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CANADIAN CIVIL ENGINEER | L'INGÉNIEUR CIVIL CANADIEN

So, What's in a Name?

ENVISION REFRESHER

DES NOUVELLES D'ENVISION

**Gordie Howe
International Bridge 15**

**Le nouveau pont
international de Gordie-Howe 17**

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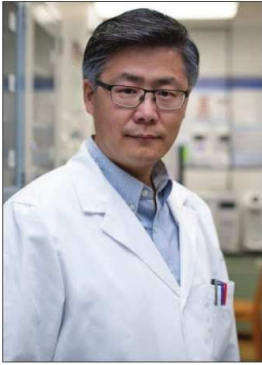
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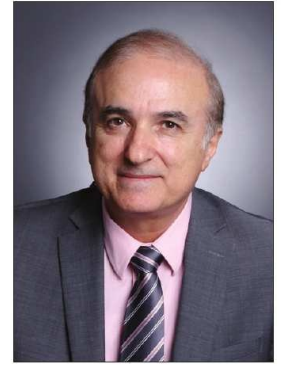
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CIVIL CORRECTION

In the Fall 2020 issue of *CIVIL*, the Canadian Society for Civil Engineering featured the 13 members who were distinguished through their election as Fellows. This page is a re-feature of those 13 selected members with our apologies and a correction to their cities of origin.



Mohsen Rassem,
Regina, SK



Jonathan Reiter,
Victoria, BC



Alcide Richard,
Moncton, NB



Aminah Robinson Fayek,
Edmonton, AB



Bruce Wilson,
Fredericton, NB

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Catherine N. Mulligan,
ing., Ph.D., FCSCE, FEIC, FCAE
President, CSCE
president@csce.ca

Meeting the present challenges

Dear friends, colleagues and members,

At this time, the impact of COVID-19 is still continuing as we are now into a second wave. As going out now requires masks, we'd like to remind members that we have a new partnership with GOMASK to supply your masks.

This new reality has been tremendously challenging for everyone, including the CSCE. This past August, both the annual conference and the 2020 ACMBS – 8th International Conference on Advanced Composite Materials in Bridges and Structures were cancelled by the local organizing committees. During the outbreak, the Canadian Government launched a series of financial support initiatives for organizations. However, despite sending numerous letters to various federal ministers, none of these appeals were successful. We were, however, able to take advantage of the CERB, a loan, and the partial payment of salaries.

Following the board meeting, which was held virtually in June, new taskforces were established and are continuing their work, including revenue generation, establishment of certificates and the Envision Steering Committee. Most recently, we launched a taskforce to evaluate the potential of hiring

an executive director, a position that we have not had since 2017. Status reports from all are expected at the next board meeting in November. The next edition of *CIVIL* will cover this. The new strategic initiatives were described in the Fall 2020 issue. Townhalls to promote them will be held in the future.

Another new and exciting initiative was also formed to hold online webinars starting this fall every two weeks on Wednesdays from 1:00 to 2:00 Eastern time, using Zoom. These webinars started on September 16 with Tom Middlebrook, P.Eng., Senior Vice President, Strategic Business Development, Dragados Canada, to speak on the Construction of the Gordie Howe Bridge (Windsor-Detroit). This was followed by Mike Bartlett of the History Committee who spoke on Tales from CSCE Civil Engineering Historic Sites and then yours truly, who presented Sustainable Engineering Practices for Contaminated Sites. So, visit our website and look out for the e-bulletins, which provide updates on new webinars. These webinars will remain free for members and is another good reason to renew your membership for the coming year. You should have recently received the reminder so, please do the renewal as soon as you can. It will be much appreciated.

Planning for the next CSCE 2021 Annual Conference and the Triennial Summit with the ASCE and ICE are underway. We have had to shift both to virtual conference formats as we do not know what next spring holds. In addition, we have now procured a new publishing company to publish the conference papers on SCOPUS. This will increase the impact of our conference papers worldwide, so we look forward to your paper submissions.

In conclusion, I would like to acknowledge all the contributions of Lyanne St. Jacques, particularly the look and content of past issues of the *CIVIL* magazine. She has recently left the CSCE, however, her contributions are very much appreciated. We wish her all the best in her new endeavours. We also welcome Peter George who has now joined the effort of putting this edition together.

As always, be seen, be heard and be relevant. We must all work together in this new world.

Best regards.

Catherine N. Mulligan,
ing., Ph.D., FCSCE, FEIC, FCAE
President, CSCE/Président de la SCGC
president@csce.ca. ■



Catherine N. Mulligan,
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Relever les défis actuels

Chers amis, collègues et membres,

À l'heure actuelle, la pandémie de COVID-19 se poursuit : nous voilà plongés dans une deuxième vague. Comme les sorties nécessitent maintenant de porter un couvre-visage, nous voulons rappeler aux membres notre récent partenariat avec GOMASK pour nous approvisionner en masques.

Cette nouvelle réalité a posé un énorme défi pour tous, y compris pour la SCGC. En août dernier, le congrès annuel et la 8e Conférence internationale sur les matériaux composites d'avant-garde pour les ponts et structures ont tous deux été annulés par les comités organisateurs locaux. Pendant la pandémie, le gouvernement canadien a adopté une série de mesures d'aide financière pour les organismes. Cependant, malgré l'envoi de nombreuses lettres à divers ministres fédéraux, aucune de nos demandes n'a abouti. Nous avons cependant pu bénéficier de la PCU, d'un prêt et du paiement partiel des salaires.

À la suite de la réunion du conseil d'administration de juin, qui s'est tenue en mode virtuel, nous avons créé des groupes de travail, qui sont toujours à l'œuvre, notamment pour générer des revenus, établir des certificats et former le comité directeur Envision. Plus récemment, nous avons confié à un autre groupe de travail l'évaluation de la possibilité d'embaucher à nouveau une direction générale, poste inexistant depuis

2017. Chacun de ces groupes doit présenter un rapport de la situation à la réunion du conseil d'administration de novembre, et le prochain numéro de CIVIL fera le point sur ces comptes rendus. Les nouvelles initiatives stratégiques ont été présentées dans le numéro d'automne 2020, et des assemblées visant à promouvoir ces initiatives sont au programme.

Autre nouveau projet emballant : l'organisation de webinaires sur Zoom toutes les deux semaines, le mercredi de 13 h à 14 h, heure de l'Est. Le premier webinaire a été présenté le 16 septembre par Tom Middlebrook, ing., vice-président principal du développement stratégique des entreprises à Dragados Canada, qui a parlé de la construction du pont Gordie-Howe (Windsor-Détroit). Mike Bartlett, du comité d'histoire, a ensuite proposé des récits de sites historiques de génie civil de la SCGC, puis j'ai moi-même présenté des pratiques d'ingénierie durable pour les sites contaminés. Je vous invite à consulter notre site Web et à surveiller les bulletins électroniques pour tous les détails sur les prochains webinaires. Ces derniers resteront gratuits pour les membres et constituent une raison de plus de renouveler votre adhésion pour l'année à venir. Vous devriez avoir reçu le rappel récemment, et nous serions très reconnaissants de votre prompt renouvellement.

Par ailleurs, nous travaillons actuellement à la planification du congrès annuel de la SCGC 2021 et du sommet triennal avec l'ASCE et l'ICE. Nous présenterons ces deux événements en format virtuel, car nous ne savons pas ce que le printemps prochain nous réserve. En outre, nous avons trouvé une nouvelle maison d'édition pour publier la documentation du congrès sur SCOPUS. Ce choix permettra d'accroître la portée de nos publications dans le monde entier, c'est pourquoi nous attendons avec impatience vos propositions d'articles.

En conclusion, j'aimerais remercier Lyanne St-Jacques pour l'ensemble de son travail, et en particulier pour la présentation et le contenu des derniers numéros de la revue CIVIL. Elle a récemment quitté la SCGC, mais nous sommes très reconnaissants de sa contribution. Nous lui souhaitons beaucoup de succès dans ses nouvelles fonctions. Nous souhaitons également la bienvenue à Peter George, qui a participé à la réalisation de ce numéro.

Comme toujours, soyez vus, soyez entendus et soyez pertinents. Nous devons tous travailler de concert dans cette nouvelle réalité mondiale.

Mes sincères salutations.
Catherine N. Mulligan,
ing., Ph.D., FCSCE, FEIC, FCAE
President, CSCE/Présidente de la SCGC
president@csce.ca ■



MacKenzie Walker,
P.Eng., MCRP
Vice-President, Western Region

Opportunities to Expand **Abound**

Uneventful. It's how I've begun to describe 2020, fully saturated in irony of course. But amid the challenges of the pandemic, our society and the sections within the Western Region have continued to find new ways to host events while pulling together our members and the profession.

I'd like to encourage you to volunteer with the Western Regional Council. You can reach out to me, or your local section. This society is built by and for us members. In this vein, I'd like to thank Hazel Battad and Alex Drover from the Edmonton and Vancouver sections respectively, for serving as our regional representatives on the National Tech-Talks Task Force.

First Western Regional Council Meeting

In May, we had our first Western Regional Council meeting in more than three years. I hosted the meeting from my home in Vancouver on the unceded territories of the Musqueam, Squamish, and Tsleil-Waututh Nations. Our subsequent meeting in October was full of updates and innovations. The Vancouver Island Section, chaired by Jonathan Reiter, has been assessing how to adapt its programming. As a growing section, there had been exciting progress last year with its dinner presentations. Ah, the good ol' days of gathering in person. I miss those, as I'm sure you do, too.

The Calgary Section, chaired by Annie Wang, is planning a four-part webinar series on the Calgary Cancer Centre to showcase the multidisciplinary aspects of the \$1.4B project. They are also planning a virtual popsicle bridge competition, where teams from University of Calgary and Southern Alberta Institute of Technology will see their masterpieces tested to their limits. It is an innovative spin, which allows them to carry on with a local tradition.

The Vancouver Section, chaired by Luis Valenzuela, has launched a monthly webinar series. The September presentation featured an overview of the Vancouver Fraser Port Authority-led Transportation Infrastructure projects. The presentation was well attended and reached members and non-members.

The Edmonton and Northern Alberta Section, chaired by Eugene Hsung, has a group of dedicated and collaborative volunteers who make the lifting lighter with many hands. In July, they hosted a virtual AGM and technical presentation, and will continue with both virtual presentations and technical site tours, organized to follow COVID-19 protocols. In the past, they have had issues with free registrants not attending events, so they implemented a nominal \$5 registration fee for their webinars. Since their costs are lower than

in-person events, they are able to donate all the proceeds to the University of Alberta Food Bank.

If you'd like more information on the webinars and virtual events being hosted by the sections in the western region, please visit the sections webpages, or subscribe to their newsletters, Facebook or LinkedIn updates. Our student chapters in the region are doing great work too, but I cannot fit it all into one short update. I will highlight that this is a challenging time to be a student. Focusing on school while attending virtually is certainly not easy and may lead some to feel isolated. I encourage all members to consider opportunities to connect with their local student chapters. There is a greater need now for mentorship and "practitioner advisors" who can provide guidance to the future leaders of our society.

This year has also resulted in conversations on how our systems may marginalize groups within our society. The engineering profession does not operate outside of these systems, neither is it altruistic and unbiased. As one outlet to explore and better understand these issues, the Engineering Students Services at University of British Columbia (UBC) has launched a virtual four-part series on Truth and the Role of Engineering in Decolonization. Having participated, I encourage you to consider similar initiatives, share resources, and challenge yourself to seek out the voices of those you may not be hearing from in your offices and on your teams.

We are also exploring opportunities to expand the presence of the CSCE, particularly in Northern BC. Dr. Jianbing Li, professor at the University of Northern British Columbia (UNBC) is leading the way. UNBC launched its Civil and Environmental Engineering programs two years ago, in addition to its Environmental Engineering program provided jointly with UBC. We are excited by the potential of establishing a new Student Chapter at UNBC and a new CSCE Section for Northern BC. There are more than 40 CSCE members in Northern BC, with approximately 20 of them based in Prince George where UNBC is located. It is an exciting time to consider opportunities to expand the society to better serve civil engineering practitioners in Northern BC.

Lastly, we are excited that the CSCE National Conference for 2022 will be in Whistler, BC. The Local Organizing Committee has been formed with Dr. Rishi Gupta as the chairperson. I'm sure you too are excited to gather again in person. I hope to see you all at the 2022 Whistler Conference with the pandemic hopefully behind us. Until then, stay well. ■

The Importance of Collaboration for Career Development



Rami Mansour, M.A.Sc., P.Eng.
 Bridge Designer, SYSTRA-IBT Chair, National Young Professionals Committee, CSCE

The COVID-19 pandemic has impacted the lives of people in numerous ways. Statistics Canada reports that one-third of businesses have more than 10% of their workforce working from home. Nearly half of professional, scientific and technical service businesses expect that 10% or more of their workplace will continue working from home after the pandemic is over (Statistics Canada 2020). For Canadian civil engineers, the latest technologies provide the means to work from home without impacting short-term productivity. Collaboration software has become widely available, safely allowing meetings between coworkers. Although there are some jobs where working from home is not feasible, there are still opportunities for flexible workdays.

Working from home provides engineers with flexibility, which can create a better work-life balance. However, the potential long-term impacts on the development of young civil engineering professionals is not yet clear. The first few years of an engineer's career are critical in developing the skills, understanding and confidence needed to progress into an intermediate and senior engineering role. Traditionally, engineering firms provide a mentorship program where experienced engineers supervise and provide guidance to younger engineers. Working from home makes the mentor-mentee relationship more difficult to develop and maintain. In many instances, being together in the same room makes it easier to discuss problems and gain understanding of difficult technical material. Working apart also makes it more difficult for supervisors to assess the development of younger engineers, potentially impacting the rate of career advancement.

In addition to mentorship, there is benefit to unorganized social interactions that regularly occur in workplaces. This includes discussions over coffee, at lunch, or in office hallways. These informal settings provide a safe environment to share ideas or discuss doubts. Current collaboration software requires more formal request to discuss specific topics, and it remains difficult to recreate unorganized social interactions.

Any major shifts in work culture also requires equal shifts in human behaviour. As it is likely that there will be a lasting change to the workplace after the pandemic, it will be important that young professionals be proactive in engaging in social activities with coworkers, including their mentors.

This can be achieved by coordinating schedules to be at the office on the same days as those who most collaborate. In addition, scheduling after work meetups can help keep the bonds between coworkers strong. For young professionals, scheduling one-on-one time with supervisors can be a critical aspect of development, and is something that should be done often. During a health pandemic, this

requires that employees follow the recommendations of local health experts, and employers ensure that proper protective equipment and rules are in place.

The COVID-19 pandemic has shed light on the benefits of working from home, and may result in a shift in industry workplace practices. These shifts must be balanced with social changes that maintain both formal and informal collaboration between co-workers.


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- Statistics Canada (2020). "Canadian Survey on Business Conditions: Impact of COVID-19 on businesses in Canada, May 2020" The Daily. Statistics Canada Catalogue no. 11-001-X. Ottawa: Statistics Canada. ■

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THE CUTTING EDGE

City of Toronto's Don River and Central Waterfront and Connected Projects (DR&CW Project)



COXWELL BYPASS TUNNEL


One of three tunnels that form the backbone of the DR&CW Project.

Black & Veatch, in association with R.V. Anderson Associates Limited (BV/RVA), have been contracted by the City of Toronto to undertake detailed design and construction administration of the Coxwell Bypass Tunnel project. The project is meant to address degraded environmental conditions in the Lower Don River.

The Coxwell Bypass Tunnel is one of five stages of the DR&CW Project which is an integrated system of tunnels and storage tanks to intercept and store wet weather flows, along with key infrastructure upgrades at Ashbridges Bay Treatment Plant.

The Coxwell Bypass Tunnel consists of a deep-rock tunnel that includes five deep-rock wet weather flow storage shafts, eleven deep-rock drop shafts and deaeration / adit tunnels, and two at-grade sewer connection structures.

BV/RVA, North Tunnel Constructors (JayDee Canada, Michels Canada, and C&M McNally Tunnel Constructors), and the City of Toronto are working together to deliver the Coxwell Bypass Tunnel Project. Construction commenced in August 2018 with expected completion in 2024.





Charles-Darwin Annan, Ph.D., P.Eng.,
Chair, CSCE Student Affairs Committee
Professor of Civil Engineering at
Université Laval, Québec City

Introducing the CSCE Student Champions!

Students play a pivotal role in the survival and growth of the civil engineering profession. Their voices matter. The Canadian Society for Civil Engineering (CSCE) recognizes this fact and has made it its mission to provide opportunities to help stimulate early professional consciousness. Under this backdrop and in the face of the challenges currently confronting us, the CSCE, through its Student Affairs committee has launched an initiative to solidify the place of students in the Society and to provide a platform to amplify the voice of students. The CSCE Student Champions was birthed at the beginning of the school year after holding a first-of-its-kind meeting between CSCE student chapter leaders across Canada and the leadership of CSCE, comprising CSCE president, Catherine Mulligan, past president, Michel Khouday, incoming CSCE president, Brenda McCabe, senior vice-president, Wade Zwicker, and some members of the Student Affairs committee.

The goal of the CSCE Student Champs is to be the voice of students. Currently, the Student Champs comprise 12 selected

CSCE student chapter leaders who will have regular meetings with the leadership of CSCE to discuss the concerns of students and be educated on CSCE engagements. They will liaise with the CSCE student membership and CSCE leadership. They will be assigned specific tasks to engage the student membership and present possible solutions to CSCE leadership. CSCE leadership will provide guidance and direction throughout the process. The Champs are already at work! Recognising that communication among all parties is key, they have established a platform on Discord where they are engaging each other, and hoping to bring on board the entire CSCE membership and industry.

Please, read the article written by two of our CSCE Student Champs, also published in this issue.

Dr. Charles-Darwin Annan is a professor of civil engineering at Université Laval and can be reached at charles-darwin.annan@gci.ulaval.ca

CSCE Student Champs!

Civil engineering is the application of physical and scientific principles for solving the problems of society, or so Google tells us. And though unique, the COVID-19 pandemic is still just another problem yet to be solved. It would be easy to get caught up in the doom and gloom, but we, the CSCE Student Champs, would rather use our inaugural Student Voice article to look forward and focus on the opportunities that it presents us as student leaders at our respective universities.

So, who are these CSCE Student Champs? Well, we are a group of executives and presidents from CSCE Student Chapters across Canada with a unified ambition to be the VOICE of students in CSCE, to leverage the new virtual landscape, thrust upon us, into an opportunity for an unprecedented social network for all Civil Engineering Students. We have already taken the first steps by setting up a Discord Server, which we are officially announcing, to invite all current students and CSCE regions and local sections to join by sending an email to csce.champs@gmail.com. This server is capable of multiple text and voice chats, image and screen sharing, and will serve as a hub for students nationally and globally (hey there, Hong Kong!). Members can talk about schoolwork, see what's going on at other schools, find someone to partner with for a round of their preferred game, and even host some multi-chapter events; all of which will hopefully result in forging unique friendships and bonds. For a more detailed action plan of how to foster this new social space, look no further than the next column.

Action Plan:

- Unification:** Establish a viable means of communication between CSCE Student chapters and their regions and local sections to promote national/regional events through virtual platforms.
- Establishment:** Expand the CSCE Student Champs Discord usership to include industry, student, young professional and executive members to share a unilateral means of communication.
- Post Pandemic:** Ensure the platform is active and carried forward from each Student Chapter Executive predecessor.

With all this being said, we hope you like hearing our opinion (or our "Student Voice") and we look forward to hearing from anyone motivated with ideas for future Student Voice Topics, or with comments and concerns. We hope the next time you hear from us the world is a little bit better. ■

The CSCE Champs:



Austin Martins-Robalino is the President of the York University CSCE Student Chapter



Cody Pallin is the Co-President of the BCIT CSCE Student Chapter

So, What's in a Name?

ENVISION REFRESHER

Gord Lovegrove, P.Eng., MBA, MASCE
CSCE Vice-President, Technical Programs
UBC Associate Professor, School of Engineering



You may recall our *CIVIL* Summer 2017 edition on Envision, “Civil Engineering for a more sustainable quality of life: which rating system should I use?” It was part of our nationwide CSCE stakeholder consultation process of adopting Envision as a best-practice tool. Since then, we have offered input opportunities at several AGMs, workshops, committees and discussion groups. We highlighted needs for use of Envision by Canadian civil engineers, including the need to ensure Envision can take into account:

- First Nations rights to consultation and unceded territory; and
- Northern climatic conditions.

Since Summer 2017, we have heard other comments related to:

- Sustainable road safety;
- Policy rating tools; and,
- Go/No-Go as an assessment outcome.

All of your input has been shared with your CSCE Board. As a result, we have begun discussions with the Institute for Sustainable Infrastructure (ISI), steward of the Envision rating tool, regarding the adoption of Envision as a best practice for Canadian civil engineers. The adoption of Envision essentially spells the technology transfer exercise from theory (i.e. a good idea) to practice (i.e. clients expecting it). I suspect you would agree that getting ISI's Envision both adopted and integrated into CSCE best practice (i.e. your practice!) is no trivial process. Time is money and Envision will add more time to your assignment – innovative yes, but in a competitive market, innovators go out of business unless they can shave off their bottom line unless those innovators/early adaptors can use it to grow their business. So, let's take a step back and consider, why should you adopt Envision into your business model?

WHAT IS ENVISION?

(<https://sustainableinfrastructure.org/envision/overview-of-envision>)

Quoting from ISI's website, the purpose of Envision is “to foster a dramatic and necessary improvement in the performance and resiliency of our physical infrastructure across the full spectrum of sustainability.” Envision provides the framework and incentives needed to initiate this systemic change. As a guidance tool, Envision provides industry-wide sustainability metrics for all infrastructure types. Fundamentally, Envision is about supporting higher performance through more sustainable choices in infrastructure development. The framework provides a flexible system of criteria and performance objectives to aid decisionmakers and help project teams identify sustainable approaches during planning, design and construction that will continue throughout

ENVISION REFRESHER

the project's operations and maintenance and end-of-life phases.

Envision recognizes resource constraints and the diversity of mandates, schedules, budget cycles and funding sources. For that reason, external benefits, most notably, how well infrastructure projects contribute to the efficiency and long-term sustainability of communities that the projects may serve is paramount. Envision not only asks: "Are we doing the project right?" It also asks: "Are we doing the right project?" While initially developed for the US and Canada in 2011, Envision is being applied world-wide after its 3rd iteration of refinements in April 2018.

Envision has been designed as a holistic framework to apply to ALL types and sizes of civil infrastructure. This includes the roads, bridges, pipelines, railways, airports, dams, levees, landfills, water treatment systems, and other components that make up our civil works. However, Envision does not evaluate buildings intended exclusively for human occupation such as hospitals, schools, offices, or residences. The rating system for buildings are gaining popularity (e.g. LEEDS, Green Globes), but these aren't applicable or transferrable for infrastructure projects. Much of the focus of these systems is on the comfort and health of the building occupants, but most infrastructure does not have occupants. Infrastructure has different challenges than buildings. Buildings are under the control of a single owner or entity. You can readily optimize building systems. For infrastructure, there is no single responsible entity. There are multiple departments with different issues, agendas, schedules, budgets, customers and integration needed at the city/community and regional levels.

THE FIVE CATEGORIES OF SUSTAINABILITY CRITERIA

The Envision sustainable infrastructure rating system is a comprehensive framework of 60 criteria, which encompass the full range of environmental, social, and economic impacts that should be

assessed in order to determine how a project has incorporated sustainability into its design, construction, and operation.

These 60 sustainability criteria, called 'credits', are arranged in five categories that employ a multiple account evaluation format to add up to a 'score' for your project. These include:

- **Quality of Life:** specifically addresses a project's impact on communities from the health and wellbeing of individuals to the wellbeing of the larger social fabric as a whole.
- **Leadership:** comprised of the tasks that demonstrate effective leadership and commitment by all parties involved in a project. The meaningful commitment from the owner, team leaders, and constructors.
- **Resource Allocation:** measures the use of renewable and non-renewable resources for the project. Benefits of managing resources needed will allow a longer life as we know it.
- **Natural World:** allows project teams to assess the effect of the project on the preservation and renewal of ecosystem functions. This section addresses how to understand and minimize negative impacts, while considering ways in which the infrastructure can interact with natural systems in a synergistic and positive way.
- **Climate and Risk:** looks at two main concepts: minimizing emissions that may contribute to increased short- and long-term risks, and ensuring that infrastructure projects are resilient to short-term hazards or altered long-term future conditions.

ENVISION'S BEST-PRACTICE MOTIVATIONS

So, what have you been using as an independent/peer review of your infrastructure project, what kind of value engineering process do you follow? Why would introducing Envision profit you? Beyond a call in our professional engineering provincial statutes to practice ethically and hold paramount the protection

of the environment and welfare of the public, there are several critically important best-practice motivations, including:

- Your practice needs to stay current with the test of what the reasonable engineer would do. The UN's Intergovernmental Panel on Climate Change (IPCC) report on climate emergency is just one of many recent reports noting our collective need to conserve resources, reduce emissions, and help (literally) turn back the tide of over-consumption. Engineers are all about efficiency and optimization, right? This is an easy one, let's get a little more personal.
- You owe it to yourself not to be left behind. The Envision framework has been used on hundreds of projects. Tens of billions of dollars in infrastructure projects have pursued third-party verification and awards throughout the US, Canada, and internationally. Just as when LEEDS was introduced and your clients/shareholders/publics/peers started requiring more environmentally-friendly approaches to buildings, Envision is gaining in popularity and you will need to get up to speed with it by professional development training as an Envision Sustainability Professional (Env SP). Your CSCE Board in partnership with ISI expects to make this Env SP training more widely available across Canada to help you keep up.
- Your professional reputation and business model need to be sustained. For early career professionals, Envision will help in your marketing and rising career path. For businesses, it covers an area on the civil engineering profession that is important to the future and helps to improve projects. It is about reputation in a competitive business environment, where you must respond to challengers that endanger your market share. Do you really have a choice?

It's your future. It's your profession. It's your community. It's your choice. Right now, right thing, right reason. Make it. Please. ■

Un nom qui voit grand

DES NOUVELLES D'ENVISION

Gord Lovegrove, ing., MBA, MASCE

Vice-président de la SCGC, Programmes techniques

Professeur agrégé à l'École de génie de l'Université de la Colombie-Britannique



Vous vous rappelez peut-être notre article paru dans le numéro de l'été 2017 de *CIVIL* sur le système Envision : « Le génie civil pour une qualité de vie plus durable : quel système de notation devrais-je utiliser? » Il s'inscrivait dans notre processus national de consultation des parties prenantes de la SCGC, qui nous a permis d'adopter Envision comme outil de pratique exemplaire. Depuis, nous avons offert des possibilités de contribuer lors de plusieurs assemblées générales annuelles, ateliers, comités et groupes de discussion. Nous avons souligné les besoins des ingénieurs civils canadiens d'utiliser Envision, y compris la nécessité de nous assurer que le système peut tenir compte :

- des droits des Premières Nations à la consultation et aux territoires non cédés;
- des conditions climatiques nordiques.

Depuis l'été 2017, nous avons entendu d'autres commentaires au sujet :

- de la sécurité routière durable;
- des outils d'évaluation des politiques;
- de l'issue « Feu vert » ou « Feu rouge » des évaluations.

Nous avons transmis tous les commentaires au conseil d'administration de la SCGC avant

d'entamer des discussions avec l'Institute for Sustainable Infrastructure (ISI), responsable de l'outil de notation Envision, concernant l'adoption du système comme pratique exemplaire pour les ingénieurs civils canadiens. L'intégration d'Envision constitue essentiellement un exercice de transfert de technologie de la théorie (une bonne idée) vers la pratique (les clients s'y attendent).

Vous conviendrez sans doute que l'intégration du système Envision de l'ISI dans les pratiques exemplaires de la SCGC (c'est-à-dire votre pratique!) n'est pas une mince affaire. Si le temps représente de l'argent, et qu'Envision ajoutera du temps à vos projets... Bien sûr, cette pratique est novatrice, mais dans un marché concurrentiel, les innovateurs font faillite s'ils n'arrivent pas à réduire leurs coûts, à moins qu'ils ne puissent l'utiliser pour faire croître leur entreprise. Prenons donc un peu de recul pour réfléchir : pourquoi devriez-vous adopter Envision dans votre modèle d'entreprise?

TOUT SUR ENVISION

(<https://sustainableinfrastructure.org/envision/overview-of-envision>)

Sur son site Web, l'ISI présente l'objectif d'Envision, qui consiste à « favoriser une amélioration notable et nécessaire du

rendement et de la résilience de nos infrastructures matérielles sur toutes les facettes de la durabilité ». Envision fournit le cadre et les mesures incitatives nécessaires pour amorcer ce changement systémique. En tant qu'outil d'orientation, il fournit des paramètres de mesure de durabilité à l'échelle du secteur, et ce, pour tous les types d'infrastructures. Fondamentalement, il vise à soutenir un rendement supérieur grâce à des choix plus durables en développement des infrastructures. Le cadre fournit un système flexible de critères et d'objectifs de rendement pour aider les décideurs et les équipes de projet à cibler des approches durables pendant la planification, la conception et la construction, approches qui seront maintenues tout au long des phases d'exploitation, de maintenance et de fin de vie des projets.

Le système Envision tient compte des contraintes de ressources et de la diversité des mandats, des calendriers, des cycles budgétaires et des sources de financement. C'est pourquoi les avantages externes, notamment la façon dont les projets d'infrastructure contribuent à l'efficacité et à la durabilité à long terme des collectivités qu'ils peuvent servir, sont primordiaux. Le système ne se contente pas de demander :

DES NOUVELLES D'ENVISION

« *Faisons-nous le projet correctement?* » Il pose également la question : « *Faisons-nous le bon projet?* » Pensé au départ pour les États-Unis et le Canada en 2011, Envision est appliqué dans le monde entier depuis sa troisième mouture de perfectionnements en avril 2018.

Conçu comme cadre holistique, il s'applique à TOUS les types et à toutes les tailles d'infrastructures civiles : routes, ponts, pipelines, chemins de fer, aéroports, barrages, digues, sites d'enfouissement, systèmes de traitement des eaux et autres composantes qui constituent nos travaux de génie civil. Envision névalue toutefois pas les bâtiments destinés exclusivement à l'occupation humaine comme les hôpitaux, les écoles, les bureaux ou les résidences. Les systèmes d'évaluation des bâtiments gagnent en popularité (p. ex. LEEDS, Green Globes), mais ils ne sont pas applicables ou transférables pour les projets d'infrastructure. Ces systèmes mettent surtout l'accent sur le confort et la santé des occupants des bâtiments, tandis que la plupart des infrastructures n'ont pas d'occupants; elles posent des défis différents. En effet, les bâtiments sont sous le contrôle d'un seul propriétaire ou d'une seule entité, et leurs systèmes peuvent être optimisés facilement. Quant aux infrastructures, elles n'ont pas d'entité responsable unique. De nombreux services gèrent des problèmes, des programmes, des calendriers, des budgets, une intégration et des clients différents qui sont nécessaires au sein de la localité et de la région.

LES CINQ CATÉGORIES DE CRITÈRES DE DURABILITÉ

Le système Envision de notation des infrastructures durables propose un cadre complet de 60 critères, qui englobent toute la gamme des répercussions environnementales, sociales et économiques à évaluer afin de déterminer comment la durabilité a été intégrée dans la conception, la construction et l'exploitation d'un projet. Ces 60 critères de durabilité, nommés « crédits », sont classés en cinq catégories qui utilisent un format d'évaluation à comptes multiples qui s'additionnent pour donner une « note » à votre projet. Ces catégories sont les suivantes :

- **Qualité de vie** : Concerne spécifiquement les répercussions d'un projet sur les collectivités : la santé et le bien-être des individus autant que le bien-être du tissu social dans son ensemble.
- **Leadership** : Comprend les tâches qui démontrent un leadership et un engagement efficaces de la part de toutes les parties participant à un projet. L'engagement significatif du propriétaire, des chefs d'équipe et des entreprises de construction.
- **Allocation des ressources** : Mesure l'utilisation des ressources renouvelables et non renouvelables pour le projet. Les avantages de la gestion des ressources nécessaires permettront une plus longue durée de vie, comme nous le savons.
- **Milieu naturel** : Permet aux équipes de projet d'évaluer l'effet du projet sur la préservation et le renouvellement des fonctions de l'écosystème. Cette section traite de la manière de comprendre et de minimiser les effets négatifs, tout en considérant les façons dont l'infrastructure peut interagir avec les systèmes naturels de manière synergique et positive.
- **Climat et risques** : Examine deux concepts principaux : minimiser les émissions qui peuvent contribuer à augmenter les risques à court et à long terme, et s'assurer que les projets d'infrastructure sont résistants aux dangers à court terme ou aux conditions futures modifiées à long terme.

MOTIVATIONS D'ADOPTER LES PRATIQUES EXEMPLAIRES D'ENVISION

Et vous, qu'utilisez-vous comme examen indépendant ou par les pairs de votre projet d'infrastructure? Quel processus d'ingénierie de la valeur suivez-vous? Pourquoi l'intégration d'Envision vous serait-elle profitable? Au-delà du respect des statuts de nos organismes professionnels provinciaux pour une pratique éthique et la protection primordiale de l'environnement et du bien-être du public, plusieurs motivations essentielles incitent à adopter des pratiques exemplaires. En voici quelques-unes :

- Votre pratique doit rester à la hauteur de ce que ferait un ingénieur raisonnable. Le rapport du Groupe d'experts

intergouvernemental sur l'évolution du climat (GIEC) des Nations Unies sur l'urgence climatique n'est qu'un des nombreux rapports récents qui soulignent le besoin collectif de conserver les ressources, de réduire les émissions et de contribuer à renverser (littéralement) la tendance à la surconsommation. Les ingénieurs raffolent d'efficacité et d'optimisation, n'est-ce pas? En voilà une motivation facile. Mettons-y un peu plus du nôtre.

- Vous vous devez de ne pas être à la traîne. Des centaines de projets ont déjà utilisé le cadre Envision. Des dizaines de milliards de dollars en projets d'infrastructure ont fait l'objet de vérifications et de récompenses par des tiers aux États-Unis, au Canada et dans le monde entier. Tout comme lorsque le système LEEDS est arrivé et que vos clients, actionnaires, publics et pairs ont commencé à exiger des approches plus écologiques pour les bâtiments, le cadre Envision gagne en popularité. Vous devrez vous y mettre en suivant une formation de perfectionnement professionnel pour devenir un professionnel de la durabilité Envision (Env SP). Le conseil d'administration de la SCGC, en partenariat avec l'ISI, prévoit de rendre cette formation plus accessible au Canada pour vous aider à vous maintenir à jour.
- Vous devez conserver votre réputation professionnelle et votre modèle d'entreprise. Professionnels en début de carrière : Envision vous aidera dans votre marketing et dans l'évolution de votre carrière. Et pour les entreprises, il couvre une sphère de la profession d'ingénieur civil qui est importante pour l'avenir et qui contribue à améliorer les projets. Votre réputation est en jeu dans un environnement commercial concurrentiel où vous devez relever les défis qui menacent votre part de marché. Avez-vous vraiment le choix?

Il s'agit de votre avenir. De votre profession. De votre communauté. Vous pouvez faire le bon choix maintenant, pour les bonnes raisons. Je vous en prie, faites-le. ■

Hopes to address cross-border pile ups

Randy Pickle, P. Eng., FCSCE, FEC, FEIC, Construction Phase Services Manager, AECOM
Peter Byrne, C. Eng., Design Phase Services Manager, AECOM

In 2004, a Planning/Need and Feasibility Study completed by the Governments of Canada, Ontario, the United States and Michigan identified the need for the improvement of cross-border traffic movement between Canada and the U.S. at one of the busiest Canada-U.S. land-border crossings. This led to the undertaking of the Detroit River International Crossing Study, which identified the preferred location and route for an extension of Highway 401 in Canada, the bridge itself, and where it would connect in the U.S. The Gordie Howe International Bridge Project will address the regional transportation needs of redundancy, capacity, system connectivity and improved border processing, and will positively impact the flow of traffic and goods through this key gateway, while supporting the economies of Windsor, Detroit, Ontario, Michigan, Canada and the U.S.

After an approximately three-year long procurement process, on July 5, 2018, Windsor-Detroit Bridge Authority (WDBA), a Canadian Crown corporation responsible for the delivery of the project, announced that Bridging North America (BNA) had been selected as the Preferred Proponent to design, build, finance, operate and maintain the Gordie Howe International Bridge project. Bridging North America is responsible for designing, building, financing, operating and maintaining the Canadian and U.S. Ports of Entry and the bridge, and also for designing, building and financing the Michigan Interchange under a public/private partnership agreement (P3). The State of Michigan will be responsible for the operations and maintenance of the Michigan Interchange at turnover.



Photo courtesy of Bridging North America



BNA is comprised of ACS Infrastructure, Dragados Canada, Fluor and Aecon, which are firms with local experience and knowledge, world-class transportation expertise, and a proven ability to deliver

bridge, facility and highway infrastructure projects. Design is being led by AECOM.

There are four components to the Gordie Howe International Bridge project – the Canadian Port of Entry, the bridge,

the U.S. Port of Entry and the Michigan Interchange with I-75.

The essence of the project is the six-lane, cable-stayed bridge, providing three Canada-bound lanes, three U.S.-bound lanes, a multipurpose path for pedestrians and cyclists over the Detroit River. The bridge will have a clear span of at least 853 metres (2,798 ft.) across the Detroit River with no piers in the water. Two approach bridges, one on each side, will connect the main span to the Canadian Port of Entry and the U.S. Port of Entry. The crossing, including the bridge and approaches, will be approximately 2.5 kilometres in length. This cable-stayed bridge will be the sixth longest in the world, the longest in North America. It is the longest composite cable-stayed bridge in the world, with concrete towers and drilled shaft foundations at 218m in height. These towers will be the tallest structures in both the Windsor and Detroit skylines. The approach bridges will all be concrete in design; 11 spans on U.S. side, 10 spans on the Canadian side and precast concrete girders

and drilled shaft/driven pile foundations.

The Canadian Port of Entry will be situated on an approximately 53-hectare site which will include such features as Canadian inbound border inspection facilities for both passenger and commercial vehicles, Canadian outbound inspection facilities, tolling operation for both U.S.-bound and Canada-bound traffic and maintenance facilities. Once constructed, this port will be the largest Canadian port along the Canada-U.S. border, and one of the largest anywhere in North America. It includes eight buildings, four canopies, U.S. turn-around bridge, extensive site works and circulation, utilities and security.

The U.S. Port of Entry will be situated on an approximate 60-hectare site which will include such features as U.S. inbound border inspection facilities for both passenger and commercial vehicles, U.S. outbound inspection facilities, and commercial exit control booths. It includes six buildings, eight canopies, an enclosed pedestrian bridge, various parking facilities, circulation roadways and other site works.

As identified by the Detroit River International Crossing Study, an extension of Highway 401, known as the Rt. Honourable Herb Gray Parkway was undertaken. This 11 km below-grade freeway provides direct connection to the Canadian Port of Entry and was a successful P3 project undertaken by the Governments of Canada and Ontario. In Michigan, the connection to U.S. I-75 has been included in this project. These works will consist of the primary connecting ramps to and from the U.S. Port of Entry to U.S. I-75 and associated local road improvements required to fit the new ramps into the interstate system. It includes four flyover ramps, four new crossing road bridges, five new pedestrian bridges, two bridges crossing the railway and connecting I-75 to the U.S. Port of Entry, and relocation/reconstruction of service roads and local road improvements.

Detailed design of the works commenced in September 2018, and construction works, by BNA, started in July 2019. WDBA had undertaken some early works to prepare the sites. The Gordie Howe International Bridge will be open to traffic by the end of 2024. ■



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L'espoir d'un désengorgement à la frontière

Randy Pickle, P. Eng., FCSCE, FEC, FEIC, responsable des services de la phase de construction, AECOM

Peter Byrne, C. Eng., responsable des services de la phase de conception, AECOM

En 2004, une enquête de planification, de besoins et de faisabilité réalisée par les gouvernements du Canada, de l'Ontario, des États-Unis et du Michigan a mis en évidence la nécessité d'améliorer la circulation entre le Canada et les États-Unis à l'un des postes frontaliers terrestres les plus fréquentés entre les deux pays. Elle a mené à la réalisation de l'étude sur le passage frontalier de Detroit River, qui a ciblé l'emplacement et l'itinéraire de choix pour le prolongement de l'autoroute 401 au Canada, le pont lui-même et l'endroit où il serait relié aux États-Unis. Le projet du pont international Gordie-Howe répondra aux besoins régionaux de redondance, de capacité, de connectivité des systèmes et d'amélioration du passage à la frontière, en plus d'améliorer le flux de trafic et de marchandises à cette porte d'entrée clé. Il sera également bénéfique pour les économies de Windsor, de Detroit, de l'Ontario, du Michigan, du Canada et des États-Unis.

Le 5 juillet 2018, après un processus de passation de marché d'environ trois ans, l'Autorité du pont Windsor-Detroit (APWD), une société d'État canadienne responsable de la réalisation du projet, a annoncé que Bridging North America (BNA) avait été sélectionné comme promoteur préféré pour concevoir, construire, financer, exploiter et maintenir le projet du pont international Gordie-Howe. Ainsi, BNA est responsable de la conception, de la construction, du financement, de l'exploitation et de la maintenance du pont et des passages frontaliers canadiens et américains, ainsi que de la conception, de la construction et du financement de l'échangeur du Michigan dans le cadre d'un accord de partenariat public-privé (PPP). L'État du Michigan sera ensuite chargé de l'exploitation et de la maintenance de l'échangeur du Michigan.

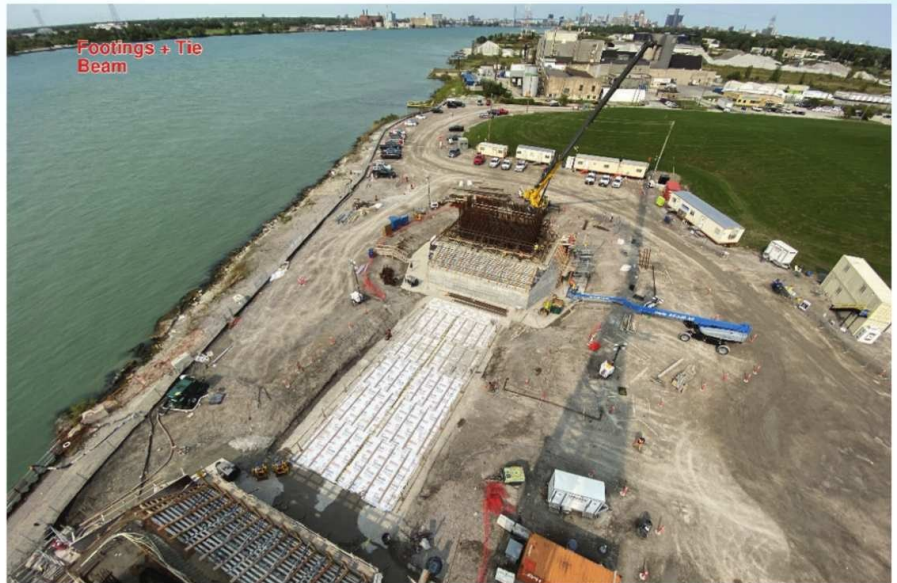


Photo avec l'autorisation de Bridging North America



BNA est formé d'ACS Infrastructure, Dragados Canada, Fluor et Aecon, des entreprises fortes d'une expérience et de connaissances locales, d'une expertise de calibre international en matière de transport et d'une capacité avérée à réaliser des projets de ponts, d'installations et

d'autoroutes. AECOM orchestre quant à elle la conception.

Le projet du pont international Gordie-Howe comporte quatre volets : le poste frontalier canadien, le pont, le poste frontalier américain et l'échangeur du Michigan avec la I-75.

Le cœur du projet est le pont à haubans comptant six voies – trois voies en direction du Canada et trois voies en direction des États-Unis –, en plus d'une voie multifonctionnelle pour piétons et cyclistes enjambant la rivière Detroit. Le pont aura une ouverture libre d'au moins 853 mètres sur la rivière, sans piliers dans l'eau. Deux approches, une de chaque côté, relieront la travée principale au poste frontalier canadien et au poste frontalier américain. La traversée, en incluant le pont et les approches, s'étendra sur environ 2,5 km. Ce pont à haubans sera le sixième plus long du monde et le plus long en Amérique du Nord. Il sera aussi le plus long pont composite à haubans sur la planète, avec des tours en béton et des fondations à puits forés d'une hauteur de 218 mètres. Ces tours deviendront les plus hautes structures de Windsor et de Detroit. Les approches, entièrement en béton, seront composées de 11 travées du côté américain et de 10 travées du côté canadien, et seront supportées par des poutres en béton précontraint et des fondations à puits forés et à pieux foncés.

Le poste frontalier canadien sera situé sur un terrain d'environ 53 hectares où l'on trouvera principalement des bâtiments d'inspection à la frontière pour l'entrée

au Canada des véhicules à passagers et commerciaux, des bâtiments d'inspection pour la sortie du Canada, des péages pour les véhicules à destination des États-Unis et du Canada et des installations de maintenance. Ce poste frontalier sera le plus grand du Canada le long de la frontière canado-américaine, et l'un des plus grands de toute l'Amérique du Nord. L'ensemble comptera huit bâtiments, quatre toits-abris, un pont de retour aux États-Unis, de vastes travaux d'aménagement et de circulation, des services publics et des services de sécurité.

Quant au poste frontalier américain, il sera situé sur un terrain d'environ 60 hectares et comprendra des bâtiments d'inspection à la frontière pour l'entrée aux États-Unis des véhicules à passagers et commerciaux, des bâtiments d'inspection pour la sortie des États-Unis et des postes de contrôle des sorties commerciales. Il comptera six bâtiments, huit toits-abris, un pont piétonnier couvert, diverses installations de stationnement, des voies de circulation et d'autres travaux d'aménagement.

Comme l'a indiqué l'étude sur le passage frontalier de Detroit River, un prolongement de l'autoroute 401, connu sous le nom de

Rt. Honourable Herb Gray Parkway, a été entrepris. Cette autoroute de 11 kilomètres sous le niveau du sol offre une connexion directe avec le passage frontalier canadien, un projet en PPP réussi des gouvernements du Canada et de l'Ontario. Au Michigan, la connexion avec l'autoroute américaine I-75 a été incluse dans ce projet. Les travaux consisteront à construire les principales bretelles de raccordement entre le passage frontalier américain et l'autoroute américaine I-75, et à apporter les améliorations routières locales nécessaires pour intégrer les nouvelles bretelles au réseau interétatique. Ils comprennent quatre bretelles dénivelées, quatre nouveaux ponts routiers, cinq nouveaux ponts pour piétons, deux ponts traversant la voie ferrée et reliant la I-75 au passage frontalier américain, ainsi que le déplacement et la reconstruction des voies de desserte et l'amélioration des routes locales.

La conception détaillée des travaux a commencé en septembre 2018, et BNA a entamé la construction en juillet 2019. L'APWD avait déjà effectué quelques travaux préliminaires pour préparer les sites. Le pont international Gordie-Howe sera ouvert à la circulation d'ici la fin de 2024. ■



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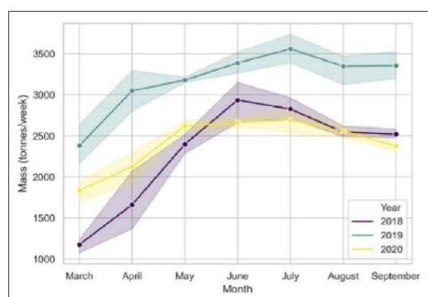
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How Does a Pandemic Change our Waste Disposal Habits?

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The COVID-19 pandemic has significantly disrupted day-to-day life in Canada and around the world. As of the preparation of this article, there were approximately 35.5 million cases worldwide and 1.04 million deaths (JHU, 2020). In Canada, there were approximately 169,000 cases and 9,500 deaths (JHU, 2020). As the number of cases increased in Canada, the Federal government recommended social distancing rules and good hygiene practices. The first presumptive case in Saskatchewan was confirmed on March 12, 2020, and the provincial government declared a state of emergency on March 18. From the strong recommendation to work from home when possible, to a controlled approach, to lifting lockdown restrictions, many facets of daily life, including waste generation and disposal are likely to be disrupted. The economic effect of the pandemic may be more prominent in certain industries, depending on their ability to meet social distancing protocols. Furthermore, with more testing and an increase in the use of personal protective equipment, changes in waste disposal behaviours may occur. Waste disposal data from Regina is investigated to better understand changes in waste disposal habits throughout the pandemic. Regina is a mid-sized Canadian prairie city (180 km²) with a population of 215,000 (Statistics Canada, 2017), and a GDP at basic price of \$16.8B (Statistics Canada, 2020).

Figure 1 shows the weekly aggregate disposal of municipal solid waste between March and September from 2018-2020, with a confidence interval for the estimate (shaded areas). In Canada, waste generation is



expected to increase in the summer months (EC, 2013), usually due to increases in yard waste. Although there is a slight increase for the 2020 waste disposal curve in Regina (shown in yellow), it is much less prominent than in previous years. Between May and July, the number of active cases decreased in the province (GSask, 2020a), which may have prompted people to start enjoying gardening again. Furthermore, the anomalous changes to waste disposal in 2020 may be related to increasing unemployment rates during the lockdown. The unemployment rate was highest in May and June of 2020, at 12.5% and 11.6%, respectively (GSask, 2020b). The closure of non-essential businesses and limitations on social gatherings possibly caused the reduction in waste disposal, which showed a slight decrease from August to September, and may reflect the provincial plan to lift restrictions with guidelines aimed at reducing the spread of the virus (GSask, 2020c). It is important to note that although the amount of waste has decreased slightly during the pandemic, it is possible that the composition of waste has changed drastically. Manual sorting of recycled waste in many cities has been restricted due to the potential risk of infection, possibly indicating a shift in waste composition with more recyclable waste now taking up valuable landfill space.

The closure of businesses and facilities could be another cause for the 24.0% decrease in average waste disposal between March and September 2019 and 2020. For example, most restaurants continued to operate on a take-out-only basis. Furthermore, the impact of the pandemic on non-residential waste sectors typically responsible for a larger portion of waste disposed (Government of Canada, 2018) may also be responsible for the decrease. Although the waste disposal rate seems relatively normal within the context of 2018-2019, the larger differences between waste disposal in 2019 and 2020 may indicate behavioral changes during the pandemic. Due to the dynamic nature of solid waste management, these differences in waste

disposal could be attributable to various factors. An in-depth study is currently underway at the University of Regina to better understand the nature of waste generation and recycling behaviours during the pandemic.

Results showed subtle changes to the amount of waste disposed of in Regina during the pandemic. It should be noted that inconsistencies in waste definitions (Wang et al., 2016), disposal practices, and landfill design (Richter et al., 2019) are not uncommon across Canadian municipalities. Cautions must be used when interpreting the data. The data presented herein gives a glimpse of the changes in disposal practices in a prairie city, though information on waste composition will be required to truly understand the impacts of the pandemic on waste management and diversion efforts. Despite six months of data being presented herein, it is likely the effects on waste management will continue to be observed at the landfill for the foreseeable future.

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In Memoriam: **ROGER A. DORTON**, C.M., F.CSCE

We regret to announce the passing of our friend and colleague, Roger Dorton on October 16, 2020. He was 92.

Roger was born in England in 1929 and spent much of WWII in the United States. He would later enroll in the first class of civil engineering students at the University of Nottingham after returning to England. He completed his degree with Honours in 1951, and remained at Nottingham researching suspension bridges (and playing cricket). Receiving his PhD in 1954, he emigrated to Canada, meeting his wife-to-be, Patricia, on the transatlantic crossing. His first position was with the Ontario Department of Highways in Toronto.

In 1956, Roger joined P. L. Pratley's firm in Montreal where the design and erection of the Champlain Bridge steel cantilever main spans were among his first assignments. In 1965, with Hugh Pratley, he led design for the A. Murray MacKay suspension bridge in Halifax. Of all his projects, this bridge gave Roger the greatest satisfaction. Another was winning a nationwide competition to design 19 pedestrian bridges for the Expo 67 site.

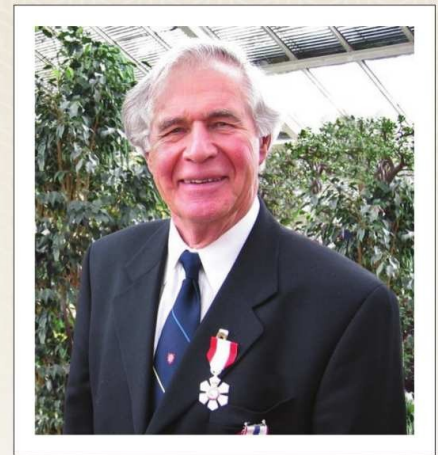
In 1972, he joined the Structures Research Group of the Ministry of Transportation of Ontario, and was promoted to Manager of the MTO Bridge Office in 1976. Roger played a major role in the development of new traffic loadings for highway bridges and the testing of the Conestoga River Bridge. In 1975, with colleagues Paul Csagoly and Kris Bassi, he initiated the creation of the new

Ontario Highway Bridge Design Code. He later chaired the Technical Committee for the new Canadian Highway Bridge Design Code. As Manager, he helped establish the Ontario Heritage Bridge Program, and oversaw iconic projects, including the Twelve Mile Creek Bridge at St. Catharines and the second Burlington Skyway.

In 1993, Roger became the Manager of the Ontario Office of Buckland & Taylor Ltd. His projects included the design and erection of the second Blue Water Bridge at Sarnia and renovations to the Lions' Gate Bridge. In 2000, he semi-retired, pursuing initiatives to develop aesthetic guidelines for bridges and to preserve heritage bridges.

The Society is appreciative of Roger's service: three years as the chair of the Structural Division, and then five years as Editor of the Canadian Journal of Civil Engineering. He led the initiative to create the P.L. Pratley Award presented annually for the best paper on bridge engineering. In 1982, he was Conference Organizing Committee Chair for the first International Conference on Short and Medium Span Bridges held in Toronto, had helped found the Society's National History Committee, remaining a member until 2015, and was named a Fellow of the Society. In 1990, he was named a Fellow of the Engineering Institute of Canada.

Roger was invested as a Member of the Order of Canada in 2005 and received honorary doctorates from the University of Waterloo (1989) and Queen's University



(1990). He also received the Casimir Gzowski Medal (1977); the James A. Vance Award (1984), the A. B. Sanderson Award (1988), the EIC's Julian C. Smith Medal (1998); a special CSCE award (2002) for outstanding contributions to bridge engineering; and the W. Gordon Plewes Award (2019).

Roger was predeceased by his wife, Pat, and is survived by their four children and six grandchildren.

We are saddened by the news of Roger's passing. His enthusiasm was infectious, and the high standard he brought to the profession was inspiring. Roger Dorton's warm, genuine smile will be missed, but his legacy and influence on engineering will live on. ■

Michael Bartlett and Peter Wright
October, 2020

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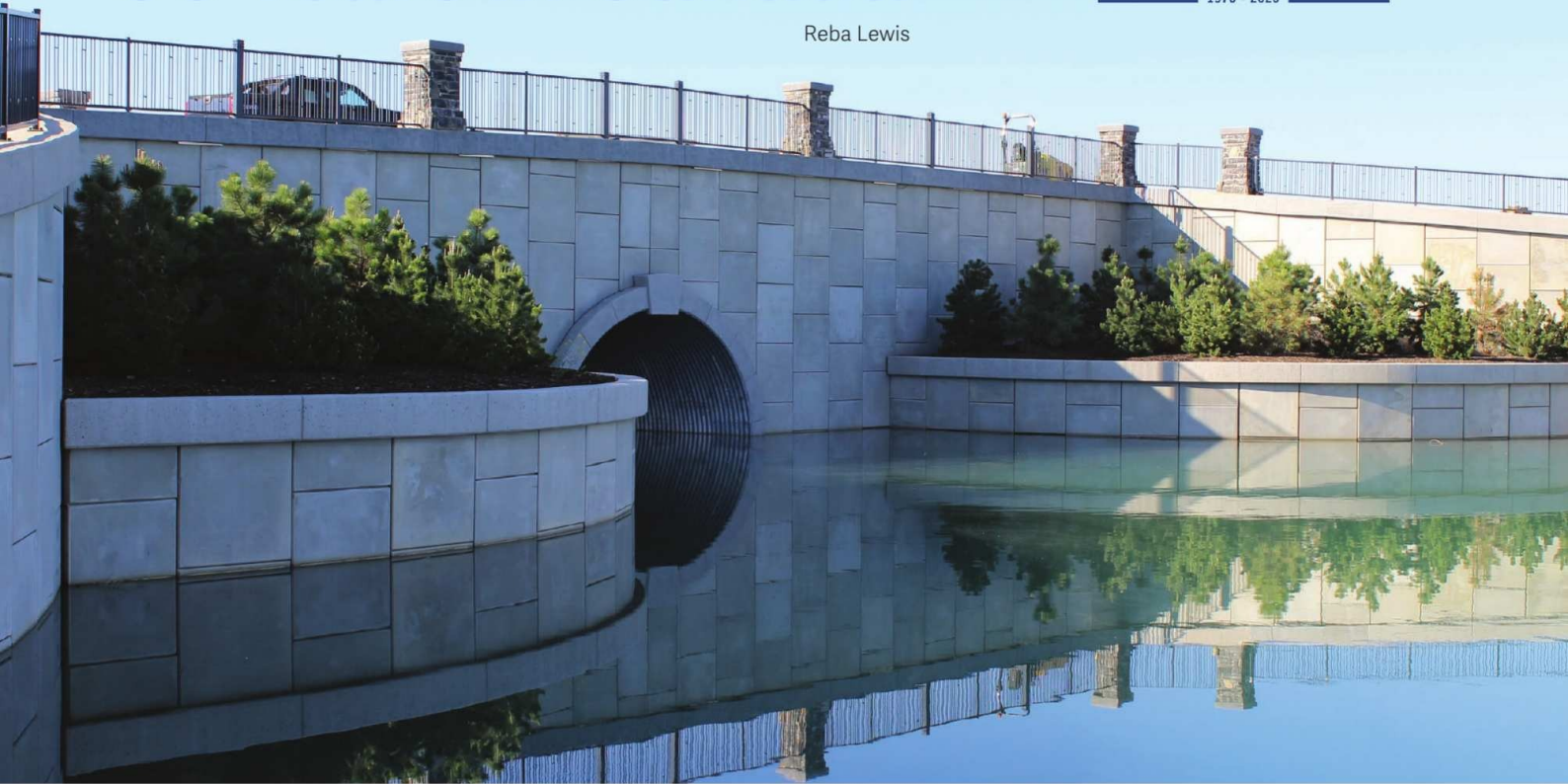
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Reinforced Earth Celebrates 50 Years in Canada

Reba Lewis



Fifty years may not seem like a long time, but in the world of business, where so many companies have risen as quickly as they have fallen, half a century and still going strong is a milestone that any organization should be proud of having achieved. One such organization celebrating one such milestone is Reinforced Earth Company Ltd., also known as RECo.

Based in Quebec, Reinforced Earth opened its doors in Canada in 1970 as the first registered subsidiary of its founder, Henri Vidal, outside of France. Vidal was responsible for the invention of the system that is now trademarked as Reinforced Earth technology, which would prove groundbreaking in the world of civil engineering. The Reinforced Earth System (also known by its generic name, MSE) features soil reinforcements that rely on inextensible high-adherence strips or ladders, and extensible geosynthetic straps, which are typically connected to pre-cast concrete panels. Along with his business partner, Maurice Darbin, Vidal worked at developing local networks and once the first job was awarded, and a local corporation was required, RECo Canada entered the Canadian engineering market.

The company prides itself on being a reliable solution provider for customers' needs, while simultaneously employing prudent engineering techniques and safe operations first. What has resulted is a company that has withstood the challenges that any new business entering a foreign market can attest to, coming out on the other side of it still standing and better off than it was before.

"Five decades have passed, and each one has specific characteristics that define them in terms of business and challenges," said the company's President, Daniel Calatrava.

Calatrava itemized some of those challenges and growing pains that the company faced by each decade of the company's evolution:

- **The 70s, Beginning Decade:** This period challenged the pioneers during the introduction of a new technology to the market. Convincing owners and consultants was a challenge at that time, but by the end of this decade, RECo was proud to have its technology used in most regions of Canada.
- **The 80s, Growth Decade:** RECo became involved in larger and more complex projects, such as the Coquihalla Highway, the early structures of Hwy 407, and the Gaspé Sea Walls. This period allowed RECo to contribute to the mining sector by the design and supply of diverse solutions ranging from coal storage structures, to tall vertical dump walls in the Albertan Oil Sands.
- **The 90s, Stability Decade:** RECo expanded its toolbox with the addition of the new and diversified TechSpan technology, a precast concrete arch system, which has contributed positively with an enhanced company offer. Transportation and mining were the main sectors of this period.
- **2000-2010, Expansion Decade:** The new millennium arrived bringing new owners. With guidance and support provided by the new corporate group, RECo Canada was able to reach even more remote places in Canada and also parts of the Caribbean. The mining activity remained a leading factor for growth during this period.



- 2010-2020 Record-Setting Decade:** RECo was able to set new records for greatest wall height, largest project size, and greatest engineering complexity with the execution of several major projects, which include Port Mann/Hwy 1, Regina Bypass, Herb Gray Parkway, Hwy 407 Extension Phase 2, Turcot Interchange, and most recently, its synergy with its sister company Menard at the Winnipeg Transitway project.

Of course, even with the foresight and vision of its leaders for the future of civil engineering, no company could achieve as much as RECo has without a dedicated group behind the scenes supporting and carrying forward that vision, a fact that isn't lost on Calatrava or his predecessors. "RECo has faced many challenges in its first 50 years, but even in the most difficult times, such as the current pandemic, RECo has always found a way to succeed. The key to this success was and continues to be our talented and dedicated team," he said.

Some of the company's first leaders have also been instrumental in its evolution, including Pierre Mora, who, from Quebec, worked closely with WWII veteran Bob MacKenzie for the business development in the predominantly English-speaking provinces; directors Herwig Wandschneider and Richard MacDonnel, and Peter Wu, who, for almost 30 years oversaw the company's stability and growth up until his retirement in 2019.

Another way in which the company remains grounded is through its social efforts. RECo focuses on local hiring and a strict adherence to environmental policies. The company also actively supports learning and professional societies in an effort to impart some of the knowledge it has gained over its 50 years in the business.

And just how is the company celebrating its momentous milestone? "Although we planned to have a large dinner party to celebrate our golden anniversary, due to the social distancing requirements as a result of the current pandemic, we have decided to celebrate in a different and greener way by planting trees for the City of Mississauga," said Calatrava.

And Reinforced Earth has every reason to celebrate. Today, the company operates in all of the country's provinces, with offices in British Columbia, Alberta and Quebec. Its head office is based in Ontario. Throughout every region, RECo can point to the work it has done with resounding success that has benefited all 10 provinces and three territories. That work has even extended to the Caribbean with

a total facing wall area that exceeds 1.7 million square metres. A 50th anniversary milestone indeed.

Of course, the company has no intentions of stopping there, not when there is another 50 years to look forward to and new opportunities to seize upon.

"We plan to continue our growth by enhancing our existing offer to continue providing safe and customized solutions to our clients," said Calatrava. ■

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