ENGINEERS AND GEOSCIENTISTS BRITISH COLUMBIA MAY/JUNE 2022

INNOVATION

2021 | 2022 PROJECT HIGHLIGHTS

WE SPOTLIGHT THE WORK OF REGISTRANTS HERE IN BC AND AROUND THE WORLD

PM40065271

AM I COVERED?

Understanding Water Damage Coverage

Most standard home insurance policies provide coverage for sudden and accidental water damage caused by a **burst pipe or appliance*.**

You may need to take certain precautions during the usual heating season.

Overland water (flooding), sewer backup and service line coverage are typically not covered under a basic policy*. They can usually be purchased as an optional add-on to your policy.

Ask us about Enhanced Water Damage Coverage!

Overland water (flooding) coverage is not available for certain areas.

* Always consult your policy wordings to determine your specific coverage and exclusions

LET US HELP YOU PROTECT YOUR HOME, AUTO OR BUSINESS.

PARK INSURANCE

Park Insurance has provided high-value insurance coverage for Engineers and Geoscientists BC for over 30 years.

1.800.663.3739
info@park.ca

www.park.ca/egbc

INNOVATION

MAY/JUNE 2022 | VOLUME 26 NUMBER 3

COVER STORY

PROJECT HIGHLIGHTS 2021 | 2022

From an Expo 2020 pavilion in Dubai to the seismic upgrade and heritage restoration of a church in downtown Vancouver, and from carbon-neutral sewer coatings to an optical spectrograph destined for Chile—the work of BC's engineers and geoscientists is everywhere. Each year, in our Project Highlights edition (beginning on Page 16), *Innovation* showcases the engineering and geoscience work of our registrants here in BC and around the world. *Innovation* and the Engineers and Geoscientists BC Editorial Advisory Group thank all who submitted photos and project descriptions.

BC engineers found a way to apply a seismic upgrade to St. Andrew's Wesley United Church in downtown Vancouver, while preserving the building's designated heritage status.
PHOTO: ADRIEN WILLIAMS/MICHAEL SHERMAN

NEWS / DEPARTMENTS

COMMENT

OTHER

ON THE COVER
The Umtanum Bridge in Yakima Canyon, Washington State.

THIS DIGITAL EDITION OF *INNOVATION* INCLUDES VIDEO EXTRAS. LOOK FOR THIS PLAY ICON, AND CLICK ON IT TO VIEW VIDEO AND OTHER MULTIMEDIA CONTENT. AN INTERNET CONNECTION IS REQUIRED.

ENGINEERS & GEOSCIENTISTS
BRITISH COLUMBIA

THE NEW STRATEGIC PLAN: BECOMING AN INCLUSIVE, PROGRESSIVE, FUTURE-FOCUSED REGULATOR

Six months ago, Council began work developing Engineers and Geoscientists BC's next five-year Strategic Plan. I am happy to report that the Plan, released in late May, provides clarity to our role as a regulator, emphasizes modernized and agile approaches to regulation, strengthens our collaboration with partners, embodies social responsibility as a core value, and provides support for emerging as well as traditional disciplines.

Volunteers, staff, and stakeholders thought that it was the right time for a new, overarching plan to guide the organization. With the introduction of the *Professional Governance Act* last year, Engineers and Geoscientists BC has gone through an exceptional period of change, and our previous plan was outdated and no longer reflected who we are today. The new Strategic Plan charts our course over the next five years and outlines our values as an organization.

The Strategic Plan also considers Engineers and Geoscientists BC's role within a world that is constantly changing. Climate events, social movements, incredible technological advances, and the evolving ecosystems of engineering and geoscience all influence the work that we do. So while our primary focus remains the same—protecting the public interest—we must also adapt to ensure our organization and our registrants can continue to support the safety, resilience, and evolution of the communities we all call home.

For registrants, our Plan means strengthening public confidence in our organization and our professions and supporting both emerging and traditional disciplines.

For volunteers, our Plan means providing the necessary and deserved support for the vital work they provide as the cornerstone of self-regulation.

For the public, the Plan means applying all its elements towards a primary goal: being resilient and agile so that we can meet the public's needs not just for today, but for tomorrow.

For more information about the 2022-2027 Strategic Plan, or to view the video, visit Page 12 or *egbc.ca/Strategic-Plan*.

Carol P ark , P.Eng., President

president@egbc.ca

INNOVATION

MAY/JUNE 2022 | VOLUME 26 NUMBER 3

ENGINEERS AND GEOSCIENTISTS BRITISH COLUMBIA
Suite 200 - 4010 Regent Street, Burnaby, BC Canada V5C 6N2
Tel: 604.430.8035 Fax: 604.430.8085
Email: info@egbc.ca Web: egbc.ca
Toll free: 1.888.430.8035

Advertising material must reach the publication by the first day of the first month (e.g., May 1 for the MAY/JUNE issue), or by the first business day immediately preceding the first day of the first month.

Design/Production & Advertising Sales:
AdvertisingInPrint
Sales Representative: Monique Nguyen
Tel: 604.681.1811
Email: advertising@egbc.ca

Printed in Canada by Mitchell Press Ltd on recycled paper

Subscription rates per issue $4.50; six issues yearly $25.00. (Rates do not include tax.)

ISSN 1206-3622
Publications Mail Agreement No 40065271. Registration No 09799.

Return undeliverable Canadian addresses to *Innovation*,
Suite 200 - 4010 Regent Street, Burnaby, BC V5C 6N2.

MOUNT POLLEY INVESTIGATION AND DISCIPLINARY PROCEEDINGS CONCLUDE

Engineers and Geoscientists BC has concluded its disciplinary proceedings against three individuals in relation to their work at the Mount Polley Mine. The multi-year investigations were initiated following the breach of the mine's tailings storage facility on August 4, 2014.

Three current and former engineers involved at the Mount Polley Mine Tailings Storage Facility (TSF) face a range of penalties arising from the disciplinary proceedings:

- Former engineer Todd Martin;
- Laura Fidel, P.Eng.; and
- Former engineer Stephen Rice.

These cases represent some of the most complex investigations Engineers and Geoscientists BC has undertaken. During the course of the investigations, thousands of documents were reviewed, including contracts, technical reports and drawings, correspondence, and daily site reports.

"This marks the final chapter in a long and difficult story for our province and our professions," said Heidi Yang, P.Eng., CEO of Engineers and Geoscientists BC. "Over the past several years, our focus has been on delivering a comprehensive, rigorous, and fair process, and we're pleased to be able to provide the public with these results. The conclusion of these cases, combined with resources we've developed to improve dam safety, will strengthen our professions and our province's environmental safeguards."

Following the breach, Engineers and Geoscientists BC took actions to improve dam safety in BC, which included producing professional practice guidelines for site characterization for dam foundations in BC, updating existing guidelines to confirm the duties of the "Engineer of Record," and holding professional development seminars. Engineers and Geoscientists BC is also currently updating its guidelines on legislated dam safety reviews.

Photos: Terrasaurus Aerial Photography Ltd.

The authority to regulate engineering and geoscience firms—a new regulatory responsibility that was introduced with the *Professional Governance Act*—will also enhance Engineers and Geoscientists BC's ability to protect the public and address standards of conduct and practice at the organizational level.

In the course of these disciplinary proceedings, Engineers and Geoscientists BC did not make allegations or findings as to the cause of the embankment failure. That matter was separately addressed in reports of the Mount Polley Independent Expert Engineering Investigation and Review Panel and the Chief Inspector of Mines.

Photos: Terrasaurus Aerial Photography Ltd.

These cases were conducted under the legislation in place at the time the engineering work was undertaken (the *Engineers and Geoscientists Act*), which allowed for a maximum fine of $25,000. That legislation has since been replaced by the *Professional Governance Act*, which allows for fines of up to $100,000 for individuals and $250,000 for firms.

The summary of the discipline notices for Mr. Martin and Ms. Fidel are provided on Page 43. The summary of the discipline notice for Mr. Rice was published in the September/October 2021 edition of *Innovation* Magazine. The full text of the all the disciplinary orders and penalties can be found at *egbc.ca/Discipline-Notices*.

ANNUAL REPORTING AND CONTINUING EDUCATION REQUIRED BY JUNE 30

Under the *Professional Governance Act* (PGA), registrants are required to annually verify contact and certain practice-related information, complete declarations, and report on continuing education. The deadline to update this information is **June 30, 2022**. Registrants who have not reported their information by the deadline may be subject to late fees, suspension, or cancellation.

Registrants can complete these requirements through their Engineers and Geoscientists BC account at *egbc.ca/Account*. This simple five-step process only takes a few minutes to complete and includes reviewing and/or updating your:

- industry and area(s) of practice;
- employer, if applicable;
- mailing address, business contact information, and a unique and personal email address;
- optional self-identification questions; and
- Continuing Education Program requirements.

You will also be required to declare if you have been the subject of a criminal conviction or disciplinary action. Practising registrants must complete and report their Continuing Education (CE) activities before completing their Annual Reporting requirements. More information on the CE reporting requirements can be found on our Program Overview webpage, at *egbc.ca/Continuing-Education*.

NEW EQUITY, DIVERSITY, AND INCLUSION REPORTING

This year, registrants will have the opportunity to complete several self-identification questions as part of the Annual Reporting process. Responses to these questions are voluntary and will not impact your annual reporting requirement or your registration with Engineers and Geoscientists BC. To learn more, visit our Demographic Data webpage at *egbc.ca/Demographic-Data* or email *diversity@egbc.ca*.

MORE INFORMATION

For questions about your Annual Reporting requirements, visit our Annual Reporting page at *egbc.ca/Annual-Reporting*, email *AnnualReporting@egbc.ca*, or call 604-412-4896. If you have questions about your Continuing Education Program requirements, email *cep@egbc.ca* or call 236-521-9154.

PHOTO: SHUTTERSTOCK.COM/STEVE SMITH

AMENDMENTS PROPOSED TO *PROFESSIONAL GOVERNANCE ACT*

On April 25, BC Attorney General David Eby announced several proposed amendments to the *Professional Governance Act* (PGA), the legislation governing Engineers and Geoscientists BC and several other regulators in the natural and built environment.

The amendments (Bill 21) are intended to improve oversight of the professions and draw from recommendations made in recent reviews of professional governance models in the health and legal professions. They also enable more professions to be brought under the legislation in the future, including the Architectural Institute of BC, which will be brought under the PGA later this year.

The amendments focus on changes that will improve the function of the legislation based on operational experience, and include:

PHOTO: SHUTTERSTOCK.COM/EB ADVENTURE PHOTOGRAPHY

- the ability for regulatory bodies to address non-compliance with administrative requirements (e.g., information reporting) outside of complex and lengthy investigations;
- an updated definition of "firms" that clarifies regulated firms include those where the regulated practice is carried out for internal purposes;
- updated terminology to reinforce the regulatory role of organizations under this legislation, including changing the name "Council" to "Board" and "President" to "Chair";
- ensuring that the *Act* does not affect Indigenous traditional knowledge or practices by clarifying that a person exercising the rights of an Indigenous people is not subject to the prohibition regarding reserved practice; and
- updates to declaration requirements based on feedback that the previously proposed requirement for registrants to submit declarations every time they were engaged to provide services was overly burdensome.

The amendments will now require a regulation to be made for more specific instances where declarations add value. The amendments also allow for the authority to create an annual fee paid by regulatory bodies to offset a small percentage of the budget of the Office of the Superintendent of Professional Governance (OSPG). Additional work is required by the OSPG to determine whether this authority will be used, and on what basis; the OSPG has committed to continued consultation with regulatory bodies on any potential funding models in advance of a new regulation being introduced.

Engineers and Geoscientists BC supports legislative amendments that will make the PGA more effective and define our role as a regulator more clearly. We will continue to work with the OSPG to provide our perspective to government, and to ensure they understand the complexities, risks, and alternatives to any proposed legislative changes. As this work progresses, we will keep registrants up to date.

Bill 21 has currently passed Third Reading in the BC Legislature. The amendments will take effect once the Bill achieves Royal Assent.

APRIL 22, 2022

Engineers and Geoscientists BC's Council of elected registrants and government representatives meets throughout the year to conduct the business of organizational governance. The following are the highlights of its April 22, 2022 meeting.

2022-2027 STRATEGIC PLAN APPROVED

Council approved Engineers and Geoscientists BC's next five-year Strategic Plan, following several months of consultation and development. The plan establishes a new vision for Engineers and Geoscientists BC: modern regulation for a resilient world. For additional information about the Strategic Plan, see pages 12-13.

BYLAWS UPDATED

Council approved updates to Engineers and Geoscientists BC's Bylaws to address staggered entry into the continuing education program for newly registered individual registrants, and to address delaying publication of a disciplinary decision in situations where that may prejudice an ongoing investigation or disciplinary proceeding. Engineers and Geoscientists BC's current Bylaws are available at *egbc.ca/Bylaws*.

2022/2023 BUDGET APPROVED

Council reviewed and approved its budget for the 2022/2023 fiscal year, proceeding with a budget scenario that will account for the additional pressures placed on the organization by several major changes – including increased legal costs associated with regulating firms, increasing inflation rates, and integrating the legislative requirements of the *Professional Governance Act* into the organization's operations.

Despite these added pressures, registrant fee increases will be limited to inflation. Effective January 1, 2023, the annual fee for practising registrants will increase by $10 to $470 plus applicable tax. The fee for non-practising registrants will remain at 25 percent of the annual fee for practising registrants—$117.50 plus applicable tax.

FORMAT OF 2022 ANNUAL GENERAL MEETING

The Engineers and Geoscientists BC 2022 Annual General Meeting (AGM), scheduled for Saturday, October 15, was confirmed to proceed virtually. The AGM has been delivered virtually for the past two years and has seen increased attendance from registrants across the province in this format. While provincial health orders may permit an in-person event, a virtual format allows the organization to be flexible amidst the continued uncertainty around the COVID-19 pandemic. Registration for the AGM will be available in summer.

ENGINEERS &
GEOSCIENTISTS
BRITISH COLUMBIA

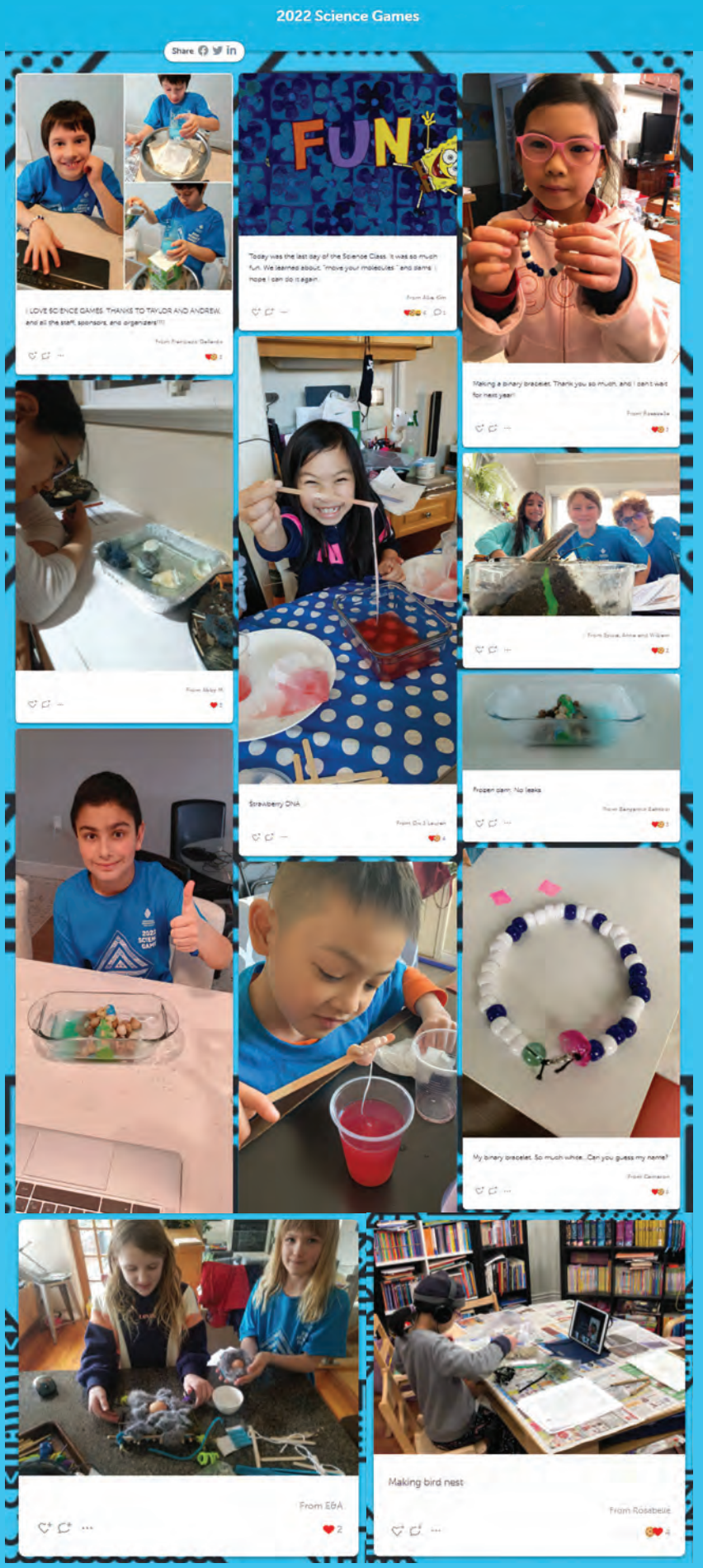
SAVE THE DATE FOR OUR VIRTUAL ANNUAL CONFERENCE

OCTOBER 12–13, 2022

The 2022 Engineers and Geoscientists BC Annual Conference will be held virtually on October 12-13, 2022. Join us for two days of topical continuing education sessions, keynote speakers, networking, and a virtual tradeshow. Our online conference platform makes it more flexible and accessible for registrants to attend from all over the province, whether you are working from home or in the office.

Don’t miss out! Mark this in your calendar today.

egbc.ca/conference



2022 VIRTUAL SCIENCE GAMES ENGAGES 160 STUDENTS ACROSS BC

In February and March, Engineers and Geoscientists BC hosted the 11th annual Science Games, a virtual three-week science journey designed for students from Grades 1 through 6 across BC to celebrate all things Science, Technology, Engineering, and Math (STEM).

This year, 160 students from across BC participated in the program, through fun, interactive activities and weekly challenges, and explored the principles and theories of science through the eyes of their engineer or geoscience mentor. Investigating the natural processes of water filtration systems, constructing a dam, studying DNA that was extracted from strawberries, and designing binary code bracelets to explore the basics of binary code were among the many experiments that students participated in.

Another highlight of this year's Science Games were two "Meet an Expert" sessions, which provided students the opportunity to meet various engineering and geoscience industry professionals. The sessions discussed topics such as how professionals work with Indigenous communities, highlighted careers in civil engineering and geoscience, and included a Q&A period. This year, 650 students participated in the "Meet an Expert" sessions.

The 2022 Science Games was supported by sponsors True Consulting, Golder Associates, SLR Consulting, and Teck Resources, and contributors BC Hydro and MineralsEd.

MODERN REGULATION FOR A RESILIENT WORLD

ENGINEERS AND GEOSCIENTISTS BC'S 2022–2027 STRATEGIC PLAN

VISION

Modern regulation for a resilient world.

VISION OUTCOMES

Our Vision Outcomes describe the long-term (10+ years) outcomes we want to achieve.

PUBLIC CONFIDENCE

Strengthen public confidence in our regulatory role and the professions of engineering and geoscience.

COLLABORATION HUB

Connect with registrants, stakeholders, national bodies, and other professions and regulators to generate diverse insight and regulatory expertise.

STRATEGY

Our four Strategic Imperatives describe the specific work we will undertake over the next 5 years in pursuit of our Vision.

STAKEHOLDER ENGAGEMENT

Build confidence and trust in our mandate and our professions, establish an inclusive approach to regulation for new areas of practice, and foster strong and collaborative working relationships with stakeholders.

PEOPLE AND CULTURE

Align organizational resources to effectively deliver our vision and mandate, support and invest in our volunteers, and modernize our virtual and physical work environment.

Engineers and Geoscientists BC's Council recently confirmed the organization's 2022–2027 Strategic Plan, with a new vision of modern regulation for a resilient world. With an emphasis on modernized processes, collaboration with partners, agile regulation, and social impact, the new Strategic Plan will shape Engineers and Geoscientists BC's future as an inclusive, progressive, and future-focused regulator.

For registrants, the Strategic Plan will enhance support for our volunteers, create a stronger commitment to equity, diversity, and inclusion, build public confidence in our professions, and invest in regulation for both traditional and emerging areas of practice.

To view our full Strategic Plan and learn more, visit *egbc.ca/Strategic-Plan*.

MISSION

We serve the public interest as an inclusive, progressive, and future-focused regulator.

FUTURE READY

Invest in processes that enable agile regulation and support strong professional practice in both traditional and emerging areas of practice.

SOCIAL RESPONSIBILITY

Advance equity, diversity, and inclusion and reconcilliation with Indigenous peoples, and take meaningful action on climate change.

PROCESS

Integrate the requirements of the *Professional Governance Act* act into our processes, strengthen foundational business systems, and instill a philosophy of continuous improvement.

SOCIAL RESPONSIBILITY

Ensure internal and external initiatives advance our commitment to the well-being of society and the environment.

These guidelines, and other professional practice guidelines and practice-related resources, are provided at egbc.ca/Guidelines.

NEWLY PUBLISHED PROFESSIONAL PRACTICE GUIDELINES

egbc.ca/Guidelines

Practice Advisory: Climate Change Considerations for Building Enclosure Engineers

The Practice Advisory: Climate Change Considerations for Building Enclosure Engineers has been issued for engineering professionals and firms to provide clarity on considering and addressing the implications due to climate change in design and decision-making processes for the selection of building enclosure assemblies. This advisory also discusses the roles and responsibilities of professionals involved in these projects.

Practice Advisory: Structural Design of Part 9 Buildings in High Snow Load Regions

This *Practice Advisory: Structural Design of Part 9 Buildings in High Snow Load Regions* has been issued for engineering professionals and firms who provide structural engineering services on buildings located in high snow load regions that are classified under Part 9 of the *BC Building Code 2018* or the *Vancouver Building By-law 2019*. The advisory outlines considerations for determining the specified snow load and appropriate design methodology, as well as the implications of high snow load on the primary structural system.

The following three advisories represent minor revisions to previously published guidance.

Practice Advisory: Permit to Practice Requirements for Letters of Assurance

The *Practice Advisory: Permit to Practice Requirements for Letters of Assurance* has been issued for engineering professionals and firms to provide clarity on permit to practice requirements for Letters Of Assurance in the *BC Building Code* and *Vancouver Building By-law*. This revision clarifies who can apply a permit to practice number based on recent revisions to the Engineers and Geoscientists BC Bylaws, and also includes an update to the latest version of the BC Government-issued *Guide to the Letters of Assurance In The BC Building Code 2018* and *Vancouver Building By-Law 2019*.

Practice Advisory: Site Response Analysis and Site-Specific Response Spectra

The *Practice Advisory: Site Response Analysis and Site-Specific Response Spectra* has been issued for engineering professionals and firms to provide clarity on requirements for using site response analysis as a seismic design tool for analyzing the interaction between a building structure and the soil at a specific site. This revision provides some specific considerations for soil class Site F.

Practice Advisory: Flowing Artesian Wells and Excavations

The *Practice Advisory: Flowing Artesian Wells and Excavations* has been issued for engineering professionals and firms to provide clarity on responsibilities for anticipating and managing flowing artesian conditions during well design and construction. The advisory also includes reporting requirements and roles for professionals, under the *Water Sustainability Act* and *Groundwater Protection Regulation*. This revision includes a revised Figure 1 to depict the appropriate water level in the artesian well.

PROFESSIONAL GUIDELINES IN DEVELOPMENT

Professional Services in the Forest Sector – Forest Roads:

These in-development guidelines are a revision of the 2012 guidelines that were jointly developed with the Association of BC Forest Professionals. They are intended to clarify professional expectations and obligations of registrants of Engineers and Geoscientists BC and the Association of BC Forest Professionals when designing, reviewing, maintaining, or deactivating roads in the forest sector. For more information, contact Alice Kruchten, P.Eng., at *akruchten@egbc.ca*.

Highlight on Retaining Walls

Retaining walls are utilized in various construction applications and can have major life safety implications. As such, Engineers and Geoscientists BC released *Professional Practice Guidelines – Retaining Wall Design* in 2019 with a minor update in 2020. These guidelines provide a common level of expectation for various stakeholders with respect to the level of effort, due diligence, and expectations and obligations of professional practice when carrying out retaining wall design and construction in BC. The guidelines also include an assurance statement to assign responsibility for the design and field reviews of the retaining wall, and the requirement for an independent review for any walls over three meters.

An archived webinar (found at *egbc.ca/Knowledge-Centre*) provides an overview of the guidelines.

FREQUENT PROFESSIONAL PRACTICE INQUIRIES

What are Professional Practice Guidelines and how do I include them in my professional practice?

Professional practice guidelines assist registrants in meeting their obligations under the *Professional Governance Act* and Engineers and Geoscientists BC's Bylaws. They describe professional practice expectations and obligations related to specific professional activities – including the roles and responsibilities of various participants and stakeholders in that activity, the training and experience required, and how to apply quality management requirements (i.e., authentication of documents, field reviews, etc.). Guidelines cover a wide range of practice areas—like buildings, natural resources, and equipment safety—but also address general topics that apply to all registrants, such as equity, diversity, and inclusion, and sustainability.

While Engineers and Geoscientists BC has been publishing guidelines for about 30 years, a new Bylaw requirement that was introduced alongside the *Professional Governance Act* strengthens the role of guidelines in the day-to-day practice of professionals in BC. Registrants are required to stay informed of, knowledgeable about, and meet the intent of guidelines that are relevant to their area of practice.

To stay informed on guidelines that apply to your practice area, we recommend that individuals and responsible registrants for firms frequently review the available guidelines on our website. Updates to guidelines and newly published guidelines are also communicated through eNews and *Innovation*.

Meeting the intent of a guideline means following the guidance provided within the content of the guidelines. Guidelines themselves describe in detail what the registrant *must* do (i.e., an obligation or expectation of professional practice) versus what the registrant *should* do (i.e., recommended good professional practice). Guidelines cannot cover all possible situations, examples, and outcomes, so registrants must use professional judgment to determine how to apply the guidance to their work.

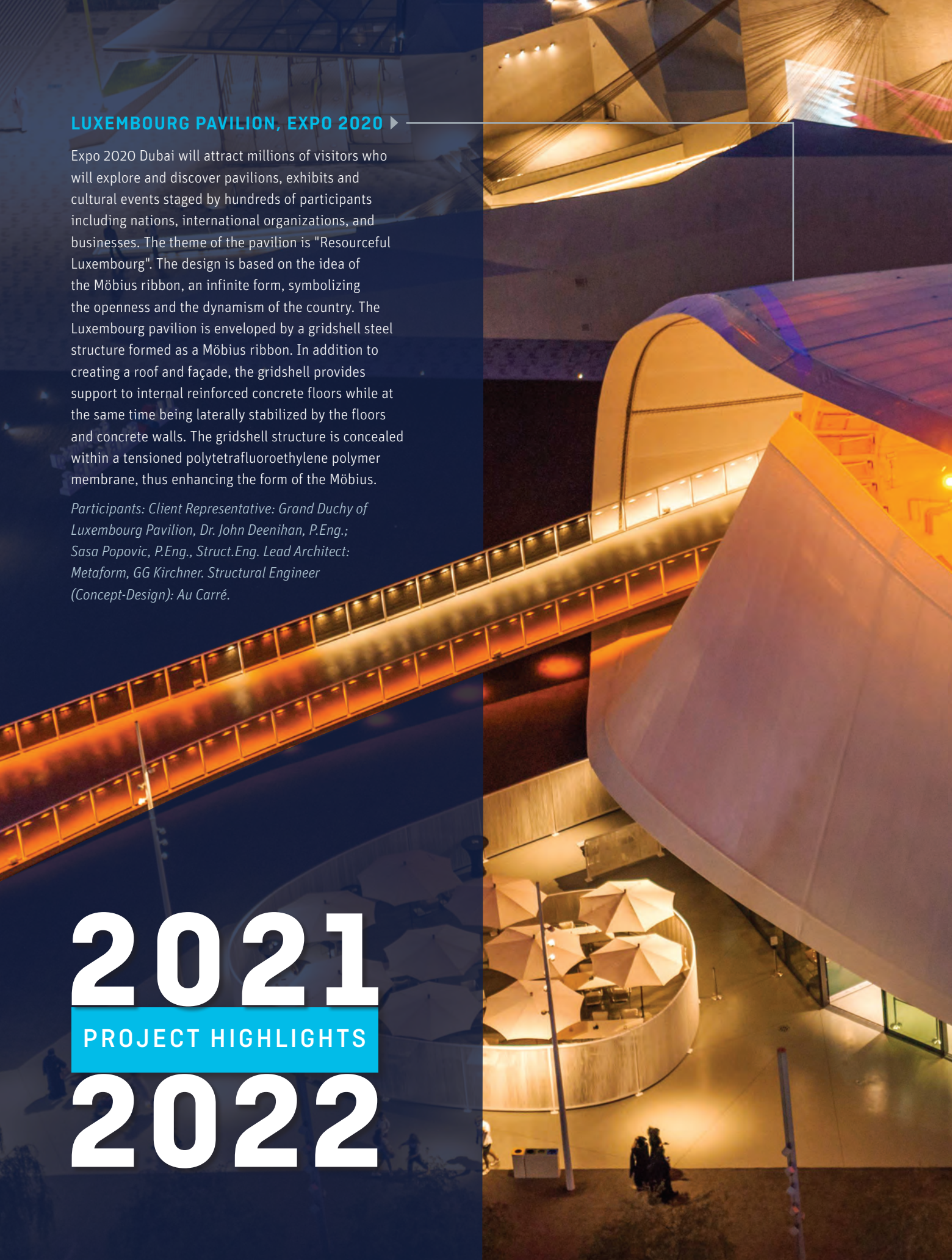
You can also exceed the intent of relevant guidelines, and may depart from a guideline if appropriate, provided you identify a reason. In these situations, you must document the reason for departing from the guideline; the rationale for departure must be consistent with your obligations under the *Professional Governance Act*, relevant regulations, and our Bylaws and Code of Ethics. You should keep this documentation as a record and consider supporting this decision through a documented risk assessment and/or, if appropriate, a review by an independent, appropriately qualified registrant.

In terms of how guidelines are developed, we prioritize the development (or revision) of guidelines based on risk to public safety and the environment, the target audience, whether similar guidance is found elsewhere, and resource availability.

More information on use of professional practice guidelines can be found in the *Guide to the Standard for the Use of Professional Practice Guidelines*, at *egbc.ca/Quality-Management-Guides*. For more on the development of professional practice guidelines, refer to *egbc.ca/Guideline-Development-Process*.

Do you have an idea for a future guideline topic, a revision, or the adoption of guidance published by another regulatory body? If so, contact *practiceadvisor@egbc.ca*.

Alice Kruchten, P.Eng.
Practice Advisor



LUXEMBOURG PAVILION, EXPO 2020

Expo 2020 Dubai will attract millions of visitors who will explore and discover pavilions, exhibits and cultural events staged by hundreds of participants including nations, international organizations, and businesses. The theme of the pavilion is "Resourceful Luxembourg". The design is based on the idea of the Möbius ribbon, an infinite form, symbolizing the openness and the dynamism of the country. The Luxembourg pavilion is enveloped by a gridshell steel structure formed as a Möbius ribbon. In addition to creating a roof and façade, the gridshell provides support to internal reinforced concrete floors while at the same time being laterally stabilized by the floors and concrete walls. The gridshell structure is concealed within a tensioned polytetrafluoroethylene polymer membrane, thus enhancing the form of the Möbius.

Participants: Client Representative: Grand Duchy of Luxembourg Pavilion, Dr. John Deenihan, P.Eng.; Sasa Popovic, P.Eng., Struct.Eng. Lead Architect: Metaform, GG Kirchner. Structural Engineer (Concept-Design): Au Carré.

2021
PROJECT HIGHLIGHTS
2022

SCHOU EDUCATION CENTRE

Omicron was engaged to rehabilitate the former school through a complete heritage revitalization process, and the addition of a new wing. The existing building is a designated heritage building. Accordingly, efforts were made such that any structural upgrades would have minimal effect on appearance, especially to the building's exterior. Design of the existing heritage building and new annex included geothermal system, energy studies in cooperation with BC Hydro, building materials with significant (up to 90% percent) recyclable content, electric vehicle charging stations and incorporating VDC technology to optimize service spaces. A new cupola was designed and built to scale, based upon photos of the original. Exposed mass timber elements, glulam beams and a cantilevered steel stair with glass guards are featured in the link.

Participants: Calvin Schmitke P.Eng.; Svet Milev P.Eng.; Tommy Fung P.Eng.; Lynsey Rafferty P.Eng.; Jack Zhang P.Eng.; Kimmy Poon P.Eng.; Teresa Paqueo, P.Eng.; Dan Kikuchi EIT.

BARRIER LAKE BOAT LAUNCH

Alberta Parks identified the need to improve emergency access to Barrier Lake as its existing boat launch had become impassible due to a change in operation of Barrier Dam, since the 2013 flood events. Due to Barrier Lake's unique regulated water levels, SweetTech found that the new boat launch could experience an 8.6-metre range in water level elevations. Through detailed design, SweetTech worked to optimize earthworks, ramp geometry, and construction materials. SweetTech prepared a design and tender that provided the Contractor the option to complete the work in dry or wet conditions. The Contractor opted to construct the launch in wet conditions utilizing a double turbidity curtain isolation, GPS-enabled equipment, and SCUBA divers to assist the placement of precast concrete ramp panels. During construction, SweetTech worked closely with the Contractor to provide timely design changes based on encountered subsurface conditions.

Participants: SweetTech Engineering Consultants, Austyn Schutta, P.Eng., Andres Ocejo, P.Eng.

CENTENNIAL ROAD OVERPASS

Centerm is a container terminal on the south shore of Vancouver's inner harbour and handles one-fifth of goods shipped in containers through the Port of Vancouver. The Centennial Road Overpass is a 480-metre-long, 13-span bridge that provides a rail and road grade separation for through traffic, eliminating rail crossing delays. The overpass dramatically increases traffic capacity and throughput to and from Vancouver's south shore terminals. Hatch was the bridge designer and provided innovative design solutions for the overpass, which was heavily constrained by existing infrastructure; and maintaining traffic to the terminal during construction was critical. The overpass is essential to the goal of increasing Centerm's throughput by 60 percent, while only increasing its physical footprint by 15 percent.

Owner: Vancouver Fraser Port Authority.
Owner's Engineer: AECOM. Hatch participants: Adam Neale, P.Eng., Matthias Yu, P. Eng., Milad Khorasani, P.Eng., Samson Lee, P. Eng., Mohammad Akbar, P.Eng., Filip Hristov, P. Eng., Carson Feng, EIT.

MV MIDNIGHT SUN LIQUID NATURAL GAS CONVERSION

On February 1st, 2022, Victoria Shipyards completed the industrial work required to convert the TOTE Services vessel the MV Midnight Sun to use natural gas as a fuel. This is the largest vessel to date in North America to undergo an LNG conversion. The MV Midnight Sun is 255 metres long, can carry 600 FEU and 220 autos. This was a complex project; work was coordinated between 20 companies in 8 countries spanning 3 continents. Victoria Shipyards executed work over a ten-week and eight-week shipyard work period, installing three structural units totaling 500 tonnes, two 1,100 cubic meter liquid natural gas tanks, 5 kilometres of piping, 53 kilometres of cable and 4,000 individual items. Gas commission and testing is expected to be completed by TOTE Services in March 2022.

Participants: Kelly Scott, Jon Markestad.
Victoria Shipyards: Ryan Tuira, P.Eng.; Steve Miller.

Photo: Adrien Williams/Michael Sherman

DOWNTOWN VICTORIA URGENT AND PRIMARY CARE CENTRE

PBX Engineering provided electrical consulting engineering services for the new Downtown Victoria Urgent and Primary Care Centre, giving residents better access to team-based care including family physicians, registered nurses, physiotherapists, and mental health counsellors. Construction adhered to an aggressive timeline with expedited design and construction phases. The project featured new power distribution, lighting, access control, security, and life safety systems. The 808 square metre leased space included intermediate and basic patient care areas that were designed to CSA Z32 requirements with patient reference grounding systems. Design occurred during the COVID-19 pandemic, which emphasized the need for droplet control, negative pressure rooms, and remote physician care workstations. PBX Engineering's services included detailed design, tendering, and construction services.

Participants: PBX Engineering: Raj Atwal, P.Eng., Andrea Sommer, P.Eng., Darren Gervais-Harrison, EIT. Kasian Architecture: Wojciech Brus, Christine Craik; WSP Engineering: Craig Harrison, P.Eng; Skyline Engineering: Wade Griffin, P.Eng.

ST. ANDREW'S WESLEY UNITED CHURCH HERITAGE CONSERVATION AND SEISMIC UPGRADE

Originally built in the early 1930s, the conservation of Vancouver's St. Andrew's Wesley United Church celebrates the church's rich history while preserving the structure's long-term future through key improvements to seismic resiliency, envelope durability, occupant safety, and accessibility. The project team put in countless hours to stabilize and renew the designated heritage exterior, including a new copper roof and flashings, while also re-creating a heritage interior that effectively conceals the extensive upgrades to the primary building structure and gives the building 100 percent capacity against the design seismic force level in the National Building Code of Canada, 2015. The distinguished new elements and features of the church show true to its time, reflecting the importance of its heritage while providing a safe and durable building structure that will sustain decades to come.

Participants: RJC Engineers: Michael Maclean, P.Eng., Dennis Gam, P.Eng.: Ryder Architecture: Donald Luxton & Associates; AES, AME.

TIMBER HOUSE

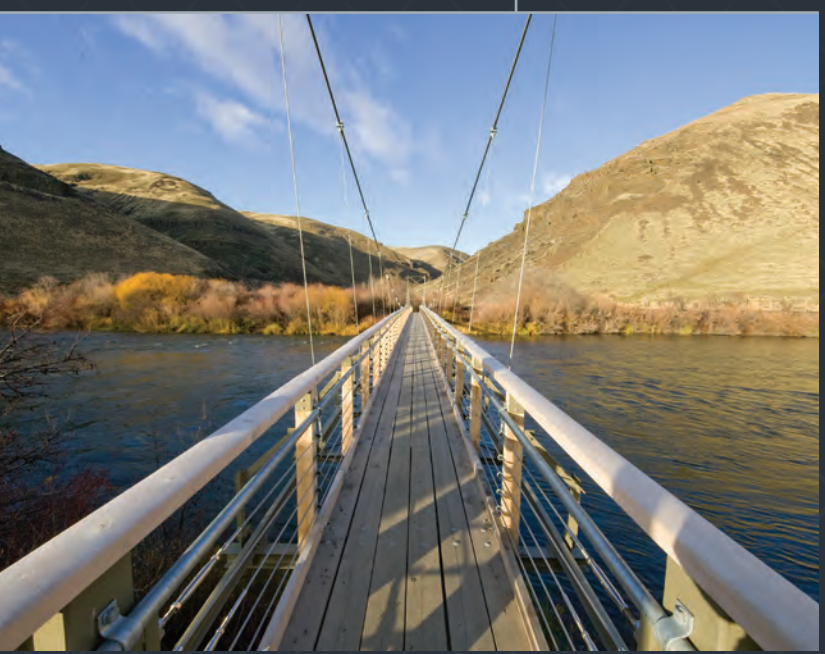
Timber House is an exciting multi-family residential development that demonstrates a new way to build with mass timber in this sector. Designed in collaboration between Fast + Epp and RWA Group Architecture Ltd. for Aragon Properties, the 120,000 square feet complex will consist of five- and six-storey buildings on the Fraser River in British Columbia. As a developer project, the design challenge was to create a cost-effective kit-of-parts mass timber structural system, which could also be exposed within the units. Out team designed a prefabricated structure for quick installation, and cross-laminated timber panels have not only been used for the floors on this project, but also for the bearing walls and shear walls. It is one of very few buildings in the local market to use this innovative cross-laminated timber wall and floor approach.

Participants: Robert Jackson, P.Eng., Struct.Eng.; Chris Mills, P.Eng.

UMTANUM BRIDGE REHABILITATION

Picturesquely framed by massive basalt cliffs and the rolling desert hills of Yakima River Canyon, the Umtanum Suspension Bridge is a 100+ year old, recently rehabilitated, structure spanning 67 meters over the winding Yakima River, Washington's only Blue-Ribbon trout stream. Built in the early 20th century, this cable-supported bridge replaced an early ropeway that the railroad used to cross the river. Within the canyon, the bridge has remained the only recreational access to the rugged and expansive land on the west side of the river. HDR's team worked closely with BLM to design a unique rehabilitation strategy for the damaged and deteriorated bridge, leveraging innovative structural engineering technology and expertise while respecting the site's environmental and historical sensitivities. The context-sensitive and environmentally sustainable rehabilitation solution improves crossing safety, enhances the bridge-user experience, and provides an enduring gateway to nature at one of BLM's busiest recreational sites for years to come.

Participants: Owner: United States Department of the Interior Bureau of Land Management (BLM); Consultant: Michael Roberts, P.Eng./HDR; Contractor: Rickabaugh Construction, LLC.



SIXTH STREET VIADUCT REPLACEMENT

COWI North America is providing erection engineering services for the Sixth Street Viaduct Replacement currently under construction. The new viaduct is one of the biggest bridge projects ever undertaken by the City. The replaced bridge was a well-known local landmark and has appeared in numerous movies since 1932. This new iconic structure comprises 10 network arch spans with 1,000 metres total length without any intermediate joints. It features unique-looking Y-shaped piers that are supported on friction pendulum bearings for seismic isolation. COWI, working with the contractor Skanska-Stacy and Witbeck, developed a detailed construction sequence, including camber and stress analyses, customized lock-up devices, and hanger installation procedure. The work has been performed in collaboration with the City of Los Angeles and the bridge designer HNTB.

Participants: Darryl Matson, P.Eng., Hesham Ibrahim, P.Eng., Tobias Petschke, P.Eng., Alejandro Bohl, P.Eng., Alex Breese, P.Eng., Majid Ebad Sichani, EIT.

HYDROGEN FUEL CELL FOR LONG RANGE AUTONOMOUS UNDERWATER VEHICLES

To improve reliability for long duration autonomous underwater vehicle (AUV) missions, Cellula Robotics began a fuel cell upgrade program in 2021. The peripheral fuel cell systems, such as the pumps and blowers, have been improved and the control architecture has been simplified prior to significant endurance testing. The hydrogen-powered fuel cell provides 250 kilowatt hours of onboard energy to Cellula's Solus-LR AUV, which enables submerged mission ranges greater than 2,000 kilometres. Extending the usable range to nearly 10 times the industry standard allows for port-to-port missions, eliminating the need for vessel-based launch and recovery. A series of missions integrating commercial and defence payloads are being conducted in 2022 by Cellula.

Participants: Eric (James) Jackson, P.Eng., Alex Johnson, P.Eng., Reuben Meikle, P. Eng., Chris Kaminski, P.Eng., Saqueib Khan, EIT, Elizabeth Hunter, EIT, Thomas Deaton, EIT, Drew Davison, EIT, Keira Lane, EIT, Nicholas Hetherington, EIT.

COMPACT CONTINUOUS COLUMN, DISTILLATION FOR CRAFT DISTILLERS

Revival Stillworks have developed the first made-in-Canada automated compact continuous distillation system for craft distillers. With a height of 13 feet, the system is small enough to fit within most craft distilleries and provides continuous distillation capabilities previously only achievable in larger facilities. This system has been designed for a distillery in Quebec to accept a continuous stream of old beer approximately 8 percent ABV) and distill it into vodka (95 percent ABV).

The system can be used to produce a multitude of additional spirits such as whisky, bourbon, rum, and brandy. The innovative design doubles a typical craft distillers ethanol production while cutting the utility requirements in half. This increases the ROI for distillers while reducing their environmental footprint. With the added production capacity this technology increases the consumption of Canada's locally sourced grains thereby providing a significant value add to the agricultural sector.

Participants: Darcy Lane, P.Eng., Brandon Fry, EIT.

GALLANT CREEK FLOOD CONVEYANCE PROJECT

Gallant Creek is a steep watercourse in the District of North Vancouver, BC that used to be conveyed through the town centre of Deep Cove via a 1200 millimetre diameter concrete culvert constructed between 1950 and 1984. Following repeat flooding events, replacement of this culvert was identified as one of the highest priorities in the District's Integrated Storm Management Plan.

The 1800- and 2100-millimetre diameter, 150-m long, replacement culvert is sized to convey the 200-year climate-change adjusted design flow. The new culvert was installed in fall 2021 in a dense urban town center and includes a side-tapered inlet structure, an upgraded upstream channel, and a new 40-m long section of downstream channel designed for aesthetics, fish habitat, and flood conveyance.

Participants: District of North Vancouver: Wendelin Jordan, Joanne Slazyk, Shane Devine; Water Street Engineering: Allan Bronsro, P.Eng., Stuart Fretwell, P.Eng., Luc Harvey; Gygax Engineering Associates: Adam Williams, P.Eng., Struct.Eng.

UNIVERSITY OF VICTORIA WIND RESEARCH BUOY

Weighing 5,500 kilograms and measuring six metres long, this buoy is the first of its kind in BC waters to relay rich data to engineering researchers about offshore wind. The buoy is integral to the University of Victoria's projects to help remote BC coastal communities replace diesel use with offshore wind, or power direct air carbon dioxide capture for sequestration and offshore green hydrogen production. Built to researchers' specifications by Sidney-based AXYS Technologies, the buoy was deployed for commissioning in November near Victoria. Powered by a solar panel, wind turbine and methanol fuel cell, the buoy uses a 3-D laser-scanning system to measure winds up to 200 metres aloft, along with meteorological and oceanographic sensors to continuously gather and transmit live data about wind and ocean conditions. The datasets are critical in helping address knowledge gaps to accelerate the deployment of floating offshore wind turbines.

Participants: Brad Buckham, P.Eng., Curran Crawford, P.Eng., University of Victoria.

FORT SEVERN FIRST NATION SOLAR ARRAY

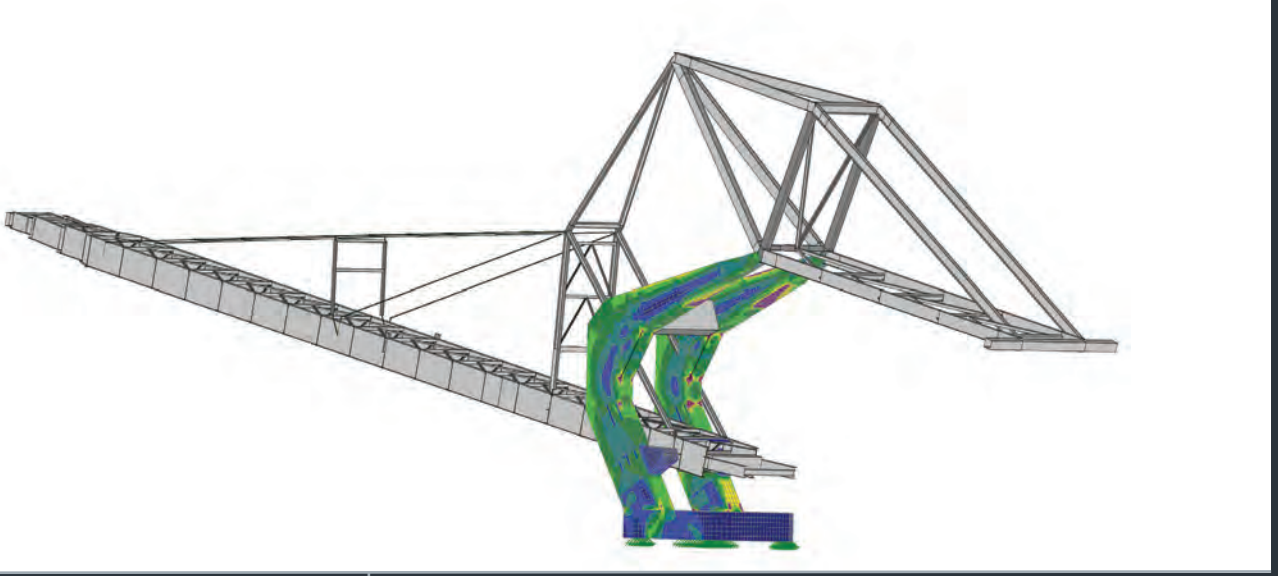
The Fort Severn First Nation was determined to transition into renewable clean energy through a microgrid solar array project. In December 2021, project partner Hedgehog Technologies and contractors Igloo Innovations, and Bower Electric completed the solar array under the vision of Chief Paul Burke. Seasonal weather conditions limited the supply chain to ice roads, barges, and air cargo, creating logistically challenging scenarios. An e-house was installed during a blizzard using a lateral dragging technique with two excavators after previously being delivered on a barge. Any structural damage sustained could have delayed the project indefinitely. Before the solar array powered on, the local residents were trained in maintenance and operations creating more economic opportunities for the remote community. The success of Fort Severn is an example of the resilience and collaborative spirit within the Indigenous community.

Owner: Fort Severn First Nation; Participants: Dr. Michael Wrinch, P. Eng., Charles Lewthwaite, EIT; Contractor: Bower Electric, Igloo Innovations.

OAKRIDGE CENTRE REDEVELOPMENT GROUNDWATER MANAGEMENT STRATEGY

The 4.5 million square foot Oakridge Redevelopment will transform Oakridge Mall into a major cultural hub, with retail, residential, office, parks, and civic space. The site sits on the Quadra Sands Aquifer and has historically extracted groundwater from the aquifer for building cooling for over 60 years. A comprehensive Groundwater Management Strategy (Strategy) was developed to mitigate impacts to surrounding infrastructure and optimise the reuse of the natural resources in the built environment. The Strategy entails extracting groundwater and capturing stormwater and directing it to a non-potable water treatment plant. The treated water will be used on-site for toilet flushing, laundry, cooling towers, non-edible crop irrigation, and car washing. The reuse of groundwater and stormwater for non-potable purposes will significantly offset the need for potable water from the Seymour-Capilano-Coquitlam Reservoirs, which services much of the lower mainland.

Participants: Associated Engineering: Helen Chan, P.Eng.; Core6 Environmental: Stephen Munzar, P.Geo.



EQUIPMENT FATIGUE ANALYSIS

Ridley Terminals Inc. engaged CWA Engineers (CWA) to complete a detailed fatigue analysis and fatigue service life prediction of their major materials handling equipment, including two slew-mounted ship loaders and three rail mounted stacker-reclaimers. CWA developed computerized 3-D structural models of each machine (considering extensive structural upgrades completed since commissioning) and applied the relevant dynamic effects and cyclic loads. A code-based approach was used to establish a detailed stress map of the equipment, identifying specific members and areas with critical remaining fatigue life. The results of this innovative study provided actionable information that will facilitate asset management decisions, including planned maintenance, capital upgrades, and equipment replacement considerations.

Participants: Ryan Thomson, P.Eng., Ridley Terminals Inc. CWA Engineers: Spencer Townsend, P.Eng.; Saeed Samani, P.Eng.; Devin Hagardt, P.Eng.; Manny Wang, P.Eng.; Steven Yee, P.Eng.

DECONSTRUCTION OF THE ORIGINAL CHAMPLAIN BRIDGE: LOWERING OF THE SUSPENDED SPAN

On January 7, 2022, in Montreal, the 117.5-metre long suspended span of the Original Champlain Bridge main span, owned by The Jacques Cartier and Champlain Bridges Incorporated, was lowered 33 meters over the navigation channel onto a barge. This was the most complex operation in the bridge deconstruction led by Nouvel Horizon Saint-Laurent. Before the lowering, T. Y. Lin International designed the reinforcement of multiple members for the dismantlement operations. The load of the suspended span (2,200 tonnes) was transferred to the 6 strand-jacks installed on top of the cantilever arms. The suspended span was then disconnected from the anchor spans by torch-cutting the disengaged connecting members. The lowering itself lasted 10 hours with continuous monitoring and evaluation of the loads. The suspended span will be dismantled later while on the barge, following a precise deconstruction sequence verified by T. Y. Lin International's engineering team.

Participants: Marwan Nader, P.Eng., Hayat Tazir, P.Eng. (OIQ), Lucie Tabor, P.Eng. (OIQ), Tim Ingham, George Baker, Marco Tremblay.

CARBON-NEUTRAL COATINGS TO REHABILITATE SEWER INFRASTRUCTURE

In BC and around the world, underground sewer infrastructure is deteriorating rapidly due to bacteria-induced bio-corrosion. Bacteria in sewerage produce sulphuric acid that rapidly attacks concrete and results in expensive collapses, endangering life and property. UBC and Metro Vancouver have teamed up to develop a carbon-neutral, geopolymer coating with biocides (called multi-phase composite coating, or "MCC") that when applied on sewer infrastructure, will resist bacterial attack, prevent further corrosion and extend the infrastructure's existing service life. This coating was recently applied at the Tilbury Wastewater Junction Chamber near Annacis Island. A better-than-expected performance of the MCC coating was observed. With various doctoral students involved, the project is a good example of industry-academia partnership leading to significant long-term benefits for essential public infrastructure.

Participants: UBC and India-Canada Centre for Innovative Multidisciplinary Partnerships to Accelerate Community Transformation and Sustainability (IC-IMPACTS): Dr. Nemy Banthia, P.Eng. (Project Lead); Rob Shilto; Dr. Negar Roghanian, EIT; Metro Vancouver: Emma Slater, P.Eng., Peter Hair, P.Eng.

GIS MODELLING OF SEA WATER INTRUSION RISK

Over-development of groundwater resources in coastal areas can cause seawater intrusion into coastal aquifers. Once seawater intrusion occurs, remedial measures can be slow and costly. Western Water Associates Ltd. and partners mapped the sea water intrusion risk to unconsolidated and bedrock aquifers over the entire BC coast (i.e., 25,700 kilometres long). Mapping sea water intrusion risk helps to ensure these risks are appropriately managed. The assessment relied principally on physical factors that are believed to be either drivers or reflect conditions that influence sea water intrusion risk, including (but not limited to) topography, aquifer properties, pumping threat, sea level rise and storm surge.

Participants: Tim Sivak, P.Geo. (Western Water Associates Ltd.), Mike Wei, P.Eng. (Hydro Geo Logic), Christine Bieber, P.Geo., (BC Ministry of Environment and Climate Change Strategy), Sylvia Barroso, P.Geo. (now the BC Ministry of Forests), William Shulba, P.Geo. (Islands Trust Council), Diana Allen, P.Geo. (Simon Fraser University).

PHOTO: DONALD GILLIES

BAY CLASS LIFEBOATS

In 2021, the Cadboro Bay and Florencia Bay Lifeboats were delivered in Victoria to the Canadian Coast Guard. These high-performance fully self-righting 19-metre-long lifeboats were designed in Vancouver by Robert Allan Ltd. to operate in up to 12-metre seas with a range of 250 nautical miles. Built by Hike Metal in Ontario and Chantier Naval Forillon in Quebec, these two new lifeboats join the McIntyre Bay and Pachena Bay already in service on the BC coast, with 20 of these new lifeboats eventually entering service at Coast Guard stations across Canada. This new Bay Class series of lifeboat significantly increases the Canadian Coast Guard's heavy weather search and rescue capabilities and will also be used for environmental protection purposes.

Participants: Hans Muhlert, P.Eng., Andra Papuc, P.Eng., Allan Turner, P.Eng., Norbert Schumacher P.Eng.

VANCOUVER LANDFILL DRAINTUBE GAS COLLECTORS

To continue to increase early landfill gas collection, in October 2017 the City of Vancouver installed 240,000 square metres of draintube collectors (i.e., perforated mini-pipes in nonwoven geotextile layers) as part of the Western 40 Hectares Closure and gas works at the Vancouver Landfill. In December 2021, square metres of draintube collectors were installed in Phase 5-South area of the landfill. Similar to horizontal gas collectors, draintube collectors are installed in the active filling area and can be sloped up to 20 percent for drainage purposes. Draintube collectors are easier and cheaper to install and are expected to be just as efficient as the horizontal gas collectors.

Owner: City of Vancouver: Lynn Belanger, P.Eng., Jerry Sobejko, P.Eng., Rod Zedan, P.Eng., Chikezie (Kezi) Nwaoha, Ph.D., P.Eng., Javier Nava Avendano, P.Eng., Hanna Musslick, Sarah Wilson, P.Eng.; Owner's Engineer: Sperling Hansen Associates: Cris Ciuperca, P.Eng. SCS Engineers: Ted Massart; Project Management Consultant: R.F. Binnie: Adam Stubbs, P.Eng.

MAPLEWOOD MARINE RESTORATION PROJECT

The Maplewood Marine Restoration Project is a marine site identified as a critical nearshore habitat restoration priority by the Tsleil-Waututh Nation. Providing the largest eelgrass bed in Burrard Inlet, the project included the transplanting of approximately 125,000 eelgrass shoots to create a 1.5-hectare eelgrass bed—about the size of 1.5 football fields. Located within the northeast basin of the previously dredged Maplewood Basin, MMRP transformed approximately five hectares of lower diversity marine habitat into higher diversity marine habitat for fish, birds, and other wildlife. The higher diversity habitat included intertidal flat, eelgrass, and rock reef habitat. During the development of the design, the project team collaborated with local Indigenous groups on the design and project implementation.

Owner: Vancouver Fraser Port Authority. Participants: AECOM, Klohn Crippen Berger, Precision ID, Balanced Environmental, TetraTech, Hemmera, Kirk and Co, Jemma Scoble Consulting, Pacific Pile and Dredge, CanPac Marine, Inlailwatash LP.

THE DISH VERIFICATION ANTENNA PROJECT

The Dish Verification Antenna 2 (DVA-2) is the latest in a series of single-piece carbon composite radio reflectors developed at the Dominion Radio Astrophysical Observatory, as part of the National Research Council of Canada in Penticton BC. The DVA-2 is a 15-metre diameter offset Gregorian design. The unique aspect of about this telescope is its single piece carbon-epoxy reflector surface, a technology developed at DRAO, which enables the construction of large and accurate reflectors at lower cost than multi-piece metal designs. The DVA-2 has a surface accuracy of 335 microns, accurate enough to support operation at 50GHz. After its completion late last year the DVA-2 switched from being an engineering demonstrator to a functioning radio telescope. Its first astronomy task is to map out the polarization of the sky in the 350-1050Mhz frequency range in support of the Canadian Hydrogen Intensity Mapping and Global Magneto-Ionic Medium Survey projects.

Participants: Gordon Lacy, P.Eng., Dr. Mohammad Islam, Peter Byrnes, P.Eng., Joeleff Fitzsimmons, P.Eng.

POND INLET MARINE INFRASTRUCTURE

Situated 700 kilometres north of the Arctic Circle on the north shore of Baffin Island, a $41 million small craft harbour is nearing completion in Pond Inlet (Mittimatalik), Nunavut. The new facility provides a sheltered harbour and cargo laydown space, which will improve efficiency and safety of the annual dry cargo resupply operation. The project includes a 40-metre sheet pile wharf for commercial fishing boats and a floating dock moorage for 80 small craft. The floating docks will enhance food security by supporting traditional subsistence hunting and fishing activities and reducing reliance on southern foods. Construction in this environment is challenging due to the short open water season, arctic climate, and remote location.

Participants: Harald Kullmann, P.Eng., Robert Crompton, P.Eng., Andre Dratwa, P.Eng., Jeffrey Gibson, P.L.Eng., Hugo Hills, EIT, Peter Snow, EIT.

GRT'S RESOURCE REGENERATION FACILITY

After consultation with the Snuneymuxw First Nation, GRT opened Canada's first land-based Resource Regeneration Plant at Duke Point in Nanaimo. The GRT plant accepts and treats excess soil, dredge, and slurry materials, diverting them from increasingly scarce landfills and producing clean aggregate products for local reuse. The facility uses soil washing technology to clean, sort and classify excess materials into six output products: clay, sand, pea gravel, rock, scrap metal, and organics (wood and plastic). The water used in the soil wash process is treated so that it can be reused to clean the next batch of soil, thus minimising discharges to the environment. Over 90 percent of incoming materials are reintegrated back into local aggregate markets; the embodiment of a local, sustainable, resilient circular economy that works for everyone.

Participants: GRT Environmental Services (Canada) Ltd.: Peter Reid, P.Eng., Claire Lewis, P.Eng., Alain Consigny, P.Eng.

PORT ALBERNI WASTEWATER TREATMENT FACILITY

While upgrading its wastewater system to meet provincial and federal regulations, the City of Port Alberni identified a significant opportunity to reduce the vulnerability of salmon in Alberni Inlet at the mouth of the Somass River. Due to the cumulative impacts of industry, changes in the watershed, and climate change, the marine waters of Alberni Inlet suffer from periodic episodes of low dissolved oxygen in late summer. Associated Engineering designed a unique discharge system that the City operates only during an ebb tide, when the Somass River freshwater discharge provides optimal dispersion into the surface waters of Alberni Inlet. During late summer when River temperatures remain high and fish are stressed in low dissolved oxygen conditions, the City can retain treated effluent in the lagoon, preventing any discharge for up to two weeks.

Participants: City of Port Alberni: Ken Watson, P.Eng. (Retired); Associated Engineering: Tom Robinson, P.Eng., Michal Simhon, P.Eng.

FRASER CANYON HOSPITAL FLOOD EMERGENCY WORKS

In November 2021, the District of Hope retained LCI Engineering Group (owned by LaCas Consultants Inc.), river engineering and flood control specialists, for emergency flood restoration works on the Coquihalla River. The riverbank adjacent to the Fraser Canyon Hospital, was severely eroded and unstable. The riverbank was about seven metres high in some places, with a vertical cut. Equipment was immediately mobilized to repair the bank and excavate an emergency flood channel on the opposite side of the river. A bench road was constructed along the riverbank and rock riprap was placed. Once the bank was stabilized, the emergency flood channel was enhanced with rock weirs and large woody debris. The work was substantially completed before the end of 2021.

Participants: Brian LaCas, P.Eng., FEC.

UNITED BOULEVARD RECYCLING AND WASTE CENTRE

Metro Vancouver's new United Boulevard Recycling and Waste Centre is one of the most comprehensive solid waste facilities in North America, with enhanced recycling opportunities to help Metro Vancouver meet its diversion goals and move to a circular economy. The 6.2-hectare complex, located on a former landfill in Coquitlam, BC, incorporates many sustainable features and demonstrates that large structures can be developed on challenging closed landfill sites using advanced geotechnical, structural, mechanical, electrical, and civil engineering solutions. Safety was a key priority in the design that led to distinct customer and service vehicle streams and areas. This underutilized brownfield land is transformed into a state-of-the-art recycling and waste centre for the region.

Owner: Metro Vancouver: Nathan Jamieson, P.Eng., Senior Project Engineer; Harvey Choy, P.Eng., Senior Engineer; Paul Litt, P.Eng., Senior Engineer; Brandon Ho, P.Eng., Senior Project Engineer. Prime Consultant: Morrison Hershfield: Lillian Siu, P.Eng., Project Manager. HDR. Thurber.

SUMAS RIVER DIKE BREACH REPAIR, ABBOTSFORD FLOOD 2021

In November 2021, atmospheric rivers over the Fraser Valley resulted in widespread flooding and damage to property and infrastructure. On November 16, the Sumas River Dike breached, sending hundreds of cubic meters per second of water into the farmland of the Old Sumas Lake Bottom. Kerr Wood Leidal (KWL) took a central role directing the repairs of the main, 100m wide by 8m deep, breach. KWL assessed and supervised repairs of access roads, and utilizing the Sumas Prairie hydraulic model, predicted upcoming water levels to guide operations. The breach was sealed by 4:00 am November 21, allowing the Lake Bottom area and Highway 1 to recover. KWL's decisive response prevented further complications from the ongoing weather events.

Owner: City of Abbotsford. Participants: Colin Kristiansen, P.Eng., David Zabil. Kontour Geotechnical Consultants: Dr. Brian L.J. Mylleville, P.Eng. Contractor: Jakes Construction. Funding Agency: Emergency Management BC.

In-SHUCK-ch FOREST SERVICE ROAD BRIDGE INSTALLATION

The In-SHUCK-ch forest service road, southeast of Pemberton, provides public, recreational, and industrial access along Lillooet Lake. This forest service road is the only road access for light vehicles to First Nations communities, recreational properties, and backcountry access. A short section of the road located between a BC Hydro transmission tower and Lillooet Lake remained very challenging, with narrow road widths and poor sight lines. A 115-metre-long, double-lane, 7-span bridge structure founded on wall-type piers was proposed to allow the road to be shifted towards the lake, resulting in both an improved road alignment and increased road width. The completed structure has greatly improved road user safety and strengthened long-term access.

Owner: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Tyson Miller, P.Eng., Malcolm Schulz. Participants: Onsite Engineering: Michael Foster, P.Eng., Mike Hanson, P.Eng. Associated Engineering: Julien Henley, P.Eng., Nima Mohajerrahbari, P.Eng., Helen Du, P.Eng. Contractor: Triex Contracting Ltd. Fabricator: Rapid-Span Structures Ltd.

LOW CARBON ELECTRIFICATION AT KILLARNEY COMMUNITY CENTRE

A low carbon electrification study was conducted to identify measures for improving the performance of the center's mechanical systems and reduce greenhouse gas emissions. The natatorium was served by a 100 percent outdoor air handling unit with heat recovery. This system over-dehumidifies the space and increases evaporation, resulting in excessive energy use for heating. The natatorium air handler was converted to a conventional mixed air unit with an exhaust air heat recovery coil. A new heat recovery chiller recovers heat from the exhaust air and returns it to the pools and supply air. The system is piped to allow the heat recovery chiller to provide mechanical cooling in summer months, further reducing energy use. The expected greenhouse gas emissions savings is above 80 percent, or 500 tonnes of carbon per year.

Participants: City of Vancouver: Craig Edwards, P.Eng.; Prism Engineering: Tim Aske, P.Eng., Iram Green, P.Eng.

TIBBITT TO CONTWOYTO WINTER ROAD

The Tibbitt to Contwoyto Winter Road (TCWR), an ice road constructed annually north of Yellowknife, NT, is approximately 400 kilometres long, with 85 percent of the road crossing over frozen lakes. The TCWR has been used as a safe, environmentally sound and economically viable route, connecting three diamond mines in the far north, with southern supply routes, to facilitate mineral exploration. During its 8-10 week Operations Phase, the TCWR can see upwards of 100 truck loads per day. As engineer-of-record, Associated provides ice engineering and environmental services, including ice loading tables, heavy haul load reviews, quality assurance, and environmental stewardship and progressive remediation programs. Associated works with the owner to conduct controlled on-ice testing programs and desktop analyses to safely increase truck payload efficiency during the TCWR's operating window.

Participants: Associated Environmental: Mike Weldon, P.Geo.; Associated Engineering: Willem Janse Van Rensburg, P.Eng. (NAPEG, APEGA), Al Fitzgerald, P.Eng., Jason Dowling, P.Eng., Karine Poliquin, P.Eng.

NEW AFTON MINE THICKENED AMENDED TAILINGS PROCESS FACILLITY

New Gold's New Afton mine, near Kamloops, required a new deposition method and expansion for copper tailings deposition. Cemented tailings paste deposition into the historic Afton open pit was selected. This solution also improves process water recovery from tailings. Fluor completed detailed engineering to handle 16,000 tonnes per day of tailings. The scope included the highly automated paste thickener and pumping systems, buildings, cement system, process controls, reagent systems, distribution pipelines, and ties with the existing plant. Central to the process is the paste thickener, 45 metres in diameter and 22 metres tall, which at the time of construction made it the largest of its kind in the North America and matched the world's largest one.

Particpants: Fluor: Yarek Koziura, P.Eng. – project/engineering manager, Viran Uduman, P.Eng. – process, Emir Mehmedbegovic, P.Eng. – civil, Mehdi Yadegari, P.Eng. – structural, Mike Wu, P.Eng. – mechanical, Kyoung Lee, P.Eng. – piping/pipe stress, Dylan Graydon, P.Eng. – electrical, Andrew Ji, P.Eng. – instrumentation, Sasha Golijanin, P.Eng. – HVAC, Alex Seres – plant design.

BRILLIANT DAM SPILLWAY PIER REPAIR

The Brilliant Dam is located on the Kootenay River, near the city of Castlegar, BC, and was constructed in 1944. Brilliant Dam is owned by the Brilliant Power Corporation and is managed by FortisBC. The facility consists of a 42-metre-high concrete gravity dam and has a spillway with eight gated bays. Since the construction of Brilliant Dam in 1944 the condition of the spillway piers concrete has deteriorated and required to be repaired. Due to the difficulty of lowering and controlling the forebay water level, FortisBC has opted to design a bulkhead that could be attached to the concrete piers to facilitate the repairs below the water level. The project started in 2018 and will continue until 2025 when the last concrete pier will be repaired.

Participants: Senior Project Manager: Matthew Roberts, P.Eng.; Construction Manager: Scott Macintosh, P.L.Eng.; Engineering Supervisor: Gregory Johnston, P.Eng.

HIGHWAY 91/17 UPGRADE PROJECT

The Highway 91/17 Upgrade Project enhances safety for travelers and commercial traffic while improving economic and trade development south of the Fraser River. Despite geometric, geotechnical, environmental, and archaeological challenges, tight spacing constraints, and issues associated with design, four interchanges were designed within an area typically available for one. McElhanney and Pacific Gateway Constructors responded to the province of BC's request for innovation and developed an unprecedented "one-way-couplet-road-network-system" configuration for the Highway 91/Nordel Way-Interchange as part of the project. The solution provided sustainable design within the province's budget while optimizing existing serviceable infrastructure, accommodated the province's commitment to future climate change features and improved safety, and minimized impact to the historic Burns Bog and providing environmentally friendly stormwater management features (such as bio-swales and landscaped wet-ponds).

Participants: Dave Dulay, P.L.Eng., Design Manager; Denny Leung, P.Eng., Traffic-Engineering-Lead; Tijana Smiljanic, P.Eng., Civil Design Lead; Nav Sandhu, P.Eng., Stormwater Design Lead; Associated Engineering, Thurber Engineering, COWI, DMD & Associates Electrical Consultants, Kleanza Consulting.

ST. MARY LOW LEVEL OUTLET VALVE REPLACEMENT

The low-level outlet (LLO) at St. Mary Dam is a concrete-lined tunnel used to discharge riparian flows into the St Mary River. Riparian flows must be maintained to provide habitat for local species and maintain water supply to farmers, ranchers, and small towns downstream. The supply of irrigation water from the dam's irrigation tunnel to the St Mary Irrigation Canal is the lifeblood of Southern Alberta's agriculture industry. Klohn Crippen Berger was contracted to replace critical valves within the LLO, while maintaining water flows to agriculture and wildlife. The project involved innovative construction methods such as underwater remotely operated vehicles to complete repairs, and the design of a pipeline to replace the existing irrigation canal drain line (which was too small to supply the required riparian flows).

Project Owner: Government of Alberta.
Participants: Rob McLachlan, P.Eng., Don Sproul, P.Eng., Dan Campbell, P.Eng., Lubos Petrik, P.Eng., James Dong, P.Eng.

STRENGTHENING THE LOWER LIARD SUSPENSION BRIDGE

For those that have driven the Alaska Highway and appreciate iconic structures, the Lower Liard Suspension Bridge is a stunning landmark with a fascinating history; it is believed that the towers of this bridge were re-purposed from the Tacoma Narrows suspension bridge following its tragic collapse in 1940. Public Service Procurement Canada retained WSP Canada to complete a detailed inspection of the bridge followed by a load evaluation and strengthening design. Special consideration was given to the geometry of the suspension cables and deck profile which were obtained through a site survey. The load evaluation also considered seismic performance and included a specialty review of wind loading with support from RWDI. Strengthening of the bridge was completed by Online Constructors.

Participants: Public Service Procurement Canada: Dr. Alex Taheri, P.Eng.; WSP: Réda Aiouch, P.Eng., Gurpreet Sohal, P.Eng., Arpit Kansal, P.Eng., Matthew Bowser, P.Eng.

THE FIBRECO EXPORT TERMINAL

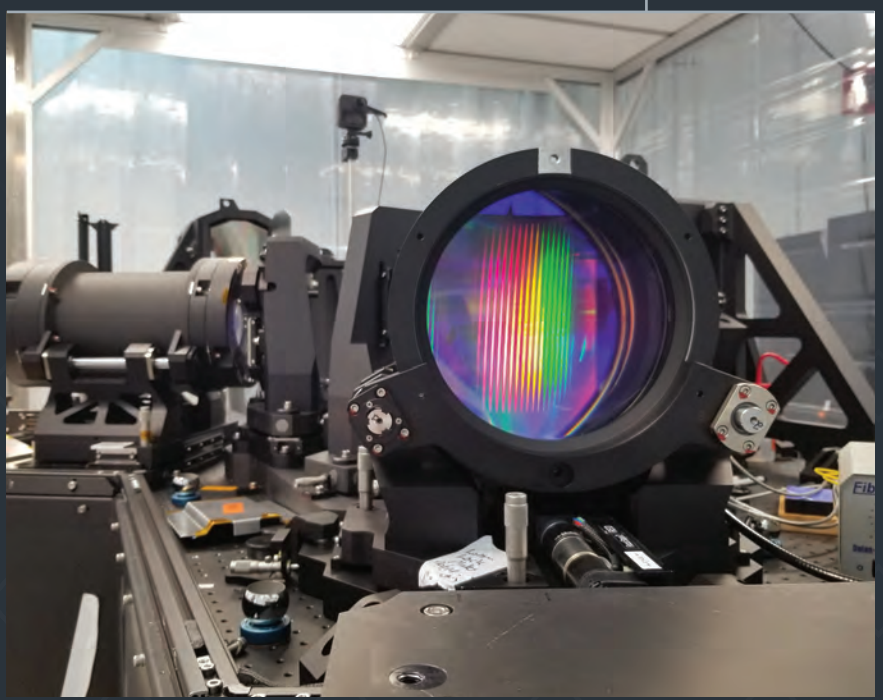
The Fibreco Export Terminal in North Vancouver, a primary commodity handling terminal, expanded its operations by adding 18 silos with a 57,100-tonne total capacity. A collapse during commissioning of the original silos made 15 silos unusable and required a new approach to its complex and challenging situation. PCL was able to bring the terminal back to operations four months sooner than expected. During forensics, PCL used the precision of laser scanning, and during extensive demolition and recovery of the old, damaged silos, which required methodical cataloguing, PCL utilized the power of StructionSite software and Autodesk's BIM 360 Construction Management Software, combined with pull planning sessions to ensure schedule compliance. PCL demolished each silo systematically while new silos were being fabricated, enabling the terminal to meet the operational demands ahead of schedule and under budget.

Participants: Ryan Andrews, P.Eng., Rodrigo Camelo, Amrit Virk, EIT, Aaron Akehurst, P.Eng.

THE GEMINI HIGH RESOLUTION OPTICAL SPECTROGRAPH (GHOST)

The Gemini High Resolution Optical Spectrograph (GHOST) will search for planets around other stars and will help us understand how the elements of the periodic table came into existence. It uses the latest detector technology, high reflectance optical coatings, and an innovative optical design to ensure high optical throughput from which the detailed spectra of light from faint stars can be examined. An innovative thermal enclosure design coupled with vibration isolation technology and precision opto-mechanical mounts produces a level of stability that detects the motion of stars away or towards us at a speed equivalent to a human running 100 meters. NRC-HAA assembled a team of optical, mechanical, electronic and software engineers and astronomers to design and build GHOST, alongside colleagues at Australian institutions. It is being deployed on one of Canada's largest offshore telescopes, Gemini South, in the mountains of Chile.

Participants: Jennifer Dunn, P.Eng., Adam Densmore, John Pazder.



WII GYEMSIGA SIWILAAWKSAT STUDENT RESIDENCE AT COAST MOUNTAIN COLLEGE

The new Wii Gyemsiga Siwilaawksat student residence at Coast Mountain College's Terrace, BC campus embraces First Nations culture and exceeds goals for durability and energy efficiency. Non-conventional construction groups light wood framed modular student housing units around a mass timber central atrium. Adaptable high-performance building envelope assemblies meet precise thermal performance and air tightness targets. Wii Gyemsiga Siwilaawksat satisfies the BC Wood First Act and exceeds BC Energy Step Code 4 energy efficiency for a Northern Coastal Climate.

Participants: Morrison Hershfield: Brett Pattrick, P.Eng. Engineer of Record (Building Envelope); Voytek Gretka, P.Eng., Energy Modelling; Stephen Wong, EIT, Building Envelope Airtightness Testing. Owner: Coast Mountain College. Architect: hcma architecture + design.

Engineers and Geoscientists BC's website contains information on the complaint, investigation, and discipline processes. You can contact us at 604.558.6647 or toll-free at 1.888.430.8035 ext. 6647, or by email at *complaints@egbc.ca*. The full text of Consent Orders can be found in the Discipline Notices section of our website, at *egbc.ca/Discipline-Notices*.

DISCIPLINE NOTICE: JOHANN G. DUERICHEN, SMITHERS, BC

On March 28, 2022, Engineers and Geoscientists BC and Johann G. Duerichen agreed to resolve two proceedings by way of a Consent Order (the Consent Order). The Consent Order concludes all matters with Mr. Duerichen and supersedes two interim orders.

The first proceeding was initiated on December 2, 2020, when the Discipline Committee of Engineers and Geoscientists issued a Notice of Inquiry to Mr. Duerichen under the *Engineers and Geoscientists Act*. The Notice of Inquiry related to engineering services Mr. Duerichen provided for the construction of a single-family residence in Revelstoke, BC (the Revelstoke Project), and a retail store in Smithers, BC (the Smithers Project). The Notice of Inquiry alleged that Mr. Duerichen demonstrated unprofessional conduct, incompetence, and violated the Bylaws of Engineers and Geoscientists BC with respect to the two projects. The allegations called into question Mr. Duerichen's qualifications and competency with respect to structural, geotechnical, and electrical engineering.

Due to the nature of the allegations, and the potential risk to public safety, on December 16, 2020, following a hearing, a panel of the Discipline Committee issued an interim order (the 2020 Interim Order) which prohibited Mr. Duerichen from practising geotechnical and electrical engineering and required that any structural engineering work conducted by Mr. Duerichen be directly supervised by a professional engineer. The 2020 Interim Order also prohibited him from applying his seal to any geotechnical, electrical, or structural drawings, reports, or other documents.

In December 2021, the Investigation Committee of Engineers and Geoscientists BC issued a Citation (formerly known as a Notice of Inquiry) to Mr. Duerichen under the newly enacted *Professional Governance Act*. The Citation alleged that he had breached the 2020 Interim Order by authenticating Letters of Assurance for projects in Burns Lake, BC and Vanderhoof, BC when he was prohibited from doing so. The Citation also alleged that he had falsely dated the Letters of Assurance to create the appearance that he had completed the work before the 2020 Interim Order came into effect.

Following the issuance of the Citation, Engineers and Geoscientists BC applied to a panel of the Discipline Committee seeking an interim suspension of Mr. Duerichen's registration.

On February 28, 2022, following a hearing, the panel ordered that Mr. Duerichen's registration with Engineers and Geoscientists BC was suspended effective March 1, 2022. The panel agreed with the submissions of Engineers and Geoscientists BC that an engineer who provides false information to authorities having jurisdiction in Letters of Assurance may constitute a risk to public safety and a suspension was proportionate to the risks identified.

Instead of proceeding to disciplinary hearings, Mr. Duerichen agreed to the Consent Order in which he admitted to numerous allegations. Regarding the allegations contained in the Notice of Inquiry, Mr. Duerichen admitted, among other things, that he demonstrated unprofessional conduct when he:

- failed to ensure that documented independent reviews were conducted of his structural designs for the Smithers Project and Revelstoke Project;
- accepted responsibility for the structural, geotechnical and electrical engineering components of the Smithers Project when he was not qualified by training or experience to do so;
- provided his assurance that he had conducted field reviews in relation to the structural and geotechnical components of the Smithers Project in circumstances where he had not conducted or directly supervised adequate field reviews;
- provided his assurance that he had conducted field reviews in relation to the electrical, mechanical and plumbing components of the Smithers Project in circumstances where he had not conducted or directly supervised documented field reviews of these components;
- failed to document or performed inadequate calculations in the course of the Smithers Project;
- signed and sealed structural design drawings for the Smithers Project that had demonstrated deficiencies;
- performed inadequate calculations in the course of the Revelstoke Project; and
- failed to review truss shop drawings to ensure they conformed with design requirements and address a warning in the drawings in the course of the Revelstoke Project.

Regarding the allegations contained in the Citation, Mr. Duerichen admitted, among other things, that he committed professional misconduct by:

- violating the 2020 Interim Order by engaging in the practice of structural engineering, including signing and sealing Schedule C-Bs, giving his assurance to the Authority Having Jurisdiction that the structural components of projects in Vanderhoof and Burns Lake, BC substantially complied with the applicable requirements; and
- backdating the Schedule C-Bs for the projects to create the appearance of compliance with the 2020 Interim Order.

In accordance with the terms of the Consent Order, Mr. Duerichen's registration with Engineers and Geoscientists BC is cancelled, effective March 28, 2022. Mr. Duerichen is prohibited from re-applying for registration for at least two years, and then only after he completes the Professional Practice Examination and the Professional Engineering and Geoscience in BC Online Seminar.

If Mr. Duerichen's registration is reinstated, he will be subject to direct supervision by a professional engineer for a minimum of nine months and must undergo a Practice Review following the conclusion of the supervision period. Mr. Duerichan paid $5,000 toward the legal costs of Engineers and Geoscientists BC.

DISCIPLINE NOTICE: LAURA FIDEL, P.ENG.

On August 4, 2014, there was a breach of a portion of the perimeter embankment of the tailings storage facility (TSF) of the Mount Polley Mine near Likely, BC, leading to the discharge of tailings from the TSF into the local environment. The cause of the breach was separately addressed in reports prepared for the provincial government.

On July 12, 2021, after a hearing in July 2020, a Panel of the Discipline Committee found that Laura Fidel, P.Eng., committed several acts of unprofessional conduct in relation to her engineering work. The Panel found that Ms. Fidel failed to ensure sufficient observation and monitoring of the tailings dam while acting as Engineer of Record, including by failing to ensure sufficient site visits and failing to monitor seepage flows which could provide evidence of a potentially unsafe condition within the embankments.

Ms. Fidel also failed to ensure that an excavation left unfilled at the toe of the embankment was assessed to determine what impact it may have on the stability of the embankment and demonstrated unprofessional conduct by sealing design drawings for the Stage 9 embankment raise without undertaking sufficient review of the design which was not prepared by her.

A number of other allegations against Ms. Fidel were found by the Panel not to be proved and were dismissed.

In its penalty decision, the Panel ordered Ms. Fidel's registration as a professional engineer be suspended for a period of two months. In addition, Ms. Fidel was ordered to complete three education courses relating to tailings management, tailings facility design and operation, and engineering management for mine geowaste facilities.

DISCIPLINE NOTICE: TODD MARTIN

On August 4, 2014, there was a breach of a portion of the perimeter embankment of the tailings storage facility (TSF) at the Mount Polley Mine near Likely, BC, leading to the discharge of tailings from the TSF into the local environment. The cause of the breach was separately addressed in reports prepared for the provincial government.

On September 26, 2018, Engineers and Geoscientists BC issued a Notice of Inquiry (amended January 5, 2022) to Todd Martin, concerning aspects of his engineering work in relation to the TSF. From March 2011 to December 2012, Mr. Martin was the Senior Geotechnical Engineer at AMEC responsible for the geotechnical engineering in connection with the TSF.

Instead of proceeding to a Disciplinary Hearing, in a Consent Order dated February 15, 2022, Mr. Martin admitted to some of the allegations that aspects of his engineering work were not consistent with prudent engineering practice, including his failure to recommend drilling from the 2011 embankment crest into soils under the footprint of the TSF perimeter embankment to improve the characterization of embankment foundation soils. Mr. Martin further admitted that he failed to make a record of important field observations in 2011, a matter which constitutes unprofessional conduct.

Mr. Martin agreed to pay a fine of $25,000, and an additional $69,000 toward the legal costs of Engineers and Geoscientists BC. Mr. Martin ceased practising engineering in 2018 and resigned his license in January 2020 and accordingly is no longer permitted to practise professional engineering or geoscience in British Columbia. Should he re-apply for registration, the Consent Order identifies the steps Mr. Martin will have to take to successfully be licensed.

IN MEMORIAM

Engineers and Geoscientists BC announces with regret the passing of the following registrants.

Edward Axel Balon, P.Geo. (Retired)
Patrick John Bonser, P.Eng. (Non-Practising)
Peter Barry Cavens, P.Eng. (Retired)
John Albert Connell, P.Eng. (Retired)
Donald Manson Henderson, P.Eng. (Retired)
Leigh Philip Holmes, P.Eng. (Non-Practising)
Kenneth Kwok-Kuen Lo, P.Eng. (Retired)
Moe Nallasegaram Mahendran, P.Eng. (Retired)
Ovais Quraishi, P.Eng. (Retired)
John Dexter Sansom, P.Eng., FEC (Non-Practising)
Charles Patrick Tisdall, P.Eng. (Retired)
Leo Allas, P.Eng. (Retired)
Chester Harold Allen, P.Eng. (Retired)
Roy Milton Bartholomew, P.Eng., FEC (Retired)
Bruse Laird Butcher, P.Eng. (Retired)
Thomas William Gillies Calvert, P.Eng., FEC (Retired) ◆

AD INDEX
MAY/JUNE 2022
INNOVATION

CONTINUING EDUCATION: REQUIREMENTS

CONTINUING EDUCATION REQUIREMENTS

The Continuing Education Program is mandatory and applies to all registrants with practice rights. Registrants without practise rights (Non-Practicing or Retired) must complete minimum requirements to maintain ethical and regulatory competency. Engineers-in-training, geoscientists-in-training, and Life Members are exempt. The end of the first reporting year is June 30, 2022. By June 30 each year, the Ethical Learning and Regulatory Learning Modules and CE Plan must be completed and recorded in the online reporting system. More information, including our Guide to the Continuing Education Program, a CE Plan Template, a CE Plan Example, and a link to the Reporting System is provided at egbc.ca/Continuing-Education.

DESIGNATION	TOTAL HOURS REQUIRED	ETHICAL/REGULATORY	TECHNICAL, COMMUNICATIONS AND LEADERSHIP	CE PLAN
P.Eng., P.Geo, P.L.Eng., P.L.Geo.	60 CE Hours per 3-year rolling period	The Mandatory Regulatory Learning Module (once per reporting year) One CE Hour of ethical learning (once per reporting year)	Balance of Hours Requirement	Required
Non-practising, Retired	2 CE Hours per 3-year rolling period	The Mandatory Regulatory Learning Module and one CE Hour of Ethical Learning per 3-year rolling period	Optional	Optional
Struct.Eng.	120 per 3-year rolling period	The Mandatory Regulatory Learning Module (once per reporting year) One CE Hour of ethical learning (once per reporting year)	Balance of Hours Requirement	Required
EIT/GIT, Non-Practising Life Member	Optional	Optional	Optional	Optional

PROFESSIONAL SERVICES

CONTINUING EDUCATION

SELF-PACED COURSES

EQUITY, DIVERSITY, AND INCLUSION FOR ENGINEERS AND GEOSCIENTISTS

Eligible for 1 CE Hour

This free, self-paced online course provides foundational training on equity, diversity, and inclusion to help individuals develop competencies in inclusive behaviours and emotional intelligence. ●

MANDATORY: REGULATORY LEARNING MODULE FOR 2021-2022

Eligible for 1 CE Hour

As part of the Continuing Education (CE) Program, practising registrants must view this mandatory Regulatory Learning module in the current reporting year (July 1, 2021 to June 30, 2022) to meet their requirements. Non-practising registrants and trainees may also view the module and record it as a CE activity; non-practising registrants must view at least one module every three years. ●

4 SEASONS OF RECONCILIATION—INDIGENOUS AWARENESS LEARNING

Eligible for 2.5 CE Hour(s)

This self-paced online course promotes a renewed relationship between Indigenous Peoples and Canadians through transformative learning about truth and reconciliation. Learners will be provided foundational knowledge on the history and culture of Indigenous communities in Canada, the history of residential schools, and treaties around the country. ●

DIGITAL TRANSFORMATION—TO DO OR NOT TO DO?

Eligible for 8 CE Hour(s)

An opportunity to learn everything you need to know about Digital Transformation (DX) – the "why", "what", "when", and the most important "how's" of this key, emerging strategy that is much talked about, but often misunderstood. ●

GEOLOGIZE PRACTICAL GEOCOMMUNICATION

Clear and appropriate communication of geoscience and engineering to the public is a key element of fulfilling professional ethical obligations. This self-paced, flexible course discusses the importance of communication in geoscience and is intended for registrants, trainees, and student members registered with Engineers and Geoscientists BC.

UPCOMING WEBINARS

HOW TO MEET YOUR CONTINUING EDUCATION PROGRAM AND ANNUAL REPORTING REQUIREMENTS

June 13, 2022 | Eligible for 0.5 CE Hour(s)

The first deadline for the Continuing Education (CE) Program is coming up on June 30, 2022. In this webinar, we will review the CE Program and Annual Reporting requirements that are due, and direct registrants on how to meet them. ●

AUTHENTIC COMMUNICATION

June 14, 2022 | Eligible for 3 CE Hour(s)

This workshop focuses on how to express oneself in an authentic way, while maintaining psychological safety for both parties, with a view to building trusting relationships. ●

INTRODUCTION TO QUANTUM COMPUTING

June 14, 2022 | Eligible for 4 CE Hour(s)

This interactive seminar is designed for professionals who want to gain an intuitive, entry-level understanding of quantum computing: what it is, how it's done, and what its potential applications are. ○

RESERVE FUND STUDIES AND PREPARATION OF DEPRECIATION REPORTS—PART 1

June 14, 2022 | Eligible for 7 CE Hour(s)

Part 1 of this two-day seminar will provide engineers with a good fundamental understanding of the steps required to carry out the physical analysis of contingency reserve fund studies. ○

RESERVE FUND STUDIES AND PREPARATION OF DEPRECIATION REPORTS—PART 2

June 16, 2022 | Eligible for 7 CE Hour(s)

Part 2 of this two-day seminar will provide engineers with a good fundamental understanding of the steps required to carry out the financial analysis of contingency reserve fund studies, and how to assemble a depreciation report. ○

THE ROI FOR EMOTIONAL INTELLIGENCE

June 16, 2022 | Eligible for 3 CE Hour(s)

This workshop focuses on how to express oneself in an authentic way, while maintaining psychological safety for both parties, with a view to building trusting relationships. ●

INWED PANEL DISCUSSION: ROLE MODELS, MENTORS, AND SPONSORS

June 23, 2022 | Eligible for 1 CE Hour(s)

In celebration of International Women in Engineering Day on June 23, Engineers and Geoscientists BC will be hosting a panel discussion on the importance of building relationships for women in the engineering and geoscience professions. ●

INWED NETWORKING EVENT: ROLE MODELS, MENTORS, AND SPONSORS

June 23, 2022 | Eligible for .75 CE Hour(s)

In celebration of International Women in Engineering Day (INWED) on June 23, Engineers and Geoscientists BC will be hosting a virtual networking event to discuss the importance of building relationships for women in the engineering and geoscience professions. ●

STRESS MANAGEMENT

June 23, 2022 | Eligible for 3 CE Hour(s)

This workshop focuses intensively on skills practice to ensure participants build a higher level of resilience in dealing with stress. ●

THE NEW NORMAL—HYBRID NETWORKING

June 28, 2022 | Eligible for 1.5 CE Hour(s)

This webinar will give you the best tips to build relationships with colleagues, clients, and customers in an online world. ●

● **Regulatory Learning** ● **Ethical Learning** ○ **Technical Learning** ● **Communications/Leadership Learning**

We encourage you to take advantage of the new Knowledge Centre, at **egbc.ca/Knowledge-Centre**, *which provides on-demand educational opportunities. The Centre now hosts more than 100 on-demand recorded and self-directed courses on a variety of topics.*

For a complete listing of online learning opportunities, or for more information, visit *egbc.ca/Online-Offerings*, or contact us at 604.430.8035 or 1.888.430.8035.

CALL FOR PRESENTERS

Are you an expert in your field who would like to contribute to engineering and geoscience practice? Engineers and Geoscientists BC is actively seeking members to present on a variety of topics. For more information, please visit *egbc.ca/Practice-Resources/Professional-development*.

ENGINEERS & GEOSCIENTISTS BRITISH COLUMBIA

Exclusive Protection. Exclusive Rates. Exclusively *Yours.*

Help protect your family with the Engineers Canada-sponsored Insurance plans.

As an engineering professional or geoscientist, you and your family can take advantage of affordable association rates and flexible plan options. Several plans are available, and we think there could be a plan that's right for you and your family.

Exclusive offer: First-time term life applicants can get an **extra $50,000 of coverage at no cost** for up to 2 years!*

Learn more and apply online or speak with a Licensed Insurance Advisor.

manulife.ca/innovations
1 877 598-2273

Your exclusive coverage options:

- Term Life Insurance
- Health & Dental Insurance (including plans for retirees)
- Disability Income Protection
- Critical Illness Insurance
- Major Accident Protection

engineerscanada ingénieurscanada

ENGINEERS & GEOSCIENTISTS BRITISH COLUMBIA

Manulife

* To be eligible for the offer of $50,000 of additional Term Life coverage at no extra cost for up to two years, Members must meet the Engineers Canada-sponsored Term Life eligibility requirements: be aged 18 to 65; be applying for Engineers Canada-sponsored Term Life Insurance for the first time without having previously been declined for Term Life coverage by Manulife; be applying and approved for $25,000 of Term Life coverage or more. Available to Members only (not available on Spousal coverage). For complete details, see manulife.ca/newmember.

Scan to learn more.

Underwritten by The Manufacturers Life Insurance Company (Manulife).