CEO Retirement | Council Election Results | Climate Change Action Plan

ENGINEERS AND GEOSCIENTISTS BRITISH COLUMBIA NOVEMBER/DECEMBER 2020

INNOVATION

MEET THE PRESIDENT

BUILDING THE TŜILHQOT'IN SOLAR FARM

STEPPING UP TO THE BC ENERGY STEP CODE

HYDROGEN GETS ITS DUE

LARRY SPENCE, P.ENG.

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INNOVATION

NOVEMBER/DECEMBER 2020 | VOLUME 24 NUMBER 6

COVER STORY

MEET THE PRESIDENT

New Engineers and Geoscientists BC President Larry Spence, P.Eng., is the organization's first president since 2012 whose career has been based mainly outside of southwestern BC—something he believes helps him understand the needs of registrants living and working outside major urban centres.

STEPPING UP TO NET-ZERO ENERGY-READY BUILDINGS

The *BC Energy Step Code* is an optional code for designers and builders striving to develop green buildings. Even though 72 BC municipalities have already adopted the Step Code as part of their building code requirements, many designers and builders are volunteering to meet the Code before they are required to do so.

BUILDING THE TSILHQOT'IN SOLAR FARM

With the help of the EcoSmart Foundation, the community of Yunesit'in, one of six Tŝilhqot'in communities, took on the challenge of building a 3,456 solar photovoltaic-module solar farm near the Chilcotin Plateau in BC.

NEWS / DEPARTMENTS

COMMENT

OTHER

ON THE COVER

Larry Spence, P.Eng., was inducted as president of Engineers and Geoscientists BC on Saturday, October 17, 2020.
PHOTO: LARRY DOELL

THE DIGITAL EDITION OF *INNOVATION* INCLUDES VIDEO EXTRAS. TO ACCESS, SCAN THIS QR CODE FROM ANY MOBILE DEVICE, OR GO TO *EGBC.CA/INNOVATION*. IN THE DIGITAL EDITION, CLICK ON THE PLAY BUTTON TO VIEW CONTENT.

100 YEARS

ENGINEERS & GEOSCIENTISTS BRITISH COLUMBIA

PREPARED FOR CHANGE

In late October, at Engineers and Geoscientists BC's virtual Annual General Meeting, I was sworn in as president of Engineers and Geoscientists BC, along with five new Councillors and a new vice president on this organization's 101st Council.

Serving as your president is an honour and a privilege—however, the year will also hold many challenges. New legislation in the form of The *Professional Governance Act* (PGA), is expected to come into force by February 2021, replacing the 100-year-old *Engineers and Geoscientists Act*. We are also facing a completely "new normal" way of life resulting from the global COVID-19 pandemic.

As I pondered my new role as president with some uncertainty as to what the year might bring, I couldn't help but think some of you might be feeling a similar sense of uncertainty about the coming year's changes. We are all embarking on a new journey of the second century of engineering and geoscience regulation in BC, and the new legislation will introduce the biggest change we've managed in recent memory—probably the biggest we've seen since this organization was established in 1920.

Although this change might naturally lead to some uneasiness, I am confident that this new legislation will position us to be a strong and progressive regulator for years to come.

I am also thankful and confident that our Council, capable staff, and volunteers have worked tirelessly to prepare us, minimize unintended consequences, and help transition us into compliance with this new legislation. Change is never easy, but we are ready. Council and staff of Engineers and Geoscientists BC are invested in keeping registrants informed of these changes, and how they will enhance our path towards our collective purpose: protection of the public.

This edition of *Innovation* magazine includes a comprehensive pull-out section designed to help us all in our understanding of the implications of the PGA. The insert provides a very helpful overview of the new Code of Ethics, continuing education requirements, firm regulation, annual reporting requirements, and changes to practice review and audit programs. The insert summarizes what you need to know, and what you need to do, under the new legislation. I encourage all registrants to keep this pull-out nearby and refer to it as necessary.

This year's Council has the opportunity to shape our journey; for the paths on which we are collectively travelling, I believe we can best enjoy the journey by working together.

LARRY SPENCE, P.ENG., President
president@egbc.ca

INNOVATION

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CEO AND REGISTRAR ANN ENGLISH TO RETIRE IN AUGUST 2021

At Engineers and Geoscientists BC's Annual General Meeting on Saturday, October 17, CEO and Registrar Ann English, P.Eng., FEC, FCSSE, announced that she will retire in August 2021.

Ann has been with the organization since 2012, bringing her skills in organizational development, risk management, and effective governance to position Engineers and Geoscientists BC as a strong, modern, and agile regulator focused on public protection. She has led the organization through major changes to its oversight and legislation, enhanced its governance framework, advanced equity, diversity and inclusion initiatives for the professions and the organization, and introduced new regulatory tools and programs that have set the benchmark for professional regulation in engineering and geoscience across the country.

Before joining Engineers and Geoscientists British Columbia, Ann was Director of Interconnections with BC Hydro, where she led the organization to receive multiple awards for sustainability and innovation as a result of her work on BC Hydro's Olympic Initiatives project. She also has significant experience in the private industry, with nearly 20 years at Foster Wheeler.

"Ann's impact goes far beyond the many notable policy initiatives she's been responsible for implementing. In the past eight years, she has truly established Engineers and Geoscientists BC as a leading professional regulatory body in BC and across Canada," said Larry Spence, P.Eng., Engineers and Geoscientists BC's President. "She's also an inspiring leader who will be fondly remembered for fostering a culture of inclusion and engagement with her staff. On behalf of Council, I thank Ann for her many years of service. She'll be missed by all of us."

In the coming months, executive search consultants Pinton Forest Madden (PFM) will lead the search for Ann's successor, supported by a task force of six Engineers and Geoscientists BC registrants and one lay member. Inquiries can be directed to PFM

via email to *pfm@pfmsearch.com* with the subject line: **CEO Opportunity with Engineers and Geoscientists BC**.

To account for the growing size and complexity of the organization and the increasing administrative demands on the CEO, the role of Registrar—which is currently embedded in the CEO's responsibilities—will be separated from the role of the CEO once the incumbent is appointed. The role of Registrar will be incorporated into the Chief Regulatory Officer's role.

In her retirement, Ann is hoping to carry on her service to Engineers and Geoscientists BC and other organizations through volunteer work, as well as to travel and enjoy beautiful British Columbia with her husband and fellow engineer, Chris English, P.Eng. (Non-Practising).

Engineers and Geoscientists BC sincerely thanks Ann for her strategic vision, tireless efforts, and dedication of time and energy to the organization over the past eight years, and wishes her a well-earned, healthy, and happy retirement.

BENEVOLENT FUND SEEKS DONATIONS TO HELP REGISTRANTS OVERCOME FINANCIAL CRISES

The Engineers and Geoscientists BC Benevolent Fund Society is a registered charity that helps registrants overcome short-term financial distress and cash-flow difficulties, usually from a loss of employment. Donations to the Benevolent Fund Society will allow the fund to help more registrants navigate through this time of COVID-related uncertainty. The Society is expecting a possible increase in applications in the coming months resulting from the impact of COVID-19 on registrants.

Many of the registrants who have received assistance from the society have felt that someone still cared, providing them a boost when they were experiencing difficult circumstances.

The Benevolent Fund Society is administered by a board of directors, and operates at arm's length from Engineers and Geoscientists BC. The society's board of directors confidentially reviews applications for assistance, and the society may provide one-time grants, or access to career counselling or other services as necessary.

Tax receipts are issued for contributions over $10; all donations are greatly appreciated. To view a full list of donors, or to donate to the Benevolent Fund Society, visit *egbc.ca/Benevolent*.

PROFESSIONAL GOVERNANCE ACT RESOURCES FOR REGISTRANTS

The regulatory landscape in British Columbia is changing. Engineers and Geoscientists BC is preparing for the implementation of the *Professional Governance Act* (PGA)—new governing legislation for professional regulators in the natural and built environment, including Engineers and Geoscientists BC and the regulators for forestry, agrology, biology, and applied science technology.

The PGA will replace *the Engineers and Geoscientists Act*, and introduce new regulatory tools, processes, and requirements for Engineers and Geoscientists BC, and you, our registrants, ultimately creating a stronger regulatory framework and a safer British Columbia.

This change means that as a registrant, you will have new obligations to be aware of, and new requirements to follow—including an updated Code of Ethics and mandatory continuing education obligations. Learn more about these changes by watching our PGA video at *egbc.ca/pga*.

The implementation of this new legislation was originally planned for November 2020, but due to the recent election and its impact on timelines for legislative approval, we anticipate the PGA will come into force by February 2021. We will keep registrants up to date as we learn more about the implementation timeline.

To ensure registrants are kept informed of the changes coming into effect, we have included a special pull-out PGA reference guide in this edition of *Innovation* magazine. This insert outlines everything registrants need to know about the new legislation and how these new obligations will impact you as a professional. Registrants are encouraged to review and save the guide for future reference.

Engineers and Geoscientists BC will host a PGA webinar series in 2021 on key obligations and requirements for registrants, including webinars on the updated Code of Ethics, Continuing Education requirements and Regulation of Firms. This series is in addition to the *Professional Governance Act: 2020 Update - What You Need to Know* webinar that we hosted in August 2020. To sign up for the upcoming webinars, or to watch the recording from the August webinar, visit *egbc.ca/pga*.

As new requirements come into force, additional information and resource guides will also be available to support registrants in their understanding of the changing obligations.

This is one of the most significant changes to face our organization and our professions in our 100-year history. We encourage registrants to spend some time orienting themselves with the new requirements so that they are informed and prepared when they come into force.

Questions about the new legislation? Contact us at *professionalgovernance@egbc.ca* or visit *egbc.ca/pga*.

INNOVATION'S PROJECT HIGHLIGHTS EDITION IS COMING SOON

Each year, *Innovation* invites BC's professional engineers and geoscientists to submit photographs and project descriptions of recent work, for consideration for the magazine's popular Project Highlights Edition, planned for the May/June 2021 edition.

Registrants or companies may submit photographs of projects undertaken in 2020 or 2021, within or outside BC, involving Engineers and Geoscientists BC registrants. Members are encouraged to watch for an email announcement early in 2021 that will provide submission criteria, deadline dates, and other important information. The submission time frame is expected to be in early January 2021, and close about eight weeks later. For more information, visit *egbc.ca/Innovation*.

2020 COUNCIL ELECTION RESULTS

Engineers and Geoscientists British Columbia's 2020 Council election opened on August 31, 2020, and closed at noon on October 2, 2020. This year, 15.5 percent of registered members and limited licensees cast ballots.

The results of the election are as follows:

PRESIDENT (One-year term)
Larry Spence, P.Eng.

VICE PRESIDENT (One-year term)
Carol Park, P.Eng.

COUNCILLORS

Three-year terms
Michelle Mahovlich, P.Eng./P.Geo.
Jessica Steeves, P.Eng.

Two-year terms
Kevin Turner, P.Eng., FEC, FGC (Hon.)
Brent Ward, P.Geo., FGC, FEC (Hon.)

One-year term
Tomer Curiel, P.Eng., FEC

IMMEDIATE PAST-PRESIDENT (One-year term)
Lianna Mah, P.Eng., FEC will continue for one year in the role of Immediate Past President.

RETURNING COUNCILLORS
Alan Andison, BA, LLB*
Suky Cheema, CPA, CA
Antigone Dixon-Warren, P.Geo.
Leslie Hildebrandt, ICD.D, LLB
Susan MacDougall, P.Eng.
Brock Nanson, P.Eng.
Kevin Turner, P.Eng., FEC
David Wells, JD.

**until December 2020*

To support appropriate staggering of terms as we transition from the current Council size to new requirements under the *Professional Governance Act*, term lengths for the five elected Councillors elected were determined according to the number of votes received. These term lengths will be adjusted once the new legislation comes into force. To learn more about the transitional requirements about composition of Council, visit *egbc.ca/Transitional-Requirements*.

The online ballot was conducted using systems contracted from Simply Voting Inc., which operates under high-security, TLS 1.2, 256-bit encryption with anti-fraud controls and secure login for eligible voters. This third-party system protects the anonymity of a vote. Election results were not available to Engineers and Geoscientists BC until after the close of the election.

ABOUT PAPER BALLOTS

In previous Council elections, the overwhelming majority of Engineers and Geoscientists BC registrants voted electronically. Council previously had determined that paper ballots would be discontinued in 2021. However, due to new circumstances related to COVID-19, paper ballots were discontinued this year, one year earlier. All ballots received for this Council election were electronic.

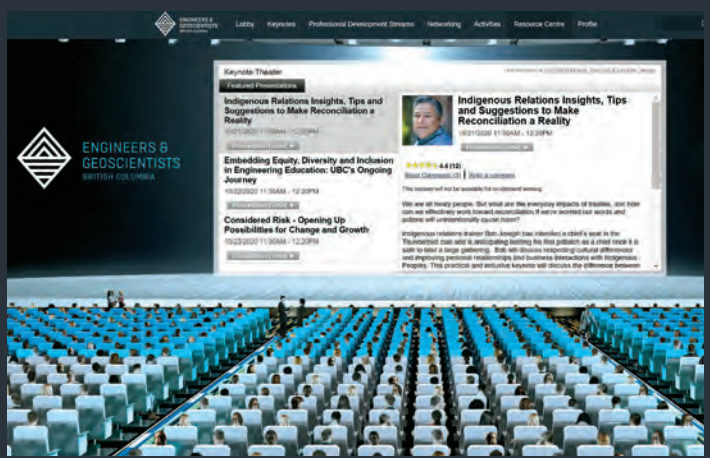
SCRUTINEERS

Three registered members of the association, Kathleen Kompauer, P.Eng., FEC, FGC (Hon.), Margaret Li, P.Eng., FEC, FGC (Hon.), and John Watson, FEC, FGC (Hon.) scrutinized the voting processes. The scrutineers have confirmed the ballot results and that the election was conducted in a confidential, fair, and impartial manner.

For more information, visit *egbc.ca/Council-Election-Results*.

ENGINEERS AND GEOSCIENTISTS BC COMPLETES FIRST-EVER VIRTUAL ANNUAL CONFERENCE AND ANNUAL GENERAL MEETING

For the first time in its history, Engineers and Geoscientists BC held both its Annual Conference and Annual General Meeting (AGM) virtually, giving registrants the ability to attend both events from anywhere in the world. Nearly 300 individuals attended the AGM on October 17, 2020, and over 420 registered to attend the conference on October 21–23, 2020.



Registration for the Annual Conference included comprehensive access to three keynote speakers (Dr. Roberta Bondar, Bob Joseph, and Dr. Sheryl Staub-French, P.Eng.), along with professional development opportunities through 10 streams. The streams were: Engineering and Geoscience in the Resource Sector; Environmental Engineering and Geoscience; Municipal Engineering; Emerging Professional; Management; Regulatory Affairs; Structural; Energy Efficiency and Renewable Energy; Better Business; and Diversity and Inclusion. Engineers and Geoscientists BC thanks the more than 60 presenters who shared their knowledge and expertise at the Conference. Those who registered for the conference continue to have access to most professional development seminars on an on-demand basis.

At Engineers and Geoscientists BC's AGM, new president Larry Spence, P.Eng., vice president Carol Park, P.Eng., and five Councillors were inducted to Council as part of Engineers and Geoscientists BC governing leadership. For more information about Council, visit *egbc.ca/Council*.

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CLIMATE CHANGE ACTION PLAN "WHAT WE HEARD" REPORT NOW AVAILABLE

The Earth's climate is changing at an unprecedented rate, and this presents new and evolving challenges, risks, and opportunities that will need to be considered by registrants in the fulfillment of their professional responsibilities.

Earlier this year, registrants provided feedback on the development of Engineers and Geoscientists BC's first Climate Change Action Plan—a document that will provide strategic direction for how Engineers and Geoscientists BC can better support its registrants in their professional practice and respond to climate change issues proactively rather than reactively. The plan will be the first plan of its kind across engineering and geoscience regulatory bodies in North America, and has been developed by Engineers and Geoscientists BC's Climate Change Advisory Group following a motion that was put forward at the 2018 Annual General Meeting seeking more direction on the role engineers and geoscientists should play in addressing climate change in their professional practice.

Engineers and Geoscientists BC recently released its "What We Heard" Report, summarizing the feedback we received from registrants during our engagement process on the development of the Action Plan.

WHAT WE HEARD

From February to July 2020, we sought feedback from registrants, industry professionals, and the wider professional community—through written submissions, webinars, one-on-one meetings, and focus groups—on how Engineers and Geoscientists BC should approach climate change issues related to the practice of professional engineering and geoscience.

There were several recurring themes heard throughout the engagement process that related to climate change in the context of professional practice.

We heard widespread support for Engineers and Geoscientists BC to take action, and in particular for improved access to education and guidance on climate change. Registrants asked for sector-specific guidance, advice on interdisciplinary and collaborative approaches, and for clarity on what it means to consider climate change in professional practice.

Registrants also identified that there are varying levels of awareness and knowledge around climate change, as well as different levels of prioritization of the issue, and also identified a desire for more information on how climate change relates to liability.

In addition, registrants highlighted challenges they encountered in responding to climate change in their professional practice and provided suggestions for specific actions Engineers and Geoscientists BC could include in its plan.

Feedback provided by registrants throughout the engagement process was analyzed to understand key areas for support, challenges to address, potential initiatives and opportunities, and integrated with input from the Climate Change Advisory Group to form the completed Action Plan.

NEXT STEPS

The Climate Change Action Plan was presented to Council in November. Council approved the plan and directed staff to initiate its implementation following legal and editorial review. Council thanked the Climate Change Advisory Group and staff for their efforts in creating a plan that will provide the organization with strategic direction and a framework for action. The Action Plan will be published in the new year, once the legal and editorial review process is complete.

For more information and to access the "What We Heard" Report, visit our consultation page at *egbc.ca/Climate-Change-Action-Plan*.

UPDATED GUIDELINES FOR GEOTECHNICAL ENGINEERING SERVICES FOR BUILDING PROJECTS NOW AVAILABLE

Engineers and Geoscientists BC has released updated guidelines, titled *Professional Practice Guidelines – Geotechnical Engineering Services for Building Projects*, to assist professionals who may be involved in, or have an interest in, geotechnical engineering in the building design and construction industry in BC.

First published in 1998, these updated guidelines provide additional clarity on the specific items related to geotechnical engineering for building projects in the Letters of Assurance, and discuss the roles and responsibilities of engineering professionals, particularly the Geotechnical Engineer of Record and other relevant parties.

Notably, the updated guidelines clarify the obligations of professionals to identify and protect archeologically sensitive or significant areas affected by building projects. Specifically, the guidelines outline the need to determine the archeological significance of a project site in advance, and provide direction in situations where potential archeological artifacts are encountered after site work begins.

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

NEW PRACTICE ADVISORY NOW AVAILABLE FOR BUILDING PERMIT DOCUMENTS

Engineers and Geoscientists BC has issued a practice advisory, titled *Issued for Building Permit Documents*, to inform registrants of the standards of practice regarding the completeness of sealed plans and supporting documents from Engineers Of Record for a building permit application. The advisory also summarizes the results of a March 2019 disciplinary decision that confirms the standard for the completeness of these plans.

The advisory indicates that plans submitted to an Authority Having Jurisdiction (such as a municipality) in support of an application for a building permit must substantially comply with the *British Columbia Building Code*, the Vancouver Building By-law, and the *National Building Code of Canada*.

The advisory clarifies that submission of an incomplete design as part of a permit application exposes multiple parties to various types of risks, and may be considered evidence of unprofessional conduct. Full details and the current standard of practice are described in the practice advisory.

This and other practice advisories, guidelines, and resources are available at *egbc.ca/Guidelines*. To contact an Engineers and Geoscientists BC practice advisor, email *practiceadvisor@egbc.ca* or call 1.888.430.8035 or 604.430.8035.

ENGINEERS AND GEOSCIENTISTS BC LOOKS BACK AT CENTENNIAL CELEBRATION YEAR

While 2020 has introduced major disruptions into our world, it also marked a very significant event for Engineers and Geoscientists BC: our centennial anniversary. This year, engineering and geoscience professionals celebrated 100 years of ethics, excellence, and innovation—a century that has seen our professions grow from about 500 registrants in 1919 to over 38,000 registrants today who have anchored BC's growth and prosperity. This past year, Engineers and Geoscientists BC celebrated this anniversary in many ways, both physically and virtually, including last year's Centennial Reception in Kelowna, a Centennial Celebration at Science World in Vancouver on March 5, a virtual STEM contest for students, and a regular Centennial Newsletter. As this year-long celebration concludes, we look forward to another century focused on public protection and a vibrant future for engineering and geoscience.

CEO ANN ENGLISH HONOURED WITH TOP CEO AWARD

Engineers and Geoscientists BC's CEO and Registrar Ann English, P.Eng., FEC, FCSSE, was recently awarded one of Business in Vancouver's CEO of the Year Awards, in the category of publicly accountable organizations. Recipients were selected on the basis of their vision and strategy, financial performance, development of their employees, innovation, social responsibility, and sustainability.

"We are proud to honour the business leadership of these individuals through challenging times," said Kirk LaPointe, Business in Vancouver's publisher and editor-in-chief. "Their accomplishments are remarkable and exemplary of British Columbia's outstanding business community."

Ann's award recognized her skills in organizational development, risk management, and effective governance as well as her work to advance equity, diversity, and inclusion initiatives for the professions and the organization. Over the past few years, Ann has led the organization through significant changes to its oversight and legislation and introduced new regulatory tools and programs that have set the benchmark for professional regulation in engineering and geoscience across the country. She recently announced her intent to retire in August 2021 after eight years with Engineers and Geoscientists BC.

"Although these awards are given to CEOs, the accomplishments that are recognized are the result of shared vision, collaboration, and teamwork across the whole organization and Council," Ann stated. "It is indeed a pleasure and privilege to work with the entire team and this award recognizes the joint accomplishments of years of very hard work, dedication, and talent from a multitude of people."

Ann was honoured alongside Milton Carrasco of Transoft Solutions Inc., Shahrzad Rafati of BroadbandTV Corp., Roger Dall'Antonia of FortisBC, Darlene Hyde of the British Columbia Real Estate Association, and Cathy Thorpe of Nurse Next Door.

Ann participated in a video podcast, sharing more about the challenges of leading an orgazniation during a pandemic, what lessons we can take away, and advice she would share with other leaders. To view the podcast, visit *www.biv.com/video*.

LARRY SPENCE, P.ENG.

THE BEST SOLUTIONS ALWAYS COME FROM DIVERSE PERSPECTIVES.

Monique Keiran

New Engineers and Geoscientists BC President Larry Spence, P.Eng., is the organization's first president since 2012 whose career has been based mainly outside of southwestern BC—something he believes gives him insight into the needs of registrants working outside of urban areas.

"There's a difference between registrants working in urban centres in BC and those working in the rest of the province," he said. "The BC economy is strong in resources, and relies on resource developments outside the Lower Mainland or Vancouver Island. I've worked in both rural BC and urban BC, so I understand to some extent how engineering and geoscience work differs between the two. Working in different communities around BC has helped me better understand the concerns and perspectives of registrants working in those regions, many of which depend on the resource industry."

In addition, Spence spent 14 years in the forestry industry and another two decades with international equipment manufacturers and consultants that serve the resource industry.

Spence also understands the challenges of members-in-training and early-career professionals—and empathy which is informed partly by his own family (his son is an engineer-in-training and his daughter is considering a career in engineering) and partly by his career's rocky start as a mechanical engineer. When he graduated from UBC in the early 1980s, the province's economy was in a downturn and few firms were hiring university

graduates straight out of school. With his new engineering degree in hand, a young Larry Spence found himself moving back in with his parents in Salmon Arm and working at a local gas station.

"It wasn't at all what I had expected or planned," he said. He landed an equipment-maintenance position 15 months later at the pulp mill in Crofton, on Vancouver Island, and the memory of those first, disappointing months and countless rejection letters stuck with him.

It even may have contributed to his decision to run for Council in 2016.

"I thought of the countless members and volunteers before me who had indirectly supported my career," he said, "and I thought it was time I helped young people who were starting theirs."

Spence isn't the only Council member working in the BC Interior or resource industry, but his 35 years of experience doing so provides him with a unique and broad-based perspective.

Since 2016, he has applied that perspective as a member of Council, working with Council colleagues and staff to understand the implications of the Province's pending changes to how the professions are governed in BC "And I intend to continue using that perspective in my role as Council president."

Considering diverse perspectives, he said, will be key to the professions' success this year.

"Not only are communities dealing with short- and long-term impacts of the COVID-19 pandemic, but BC engineers and geoscientists will also be adjusting to a new regulatory reality under the *Professional Governance Act*. There will be a new Code of Ethics, mandatory continuing education, additional reporting requirements, and the regulation of firms. The new *Act* is the most impactful thing to happen to the governance of the professions in BC in 100 years."

Despite its significance, the new *Act*, he feels, will equip Engineers and Geoscientists BC to be a strong and progressive regulator. Council's main priority will be to continue to adapt to the *Act* with minimal unintended consequences, he said; drawing on a broad range of viewpoints becomes critical to ensure those impacts are minimized.

The same goes for other work by Engineers and Geoscientists BC.

"So much great work has been done by staff and volunteers on really important, long-term initiatives—diversity, Indigenous reconciliation, and the Climate Change Action Plan, for instance—that just haven't been as visible as the work with the *Professional Governance Act*," he said. "At Council, we're looking at these initiatives to make sure they continue to be adequately resourced and progress, and that we continue to consider them in all of our work."

For example, when the new Council met formally (via videoconference) in October for the first time, Spence asked Council to maintain its current process of nominating a 30 by 30 Champion appointee—a Council member who ensures this perspective is considered in Council discussions —at each Council meeting. "Every member of Council is responsible for considering diversity and 30 by 30 in Council decisions," Spence said, referring to Engineers Canada's national initiative to increase the percentage of newly licensed engineers who are women to 30 percent by the year 2030. "But it's important that one person on Council be tasked with owning that perspective and ensuring it's always brought forward in our discussions at each of our meetings."

It comes back to encouraging, considering and applying broad and varied viewpoints—because, he said, "It's through diverse perspectives that the best solutions are found."

PERSONALLY SPEAKING

What got you interested in a career in engineering?

Like so many kids who are good at math and science, I considered a career in medicine. However, during my first year at university, I realized I enjoyed math and physics far more than chemistry and biology. A good buddy was planning to go into engineering, so I thought, "That sounds interesting." As it turned out, he and I were part of a small class of Okanagan College first-year applied science students participating in a new offering of a transfer program to UBC.

When did you begin volunteering with Engineers and Geoscientists BC?

I actually first volunteered in my final year of university in the 1980s. I was one of the first student members of the newly founded Benevolent Society. More recently, a colleague on the Nominating Committee approached me in 2016 to ask if I would consider running for Council. With my family's support and encouragement, I decided it was time I gave back to my chosen profession.

Describe your leadership style.

I believe in providing my teams with a clear understanding of our overall objectives and their respective roles to achieve them. A team is successful only when it works as a whole.

What are you most proud of in your career? In your life?

I am proud of the many younger people I have worked with and mentored, and their many impressive accomplishments over the years. In life, I am most proud of my three children—who they are and what they can accomplish.

The last eight months have been challenging for many British Columbians. How do you see BC engineers and geoscientists contributing to solutions?

Engineers and geoscientists are always at the forefront of a developing economy, and the next few years will be no different. Every time I experience or see a change to what is now our new normal, I think of the hard-working people involved in making those changes—from developing antiseptic cleaners and plexiglass screens to biodegradable masks, portable hepa-filtration systems and more.

What key lesson that you've learned in your career would you like to share with your colleagues?

Keep your options and minds open to change, which is the only constant in life. Never be too proud to ask for assistance from the team around you.

ORGANIZATIONAL QUALITY MANAGEMENT PROGRAM TO BE PHASED OUT AS NEW REGULATORY REQUIREMENTS ARE INTRODUCED

The Organizational Quality Management (OQM) Program—a voluntary certification program for firms demonstrating they meet Engineers and Geoscientists BC's quality management requirements—was created in 2012. Since its launch, the OQM Program has certified more than 400 firms.

The *Professional Governance Act* will soon come into effect in BC, however, and will introduce a new requirement for Engineers and Geoscientists BC to regulate firms. Beginning July 2, 2021, all firms offering engineering or geoscience services or products in BC

GAIRNS SANTOS ENGINEERING INC | TWD TECHNOLOGIES LTD | EQUITY EXPLORATION CONSULTANTS LTD | AUM BUILDING SCIENCE & ENGINEERING LTD SITKUM CONSULTING LTD | ROV CONSULTING INC | ZE POWER ENGINEERING INC | SGB SERVICES LTD | TONG NGO ENGINEERING LTD | SANGUINETTI ENGINEERING GYGAX ENGINEERING ASSOCIATES LTD | PBX ENGINEERING LTD | MOTT MACDONALD CANADA LTD | HORACE ENGINEERING LTD | WEDLER ENGINEERING LLP OLAND ENGINEERING LTD | WSP CANADA GROUP LTD | WARD ENGINEERING & LAND SURVEYING LTD | JECTH CONSULTANTS INC | IREDALE ARCHITECTURE OMICRON | R&A ENGINEERING (1997) LTD | MAINLAND ENGINEERING CORP | AZTEC GEOSCIENCE INC | CITY OF COURTENAY (ENGINEERING SERVICES GROUP) O&S ENGINEERING INTERNATIONAL INC | LMDG BUILDING CODE CONSULTANTS LTD | LINKFIELD ENGINEERING CONSULTANTS LTD | TECHNOLOGY BREWING CORP REDWOOD ENGINEERING LTD | BLACK & VEATCH CANADA COMPANY | WSA ENGINEERING (2012) LTD | BKL CONSULTANTS LTD | DYNAMIC SYSTEMS ANALYSIS KNIGHT PIÉSOLD LTD | INTERCAD SERVICES LTD | HIGHLAND ENGINEERING SERVICES LTD | SOLARIS MANAGEMENT CONSULTANTS INC | RST INSTRUMENTS LTD METSO MINERALS CANADA INC | BQE WATER INC | NORAM ENGINEERING & CONSTRUCTORS LTD | ATLAS ANCHOR SYSTEMS (BC) LTD | BBA ENGINEERING V.K. ENGINEERING & CONSULTING LTD | BRAUN GEOTECHNICAL LTD | WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS (A DIVISION OF WOOD CANADA LTD) CLEAN ENERGY CONSULTING INC | READY ENGINEERING (BC) CORP | DBS ENERGY SERVICES INC | CHATWIN ENGINEERING LTD | BUSH BOHLMAN & PARTNERS CIMA CANADA INC | WEILER SMITH BOWERS CONSULTING STRUCTURAL ENGINEERS | APLIN & MARTIN CONSULTANTS LTD | NOVA POLE INTERNATIONAL INC KLOHN CRIPPEN BERGER LTD | TRENIC CONSULTING INC | AMERESCO CANADA INC | CLARKE GEOSCIENCE LTD | ANTHONY-SEAMAN CONSULTING ENGINEERS BANNERMAN CONSULTANTS INC | DWB CONSULTING SERVICES LTD | SKC ENGINEERING (AN APPLUS+ COMPANY) | MCELHANNEY LTD | BLUEROCK ENGINEERING CWA ENGINEERS INC | BEST WEST ENGINEERS LTD | TRYON ENGINEERING INC | AQUA-COAST ENGINEERING LTD | P.K. READ ENGINEERING LTD ARCADIS CANADA INC | WESTCOAST HOME & TRUSS LTD | BGC ENGINEERING INC | DIALOG BC ARCHITECTURE ENGINEERING INTERIOR DESIGN PLANNING INC INNOPATH ENGINEERING LTD | KERR WOOD LEIDAL ASSOCIATES LTD | FLETCHER PAINE ASSOCIATES LTD | GOLDER ASSOCIATES LTD | AM POWER SYSTEMS FLUOR CANADA LTD | RB ENGINEERING LTD | LEWKOWICH ENGINEERING ASSOCIATES LTD | JENSEN HUGHES CONSULTING CANADA LTD | CFT ENGINEERING INC SYNERGYASPEN ENVIRONMENTAL INC | FRONTIER GEOSCIENCES INC | FRASER VALLEY ENGINEERING LTD | SYNERGY ENGINEERING LTD | FALCON ENGINEERING LEX ENGINEERING LTD | OMEGA & ASSOCIATES ENGINEERING LTD | SASA CONSULTING LTD | WICKE HERFST MAVER CONSULTING INC | CTQ CONSULTANTS LTD GEOADVICE ENGINEERING INC | EXMINDA CORP | WSP CANADA INC | STANTEC CONSULTING LTD | EXP SERVICES INC | NRS ENGINEERING LTD | KAY-SON STEEL E3D TECHNOLOGY CORP | INTERIOR TESTING SERVICES LTD | ACCESS ENGINEERING CONSULTANTS LTD | EDWARDS CM ENGINEERING & PROJECT MANAGEMENT WEIR-JONES GROUP OF COMPANIES | GEONORTH ENGINEERING LTD | THE AME CONSULTING GROUP LTD | BOURCET HOLDINGS LTD DBA BOURCET ENGINEERING AES ENGINEERING | TRAXX AUTOMATION LTD | BANSAL & ASSOCIATES CONSULTING ENGINEERS INC | CITY OF KAMLOOPS | HOWES TECHNICAL ADVANTAGE LTD WESTERN WATER ASSOCIATES LTD | SCOTT ENGINEERING INC | SACRÉ-DAVEY ENGINEERING INC | POWERTECH LABS INC | TRUSENSE CONSULTING SERVICES RTR TERRA CONTRACTING LTD | VOLTAS ENGINEERING LTD | METRO TESTING & ENGINEERING LTD | COMTECH COMMUNICATION TECHNOLOGIES PARADIGM ENGINEERING INC | JOHN IVISON & ASSOCIATES LTD | VERMA ENTERPRISES LTD | ON POINT PROJECT ENGINEERS LTD | DEAN BROX CONSULTING LTD STATLU ENVIRONMENTAL CONSULTING | DMA CONSULTING & ENGINEERING INC | EVOLVE ENGINEERING INC | CBS ENGINEERING GROUP LTD | RIDING ENGINEERING KM CIVIL CONSULTANTS LTD | LIA ENGINEERING LTD | CORE GEOTECHNICAL INC | SNC-LAVALIN INC (ENGINEERING, DESIGN & PROJECT MANAGEMENT CANADA) SKYLINE ENGINEERING LTD | FOCAL ENGINEERING INC | MCMILLEN JACOBS CANADA CORP | SEDGMAN CANADA LTD | BETA-TECH INC | ALLNORTH AMERICAS LLC WEST COAST ROAD TESTING & CONSULTING LTD | LIANG ENGINEERING LTD | KO STRUCTURAL ENGINEERING LTD | CREATIVE ENERGY VANCOUVER PLATFORMS INC ICI ELECTRICAL ENGINEERING LTD | UBC ENERGY & WATER SERVICES | IBI GROUP PROFESSIONAL SERVICES (CANADA) INC | WESTERN ELEMENT ENGINEERING HYCROFT ENGINEERING INC | ADVANCED ELECTRICAL SERVICES LTD | S SURA & ASSOCIATES LTD | GREATPACIFIC CONSULTING LTD | APOC ENGINEERING LTD COOEC CANADA COMPANY LTD | SYSENE CONSULTING | ERIEZ FLOTATION DIVISION / CANADA INC | SOUTHEAST GATEWAY ENGINEERING & CONSTRUCTION CO SENSE ENGINEERING LTD | PETER A. RONNING, P.ENG. (SOLE PRACTITIONER) | FARHILL ENGINEERING LTD | EARTH FIRE ENERGY INC | FZ STRUCTURAL ENGINEERS MK STRUCTURAL ENGINEERING CORP (MKSE) | CES ENGINEERING | ALLNORTH CONSULTANTS LTD (ALBERTA) | ALLNORTH CONSULTANTS LTD (NEWFOUNDLAND) TETRA TECH CANADA INC | ISHERWOOD GEOSTRUCTURAL ENGINEERS, BRIAN ISHERWOOD & ASSOCIATES LTD (ONTARIO) | PGL ENVIRONMENTAL CONSULTANTS SNC-LAVALIN INC (POWER, GRID & INDUSTRIAL SOLUTIONS) | SNT GEOTECHNICAL LTD | INNOREFLECTION ENGINEERING LTD | TERRALIVING CONSULTING INC LAWSON ENGINEERING & DEVELOPMENT SERVICES LTD | ASPECT STRUCTURAL ENGINEERS LTD PARTNERSHIP | SITE POWER ENGINEERING CONSULTANTS LTD EQUILIBRIUM ENGINEERING LTD | NDY MANAGEMENT CANADA INC | FURANO PACIFIC CONSULTING LTD | FINNING (CANADA) POWER SYSTEMS ENGINEERING MARK ROOZBAHANI CONSULTING LTD | SPOKE ENVIRONMENTAL ADVISORY LTD | QXM ENGINEERING LTD | SR ENGINEERING LTD | BUEPOINT CONSULTING LTD J. TUAMA ENGINEERING & CONSULTING LTD | CSR ENVIRONMENTAL LTD | PMY CONSULTING LTD | FOREMOST CONSULTING INC | PROTECH CONSULTING 2012 SY TEH ENGINEERING LTD | ORIGO ENVIRONMENTAL CONSULTING LTD | HEADWALL ENGINEERING LTD | TRI-CAN CONSULTING LTD | RELIANCE ENGINEERING INC ISHERWOOD GEOSTRUCTURAL ENGINEERS, BRIAN ISHERWOOD & ASSOCIATES LTD | JRG BUILDING ENGINEERING INC | SENSEKEY CANADA CONSULTANTS LTD COLUMBIA VALLEY ENGINEERING INC | OKONA FIELD SERVICES LTD | STIRLING GEOSCIENCE LTD | R. MARK LASBY, P.ENG. CONSULTING STRUCTURAL ENGINEER PERIHELION VENTURES LTD | TOCHAL CONSULTING LTD | AE CONCRETE | CONTINUITY STRUCTURAL ENGINEERING INC | TOURAND ENGINEERING APPLEBRUIN ENGINEERING INC | A&H ENGINEERING LTD | BASIS ENGINEERING LTD | POLAR ENGINEERING | A PLUS STRUCTURAL ENGINEERING INC

will be required to apply for a permit to practice, superseding the voluntary requirements of the OQM Program. The OQM Program will be discontinued on July 2, 2021 when permits to practice are introduced.

In the lead-up to this transition, OQM certified firms can continue to use the OQM logo and reference their certification. Applications for OQM certification will no longer be accepted after December 31, 2020.

Engineers and Geoscientists BC would like to thank all OQM-certified firms for their dedication to quality management and their participation in this program. The OQM Program helped to establish a culture of high standards in the engineering and geoscience industries, and has enhanced public protection through greater accountability and reduced risk.

NORTHWEST HYDRAULIC CONSULTANTS LTD | SEAWARD ENGINEERING & RESEARCH LTD | HORIZON ENGINEERING INC | SIMPSON STRONG-TIE CANADA LTD TEMEC ENGINEERING GROUP LTD | CHARTWELL CONSULTANTS LTD | CITY OF VANCOUVER (ENGINEERING) | CITIWEST CONSULTING LTD | TRUE CONSULTING KRAHN ENGINEERING LTD | URBAN SYSTEMS LTD | INTEGRAL ENGINEERING INC | PHASOR ENGINEERING INC | RANGELAND ENGINEERING CANADA CORP PITEAU ASSOCIATES ENGINEERING LTD | ROCKY POINT ENGINEERING LTD | READ JONES CHRISTOFFERSEN LTD | HILLSIDE ENGINEERING SERVICES LTD FAST + EPP | GEO CONSTRUCTION CONSULTING INC | SLR CONSULTING (CANADA) LTD | ENGINUITY CONSULTING LTD | R. RADLOFF & ASSOCIATES INC CH2M HILL CANADA LTD | RKTG ASSOCIATES LTD | HUB ENGINEERING INC | ALLNORTH CONSULTANTS LTD | HEDGEHOG TECHNOLOGIES INC | INTEGRAL GROUP VIBRA TECH ENGINEERING LTD | MORRISON HERSHFIELD LTD | NORTHWEST ENGINEERS INC | BURNABY ENGINEERING ASSOCIATES LTD | ICA PROJECTS INC INNOVO POWER ENGINEERING INC | REO ENGINEERING & TESTING INC | ONSITE ENGINEERING LTD | LDR ENGINEERING GROUP | HATCH CORP HEROLD ENGINEERING LTD | SES CONSULTING INC | WEB ENGINEERING LTD | WHITEWATER WEST INDUSTRIES LTD (STRUCTURAL ENGINEERING DEPARTMENT) IB CONSULTING & TECHNOLOGIES LTD | FLOW CONSULTING GROUP INC | MCCUAIG & ASSOCIATES ENGINEERING LTD | GHOSH ENGINEERING ASSOCIATES LTD RDH BUILDING SCIENCE INC | JRS ENGINEERING LTD | I/O DESIGN & ENGINEERING | APEX BUILDING SCIENCES INC | AUSENCO ENGINEERING CANADA INC CREUS ENGINEERING LTD | CORNERSTONE GEO-STRUCTURAL ENGINEERING LTD | R.F. 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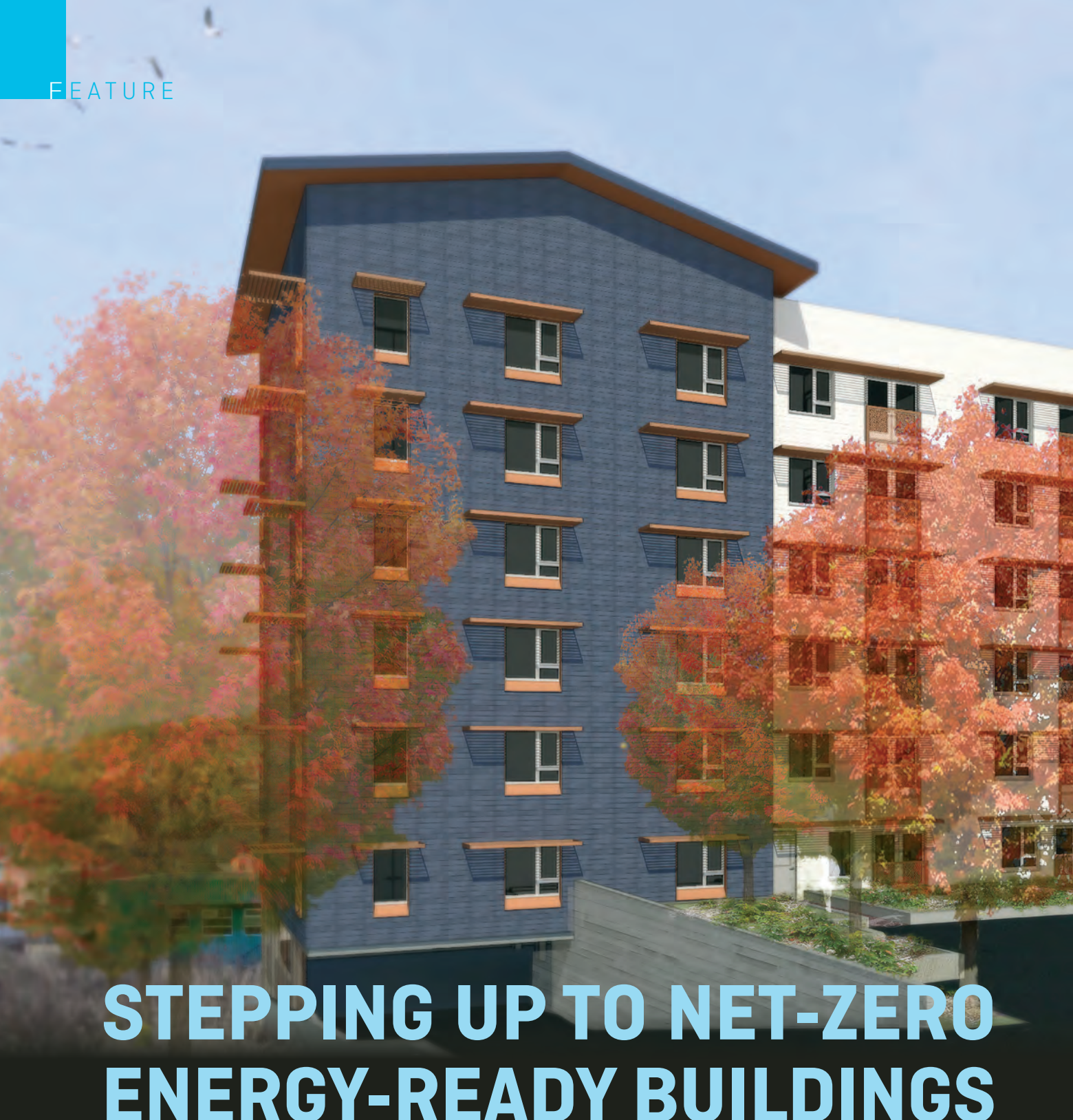
ENGINEERING & CONSULTING LTD ALTEC INSPECTION LTD | GHL CONSULTANTS LTD | ROCK GLEN CONSULTING LTD | ISL ENGINEERING & LAND SERVICES LTD | CEDAR CORE TECHNOLOGIES INC INTERNATIONAL QUEST ENGINEERING LTD | ANTRONICS CONTROLS INC | SCOUTEN ENGINEERING LTD | MCW CONSULTANTS LTD | FWS GROUP OF COMPANIES NEXT ENVIRONMENTAL INC | GES GEOTECH INC | THIRD ROCK GEOSCIENCE INC | MCINTOSH PERRY LTD | DMD & ASSOCIATES ELECTRICAL CONSULTANTS LTD PICA ENGINEERING LTD | MSR SOLUTIONS INC | PRIMARY ENGINEERING & CONSTRUCTION CORP | CITY OF KELOWNA (DEVELOPMENT ENGINEERING DEPARTMENT) STARLINE WINDOWS LTD | SOLIDUS GEOLOGICAL SERVICES | SOMERSET CONSTRUCTION ENGINEERING | POLAR GEOSCIENCE LTD | ABM ENGINEERING SERVICES BC COMFORT AIR CONDITIONING LTD | KEYSTONE ENVIRONMENTAL LTD | LAYTON CONSULTING LTD | J. MANRIQUE CONSULTANTS LTD | RYZUK GEOTECHNICAL WOOD CANADA LTD (MINING & MINERALS, PROCESS & ENERGY) | BC BUILDING SCIENCE LTD | ENGINEERED STRATEGIES INC | SIMPSON GEOTECHNICAL LTD S.A. ENGINEERING & ASSOCIATES INC | CWMM CONSULTING ENGINEERS LTD | COASTAL GEOFORESTRY CONSULTING LTD | MCCUE ENGINEERING CONTRACTORS JARVIS ENGINEERING CONSULTANTS LTD | KOERS & ASSOCIATES ENGINEERING LTD | AC EAGLE ENTERPRISES LTD | LITTLE MOUNTAIN ENGINEERING CO LTD WEST HOME ENGINEERING INC | CR ENGINEERING INC | WESTERN PACIFIC ENGINEERING GROUP LTD | RAM ENGINEERING LTD | VAST RESOURCE SOLUTIONS INC CELERITY ENGINEERING LTD | MONAGHAN ENGINEERING & CONSULTING LTD | MARCH & ASSOCIATES ENGINEERING LTD | GEOCLIMA MECHANICAL ENGINEERING MAVEN CONSULTING LTD | MFPE ENGINEERING LTD | MINEIT CONSULTING INC | OCTO ENGINEERING INC | PACIFIC POWERTECH INC | ELGABRY ENGINEERING INC GREAT NORTHERN ENGINEERING CONSULTANTS INC | HAMID DESIGN BUILD LTD | WESTRIDGE ENGINEERING & CONSULTING LTD | AXINE WATER TECHNOLOGIES TELFORD GEOTECHNICAL LTD | ASA ENERGY CONSULTING LTD | LORNIE ENGINEERING LTD | AECOM CANADA LTD | ECORA ENGINEERING & RESOURCE GROUP LTD WATERS EDGE ENGINEERING LTD | WCC CRANE SOLUTIONS INC | MACLEOD NINE CONSULTANTS LTD | BUILTEX ENGINEERING GROUP LTD | INTERIOR DAMS INC LAPORTE ENGINEERING INC | SB ENGINEERING | ZOOM ENGINEERING LTD | TRUE CONSULTING (TRUE CONSULTING (KELOWNA) LTD DBA TRUE CONSULTING) HXG CONSULTING ENGINEERING INC | TWIN PEAKS ENGINEERING LTD | GDR STRUCTURAL ENGINEERS INC | FWD ENGINEERING LTD | LIGHTSPEED ENGINEERING CITY OF VANCOUVER (CHIEF BUILDING OFFICIAL & BUILDING REVIEW DIVISION) | ALLESTER ENGINEERING LTD | GWES GREYWATER ENVIRONMENTAL SOLUTIONS TAG ENGINEERING INC | J.E. ANDERSON & ASSOCIATES | M1 METZGER ENGINEERING LTD | RONEY ENGINEERING LTD | ELEMENTAL STRUCTURAL ENGINEERS LTD ECO GEOTECHNICAL LTD | TIDES CONSULTING LTD | TERRAN GEOTECHNICAL CONSULTANTS LTD | KONSTANT, A DIVISION OF THE ECONO-RACK GROUP (2015) INC ALLNORTH CONSULTANTS LTD (SASKATCHEWAN) | MUSIC SCULPTOR BUILDING CONSULTANTS INC | TRINITAS ENGINEERS INC | TE BURNS ENGINEERING LTD SOVEREIGN ENGINEERING LTD | ADEPT ENGINEERING LTD | MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPERATIONS & RD (ENGINEERING BRANCH) GLS ENGINEERING LTD | MIDSEA ENGINEERING LTD | GEOWEST ENGINEERING LTD | ALVERSTONE STRUCTURAL ENGINEERING LTD | TLSE ENGINEERING INC SYME STRUCTURAL ENGINEERING LTD | SEG CONSULTING LTD | CHALTEN ENGINEERING LTD | M3 MECHANICAL CONSULTANTS INC | SPLINE CONSULTING LTD MINISTRY OF FORESTS, LANDS, NATURAL RESOURCE OPS & RURAL DEVELOPMENT (WEST COAST REGION) | SUNLYNN CONSULTING LTD | WEST POWER ENERGY METHOD ENGINEERING & BUILDING SERVICES LTD | WAYBETTER DESIGN + CONSULTING LTD | URBAN GEO ENGINEERING LTD | CARISBROOKE CONSULTING INC BAYSIDE ENGINEERING ADVISERS LTD | T.G.I. ENGINEERING & DESIGN CONCEPTS LTD | ARVAND CONSTRUCTION CONSULTANT LTD | CHEN CONSULTING LTD ELEMENT CONSULTING ENGINEERS LTD | ENVISION ENVIRONMENTAL CONSULTING LTD | ALPINE CIVIL ENGINEERING CONSULTANTS LTD | INFINITY SOLUTIONS PEL ENGINEERING LTD | JD STRUCTURAL CONSULTING LTD | PONTEM CONSULTING GROUP LTD | OBEE ASSOCIATES ENGINEERING LTD | SMCN CONSULTING INC AIRY POINT ENGINEERING SERVICES INC | PHAM STRUCTURAL ENGINEERING INC| MUNRO ENGINEERING LTD | PAGET ENGINEERING INC | PETRO SADR CORP OUT OF THE BOX ENGINEERING | EMERGENT MECHANICAL ENGINEERING LTD | SENEZ CONSULTING LTD | GRAY BUILDING DESIGN LTD | XT ENGINEERING LTD MINISTRY OF TRANSPORTATION & INFRASTRUCTURE | PARSONS INC | ADVISIAN | POWERSAFE ENERGY SERVICES INC | SEABULK INC | E-COMM 911



STEPPING UP TO NET-ZERO ENERGY-READY BUILDINGS

THREE YEARS AGO, BRITISH COLUMBIA COMMITTED TO MAKING ALL NEW BUILDINGS NET-ZERO ENERGY READY BY 2032. THAT'S AN AMBITIOUS GOAL, TO SAY THE LEAST, BUT WITH THE HIGH NUMBER OF MUNICIPALITIES AND BUILDERS ALREADY STARTING TO WORK TOWARD THE TOP LEVELS OF THE BC ENERGY STEP CODE, IT MIGHT BE POSSIBLE.

Robin J. Miller

330 Goldstream Avenue, a six-storey, 102-unit in Langford, BC, owned by the Greater Victoria Housing Society project, was designed and constructed to Step Code Level 4 and the International Passive House Standard. Cascadia Architects Inc. was the architect and the construction contractor was Kinetic Construction.
RENDERINGS: CASCADIA ARCHITECTS INC.

The City of Langford is the fastest growing community in British Columbia. In 2019 alone, it welcomed more than 2,000 new residents and built a jaw-dropping 37 percent of all new housing in Greater Victoria. This could easily have resulted in lots of building-code-basic residential buildings since, until the city adopts the *BC Energy Step Code* (it is in the middle of that process now), builders are not technically required to go beyond that minimum. But some Langford builders—including Design Build Services—are already voluntarily going well beyond current building codes, and creating buildings at the very top step of the *BC Energy Step Code*.

From April 2017, when the BC Government first introduced the *BC Energy Step Code*, municipalities have had the choice to require, or provide incentives for, builders to meet or exceed one of the Step Code's steps—each of which represents energy-efficiency measures above the base *British Columbia Building Code* (BCBC). The top step is a building that is approximately 80 percent more energy efficient than under the current BCBC, which means that it is net-zero energy ready: the building could produce as much clean energy as it consumes over a year by using on-site (or near-site) renewable energy systems, such as solar panels. The intention is for the BCBC to transition to the net-zero energy-ready standard as a minimum requirement by 2032.

Design Build Services decided not to wait, however, designing Peatt Commons West, a 72-unit, mass-timber-framed rental building completed in June 2020, to be net-zero energy ready now, more than a decade before that standard will be required under the BCBC. And they are not alone: an increasing number of owners, builders, architects, and engineers across the province are choosing to add extra energy-efficiency measures well beyond those currently mandated by the BCBC or municipal bylaws as part of their everyday practice.

Brittany Coughlin, P. Eng., is a principal with building consulting firm RDH Building Science Inc. in Vancouver. She's also the Energy and Sustainability Specialist.

Previous page: **The Penticton Affordable Rental Housing Project was designed and constructed to Step Code Level 3. The architect was VIA Architecture.** Photo: **RDH Building Science Inc.**

The extent of early Step Code adoption is, she thinks, due to its being "a clear path toward the future. The Province has really, really ambitious goals for net-zero ready buildings and the Step Code gives us a roadmap of how we're going to get there that helps people to see and understand and buy into the net-zero goal. Lots of jurisdictions are onboard with the Step Code now, and lots of developers and project teams are following it even where it's not required as a way to drive building sustainability and energy performance. And I think it's just going to accelerate from here."

To date, 72 BC municipalities have adopted the *BC Energy Step Code*, with many starting at two or even three steps above basic BCBC, while the City of Vancouver has its own, energy efficiency requirements (plus equivalent low emission standards, which is one drawback, says Coughlin, to the Step Code: "It's all about energy performance targets," which is great, she said, "but it doesn't necessarily ensure low carbon emissions"). The result is that the vast majority of all new residential construction in BC is being built to use, and even produce its own, energy much more effectively than ever before.

The *BC Energy Step Code* works, not by prescribing the use of specific systems, materials, or approaches, but by providing minimum performance targets for each step. These targets include, most importantly, thermal energy demand intensity (TEDI) and total energy use intensity (TEUI). TEDI is the amount of annual heating demand (delivered heat) needed to maintain a stable interior temperature, taking into account heat loss through the

From top: This Chilliwack Modular Supportive Housing residential building project was designed and constructed to Step Code Level 3. The architect was Mobius Architecture. Photo: RDH Building Science Inc.

The 330 Goldstream Avenue in Langford, BC, under constuction. Photo: Cascadia Architects Inc.

envelope minus heat gains from such sources as solar energy passing through the envelope, cooking, or simple body heat. TEUI is the amount of energy used by space heating and cooling, ventilation, and domestic hot water systems—plus lighting and plug load energy for larger buildings—per unit of area, over the course of a year.

Design teams can decide for themselves exactly how they are going to meet or exceed the targets required by the jurisdiction in which they are building or, where no bylaws are in place, that they have decided to pursue. It is up to them to choose the combination of building systems, energy sources, and other factors, such as the building's orientation, shape, mass, or envelope, that will best help them meet both their targets and their budgets. They must then prove that their design will meet the technical requirements of a given step, through both in-advance energy modelling and after-build on-site airtightness tests.

Ruth McClung, EIT, works with engineering consultants Morrison Hershfield Ltd. in Vancouver. As Building Energy Technical Lead, she does energy modeling for a variety of clients, most of whom, she said, have responded positively to the Step Code requirements, especially the lower steps. "When we are involved really early in the design process, we are often able to give them feedback like, 'if you follow your typical standard practice, this is where you end up, but if you make a few tweaks, push this aspect for the building one way or the other, then you can really easily get to a higher step.'"

McClung said Step 2—which is about 10 percent more energy efficient than *BCBC*—was deliberately set low, "typical standard practice will pretty much get you there," as a way to help builders get used to the step format. "Step 3 [about 20 percent more energy efficient] again is also fairly achievable. They may just have to change a few little things about their design, depending on their building type. A low-rise wood-frame building, for example, just naturally has a lot less thermal bridging—which is extra heat loss through localized building envelope details—so you are already going to get good envelope performance. But if you're doing a high-rise building that's completely window-wall, then your envelope performance is going to be limited, and you may have to invest in other parts of your building , like better heat recovery ventilation, to get there. Step 4 [about 40 percent more energy efficient] is a fairly challenging target. You need to be intentionally designing for low TEDI *and* implementing current best practices to get there."

BC Housing—which develops and manages subsidized housing options across BC on behalf of the Province—already makes at least Step 3 and often Step 4 mandatory where it is "the primary funder," said Bill MacKinnon, Senior Manager, Energy and Sustainability. "As developer/owner, we can simply require it." For other builds, where they are just one of a number of stakeholders, the organization must be content with "whatever step is reasonably possible."

"We certainly had some resistance early on," said MacKinnon. "I think that was a result of the building code not changing very radically over the last 30 years.

Continues on page 37...

SPECIAL INSERT

THE PROFESSIONAL GOVERNANCE ACT:

WHAT YOU NEED TO KNOW

The regulatory landscape in British Columbia is changing.

The *Professional Governance Act* will soon come into force—new governing legislation for professional regulators in the natural and built environment, including Engineers and Geoscientists BC and the regulators for forestry, agrology, biology, and applied science.

It will replace the *Engineers and Geoscientists Act*, and introduce new regulatory tools, processes, and requirements for Engineers and Geoscientists BC and its registrants.

This change means you will have new obligations you need to be aware of, and new requirements you need to follow.

100 YEARS

ENGINEERS & GEOSCIENTISTS
BRITISH COLUMBIA

PATHWAY TO NEW LEGISLATION

The *Professional Governance Act* was a key recommendation of the BC government's professional reliance review, which examined the current legislation governing qualified professionals in the natural resource sector, and the role professional regulators play in upholding the public interest. It aims to strengthen governance, institute best practices, and provide modern regulatory tools for professional regulators to ensure professionals are held to high technical and ethical standards.

The regulatory tools under the *Professional Governance Act* will improve public safety and confidence in the engineering and geoscience professions, ultimately resulting in stronger regulation and a safer British Columbia.

Due to the recent election and its impact on timelines for legislative approval, we anticipate the *Professional Governance Act* will come into force by February 2021.

This change means you will have new obligations you need to be aware of, and new requirements you need to follow.

WHAT'S CHANGING?

1

AN UPDATED CODE OF ETHICS

The *Professional Governance Act* requires each regulator under this legislation to include a minimum of 12 standardized mandatory principles within their Code of Ethics for their registrants.

WHAT DO YOU NEED TO KNOW?

- Engineers and Geoscientists BC's Code of Ethics will be updated to include 13 principles.
- Generally, the changes are modest and are consistent with the Code that has been in use since 1991.
- We consulted registrants earlier this year, and 87% said they either "fully" or "mostly" understood their obligations under the new Code.
- Guidance documents, resources, and answers to frequently-asked questions will be published to support registrants' understanding of their ethical obligations.
- The updated Code of Ethics will come into effect when the *Professional Governance Act* is in force.

CODE OF ETHICS

A registrant must adhere to the following Code of Ethics:

Registrants must act at all times with fairness, courtesy and good faith toward all persons with whom the registrant has professional dealings, and in accordance with the public interest. Registrants must uphold the values of truth, honesty and trustworthiness and safeguard human life and welfare and the environment. In keeping with these basic tenets, registrants must:

1. Hold paramount the safety, health, and welfare of the public, including the protection of the environment and the promotion of health and safety in the workplace;
2. Practice only in those fields where training and ability make the registrant professionally competent;
3. Have regard for the common law and any applicable enactments, federal enactments or enactments of another province;
4. Have regard for applicable standards, policies, plans and practices established by the government or EGBC;
5. Maintain competence in relevant specializations, including advances in the regulated practice and relevant science;
6. Provide accurate information in respect of qualifications and experience;
7. Provide professional opinions that distinguish between facts, assumptions and opinions;
8. Avoid situations and circumstances in which there is a real or perceived conflict of interest and ensure conflicts of interest, including perceived conflicts of interest, are properly disclosed and necessary measures are taken so a conflict of interest does not bias decisions or recommendations;
9. Report to EGBC and, if applicable, any other appropriate authority, if the registrant, on reasonable and probable grounds, believes that:
    a. The continued practice of a regulated practice by another registrant or other person, including firms and employers, might pose a risk of significant harm to the environment or to the health or safety of the public or a group of people; or
    b. A registrant or another individual has made decisions or engaged in practices which may be illegal or unethical;
10. Present clearly to employers and clients the possible consequences if professional decisions or judgments are overruled or disregarded;
11. Clearly identify each registrant who has contributed professional work, including recommendations, reports, statements or opinions;
12. Undertake work and documentation with due diligence and in accordance with any guidance developed to standardize professional documentation for the applicable profession; and
13. Conduct themselves with fairness, courtesy and good faith towards clients, colleagues and others, give credit where it is due and accept, as well as give, honest and fair professional comment.

2

CONTINUING EDUCATION REPORTING WILL BECOME MANDATORY

The *Professional Governance Act* requires Engineers and Geoscientists BC to develop and implement a mandatory Continuing Education Program.

WHAT DO YOU NEED TO KNOW?

- Requirements for the new Continuing Education Program will come into effect **as of July 1, 2021**. Reporting will begin in **June 2022**.
- You will need to:
  - Complete 60 hours of continuing education on a three-year rolling period (20 hours a year on average);
  - Complete at least one hour of ethical learning and one hour of regulatory learning per year;
  - Complete and submit a Continuing Education Plan on an annual basis; and
  - Report all activities by June 30 each year.
- To ease the transition to the new program, continuing education undertaken between January and July, 2021 can be counted toward the first reporting year of the new program.
- Our continuing education model lets you undertake a blend of technical, non-technical, professional and ethical training, and reflects feedback from registrants on how our program can better enable you to maintain competency in your area of practice.

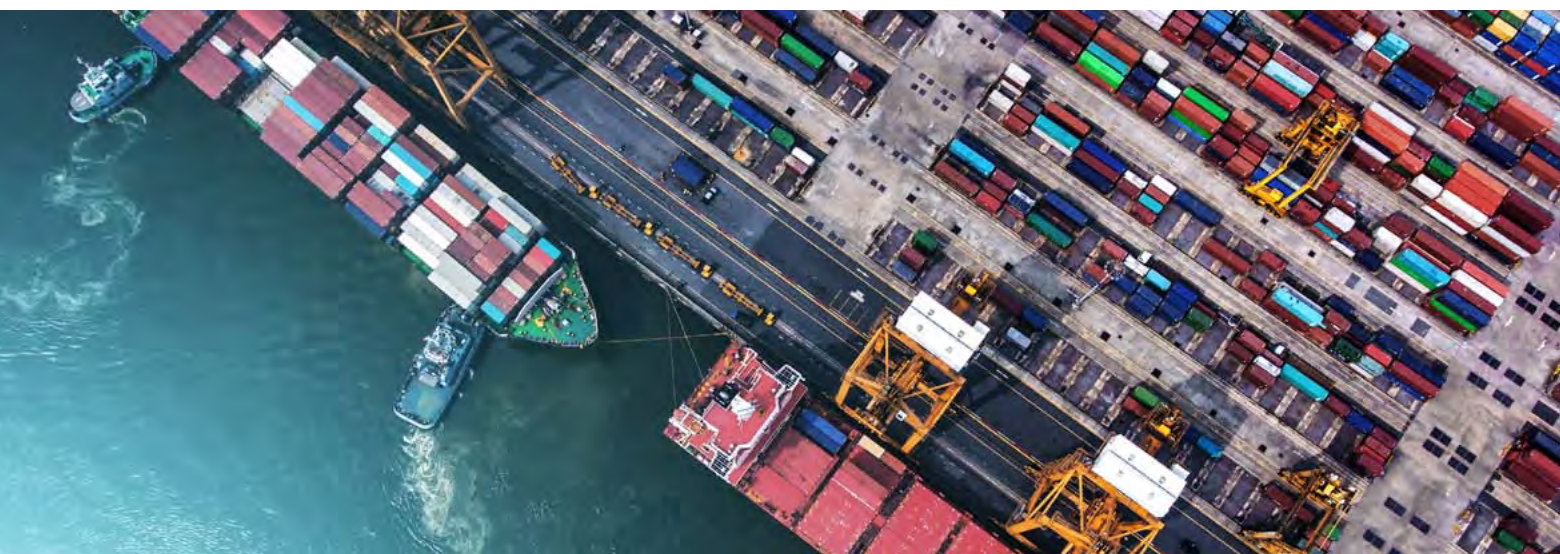
3

ENGINEERING AND GEOSCIENCE FIRMS WILL BECOME REGULATED

The *Professional Governance Act* requires all firms that engage in the practice of professional engineering or professional geoscience to be regulated by Engineers and Geoscientists BC.

WHAT DO YOU NEED TO KNOW?

- If your firm engages in the practice of professional engineering or professional geoscience, registration becomes mandatory **on July 2, 2021** and must be renewed annually. Once registered, firms will be issued with a Permit to Practice.
- Regulation will apply to entities in the private and public sector, including sole practitioners.
- Our regulatory model is based on three pillars: quality management, ethics, and continuing education. It was developed over several years by an advisory task force, supported by extensive research and engagement with registrants.
- Firms will be required to complete training and have documented policies and procedures in place for each of the three pillars within 12 months of registration.
- To support firms in meeting these new requirements, we'll be providing templates, documentation, and training beginning early in 2021.



4

NEW ANNUAL REPORTING REQUIREMENTS

The *Professional Governance Act* requires registrants to verify their area of practice annually and keep their contact information up to date with Engineers and Geoscientists BC.

WHAT DO YOU NEED TO KNOW?

- You'll need to verify certain practice-related information and contact information annually:
  - Your area of practice;
  - Your industry of practice;
  - Your employer, if applicable; and
  - Your mailing address, business contact information, and email address.
- If your contact or practice-related information changes, you'll need to update your information **within 30 days**.
- The first mandatory reporting deadline is **June 30, 2021**.
- If you fail to update your information, you may be subject to late fees, suspension, or cancellation.

5

CHANGES TO PRACTICE REVIEW AND AUDIT PROGRAMS

The *Professional Governance Act* requires Engineers and Geoscientists BC to establish both proactive and reactive programs to ensure registrants and firms are complying with our regulatory requirements.

WHAT DO YOU NEED TO KNOW?

- Our existing Practice Review program will be separated into two distinct processes:
  - Audits: proactive, randomly-selected reviews that measure registrants' compliance with requirements such as continuing education and quality management. For firms, audits will measure compliance with firm regulatory requirements.
  - Practice Reviews: reactive, technically-focused reviews that are triggered when significant issues are identified during an audit of an individual or firm, or as the result of a complaint.
- More information on the timing of these new programs will be available when the *Professional Governance Act* comes into force.

TIMELINE

- By February 2021: *Professional Governance Act* comes into force
- June 30, 2021: First mandatory reporting of practice-related information and contact information
- July 1, 2021: Mandatory Continuing Education requirements come into effect
- July 2, 2021: Firms must register with Engineers and Geoscientists BC
- June 30, 2022: First mandatory reporting of continuing education activities

KEEP INFORMED

Stay up to date on the *Professional Governance Act* and check out a schedule of upcoming webinars, FAQs, and other resources at egbc.ca/pga.

Questions? Contact us at professionalgovernance@egbc.ca.

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BUILDING THE TŜILHQOT'IN SOLAR FARM

What started as an idea became an opportunity. Russ Myers Ross, former Chief of Yunesit'in Government, completed solar energy studies in his community of Yunesit'in, one of six Tŝilhqot'in communities, with the EcoSmart Foundation. From these studies, he decided to take up the challenge of developing a large solar photovoltaic farm open to all the communities of the Tŝilhqot'in Nation. Today, the largest solar farm in BC—built almost entirely by members of local Indigenous bands—is proof of the capacity of First Nations to undertake their own renewable energy projects.

Michel de Spot, P.Eng. (Non-Practising)

Sixteen rows of solar panels come into view on the Chilcotin Plateau on the drive to Bella Coola, just 100 kilometres west of Williams Lake, BC. Comprising 3,456 solar photovoltaic modules, perched at the edge of an old sawmill site, the Tŝilhqot'in Solar Farm is the largest solar farm in BC and the first to be fully developed, owned, built, and operated by a First Nation in Canada.

A milestone in the advancement of solar technology in BC, the facility is a huge accomplishment for the Tŝilhqot'in Nation. It contributes to local economic development by creating a stable, continuous source of revenue from the sale of electricity to BC Hydro, while providing wages, training, and pride to the Indigenous men and women who worked for a year on its construction.

PHOTO: ECOSMART FOUNDATION INC.

More than 1,500 megawatt-hours per year of clean electricity is sold to BC Hydro, through a long-term energy purchase agreement. During its 25-year lifetime, the facility will generate more than 37 gigawatt-hours of clean electricity worth about $3.7 million in gross revenue.

A unique 250-kilometre distribution line serves the entire Chilcotin region. This unusual length makes the grid more vulnerable to instability and power loss. In its heyday, the sawmill had to rely on diesel generators to compensate for the lack of capacity of the adjacent power line. Electricity from diesel was from four to five times more expensive than electricity from the grid—a major operational cost for the sawmill.

The Tŝilhqot'in Solar Farm comprises 3,456 solar photovoltaic modules, will generate more than 37 gigawatt-hours of clean electricity over its estimated 25-year life. The farm is the largest in BC, and the first in Canada to be developed, owned, built, and operated by a First Nation in Canada. Photo: EcoSmart Foundation Inc.

The solar farm reinforces this weak grid with an additional power source at the grid's midpoint. Thus, the project not only creates revenue from the sale of electricity, but it also supports the economic development of the Chilcotin by increasing the regional grid capacity and resilience. The electricity produced is consumed regionally in the Chilcotin, without reaching back to the Williams Lake substation. That makes it an interesting case study of the benefit of distributed generation on semi-isolated grids.

SOLAR DESIGN

The principle of the PV effect has been shown in laboratory settings since the nineteenth century, and was explained by Albert Einstein in the 1920s. Ironically, Einstein received the Nobel Prize in Physics for his theory on the PV effect, not for his famous work on the theory of relativity.

Light is energy in the form of photons or electromagnetic waves. The engine of a solar system is the crystalline silicon photovoltaic (CSPV) cell. To produce a PV cell, pure silicon is processed into a semiconductor by "doping" it with foreign elements. A PV cell is basically a diode, similar to semiconductors found in computers or cell phones. When the cell is lighted, the photons transmit their energy to the atoms, resulting (as explained by Einstein) in the escape of electrons from their nucleus. The diode separates the electrons and produces a small electric potential—about 0.5 volt per "diode." Connecting a circuit between this potential will produce a direct electric current continuously generated by new electrons "excited" by

Workers install solar photovoltaic modules on custom racks. Photo: EcoSmart Foundation Inc.

new coming photons. That's how solar energy is transformed into electrical energy. Commercial PVs have an efficiency between 15-20 percent (i.e., up to one-fifth of the photon energy is transformed into electricity, the rest of which degrades into heat).

To raise the voltage to a practical level, the cells are connected in series. The project places enough cells in long strings to achieve 1,000 volts. This configuration reduces current losses but requires stringent insulation and handling precautions.

There are two types of CSPV: monocrystalline and polycrystalline, according to how the silicon crystal is grown. Monocrystalline is more efficient and lasts longer but is more expensive. Monocrystalline has come into normal use because the price difference can be largely compensated by other benefits. Higher efficiency means fewer installed modules, less land area, fewer racks, less foundation, and less wiring. Longer lifespan means lower operations and maintenance costs. Consequently, the project uses high-quality 360 watt peak Mono PERC Q-Cells PV modules, which are designed in Germany and manufactured by Hanwha in Korea.

Solar peak irradiance is the amount of solar energy available on a clear day at ground level, on a plane that directly faces the sun. It is roughly 1,000 watts/m^2 everywhere on Earth. Of course, actual solar energy varies according to local conditions, such as clouds, atmospheric humidity, latitude, or altitude. Computer simulations can predict the actual performance, based on satellite data and system characteristics, such as module efficiency, panel orientation, and temperature.

Inverters are essential components of solar systems. Their purpose is to transform the string direct current (DC) into alternative current (AC), compatible with the grid, while optimizing the performance of the PV system under varying irradiance conditions. Inverter technology has improved considerably in recent years. Today, it is common to use multiple, small, transformer-less, distributed inverters, replacing the traditional single large, centralized inverter in a substation setting. Distributed inverters have many advantages; they are easier to handle, install, repair or replace. Mass-produced like appliances, their prices follow the same downward course as the PV Modules.

The solar plant has 16 Schneider inverters, installed at the end of each row. Their combined capacity is 992 kilowatts (AC), or 25 percent less than the 1,240 kilowatts DC peak capacity of the combined PV panels. Reducing the size of AC system reduces its costs (e.g., wires, transformer) but caps peak solar input. Since peak irradiance is not very frequent, this configuration results in only 0.7 percent loss from DC power clipping.

LAND CHALLENGE

The project is located at a high altitude (i.e., 1,100 metres) as well as at a high latitude (lat 51°56 N'). It is farther north than any other large-scale solar plant in Canada, and possibly the farthest from the equator in North America.

While theoretical peak solar irradiance is roughly the same at the equator as it is at high latitude, ground installation is more challenging at a lower sun position and lower ground temperatures.

At this latitude, the optimum panel slope for a maximum year-round yield was found to be 45 degrees, much steeper than the usual 20 degrees to 30 degrees needed in the US. A greater slope means higher wind load, longer shading, and a non-standard design for off-the-shelf rack suppliers.

The challenge of this higher wind load was addressed by structural engineers RJC Engineers, with the help of wind experts RWDI Consulting Engineers and Scientists. Then, Solar FlexRack, a US-based solar mount manufacturer, supplied prefabricated racks that met these specifications.

Increasing the distance between rows decreased inter-shading but increases the cost of land and electrical connections. The balance was optimized by computer simulations resulting in a footprint of 2.6 hectares—easily accommodated within the sprawling brownfield of the abandoned sawmill.

Short piling is the most economical and usual foundation system for ground-mounted solar plants. Normally, the solar farm would have used about 400 short piles driven by a small, specialized piling machine. But the site did not allow it; higher wind load required heavier and deeper piles. Deeper piles were also required to address sub-zero ground frost heave. Finally, geotechnical tests by Thurber Engineering indicated an extremely hard and rocky ground. Not a single pile could be driven deeper than a few feet in subsequent trial piling tests. As a result, the foundation design had to be changed into a ballast system; concrete had to be trucked from a ready-mixed plant in Williams Lake —a 200-kilometre road trip that increased considerably the cost of foundations.

Only two large-scale solar PV farms have been built in BC, both of which were designed by EcoSmart. The first farm, at SunMine in Kimberley, demonstrated the outstanding solar energy potential in this province, together with the benefits of redeveloping an industrial brownfield into a "brightfield." The Tŝilhqot'in Solar Farm reiterates these facts but adds 25 percent less solar irradiance than the Kimberley farm, a remote sawmill location instead of a mine site inside a town, fixed panels instead of trackers, a small Indigenous developer instead of a large mining company, complex grid interconnection, and a higher latitude.

Because of its northern location, the modules of the Tŝilhqot'in Solar Farm had to be angled to about 45 degrees. PHOTO: ECOSMART FOUNDATION INC.

A solar project is more than a high-tech application of PV modules and inverters; it is a full-fledged engineering project involving traditional disciplines such as geotechnical, civil, structural and electrical. And while the specialized solar equipment, such as PV modules, inverters and racks, had to be imported, all the engineering work was completed by local firms, including ICI Electrical Engineering Ltd. in Kamloops for the electrical engineering and interconnection, and Prime Engineering Ltd. in Victoria for the design and supply of the substation.

As the price of CSPV continues to drop, the cost of the balance of the system—in particular the services that can be provided locally—is becoming more prevalent for engineers interested in a technology that is clearly our future. ♦

Michel de Spot, P.Eng. (Non-Practising) is president and CEO of EcoSmart Foundation Inc., a not-for-profit organization dedicated to the advancement of solar energy in BC. Michel has been responsible for the design and implementation of the only two large-scale solar farms in BC.

FEATURE

HYDROGEN GETS ITS DUE

HOW THIS ALTERNATIVE ENERGY SOURCE IS HELPING PUSH BC TOWARDS A GREEN FUTURE

Heather Ross

Ballard employees assemble a FCwave fuel cell module at its Marine Center of Excellence in Hobro, Denmark.
Photo: Ballard Power Systems.

Demand for hydrogen as a replacement for fossil fuels is growing worldwide as countries work to address climate change. British Columbia is well-positioned to capitalize on this opportunity, because it is abundant in the right types of energy resources and infrastructure.

"There's been a fundamental change in thinking in the last five years," says Warren Johnson, P.Eng., vice president of Sacré-Davey Engineering. In the past, the go-to choice for new hydrogen production "would have been a steam-methane reformer burning natural gas," he says. "Today, people are saying, 'I need to confirm the sustainability of my product, I want to have it as green and sustainable as I can.'"

Steam reforming of methane-rich gas, which produces hydrogen and carbon dioxide, is a production process currently used for over 95 percent of hydrogen globally. Steam reforming of methane-rich gas uses high-temperature steam to produce hydrogen from a methane source, such as natural gas. It is a cheap option, but fossil fuel-reliant. Another method—electrolysis hydrogen processing—breaks the bonds of water molecules to produce oxygen and hydrogen gases. Electrolysis is quickly becoming a more attractive option: when it's powered by renewable energy, the result is renewable hydrogen (RH2). Thanks to abundant water resources and renewable hydroelectric energy, BC has a competitive advantage for RH2 production.

A 2019 study by consulting firm Zen and the Art of Clean Energy Solutions concluded that hydrogen is an essential part of any strategy to meet near- and longer-term climate goals in BC. The study estimated that hydrogen has the potential to comprise almost one-third of the 2050 carbon reduction goal in the *2018 Climate Change Accountability Act* (formerly the *Greenhouse Gas (GHG) Reduction Targets Act*). The *Act* legislated a 40 percent reduction of greenhouse gases by 2030—based on 2007 levels—rising to a 60 percent reduction by 2040 and 80 percent by 2050. Beyond decarbonization and emissions reduction, the study estimated that hydrogen represents a potential $15 billion export industry for the province.

Photo: HTEC.

Ballard provided two next-generation 200 kilowatt fuel cell modules to power a Norled A/S hybrid ferry in Norway.
Photo: Ballard Power Systems.

Developing hydrogen resources in tandem with BC's existing natural gas industry could help bridge our current fossil fuel dependence to a green energy future. And as a versatile energy carrier, hydrogen can store energy to deliver to the grid when wind or solar generation is idle.

"Globally there's a lot of momentum building…[and] government funding strategies and programs are being put in place," says Colin Armstrong, P.Eng., president and CEO of HTEC Hydrogen Technology and Energy Corp. "[Hydrogen] can decarbonize transportation. It can decarbonize the natural gas world and… it can also decarbonize a number of industrial steps. It can also allow distribution and storage of large amounts of energy around the globe.

The natural gas infrastructure that currently exists throughout the province means that a number of locations could work for renewable hydrogen production projects. As Johnson points out, "A place that's good for wind power…may not be next to a large transmission line right now, but you could take that hydrogen, put it into an existing natural gas pipeline…and transport it that way. It's a way of capturing remote or alternate green energy and tying it into the overall energy system in a way that uses existing assets and infrastructure."

"There are projects around the world taking surplus power or variable power or renewable power and converting it into hydrogen and then injecting it into the existing natural gas stream in amounts that are safe and code compliant," Johnson says. "And then, allowing it to just be used as an industrial fuel so it effectively boosts the amount of green or renewable content in the existing energy distribution. Somebody who burned it in their house wouldn't even know the difference: it's all within regulatory and safe practices."

There is significant progress towards elevating the status and availability of hydrogen in BC. Sundance Hydrogen's RH2 plant in Chetwynd, for example, recently received a $200 million investment from Macquarie Capital, an Australian infrastructure investment giant.

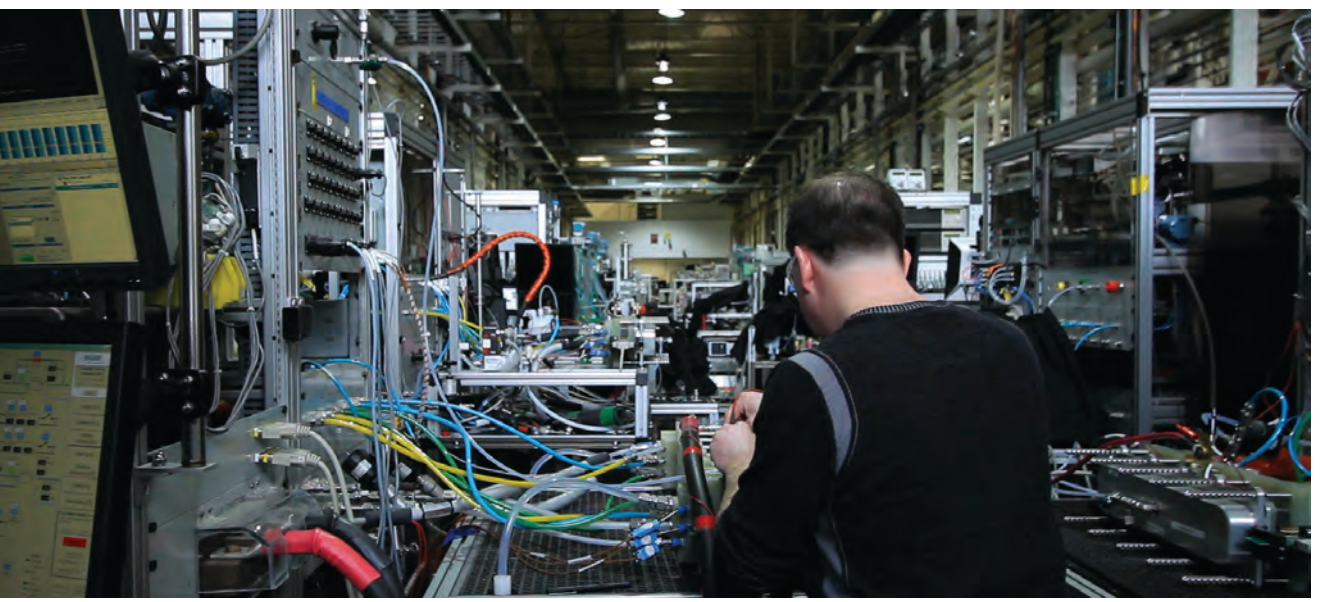
Macquarie is partnering with Renewable Hydrogen Canada (RH2C), Fortis BC, and Sundance Produce on the project. The large-scale plant will produce hydrogen through electrolysis, using wind power from Aeolis Wind and supplemented with electrical power from BC Hydro. FortisBC will blend 60 tonnes of hydrogen the plant will produce each day with natural gas, as part of their renewable natural gas program goals to lower the carbon footprint of gas consumed in the province. Sundance Produce, an Indigenous-owned greenhouse company, will use waste heat from the electrolysis operation.

And, in early September 2020, the BC government announced an allocation of $10 million for construction and operation of 10 hydrogen fueling stations in the province, plus three years of support for Hydrogen BC, a new entity of the Canadian Hydrogen and Fuel Cell Association focused on advancing hydrogen and fuel cell use in BC. “These announcements help solidify hydrogen and fuel cells as mainstream technology,” says Cara Startek, P.Eng, director of technology solutions at Ballard Power Systems. “I can go fill up my fuel cell car at a fueling station.”

From Top: HTEC H2 production facility. Photo: HTEC.

A fleet of 500 delivery trucks, powered by Ballard fuel cell stacks, in operation in Shanghai, China. Photo: Ballard Power Systems.

Each year, Ballard generates more than 400,000 hours of test data at its facilities in Burnaby, BC. The facilities are home to one hundred fuel cell test stations and specialized tools, including eleven environmental chambers. Photo: Ballard Power Systems.



"Globally, there is an emerging pull for megawatt scale fuel cell applications [like distributed generation and large-scale marine] because widespread hydrogen availability is expected," explains Startek. "Green energy producers are looking for methods to store energy in large scale when it is not immediately needed. Batteries are not ideal for large scale energy storage, but hydrogen is."

With increased demand for large-scale renewable energy in BC, Startek sees an opportunity for hydrogen fuel cells to play an important role. "If we're investing in infrastructure for solar and wind, we should also consider fuel cells, hydrogen production and storage. This enables power production when there is insufficient sun or wind and with stored hydrogen available locally it's more feasible for other customers, like bus fleet operators, to consider fuel cell solutions."

This type of consideration, along with up-front investment of time, money, partnerships, and relationship building will be required in many areas for the province to be able to make use of current resources. A particular challenge for engineers will be integration of hydrogen products and processes into existing industry and infrastructure. "The engineering challenges aren't [about] a new product being made in a new way," Johnson notes, "[but] how it fits into an existing or a new industry. Whenever somebody puts in a new type of system," Johnson says, the question is "have they taken into account how it responds with whatever their base industry is?"

Armstrong, Johnson and Startek all agree: one area that is key for increased integration of hydrogen is updating of codes and standards. Armstrong is clear, "codes and standards need to evolve."

"To grow the industry we need to address regulatory and safety standards for new applications," says Startek. "We need deeper collaboration with certification bodies." Another key question, says Johnson, will be "how does [a new hydrogen production plant] fit in the existing utility regulatory structure?"

Johnson is positive about the future for BC. "I think we should be leading and developing more [green power] projects. It's a challenge to everyone to figure out how we [can] best embed that value so that our products are greener, and then we can export some of our abundant green resources embedded in the products we can sell to the rest of the world." Some of BC's Pacific Rim neighbours—China, Japan, South Korea—are going to have significant green power requirements that our exports could address. And closer to home, California is another strong market.

The strongest sign of a shift to green energy taking hold in the province may be the interest from within the hydrogen industry for the growth of renewable hydrogen. "We would definitely like to see more accessible green hydrogen," says Startek, "but access to locally produced green hydrogen is not yet economical and the up-front investment is the critical step. Transforming the industry to green hydrogen is the ultimate goal. ♦

DISCIPLINARY NOTICE: GLEN MACDONALD, P.GEO., VANCOUVER, BC

Engineers and Geoscientists BC issued a Notice of Inquiry to Glen MacDonald, P.Geo., in March 2020, regarding his conduct related to public disclosures in two news releases. The Notice of Inquiry alleges that Mr. MacDonald acted as Qualified Person as defined in *National Instrument 43-101, Standards of Disclosure for Mineral Projects* (NI 43-101), and as director of the company making the disclosures through the news releases. The Notice of Inquiry alleges that Mr. MacDonald permitted or participated in disclosing the company's news releases to the public, while he knew, or should have known, that the disclosures in the news releases contained misleading and incorrect information, and the disclosure was contrary to NI 43-101 requirements. The Notice of Inquiry specified that the following particulars of the disclosure were contrary to the requirements outlined in NI 43-101.

- The disclosure of "6 million" grams of gold as an "inferred reserve", or "reserve", are contrary to NI 43-101 mineral resource and mineral reserve categories, when there was no categorized "reserve" of gold at the property in question.
- The disclosure "6 million" grams of gold when any disclosure of the quantity of gold is contrary to NI 43-101, because the deposit had not been categorized as a mineral resource or mineral reserve in a technical report issued by the company, as required by NI 43-101.
- The disclosure of a historical estimate prepared for a different company is contrary to the requirements of NI 43-101. In particular, the disclosures in these news releases improperly used the terms "inferred resource" as used in the historical estimate; did not adequately identify the source and date of the historical estimate; did not comment on the relevance and reliability of the historical estimate; did not provide the key assumptions, parameters and methods used in the historical estimate; did not comment on what work needs to be done to upgrade or verify the historical estimate as a current mineral resource; and did not state with equal prominence that a Qualified Person has not done sufficient work to classify the historical estimate as a current mineral resource.

The Notice of Inquiry also alleged that these two news releases disclosed a figure of "6 million" grams of gold when the actual amount of gold in the historical estimate was an order of magnitude lower. The Notice of Inquiry alleged that Mr. MacDonald acted as a Qualified Person when he had not kept himself informed in order to maintain his competence in relation to NI 43-101, and in particular that he did not know that "inferred reserve" was not a category of mineral resource or mineral reserve as required in NI 43-101.

Instead of proceeding to a disciplinary inquiry, Mr. MacDonald agreed to a Consent Order, dated October 19, 2020. In the Consent Order, Mr. MacDonald admitted to the charges listed in the Notice of Inquiry, and that his conduct was negligent and violated Principles 1, 3 and 6 of the Engineers and Geoscientists BC Code of Ethics.

Through the Consent Order, Mr. MacDonald agreed that his registration with Engineers and Geoscientists BC will be suspended for four months, beginning October 19, 2020. Mr. MacDonald further agreed that he pass the Engineers and Geoscientists BC Professional Practice Examination scheduled from January 25 to 27, 2021. Mr. MacDonald agreed to pay $5,000 towards Engineers and Geoscientists BC's legal costs. Mr. MacDonald also agreed that, after his suspension, he will no longer act as a Qualified Person as defined in NI 43-101.

The full text of the Consent Order can be found in the Disciplinary Notices section of our website, at *egbc.ca/Complaints-Discipline/Discipline-Notices*.

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*.

ORGANIZATIONAL QUALITY MANAGEMENT PROGRAM

The following organizations have recently received OQM certification.

To find out more, visit *egbc.ca/oqm*.

A Plus Structural Engineering Inc.
BASIS Engineering Ltd.
City of Langford
Holistic Engineering Ltd.
iaconicDesign Inc.
Infinity Solutions (1191027 BC Ltd.)
Innovo Power Engineering Inc.
Interior Testing Services Ltd.
Jing Kong & Associates Consulting Structural Engineers Inc.
Liang Engineering Ltd.
Linkfield Engineering Consultants Ltd.
MidSea Engineering Ltd.
O&S Engineering International Inc.
Perihelion Ventures Ltd.
RMTEC Consultant
Simpson Geotechnical Ltd.
Skyline Engineering Ltd.
SMcN Consulting Inc.
UNISOL Engineering Ltd.
Vancouver Fraser Port Authority - Infrastructure Delivery Department
Waters Edge Engineering Ltd.
XT Engineering Ltd.

Continued from page 20...

An eight-storey concrete BC Housing project at 1st Street and Clark Drive in Vancouver.
Rendering: BC Housing.

Some people have been building the same two-by-six walls since the 1980s and they've got a system. To change that system, they've now got to go and get some additional education and those first couple of projects are a risk for them. They're bidding on something they may or may not have much experience with." However, as the *BC Energy Step Code* has become "more mainstream and been adopted by us and more and more municipalities, and there's been more and more education available, a lot of our builders are betting better and better." Now, BC Housing is approaching Step 4 even on one of its rare taller and more complex buildings, an eight-storey concrete tower in Vancouver, at 1st Street and Clark Drive.

The benefits of requiring these higher steps are clear to BC Housing. "It's a building-envelope-first strategy," said MacKinnon. "The energy savings and performance of the building are baked-in to the building envelope with additional insulation and air sealing and we're not relying on complex systems as much as we would under standard Building Code." That higher-quality envelope results in lower utility costs, of course, but also happier tenants and increased sustainability, because structures "that do *not* take into account thermal bridging and air sealing open the building to other risks," including draftier, cooler or hotter buildings, and a shorter lifespan.

Many British Columbians will notice over time that the *BC Energy Step Code* has resulted in changes to what new residential construction looks like. Fewer balconies, for example, and a visibly lower window-to-wall ratio—no more floor-to-ceiling glazing beloved by lifestyle magazines everywhere—but, as Brittany Coughlin said, "you can still have really good views and daylighting with something that's more in the 50 percent window-to-wall range than the 80 percent range." After all, your feet really don't need to see out the window.

MEMBERSHIP

IN MEMORIAM

The association announces with regret the passing of the following members:

JMr. James Thomas Armstrong, P.Eng. (Non-Practising)
Mr. Dick Wong Chao, P.Eng. (Non-Practising)
Mr. John Bernard Claydon, P.Eng. (Non-Practising)
Mr. John Coppin Collings, P.Eng. (Retired)
Mr. Frank August Forster, P.Eng. (Non-Practising)
Mr. Norman Elburn Green, P.Eng.
Mr. John Michael Lainsbury, P.Eng. (Retired)
Mr. John Frank Mausser, P.Eng. (Non-Practising)
Mr. Takashi Negoro, P.Eng. (Retired)
Mr. Paul Schincariol, P.Eng.
Mr. Alexander John Shaw, P.Eng.
Mr. Alan Edgar Taylor, P.Eng.
Mr. Walter Karl Thut, P.Eng. (Non-Practising). ♦

AD INDEX

NOVEMBER/ DECEMBER 2020

INNOVATION

CONTINUING PROFESSIONAL DEVELOPMENT

PERSONAL INVESTMENT. PROFESSIONAL COMMITMENT.

UPCOMING WEBINARS

BUSINESS DEVELOPMENT AND SALES SKILLS FOR ENGINEERS AND GEOSCIENTISTS

January 4–March 31, 2021

This program provides registrants with the skills and confidence to effectively address issues relating to sales and business development. Course topics include: presenting your firm's value proposition, discovering your client's requirements, conducting professional sales presentations, and securing commitment while selling. Participants receive 3 months of access to the myKISON eLearning program along with monthly 90-minute webinars facilitated by program creator Ralph Kison. The webinars include case studies, role plays, and peer discussions so participants can apply the content to their own situations.

FUNDAMENTAL OF POWER SYSTEM PLANNING AND OPERATION

January 12–14, 2021

Power system planning and operation covers wide and diverse topics in electrical engineering. This course will cover fundamental concepts, aspects and issues in system planning and operation. The most basic objectives are voltage and frequency control and management. The session introduces means of controls such as synchronous generator, shunt and facts devices

INCLUSIVE LEADERSHIP PROGRAM

January 18–February 14, 2021

Inclusive Leadership is an immersive, interactive digital program designed to provide leaders with the concrete communication tools they need to create inclusive teams and inclusive workplaces. The program combines expertise in leadership communication with the latest technology to create a learning experience that is second to none. The goal is to enable participants to confidently get the most out of diverse teams by making every person they work with feel included.

LEADERSHIP: THE ART OF INFLUENCING

January 19 & 20, 2021

This course is a hands-on experiential learning workshop. It combines personal strengths and experience with team processes to make timely, effective leadership decisions. The result can be an organization or team culture that continually improves its leadership decision making and problem solving, and its ability to prevent or resolve issues before they become crises.

PERFORMANCE UNDER PRESSURE

January 20 & 21, 2021

The pressures experienced at work today are unprecedented. You may not be able to change the work difficulties you face, so it's in your best interest to build the capability to perform effectively under daily pressure, without burning out. We have identified the disciplines of professionals who rise to the occasion in various high-pressure situations, and have translated them into the practical tools and skills that are featured in the Performance Under Pressure.

INTRODUCTION TO LANDFILL GAS FLOW: AN ELUSIVE PUZZLE IN ENGINEERING AND MATHEMATICS

January 25, 2021

This session will introduce the landfill's unique flow system: a puzzle of porous media flow, pipe flow, non-negligible gravity and inconsistent flow controllability. Historically the evolving engineering practices and mathematical support tools seem to have never met until very recently. Come to learn what happens deep inside the landfill, how engineers made it work without math, when intuition fails and how innovative mathematics behind landfill gas flow explains strange system responses in the field.

CLIMATE CHANGE, GEOTECHNICAL ENGINEERING, AND GEOHAZARD ASSESSMENTS IN COLD REGIONS

January 26, 2021

This webinar provides an introduction to permafrost science and engineering, challenges related to geotechnical engineering and geohazards in cold regions, including mountain permafrost, are discussed and approaches presented on how to incorporate climate change projections into a geotechnical design or geohazard assessment.

UNDERSTANDING THE NEW CODE OF ETHICS

January 27, 2021

The regulatory landscape in BC is changing and the upcoming implementation of the Professional Governance Act will introduce a new Code of Ethics for professional engineers and geoscientists. The Professional Governance Act requires that each regulator under this legislation, including Engineers and Geoscientists BC, and the regulatory bodies for forestry, applied biology, agrology, and applied science technology, include a minimum of 12 standardized mandatory principles within their Code of Ethics for their registrants.

BUILDING CONDITION ASSESSMENT FUNDAMENTALS: LEVEL 1

January 28, 2021

Engineers are often engaged by owners to conduct assessments of buildings and structures. This Level 1 seminar will provide engineers with a good fundamental understanding of the steps required to conduct a building condition assessment, including methods of evaluating the building structure and envelope and reporting one's findings.

DECOLONIZING PRACTICES WORKSHOP

February 1, 2021

Decolonizing Practices offers experiential training and dialogue facilitation grounded in Indigenous ways of knowing. The award-winning workshop features Sínulhkay and Ladders, a giant board game designed by Ta7talíya Michelle Nahanee, Squamish. Since the pandemic started in March 2020, we have been able to alter the game and redesign our workshop to be delivered online. We're still decolonizing, still dialoguing but through ZOOM and Google Slides.

BUILDING CONDITION ASSESSMENT FUNDAMENTALS: LEVEL 2

February 4, 2021

Engineers are often engaged by owners to conduct assessments of buildings and structures. This Level 2 seminar will provide engineers with a good fundamental understanding of the steps required to conduct a building condition assessment, including methods of evaluating HVAC, plumbing, and electrical systems and reporting one's findings.

DESIGN AND ANALYSIS OF RETAINING STRUCTURES AND SHALLOW FOUNDATIONS

February 8 & 9, 2021

This online course is a comprehensive foundation engineering course dealing with retaining structures, shallow foundations, and excavations. Major emphasis will be on the analytical methods and the problem solving aspects as related to retaining structures and shallow foundations. This course provides the participants with an opportunity to apply the design procedures to a "real life" challenging geotechnical design projects.

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*.

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