal, the importance of disagreement and understanding opposing perspectives should not be forsaken. As is common practice in the consulting engineering industry, the involvement and collaboration of all stakeholders with many and varied perspectives is the key to developing solutions that fit the bill. In this way, recognizing our interdependency presents opportunities to cooperate, innovate and engineer solutions, be it on the world stage or on a local scale. The consulting engineering industry demonstrates that from embracing interdependency stems the potential for the development of innovative and pragmatic solutions that set the stage for future success.



The Case for DPD

Digital project delivery benefits clients,
managers and project partners

BY GEOFF GEDDES | ILLUSTRATION BY HEFF O'REILLY

A PRIME CHALLENGE FOR CONSULTING ENGINEERS IS RESPONDING TO rapid change, and today that challenge is greater than ever. Advances in technology are leading to more complex buildings and equipment. This requires a greater number of stakeholders and expertise – and, increasingly, more specialization – to ensure success.

In the quest for greater efficiency to better serve clients, industry's latest advancement is the adoption of digital project delivery (DPD) to harness cutting-edge technology for the benefit of clients, managers and project partners.

"DPD is a process of project delivery to the end client by digital means that involves owners, design teams, consultants, contractors and manufacturers all working together," says Nick Dang, associate with SMP Engineering in Edmonton. "It was created to keep up with the evolution of design and construction and provide a more collaborative design document process."

Though there are software programs to support it, DPD is really a process, almost akin to an assembly line. Each person involved in a project – from contractors to consultants – contributes information needed to complete the project. They do this in a digital format that is clear and translatable so that every professional along the line can easily add their own data, and everyone is speaking the same language.

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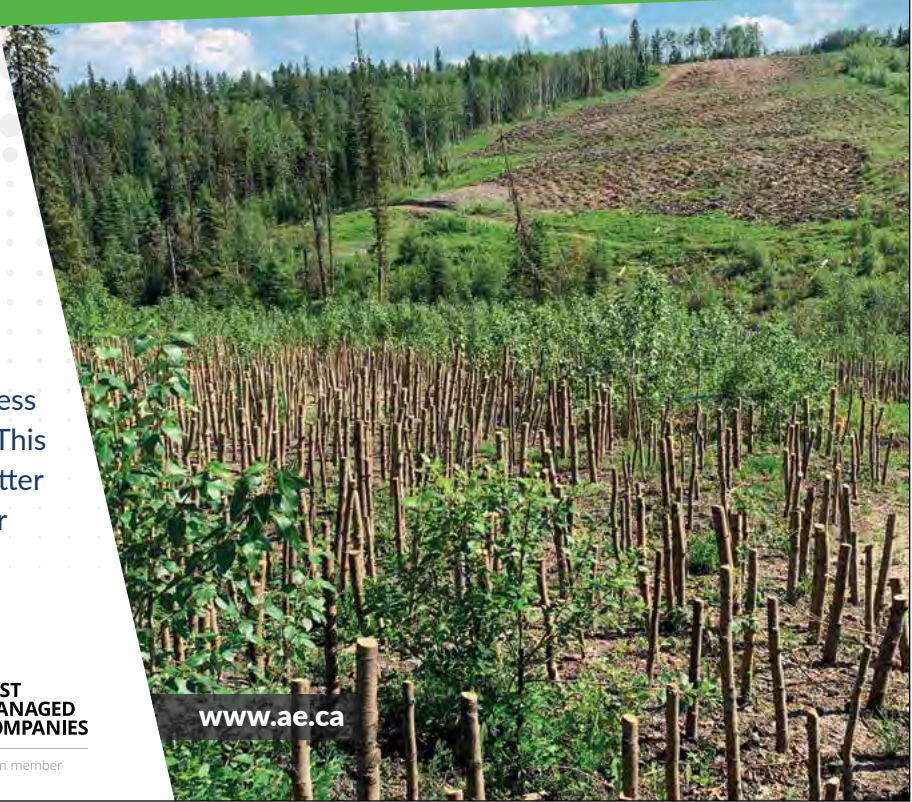
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As is often the case in the digital world, success with DPD is driven by the data, but what that data includes will vary.

“Every owner must decide what data is most valuable to them for inclusion in the DPD process,” says Roddy Handa, lawyer, architect and problem-solver at Holo-Blok in Edmonton. “Often that will include elements that could cause them grief down the road if something goes wrong, such as major electrical and mechanical systems. It could also involve aspects that are harder to manipulate once in place and must be planned around in the event of substantial modifications or additions – things like walls, ceilings, stairs, rigid ducts and conduits.”

AN ENRICHING EXPERIENCE

Though more isn't always better, having as much data to draw from as possible can help maximize the effectiveness of DPD.

“The most important step to take with DPD is ensuring that design documentation is data-rich,” says Jeff DiBattista, practice principal at DIALOG in Edmonton. “For the last 10 or 15 years, the design industry has been moving toward using data-rich ways of describing buildings and other infrastructure. In the old days, you would draw lines on pieces of paper and make blueprints from them, which was clearly not a data-rich approach. When the world moved to programs like AutoCAD, it just meant we were drawing lines on paper with computers rather than by hand.”

Now, using DPD in conjunction with Building Information Modeling (BIM), industry is developing rich databases of information about design work.

“Once that information is in the database, it can be passed along to contractors, owners, cost estimators and others in the supply chain that need it to do their jobs,” says DiBattista. “The holy grail is where you have converted the entire chain to using digital methods for collecting and sharing data. Apart from greater efficiency, if you have a good model of the building, you can quickly extract details from the model to estimate costs. For instance, how much concrete, paving or structural steel is required?

It also helps you manage risk by better understanding the building parameters and having more control of schedules, budgets and quality.”

SPRING AHEAD OR FALL BACK

In any business sector, change is spurred by demand, and DPD is a perfect example.

To succeed in today's highly competitive business environment, companies and

allows consulting engineers, and their project partners, to do both.

“There has always been pressure on the design industry to be more efficient and better able to respond to the types of projects that developers want to do,” says Prosperi-Porta. “The focus is on doing it better, faster and more economically, and DPD helps make that possible. As well, the digital age allows industry to track,

manage and quantify various pieces of a project so clients have a more accurate sense of overall costs.”

Still, while the benefits of DPD are clear to many who use it, large-scale adoption of the process

will take plenty of leading by example. At present, institutions and government bodies such as the University of Alberta and Alberta Infrastructure have been testing the waters and doing some pro-

“There has always been pressure on the design industry to be more efficient and better able to respond to the types of projects that developers want to do.”

► Frank Prosperi-Porta, RJC Engineers

professionals must find ways to do more with less, which often means maximizing quality while minimizing cost. According to Frank Prosperi-Porta, a principal at RJC Engineers, the adoption of a DPD process





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jects via DPD. Alberta Infrastructure, for example, retained Holo-Blok for Edmonton's new Royal Alberta Museum with the intent of implementing the DPD process as a test pilot.

"[At Holo-Blok], we have been trying to increase DPD adoption by being third-party consultants for anyone wanting to play in the DPD sandbox," explains Roddy Handa of Holo-Blok. "There is a lack of expertise out there, so the goal should be greater comfort with DPD, and we can help other organizations meet that overarching goal for industry."

In Handa's view, wider adoption of DPD starts with education.

"We recently completed inaugural delivery of a DPD course for the Edmonton Construction Association," he says. "The response from industry was positive, and now we are currently revamping the course to make it more accessible to more people."

The benefits of educating industry about DPD are two-pronged, according to Handa. Firstly, the more newcomers to DPD learn about its benefits, the more likely they are to adopt it. Once they've mastered the basics, adding to their knowledge around DPD will help them implement it more effectively for a range of projects and purposes.

MOVING WITH THE TIMES

For many engineering firms, the greatest impetus for adopting DPD relates to keeping pace with shifting societal goals and expectations. Properly employed, DPD can help firms reach ambitious goals such as net zero energy, something that DIALOG has targeted as a signatory to the 2030 Commitment organized by the American Institute of Architects.

"We've agreed that by 2030, all buildings we design will be capable of net zero energy, and that requires looking at a range of design options," says DiBattista. "Using a data-rich approach like DPD lets us quickly run multiple simulations and computer models."

For example, designers might want to analyze the window/wall ratio, which is the ratio of solid walls to glass in a building. More solid walls mean more control over heat loss or gain, but would also reduce natural light for workers, so it's important

to explore different combinations of that ratio.

"We need to work with [building owners] to make informed decisions along the way," says DiBattista. "If they want more windows that let heat in or out, can we compensate by increasing roof insulation? Using DPD, we can generate thousands of options and explore them in real time with

"We've agreed that by 2030, all buildings we design will be capable of net zero energy, and that requires looking at a range of design options."

► Jeff DiBattista, DIALOG

the owner; that would be impossible if not using digital methods."

For consulting engineers at RJC, meanwhile, the greatest impetus for adopting DPD is the demand to create and run increasingly large-scale high-rise projects.

Indeed, the firm has been taking the design of the entire digital project delivery process into its own hands to do so.

"As a firm, [we've been exploring how we can] analyze more complex towers and execute the production of documentation," explains Proserpi-Porta.

"Our people have had little choice but to develop internal [DPD] software and methodologies to design, draw, quantify and track projects. We've gone from analysis software to document production, adjustment and development, always mindful of needing to keep pace with the rest of the world."

NO PAIN, NO GAIN

Tapping the true potential of DPD is clearly a priority for many, but that doesn't mean it will be easy. Apart from the fear of the unknown that many feel



around new technology, and the “if it ain’t broke, don’t fix it” mindset of some in the industry, there is a financial question around DPD adoption.

“Many owners haven’t seen enough case studies around the return on investment for DPD,” says Handa. “Moreover, a lot of owners are not interested in holding their assets for long and carrying the minor costs of DPD, since they plan to flip that asset shortly.”

Resistance to new technology is common in many fields, and often breaking through that reluctance is a matter of answering a simple question: Is it worth the effort?

For many in the industry, when it comes to DPD, the answer is a resounding yes.

“When we fully realize the potential of DPD, it will be like having a video game experience of a building,” says John McNicoll, executive director of the Edmonton Construction Association. “You’ll be able to virtually walk through, push a button and move walls, show all the hot water pipes in red or show exact specs and quantities for everything needed to build the whole hot water system. Getting all the stakeholders to participate requires transformational change. It’s challenging, of course, but it will bring huge efficiency and value to owners, industry and ultimately the people of Alberta. That is why we are trying to enlist everyone and say ‘Let’s get going.’”

In spite of the potential, treating DPD as the ultimate solution and authority also has its hazards, and some slow adopters



to question anything.

“[But] it’s not so much that technology [can be] wrong,” he adds. “Rather, it’s the ‘garbage in, garbage out’ phenomenon. Technology like DPD is great at giving you an output based on the input, but that input needs to be valid, and that’s where you need experience as an engi-

tools like DPD, we would have no hope of staying competitive in the marketplace. We need to apply this technology in executing our work more efficiently, because if we can’t compete, we run the risk of clients going elsewhere for their services, just as in any business.”

Success with DPD has its challenges, but if the health of the industry is at stake, it sure beats the alternative. [▶](#)

“Without tools like DPD, we would have no hope of staying competitive in the marketplace. We need to apply this technology in executing our work more efficiently, because if we can’t compete, we run the risk of clients going elsewhere for their services, just as in any business.”

▶ Frank Prosperi-Porta, RJC Engineers

warn against developing an all-knowing and always-correct attitude toward technology.

“That is part and parcel of the maturing of our profession,” explains Prosperi-Porta. “Even twenty years ago, the concern was that the onslaught of new technology could be problematic if engineers were too reliant on it and failed

neer to ensure you enter information correctly.”

Ultimately, the impetus for spending the time, money and effort to adopt DPD and use it to full potential may come from the consequences of failing to do so.

“A huge priority of industry today is controlling our costs in light of ever-increasing pressure on the consulting sector to reduce its fee structure,” says Prosperi-Porta. “Without

DPD in a Nutshell

“Essentially, DPD is about using digital tools to conceive and document design and construction work,” says Jeff DiBattista, practice principal at DIALOG. “DPD creates a data-rich environment that facilitates passing data along the supply chain digitally rather than passing paper or raw information.”

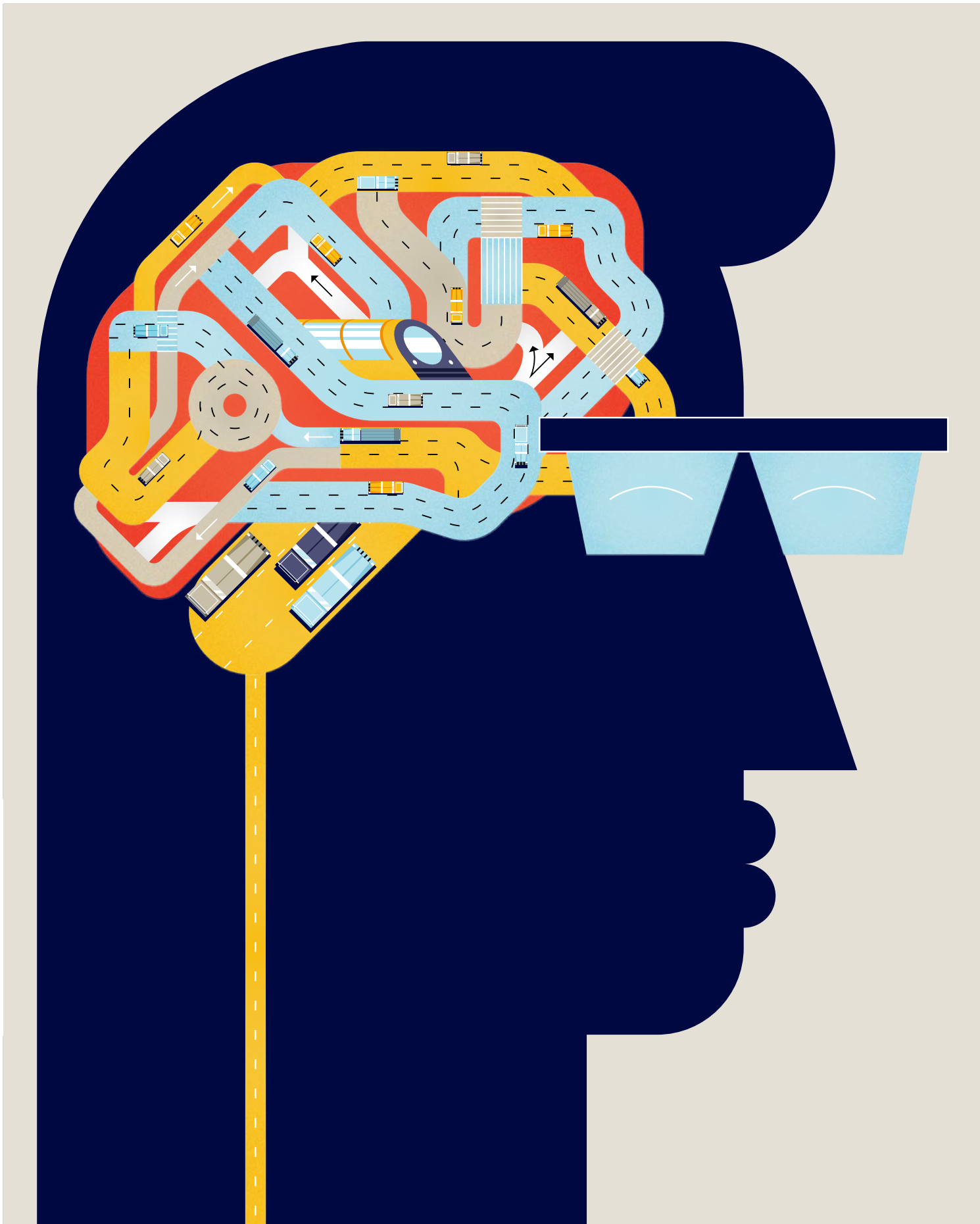


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The Evolution of Urban Mobility

Designing spaces and solutions to meet our changing transportation needs

BY SEAN P. YOUNG | ILLUSTRATION BY ANDREW WEDMAN

OUR CITIES ARE GETTING more crowded. It is estimated that 60 percent of the world's population – more than five billion people – will live in cities by 2030.

Alberta alone is expected to add more than two million new people in the next 30 years, with 80 percent of all Albertans concentrated in the province's urban centres.

As our metropolitan hubs become increasingly dense, consulting engineers will face a distinct and multi-faceted challenge around urban mobility – namely, designing spaces and solutions that help to both combat congestion and accommodate transportation innovations that diverge from centuries-old conventions. Disruptive forces such as shared mobility services, autonomous vehicles, and a growing public discourse centered on the sustainability of urban environments will need to be factored into every new road, sidewalk, bike lane, and transit project built.

The time to face the future is now. Following is a look at how consulting engineers in Alberta are already working to ensure our cities keep moving.

PREPARING CITIES FOR SMART MOBILITY

It is widely accepted that connected and autonomous vehicles (CAVs) are poised to overtake human-operated vehicles, and this will undoubtedly help alleviate congestion – vehicles will be able to travel closer together at higher speeds and could eventually be rerouted remotely by AI that is continuously learning and improving its traffic management algorithms.

“Smart mobility involves a plethora of different technologies, applications, infrastructure modifications, policy changes, and economic models.”

▶ Rod Schebesch, Stantec Consulting

But this future is at best two decades away. Today, engineers are being challenged to navigate a 25-plus-year overlap period from operator-driven to self-driving cars, designing roads for both types of vehicle.

“Technology is changing the vehicles and control systems, but not the roads,” says Kelly Yuzdepski, regional vice president - Western Canada at CIMA+. “Roads

will evolve more slowly. It may take decades to catch up with the technology for vehicles.”

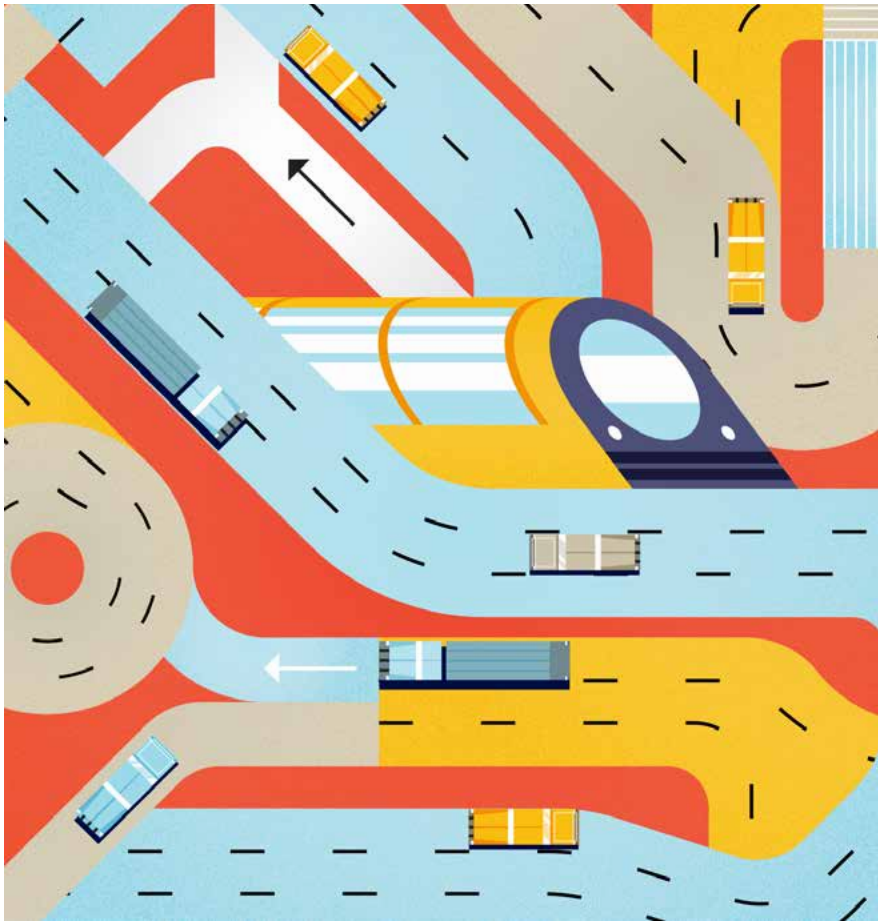
Smart mobility as a concept addresses four emerging areas of innovation: Autonomous, Connected, Electric, and Shared (A.C.E.S). Engineers around the globe are trying to anticipate the broad adoption of these technologies into their urban road designs. Cities that are successful in

converging and preparing for A.C.E.S. will likely see big drops in gridlock, increasing productivity and improving sustainability.

“Smart mobility involves a plethora of different technologies,

applications, infrastructure modifications, policy changes, and economic models,” says Rod Schebesch, senior vice president, Smart Mobility & Innovation at Stantec.

In trying to address the CAV part of the A.C.E.S. equation, Schebesch points to the ongoing ACTIVE-AURORA Connected Vehicle Testbed Network project in Edmonton and Vancouver. The project



was launched in 2014 as a collaborative effort between the Government of Canada, the Government of Alberta, the City of Edmonton, the University of Alberta's Centre for Smart Transportation (CST), and the University of British Columbia. Stantec provided project management, design and construction administration services for ACTIVE-AURORA.

The project – the first of its kind in Canada – provides real-world test zones, including Edmonton's Anthony Henday Drive, for connected vehicles. The aim is to see how connected vehicle technology performs in mixed traffic on highways and arterial roads and in various weather conditions. Test vehicles relay data to test bed infrastructure boxes, and the infrastructure can relay information to all the vehicles connected to the system in return. The connected technology allows vehicles to wirelessly transmit speed, location, following distance, weather conditions, adverse road conditions and more to other vehicles and

roadside infrastructure.

The ACTIVE-AURORA tests are being done with human drivers, but Schebesch says the system will work with autonomous vehicles as they become more

“There is a growing desire in many urban centres to reallocate space that has previously been allocated to motor vehicles.”

► Kelly Yuzdepski, CIMA+.

commonplace. This hivemind of autonomous vehicles all connected to the same system could be rerouted remotely in seconds, greatly increasing the customization of traffic flows, reducing congestion.

“That’s the real power in these connected vehicle technologies as vehicles start to become more autonomous,” Schebesch says. “There’s another level of enhancement that will help mitigate congestion, increase safety, as well as many other applications that will

become viable.”

MAXIMIZING EFFICIENCY

The rise of CAVs will not solve the immediate need to get more people moving safely and efficiently through their cities. Engineers are also being asked to come up with solutions to maximize existing infrastructure use. Building bigger roads is rarely an option in established urban areas – there’s no land left to develop. Instead, cities are looking to limit vehicle access to their cores and connect citizens through multi-modal transportation options.

“There is a growing desire in many urban centres to reallocate space that has previously been allocated to motor vehicles to other modes of travel or uses,” Yuzdepski says.

At CIMA+, Yuzdepski and his team have worked with many municipalities in Canada to design multimodal spaces – removing roadway lanes to make room for bike lanes, reallocating parking lanes to provide more pedestrian space, and nixing turning lanes to reduce intersection crossing distances through curb bulbs. These types of reforms limit motor vehicle capacity and increase shared use. Bike lanes and bike accommodations, which were very uncommon for small- and medium-sized municipalities (and especially in northern climates) not long ago, are steadily being implemented in core neighbourhoods across Canada to provide

multimodal transportation options, Yuzdepski says.

“Dedicated protected bike lanes have demonstrated a strong link to improving urban mobility in general and creating options other than vehicles

to get around,” he says.

Yuzdepski also maintains that cities will increasingly be looking at integrating “last mile technologies” to reduce congestion. Bike rentals, ride-sharing hubs, and the contentious e-scooters being trialed in Edmonton and Calgary could be incorporated into mobility designs to connect users from train or bus stops to their final destinations. The challenge for engineers will be accommodating these technologies safely into

their designs – separating the modes of transport, the allocation of physical space and winter use.

“Do we need to deal with the people-moving capacity of a system, the transit level of service, or something else?” Yuzdepski says.

Developing new key performance indicators that work for a multimodal system rather than just automobiles will also be important in showing engineers how these new designs can be improved.

THE WILL OF THE PEOPLE

Citizens have more say than ever in how their cities are designed and utilized, thanks to social media, consumer-behaviour tracking and public consultations.

As cities get denser and new technologies emerge, policymakers are relying on engineering firms to explore and thoroughly understand the social

and ethical discourse surrounding their designs. Firms are also being asked to provide educational opportunities and engagement with the public on emerging transportation technologies.

“We’re all more connected, and municipalities have to be transparent as to why decisions are made – people are holding governments accountable to have those

“If we don’t understand these new technologies or haven’t been exposed to them, it’s really hard to be able to recommend them.”

➤ Rod Schebesch, Stantec Consulting

discussions,” says Sean Snowden, manager, transportation engineering at WSP.

WSP helped initiate the City of Edmonton’s Smart Transportation Action Plan, released in 2018. The extensive plan outlines 35 actions the City is taking, or considering, to create new ways to

move people, goods, and services. Themes highlighted through public engagement during the creation of the plan helped inform its principals and strategic actions. Feedback revealed Edmontonians did not want the City to commit to any emerging transportation technology prematurely and risk being “bleeding edge” rather than

leading edge. The Plan also framed Edmontonians’ concerns around the physical and cyber safety of driverless and automated technologies.

“Municipalities are really being challenged to create smarter cities, not only in regard to passenger vehicles but all modes of transportation, and safety comes into play there, too,” Snowden says.

DOING MORE WITH LESS

Innovative ideas and transformational technologies like connected roads or even public charging infrastructure for electric vehicles could reinvent urban mobility. However, if these revolutionary projects are to be funded with public dollars, getting them off the ground depends largely on the area’s economic health and priorities, and the current provincial budget, which focuses on fiscal restraint, makes this all the more challenging.

According to Schebesch, in addition to budget woes, the reluctance for clients to take big swings on bold innovations in urban mobility also comes down to a lack of understanding. He believes that consulting engineers can help mitigate this by sharing their expertise and experience, educating clients on the possibilities of new technologies and the benefits they will bring to Alberta and beyond.

“That education and communication is [key] for everybody – stakeholders, the public, clients, even your staff within your own organization,” Schebesch says.

“If [we] don’t understand these new technologies or haven’t been exposed to them, it’s really hard for engineers to be able to recommend them.” ■





DESIGNING DIFFERENTLY

Consulting engineers must tackle new and mounting challenges in the face of climate change

BY ELIZABETH CHORNEY-BOOTH | ILLUSTRATION BY RAYMOND REID

INFRASTRUCTURE AND industrial projects all exist in the context of their surroundings – factors like weather conditions, government regulations and social norms all play a part in how consulting engineers approach their work. Over the last decade, climate change in particular has had a significant impact on many aspects of engineering in Alberta, ranging from the implementation of clean energy initiatives to building resilient structures that can withstand extreme weather.

The impact of climate change touches different branches of engineering in different ways, but generally speaking, engineers look at climate change-related work through two lenses: adaptation and mitigation. Adaptation refers to strategies used to ensure that projects – be they roads, bridges, water systems or industrial structures – remain safe and functional even as climate impacts increase. Mitigation, meanwhile, is more about developing systems that actively work to reduce harm being done to the environment.

“Those are two somewhat discreet trains of thought,” says Jeremy Fyke, manager of the climate services group at Associated Engineering. “Climate adaptation is essential. We know there are big changes coming and we need to make sure our

systems and assets, and society in general, are resilient to those changes as they come. The other side is climate mitigation, which means reducing our emissions of greenhouse gases. Successful mitigation at the global scale means less adaptation will ultimately be necessary.”

Since the adaptation side of the equation is more pressing from both an invest-

“Engineers have always worked in an evolving environment. The climatic data that engineers design to is constantly evolving and constantly updating. This idea that we have data that informs us to changing conditions really isn’t anything new.”

▶ Tim Cartmell, Edmonton City Councillor

ment and public safety point of view (no one wants to see bridges or roads losing functionality, for instance), resiliency and smart design have become key concerns. Here, technology plays a big role: experts like Fyke, whose personal background is in climate change science rather than engineering, will analyze output from climate models to predict how weather and climate conditions may change over the course of years or even decades. That data is then applied as part of vulnerability and

risk assessments that inform engineers on, for example, what sorts of materials projects should be built with, or what tweaks engineers have to make to protect the structural integrity of their designs in the face of climate change.

According to Peter Hall, Wood Global Director – Climate, Resilience & Sustainability, most firms now integrate these

climate resilience and vulnerability assessments directly into their project delivery frameworks so that projects can provide reliable performance against future shocks and stresses.

“Say you’re going to build a roadway system – you would first do that vulnerability assessment,” says Hall.

“You look at the future, and typically it’s extreme rainfall, heat, seismic, sea level rise, or storm surges. It could be a range of other shocks or disruptions over a 30-year minimum lifespan that you then need to address.”

Hall explains that if an assessment on a roadway system were indeed to reveal the potential for increased precipitation, floods or intense heat, consulting engineers would incorporate adaptation solutions to those projects that could include changing the



time working on internal projects with Associated Engineering, but also regularly works with municipalities and other governments to help improve infrastructure resiliency.

Edmonton City Councillor Tim Cartmell, who comes from an engineering background himself, says that in some ways, adapting city infrastructure to changing climate patterns is something consulting engineers have long been doing.

“Engineers have always worked in an evolving environment,” Cartmell says. “There’s perhaps a raised consciousness, but really this is business as usual in terms of engineering a city to meet climatic conditions.”

That said, municipalities also have the opportunity to act as leaders not only in terms of building durable projects that are safe and make the most out of the city’s tax revenues, but also to look ahead in terms of mitigation and efficiency. The City of Edmonton, for example, has built climate resilience measures into its strategic plan for the next decade and is also updating its design and construction standards, with issues related to climate change playing a central role. Chandra Tomaras, an environmental program manager at the City of Edmonton, says the City is considering both the longevity of the construction and aspects of mitigation, being sure to build factors such as energy efficiency, lower carbon emissions, and green technology into infrastructure designs whenever possible.

“This has been an emerging field for municipalities,” Tomaras says. “We’ve really begun to see the impacts of climate change, and it’s not hard to see them. There are examples in Alberta, from flooding to wildfire, and

positioning for the road, elevation of critical assets or the use of different materials to make sure the structure could withstand future shocks and impacts.

Alistair James, principal geotechnical engineer at SNC-Lavalin, says that considering the effects of changing weather figures prominently into most of his team’s work, too. He points to structures like pipelines and culverts that are often placed in areas that are predicted to get more frequent bouts of intense precipitation over the coming decades. The engineers on these projects have to design the cover for the pipelines so that they won’t be washed out, or, in the anticipation of significant soil erosion, they

have to bury pipes at a greater depth than they would have been buried previously.

MUNICIPAL INITIATIVES

Since a lot of climate resilience-related work centres around civic infrastructure, municipalities have had to become leaders on this front. Both Calgary and Edmonton have built climate change adaptation and mitigation into modern infrastructure planning. In-house departments often collaborate with consulting engineers and climate change experts to keep both citizens and public investments safe from damage that can come with extreme weather events. Fyke says that he spends about half of his



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these events are increasing in frequency and severity. Many municipalities in Alberta are learning how to adapt and are beginning that process of integrating or mainstreaming climate resilience into infrastructure and asset management decisions.”

Recent municipal projects that reflect this new integration approach include LEED-certified buildings like the City of Calgary Water Centre and Edmonton’s Meadows Fire Station No. 26, which is fitted with a solar photovoltaic system that generates power on-site.

Of course, public policy is also playing a role in the private sector as various regulations and national guidelines are requiring engineers to consider how their projects will both affect and be affected by climate changes. For example, Infrastructure Canada has Climate Lens guidelines for both mitigation and resilience assessments that are required for any applications seeking funding for new major public infrastructure projects. Hall, who works on projects around the world, notes that some areas in North America have better regulations than others and that consistency is an issue, but that governments are starting to make some ground on codes and regulations.

BUILDING BETTER

Beyond government policy, clients, investors and even insurance companies are also starting to demand that engineers and consultants build climate change protections into projects, be it through vulnerability assessments that will proactively protect structures from extreme weather changes or the use of renewable energy systems.



Many stakeholders feel like it’s the right thing to do from an ethical and public safety point of view and also feel that the technology that engineers and their environmental teams are using to address climate resiliency and mitigation makes for stronger, more efficient and more attractive products.

Hall says that engineering firms that fail to address climate change risk losing business and will also fail to attract the best and brightest young engineers, who have come of age in the era of green technology.

“If you do it in the right way, you’re going to get more work,” Hall says. “You’re also going to keep the future workforce of tomorrow because they really want to attach

to companies that are doing sort of a greater good. You’re getting a more energized workforce, you’re making more money, you’re building better projects and at the same time addressing sustainable development goals.”

To that end, many major consulting engineering firms are assembling teams that are dedicated to addressing climate change solutions for a range of public and private sector clients. Peter Nimmrichter, who is a water resources engineer by trade and the Canadian climate, resilience and sustainability lead at Wood Technical Consulting Solutions, says that his in-house teams have proven to be invaluable in getting the best possible data to address the safeguards that



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Associated Engineering, are becoming increasingly sought-after as sustainability experts. Tang believes that this is an opportunity for consulting engineers to really provide leadership and to help guide those clients who aren't fully on board.

"In many ways, we're the first line of defense," Tang says. "We have the responsibility to educate our clients on how to do things sustainably. They rely on us to provide them with expertise and assistance."

As a climate change expert, Jeremy Fyke says he's excited to work for an engineering firm because it gives him a chance to really make a tangible impact. In many ways, it will be the engineers of the world who will be entrusted with putting government policy into action and taking concrete steps to improve ways that human

beings interact with the planet.

"Engineers are disproportionately powerful here in moving the needle," Fyke says. "It's really important to me to build up climate literacy among the front-line engineers. Climate

literacy means knowing how

the climate will affect their projects and how their projects will affect the climate. With that knowledge in hand, there's a huge opportunity for the engineering sector to really step up and be a critical part of the solution." [a](#)

both clients and engineers are looking for. These teams often also act to consult externally to help other engineers and project leads to build more resilient or efficient projects.

"From a weather standpoint, Wood has the largest private meteorological forecasting organization in Canada," Nimmrichter says. "We do private forecasting for various clients for both near-term weather as well as looking years in the future. We have a very specialized group that does data analytics and machine learning using state of the art models and data sources, and we use the information from those models to assist us in our work."

"In many ways, we're the first line of defense. We have the responsibility to educate our clients on how to do things sustainably. They rely on us to provide them with expertise and assistance."

► Juliana Tang, Associated Engineering

The degree to which individual consulting engineers and firms are prioritizing climate change provisions varies greatly, but it's clear that the tides are metaphorically shifting. As mindsets change, professionals like Juliana Tang, a geo-environmental engineer and sustainable design specialist at

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CAREER PROFILE

> 2020



An Act of Service

For incoming CEA president Sara Anderson, improving lives through engineering is at the core of everything she does

BY NATHAN KUNZ | PHOTOGRAPHY BY BOOKSTRUCKER

SARA ANDERSON'S TWO DECADES OF WORK IN engineering all come back to one simple mission.

“Everything I do is really [about] taking care of others, taking care of the communities we live in, and trying the best that I can, with all the information that I have, to make things better,” says Anderson. “I see myself as an engineer to be in service of others.”

The approach has guided much of Anderson’s work, from professional beginnings stateside to her current job at Urban Systems in Calgary, where she works as a senior engineer and principal. It’s also what motivated her to become involved with the CEA, where she will serve as president for 2020-2021.

“It’s not just dealing with a project or one client,” Anderson says of what compelled her to take on this new role with the CEA. “It’s really to take care of the industry that we are a part of and that we serve.”

Anderson’s tenure as president will mark a milestone for the CEA, as she will be the first woman to serve in the role. She first got involved with the organization in 2013 as a general member with the municipal liaison committee, eventually holding the role of committee chair. From there, she was elected to the board of directors in 2017 and served as vice president of the board from 2019-2020.

Now, as she embarks on helming the organization, Anderson says she looks forward to continuing to support and enhance the CEA’s commitments in speaking with one voice for the industry through meeting and working with the provincial government, stakeholders and other industry professionals to reach solutions that help consulting engineers – and all Albertans.

Originally from Vigevano, Italy, Anderson moved to Alberta to attend the University of Calgary as a visiting student in 1996. The initial one-year commitment was ultimately extended, and she graduated from U of C with a degree in civil engineering. From there, she began her professional career in Poughkeepsie, New York, working as staff engineer at The Chazen Companies before moving to Colorado, a shift that was partly influenced by her love of the outdoors.

It was this same love that motivated Anderson to return to Alberta in 2008; that year, she moved to Canmore to work as a project engineer with McElhanney, then made the leap to her current position with Urban Systems in 2010. Still based in Canmore – with her husband and two children – she commutes daily to the Urban Systems office in downtown Calgary.

At Urban Systems, Anderson provides services to clients in both the private and public sectors, working on projects that range from assessing and improving existing infrastructure, such as retrofitting lift stations, to designing new subdivisions. No matter the project, Anderson says she considers community vision in everything

she does. This means listening to what’s important to residents, owners, and stakeholders and applying it in practice. Through consultation and using soft skills, she has found she can better serve those affected by her work, blending necessary infrastructure into communities naturally, and working with people rather than around them.

Anderson plans to apply this same approach in her role as CEA president, taking on challenges that affect the community of Alberta consulting engineers while also addressing issues facing Alberta as a whole, such as aging infrastructure and management of current assets. She’s also looking to collaborate with industry professionals and public stakeholders to standardize language and formats in contracts, thereby streamlining projects further.

“It’s not about myself or a project or the glory of it – it’s just to serve others. It’s a good feeling when you can contribute to the betterment of all of us.”

➤ Sara Anderson, Urban Systems

“Standardizing the language will make collaboration easier,” says Anderson. “It will also be more transparent and fairer to all parties and stakeholders when there is a full understanding of the language used.”

David Nagy, a bridge group manager with Associated Engineering who served as CEA president in 2017-2018, says what he’s seen from Anderson in the past leaves him to believe she’ll thrive in her new leadership role.

“When you’re in a boardroom with 20 other Type-A personalities – successful engineers or business people who all believe they have the answer – mediating can be very difficult. And mediating without hurting people’s feelings is another level of political savviness,” says Nagy. “Sara is extremely good at that.”

Beyond engineering, Anderson extends her leadership and diplomacy skills to her community through various volunteering efforts, including as a class representative on the Our Lady of the Snows school council in Canmore, as well as two seasons spent as president of the Canmore Minor Hockey Association.

Whether it’s with Urban Systems, the CEA or within her own community, Anderson says she always focuses on her underlying mission. “It’s not about myself or a project or the glory of it – it’s just to serve others,” says Anderson. “It’s just a good feeling when you can contribute to the betterment of all of us.” ■

CAREER PROFILE

> 2020



Creating His Own Playing Field

The chief technical officer of Tetra Tech can't help but innovate

BY JENNIFER DOROZIO | PHOTOGRAPHY BY BUFFY GOODMAN

FROM CREATING ENGINEERING TECHNOLOGY IN HIS basement workshop as a young teenager to developing autonomous ways to map 3D space while in motion 30 years later, Darel Mesher has been an innovator for pretty much all of his life.

"I think anyone who has a creative bent will tell you it's due to having an innate curiosity," Mesher says. "And applying that curiosity in connection to a whole bunch of different areas can help you find innovative solutions to challenging problems in different fields."

As the chief technical officer for Tetra Tech, an international consulting and engineering firm, Edmonton-based Mesher has a long and impressive history of applying his curiosity.

At 15, he hand-built a pulsating light fixture – called a light organ – that responded to music by changing colours depending on the audio frequency of music being played. The device was so impressive, he began reproducing it in order to sell to friends.

Mesher credits his mechanically-minded dad for inspiring both his early creations, and his career path.

"My father was an electrical engineer and a very creative problem-solver," he says. "I was following in his footsteps. I can't think back to a time in my life when I wasn't going to be an electrical engineer, or a problem-solver."

While his dad may have been the one to spark his interest in innovation, Mesher's remarkable ability to turn ideas into tangible solutions was something he honed over a lifetime of hard work.

In his university years, he made money for tuition by rebuilding old electronics into usable products, then selling them at a profit.

"I spent countless summers tinkering around with cast-off lawn mowers and building go-karts and anything motorized," he says.

After receiving his undergraduate degree in computer engineering in 1985 at McMaster University in southern Ontario, Mesher began his master's degree in electrical engineering. While completing that program, he invented a piece of technology that could be used as a remote control in energy-efficient homes, and he applied to have it patented.

He got the patent, but it wasn't enough to calm his creative ambition: he wanted to go beyond hardware research and into the wide-open world of emerging technologies. Following his gut, he began a PhD that focused on how to use artificial intelligence to create non-destructive testing technologies in the roadway industry.

"It was a difficult problem that hadn't been solved," says Mesher. But that prospect only excited him more, as one of Mesher's life

mantras is: Never compete on a level playing field. "If you can invent a new technology, you have no competitors," he explains. "If you take that approach, you'll never stop innovating."

Mesher's switch into emerging technology for his PhD led him to his long-time career with Tetra Tech. One of his PhD examiners, Dr. Jamie Rossiter, had worked with research similar to Mesher's, and he offered Mesher a position as a postdoctoral researcher. It was while under Rossiter that Mesher began working on a project for EBA Engineering (now Kiggiak-EBA Consulting Ltd.), which is a Tetra Tech company.

"You have to be willing to take risks, because failures are nothing other than experience." > Darel Mesher
chief technical officer, Tetra Tech

Now, more than three decades into his career, Mesher still brings a deep enthusiasm to whatever he's working on. Currently it's a series of innovative technologies that work together to autonomously test and monitor rail corridors. Years in the making, the project involves digital imaging technology, global positioning systems, inertial navigation systems and more, and it's poised to disrupt the rail industry, ultimately making rail testing a safer and more efficient practice across the country.

"The impact is going to be the most significant thing I have done in my career," says Mesher.

In addition to the personal reward of job satisfaction, this year, Mesher won the Technical Achievement Award at Tetra Tech for his rail innovation, beating out more than 20,000 other employees.

"Problem-solving and innovation are part of Darel's DNA. I've known and worked with very few individuals like him," says Bernie Teufele, president of Tetra Tech. "He is one of the most well-rounded technical professionals."

Passionate in work and play, Mesher is an avid motorcyclist who travels the world with his wife to race on world-class tracks. He has also spent time mentoring with Big Brothers Big Sisters. The father of two girls, he is a big believer in pursuing an education, and his piece of advice to students is always the same.

"You have to be willing to take risks," he says. "Because failures are nothing other than experience." ■



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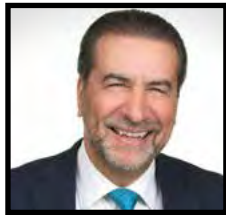
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Always an Engineer

Bob Gomes' impressive career was built on a commitment to learning, a love of business and a strong sense of leadership

BY ELIZABETH CHORNEY-BOOTH

WHEN THIS YEAR'S LIEUTENANT GOVERNOR'S AWARD

for Distinguished Achievement winner, Bob Gomes, started his career, he certainly didn't expect to end up as the CEO of Canada's third largest engineering firm. But his love of the business, willingness to learn about a wide range of engineering disciplines, and innate understanding of people led Gomes to an extraordinary career that ended with nearly a decade as the CEO of Stantec, a company he was with for nearly 30 years before retiring in 2017.

Growing up, Gomes enjoyed building things, but he never really considered becoming an engineer. In fact, he started at the University of Alberta in a general science program, with the intent of one day going into medicine. But after taking a number of organic and inorganic chemistry classes, he realized that a science-based career might not be something he excelled at. Since many of his friends were in the engineering program, he decided to join them and see where it took him.

After graduating in 1978, Gomes was offered a job with the Edmonton land development firm Walker, Newby and Associates Ltd., where he learned some valuable career lessons early on.

"George Walker from Walker, Newby and Associates Ltd., who really was my first mentor in engineering, taught me the value in volunteering on nonprofit boards, which taught me the benefit of leading without leverage," says Gomes. "Leading a nonprofit board where the other board members don't get paid for what they do and don't report to you as their boss, requires a much different leadership style. You need to find consensus, compromise. You need to find agreement in the best solution where many different solutions exist, but do it in a way where all the board members can agree on the direction. This experience gave me the skills to use that style throughout my career."

Though Gomes valued Walker's mentorship and enjoyed the work he was doing at Walker, Newby and Associates, when the local economy crashed in the late 1980s, he decided to seek the stability of a bigger firm and joined Stantec (then called D.R. Stanley Associates).

Starting out at Stantec as an urban land project manager, Gomes worked his way up the ranks, holding increasingly more senior roles in both operational and practice areas before becoming CEO of the entire company in 2009. He's particularly proud that he's managed to stay in Edmonton for his entire career – he was able to negotiate the 2018 move of Stantec's headquarters to downtown Edmonton's

Ice District, creating the largest office tower west of Toronto and redefining Edmonton's downtown. Helming such a large company in his home city gave Gomes a tremendous sense of accomplishment, even if it wasn't what he was looking for when he first became an engineer.

"Becoming CEO certainly wasn't my target early on," says Gomes. "But an opportunity arose and I saw that I could impact the company even more by taking the role of CEO. When I took over that role we were around 8,000 people, and when I left there were 22,000 people in the company."

That growth comes from Gomes' talent in acquiring smaller engineering firms that would help strengthen Stantec as a company. Having served as the president of the Consulting Engineers of Alberta from 2003 to 2004, Gomes credits his work with the CEA in helping him to better understand the larger engineering landscape. Since his own hands-on expertise was largely in land development projects, working with other CEA members helped him to broaden his knowledge and better build Stantec's portfolio of acquisitions.

"CEA provided me with the benefit of really understanding how much added value a small firm can provide to a larger firm like Stantec," Gomes says. "Having that understanding of how small firms work and what makes them tick provided me a great base for that aspect of being a corporate CEO."

Even though Gomes' career was demanding, he was always fortunate to have the support of his wife Diane, as well as their son and two daughters. Gomes says he's humbled to receive this year's CEA Lieutenant Governor's Award and credits his colleagues at Stantec (where he still sits on the board) for the honour. "This is really an award to my friends at Stantec and my clients who provided me the opportunity of being an engineer," he says.

Gomes also says that, although he spent so much time in upper management, at heart, he remains an engineer. The love of design and creation of projects has always informed Gomes' decisions at Stantec and is another reason why he feels so moved to be honoured by his peers.

"Stantec became something that was more of a corporation than an engineering firm, but I have always loved engineering," Gomes says. "I didn't become CEO because I wanted to be CEO. I became CEO because I was a good engineer. I'll always think of it that way." ■

SHOWCASE AWARDS

> 2020

Leaders of Tomorrow

CEA 2020 Showcase –
Young Professional Nominee Judges:
Art Washuta, CEA Past President
Ben Novak, CEA Past President
Herb Kuehne, CEA Past President



Zion Yua, M.Eng., P.Eng., PMP
Environmental Engineer
Thurber Engineering Ltd.

HAROLD L. MORRISON AWARD

RISING YOUNG PROFESSIONAL

> Nominees



Keal MacNaughton, P.Eng., B.Eng., C.A.S.
Area Manager - Emergency Response
GHD Limited

SINCE GRADUATING FROM THE UNIVERSITY of Alberta in 2011, Zion has worked in environmental consulting and managed projects in the commercial, municipal, industrial, and upstream oil and gas sectors. Zion has provided project management and technical support for environmental site assessments, risk management plans, and site remediation projects. He regularly provides project leadership and support to junior engineers and technicians on technical assignments and has become a valuable resource to peers for career mentorship.

Outside of Thurber, Zion volunteers regularly for the Association of Professional Engineers and Geoscientists of Alberta, the Geotechnical Society of Edmonton, and the Faculty of Engineering Young Alumni Council and has led teams for international missions. Zion has excelled within Thurber's environmental group and is always available to lend a hand, listen, advocate a solution and be attentive to clients' needs.

KEAL HAS EXTENSIVE SPILL RESPONSE AND preparedness experience and considerable experience with emergency air monitoring and sampling protocols. He has responded to and managed numerous large-scale environmental emergencies. Keal also has significant experience managing environmental due diligence projects, site remediation, risk assessment and toxicology, industrial hygiene and air monitoring, storm water and wastewater, wildlife management, site restoration, and environmental litigation.

Keal graduated from Biological Engineering in 2013 and has a certificate in Applied Science. Keal's passion and solution-based thinking inspires his team to think on their feet. Keal is helping mentor and shape the future of this industry by igniting enthusiasm for the services offered and building a team that can follow his footsteps in building genuine client relationships built on trust and the commitment to do what is right for the client and the environment.



Jarret MacDonald, P.Eng.
Civil Engineer
Klohn Crippen Berger Ltd.

JARRET IS A CIVIL ENGINEER WITH

over nine years of experience in the consulting engineering industry. He graduated with a Bachelor of Civil Engineering from Dalhousie University in January 2011. Post-graduation, he spent almost two years working as a commercial project engineer at ARXX Building Products in Ontario before joining Klohn Crippen Berger in August 2012 as a Civil Engineer-in-training. His success has been founded on a strong work ethic and a willingness to take on new challenges. Because of this, Jarret has developed a diverse engineering skill set in keeping with that of a much senior engineer.

Jarrett is leading by example, takes on any new challenges offered, mentors and trains our next generation of engineers, volunteers and has become a role model at Klohn Crippen Berger.



Aparna Krishan, P.Eng.
Transportation Engineer
McElhanney Ltd.

APARNA EMBODIES THE ARCHE-

type of a young, successful engineer. Although technically adept, she is equally passionate about servicing her industry and community through volunteer work and her involvement with the CEA. With over eight years of experience with a strong focus on traffic engineering, transportation planning, and road safety, Aparna is emerging as an expert in traffic modelling, safety analysis, and the accessibility of active and sustainable transportation. Aparna has been involved in both rural and urban projects throughout Alberta, British Columbia, Saskatchewan, Manitoba, and the Northwest Territories and has extensive experience conducting on-site reviews and collecting data in the field. Her work has had significant societal impact through improvements to safety, traffic congestion, and promoting active and sustainable transportation solutions designed for all ages and abilities.



Andrew Lischuk, M.Eng., P.Eng., LEED AP
Senior Associate, Buildings Engineering
Structural Lead, Stantec Consulting Ltd.

BORN INTO A FAMILY OF BUILD-

ers and electricians, Andrew has engineering engrained into his DNA. Gifted in his speciality of structural engineering, Andrew has well-rounded skills in communication, organization and leadership. With a solid experience in construction and a master's degree in structural engineering under his belt, Andrew has forged a stellar career in the industry. He handles significant responsibility on large, complex and highly visible projects, and believes in creating lasting and positive change in his community through his work as a professional engineer. Serving as a client's trusted advisor is the consulting business' golden rule Andrew lives by.

Andrew's "hyper collaborative" leadership style brings out the best in everyone on his team. Andrew is passionate about giving back to the industry that gave him his dream career.

SHOWCASE AWARDS

> 2020



Stantec Tower

FIRM: Stantec Consulting Ltd.

CLIENT / OWNER: ICE District Development Partnership for the ICE District Properties (Joint Venture)

LOCATION: Edmonton, Alberta

SUB CONSULTANTS: Stantec Architecture Ltd., RWDI, Thurber Engineering Ltd.

CONTRACTORS: PCL Construction Management Inc.

OTHER KEY PLAYERS: ICE District, ONE Properties, Canderel

Civilizations have long set their sights on the sky. A monument to years of engineering and architectural passion, Stantec Tower stands 69 storeys (251 metres) high in the heart of Edmonton's bustling ICE District, Canada's largest mixed-use sports and entertainment hub. Composed of 29 floors of office space, 483 luxury residential units, and below-grade parking stalls, the mixed-use tower combines retail, commercial office, and prime residential spaces, perfectly balancing work and play. This soaring edifice is the result of collaboration between the Katz Group, ICE District Joint Venture, Stantec, PCL Construction, Thurber Engineering, and RWDI.

AWARD OF EXCELLENCE

> Building Engineering – Commercial



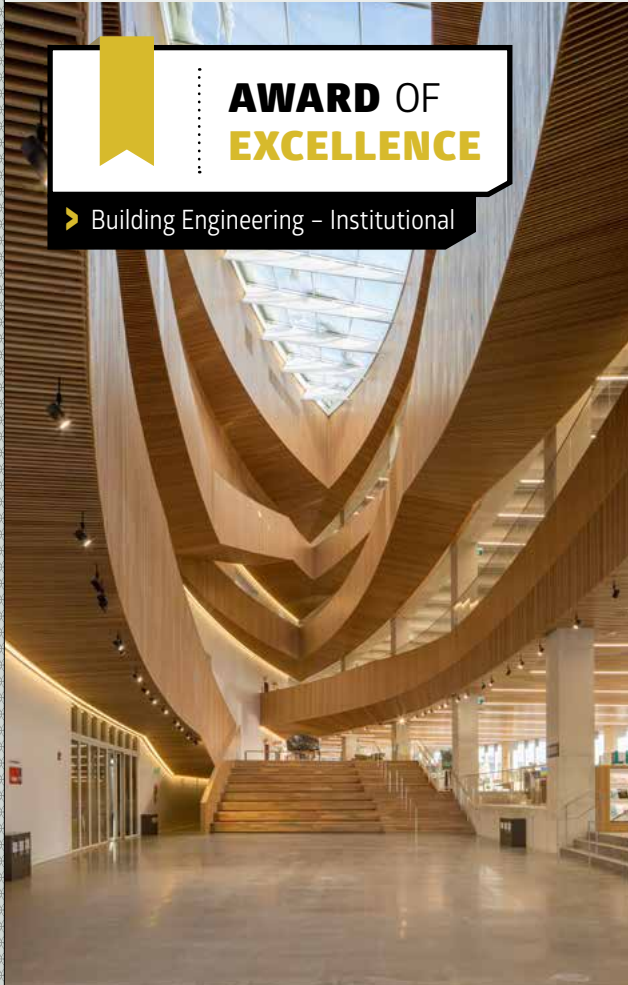
AWARD OF MERIT

> Sustainable Design



JUDGES' COMMENTS

Impressive risk mitigation, forward-looking environmental outcomes, high degree of innovations and significant benefits to society. From the steel outriggers to the way you addressed the stacking effect, this project is a tour de force of what Alberta engineering can accomplish.



AWARD OF EXCELLENCE

> Building Engineering – Institutional

New Central Library

FIRM: SMP Engineering

CLIENT / OWNER: Calgary Public Library

LOCATION: Calgary, Alberta

SUB CONSULTANTS: DIALOG Alberta Architecture Engineering Interior Design Planning Inc., Entuitive Corporation

CONTRACTORS: Stuart Olson Inc., Canem Systems Ltd.

OTHER KEY PLAYERS: DIALOG Alberta Architecture Engineering Interior Design Planning Inc., Snøhetta, McSquared System Design Group, Inc., CMLC, City of Calgary, Colliers Project Leaders

The new Central Library was designed to bridge the gap between the existing downtown core and the new East Village development. Serving as the flagship library within the City of Calgary, the design concept was focused on social interaction, studying, learning and community activities. Built on four levels, the building has designated areas for varying uses and houses a 350-seat theatre, performance hall and public gathering spaces, in addition to its physical collection of books. Constructing atop an existing LRT track (which remained in service continuously during construction) presented numerous engineering challenges, which the design team addressed while staying on-budget.



JUDGES' COMMENTS

This project will be a landmark for citizens to enjoy for many years. A perfect example of how engineering and architecture can combine to create extraordinary public spaces.

SHOWCASE AWARDS

> 2020



AWARD OF EXCELLENCE
> Community Development

AWARD OF MERIT
> Water Resources



Harvie Passage Rehabilitation

FIRM: Klohn Crippen Berger Ltd.
CLIENT / OWNER: Alberta Environment and Parks, Alberta Transportation
LOCATION: Calgary, Alberta
SUB CONSULTANTS: SGI Water Consulting Ltd., Recreation Engineering & Planning, Northwest Hydraulic Consultants Ltd., O2 Planning and Design
CONTRACTORS: Bluebird Contracting Services

Klohn Crippen Berger Ltd. was engaged to plan, design, and administer construction of the rehabilitation of the Harvie Passage, which was damaged in the unprecedented flood of June 2013. Harvie Passage's primary purpose is to enable river passage for boaters and fish while maintaining water diversions from the Bow River. Rehabilitation of Harvie Passage allowed "lessons learned" from its design and construction to be implemented, leading to a more robust and sustainable facility with creation of terrestrial and aquatic habitats that are seamlessly integrated into Pearce Estate Park, creating a unique recreational amenity for the City of Calgary.

JUDGES' COMMENTS

Wonderful blend of safety, recreation, environment and technical. This competently planned, designed and managed rehabilitation project provides a valuable, environmentally friendly, recreational amenity for the City of Calgary.



AWARD OF EXCELLENCE

> Community Outreach and In-House Initiatives

Continuous Improvement Program at Arrow

FIRM: Arrow Engineering Inc.

CLIENT / OWNER: Arrow Engineering Inc.

LOCATION: Edmonton, Alberta

Arrow Engineering engaged employees in a program of Continuous Improvement to change how the company operates. The program is organized around Lean Management principles and is designed to ensure employees, at every level of the company, operate in a way that is driven by constant, ongoing improvement.

Continuous Improvement makes Arrow different, and lean thinking is built into the culture and work ethic. The program has made a significant and measurable difference by enabling staff to continuously improve their ability to provide value for clients at every step in the design and engineering process.

JUDGES' COMMENTS

Arrow is to be commended for implementing a culture of continuous improvement that has a positive impact on company performance and client relationships, including cost and time efficiencies for both Arrow and its clients. I am impressed at how Arrow has incorporated it within its firm and engaged staff. Well done.



SHOWCASE AWARDS

> 2020



AWARD OF
EXCELLENCE

> Environmental

Aurum Energy Park - Aurum Road Wildlife/Creek Crossing

FIRM: Stantec Consulting Ltd.

CLIENT / OWNER: Aurum Industrial Development Partnership

LOCATION: Edmonton, Alberta

CONTRACTORS: Sureway Construction and Management Ltd.

OTHER KEY PLAYERS: Keller Canada, Lafarge Holcim Canada, Reward Construction, RECO Canada, Wells Construction, WILCO Contractors Northwest Inc., Jatec Electric, ATCO Gas, EPCOR Power, Raywalt Construction Company Ltd., Alberco Construction Ltd.

Since 2008, Stantec has helped Focus Equities create connections between people, resources and infrastructure by designing a new 800 metre road from 9 Street to 17 Street Northeast that joins with Anthony Henday Drive. To allow for continued wildlife movement through the area, a large arch culvert of 21.5 metres wide by 8 metres high and 67 metres long—the biggest one in Edmonton—has been constructed through the deep Cloverbar Creek Ravine. The Aurum Arch Culvert improves connectivity within Aurum Energy Park, a vast and busy industrial hub, all while accommodating wildlife and preserving the area's unique history.



JUDGES' COMMENTS

This project proved that urban development and natural areas can be built to co-exist with benefits for all. Many complex variables and requirements in design and construction were well managed and came together in a very functional and visually appealing manner. Stantec delivered a great project where urban/ business developments and wildlife needs were addressed without putting one at the detriment to the other – a great balance.



AWARD OF EXCELLENCE

➤ Natural Resource
Production

Destiny Organics - Worm Farm

FIRM: Arrow Engineering Inc.

CLIENT / OWNER: Destiny Organics

LOCATION: Edmonton, Alberta

CONTRACTORS: Synergy

OTHER KEY PLAYERS: Planworks Architecture

Destiny Organics specializes in high-quality organic fertilizer and soil components for cannabis cultivation. To support and improve production, it required new facilities, including a storage and processing warehouse to house worms whose casings are an integral component to Destiny's organic products. The 90,000-square-foot facility required consultation services from Arrow Engineering for the electrical, mechanical, and civil engineering, as well as energy modeling. Working with Synergy, the general contractor and Planworks Architecture, the team delivered exceptional service on a unique facility designed and built to create a productive home and optimal environment for the worms.

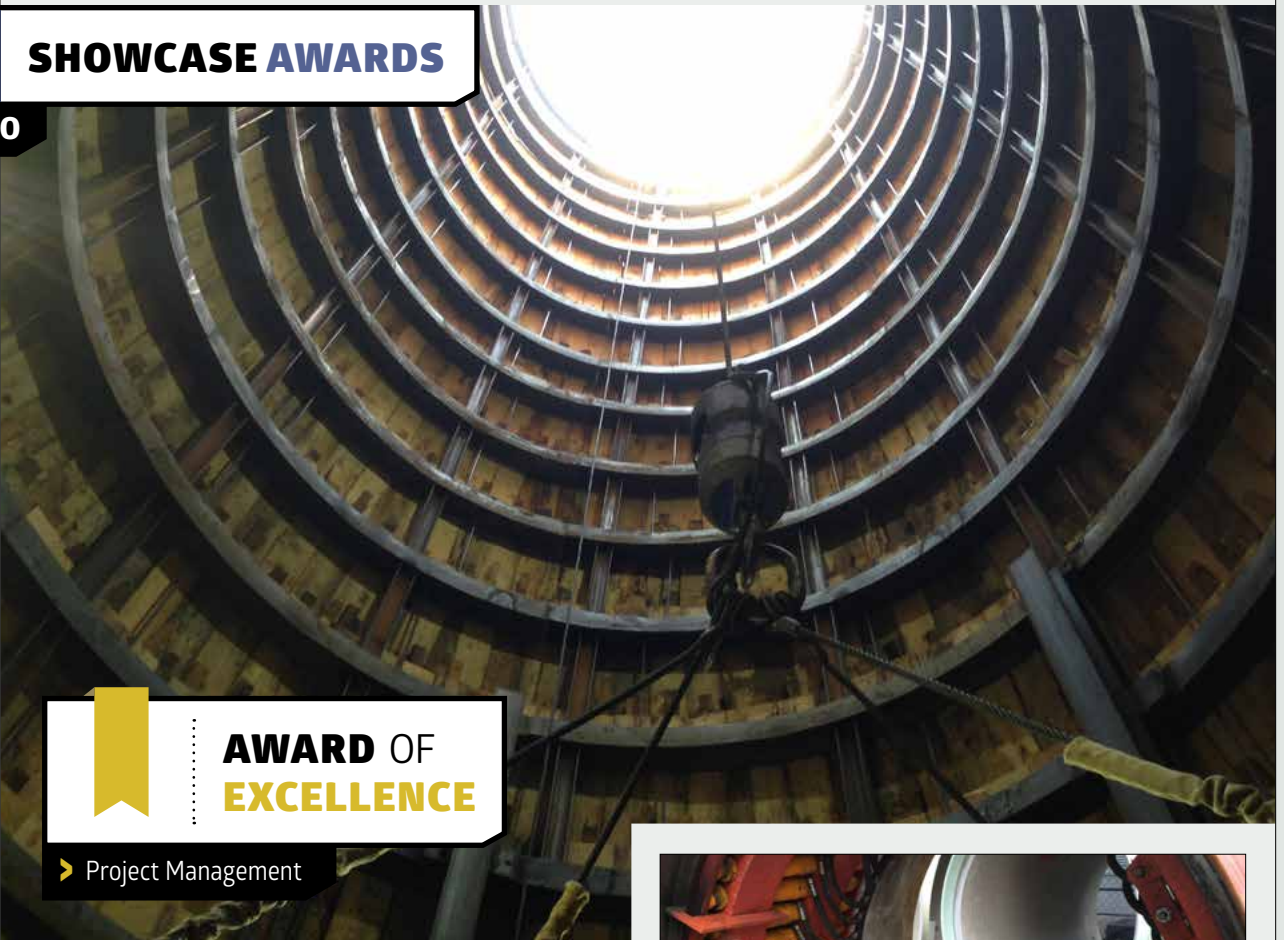
JUDGES' COMMENTS

A client-centred service-based approach contributed to the success of this challenging project.



SHOWCASE AWARDS

> 2020



**AWARD OF
EXCELLENCE**

> Project Management

Tunnelling Towards the Future: Edmonton's Downtown Intensification Storm Tunnel Project

FIRM: SMA Consulting Ltd.

CLIENT / OWNER: EPCOR

LOCATION: Edmonton, Alberta

CONTRACTORS: Associated Engineering, Shanghai Construction Group Canada Corporation, Thurber Engineering Ltd., CKB Construction

OTHER KEY PLAYERS: Stantec Consulting Ltd., Golder Associates Ltd., John Wood Group PLC

The 2.5 km Downtown Intensification Storm Tunnel supports development in Edmonton's core and reduces combined sewer overflow by 30%. EPCOR Drainage (formerly the City of Edmonton Drainage Services) worked with SMA Consulting, Shanghai Construction Group Canada, Associated Engineering, and other consultants to face downtown traffic, flowing sand, nearby gas and water lines, boulders, metal remnants from a century-old mine, crossing under the LRT, and many other challenges to complete this project. The highest-risk southernmost portion was delayed, but good planning and management meant 90% of the tunnel was in service early and the entire project was completed 10% under budget.



JUDGES' COMMENTS

Extremely interesting and challenging project throughout. Consistently high degree of difficulty matched with great benefit to society. Fantastic project.



**AWARD OF
EXCELLENCE**

> Small Firm – Big Impact

Big Lakes County: Joussard Water Treatment Plant

FIRM: M2 Engineering

CLIENT / OWNER: Big Lakes County

LOCATION: Joussard, Alberta

SUB CONSULTANTS: Wave Engineering Consultants Inc., J. Davis Engineering Ltd., Riddell Kurczaba Architecture Engineering Interior Design Ltd.

CONTRACTORS: Chandos Construction Ltd.

The hamlet of Joussard in Big Lakes County is a growing community on the south shore of Lesser Slave Lake. Originally, the county planned two projects: upgrade the water treatment plant and construct a new storage reservoir. M2 Engineering identified the challenges with this and proposed to combine the projects, offering project efficiency. The new water treatment plant and reservoir provides a robust and resilient treatment system with flexibility to accommodate the changing water quality of the lake. M2 Engineering led the project through planning, design, and construction with their team of experts: Wave Engineering, J. Davis Engineering and Riddell Kurczaba Architecture.



JUDGES' COMMENTS

M2 Engineering provided important and innovative leadership for the design and construction of a robust and reliable water treatment facility that ensures a sustainable supply of reliable drinking water for the community of Joussard in Big Lake Country. Great to see the creativity of combining the projects and challenging the client/owner to consider an alternative approach to problem solving.

SHOWCASE AWARDS

> 2020



Show Me the Money: Financial Viability Analysis for Growth in Strathcona County

FIRM: SMA Consulting Ltd.

CLIENT / OWNER: Strathcona County

LOCATION: Edmonton, Alberta

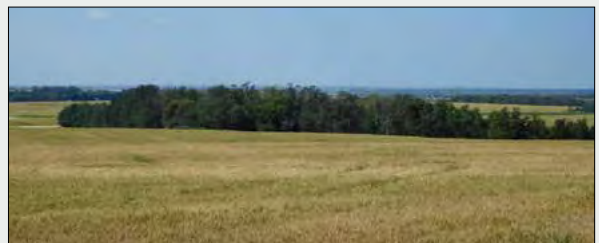
OTHER KEY PLAYERS: Stantec Consulting Ltd.

Bremner will be a new kind of community in Strathcona County – a vibrant, walkable, transit-friendly area with nearby employers in the Local Employment Area (LEA), accommodating 79,000 people with densities twice the county average. The challenge was demonstrating financial viability for the \$2 billion in necessary infrastructure. SMA Consulting worked with Strathcona County and Stantec to develop an advanced model, integrating asset management, Monte Carlo simulation, and genetic algorithms. Fifteen scenarios, 500 million calculations, and several Council presentations later, Bremner and the LEA were shown to be fully financially viable, a major factor in Strathcona County Council's decision to approve development.



AWARD OF EXCELLENCE

> Studies, Software and Special Services



JUDGES' COMMENTS

Municipal planning implementation directly impacts the taxpayers. Doing it appropriately can therefore result in savings to every home owner and business, reduced waste of materials and efforts and reduced environmental impacts. This project was comprehensive in its scope and work, with the result of providing meaningful information to guide Strathcona County going forward. SMA did a competent and skillful job in delivering.



AWARD OF EXCELLENCE

> Water Resources

AWARD OF MERIT

> Sustainable Design

Bow River Bioengineering Demonstration and Education Project

FIRM: Kerr Wood Leidal Associates Ltd.
CLIENT / OWNER: Government of Alberta, City of Calgary
LOCATION: Calgary, Alberta
SUB CONSULTANTS: Hemmera Envirochem Inc. (an Ausenco Company) Prime Consultant, Terra Erosion Control Ltd., O2 Planning + Design Inc., Thurber Engineering Ltd., Polster Environment Services Ltd.
CONTRACTORS: DFH Enterprises Inc.

The Bow River Bioengineering Demonstration and Education Project (BDEP) is a next generation riverbank erosion protection project for Alberta. Borne in response to the 2013 flood, it is the largest initiative under the Southern Alberta Fisheries Habitat Enhancement and Sustainability program and is the largest bioengineering project in Calgary. It elevates the understanding, acceptance and application of bioengineering design by showcasing seven successful common techniques and introducing seven new techniques to expand the bioengineering design toolbox, and by openly sharing project technical documentation, research findings, and performance monitoring results.



SHOWCASE AWARDS

> 2020

AWARD OF EXCELLENCE

- > Transportation Infrastructure - Roads, Interchanges, Airports, Mass Transit



WestJet Wide Body Hangar at Calgary International Airport

FIRM: Stantec Consulting Ltd.

CLIENT / OWNER: WestJet

LOCATION: Calgary, Alberta

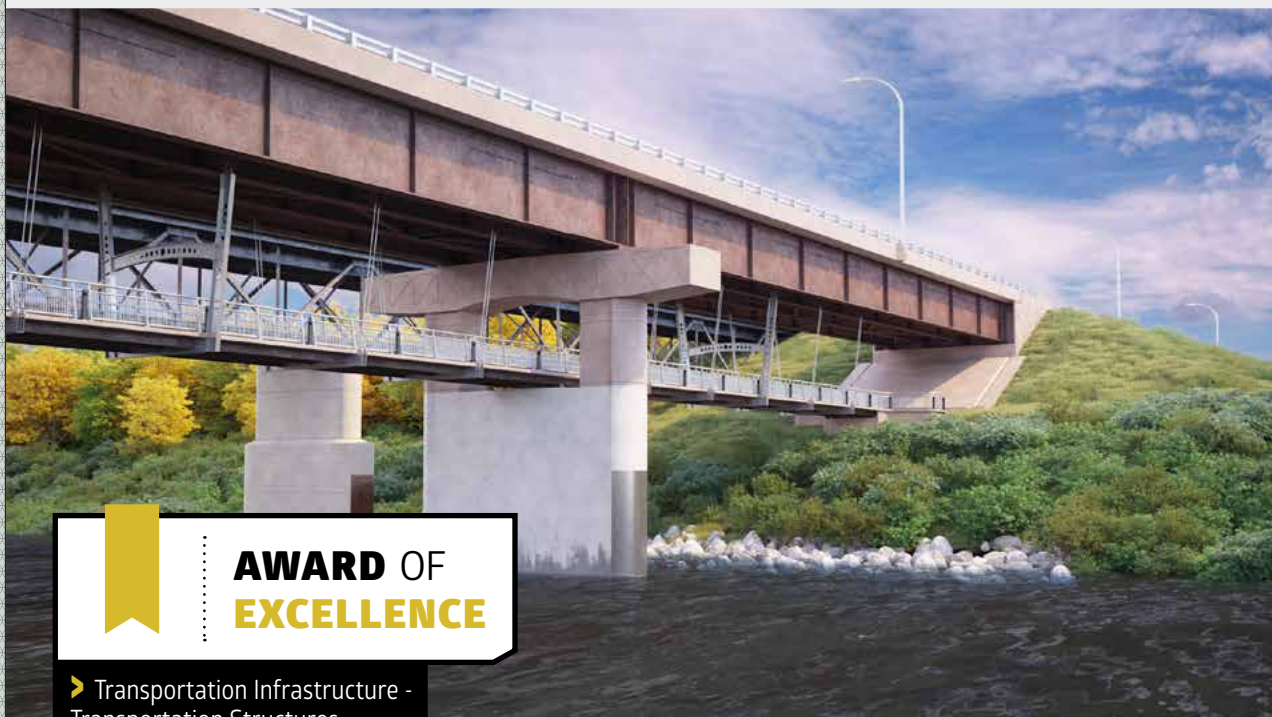
CONTRACTORS: Cana Construction

Spanning larger than three football fields, the WestJet hangar at the Calgary International Airport is the only place that can service the 787 Dreamliner west of Toronto. It also provides attractive and functional office space for 130 staff. Standing 80 feet tall, with over 125,000 square feet of floor space, the hangar is a structural feat for its long spanning steel deck and conscious reduction of material use. WestJet can now offer true long-haul service to Europe and Asia, increasing its fleet by 200 percent and expanding its stake in the travel industry.

JUDGES' COMMENTS

Many components of this project came together to give the client everything they wanted in an open, spacious and safe design. Construction elements were innovative and really set this building apart from the rest. Larger than life structure that keeps up with the leading-edge aircraft.





AWARD OF EXCELLENCE

› Transportation Infrastructure -
Transportation Structures

Highway 15 Twinning: North Saskatchewan River Bridge

FIRM: AECOM

CLIENT / OWNER: Alberta Transportation

LOCATION: Near Fort Saskatchewan, Alberta

SUB CONSULTANTS: Tetra Tech Canada Inc., Terrace Engineering Ltd., HFKS Architects Inc., Great Northern Engineering Consultants Inc., Hyroad Surveys Ltd., DEMA Land Services Inc., The Archaeology Group, Spencer Environmental Management Services Ltd.

CONTRACTORS: Alberco Construction Ltd.

OTHER KEY PLAYERS: City of Fort Saskatchewan, Sturgeon County, River Valley Alliance

Twinning of Highway 15 in Fort Saskatchewan includes a new highway bridge and underslung pedestrian bridge over the North Saskatchewan River. Roadway and bridge planning, as well as detailed design, was fast-tracked for this project to address heavy congestion and safety issues for this strategically important corridor between Edmonton and Alberta's Industrial Heartland region. AECOM delivered this Qualifications Based Selection (QBS) project within just 14 months by working collaboratively and innovatively with multiple stakeholders. The underslung pedestrian bridge is highly architectural and is an important part of the River Valley Alliance's goal to provide a continuous trail network within the Edmonton Capital Region.



JUDGES' COMMENTS

A remarkable project. AECOM receives top marks in exemplifying technical excellence in its ability to deliver a high-quality design in 14 months. AECOM was innovative in modifying the planning and design process to dramatically reduce the timelines; they added value and benefit to society through their diligence and focused attention to the inclusion of an underslung pedestrian bridge; and with such a complex and demanding project.

SHOWCASE AWARDS

> 2020

FIRM: MCW Hemisphere Ltd.
CLIENT / OWNER: Alberta Union of Provincial Employees (AUPE)
LOCATION: Edmonton, Alberta
SUB CONSULTANTS: Next Architecture, Entuitive
CONTRACTORS: Bird Construction

The new 125,000 sq. foot AUPE Corporate Headquarters is a building reflective of five key principals important to not only the team charged with the responsibility of delivering the final product but also to the over 25,000 members who will use it. These key values include solidarity, inclusivity, responsible innovation, investment in the membership, and fiscal responsibility. The design and construction team, including MCW Hemisphere, Next Architecture, Entuitive, and Bird Construction, embraced these principals, producing an attractive yet unconventional design based on conventional concepts, a highly collaborative environment, use of technology, and a dedication to thinking and acting differently.

The New AUPE Headquarters - A Collaborative Journey



AWARD OF MERIT

> Building Engineering - Commercial



JUDGES' COMMENTS

Innovation, aesthetics and practicality come together in this environmentally friendly building.

Stoney Transit Facility

FFIRM: AECOM
CLIENT / OWNER: City of Calgary
LOCATION: Calgary, Alberta
SUB CONSULTANTS: Pura Energy Inc., 3 Point Environmental Inc.
CONTRACTORS: PCL Construction Management Inc.
OTHER KEY PLAYERS: Plenary Infrastructure (Canada) Ltd.

The Stoney Transit Facility now houses the City of Calgary's new Compressed Natural Gas (CNG) buses and older diesel buses. Over 450 40-foot buses can be stored in the 44,300 m² facility. Switching to CNG buses will save \$10,000 per bus each year and provide environmental benefits. With storage, maintenance and administration facilities, the site employs over 700 people. The LEED Gold certified building is a bright, safe workspace with hundreds of skylights, open sightlines, and many sustainable design features. This is the City's first Public-Private Partnership. AECOM led the design, supported by Pura Energy and 3 Point Environmental.



AWARD OF MERIT

> Building Engineering - Institutional

> Sustainable Design



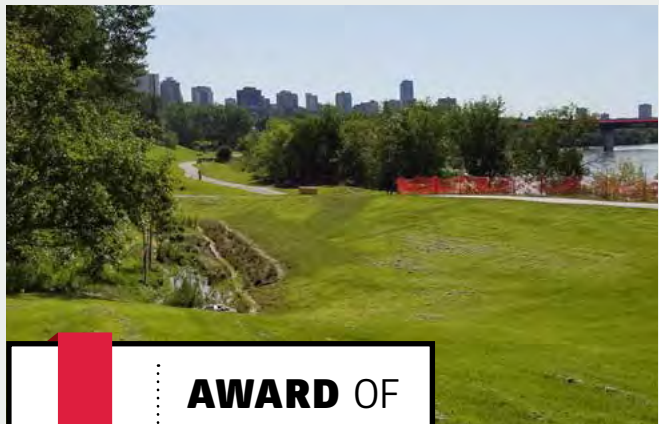
JUDGES' COMMENTS

Extremely important institutional project with great value to society and high degree of technical challenge.

Mackinnon Ravine Trail Icing Mitigation Design

FIRM: Golder Associates Ltd.
CLIENT / OWNER: City of Edmonton
LOCATION: Edmonton, Alberta
SUB CONSULTANTS: Associated Engineering
CONTRACTORS: Wilco Contractors Northwest Inc.

The City of Edmonton retained Golder to solve an ongoing problem with ice accumulation across a major shared-use trail in the North Saskatchewan River Valley at Mackinnon Ravine. Groundwater seeping from the adjacent valley wall formed large-scale, unsafe ice deposits under winter conditions, which resulted in trail closures and could not be managed by conventional means. Golder leveraged its water management expertise and experience working in cold regions to identify an innovative solution, incorporating Low Impact Development principles and taking advantage of nearby stormwater infrastructure to limit disturbance and enhance environmental values at the project.



AWARD OF MERIT

> Community Development



Faro Mine Closure: Environmental Assessment

FIRM: Golder Associates Ltd.
CLIENT / OWNER: Indigenous and Northern Affairs Canada
LOCATION: Faro, Yukon
SUB CONSULTANTS: AECOM, IMG-Golder, Laberge Environmental
OTHER KEY PLAYERS: SRK Consulting Inc., Integral Ecology Group Ltd., Robertson Geoconsultants Inc.

Golder and AECOM, working together, completed an Environmental Assessment (EA) for the Faro Mine Remediation Project. Faro Mine was once the largest open pit lead-zinc mine in the world. Today, it is one of the most complex abandoned mine remediation projects in Canada. To meet commitments to First Nations and limit ongoing site degradation, the team worked expediently to complete the EA, including working collaboratively with First Nations, intervenors and design engineers. The EA required out-of-the-box thinking to meet expectations of the affected First Nations and regulators and to maintain design flexibility while the closure design was under development.



AWARD OF MERIT

> Environmental

JUDGES' COMMENTS

Faro Mine is the largest contaminated site in the history of Canada, which poses daunting engineering challenges. Assessing and managing the ongoing risks that this site poses, long after closure, is fundamental to the health and safety of the ecosystem and local communities.

SHOWCASE AWARDS

> 2020

FIRM: WSP

CLIENT / OWNER: Veresen Midstream Limited Partnership

LOCATION: Hythe, Alberta

Canadian natural gas is one of the most environmentally responsible energy sources in the world. One of the most prolific unconventional resource plays being developed in Western Canada is the Montney. Unlocking resource plays, like the Montney, is made possible through projects like the Hythe Expansion Project.

Assisting its client, Veresen Midstream Limited Partnership (VMLP), WSP is delivering a unique solution that consists of a Sulphur Recovery Unit – the first of its kind in Alberta since the 1990s. By leveraging innovation and exceeding industry standards, the Hythe Expansion will deliver significantly reduced GHG and SO₂ emissions compared to conventional facilities.

JUDGES' COMMENTS

Innovative approach to challenges encountered. Significant benefit to society and environmental practices.

Hythe Train 7 - Sour Gas Processing and Recovery

AWARD OF
MERIT

> Natural Resource Production



Jack Tennant Memorial Bridge: Pre-Construction Collaboration

FIRM: Urban Systems Ltd.

CLIENT / OWNER: Town of Cochrane

LOCATION: Cochrane, Alberta

SUB CONSULTANTS: RJC Engineers, Tetra Tech Canada Inc., Matrix Solutions Inc.

CONTRACTORS: PCL Construction Management Inc.

Urban Systems Ltd. developed a specific value focused procurement model to design and construct the Jack Tennant Memorial Bridge in the Town of Cochrane. To preserve the Town's importance of value, it was evident that a contractor needed to support the design. Consequently, the procurement model resulted in a collaborative contract agreement encouraging the contractor to support the design using a process in accordance with the Town's specific requirements. The collaborative procurement model resulted in a very successful project credited to a highly professional understanding of contractual risk responsibility, eliminating uncertainties that often result in contractual disputes.



AWARD OF
MERIT

> Project Management



JUDGES' COMMENTS

The use of Qualifications Based Selection (QBS) for the engineers and the contractors led to a collaborative management system with positive outcomes.

Structural Rehabilitation of the Wetaskiwin Garden Meadows Reservoir

FIRM: M2 Engineering
CLIENT / OWNER: City of Wetaskiwin
LOCATION: Wetaskiwin, Alberta
SUB CONSULTANTS: Ptarmigan Engineering Ltd., Wave Engineering Consultants Inc.
CONTRACTORS: Alberco Construction Ltd.

The Garden Meadows Reservoir and Pump Station is critical drinking water infrastructure for the City of Wetaskiwin. Visibly deteriorating concrete raised concerns of untreated water ingress into the reservoir. M2 Engineering, supported by Ptarmigan Engineering and Wave Engineering, worked with the City through planning, design, and construction of the structural rehabilitation and upgrades. Various mechanical and electrical upgrades were completed in advance of the structural repairs to ensure water distribution flows could be maintained during the concrete rehabilitation work. Concealed conditions required creative problem-solving during construction. The completed repairs ensure drinking water quality will be maintained well into the future.



AWARD OF MERIT

> Small Firm - Big Impact

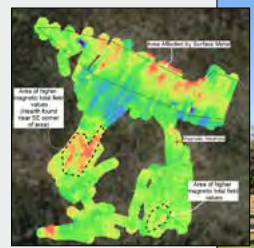
JUDGES' COMMENTS

The initiative and work of M2 Engineering enabled Wetaskiwin to extend the life of this major infrastructure, enabling the City to plan for its replacement and not defer other projects on its utility master plan, along with realising considerable reduced environmental impacts.

Geophysics to Locate Prehistoric Artifacts for Mass Transit Project

AWARD OF MERIT

> Studies, Software and Special Services



FIRM: Tetra Tech Canada Inc.
CLIENT / OWNER: Government of Alberta
LOCATION: Calgary, Alberta
OTHER KEY PLAYERS: Soriak Consulting & Research

When objects such as rocks are heated to high temperatures, the magnetic orientation of the ferrous minerals within them aligns to the Earth's magnetic field. Because the Earth's magnetic field changes over time, the magnetic field of a prehistoric heat-altered object may be different from the current ambient geomagnetic field observed in the surrounding area. Tetra Tech has developed several new geophysical routines to detect these magnetic anomalies. In 2019, it put these routines into practice in Southern Alberta. Multiple anomalies were detected. Near one of the detected irregularities, a prehistoric hearth was located by a team of archeologists.



SHOWCASE AWARDS

> 2020

FIRM: Stantec Consulting Ltd.
CLIENT / OWNER: City of Calgary
LOCATION: Calgary, Alberta
SUB CONSULTANTS: WSP
CONTRACTORS: PCL Construction Management Inc.
OTHER KEY PLAYERS: GEC Architecture, Context Engagement & Communications

The MAX Purple Bus Rapid Transitway (BRT) is a significant regional infrastructure project that will serve as a catalyst for the redevelopment of the International Avenue corridor by providing the first two segments of a critical multi-modal transportation corridor that will ultimately connect Centre City to Chestermere through East Calgary. Implementation of this project included the complete reconstruction of International Avenue to accommodate a first-in-Alberta centre-running transitway and a transit-only corridor over the Bow Valley inclusive of three major bridges. The project team was made up of Stantec, GEC Architecture, Context Engagement and Communications, and WSP (Phase 1 only).

MAX Purple Bus Rapid Transit

AWARD OF
MERIT

> Transportation Infrastructure - Roads, Interchanges, Airports, Mass Transit



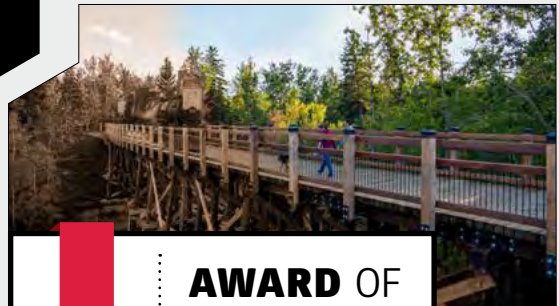
Mill Creek Ravine Pedestrian Bridges

FIRM: ISL Engineering and Land Services Ltd.
CLIENT / OWNER: City of Edmonton
LOCATION: Edmonton, Alberta
SUB CONSULTANTS: Thurber Engineering Ltd., Spencer Environmental Management Services, Golder Associates Ltd., Turtle Island Cultural Resource Management, Twenty/20 Communications
CONTRACTORS: Alberco Construction (Prime), Keller Foundations, Western Archrib, W G Chanin Hardwoods, Shy's Forest Products, IMark Architectural Metals
OTHER KEY PLAYERS: SMA Consulting Ltd.

Mill Creek Ravine is a key component of Edmonton's ecological and transportation network. ISL provided rehabilitation of five pedestrian bridges including three timber trestle bridges on the trail system through the Ravine. The public opined during engagement events that the historic bridges, built in 1902 for the Edmonton, Yukon and Pacific Railway, are a cherished part of the community. ISL's rehabilitation strategies maintained original character of the bridges while improving their safety and durability. Through a systematic grading process, ISL and Alberco Construction salvaged 20% of the historic timbers. The project was within budget and ahead of schedule.

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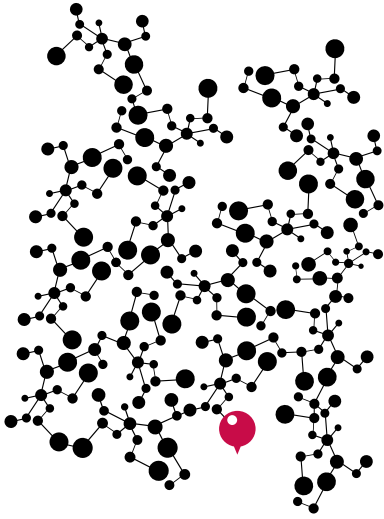
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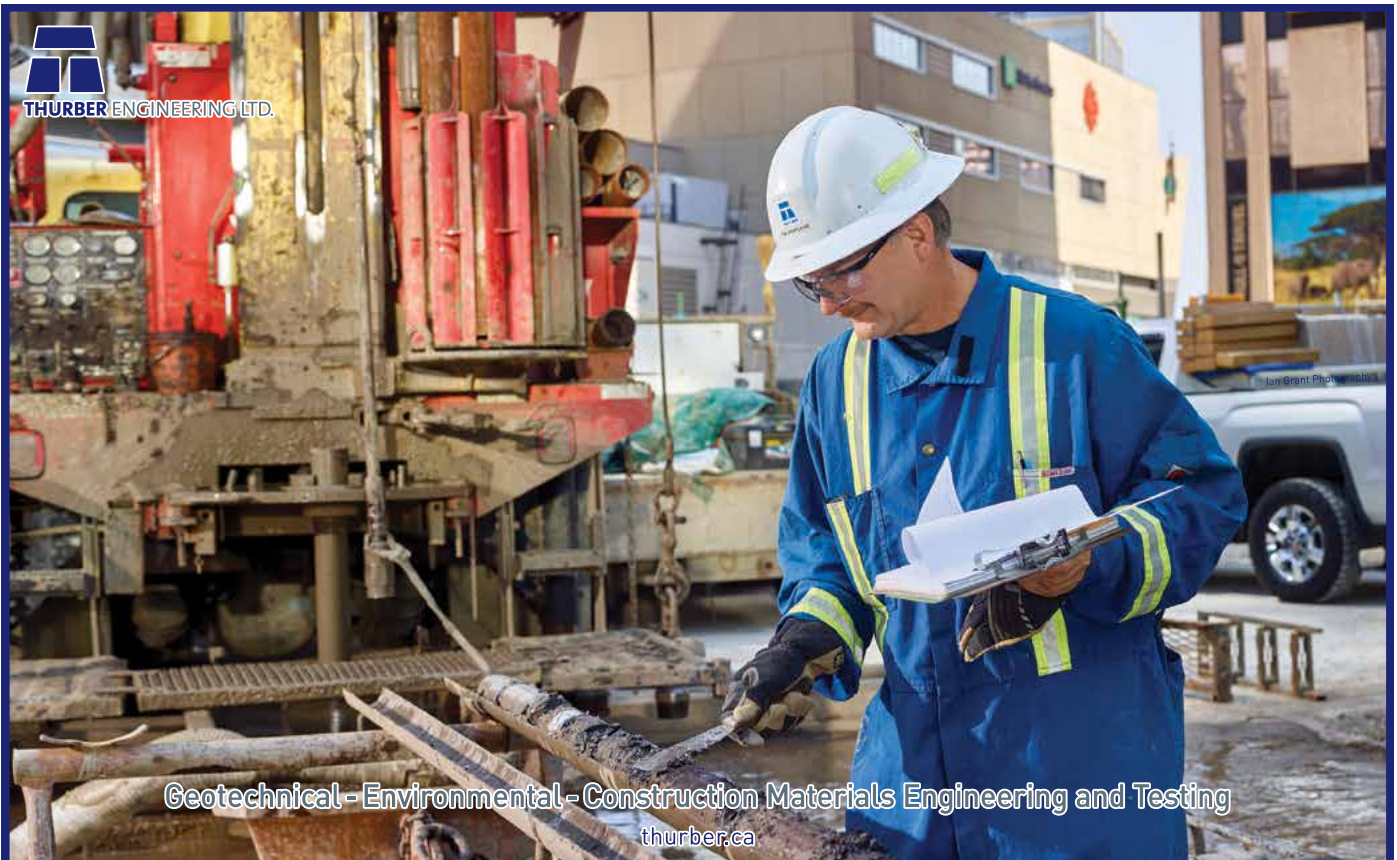
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INDEX OF ADVERTISERS

Al-Terra Engineering Ltd. MATRIX INSERT	
Arrow Engineering	65
Associated Engineering Alberta Ltd.	14
Association of Professional Engineers and Geoscientists of Alberta (APEGA)	4
Association of Science and Engineering Technology Professionals of Alberta	27
exp Services Inc.	19
Hatch	29
HDR Corporation	67
ISL Engineering and Land Services Ltd.	2
Lambert Intellectual Property Law	63
Magna IV Engineering	63
McElhanney Consulting Services Ltd.	14
MPE Engineering Ltd.	57
PCL Construction Inc.	68
RedPoint Media Inc.	63
Rotaflo	61
Sameng Inc.	26
Spencer Environmental Management Services Inc.	61
TD Meloche Monnex Inc.	16
Tetra Tech	16
Thurber Engineering Ltd.	63
Urban Systems	28
Wood	65
WSP	8

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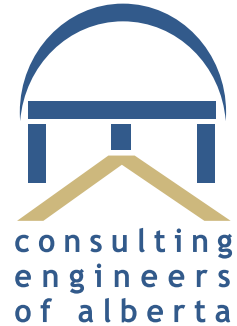
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CEA CODE OF ETHICS

CEA member firms impose upon themselves a very strict Code of Ethics requiring disciplined fulfilment of their duties with honesty, justice and courtesy toward society, clients, other members of CEA and employees. Ongoing regulation by peers ensures quality management practices and the integrity of all CEA members.

CEA membership accreditation criteria are stringent. In addition to conforming with the standards of practice set by the Association of Professional Engineers and Geoscientists of Alberta (APEGA) and the requirement to hold an APEGA Permit to Practice, member firms must maintain permanent facilities with employees in Alberta; be managed by one or more professional engineers; have at least two years operating experience as

a consulting engineering business; and employ an individual in Alberta who has at least five years experience in consulting engineering as a professional engineer. Clients benefit directly by dealing with CEA member firms, professionals who are keenly interested in maintaining and promoting their own business association which, in turn, advocates the veracity and trust which can be expected from each of its members.

SOCIETY

1. Members shall practise their profession with concern for the social and economic well-being of society.
2. Members shall conform with all laws, bylaws and regulations and with the APEGA Code of Ethics.
3. Members shall satisfy themselves that their designs and recommendations are safe and sound and, if their engineering judgment is overruled, shall report the possible consequences to clients, owners and, if necessary, the appropriate public authorities.
4. Members expressing engineering opinions to the public shall do so in a complete, objective, truthful and accurate manner.
5. Members are encouraged to participate in civic affairs and work for the benefit of their community and should encourage their employees to do likewise.

CLIENTS

6. Members shall discharge their professional and business responsibilities with integrity.
7. Members shall accept only those assignments for which they are competent or for which they associate with other competent experts.
8. Members shall immediately disclose any conflicts of interest to their clients.
9. Members shall respect the confidentiality of all information obtained for and from their clients but shall deal appropriately with any matters which may place the public in jeopardy.
10. Members shall obtain remuneration for their professional services solely through fees commensurate with the services rendered.
11. Members shall promote consulting engineering services in accordance with a qualifications based selection system endorsed by CEA.

OTHER MEMBERS

12. Members shall relate to other members of CEA with integrity and in a manner that will enhance the professional stature of consulting engineering.
13. Members engaged by a client to review the work of another member of CEA shall avoid statements which may maliciously impugn the reputation or business of that member.
14. Members shall respect the clientele of other members of CEA and shall not attempt to supplant them when definite steps, including negotiations for an engagement, have been taken towards their engagement.
15. Members, when requesting professional engineering services from other consulting engineering businesses, including members of CEA, shall promote the use of a qualifications based selection system endorsed by CEA.

EMPLOYEES

16. Members shall treat their employees with integrity, provide for their proper compensation, require that they conform to high ethical standards in their work and fully understand this Code of Consulting Engineering Ethics.
17. Members shall not require or permit their employees to take responsibility for work for which they are not qualified.
18. Members shall encourage their employees to enhance their professional qualifications and development through appropriate continuing education.



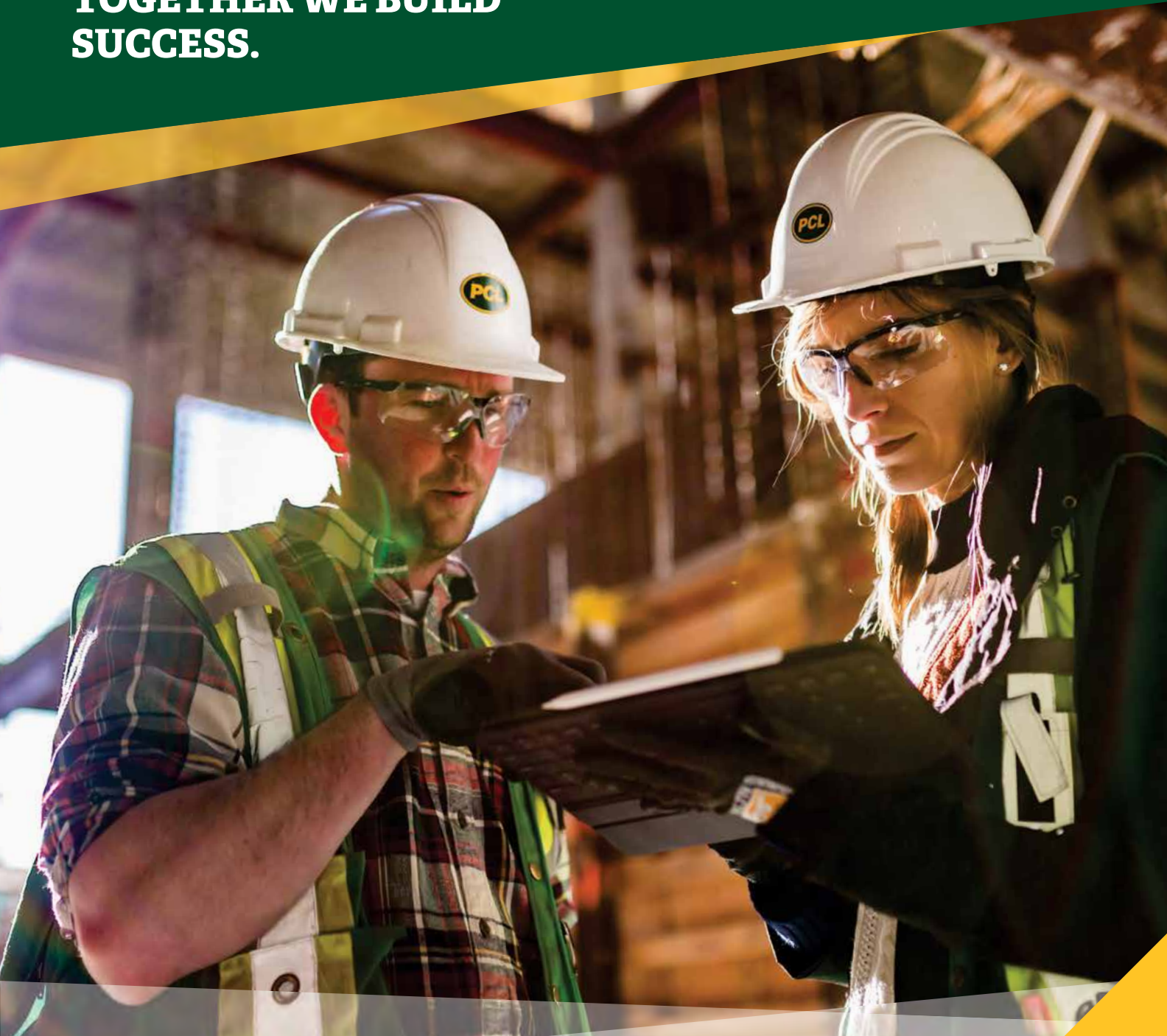
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