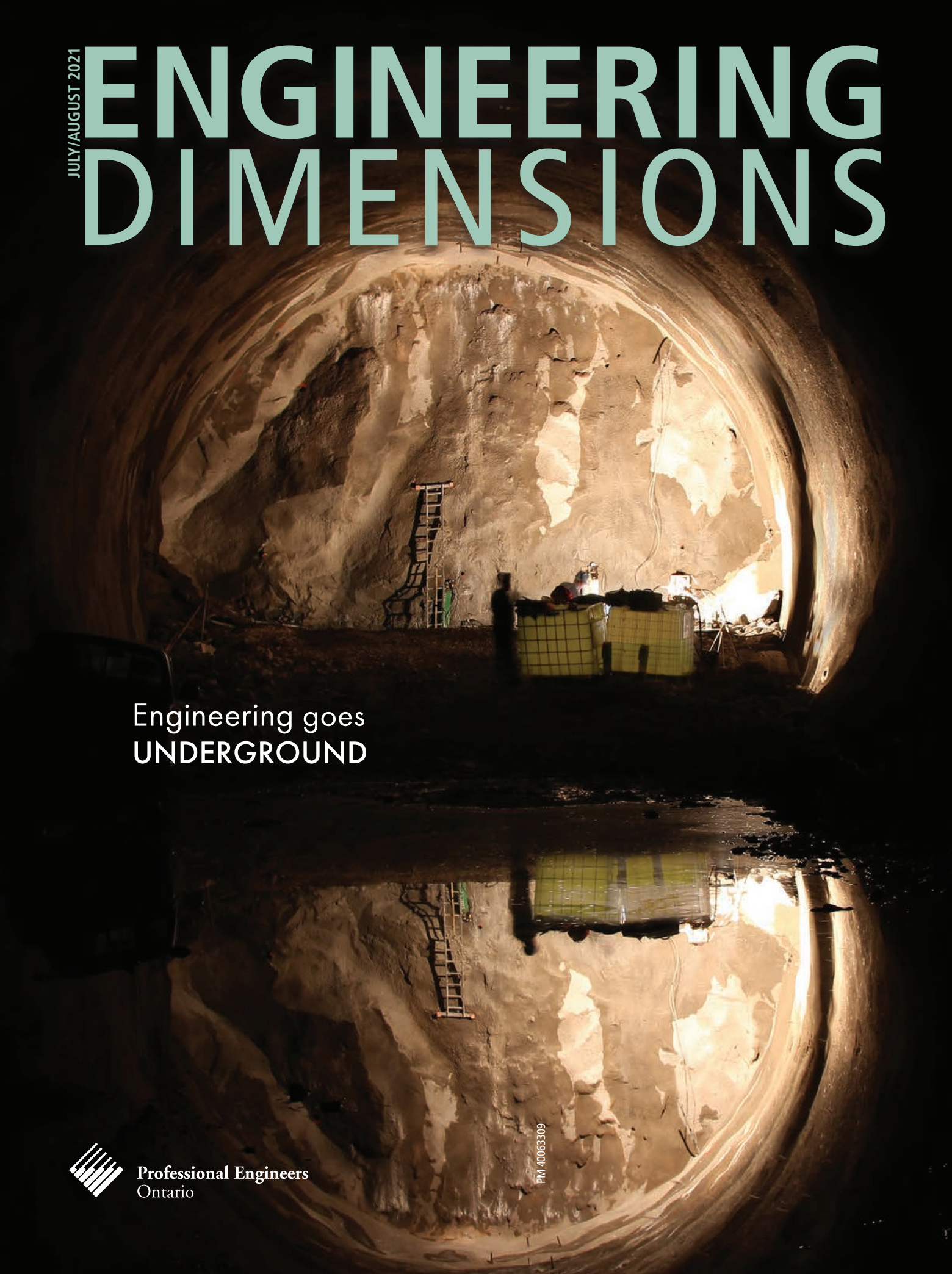
JULY/AUGUST 2021

ENGINEERING DIMENSIONS



Engineering goes UNDERGROUND

PM 40063309

Professional Engineers
Ontario

2022 ORDER OF HONOUR

CALL FOR NOMINATIONS

The Order of Honour is an honorary society of Professional Engineers Ontario. Its purpose is to recognize and honour those professional engineers and others who have rendered conspicuous service to the engineering profession in Ontario.

THE AWARDS COMMITTEE INVITES MEMBERS TO SUBMIT NOMINATIONS BY OCTOBER 8, 2021, AT 4 P.M.

Nominators should supply complete details on their nominee. Individual statements from each nominator must accompany the nomination. Members and Officers of the Order who have continued serving and leading the engineering profession can be nominated for an upgrade to a more advanced category.

For nomination forms, guidelines and a complete list of past recipients, visit PEO's website at peo.on.ca/about-peo/awards/order-honour

ENGINEERING
DIMENSIONS

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By Marika Bigongiari and Adam Sidsworth

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ENGINEERING DIMENSIONS

PUBLICATIONS STAFF

Editor
Nicole Axworthy
editor@peo.on.ca

Associate editor
Marika Bigongiari

Associate editor
Adam Sidsworth

Senior graphic designer
Stephanie Katchmar

Graphic designer
Cindy Reichle

Manager, communications
Duff McCutcheon

Digital communications coordinator
Michelle Yiu

ADVERTISING SALES

Account executives
Charlene Woron
cworon@dvtail.com

Leesa Nacht
lnacht@dvtail.com

Dovetail Communications
30 East Beaver Creek Road
Suite 202
Richmond Hill, ON L4B 1J2
Tel: 905-886-6640
Fax: 905-886-6615

EXECUTIVE STAFF

CEO/registrar
Johnny Zuccon, P.Eng., FEC

Vice president, regulatory operations/deputy registrar
Linda Latham, P.Eng.

Vice president, legislation and policy
Dan Abrahams, LLB

Vice president, governance
Liz Maier

Vice president, organizational effectiveness
Liz Maier (interim)

Director, human resources
Lolita Holden, CHRL

Professional Engineers Ontario

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Address all communications to The Editor, *Engineering Dimensions*, PEO, 40 Sheppard Avenue West, Suite 101, Toronto, ON M2N 6K9. Tel: 800-339-3716.

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DIGGING DEEP

By Nicole Axworthy

Quite often, a city is defined by its core of soaring skyscrapers competing to be the tallest of all. There's something about building tall that mesmerizes us, making passersby stop to gaze upward, our eyes following the height of the building until it ends somewhere in the sky. But not all feats of engineering go upward. For many equally impressive projects, engineers have gone underground. Because why build on the ground level when you can carve engineering masterpieces right into the earth?

This issue, we're featuring six Ontario-based projects that illuminate the complexities and marvels of subterranean engineering. In "6 Ontario projects illuminate subterranean engineering" (p. 42), associate editors Marika Bigongiari and Adam Sidsworth explore underground innovations that move us through rapid transitways, prevent flooding, generate power and facilitate exploration. From Billy Bishop Toronto City Airport's pedestrian walkway constructed under Lake Ontario to Metrolinx's rapid transit system built beneath 21 live lanes of Highway 401 traffic, subterranean projects are each unique in their own right—and often require techniques and custom machinery that have never been deployed before.

And because of each project's potentially risky undertakings, the multidisciplinary team working on it must also be able to overcome challenges and accommodate changes if things don't go as planned. "We had major problems with overbreak and falling rock," Mary Jane Ferraro, P.Eng., says of Ontario Power Generation's 10.2-kilometre-long Niagara Tunnel, which diverts water from the Niagara River to two power-generating stations. "After a kilometre of trying to deal with these conditions, we changed the alignment of the tunnel…This involved extensive redesign on the engineering side, and we had to make a lot of modifications to the machine to be able to withstand all this falling rock and access the tunnel roof…." Indeed, subterranean engineering is work that deserves a spotlight.

This issue, we also share full coverage of PEO's 2021 Annual General Meeting (AGM), which took place online—and with a record attendance—on May 15 (p. 8). In addition to the passing of the presidential chain of office from outgoing President Marisa Sterling, P.Eng., FEC, to incoming President Christian Bellini, P.Eng., FEC, what was also notable this year were the member submissions. Each year, the event gives members an opportunity to present their concerns to PEO, and the submissions that pass a majority vote are taken to Council for consideration. In total, five submissions were presented this year, and all were supported by PEO members—quite possibly a first in AGM history. And, they all shared a similar theme. New President Bellini offers some points of discussion on this matter in his President's Message this issue (p. 6).

In addition to the AGM, PEO hosted its annual Volunteer Leadership Conference (p. 11) and Order of Honour (p. 14). Plus, with the new Council year already underway, we introduce you to the members of PEO Council for the 2021–2022 term (p. 54). **e**

THIS ISSUE According to the Ontario Mining Association, Ontario is Canada's largest producer of gold, platinum group metals and nickel. Yet there is more to underground engineering in Ontario than mining. In this issue, we explore the multi-faceted subterranean engineering industry in Ontario by highlighting six top projects and how they have helped shape Ontario's standard of living.

WHY COUNCIL IS PRIORITIZING GOVERNANCE RENEWAL

By Christian Bellini, P.Eng., FEC

The new Council year is officially underway. Thankfully, the pandemic numbers are improving significantly, and with continued movement in this direction, we may be able to enjoy a return to some degree of normalcy in our lives as the summer wears on. From our perspective at PEO, with the health and well-being of staff and volunteers alike being at the forefront, we will continue to operate in a virtual world for the next while. It has been a very busy start.

The annual general meeting (AGM) signals the start of the new year at Council. Like last year, this year's AGM in May was held online with record attendance. While I miss the opportunities for interaction that come with an in-person AGM, there can be no doubt that accessibility for attendance by members from across the province is greatly enhanced in the virtual format. This is an encouraging outcome. CEO/Registrar Johnny Zuccon, P.Eng., FEC, Past President Marisa Sterling, P.Eng., FEC, and I took the opportunity to update the members on the progress made during the past year, in particular on the governance renewal project. We have made some significant strides that I will outline later in this message.

My biggest takeaway from the AGM were the member submissions—five were presented and all were supported by the members. Although these member submission motions are not binding on Council, they are nevertheless given due consideration—usually at Council's September meeting—and this year will be no different. If I had to distil the main theme from the submissions, it would be the message that modernizing our regulatory framework should be Council's paramount focus, and that there is a perception that Council is prioritizing the governance project at the expense of this regulatory work. This is a good item for discussion.

THE EXISTING SYSTEM IMPEDES CHANGE

In my previous message, I did address the issue of the priority of governance, and it bears repeating. I strongly believe that the main reason we find ourselves so far behind on tackling regulatory change is the existing governance system. It is a system that has evolved organically over decades; a system that disperses responsibility for policy development broadly over the multi-siloed volunteer and staff structure at PEO—and not only policy development, but even the critical work of horizon watching and strategy development. As such, the many previous attempts at regulatory modernization have necessarily focussed on incremental improvements to components of our regulatory structure (licensing, for example) but have lacked the high-level coherence that is so critical for us to make meaningful progress. I believe the existing governance system impedes change—this is why it is so important to see the governance work through right now.

> WITH A 99-YEAR HISTORY OF SUCCESSFUL PROTECTION OF THE PUBLIC INTEREST THROUGH OUR SELF-REGULATORY MODEL, IT IS CLEAR THAT SELF-REGULATION MUST CONTINUE TO BE THE CORNERSTONE OF OUR WORK.

Another theme from the AGM emphasized the importance of self-regulation. With a 99-year history of successful protection of the public interest through our self-regulatory model, it is clear that self-regulation must continue to be the cornerstone of our work. At a time when technological advances continually change the engineering landscape, protection of the public interest requires the presence of cutting-edge engineering expertise right at the Council table. In its strategic role, Council needs to be led by engineering practitioners who understand public engineering risk and who can ensure it is managed and mitigated via the right amount of regulation. This concept is often known as right-touch regulation, and it recognizes that while regulation protects the public, it also imposes restrictions on industry that drive up costs to the public. A balance is needed.

TACKLING COUNCIL COMPOSITION

We need to centralize strategic thinking and policy development at the Council level to affect real change. And to ensure that our self-regulatory model continues to serve and protect the public interest, we need to have active engineers at the Council table. These two ideas are interrelated. And this leads us to the next—and arguably most important—stage of the governance project: Council composition. Although no decisions have been made on this topic as of this writing, some of the topics for discussion include skills, experience and competencies that contribute to a councillor's effectiveness. This is a big topic. We need to give it the time, attention and thoughtfulness it deserves so we get the outcome that will best serve PEO and the public it serves.

Whenever I speak with members, I am struck by the overwhelming support we see for the renewal work we are undertaking. There is a real appetite to see PEO emerge as a cutting-edge regulator working in the public interest. It is energizing to hear the feedback, and I am looking forward to where we will be able to take PEO this coming year. I am enthusiastic that our momentum towards a modern PEO will produce important results this year on this journey of change. **e**

MODERNIZING OUR ORGANIZATIONAL STRUCTURE

By Johnny Zuccon, P.Eng., FEC

Earlier this year, LM² Collective was retained to assist my organizational transformation team—drawn from senior leadership—with refining our organizational structure based on recommendations we received to better meet the needs of a modern regulator.

I am pleased to announce the completion of our redesigned operating groups (see graph below), which were created based on validated design criteria, including the introduction of new capabilities and functionality and flexibility for ongoing change. It also reflects the input we received from design thinking sessions held with our main stakeholder groups—the public, applicants and licence holders.

This new structure will create efficiencies through the consolidation of PEO's core regulatory operations, key to our transition to a professional, modern regulator. It also centralizes our enabling functions to support organizational improvement and effective service delivery, and it broadens our external liaison function. It includes the following divisions:

- Regulatory Operations—To lead the multi-year transformation of our regulatory processes to ensure they are technology-enabled, secure, defensible and coordinated;
- Legislation & Policy—To ensure PEO advances strategy and stays ahead of regulatory policy;
- Organizational Effectiveness—To ensure effective deployment of PEO enabling functions through a shared-services model;
- Governance—Established in January 2021 to complement Council's commitment to the multi-year Governance Roadmap and ensure effective governance protocols are adhered to; and
- Human Resources—To ensure a strategic people advisory and practices culture of engagement in which wellness, diversity and inclusion lead to a high level of employee well-being, productivity and retention.

The foundation of the new structure includes distinct mandates with collective accountability for developing cascading operating plans aligned to ongoing strategic priorities. Further, the realignment has allowed us to redeploy internal resources to provide the necessary leadership. Specifically: Dan Abrahams, LLB, has been promoted to vice president, legislation and policy; Linda Latham, P.Eng., has been promoted to vice president, regulatory operations/deputy registrar; and Liz Maier has assumed the role of vice president, organizational effectiveness on an interim basis, in addition to her continuing role in governance. Lolita Holden, CHRL, will continue to provide strategic support as director, human resources. All of these positions report directly to the CEO/registrar.

The new structure provides the needed direction and focus on the staffing side to guide our enterprise-wide transformation to a professional, modern regulator. Key to this is applying right-touch regulatory principles to our decision-making and ensuring that our resources are focused primarily on the delivery of the outputs in our statutory mandate.

I am excited by these changes and confident they will provide us with a more stable foundation required to enable and advance our evolution. e

REGULATORY OPERATIONS	LEGISLATION & POLICY	ORGANIZATIONAL EFFECTIVENESS	GOVERNANCE	HUMAN RESOURCES
• Licensing • Compliance	• Policy & Standards • Tribunals External Affairs	• Finance • IT • Communications • Knowledge Management • Program Management	• Secretariat • Volunteer Management	• Strategic HR • Equity, Diversity & Inclusion

PEO's AGM MOVES ONLINE FOR SECOND STRAIGHT YEAR

By Adam Sidsworth

Outgoing President Marisa Sterling, P.Eng., FEC, ceremoniously hands over PEO's presidential chain of office to incoming President Christian Bellini, P.Eng., FEC, during PEO's AGM, held virtually on May 15.

PEO's 2021 Annual General Meeting (AGM) on May 15 transitioned to an online mode for a second year in a row, due to the ongoing COVID-19 restrictions in Ontario.

"Councillors embraced virtual meetings and ambitious goals," outgoing President Marisa Sterling, P.Eng., FEC, told delegates, referring to her precarious position of leading Council during a province-wide lockdown. "We tried to stay connected with virtual coffee chats, sharing favourite pastimes and cheering each other on when someone got vaccinated. Council knew it was going to have to meet much more frequently in a virtual setting to move our transformative change agenda forward. We met formally six times to make decisions; we gathered informally on a monthly basis for dialogue and education at sessions that I named Strategic Conversations; and the Executive Committee met 12 times to steward our Governance Roadmap."

PEO's AGM OPENS WITH NOD TO DIVERSITY

Acknowledging PEO's efforts to address diversity within Ontario's engineering profession, Sterling opened the AGM with a land acknowledgement to Canada's Indigenous Peoples. Additionally, Sterling invited two PEO members to speak to delegates about what diversity means to them. Jason Bazylak, P.Eng., an associate professor in the department of mechanical and industrial engineering at the University of Toronto who identifies as Métis, told delegates: "I want to thank President and Chair Sterling for her land acknowledgment. Land acknowledgements are not a new thing in Indigenous cultures. They were not invented for settlers; they have been around for thousands of years. When a member of an Indigenous community entered the lands of another Indigenous community, they proved their peaceful intentions by acknowledging the traditional lands on which they gathered. Indigenous Peoples today continue this tradition with other Canadian communities. When I heard President Sterling's personal land acknowledgement, it was meaningful to me. I spent most of my life switching between my engineering hat and my Indigenous hat."

Francophone engineer Larisse Nana Kouadjo, P.Eng., PMP, technical director, rail and transit at WSP, told delegates in French: "I am grateful for the opportunity that I and all francophones had in Ontario during Marisa's tenure, including her [President's] Message in French in the bimonthly magazine *Engineering Dimensions*. The Ontario government estimated that it had 622,415 francophones living in Ontario in 2016, the majority of whom were living in the east, to the north, and to the centre. Some of these regions are 100 per cent French speaking. We felt represented during Marisa's tenure and hope that this initiative will be implemented by all future presidents. In order to be able to regulate effectively in the public interest, it is important to be able to communicate with the Francophone community."

ATTORNEY GENERAL ADDRESSES THE AGM

Attorney General Doug Downey, LLM, LLB, MA, addressed the delegates. As attorney general, Downey is responsible for overseeing PEO in its capacity as the engineering regulator. Downey congratulated Sterling on leading Council throughout the COVID-19 pandemic and the lockdown. "Those of you who are working as engineers, who are so often on the frontlines, I want to thank you for your creativity and being able to use your expertise, now more than ever." Downey told delegates that he was supportive of PEO's recent decision to implement mandatory continuing professional development (CPD) (see "PEO to implement mandatory continuing professional development," *Engineering Dimensions*, May/June 2021, p. 9) and the province's December 2020 amendment to the *Professional Engineers Act* (PEA) that will allow PEO to more easily issue provisional licences, typically issued to internationally trained

engineering graduates (see "Fall 2020 regulation changes proclaimed," *Engineering Dimensions*, January/February 2021, p. 31). "This allows for more flexibility in times of change…when it comes to licensing individuals who have significant work and expertise for the benefit of the province," Downey said. "We want to make it easy for people to achieve success in Ontario. While these amendments had been made a decade ago, the proclamation had yet to be acclaimed. But thanks to the input of President Sterling, we had worked to make that happen."

SPECIAL GUESTS IN ATTENDANCE

Sterling acknowledged the special guests who attended the virtual event, including representatives from Engineers Canada and all 11 of PEO's sister provincial and territorial engineering regulators. Representatives from other allied professional regulators and engineering associations from across Ontario also attended, including:

- Association of Ontario Land Surveyors,
- Professional Geoscientists Ontario,
- Canadian Academy of Engineering,
- Association of Consulting Engineering Companies–Ontario,
- Council of Ontario Deans of Engineering,
- Engineering Student Societies' Council of Ontario,
- Engineers Without Borders,
- Municipal Engineers Association,
- Ontario Association of Architects,
- Ontario Association of Certified Engineering Technicians and Technologists,
- Ontario Association of Landscape Architects,
- Ontario Building Officials Association,
- Ontario Professional Engineers Foundation for Education, and
- Ontario Society of Professional Engineers.

IN MEMORIAM

Sterling asked delegates to observe a moment of silence for all PEO members and former members who had passed away in the last year. Uniquely, this year, Sterling also asked delegates to recognize the previous year's victims of the COVID-19 pandemic.

PRESENTATION OF AUDIT REPORT

Sherlock Sung, Audit Committee chair and lieutenant governor-in-council appointee, presented the financial statements for the year ending 2020, advising delegates that the report is available for public consumption in the May/June 2021 issue of *Engineering Dimensions*. Sung noted the $7.8 million and $23 million in cash and securities on PEO's balance sheet as of year-end 2020. "Due to COVID, most in-person meetings moved online, leading to substantially less expenditures," Sung noted. "Despite the 2019 P.Eng. fee increases, PEO has the lowest licence fees among the engineering regulators in Canada and the highest ratio of P.Eng. members to staff across all Canadian engineering regulator jurisdictions." During the question-and-answer session of the audit report, one delegate asked what PEO would do with its large surplus. Sterling noted that it would be premature to make any short-term decisions, since PEO is currently undergoing its governance and regulatory transformations.

CEO/REGISTRAR REPORTS TO THE AGM

Johnny Zuccon, P.Eng., FEC, gave his CEO/registrar's report at the AGM, noting that PEO staff and volunteers moved swiftly to working virtually over the past year. "The status quo is no longer an option, and more importantly, it suggests a willingness to change from the old way to the new way in how we regulate and govern in a modern world," Zuccon noted. "If there was ever an external driver to test this, COVID certainly did. While COVID has slowed our journey… we have successfully adapted our processes to the obstacles that this pandemic has ushered in while still advancing our enterprise-wide changes. And for that, I'm thankful and extremely proud of how our staff and volunteers have responded in these extraordinary times. Their dedication and perseverance to improve our functions and deliver our operations is top notch."

Zuccon observed that P.Eng. applications in 2020 increased 2 per cent year-over-year, 600 applications and 7000 renewals for certificates of authorization were processed on PEO's online portal and PEO has prepared for its upcoming records conversion project to transform its paper files to useable digital information.

Zuccon also noted:

- The online National Professional Practice Exam had over 4200 sittings since January 2021;
- The Academic Requirements Committee's adapted remote, digital interviews;
- Experience Review Committee interviews are now on Zoom;
- PEO's technical exams are now online, in co-operation with Engineers and Geoscientists BC; and
- PEO published three practice guidelines in 2020.

PRESIDENT STERLING GIVES HER OUTGOING ADDRESS

In her outgoing speech as president, Sterling focused on the three achievements Council achieved under her presidency. "The first foundation change is new Council governance," Sterling said. "Governance renewal has been a top priority. It is a means to help Council gather sufficient information and take quicker action to protect public interest and manage organizational risks. The regulatory principles adopted are right-touch regulation, meaning regulate only as much as is needed. There are four phases of the governance project and two have been completed to date. Phase 1 saw new charters approved for Council, the president and chair and the CEO and registrar to better delineate Council as setting direction and control and staff holding the pen to identify, investigate, advise and execute…Phase 2 saw new governance committees of Council created. They will bring to the forefront Council's primary responsibilities of human resources and compensation, governance and nominations, regulatory policy and legislation and audit and finance."

The second achievement Sterling addressed was PEO's commitment to adopt mandatory CPD. "I still believe that likely all engineers

already do professional development and that it is necessary to stay current," Sterling said. "But today my position has changed because, if asked, I would not be able to show to the public that this happens without having a mandatory CPD program…PEO's proactive stance will focus on preventing faulty engineering practice rather than relying on a system that punishes licence holders after harm has already come to the public."

And the third achievement Sterling mentioned was PEO's work in inclusivity, particularly the founding of the Anti-Racism and Anti-Discrimination Exploratory Working Group.

MEMBER SUBMISSIONS

This year's AGM saw five PEO members forward submissions for their fellow delegates' consideration. These submissions, which allow members to express their views on matters relating to PEO, are voted on by all members attending the AGM and those passed are considered by Council. However, Council is not bound to act on or implement any submission passed. The motions included:

- A submission by Roydon Fraser, PhD, P.Eng., FEC, seconded by Leila Notash, PhD, P.Eng., FEC, asked PEO Council to commit to a peer review, to knowledge-based decision making, to transparency, to effective communication and to a removal of biases and barriers to embracing diverse views, with Fraser questioning the role of Council's in-camera Strategic Conversations. Delegates in the virtual meeting's chat box asked if Council would indeed submit to a peer review and stop having "illegal secret meetings." The motion passed, with 80 per cent of delegates voting in favour;
- A submission by George Comrie, P.Eng., CMC, FEC, and seconded by Thomas Chong, MSc, P.Eng., FEC, asked Council to place "an immediate moratorium on governance and organization changes and instead focus on the developing and implementing of regulatory policies of effective regulation of all professional engineering activity in Ontario." Comrie told delegates: "Council has engaged consultants…who don't understand engineering…to distract it and staff from its core business, which has been on hold pending a major reorganization." Delegates in chat had diverse reactions, with some stating that you can't keep looking at the past, while others were saddened that the motion implied that Council and staff weren't acting with the best intention for the profession. The submission passed, with 58 per cent of delegates voting for the submission;
- A submission by Pat Quinn, PhD, P.Eng., FEC, seconded by Peter Cushman, P.Eng., asked that Council not implement any significant changes to the bylaws or the PEA without significant member and chapter consultation, to commit to peer review and knowledge-based decision making and transparency and that Council commit to effective communication, with the removal of biases and barriers to hearing and respecting diverse views. Quinn stated that although he isn't necessarily against the Governance Roadmap, he stated that "massive changes without peer review is likely to be flawed." Delegates were diverse in their opinions in chat, with some saying that engineers should be treated with respect, while others noted that PEO is not an engineering union for the benefit of engineers but rather a regulator with its authority granted at the behest of the province. Nevertheless, the submission passed, with 79 per cent of delegates voting for it;
- The forth submission, moved by Peter DeVita, MBA, P.Eng., FEC, and seconded by Roger Jones, MBA, P.Eng., FEC, asked delegates to recognize that PEO is no longer capable of properly licensing new engineering disciplines and their exclusive rights to practice and that PEO lobby the province to create new discipline-specific regulatory bodies. DeVita told the AGM that discipline-specific regulatory bodies "will empower engineers of similar disciplines to associate more effectively." Some delegates stated that they supported the motion, while others stated that the submission lacked accurate, fact-checked information. The motion passed, with a majority of 45 per cent voting for it; and
- The last motion, introduced by Gregory Wowchuk, P.Eng., and seconded by Alena Ravens, P.Eng., asked that all agenda items discussed during Council meetings be minuted and not discussed in closed, in-camera sessions unless absolutely necessary, in which case the chair should cite a description of the topic and the applicable section under By-Law No. 1 during the open session. Wowchuck told delegates that "many of us have noticed a disturbing trend in the past few years at PEO, namely the ongoing moves to concentrate power and communications within Council and certain managers within the organization." Some delegates noted that in-camera sessions are sometimes necessary, while others stated that in-camera meetings and Strategic Conversations were a way of implementing change that lack wide member support. The submission passed with 69 per cent of the vote.

> "PEO's PROACTIVE STANCE WILL FOCUS ON PREVENTING FAULTY ENGINEERING PRACTICE RATHER THAN RELYING ON A SYSTEM THAT PUNISHES LICENCE HOLDERS AFTER HARM HAS ALREADY COME TO THE PUBLIC.

OUTGOING PEO COUNCILLORS

Sterling took time to recognize outgoing PEO councillors whose terms had ended at the AGM. They include Past President Nancy Hill, LLB, P.Eng., FEC, Vice President (elected) Darla Campbell, P.Eng., CSR-P, Councillor-at-Large Sandra Ausma, PhD, P.Eng., Western Region Councillor Wayne Kershaw, P.Eng., FEC, West Central Councillor Warren Turnbull, P.Eng., FEC, and Vice President (appointed)

and East Central Regional Councillor Arthur Sinclair, P.Eng.

NEW PRESIDENT BELLINI TAKES PRESIDENTIAL OATH

Towards the end of the AGM, Christian Bellini, P.Eng., FEC, took the PEO presidential oath of office, during which outgoing President Sterling virtually passed the presidential chain of office to new President Bellini.

Bellini addressed the AGM, acknowledging the accomplishments of the past year, including PEO's commitment to its regulatory focus, its Governance Roadmap and four new Council-populated board committees, along with a commitment to review the size and composition of Council and a recognition of the roles of Council, staff and volunteers.

"I have been continuously involved on the regulatory side of PEO work for over 15 years," Bellini said, "and during that time I have seen many attempts to change, update or review the regulatory work we do. They were championed by volunteers and other individuals with a depth of experience and knowledge of PEO's role. And yet few of these attempts resulted in tangible change. Our decentralized policy structure lacks a central clarity of purpose and direction and leads to fragmented change—change which is not holistic and which does not gain traction." Nevertheless, Bellini remained excited about the challenges of the upcoming Council term: "I am energized by the significant accomplishments we have made these past few years, and I am excited about the prospect of wrapping up the governance project this year so we can really get on with the work of renewing and modernizing our regulatory structure…As we approach 100 years of regulating our profession in 2022, I look forward to working with all of you in the coming term as we continue the important and critical work of modernizing PEO."

VOLUNTEER LEADERSHIP CONFERENCE ALL ABOUT CHANGE

By Adam Sidsworth

Then-President Marisa Sterling, P.Eng., FEC, addresses the Volunteer Leadership Conference delegates online.

PEO's annual Volunteer Leadership Conference (VLC) was held virtually on May 14 due to the province's COVID-19 restrictions. The conference is normally held annually in person during the week of PEO's annual general meeting (AGM), and although both events were held virtually, the Volunteer Leadership Conference was still held the day before the AGM (see p. 8). Attendees included Council members, PEO volunteers, chapter leaders and staff. The theme of the conference was "Momentum towards a modern regulator."

THE EFFECTS OF PEO's TRANSFORMATION

Marisa Sterling, P.Eng., FEC, was the first speaker of the morning's session in her then capacity as PEO president. "PEO is undergoing transformation," Sterling told attendees. "And it's a necessary change that was borne from increasing scrutiny and expectations from professional regulators by both the public and governments we serve, plus an engineering landscape that is growing exponentially, with new disciplines emerging every year."

Sterling was referring to PEO's Governance Roadmap, a two-year governance renewal that aims to clarify the roles of Council, volunteers and staff. PEO's commitment to governance reform stems from a 2019 external audit of PEO's performance as Ontario's engineering regulator. The audit experts' report showcased PEO's strengths and weaknesses, and Council and staff acted on the report's 15 recommendations by creating a high-level action plan to improve—and focus—PEO's role as a regulator. As a result, PEO developed an activity filter to assess 93 activities of PEO committees, subcommittees, chapters and working groups to assess if they fit into PEO's regulatory mandate, Council's governance role or neither (see "Council hears activity filter progress report," *Engineering Dimensions*, March/April 2020, p. 36). Additionally, PEO hired external consultants to assess PEO's organizational structure; and PEO staff continue to address the consultants'

recommendations (see "Bringing organizational roles into focus," *Engineering Dimensions*, March/April 2021, p. 8).

Ultimately, Sterling told conference attendees—many of whom were PEO volunteers—that change at PEO will likely impact volunteers' roles in the organization. "Chapters and volunteers may have new terms of reference dealing with their mandates, scope, composition, authority, responsibilities, accountabilities, reporting and governance. The volunteer code of conduct/conflict of interest may need to be revised, as may other governance documents." However, Sterling noted that as change comes to PEO, volunteers and senior management will receive relevant training, adding that PEO's evolution is necessary. "The action plan, organizational renewal and Governance Roadmap will build a solid base from which we can forge ahead, refocusing our priorities on PEO's core regulatory mandate to be a better regulator." Sterling added: "Now is the time to shape a new, longer-term vision that allows PEO to respond and adapt quickly to societal trends and challenges, in order to continue to protect the public interest…And now is the time for PEO volunteers—leaders like you—to build on this work and continue looking ahead."

After Sterling's presentation, Christian Bellini, P.Eng., FEC, in his then role as president-elect, told attendees where PEO will be heading as it lays out its governance review over the next year. Bellini acknowledged the development of the four new governance committees approved by Council at its April meeting, including the Governance and Nominating, Regulatory Policy and Legislation, Human Resources and Compensation and Audit and Finance committees, all of which became active after May's AGM (see "Council approves establishment of new governance committees," *Engineering Dimensions*, May/June 2021, p. 20). "If I look at all that we want to accomplish, a lot of heavy lifting was done here," Bellini said. "We've never had a governance committee before, so I think it's key to overhauling how we do governance here and making sure we are continually on the cutting edge of how the organization is governed. [And] the Regulatory Policy and Legislation Committee is dear to my heart…one of my big missions at PEO has been looking at how we can modernize our regulatory work. If I look around the table at Council and at the voluntary committees I work with, there is a global recognition that regulatory modernization is something we need to tackle quickly, and we have tried to tackle it over the years."

Although Bellini noted that PEO is entering the second year of its two-year governance renewal project, he acknowledged that he couldn't yet give definitive answers of its final impact on PEO Council and its governing protocols. "The change will be somewhat incremental because we have existing structures that we have to work with and around," Bellini said. "If you're doing your renovation in an existing building, you want to keep in operation, sometimes you do things in a sequence that might not make sense. You leave a bearing wall in place until you finish other steps that allow you to remove the bearing wall. In our case, some of the bearing walls we have are things like legislation."

PEO's SHIFT DURING THE PANDEMIC

After Bellini's talk, CEO/Registrar Johnny Zuccon, P.Eng., FEC, addressed the operational shift that PEO has taken during the past year's pandemic. "Since the outset of the pandemic, my concern has been the health of our staff and volunteers," Zuccon said. "Last March 17, in compliance with the provincial lockdown measures, PEO's office closed indefinitely, and staff transitioned to working remotely. While our offices remain closed to our staff and visitors, select employees were allowed to return at times under controlled situations to do essential functions. On average, we've had between five and seven employees in our office each day, and, thankfully, there have been no reported cases among our staff; the same can't be said of some of our tenants [at PEO headquarters]. In late December, we had an unplanned visit for the Ministry of Labour. Their representatives did a walkthrough of our facilities, and I'm very pleased to report that we meet the appropriate safety measures without any violations. We're now in the midst of a third wave, and staff have been advised to avoid any face-to-face meetings for the remainder of 2021. My expectation is that anybody holding events under PEO's banner will fully comply with the rules in their area."

Although acknowledging the pandemic's negative impacts on Ontario, Zuccon admitted that it positively impacted PEO by forcing it to speed the digitalization of is operations, a key recommendation of the 2019 external review of PEO's performance as the provincial engineering regulator (see In Council, *Engineering Dimensions*, July/August 2019, p. 60). Zuccon highlighted some key initiatives, including:

- PEO's transition to the online National Professional Practice Exam (see "PEO adopts National Professional Practice Exam," *Engineering Dimensions*, July/August 2020, p. 13);
- A paperless stream for academic assessments that require review by the Academic Requirements Committee;
- Technical exams are now online, in collaboration with British Columbia's engineering and geoscientist regulator; and
- Interviews by the Experience Requirements Committee have also transitioned online.

AFTERNOON SESSION ALL ABOUT TRANSFORMATION

The afternoon session challenged attendees to think about transformation, particularly as PEO undergoes its governance and regulatory renewal processes. The afternoon's speaker was Kevin Gangel, partner and CEO of Unstoppable Conversations, a consulting firm that helps organizations' leaders produce radical shifts and transformations within short amounts of time. Gangel titled his talk "The Courage to Rewrite the Future."

"I'm going to start with the premise that the future is already written, almost all the time," Gangel said. "And the future is almost invariably a version of the past. It's a slightly altered, slightly modified, slightly divergent version of the past. If you look at your life, you're probably

pretty happy on Friday because you're leading into a future you know pretty well. It's called the weekend. You know what's going to happen." And according to Gangel, it's because of these patterns in people's lives that change and transformation can often be frightening for people. "People very frequently always collapse in change," Gangel said.

Predictably, according to Gangel, people often confuse change with transformation, often assuming that it's a quicker, flashier kind of change. But they are different. "Change is based on the past," Gangel said, "[but] transformation is not based on the past; for transformation you have to have nothing at first, or at least a moment of nothing, a moment of clear space uncluttered by your thinking or your history." According to Gangel, transformation leadership has been studied since the mid-1980s and has been shown to have a 75 to 85 per cent failure rate. "We fail to take into account two important things: the impact of the past and human design principles," Gangel said. "We have very little capacity to plan for first contact with other human beings inside the change. And that's why change management almost always fails."

Gangel noted that transformation can be brought by three ways—through information and knowledge, life experience and context. "If you engage with this talk informationally, you'll walk away with one or two tips," Gangel predicted. "You'll have some talking points. If you engage against your own life experience…it'll last longer. If you engage with this talk within context or a paradigm, you'll see whole new opportunities. And that's where we're headed."

Gangel used the analogy of the Apollo moon missions, which took people to the moon on the Saturn V rocket. The rocket, Gangel noted, transported people to the moon in stages, shedding rocket stages, containing millions of kilograms of weight, in mere minutes. People, Gangel said, need to know what to shed when going through transformation. "It's not that you shed everything but ask what you can shed," Gangel said. "And the question is more important than the answer. We have no idea what's coming to us next. The changes we're going to experience, the circumstances are going to come faster and faster. We can't rely on our previous success…When you start getting good at shedding things, that's when you'll get better."

END-OF-DAY BREAKOUT SESSIONS

Attendees completed the day going into breakout rooms, where they answered questions such as, "What is there to let go of?" "Having let go, what does it look like?" and "Standing on the moon, how did you get there?" The aim was to get attendees thinking about how they could bring transformation to PEO.

When the attendees reassembled, many shared their views. Lieutenant Governor Appointee Arjan Arjena, MBA, P.Eng., noted: "We need to stop being fearful of change. We need to remember what we are here for. We are here to assist the government. We are here to regulate, not to advocate. Let go of the past. We need to build a future. How can we regulate with the other [engineering] regulators across the country?" And Eastern Region Councillor and current Vice President (appointed) Chantal Chiddle, P.Eng., FEC, added that people at PEO looking to bring in the governance and regulatory changes are doing so with good intentions. "We need to take that faith and move to the moon, or the end point, and be an efficient, more effective regulator, doing our mandate one hundred per cent."

BITS & PIECES

The Detroit-Canada Tunnel is a 5160-foot-long (1573 metres) underwater highway tunnel connecting Detroit, MI and Windsor, ON. Construction cost $23 million and was completed in 1930. Recognized as the world's only underwater international border crossing for automobiles, it provides one of the fastest links between the two countries.

Cut and fill stoping is an underground mining method in which the ore body is retrieved in horizontal slices starting at the bottom and working upwards towards the surface. Ramps are excavated to connect the surface to the ore body, and drifts are excavated to reach the ore slices before they're drilled, blasted with explosives, and ore is removed and transported. Mining continues upwards towards the surface until the ore body is depleted. Photo: Celeda

Toronto's 101-year-old Union Station is in the midst of a massive revitalization project—much of it underground—that will see Canada's busiest transportation hub tripled in size to increase service, all while keeping transit moving. New infrastructure, including signalling systems, larger platforms and improvements to the tracks and corridors feeding them, is being built using a phased approach to minimize service disruptions.

ORDER OF HONOUR CELEBRATES DOUBLE COHORT

By Adam Sidsworth

PEO Past President Marisa Sterling, P.Eng., FEC, emceed the Order of Honour ceremony, which was held virtually on June 19.

The Order of Honour, an annual awards gala hosted by PEO, returned in 2021 on June 19 after a one-year hiatus, albeit in an online capacity.

The Order of Honour recognizes professional engineers and others who have rendered conspicuous and outstanding volunteer service to the engineering profession. Inductees have made substantial contributions to the profession, its professional status or one of the many functions of PEO. Each calendar year sees individuals recognized in the categories of Member, Officer or Companion. However, due to the COVID-19 pandemic, the 2020 Order of Honour gala was delayed and combined into a larger 2021 gala.

Several other PEO awards were also presented during the online ceremony, including the S.E. Wolfe and V.G. Smith awards, the G. Gordon Sterling Engineering Intern Award and the President's Award, all of which are typically awarded during the weekend of PEO's annual general meeting (see p. 8).

"As a regulator, PEO bestows these awards on both engineers and the public, as one way to protect the public interest," observed gala emcee and PEO Past President Marisa Sterling, P.Eng., FEC. "Our awards educate and encourage engineers and EITs to participate in our self-regulation governance model by highlighting examples of excellence and skills. They showcase the rigour of our application process, and they recognize the way the public can positively participate in the engineering profession. Awards recognition is one way that PEO tells its story to the public of how it is self-regulating in the public interest. We hope the examples showcased tonight educate everyone on the work of PEO and encourage your future participation in engineering regulation."

The Order of Honour award winners were introduced by Ken McMartin, P.Eng., FEC, current chair of PEO's Awards Committee and a former PEO president. McMartin was joined by Nancy Hill, P.Eng., LLB, FEC, PEO president for 2019–2020. Hill invested the 19 PEO members into the Order of Honour. Following are selections from the recipients' acceptance speeches.

COMPANIONS TO THE ORDER OF HONOUR

Paul Ballantyne, P.Eng., FEC (2020): "Who would have known that volunteering to be the Algonquin Chapter secretary in 1985 would lead to this? My chapter provided a good grounding, with many great team players over those 35 years and counting…I would like to acknowledge the team members who made the 35 years possible, the long list of volunteers and staffers who were great to work with…many of these turned into lifelong friends."

Bob Dony, PhD, P.Eng., FEC (2021): "It has been an honour and a privilege to have served the people of this great province of Ontario by contributing to the regulation of the engineering profession. It is on their behalf that I have been so proud to have given my time over these decades."

Paul Ballantyne, P.Eng., FEC (left), and Bob Dony, PhD, P.Eng., FEC, give acceptance speeches during the virtual Order of Honour ceremony, where they were invested as Companions.

OFFICERS TO THE ORDER OF HONOUR

Edward Kai-Jee Poon, P.Eng., FEC (2020): "I feel honoured today to accept this award. I started volunteering for York Chapter over 24 years ago…The chapter is a good training ground for future PEO leaders so that they can develop the right combination of skills and experience."

L. Brian Ross, P.Eng., FEC (2020): "My engineering career has been fulfilling, and I appreciate serving the profession. For over 40 years, I have enjoyed the opportunity to engage and work with enthusiastic and dedicated engineers, beginning with Grand River Chapter before moving to York Chapter, followed by Council and committees."

Stephen Hong Tsui, P.Eng., FEC (2020): "Like many of you in the audience, I am a strong supporter of volunteerism. There's an old Chinese saying: 'You benefit from the society; you should return the favour to society.' By volunteering [at] PEO, we have every intention to promote and enhance the engineering profession."

Roydon Fraser, PhD, P.Eng., FEC (2021): "I do not seek this award for myself. I do not need nor seek awards for what I do. I accept this award for the esteem and respect I have for my nominees and all the wonderful colleagues whom I've had the pleasure to meet and to get to know through PEO and the engineering profession."

Sean P. McCann, P.Eng., FEC (2021): "I have enjoyed volunteering with each person, as they have helped make our chapter great and strong.

Helen Wojcinski, P.Eng., FEC (2021): "When I got my engineering licence in 1989, only 2 per cent of professional engineers in Ontario were women. In 2018, almost 30 years later, that number was a mere 18 per cent. Should we reach Engineers Canada's goal to raise the percentage of fully licensed engineers who are women to 30 percent by 2030, I will be almost 70…at our current pace, we will reach only 25 per cent... The numbers tell the story. We have to do something different."

MEMBERS TO THE ORDER OF HONOUR

Karen Chan, P.Eng., FEC (2020): "Thank you for admitting me into the Order of Honour. I've been able to give back by encouraging kids to study STEM, encouraging women to pursue engineering and mentoring graduates towards licensure. It's been a privilege serving with you, from the Lake Ontario Chapter, the Chapter Leaders Conference the OSPE board…."

Brett Chmiel, P.Eng., FEC (2020): "I believe strongly in creating a sense of community of engineers, which includes our involvement in public events...These events show that we give back to the community and also inspire the next generation of engineers."

Waguih H. ElMaraghy, PhD, P.Eng., FEC (2020): "I have actively and enthusiastically served the profession for many years at PEO on the Academic Requirements Committee and in a broader sense [by] teaching…It has been an honour to service the profession and graduates of Canadian programs."

> "I FOLLOW IN THE FOOTSTEPS OF COUNTLESS INDIVIDUALS WHOM I RESPECT DEEPLY AND WHOSE SHOES I CAN NEVER HOPE TO FILL.
> Stacey McGuire, P.Eng., FEC

John Hazel, P.Eng., FEC (2020): "I share this recognition with the many dedicated PEO volunteers across the province, who go above and beyond their passions and talents to serve the profession. We sometimes forget how simple things can engender change."

David Kiguel, P.Eng., FEC (2020): "When obtaining my professional engineering licence, I didn't know much about [PEO]. For me, volunteering became a passion. As time progressed, I became more involved in licence policy matters and the way PEO operates to serve the profession and serving and protecting the public interest."

Jim McConnach, P.Eng., FEC (2020): "It has been a pleasure to serve as a member of the [Experience Requirements Committee] for over 20 years. This has given me the opportunity to meet and interview over 100 applicants from Canada and many other parts of the world. My fellow members of the ERC and I work to improve the interview and assessment of applicants."

Scott Schelske, P.Eng., FEC (2020): "Although I became a mining engineer like my father, I became a volunteer junkie like my mother. Little did I know at the time (when asked to become secretary of the Lake of the Woods Chapter) that it would become the start of a decades-long association with the volunteers, engineers and staff and their spouses, some of whom became good friends to this day."

Barry Westhead, P.Eng., FEC (2020): "For the past 30 years, volunteering has been a gift to others that has brought me so much pride and joy. It started the day I attended my son's Iron Ring ceremony. I found a voice within me telling me to find a way to share my experiences with the youth represented at that ceremony."

Annabelle Lee, P.Eng., FEC (2021): "Eleven years ago, when I was still an EIT, I participated in my first York Chapter event. It was the accelerated mentoring event. This was the event that got me involved in PEO."

Stacey McGuire, P.Eng., FEC (2021): "I follow in the footsteps of countless individuals whom I respect deeply and whose shoes I can never hope to fill. I did not choose to become a volunteer in order to play politics or to check a box on my resume. I volunteered my time because I am so proud to be an engineer, and I want others to feel the same way."

Pascale (Pat) Scanga, P.Eng., FEC (2021): "I am a first-generation engineer, and for as long as I remember, this is what I always wanted to do. I've always been driven to give back to our very special calling and profession and feel that it's a duty to do so."

ENGINEERING INTERN AWARD RECIPIENTS HONOURED

The G. Gordon M. Sterling Engineering Intern Award was introduced in 2010 to promote, encourage and celebrate professional leadership achievements of engineering graduates. The award, named after PEO's 2001–2002 president and father of Past President Marisa Sterling, is presented annually to an engineering intern (EIT) registered with PEO and is awarded based on the applicant's leadership potential and the suitability of the proposed professional development opportunity to the applicant's needs and aspirations; it has a monetary value of $3,500 awarded to the recipient. The 2020 and 2021 award winners were introduced by Nancy Hill and Marisa Sterling, respectively.

The 2020 recipient of the award is **Nazanin Omrani-Moghaddam, P.Eng.,** who in 2020 still had her EIT status while working with Newmont Goldcorp (she now works for Golder Associates), where she exhibited great leadership potential (see "PEO announces recipient of 2020 G. Gordon M. Sterling Engineering Intern Award," *Engineering Dimensions*, March/April 2020, p. 16).

The 2021 recipient of the award is **Shengdi (Sharon) Chen, EIT,** a designer in the Conveyance Group at WSP, where Chen actively looks for leadership opportunities, including leading project assignments and championing health and safety within her team (see "PEO announces recipient of 2021 G. Gordon M. Sterling Engineering Intern Award," *Engineering Dimensions*, March/April 2021, p. 10).

TWO ANNUAL PEO AWARDS PRESENTED

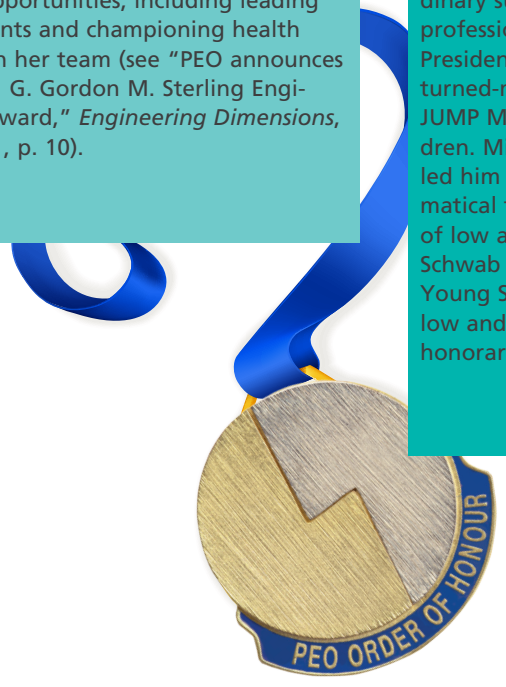
The S.E. Wolfe Award is presented to a licence holder who prepared an engineering report as part of his or her licensing requirements and was awarded the highest marks of those who became registered during the previous year. The 2020 award went to **Frederik Niemeyer, P.Eng.,** who received a mark of 91 per cent for his engineering report *Engineering Technical Report for the Design of the Damp Axial Scrape Tool (Hydraulic).*

The V.G. Smith Award is presented to an engineer who achieved registration during the previous year by completing an examination program and possessed the highest standing of those were licensed that year. The 2020 award went to **Sandeep Kumar, P.Eng.,** who successfully completed 10 technical exams, with an average mark of 94 per cent for his top three exams.

The 2019 recipients of the S.E. Wolfe and V.G. Smith awards, **Bhavin Shukla, MEng, P.Eng.,** and **Yuanpeng Li, P.Eng.,** were also honoured during the evening's celebrations (see "PEO members earn S.E. Wolfe and V.G. Smith awards," *Engineering Dimensions*, July/August 2020, p. 12).

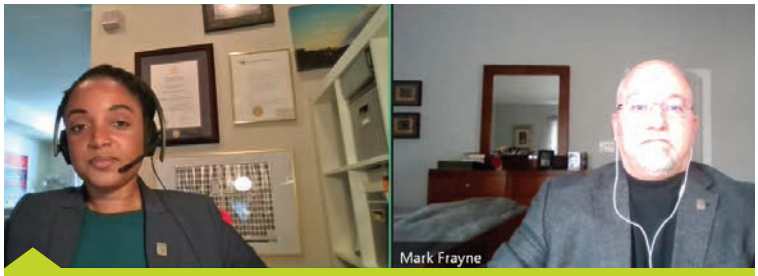
PRESIDENT'S AWARD

The recipient of the President's Award was announced during the Order of Honour virtual gala. Since 2007, the President's Award has been awarded to a non-engineer who has demonstrated extraordinary support or promoted public awareness of the engineering profession. Although it is not awarded every year, in 2020, the President's Award was given to **John Mighton, PhD,** a playwright-turned-mathematician and author who founded the non-profit JUMP Math in 2002 to help foster numeracy and math skills in children. Mighton's success in helping students achieve levels of success led him to conclude that the widely held assumption that mathematical talent is a rare genetic gift created a self-fulfilling prophecy of low achievement among students. Mighton has been named a Schwab Foundation Social Entrepreneur of the Year, an Ernst & Young Social Entrepreneur of the Year for Canada, an Ashoka Fellow and an Officer of the Order of Canada. He has also received six honorary doctorates.



ENGINEERING ADVOCACY BODY ANNOUNCES NEW PRESIDENT

By Adam Sidsworth



Réjeanne Aimey, MBA, P.Eng., introduces Mark Frayne, MBA, P.Eng., PMP, as the incoming president and chair of OSPE.

The advocacy organization for Ontario's engineering profession and community held its annual general meeting (AGM) on May 8, when it introduced its incoming president and chair.

Mark Frayne, MBA, P.Eng., PMP, is poised to lead the Ontario Society of Professional Engineers (OSPE) throughout his 2021–2022 term. "The primary focus for board of directors and [OSPE] staff is to focus on membership and getting ready for mandatory continuing professional development (CPD)," Frayne said in an interview with *Engineering Dimensions*. "Expectations and needs of engineering students, engineering interns, mid-career or retired engineers are different, and an OSPE membership needs to provide value to each member during the different stages of their career."

Frayne has already reached out to PEO President Christian Bellini, P.Eng., FEC, and Past President Marisa Sterling, P.Eng., FEC, with an eye on continuing to foster a strong working relationship between Ontario's engineering regulator and engineering advocacy organization. OSPE was created in May 2000, when PEO decided to divest its advocacy role to a separate organization. Nonetheless, PEO has been criticized in subsequent years—often by OSPE itself—for not totally ridding itself of advocacy activities. However, PEO is currently undergoing a governance renewal and action plan, with the hope of fully focusing its mandate as the provincial engineering regulator (see "Ontario's engineering advocacy group celebrates 20th anniversary," *Engineering Dimensions*, January/February 2020, p. 15).

Frayne, who grew up in a farming community in southwestern Ontario, earned his undergraduate degree in geological engineering from the University of Waterloo and his graduate degree in business from Wilfrid Laurier University. Over the past three decades, he has lived in New Brunswick, Saskatchewan and New York, eventually settling in Sudbury, ON, where he continues to work in the mining industry. His career has focused on lessening the industry's environmental impact and make it more sustainable. Frayne volunteers his time with various groups, notably PEO's Sudbury Chapter, Scouts Canada, the Sudbury Playground Hockey League, Women in Science and Engineering and Huron Woods Community Association. He also serves as the chair of the Professional Advisory Committee for Project Management at Cambrian College and the Municipal Engineers Association.

Frayne sees support for career development as the primary focus for OSPE, particularly as PEO adopts mandatory CPD; Frayne envisions OSPE serving as the central hub for CPD courses that engineers could take. "I would like to see OSPE become the one-stop shop," Frayne says. "If an engineer wants to know where they can take a technical or leadership course, OSPE will either have the material in-house or partner with relevant providers to supply the courses."

Frayne is also focused on OSPE's upcoming 2022–2025 strategic plan. "We've laid out our pathway," Frayne says. "And we will make enquiries and discussions and start our new strategic plan next May. OSPE will also reach out to the engineering community to determine what topics are relevant to the engineering profession."

> FRAYNE SEES SUPPORT FOR CAREER DEVELOPMENT AS THE PRIMARY FOCUS FOR OSPE, PARTICULARLY AS PEO ADOPTS MANDATORY CPD

Frayne also looks to continue OSPE's promotion of diversity and inclusion. "It's making sure that all engineers have a seat at the table," Frayne says, "and changing the systemic biases in society, operations, recruitment and incorporation of everyone's input into everyday engineering. It includes everybody."

Frayne is optimistic, noting: "OSPE is capable of achieving these goals. We have talented individuals, not just on the board but in the membership and on staff, who are engaged at bringing forward excellent initiatives."

OSPE's AGM GOES ONLINE

For a second subsequent year, OSPE's AGM was forced to go online due to the ongoing COVID-19 pandemic. The past year was challenging for OSPE, which experienced a sharp drop in membership during the first quarter of 2020 because of the pandemic; however, the last quarter of the year saw the organization begin to rebound its membership. According to Ron Clifton, P.Eng., an OSPE director and then treasurer and chair of the Audit and Finance Committee, OSPE's finances were consequently strained; however, OSPE applied and received the Canada Emergency Wage Subsidy, which helped ease the financial strain.

"In this turbulent time, OSPE has been working with its industry and government partners to discover how COVID has impacted the engineering community while working to find solutions that will litigate those who need help with the economic impacts," Réjeanne Aimey, MBA, P.Eng., said in her then capacity as president and chair. "Even though our offices continue to be closed to the public, OSPE continues to work hard on behalf of the engineering profession. In this time of crisis, we believe that the voice of engineers can be more important than ever. We are happy to contribute well-thought-out policies created on the examination of the best evidence."

Aimey was joined by OSPE CEO Sandro Perruzza, who noted that 2020 brought "our biggest shift as we moved from in-person events to virtual events and meetings." Together, Aimey and Perruzza presented OSPE's accomplishments throughout the year, including:

- Submitting short-, medium- and long-term recommendations to the provincial and federal governments to support engineers and spur economic growth in light of COVID-19;
- Working with the ministries of Infrastructure; Labour, Training and Skills Development; Municipal Affairs and Housing; Transportation; and the Attorney General to convene a COVID-19 infrastructure working group, create new health and safety protocols to protect workers and sort through project delays and disruptions;
- Focusing OSPE's efforts on dealing with the airborne transmission of COVID-19;
- Launching the Ontario Engineering Academy to help engineers pursue lifelong learning;
- Hosting an annual diversity and inclusion virtual conference with more than 1500 attendees online; and
- Being awarded more than $600,000 in government funding to support research and programs for engineers in 2020.

OSPE's EVOLVING RELATIONSHIP WITH PEO

During OSPE's AGM, both Aimey and Perruzza were asked by OSPE members about OSPE's relationship with PEO, given PEO's ongoing governance renewal and action plan to focus on regulation. Perruzza responded: "[PEO has] indicated that there are certain areas where they are no longer able to work with us, especially if it focuses on a member benefit or a benefit to an engineer. Their focus is on the public interest, so if there is something that benefits both the public and engineers, they can have a conversation with us, but if it's solely an engineer benefit, they will no longer [act]." However, Perruzza noted that OSPE is pleased that PEO is more strongly focusing on its regulatory role.

Bruce Matthews, P.Eng., executive director of the Association of Consulting Engineering Companies–Ontario, asked Aimey and Perruzza about OSPE's position on PEO's governance renewal and proposed mandatory CPD. Aimey replied: "Regarding CPD, we are ecstatic that this is possibly coming to fruition, not only because we would like to minimize fatalities or injuries as a result of engineering errors that could come from a lack of continuing professional development but also because of the ability of all up-and-coming and existing engineers in continuing to develop themselves and group their skills and represent their profession."

NEW HIGH SCHOOL NAMED IN HONOUR OF PIONEERING WOMAN ENGINEER

By Adam Sidsworth

A new school currently under construction in Milton, ON, is being named in honour of pioneering engineer Elsie MacGill and will host a new approach to teaching STEM subjects.

A new high school currently under construction in Milton, ON, is being named after a trailblazing PEO-licensed engineer.

Elsie MacGill Secondary School, which opens this September, will become the second Halton District School Board (HDSB) high school to host the board's I-STEM program—which stands for Innovation, Science, Technology, Engineering and Mathematics—offering a new collaborative approach to STEM education. The new program will begin in September 2022.

The school's name, which honours the late Elsie MacGill, P.Eng., was announced by the HDSB during its April 7 board meeting. "Students, families and Milton community members submitted suggestions for the name of the new school earlier this year," the HDSB said. "A shortlist of names was developed by a committee that included trustees and parents whose children will attend the school when it opens."

MacGill, a Canadian engineer, was the first woman to earn an undergraduate degree in electrical engineering in Canada when she earned her degree from the University of Toronto in 1927 (see "Heroes for the ages: Ten extraordinary engineers who have made their mark on history," *Engineering Dimensions*, March/April 2013, p. 24). MacGill earned her master's degree in aeronautical engineering at the University of Michigan in 1929, followed by postgraduate work at the Mas-

sachusetts Institute of Technology, making her one of the first woman aeronautical engineers in the world. MacGill was in Fort William (now Thunder Bay), ON, working at Canadian Car & Foundry during the Second World War, designing the Maple Leaf II Trainer, the first plane designed and produced by a woman; and overseeing the production of over 1400 Hawker Hurricanes. Later on, MacGill started her own consulting business. A strong supporter of feminist causes and a commissioner on the Royal Commission on the Status of Women in Canada in the late 1960s and early '70s, MacGill was a vocal critic of discrimination faced by women in the engineering profession and remained a member of PEO, which honoured MacGill with a Gold Medal, until her 1980 death.

Amy Collard, HDSB board of trustee for Burlington's Ward 5, was on the committee that ultimately named the school after MacGill. "I voted for the name Elsie MacGill because she was Canada's first female [electrical] engineer and played a pivotal [part of] her career as an aeronautical engineer," Collard told *Engineering Dimensions*. "As the new high school will have an I-STEM focus, naming the school in her honour seemed appropriate."

A FOCUS ON REAL-WORLD PROBLEMS

The comprehensive I-STEM program was first offered at Aldershot School in Burlington, ON, for the 2019–2020 school year. The four-year program sees students begin in Grade 9 and allows them to complete STEM subjects in a collaborative and open-concept environment, with each year offering a unique theme and focus. Although the program—which was developed with advisory partners such as McMaster University, Mohawk College, Engineers of Tomorrow and Let's Talk Science—is administered by the HDSB, it is open to students from beyond Halton Region.

"Each year has a different focus," explains Mark Duley, incoming principal for Elsie MacGill Secondary School. "In Grade 9, the focus is on the engineer's toolkit, using engineering as a way of designing and solving problems. They start off looking at a local issue in the environment and proposing solutions for that. It culminates in presentations to the City of Burlington [city council]. Then they do a human-centred design project. Last year they focused on mobility assistance for a community member in Hamilton. And then they finished off the year—even though they were all virtual—with what was called a 'real world problem,' where students had to pick anything in the world that they could improve upon. Some of them were designing green roofs while others were looking at microplastics and water issues around the world."

"THE GRADE 9 FOCUS HAS STUDENTS PARTICIPATING IN PRACTICES FAMILIAR TO PROFESSIONAL ENGINEERS, SUCH AS PROTOTYPING, DESIGN THINKING, PROFESSIONALISM, TECHNICAL DRAWINGS AND PRESENTATION AND COMMUNICATION. DULEY NOTES THAT I-STEM TAKES A PURPOSELY BROADER APPROACH THAN THE ONTARIO HIGH SCHOOL CURRICULUM, HAVING STUDENTS WORK MORE COLLABORATIVELY AND MAKE MORE INTERDISCIPLINARY CONNECTIONS THAN WHAT WOULD BE SEEN IN A NORMAL HIGH SCHOOL ENVIRONMENT.

The Grade 9 focus has students participating in practices familiar to professional engineers, such as prototyping, design thinking, professionalism, technical drawings and presentation and communication. Duley notes that I-STEM takes a purposely broader approach than the Ontario high school curriculum, having students work more collaboratively and make more interdisciplinary connections than what would be seen in a normal high school environment.

Duley, who spent part of the last year observing at Aldershot, notes that the inaugural class of I-STEM students entered Grade 10 this year. "They started their entrepreneurs toolkit—the idea being that many of the solutions that they come up with could spin off into a business. They gave presentations around local issues again. They had student groups creating and marketing their own reused and repurposed clothing to combat the idea of fast fashion. Other groups designed systems and machines to plant trees in hard-to-reach locations around the world." And as the stream enters grades 11 and 12, their focus will shift from a focus on the local community to a more global perspective, using the 17 Sustainable Development Goals of the United Nations as a model.

Duley predicts that when I-STEM opens at Elsie MacGill, it could have a slightly different focus than what already exists at Aldershot, based on staff expertise and community partners from the Milton, Cambridge and Guelph areas. In the meantime, Duley suggests that early anecdotal evidence shows that I-STEM students are thriving: "When students are interested in what they are doing, they're going to dedicate the time and effort to go at it deeply," says Duley, who already sees I-STEM students stating that they want to become engineers and doctors. "Because the I-STEM program is based on a hands-on approach to learning, it attracts a wide variety of students, not just those who have been traditionally interested in math or science. It's not the kind of high school you and I went to."

PEO MEMBER DANNY CHUI BECOMES ENGINEERS CANADA PRESIDENT

By Adam Sidsworth

Danny Chui, P.Eng., FEC, became the 2021–2022 president of Engineers Canada during the organization's annual meeting in May.

Danny Chui, P.Eng., FEC—a longtime PEO volunteer and former PEO Council member—is taking over the presidency of Engineers Canada for the 2021–2022 term. Chui's presidency was officially announced on May 29, during Engineers Canada's annual meeting of members.

Engineers Canada is the umbrella engineering organization that represents Canada's 12 provincial and territorial engineering regulators and is guided by its 10 core purposes, including facilitating and fostering working relationships between the 12 engineering regulators, organizing national programs, advocating to the federal government and accrediting undergraduate engineering programs at the university and college level through its Canadian Engineering Accreditation Board (CEAB).

Before retiring, Chui spent over 30 years with the City of Toronto, where he was manager, capital works, with the board of governors of Exhibition Place. He was responsible for planning, budgeting, programming, implementing, managing and administrating the board's annual capital works program and undertaking major construction support and advisory functions.

As a longtime PEO volunteer, Chui began volunteering at the Mississauga Chapter between 1986 and 2000 in numerous capacities, including as chapter chair, vice chair and secretary. At the PEO level, Chui was a member of PEO Council, serving as West Central Region councillor from 1994 to 1996 and again from 1997 to 2001 and has served on numerous committees, including the Discipline, Finance, Annual Conference, Engineering Action Forum, Awards and Regional Nominating committees. In recognition of his volunteer services with PEO, Chui was named an Officer of the Order of Honour in 2002 and was recognized with a 25-year service award by PEO. And in 2017, Ontario's minister of citizenship and immigration recognized Chui for his long-standing service to the engineering profession.

ENGINEERS CANADA REPORTS SUCCESSES IN 2020

In her outgoing president's message, Past President Jean Boudreau, P.Eng. (New Brunswick), FEC, noted: "The COVID-19 pandemic drove significant changes not only for the world around us but also for how Engineers Canada serves as a progressive force in engineering. Challenges met this year created new opportunities, and I am proud of Engineers Canada's successes in adapting to the rapid changes. While further uncertainty lies ahead, 2021 also brings new opportunities to continue to promote and enhance the engineering profession with an agile edge." Boudreau introduced Engineers Canada's *2020 Annual Report*, which noted Engineers Canada's accomplishments over the previous year, notably its strategic priorities that included:

- The meeting of several milestones of the Accreditation Improvement Program in 2020, including a new management tool for accreditation;
- The improvement of accountability in accreditation process of the CEAB through the Accountability in Accreditation Evaluation Strategy;
- The increased recruitment, retention and professional development of women in engineering, with women now representing 14 per cent of licensed engineers across the country and 22 of engineering interns/engineers-in-training in 2020 and increased initiatives by Engineers Canada's 30 by 30 initiative; and
- An increased focus on competency-based assessments (CBA) for candidates for licensure, with engineering regulators in British Columbia, Saskatchewan and Prince Edward Island adopting the model in 2020, and Manitoba, New Brunswick and Newfoundland and Labrador poised to adopt CBA in 2021.

PEO's REPRESENTATION ON ENGINEERS CANADA

For the next year, Chui is leading Engineers Canada's 22-person board of directors, of whom five represent PEO including Lieutenant Governor Appointee Arjan Arenja, MBA, P.Eng., and Past President Marisa Sterling, P.Eng., FEC. They are joined by former PEO president Nancy Hill, P.Eng., LLB, FEC, and Kelly Reid, P.Eng., a former PEO councillor who transitioned to the Engineers Canada board of directors after ending her PEO Council term in 2018.

Chui's term as Engineers Canada president is scheduled to end in May 2022, when he will be replaced by Kathy Baig, MBA, ing., FEC, Engineers Canada's president-elect. Baig, who is also concurrently president of L'Ordre des ingénieurs du Québec (OIQ), was re-elected to her final two-year term as OIQ president last fall, where she has proved herself committed to advocating for the engineering profession and regulation in Canada, having worked to rebuild the image of OIQ after its ability to effectively regulate engineering in Quebec came into question by the Quebec government (see "Quebec engineering regulator begins second phase of media campaign," *Engineering Dimensions*, May/June 2021, p. 11).

WHY ARE PRE-START HEALTH AND SAFETY REVIEWS IMPORTANT?

By Sherin Khalil, P.Eng., PMP

Section 7 of Regulation 851 of the *Occupational Health and Safety Act* (OHSA) requires that, in certain circumstances, an owner, lessee or employer obtain a pre-start health and safety review (PSR) prepared by a practitioner. The purpose of the report is to ensure that a timely professional review identifies the non-compliance items and indicates what measures are necessary to bring the apparatus, structure, protective element or reviewed process into compliance with applicable sections referenced in section 7 of Regulation 851.

COMPETENCY AND DISCLOSURE

Engineers' ability to carry out PSRs is critical. Any missing or misleading information in a PSR may lead to injuries or fatalities that can have a tremendous impact on families and communities. Therefore, practitioners providing PSRs must be competent to avoid serious consequences to the public and practitioners.

Practitioners providing PSRs should be reminded of their obligations under the *Professional Engineers Act* (PEA) to only accept and undertake work within their expertise and demonstrate due diligence in completing PSRs. Practitioners should be familiar and comply with applicable codes, standards, the OHSA and regulations for industrial establishments. Practitioners should clearly define their scope of work that outlines any limitations or restrictions and consult their legal counsel in writing their agreements and scope of work prior to commencing their projects.

Where the PSR requires the evaluation of a complex system, the practitioner should advise the client/owner of the involvement of a multidisciplinary team to undertake the work. In such a case, the PSR should indicate the team members, their professional designations and their scope of work.

RELEVANT DISCIPLINE CASES

There are a number of relevant discipline cases that highlight the consequences of providing inadequate recommendations when undertaking PSRs. In 2015, an engineer pled guilty to sealing an engineering opinion that failed to recommend an adequate safeguarding barrier over the in-feed conveyor on a shrink wrapper machine and failed to recommend certain required hard-wired, or equivalent, interlocks as safety features on shrink wrapper machines. As a result of an inadequate recommendation, an employee reached through the tunnel guard into the shrink wrapper while it was in operation. The employee's forearm was pushed against a rail inside the machine, resulting in a broken arm, requiring surgery. The engineer acknowledged all errors and omissions contained in the PSR that caused the injury (see Summary of Decision and Reasons, Association of Professional Engineers of Ontario v. Antero M. Gomes, P.Eng., *Engineering Dimensions*, March/April 2018, p. 36).

In another instance, on or about March 20, 2007, the Ministry of Labour inspected the guarding of welding robot cells and the inspection revealed that the guarding, as installed, did not comply with OHSA, R.S.O. 1990, Regulation 851. A subsequent review by an independent expert revealed possible errors, omissions and discrepancies with respect to the safety issues identified in the PSR prepared by an engineering firm. This resulted in an allegation that the engineering firm was guilty of incompetence and/or professional misconduct as defined in the PEA (see Decision and Reasons, Abraham Bueckert, P.Eng., and AB Engineering Inc., *Engineering Dimensions*, March/April 2011, p. 39).

> “AT TIMES, IN-HOUSE ENGINEERS WHO UNDERTAKE A PSR FOR THEIR EMPLOYERS MAY FACE PRESSURE TO PREPARE A REPORT THAT IS FAVORABLE TO THEIR EMPLOYERS.

CONFLICT OF INTEREST ISSUES

At times, in-house engineers who undertake a PSR for their employers may face pressure to prepare a report that is favorable to their employers. In such a case, engineers should be reminded of their obligations under the PEA and should be aware that section 31(2) of the OHSA speaks to the duties of engineers within the context of OHSA.

Furthermore, in some situations, clients may request that practitioners discuss the PSR at various stages before submitting the final report. Practitioners must not permit clients to exert undue influence on reports and must not agree to alter their reports to distort their opinions. (For more information on engineers' duty of honesty and best practices in preparing engineering reports, see "Honesty, integrity and engineering reports," *Engineering Dimensions*, September/October 2015, p. 36.)

CONSIDERATION FOR CLIENTS/OWNERS

For their own benefit, the client/owner may want to take a proactive approach by considering the PSRs at the early stage of the design rather than adding costly controls and/or safety devices afterward to bring the equipment or system into compliance. Delaying PSRs may be costly and cause operation interruption. In April 2011, a worker was

killed as a result of multiple traumatic injuries while cleaning up an industrial pasta maker. An assessment by the ministry's regional engineer determined that a PSR, as required under Regulation 851: Industrial Establishments, had not been completed prior to operating the equipment at this location. The company was fined $120,000, and the supervisor was fined $12,000, plus a 25 per cent victim fine surcharge to assist victims of crime. (For more information on the case, see *Repeal of the Industrial Exception Data Gathering and Analysis Research Project Final Report*, www.peo.on.ca/sites/default/files/2019-10/RepealResearch Project-FinalReport_0.pdf.)

Prior to retaining an engineer for the review, clients/owners should consider requesting that practitioners demonstrate their relevant experience, competence and knowledge with regards to the work to be undertaken by providing examples of recent projects they have worked on, while respecting the confidentiality of these projects. After the completion of a PSR, should any modifications occur to equipment, particularly in a way that affects a safety feature, a practitioner should be retained to ensure the equipment is still in compliance.

IMPLEMENTATION OF THE PSR's RECOMMENDATION

In January 2017, the *Repeal of the Industrial Exception Data Gathering and Analysis Research Project Final Report* was provided at the request of PEO Council (see "PEO brings new data to industrial exception repeal campaign," *Engineering Dimensions*, March/April 2017, p. 8). In this report, details of injury and fatality statistics were investigated and provided. It was indicated that the completion of a PSR was not identified in over half of the reviewed cases that led to either injuries or fatalities. Approximately 28 injuries of the reviewed cases were due to lack of guarding, inadequate guarding or guarding that was removed or circumvented. Further, it was determined that worker injuries and/or fatalities still occurred even with the completion of a PSR due to the lack of implementation of the recommendations made in the PSRs. For example, in one instance, a worker was struck and pinned by dropping a conveyor assembly. After the death of the worker, the PSR was provided, but the recommendations in the PSR were not implemented. In another case where a critical injury occurred after the PSR was completed, a worker's hand was caught in the pinch point of feeding rollers.

Furthermore, some clients/owners choose to remove the safeguarding systems or bypass safety devices to speed up the production after the completion of the PSR. It must be noted that the safety devices are designed to prevent hazards from occurring. These safety devices should be connected while process or equipment is in operation to protect workers, facilities and the community. Consequently, it is advisable to implement the recommendations made in PSRs and keep safety devices in place and in operation.

Finally, practitioners are encouraged to read the existing PEO guideline *Professional Engineers Providing Reports for Pre-Start Health and Safety Reviews*, which can be found in the Knowledge Centre of PEO's website. Currently, the Professional Standards Committee is reviewing this guideline and investigating the current statutory, ethical and professional aspects of providing services on PSRs. The revised version of the guideline will be available for public consultation soon.

> "[THE REPORT] INDICATED THAT THE COMPLETION OF A PSR WAS NOT IDENTIFIED IN OVER HALF OF THE REVIEWED CASES THAT LED TO EITHER INJURIES OR FATALITIES. APPROXIMATELY 28 INJURIES OF THE REVIEWED CASES WERE DUE TO LACK OF GUARDING, INADEQUATE GUARDING OR GUARDING THAT WAS REMOVED OR CIRCUMVENTED.

PEO's practice advisory team is available by email at practice-standards@peo.on.ca for practitioners looking for information on their professional obligations. For legal issues, engineers must consult their lawyers. **e**

Sherin Khalil, P.Eng., PMP, is PEO's standards and guidelines development coordinator.

PEO's ANTI-DISCRIMINATION WORKING GROUP PRESENTS REPORT TO COUNCIL

By Nicole Axworthy

542ND MEETING, JUNE 25, 2021

At its June 25 meeting, Council formally accepted the report, *Anti-Racism and Anti-Discrimination: A Bridge to PEO's More Successful Future*, created by independent consultants Patricia DeGuire and Shashu Clacken under the direction of PEO's Anti-Racism and Anti-Discrimination Exploratory Working Group (AREWG).

Council established the AREWG at its meeting in November 2020 with a mandate to scope vulnerabilities to systemic racism and discrimination within the engineering profession and activities overseen by PEO and propose best practice methodologies for identifying, studying and addressing any such vulnerabilities that exist (see "Council approves anti-racism and anti-discrimination strategy," *Engineering Dimensions*, January/February 2021, p. 46). AREWG hired a consultant with expertise in the area to explore the potential vulnerabilities and provide recommendations on how to best address them, if any, with appropriate Council oversight.

The assessment used for the review of PEO's activities is based on the policy and guidelines on racism and racial discrimination published by the Ontario Human Rights Commission, and anti-racism initiatives by the Law Society of Ontario, which the AREWG consultants consider ideal best practices for a modern professional regulator. Some of the risks that are outlined in the report presented to Council include:

- The lack of a strategic focus on anti-racism and anti-discrimination: Failing to address racism as one of PEO's strategic priorities and policy actions could perpetuate any individual or systemic racism that might exist. Such a failure is also inconsistent with PEO's statutory obligation to protect and serve the public interest.
- The individual experiences of applicants, licence holders, employees, volunteers and others: Reported experiences and perceptions provide important context for the evaluation of PEO's regulations, rules, policies, processes and practices, which in turn helps to assess whether they contribute to or perpetuate barriers facing marginalized groups.
- The severity of how PEO's approach is perceived: The AREWG's work found strong themes regarding perceived exclusion; lack of cultural sensitivity and equity, diversity and inclusion competency; elitism; fear; and undervaluing Black persons, Indigenous Peoples, and people of colour.
- The lack of race-based data: PEO is not keeping up with the prevailing views in Canada about disaggregated race-based data.
- The potentially harmful impact, especially as seen through an anti-discrimination and anti-racism lens, of further delays to reforming the licensing process: Failing to implement licensing reform with respect to the Canadian experience requirement is detrimental to PEO's image and the public's trust in it as the regulator of professional engineering.
- PEO's apparent failure to behave appropriately, in the context of a matter of serious public importance, as the repository of delegated authority from the Ontario Government: A public organization must prioritize responding to serious public interest issues, including the growing awareness of systemic racism.
- Other legal and institutional risks: Council might not be adequately fulfilling its duties concerning human rights and the public interest. These gaps are associated with significant vulnerabilities, leading to reputational, financial and legal risks to the regulator.

> "COUNCIL ESTABLISHED THE AREWG AT ITS MEETING IN NOVEMBER 2020 WITH A MANDATE TO SCOPE VULNERABILITIES TO SYSTEMIC RACISM AND DISCRIMINATION WITHIN THE ENGINEERING PROFESSION AND ACTIVITIES OVERSEEN BY PEO AND PROPOSE BEST PRACTICE METHODOLOGIES FOR IDENTIFYING, STUDYING AND ADDRESSING ANY SUCH VULNERABILITIES THAT EXIST.

The consultants made six key recommendations, all of which are outlined in the report:

1. Create a board committee, the Strategic Anti-Racism Group (SARG), to embed anti-racism in Council's policy and strategy function;
2. Publicly commit to anti-racism;
3. Ensure adequate resourcing, expertise and consultations to support SARG;
4. Develop an anti-racism strategy, aligned with the organizational strategy and transformation;
5. Achieve quick wins for the strategic plan; and
6. Commit to key components in principle for the strategy.

At Council's June meeting, after much discussion, Council passed a motion to make the report public (it is now available on PEO's web-

site at www.peo.on.ca/sites/default/files/2021-06/AREWG ConsultantsReport.pdf). Council also voted in favour of tasking the AREWG with developing recommendations for next steps, which Council will consider at its September 2021 meeting.

COUNCIL ELECTION RECOMMENDATIONS

At its June meeting, Council was presented with an issues report from the 2020–2021 Central Election and Search Committee (CESC) outlining its review of the procedures for the conduct of the 2021 Council elections along with recommendations. Traditionally, Council approves the voting procedures and election publicity procedures for each Council election year. The issues report covers nine issues and related recommendations for the elections process, ranging from a reduction in the length of the voting period (currently five weeks) to including a requirement that potential candidates complete an education component on the roles and responsibilities of Council in order to run in the election.

Council passed a motion to refer the issues report to the newly formed Governance and Nominating Committee for consideration (see "Council approves establishment of new governance committees," *Engineering Dimensions*, May/June 2021, p. 20). As part of the same motion, Council stood down the 2020–2021 CESC with thanks and voted in favour of adopting the 2021 elections voting and publicity procedures with adjusted dates for the 2022 election cycle, and without implementing the recommendations from the issues report until they have been vetted by the Governance and Nomination Committee.

The approved 2022 voting procedures and election publicity procedures will be published on PEO's website and in the September/October 2021 issue of *Engineering Dimensions*.

APPROVAL OF NEW PRACTICE GUIDELINE

Council approved publication of the new practice guideline *Professional Engineers Conducting Performance Audits and Reserve Fund Studies*. The guideline aims to provide best practices for engineers carrying out various property reviews under the *Condominium Act*, including inspections of condo buildings, performance audits, and periodic reserve fund studies of the common elements of a condo property, and provides information on how the reviewer should carry out these activities in a professional manner that is consistent with the ethical and professional obligations of a professional engineer.

The guideline was approved by Council for development in 2012, and the process for development included member and stakeholder consultation in 2016. The stakeholders that were directly invited to the public consultation were Tarion warranty corporation, Ministry of Government and Consumer Services, Consulting Engineers of Ontario and the Ontario Society of Professional Engineers. The draft document was revised based on recommendations received during the consultation. In 2017, the project was put on hold because of proposed amendments to the *Condominium Act*, but the project resumed in 2020 because the ministry had not yet confirmed a date for implementation of the act's amendments.

As part of the motion, the subcommittee of the Professional Standards Committee that developed the guideline was stood down. The new guideline will now be prepared for publication and posted under the Knowledge Centre of PEO's website.

APPROVAL OF GENDER AUDIT OF PEO's LICENSING PROCESS

At its June meeting, Council approved a gender audit of PEO's licensure process and internal operations. The audit will be conducted through Sonia Kang, PhD, University of Toronto Rotman School of Management associate professor of organizational behaviour and Canada research chair in identity, diversity and inclusion; and PhD candidate Joyce He. The study was initiated by PEO's 30 by 30 Task Force and will focus on examining PEO's existing licensure process for potential gender biases and any unintentional barriers or disadvantages that may impede women from getting licensed. The three goals of the joint research project include:

1. Examining PEO's licensing process to investigate whether systemic bias may exist;
2. Building on these insights and, if any bias or disparities are identified, offering actionable suggestions for change to be incorporated into the licensing process; and
3. Helping PEO test the effectiveness of suggested changes.

Starting this month, the researchers will work with PEO staff under the oversight of PEO's manager, engineering intern programs. The study will involve reviewing licensing documents, assessing pertinent data and interviewing applicants, staff and volunteers involved in the licensing process. The project is expected to wrap up in August 2022. **e**

DECISION AND REASONS

In the matter of a hearing under the *Professional Engineers Act*, R.S.O. 1990, c. P.28; and in the matter of a complaint regarding the conduct of ZHI QIANG CAO, P.ENG., a member of the Association of Professional Engineers of Ontario, and DBI GROUP LTD., a holder of a certificate of authorization.

The matter came on for a hearing before a panel of the Discipline Committee on November 11, 2020. The panel heard this matter by means of an online video conference platform that was simultaneously broadcast in a publicly accessible format over the internet. All participants in the proceedings, including the member and holder (combined herein as respondents) self-represented; counsel for the association, Leah Price; the panel and their independent legal counsel, David Jacobs, attended via videoconference.

AGREED STATEMENT OF FACTS AND ALLEGATIONS

Counsel Leah Price for the association advised the panel that the association and the respondents had reached agreement on the facts and introduced an Agreed Statement of Facts and the contained allegations as follows:

1. At all material times, the respondent, Zhi Qiang Cao, P.Eng. (aka Johnson Cao) (Cao), was a professional engineer licensed pursuant to the *Professional Engineers Act*. According to PEO's records, Cao's training and practice are primarily in the fields of civil and structural engineering. Cao has had no material training or experience in mechanical or electrical engineering.

2. The respondent, DBI Group Ltd. (DBI), is an Ontario corporation headquartered in Mississauga, Ontario. Cao is one of two corporate directors for DBI. At all material times, DBI held a certificate of authorization (C of A) and Cao was the individual accepting professional responsibility for engineering services provided under the C of A.

3. In or about August 2018, Cao and DBI were retained by Leilei Cheng (Cheng) to act as the lead consultant and obtain a building permit for converting an industrial building into a private school (the Project) at 55 Franklin St. E. (South), Kitchener, Ontario. Cheng was acting on behalf of Waterloo Independent Secondary School and Cheng's Group Corp.

4. On February 20, 2019, Cheng signed a Commitment to General Review form for the Project as the owner and/or authorized agent. Cao also signed the form and checked a box indicating that he and DBI had been retained for structural engineering works. Further, Cao signed the name of Ashraf Nana, P.Eng. (Nana), the complainant in this matter, without Nana's knowledge or consent. Cao checked boxes indicating that Nana had been retained for electrical and mechanical engineering works, also without Nana's knowledge or consent. Attached hereto as Schedule "A" is a true copy of the Commitment to General Review form.

5. On or about February 22, 2019, DBI provided Cheng with a package of signed and sealed architectural, mechanical, electrical and structural drawings for the Project. The package included nine (9) mechanical and electrical drawings on DBI title block, with related calculations (the Drawings). Cao applied a signature and seal purporting to be Nana's, to each of the Drawings. Nana did not have any knowledge that Cao had done so, nor did he consent to Cao's use of his signature and seal. Cao dated Nana's seal for February 22, 2019; however, the Drawings also contained the following versions and descriptions in the revisions section: on January 15, 2019, issued "for Client Review"; on February 1, 2019, issued "for Permit"; and, on February 20, 2019, "Revised per Client for Permit."

6. The Drawings and the Commitment to General Review were submitted by Cheng to the City of Kitchener in support of the building permit application for the Project.

7. Cao and DBI were removed from the project sometime before March 30, 2019.

8. Cheng contacted Victor Lan (Lan) and FDL Design and Construction in hopes of retaining their services for the Project. On March 30, 2019, Lan forwarded the Drawings to Nana. Upon review, Nana did not recognize the Project and determined that he had not prepared or sealed the Drawings.

9. On March 30, 2019, Nana emailed Cheng, advising that the Drawings were not his and therefore should not be used. On April 1, 2019, Nana emailed the city, advising that the Drawings were not his, and that "the engineer the client hired photoshopped and/or used my stamp illegally."

10. On April 1, 2019, Nana submitted a complaint to PEO regarding Cao and DBI's conduct.

11. On July 17, 2019, Cao wrote to the PEO investigator and admitted that he prepared and sealed the Drawings:
"…I have no dispute about this complain. and I feel deeply sorry and shame on my unprofessional behavior. the reason this happened is because the following reason:
    1. this is just a beginning of this project, all the design concept has been not settled and I originally think to provide the client a concept design as client's request to have a construction quote. and I had plan to contact 'Ashraf Nana' to finalize the design and submission.
    2. I was under a extremely work load a tight schedule pressure, could not contact 'Ashraf Nana' for this project on time." [sic]

    A copy of the email chain, ending July 17, 2019, is attached hereto as Schedule "F."

12. PEO retained NORR Architects & Engineers Limited to review the Drawings and prepare an independent expert report. Balazs Farkas, P.Eng., and Salil Ranadive, P.Eng., prepared a report dated December 17, 2019, a copy of which is attached hereto as Schedule "G" (the Expert Report).

13. The Expert Report found that the Drawings lacked design information and did not satisfy good engineering practices and applicable code requirements.

14. Among other things, the Expert Report noted the following deficiencies with the mechanical design:
    a. a plumbing fixture schedule was not included and plumbing fixtures were not identified (see item 3.1);
    b. no fire suppression design was submitted (see item 3.2);
    c. the total ventilation air volume supplied is only 5,100 cfm, while the applicable standard required 6,452 cfm (as per ASHRAE 62.1, "Ventilation for Acceptable Indoor Air Quality" Table 6.2.2.2) (see item 3.6);
    d. each rooftop unit supplies conditioned air to multiple spaces with different uses and different exposures but appears to be controlled by a single space temperature thermostat (see item 3.7); and
    e. the domestic hot water system supply piping in generally is in generally undersized at ½" while ¾" is required as per Table 7.6.3.1A and 7.6.3.2A of the Ontario Building Code (see item 3.11).

15. Among other things, the Expert Report noted the following deficiencies with the electrical design:
    a. the load summary confirming the adequacy of the existing electrical services was missing and/or lacking (see item 4.1);
    b. fire alarm riser diagram and fire alarm schedule service was missing and/or lacking (see item 4.3);
    c. product specifications were missing and/or lacking (see item 4.4);
    d. the spacing of smoke detectors beyond 60 feet apart within a corridor is beyond the limits rated coverage of a typical smoke detector (see item 4.5);
    e. the spacing of visual alarms and audible alarm devices 60 feet apart within the corridors is beyond the guidelines of typical vendors and does not meet the spacing criteria detailed within ULC S524-14 "Standard for the Installation of Fire Alarm" (see item 4.6);
    f. locating audible alarms only in the hall ways will result in either horns being too loud near the device or too soft at the farthest ends of the classrooms, which violated OBC fire alarm audibility requirements (OBS item 3.2.4.20 (4a) and 3.2.4.20 (6)) (see item 4.7);

g. pull station and exit sign between the basketball/gym to storage rm#2 is not located at the required exit, and this directs people to an incorrect location during evacuation (see item 4.9);
h. directional exit signs are needed in main lobby to correctly describe the path of travel (see item 4.13);
i. directional exit signs are required in the corridor between the computer and chemistry lab (see item 4.16);
j. no lighting controls are shown, and there are numerous lighting control criteria that must be met to satisfy the energy efficiency requirement of the Ontario Building Code (see item 4.17);
k. normal lighting in the washrooms is provided by two 500 lumen downlights, and a lighting evaluation shows that this will not satisfy the minimum requirement in section 3.2.7.1 of the OBC and referenced table 9.34.2.7 Column (2) (see item 4.18); and
l. there is no indication if HVAC units shown on mechanical drawings require shutdown fire alarm per OBC section 3.2.4.13(d) (see item 4.19).

16. The Expert Report concluded as follows:
"1. In the matter relative to whether or not Mr. Cao and DBI failed to be aware of, consider or comply with any standards or codes applicable to the design, review and sign-off drawings and construction details, it is our opinion that the design drawings submitted for Building Permit submission were missing some relevant information for a comprehensive Building Permit submission. In addition, the submitted design did not meet all the requirements of applicable codes and standards, nor did they include all relevant construction details.
2. In the matter relative to errors, omissions or identified deficiencies, it is our opinion that the referenced drawings in general show the design intent with the exception of the fire suppression systems and the lighting control system. There were only a limited number of other mechanical errors identified in the documents; however, we have documented numerous fire alarm and emergency lighting device location[s] that are in contravention of the applicable codes and standards.
3. In the matter of whether or not Mr. Cao and DBI failed to meet the standard expected of a reasonable and prudent practitioner given the circumstances, it is our opinion that the documentation submitted for Building Permit application did not meet the expected standard as defined by common industry practices.

Based upon the aforementioned observations, we are of the opinion that the submitted mechanical and electrical design document did not meet the minimum expected standard for a Building Permit application. It should be also noted that a Building Permit is an authorization to proceed with construction. In our opinion, the mechanical and electrical design package provided is not suitable for this intent."

17. For the purposes of this proceeding, the respondents accept as correct the findings, opinions and conclusions contained in the Expert Report. The respondents admit that they failed to meet the minimum acceptable standard for engineering work of this type and that they failed to make responsible provision for complying with applicable statutes, regulations, standards and codes. The respondents further admit that their conduct, including their conduct in issuing the Drawings and fraudulently applying Nana's signature and seal to the Drawings was disgraceful, dishonourable and unprofessional.

18. By reason of the aforesaid, the parties agree that the respondents are guilty of professional misconduct as follows:
a. Preparing, signing, sealing and issuing mechanical and electrical drawings that failed to meet the standard of a reasonable and prudent practitioner, amounting to negligence and to professional misconduct as defined in section 72(2)(a) of Regulation 941;
b. Preparing, signing, sealing and issuing mechanical and electrical drawings that failed to responsibly provide for compliance with applicable standards and codes, amounting to professional misconduct as defined in section 72(2)(d) of Regulation 941; and
c. Providing engineering services in a disgraceful, dishonour able and unprofessional manner, amounting to professional misconduct as defined in section 72(2)(h) of Regulation 941.

19. It is further agreed that Cao is guilty of professional misconduct by offering and providing engineering services that he is not competent to perform by virtue of his training and experience, amounting to professional misconduct as defined in section 72(2)(h) of Regulation 941.

PLEA

The respondents admitted the allegations set out in paragraph 18 (a) to (c) and 19 of the Agreed Statement of Facts.

DECISION

The panel found the respondents guilty of professional misconduct for conduct as follows:

a. Preparing, signing, sealing and issuing mechanical and electrical drawings that failed to meet the standard of a reasonable and prudent practitioner, amounting to negligence and to professional misconduct as defined in section 72(2)(a) of Regulation 941;
b. Preparing, signing, sealing and issuing mechanical and electrical drawings that failed to responsibly provide for compliance with applicable standards and codes, amounting to professional misconduct as defined in section 72(2)(d) of Regulation 941; and
c. Providing engineering services in a disgraceful, dishonourable and unprofessional manner, amounting to professional misconduct as defined in section 72(2)(h) of Regulation 941.

The panel further found the member guilty of professional misconduct by offering and providing engineering services that he is not competent to perform by virtue of his training and experience, amounting to professional misconduct as defined in section 72(2)(h) of Regulation 941.

REASONS FOR DECISION

The panel agreed that the acts of professional misconduct alleged in the Agreed Statement of Facts (ASF) herein were amply supported in the ASF and agreed to by the respondents and the association and thus accepted by the panel as making out acts of professional misconduct under the legislation.

The panel considered and accepted the findings of NORR Architects & Engineers Limited, the expert retained to review the respondents' mechanical and electrical drawings referred to in the allegations and the pleas. The expert found, among other deficiencies, that the mechanical and electrical drawings at issue were lacking in mechanical and electrical areas, did not satisfy good engineering practices and applicable code requirements and did not meet the minimum expected standard for a building permit application. On review of the drawings and the expert opinion, the panel agreed.

It is noted that some of these deficiencies are related to the fire suppression systems, fire and smoke detection and alarm warnings, as well as inadequate guidance for exiting personnel from the building under alarm conditions. Also, the design as proposed would not provide sufficient ventilation to maintain acceptable air quality. Implementing these designs could affect the health and safety of the occupants.

The panel thereby found that the respondents prepared, signed, sealed and issued mechanical and electrical drawings that failed to meet the standard of a reasonable and prudent practitioner. Further, the panel found that the respondents prepared, signed, sealed and issued mechanical and electrical drawings that failed to responsibly provide for compliance with applicable standards and codes and, in fact, provided engineering services that the member was not competent to perform by virtue of his training and experience.

In addition, the member applied a signature and seal to each of the impugned drawings purporting to be signed by Ashraf Nana, P.Eng. The agreed facts show that Ashraf Nana, P.Eng., did not have any knowledge that the member had done so, nor did he consent to the member's use of his signature and seal. The member applied the signature and seal of another engineer without that engineer's knowledge or approval, which conduct the panel found to be disgraceful, dishonourable and unprofessional.

PENALTY DECISION

The panel carefully considered the Joint Submission as to Penalty and Costs. In the circumstances of this case, the panel is of the view that suspension of the member's and holder's licences and publication of the panel's findings and order, including the reprimand with reference to the respondents' names, a reasonable outcome in this matter; a lesser penalty would fail to appropriately serve the aims of general deterrence, protecting the public and maintenance of the public's confidence in the regulation of the profession.

The panel acknowledges the respondents' co-operation with the association through the Agreed Statement of Facts and their statement of remorse. These considerations, combined with the respondents' lack of prior disciplinary histories, are mitigating factors in determining an appropriate penalty.

Members of the public must have confidence that professionals are held to high standards of conduct and that serious breaches of those standards are dealt with appropriately. Failing to take a proportionate response to protect the public in the face of professional miscon-

duct undermines that trust and harms both the reputation of the profession and the legitimacy of professional regulation.

In the circumstances of this case, the panel was of the view that an outcome short of some period of suspension would undermine public confidence in the regulation of the profession and would fail to adequately provide for protection of the public and general deterrence to the profession at large. Additionally, the panel notes that publication of its findings and reasons with the names serves to promote general deterrence in the profession and reinforce the public confidence in the regulation of the profession.

Accordingly, the panel accepted the Joint Submission as to Penalty and Costs for the respondents and ordered as follows:

a) Pursuant to s. 28(4)(f) of the act, the respondents shall be reprimanded, and the fact of the reprimand shall be recorded on the register for an unlimited period of time;
b) Pursuant to s. 28(4)(b) of the act, the member's licence and the holder's certificate of authorization shall be suspended for a period of four (4) months, commencing on the day the penalty decision is pronounced by the Discipline Committee;
c) Pursuant to s. 28(4)(d) of the act, a term and condition shall be imposed on the member's licence, requiring him to successfully complete the Professional Practice Examination within twelve (12) months after the day the penalty decision is pronounced by the Discipline Committee;
d) Pursuant to s. 28(4)(e) of the act, a restriction shall be imposed on the member's licence and on the holder's certificate of authorization prohibiting them from practising electrical or mechanical engineering;
e) The findings and orders of the Discipline Committee shall be published in summary form under s. 28(4)(i) and 28(5) of the act, with reference to names, and with reasons therefore; and
f) There shall be no order as to costs.

The panel pronounced its determinations as to convictions and penalty at the conclusion of the hearing on November 11, 2020. At the hearing after the pronouncement of the penalty the respondents waived their rights to appeal and thus the effective date of the suspension of the member's licence and the holder's certificate of authorization is November 11, 2020, and it was and is so ordered.

The Decision and Reasons was signed by Paul Ballantyne, P.Eng., as chair of this discipline panel and on behalf of the members of the discipline panel: Qadira Jackson, LLB, and Jag Mohan, P.Eng.

SUMMARY OF DECISION AND REASONS

In the matter of a hearing under the *Professional Engineers Act*, R.S.O. 1990, c. P.28; and in the matter of a complaint regarding the conduct of JAMES R. MALO, P.ENG., a member of the Association of Professional Engineers of Ontario, and FORM ARCHITECTURE ENGINEERING (FAE), a holder of a certificate of authorization.

The panel of the Discipline Committee (the panel) of the Association of Professional Engineers of Ontario (the association or PEO) heard this matter on November 4 and 5, 2020, by means of an online video conference platform, which was simultaneously broadcast in a publicly accessible format over the internet. All participants in the proceedings attended by video conference. The association was represented by Leah Price. The member James R Malo (Malo) was represented by counsel Mike Maher and the C of A Form Architecture Engineering (FAE) were represented by counsels Jordan Lester and Michel Caza.

STATEMENT OF ALLEGATIONS

Two complaints were filed with PEO concerning the alleged conduct or actions of the respondents. The Complaints Committee of PEO referred the first complaint to the Discipline Committee on November 2, 2017 (Matter 1). On June 13, 2018, the hearing in Matter 1 was adjourned to a date to be determined. On April 24, 2019, it was again adjourned, on consent, to permit a registrar's investigation to be completed. A second complaint was filed following the registrar's investigation. The second complaint was referred to the Discipline Committee from the Complaints Committee in July 2019 (Matter 2). A pre-hearing conference was held on September 25, 2019. At the pre-hearing conference, an order was made on consent to consolidate Matters 1 and 2 for hearing. The Notice of Hearing was issued on September 11, 2020, in respect of the hearing of the consolidated matters.

SUMMARY OF AGREED STATEMENT OF FACTS

1. The respondent Malo was a professional engineer licensed pursuant to the *Professional Engineers Act*. Kuch Stephenson Gibson Malo Architects & Engineers obtained certificate of authorization (C of A) number 10055885 on February 20, 2002. That C of A remained in place when Kuch Stephenson Gibson Malo Architects & Engineers changed its name to FAE on April 20, 2011. Malo was the individual taking responsibility for the professional engineering services provided under the C of A from March 26, 2002 until March 21, 2018. Malo resigned his membership effective May 6, 2019. FAE continues to hold a C of A.

2. PEO received a complaint dated August 9, 2013, from Paul Barnwell, P.Eng., relating to structural engineering designs and drawings done by the respondents on a school in Thunder Bay (the School). Attached as Schedule "A" is a copy of this complaint. This matter (Matter 1) was referred to the Discipline Committee (DIC) on November 2, 2017. Attached as Schedule "B" is a copy of the Statement of Allegations in Matter 1. As can be seen from the Statement of Allegations, the issue in Matter 1 is that the designs and drawings in question were allegedly deficient in that they allegedly failed to properly account for snow loads.

3. After Matter 1 was referred to DIC, it was brought to PEO's attention that a second school had been constructed utilizing Malo's and FAE designs, which were also allegedly deficient in that they allegedly failed to properly account for snow loads. As a result, the deputy registrar, regulatory compliance, issued a registrar's investigation (RI) order under s. 33 of the *Professional Engineers Act*. Attached as Schedule "C" is a copy of the RI order.

4. The DIC hearing in Matter 1 was adjourned *sine die* on July 13, 2018 (and again on April 24, 2019), on consent, to await the outcome of the RI. Malo executed an undertaking that, pending the hearing, he would not design, or sign and seal the design, of any roof structures. As noted above, Malo has since resigned, and his licence was accordingly cancelled.

5. The RI eventually involved examination of over 45 structures. The examination was conducted by PEO, together with its independent expert, in co-operation with FAE, together with its consultants. It resulted in a registrar's investigation report dated May 28, 2019, which in turn resulted in a complaint made by Irena Gawelek, P.Eng., the investigator under the RI. This complaint (Matter 2) was referred to DIC by the Complaints Committee in July 20I9.

Matter 2 raised the same or very similar issues as were raised in Matter 1 but involved additional structures.

6. On consent of the parties, Patrick Quinn, P.Eng., the presiding chair at the pre-hearing conference, ordered that Matter 1 and Matter 2 be consolidated, and that they be heard together.

THE BUILDINGS AND THE DESIGN ISSUES

7. The parties agreed that there were 25 structures (the Buildings), encompassed by the now consolidated matter, that were deficiently designed.

8. Malo designed all the Buildings listed in the complaint and signed and sealed all the structural design drawings for the Buildings. The drawings were issued under FAE's C of A.

9. Five of the Buildings identified were deficiently designed because the snow accumulation loads that were utilized did not comply with Ontario Building Code (the code) requirements.

10. Twelve of the Buildings identified were deficiently designed in that snow accumulation load values were not properly identified on sealed drawings.

11. Four of the Buildings identified were deficiently designed in that the designer utilized a Wind Exposure Factor (Cw) less than 1.0, contrary to the code requirements.

12. Four of the Buildings identified were deficiently designed in that the designer utilized an Importance Factor that did not comply with the code requirements for the building's appropriate classification.

13. PEO retained Will Teron, P.Eng., of Tacoma Engineers (Tacoma), as an independent expert to review the drawings made available to PEO, and to comment upon the snow load issue. He provided four expert reports commenting on eleven (11) of the Buildings. The expert reports concluded that the roofs of the Buildings reviewed were deficient in that they were designed based on a roof snow load less than that specified in the code. In addition, Tacoma concluded that the design deficiencies in the drawings in connection with the Buildings reviewed were of such a magnitude that they represented a significant risk to the safety of the public.

14. The as-built condition of certain of the Buildings were the subject of an engineering analysis by a team of engineers retained by or on behalf of FAE. They included Peter Halsall, P.Eng., RWDI and Lea Consulting Ltd. This team determined that, in their opinion, based on examination of excess capacity in a number of the structural elements as well as wind study modelling, this Building was not a significant safety risk to the public and required only minor work to satisfy snow load requirements. PEO took no position on whether this opinion is correct or not.

15. The as-built condition of other of the Buildings identified were the subject of a detailed examination and engineering analysis by Jamie Pilot, P.Eng., the current responsible engineer under FAE's C of A. He determined that, in his opinion, while the design of these buildings was not compliant with the OBC, the as-built structures were sufficient to support OBC defined loads and did not pose a safety risk. On the basis of that opinion, no work was required by the municipality to be carried out on these Buildings to satisfy snow load requirements. PEO takes no position on whether Mr. Pilot's opinion was correct or not.

16. FAE undertook to review all the projects identified in the RI, and provided a report dated February 26, 2019. That report covered 31 structures that had not been reviewed by Tacoma. FAE's report identified Buildings which did not include snow load information, Buildings which used Cw< I.O, Buildings in which the designer used an importance factor, Is=1.0 rather than Is=1.15, and Buildings which did not identify the snow loads used in the design. FAE's report also identified certain structures, wherein examination of relevant components as built (reverse engineering) showed that they satisfied code required loads, despite the fact that the drawings either did not identify the snow loads or used incorrect snow loads. FAE's report noted that the roofs of some of the Buildings were not code compliant even as-built. FAE determined in their engineering judgment that as-built capacities of these structures were in such proximity to code-required specified loads that, when factored, would be considered satisfactory to accommodate loading requirements imposed on them and therefore required no remediation efforts.

17. For the purposes of these proceedings, and subject to the foregoing, the respondents accept as correct the findings, opinions and conclusions in the expert reports, and admit that the roof designs

and the associated drawings in connection with the Buildings that were the subject of the complaint failed to make responsible provision for complying with applicable statutes, regulations and codes. The respondents further admit that the engineering work in relation to the design of the roofs of the Buildings fell below the expected standards that a reasonable and prudent practitioner should maintain in the circumstances, and did not make reasonable provision for the safeguarding of life, health or property of the persons affected by the work.

18. The parties therefore agree that the respondents are guilty of professional misconduct as follows:
    a. Issuing structural drawings for the construction of buildings that failed to meet the standard of a reasonable and prudent practitioner, amounting to professional misconduct as defined by section 72(2)(a) of Regulation 941;
    b. Issuing structural drawings for the construction of buildings that failed to make reasonable provision for the safeguarding of life, health or property of a person who may be affected by the work, amounting to professional misconduct as defined by section 72(2)(b) of Regulation 941;
    c. Issuing structural drawings for the construction of buildings that failed to make responsible provision for complying with applicable statutes, regulations, standards, codes and bylaws, amounting to professional misconduct as defined by section 72(2)(d) of Regulation 941; and
    d. Issuing structural drawings for the construction of buildings in an unprofessional manner, amounting to professional misconduct as defined by section 72(2)(j) of Regulation 941.

The respondents have, or have had, the opportunity to obtain independent legal advice with respect to their agreement as to the facts as set out above.

PLEA BY THE MEMBER AND THE HOLDER

Malo and FAE both admitted to the allegations set out in the Agreed Statement of Facts. The panel conducted a plea inquiry and was satisfied that the admissions of each of the parties were voluntary, informed and unequivocal.

DECISION

The panel considered the Agreed Statement of Facts and the guilty plea of both the member and FAE. The panel finds that the facts supported a finding that both Malo and FAE committed acts of professional misconduct as alleged in paragraphs 18 a., b., c. and d. of the Agreed Statement of Facts as mentioned above.

JOINT SUBMISSION AS TO PENALTY (JSP) AND COSTS WITH RESPECT TO THE MEMBER MALO

PEO and Malo made the following joint submission on penalty and costs:

a) Pursuant to s. 28(4)(a) of the *Professional Engineers Act*, Malo's licence shall be revoked;
b) Pursuant to s. 28(5) of the *Professional Engineers Act*, the order of the Discipline Committee shall be published, with reference to Malo's name; and
c) There shall be no order as to costs, and there shall be no fines imposed.

Malo has had independent legal advice with respect to the penalty set out above.

PANEL DECISION AND REASONS AS TO PENALTY FOR MALO

The proposed penalty addressed the key principles in respect of the imposition of penalties including: a) protection of the public; b) maintenance of professional standards; c) maintenance of public confidence in the ability of the profession to regulate itself; and d) general deterrence. It is well established that a joint submission as to penalty should not be lightly disregarded. It is only where the circumstances are such that the proposed penalty is contrary to the public interest and/or it would bring the administration of justice into disrepute that it should be varied.

Malo resigned and admitted guilt. His licence was revoked and he agreed to the order being published in the Gazette with his name, which sends a message to practising members that PEO considers its responsibility seriously in protecting the public from unsafe conditions. Given that the member had already resigned, the principles of specific deterrence and rehabilitation were less relevant as they related to the penalty with respect to Malo.

The panel determined that there was no compelling reason to deviate from the penalty jointly submitted by the parties.

DECISION AND REASONS WITH RESPECT TO PENALTY AND COSTS FOR THE C OF A FAE

The association and FAE did not agree on an appropriate penalty. FAE called two witnesses to give evidence with respect to penalty, Jamie Pilot, P.Eng. (Pilot), and Peter Halsall, P.Eng. (Halsall). Both parties made submissions on penalty.

Both the association and FAE agreed that FAE should be reprimanded pursuant to paragraph 28(4)(b) of the *Professional Engineers Act*, R.S.O. 1990 c. P.28 (PEA). However, the association wanted the reprimand to be registered permanently with names published in the Gazette; while FAE wanted the reprimand to be recorded for a period of one year without publication.

EVIDENCE ON PENALTY

Pilot testified that he joined FAE in 2006, apprenticed under Malo, and by the time of the hearing, had become a partner and the structural engineer responsible for FAE. He is a member in good standing of the association. He testified that he was not aware of any complaints against FAE other than these two. He was first made aware of the issues with the projects that were the subject of the complaints in Matter 1 when the first complaint was filed. He reported that he conducted an intensive review involving long hours in addition to his regular work with the time and the remediation work by FAE exceeding $250,000 to ensure public safety and developing a quality assurance program with the help of partners.

FAE was co-operative with the registrar's investigation and throughout the process.

Halsall gave evidence regarding the review process and the complexities of reviewing the large body of work that was the subject of the registrar's investigation. He stated that there was no need to force Pilot to do anything; that he was inspired by Pilot. He described the context: working in a small practice in a small community and the importance of setting up outside networks. He testified that FAE's and Pilot's conduct in response to the complaints as both professional and honourable. He considered FAE to be a firm that "did the right thing."

ARGUMENTS ON PENALTY

Summary of Submissions of Counsel for the Association

Counsel for the association agreed that Pilot had been helpful and co-operative. She noted that the designs at issue had not been done by Pilot. Pilot was not the responsible engineer. She noted that Pilot was not considered to be technically incompetent. Counsel submitted, nonetheless, with respect to FAE, the misconduct was very serious. Counsel for the association pointed out that there were 25 buildings at issue. The Buildings included two schools. The owners of Buildings and the chief building official had to be notified of the deficiencies. Some of the Buildings needed immediate temporary remediation to avoid possible public safety risk. FAE, the holder of the C of A, was guilty of serious misconduct.

Counsel for the association referred to *PEO v. Houston T. Engio, P.Eng. and Houston Engineering & Drafting Inc.,* [2016] *Engineering Dimensions* November/December 40 (Engio) and made note of paragraph 11 which set out the objectives of penalty. In terms of protection of the public, counsel for the association submitted that the association did not have a concern for future protection of the public, but general deterrence remained an important consideration that required that other holders of certificates of authorization be aware that serious misconduct is treated seriously and submitted that this requires that the name of the holder be published, that holders know that their name will be published, referring to paragraph 19 of Engio which discussed the need to denounce misconduct by publishing. Counsel for the association also pointed out that the protection of the reputation of the profession required publication of the name of the holder of the certificate of authorization, FAE, in the circumstances of this case. Counsel for the association referred to *Ontario College of Social Workers and Social Service Workers v Rozina Shaheen*, 2019 ONCSWSSW 9, especially in relation to the principle that not publishing should be a rare exception and require compelling reasons.

On the issue of the association's request for the penalty to include a reprimand being placed on the record permanently, counsel for the association referred to decisions including *PEO v. Gerard Van Iterson, P.Eng. and 694470 Ontario Ltd. O/A Unicorn Engineering*, [2018] *Engineering Dimensions* March/April 32 (Van Iterson). In Van Iterson, the parties had agreed on a time-limited reprimand, but the Discipline Committee decided that a timed reprimand was not acceptable. Counsel for the association submitted that the conduct of FAE was at least as serious in this case if not more so than the conduct at issue in Van Iterson and as such a time-limited reprimand was not appropriate.

Counsel for the association disagreed that the publication of names and a permanent reprimand amounted to a punishment of Pilot for something in the future. It was to reflect the conduct of FAE that had occurred in the past. She referred to the Agreed Statement of Facts in that the design failures were agreed to have represented a significant

risk to the public. She submitted that the case law supported a permanent reprimand in cases of serious misconduct.

Summary of Submissions of Counsel for FAE

Counsel for FAE pointed out that Malo was the responsible member at the time that the designs in issue were stamped. He described Malo as being FAE in effect until Malo was replaced by Pilot, at which time Pilot became FAE. He reviewed Pilot's evidence regarding the internal review efforts of FAE and submitted that such efforts were made out of concern for public safety. He argued that there was no deliberate disregard for the Ontario Building Code or for public safety. He pointed out the comprehensive quality assurance process and peer review process that FAE had put in place at its own expense and at its own initiative. He pointed out that Halsall had given evidence that there were no concerns with Pilot's technical competence. He submitted in all of the circumstances, that FAE did not deserve to have its name published.

Counsel for FAE referred to case law with respect to the principles on the appropriateness of penalty. In particular, he referred to paragraph 14 in the decision of the Divisional Court in *White v. Association of Professional Engineers of Ontario*, 2006 CanLII 17320 (ON SCDC) in support of FAE's position that a time-limited reprimand without names being published was appropriate given that there was no danger to the public expected in the future and no current issue with technical competence. He distinguished the comments at paragraph 16, stating that in that case the member had misled the public building official. That was not the case here. He also pointed out that this was a first offence for FAE. He distinguished the Engio case, stating that in Engio, the member had approved shoring designs without even looking at them; the designs in that case were described as incoherent and the member gave misleading evidence and had prior convictions. He pointed out that in other decisions where there was a permanent reprimand, the member was continuing to practice. In this case, Malo had resigned and his licence had now been revoked.

Counsel for FAE summarized by stating that a permanent reprimand and the publication of names was tantamount to penalizing Pilot for the conduct of Malo. FAE was co-operative. It took steps without being asked. There was no evidence that there was any future risk of danger to the public.

COMMENTS BY THE INDEPENDENT LEGAL COUNSEL (ILC)

ILC advised that the panel can only do what the statute permits, previous decisions of the Discipline Committee are not binding on this panel, but that decisions of the courts are binding. His advice was not binding on the panel.

He pointed to subsection 28(4) of the PEA which sets out the powers of the panel. Subparagraph (f) specifically states that the Discipline Committee can:

> 28(4)(f) require that the member or the holder of the certificate of authorization, temporary licence, provisional licence or limited licence be reprimanded, admonished or counselled and, if considered warranted, direct that the fact of the reprimand, admonishment or counselling be recorded on the register for a stated or unlimited period of time; a reprimand can be recorded for a limited time

ILC advised that a licence suspension must be published, whereas reprimands do not have to be published. ILC advised that the open court principle may not be engaged by the issue of publication of the name of FAE. He submitted that in *Dagenais v. Canadian Broadcasting Corp*., 1994 CanLII 39 (SCC), referred to in the decision in *Ontario College of Social Workers and Social Service Workers v Rozina Shaheen*, that the case dealt with a request for a publication ban.

In ILC's view, the Engio case was wrongly decided to the extent that it may be read as fettering the discretion of the panel to determine whether a reprimand should be recorded for a limited amount of time or indefinitely. He pointed out that it was provided for guidance.

Counsel for the parties agreed that the panel had jurisdiction to order that the reprimand be recorded on the register and that the reprimand could be time limited or permanent. Both counsel agreed that the panel had jurisdiction to order publication of the decision and of the reprimand with or without names.

PENALTY DECISION

The panel makes the following order as to penalty:

1. Pursuant to paragraph 28(4)(f) of the PEA, FAE shall be reprimanded, and the fact of the reprimand shall be recorded on the register for a period of one year.
2. Pursuant to paragraph 28(4)(i) and subjection 28(5) of the PEA, the decision and order of the Discipline Committee shall be published in PEO's official publication with reference to names; and
3. There shall be no order as to costs.

REASONS FOR PENALTY DECISION

The panel considered application of the following principles:

a) protection of the public;
b) maintenance of professional standards;
c) maintenance of public confidence in the ability of the profession to regulate itself;
d) general deterrence;
e) specific deterrence; and
f) rehabilitation

No single principle should govern. The decision should balance aggravating and mitigating factors.

The panel was mindful of the fact that FAE was co-operative in an extensive investigation of its projects involving a considerable amount of time, effort and support by FAE. The panel was impressed with the response of FAE in dealing with the complaint, including by conducting its own review, taking remediation steps, setting up quality control processes and generally taking responsibility for the design deficiencies. The panel considered the time and effort and out-of-pocket expense incurred by FAE in determining an appropriate penalty as well as what the panel found to be a genuine desire and concrete steps taken to ensure that the previous misconduct not be repeated. The panel would hope that other members and holders will follow the example of FAE and of Pilot in the event that an error in their own work or that of the holder of a certificate of authorization for which they find themselves now responsible is found.

The panel acknowledges that the Discipline Committee should act to deter members from similar acts of misconduct by imposing a meaningful but reasonable penalty. The panel decided, given the special circumstances of this case, that the publication of the decision and reasons with names and of the reprimand being recorded for a limited time period is sufficient in all of the circumstances.

The panel concluded that the penalty it has ordered is reasonable and in the public interest. FAE co-operated with the association. It agreed on the facts, has accepted responsibility for its actions and has avoided unnecessary expense to the association. It was not, in the panel's view, unreasonable for FAE to contest parts of the penalty requested by the association. The panel found the evidence of FAE on the issue of penalty helpful in making its decision. As such, the panel finds that an award of costs was not warranted.

In summary, the panel finds that the penalty ordered is reasonable and that public confidence in the ability of the association to be a self-regulator of the profession is satisfied by the penalty.

Kathleen Robichaud, LLB, chair of the discipline panel, signed the Decision and Reasons on April 14, 2021, on behalf of the other panel members: Ishwar Bhatia, P.Eng., and Gary Thompson, P.Eng.

DECISION AND REASONS

In the matter of a hearing under the *Professional Engineers Act*, R.S.O. 1990, c. P.28; and in the matter of a complaint regarding the conduct of JOHN R. MACINTYRE, P.ENG., a member of the Association of Professional Engineers of Ontario, and TSC ENGINEERING INC., a holder of a certificate of authorization.

The panel of the Discipline Committee convened to hear and determine allegations of professional misconduct on the part of the respondents, Mr. John R. MacIntyre (MacIntyre or the member), a member of the Association of Professional Engineers of Ontario (the association or PEO), and TSC Engineering Inc. (the holder or TSC), a holder of a certificate of authorization from the association, which had been properly referred to us by the decision of the Complaints Committee dated January 22, 2020. The panel heard this matter on March 12, 2021, by means of an online video conference platform that was simultaneously broadcast in a publicly accessible format over the internet. All participants in the proceedings, including the member and holder and counsel for the association, attended via videoconference.

AGREED STATEMENT OF FACTS

Counsel for the association advised the panel that the association and the member and holder had reached agreement on the facts. She introduced an Agreed Statement of Facts signed by the member and holder on February 22, 2021, and by the association on February 23, 2021. The Agreed Statement of Facts provided as follows. (Although we reproduce the Agreed Statement of Facts in whole below, including the references to schedules that were attached, the schedules themselves are not included here.)

1. "At all material times, the respondent, John R. MacIntyre, P.Eng. (MacIntyre), was a professional engineer licensed pursuant to the *Professional Engineers Act* (the act). At all material times, the respondent TSC Engineering Inc. (TSC) held a certificate of authorization issued under the act, and listed MacIntyre as the individual taking responsibility for the professional engineering services provided by TSC.

2. ThermoEnergy Structures Inc. (TSI) was hired by the complainant, Herma Van Beek, to build a barn superstructure on an already-built foundation on her farm in Asphodel-Norwood Township, Ontario (the Barn). TSI assembles and installs prefabricated farm superstructures using construction drawings prepared by Wolf System, a German manufacturer (the Design). In this instance, TSI retained TSC to review the Design and to review the Barn itself once construction was underway.

3. In May of 2013, MacIntyre reviewed the Design, which included a large format drawing sheet labelled "POSITIONSPLAN" and 19 letter size pages of construction details including a cover page. The "POSITIONSPLAN" included a roof framing plan and typical superstructure sections, all prepared by Wolf System, as well as foundation plan and section details prepared by TSI. MacIntyre provided handwritten notes on the "POSITIONSPLAN" and initialed key information. On May 15, 2013, MacIntyre signed and sealed the "POSITIONSPLAN." MacIntyre mistakenly assumed that the letter size construction details were shop drawings and did not seal those sheets. On the cover page, MacIntyre hand-wrote the name and location of the complainant's farm, hand-wrote "reviewed 15/05/13," affixed TSC's business stamp and signed the sheet. MacIntyre affixed TSC's business stamp, wrote the date and initialed each detail sheet. A building permit was issued shortly thereafter.

4. As construction of the Barn advanced MacIntyre signed and sealed a total of three site visit reports. In his first report, dated July 24, 2013, and addressed to the complainant and TSI, MacIntyre noted that the wall and roof framing was nearly complete. He stated that all structural work completed to date, including all connections, satisfied the intent of the Design and the structural requirements of Part 4 of the OBC and the NFBC.

5. On August 2, 2013, Ed Whitmore, the local chief building official (Whitmore), emailed MacIntyre several dozen questions following a site inspection of the Barn on July 29, 2013. Whitmore's questions focused on the need for brackets at various connection points, and MacIntyre replied stating that most of the questions dealt with as yet incomplete work which he would review in due course.

6. In his second sealed report dated October 21, 2013 (a copy of the report is attached hereto as Schedule "A") and addressed to TSI, the complainant and Whitmore, MacIntyre stated that the connections that had not been completed at the time of the previous visit were sampled for completeness and that all connections sampled were found to be adequate. In addition, MacIntyre provided design information on wind uplift loading and roof snow loading and stated that design loads for wind and snow were adequate. Finally, MacIntyre stated that "all structural work" satisfied the intent of the Design and the requirements of the OBC and the NFBC.

7. On October 29, 2013, Whitmore conducted a site inspection to confirm completeness of the work but continued to have concerns. In or around November 2013, the complainant retained Sara Bradley, P.Eng., of Bradley Engineering (Bradley) to prepare a second opinion regarding the structural engineering of the Barn.

8. On December 10, 2013, MacIntyre sealed a third report, addressed to Whitmore, TSI, Bradley and the complainant (a copy of the report is attached hereto as Schedule "B"). The report stated that MacIntyre had reviewed the areas of concern identified in Whitmore's photos taken on July 29, 2013, and that his review included visual examination of typical connections that were incomplete in the photos, as well as proof load testing for pull-out of the typical wedge anchors. Based on this review, MacIntyre stated that the "areas of concern" had been addressed and met the structural requirements of the OBC and NFBC.

9. On December 11, 2013, Bradley sealed an inspection report with enclosed photos addressed to the complainant. Bradley's report advised that "numerous brackets" had been omitted from the Barn's gable end wall framing.

10. On March 28, 2014, Whitmore emailed the complainant following a site inspection conducted with Bradley. Whitmore and Bradley were of the opinion that the Barn had several deficiencies requiring correction "prior to occupancy."

11. On May 1, 2014, Bradley wrote again to the complainant enclosing more photos and setting out a number of "completion requirement[s] specific to obtaining an occupancy permit," as follows:
    - installation of six omitted corner connections;
    - installation of omitted endwall connections;
    - installation of connection brackets on roof purlins;
    - shimmying vertical plates on column bases to the foundation;
    - installation of omitted anchor bolts from the vertical plates on column bases;
    - replacement of an apparently deficiently welded wind bracing rod; and
    - installation of connections at the top of a specified wood post.

12. The work recommended by Bradley was carried out and, as a result, on September 17, 2014, Whitmore conducted a final inspection of the Barn and confirmed that the deficiencies appeared to have been corrected and that the Barn now appeared to comply with the OBC.

13. PEO retained Tacoma Engineers (Tacoma) to prepare an independent review report. Tacoma's report, dated April 21, 2019 (the Report), concluded, among other things, that:
    - MacIntyre failed to be aware of or comply with the OBC and NFBC in reviewing the Design and the construction of the Barn;
    - the Design and the construction of the Barn presented safety concerns for people and property due to inadequate force resistance; and
    - a reasonable and prudent practitioner would have ensured compliance with the OBC and the NFBC and would not have signed off on the identified errors and omissions.

    A copy of the Report is attached hereto as Schedule "C." Following receipt of comments dated June 10, 2019, from the respondents (attached hereto as Schedule "D"), Tacoma prepared a second report (Reply Report 1) dated June 24, 2019, a copy of which is attached hereto as Schedule "E." Following receipt of comments dated December 1, 2020, from the respondents (attached hereto as Schedule "F"), Tacoma prepared a third and final report (Reply Report 2) dated December 30, 2020, a copy of which is attached hereto as Schedule "G." Reply Report 2 concluded as follows: "In conclusion, the MacIntyre letter of December 1, 2020, does not provide any information that materially changes the conclusions presented in my initial report—MacIntyre failed to comply with codes and standards, these failures represent a safety hazard

and as such MacIntyre failed to meet the standard expected of a reasonable and prudent engineer."

14. For the purposes of these proceedings, the respondents accept as correct the findings, opinions and conclusions contained in the Report and in the Reply Reports and admit that they failed to make responsible provision for complying with applicable statutes, regulations and codes. The respondents further admit that their professional engineering work, as described above, fell below the expected standards that a reasonable and prudent practitioner should maintain in the circumstances, and did not make reasonable provision for the safeguarding of life, health or property of the persons affected by the work.

15. The parties therefore agree that MacIntyre and TSC are guilty of professional misconduct as follows:
    a. They conducted an inadequate review of design drawings, amounting to professional misconduct as defined by sections 72(2)(a), (b), (d) and (j) of Regulation 941 under the act;
    b. They affirmed the adequacy of design drawings that did not meet or make refer ence to applicable codes and standards, amounting to professional misconduct as defined by sections 72(2)(a), (b), (d) and (j) of Regulation 941; and
    c. They affirmed the structural adequacy of an engineered structure that failed to comply with applicable codes and standards, amounting to professional misconduct as defined by sections 72(2)(a), (b), (d) and (j) of Regulation 941.

    The respondents have had independent legal advice, or have had the opportunity to obtain independent legal advice, with respect to their agreement as to the facts, as set out above.

Counsel for the association advised that insofar as there was agreement that the conduct of the member and holder amounted to professional misconduct as defined by subsection 72(2)(j) of Regulation 941 under the *Professional Engineers Act*, R.S.O. 1990, c. P.28 (the act) (conduct or an act relevant to the practice of professional engineering that, having regard to all the circumstances, would reasonably be regarded by the engineering profession as disgraceful, dishonourable or unprofessional), the parties agreed that the conduct would reasonably be regarded by the engineering profession as unprofessional, and not disgraceful or dishonourable.

PLEA BY MEMBER AND HOLDER

The member and holder admitted the allegations set out in paragraphs 15 a. to c. of the Agreed Statement of Facts. The panel conducted a plea inquiry and was satisfied that the admissions were voluntary, informed and unequivocal.

DECISION

The panel considered the Agreed Statement of Facts. It finds that the facts, as admitted, support findings of professional misconduct against the member and holder. In particular, the panel finds that the member and holder committed acts of professional misconduct as follows:

a) Conducted an inadequate review of design drawings, amounting to professional misconduct as defined by subsections 72(2)(a), (b), (d) and (j) of Regulation 941 under the act;
b) Affirmed the adequacy of design drawings that did not meet or make reference to applicable codes and standards, amounting to professional misconduct as defined by subsections 72(2)(a), (b), (d) and (j) of Regulation 941 under the act;
c) Affirmed the structural adequacy of an engineered structure that failed to comply with applicable codes and standards, amounting to professional misconduct as defined by subsections 72(2)(a), (b), (d) and (j) of Regulation 941 under the act; and
d) Insofar as the member and holder are found guilty of misconduct under subsection 72(2)(j) of Regulation 941 under the act the finding is that the conduct was unprofessional, not disgraceful or dishonourable.

REASONS FOR DECISION

Member

The panel is of the view that the conduct admitted in paragraphs 1 to 14 of the Agreed Statement of Facts constitutes professional misconduct under subsections 72(2)(a), (b), (d) and (j) of Regulation 941 under the act. That the member committed such acts is confirmed by the facts as agreed to by the parties in the Agreed Statement of Facts, admitted by the member and accepted by the panel.

Holder

With respect to TSC, counsel for the association submitted that facts contained and admitted by the holder in the Agreed Statement of Facts concerning the conduct of TSC was sufficient evidence of professional misconduct by TSC. Counsel for the association noted that, at the relevant times, TSC held a certificate of authorization issued by the

association that listed MacIntyre as a responsible engineer for the purposes of section 17 of the act.

The panel accepts that the aforesaid evidence inculpating TSC supports a finding of professional misconduct against TSC, which employed the member and for which the member served as a responsible engineer at the relevant times. Accordingly, for reasons analogous to those outlined above with respect to the member, the panel finds the holder, TSC, guilty of professional misconduct in the same manner.

PENALTY

The panel received a Joint Submission as to Penalty and Costs signed by the member and holder on January 22, 2021, and by the association on January 23, 2021.

The Joint Submission on Penalty provides as follows:

1. MacIntyre was at all material times a member of the PEO. TSC was at all material times the holder of a certificate of authorization issued by the PEO.

2. MacIntyre and TSC are the subjects of a proceeding before a panel of the Discipline Committee of PEO pursuant to section 28 of the *Professional Engineers Act*.

3. PEO, MacIntyre and TSC make the following joint submission on penalty and costs:
   a) Pursuant to s. 28(4)(f) of the *Professional Engineers Act*, MacIntyre and TSC shall be reprimanded, and the fact of the reprimand shall be recorded on the register permanently;
   b) Pursuant to s. 28(4)(b) of the *Professional Engineers Act*, MacIntyre's licence and TSC's certificate of authorization shall both be suspended for a period of one (1) month, commencing on the day the penalty decision is pronounced by the Discipline Committee;
   c) Pursuant to s. 28(4)(d) and (e) of the *Professional Engineers Act*, there shall be a term, condition, limitation and restriction imposed on MacIntyre's licence and on TSC's certificate of authorization, prohibiting them from providing professional engineering services in connection with any structures governed by, or falling within the ambit of, the National Farm Building Code;
   d) The findings and order of the Discipline Committee shall be published, pursuant to s. 28(4)(i) and 28(5) of the *Professional Engineers Act*, with reference to names; and
   e) There shall be no order as to costs.

Counsel for the association submitted that the joint proposed penalty fell within a reasonable range of penalties imposed in previous cases and appropriately served the principles of sentencing, including the protection of the public and maintenance of the public's confidence in the profession.

The panel notes that the member and holder fully co-operated with the association's investigation, had no prior disciplinary history and expressed remorse and apologized for the misconduct.

PENALTY DECISION

The panel carefully considered the Joint Submission as to Penalty and Costs. It is a well-established principle of law that a disciplinary panel should not interfere with a Joint Submission on Penalty, except where the panel is of the view that to accept the joint submission would bring the administration of the disciplinary process into disrepute or would be contrary to the public interest.

In the circumstances of this case, the panel is of the view that a reprimand, the fact of which is to be recorded permanently on the register, a one (1) month suspension of the member's licence and TSC's certificate of authorization, a permanent prohibition from providing professional engineering services in connection with any structures governed by, or falling within the ambit of, the National Farm Building Code, and publication of the panel's findings and order with reference to the member's name, is a reasonable outcome in this matter. A lesser penalty would fail to appropriately serve the aims of specific and general deterrence, protecting the public and maintaining the public's confidence in the regulation of the profession.

The panel acknowledges the member's co-operation with the association through the Agreed Statement of Facts and his statement of remorse. These considerations, combined with his lack of a prior disciplinary history, are mitigating factors in determining an appropriate penalty. It is the panel's view, however, that these mitigating factors do not completely detract from the aggravating factors, given the seriousness of the misconduct in question.

The panel has been made aware of the significant and troubling shortcomings in the member's practice in this case. The panel reiterates that the member has been found guilty of negligence and of failing to take reasonable precautions to safeguard the life and health of those who were affected by and relied on his work.

Public trust is at the core of what it means to be a professional. Members of the public must have confidence that professionals are

held to high standards of conduct and that serious breaches of those standards are dealt with appropriately. Failing to take a proportionate response to protect the public in the face of professional misconduct undermines that trust and harms both the reputation of the profession and the legitimacy of professional regulation.

In the circumstances of this case, the panel is of the view that a one (1) month suspension of the member's licence and TSC's certificate of authorization, and permanent prohibition from providing professional engineering services in connection with any structures governed by, or falling within the ambit of, the National Farm Building Code, will maintain public confidence in the regulation of the profession and adequately provide for protection of the public and general deterrence to the profession at large.

Additionally, the panel notes that the fact of a reprimand to be permanently recorded on the register and publication of the panel's findings and reasons with names serves to promote both specific and general deterrence and reinforce the public confidence in the regulation of the profession. Publication demonstrates, both to the profession and to the public, the seriousness with which the Discipline Committee regards lapses of professional standards, and the penalties for engaging in such misconduct.

Notwithstanding the above, the panel wishes to emphasize that, although the member and holder have been found guilty of professional misconduct under subsection 72(2)(j) of Regulation 941, nothing in this Decision and Reasons, including penalty, should be interpreted as the member or TSC being found guilty of conduct that is "disgraceful" or "dishonourable" under subsection 72(2)(j). The parties agreed that the finding under subsection 72(2)(j) is in reference to unprofessional conduct only.

Accordingly, the panel accepts the Joint Submission as to Penalty and Costs for the member and TSC, and orders as follows:

a) Pursuant to subsection 28(4)(f) of the *Professional Engineers Act*, MacIntyre and TSC shall be reprimanded, and the fact of the reprimand shall be recorded on the register permanently;
b) Pursuant to subsection 28(4)(b) of the *Professional Engineers Act*, MacIntyre's licence and TSC's certificate of authorization shall both be suspended for a period of one (1) month, commencing March 12, 2021;
c) Pursuant to subsection 28(4)(d) and (e) of the *Professional Engineers Act*, there shall be a term, condition, limitation and restriction imposed on MacIntyre's licence and on TSC's certificate of authorization, prohibiting them from providing professional engineering services in connection with any structures governed by, or falling within the ambit of, the National Farm Building Code;
d) The findings and order of the Discipline Committee shall be published, pursuant to subsections 28(4)(i) and 28(5) of the *Professional Engineers Act*, with reference to names; and
e) There shall be no order as to costs.

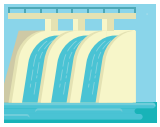
The panel pronounced its determinations as to convictions and penalty at the conclusion of the hearing on March 12, 2021, and advised that its reasons were to follow. At the hearing, after the pronouncement of the penalty, the member and holder waived their rights to appeal and, thus, the effective date of the one (1) month suspension of the member's licence and TSC's certificate of authorization is March 12, 2021, and it is so ordered. The panel administered an oral reprimand to the member and holder immediately following the hearing.

Robert Willson, P.Eng., signed this Decision and Reasons for the decision as chair of this discipline panel and on behalf of the members of the discipline panel: Paul Ballantyne, P.Eng., and Reena Goyal, JD.

Attend Virtually

The following events can be attended via videoconferencing (see individual websites for details).

July 2021



JULY 20–22
Power Conference
event.asme.org/POWER

JULY 24–25
International Conference on Nanoscience, Nanotechnology and Advanced Materials
iser.co/Conference2021/Canada/33/IC2NAM

JULY 28–29
International Conference on Robotics, Aeronautics, Mechanics and Mechatronics
gsrd.co/Conference2021/7/Canada/1/ICRAMM

JULY 30

International Conference on Artificial Intelligence, Robots and Mechanical Engineering
academicsconference.com/Conference/12768/ICAIRME

JULY 29

International Conference on Machine Learning Big Data Management Cloud and Computing
asar.org.in/Conference/17570/ICMBDC

JULY 30
International Conference on Software Engineering and Computer Science
academicsconference.com/Conference/12774/ICSECS

August 2021

AUG 3–6
Pipelines 2021 Conference
pipelinesconference.org

AUGUST 4–6
International Conference on Nuclear Conference
event.asme.org/ICONE

AUGUST 10–12
Fluids Engineering Division Summer Meeting
event.asme.org/FEDSM

September 2021

SEPTEMBER 14–15
Conference on Smart Materials, Adaptive Structures and Intelligent Systems
event.asme.org/SMASIS

Listen

The Tunnelling Podcast
From the team behind the Engineering Matters podcast, The Tunnelling Podcast explores advances in tunnelling technology, improvements in safety and industry disruptors.
tunnelling.reby.media

The Infrastructure Show
Top experts discuss the condition of infrastructure today, including repairs, upgrades and new construction, with an emphasis on preventive and predictive maintenance.
http://theinfrastructureshow.com/podcasts

Engineering Matters
Episode #54 "Keith Bannerman: A life underground," explores how some engineers spend entire careers carving out underground space for railways, roads, waterways, urban development and even farming.
engineeringmatters.reby.media

Read

Tunnels and Underground Cities: Engineering and Innovation Meet Archaeology, Architecture and Art, edited by Daniele Peila, Giulia Viggiani, PhD, and Tarcisio Celestino, PhD, 2020: Covers topics ranging from geomechanical behavior evaluation to risk management for tunneling-induced deformations to address the growing use of underground space

Shield Tunnel Engineering: From Theory to Practice, by Shuying Wang, PhD, Jinyang Fu, Cong Zhang, PhD, and Junsheng Yang, PhD, 2021: Covers the foundational concepts of shield tunnel engineering, including the latest advances in shield tunnel engineering techniques, for the construction of high-speed railways, subways and other forms of rail transport that require fast and efficient tunnelling methodologies

Watch

Tunnel Construction Explained
From subterranean roadways to the network of tubes that form mass transit systems, tunnels are among the most critical pieces of infrastructure that keep our cities moving.
youtube.com/watch?v=qvkytMLBKFc

How the World's Longest Underwater Tunnel Was Built
Discover how the English Channel Tunnel was built and the engineering challenges of building a 200-kilometre-long tunnel underwater
youtube.com/watch?v=qNS2jj2w-GI

Why Tunnels Don't Collapse
How simple reinforcement is used to prevent collapse of rock tunnels
youtube.com/watch?v=xNDppVTVUss


CAT

By Marika Bigongiari and Adam Sidsworth

6 ONTARIO PROJECTS ILLUMINATE SUBTERRANEAN ENGINEERING

So much of engineering goes unseen. It is work that is often obscured deep within a structure, the complexities of which are not always apparent to the naked eye—and this is especially true for engineering works that live underground. In fact, subterranean projects account for some of the most epic undertakings in the engineering world. Carved deep into the earth, these underground innovations move us through rapid transitways, prevent flooding, bridge gaps and facilitate exploration. Subterranean engineering projects require the expertise of a multitude of engineering disciplines, from structural to environmental.

But as impressive as these projects are, building structures underground presents unique challenges. Engineers who work in this innovative—and often volatile—space must overcome issues related to unbalanced soil conditions, stormwater management and drainage. Managing surface impacts is also critical, including considerations such as utility diversion, traffic management and potential impacts to neighboring structures. It's work that deserves a spotlight. Here, we shine a light on six notable projects that illustrate the marvels of subterranean engineering in Ontario.

401/409 RAIL TUNNELS INCREASE CAPACITY FROM UNDERGROUND

As trains zip past on adjacent tracks, and 21 live lanes of traffic zoom overhead on one of North America's busiest sections of highway less than three metres above where crews are working, two new rail tunnels are being constructed as part of Metrolinx's GO Expansion program. The program aims to transform the Kitchener line from a rush-hour commuter service to a rapid transit experience. The twin tunnels are being constructed where Highway 401 meets Highway 409, without disrupting the traffic travelling directly above. The circumstances presented a unique challenge for those involved in the tunnels' construction, and crews are using a variety of engineering techniques to get the job done. STRABAG and EllisDon Corp. are part of the consortium who took on the job, along with Dr. Sauer & Partners, WSP Canada Inc. and Wood Group, who are responsible for the design of the tunnels and associated structures.

The project involves digging two tunnels of approximately 180 metres long each, while also accommodating track, signaling and communications infrastructure to support future increased rail service. Mary Jane Ferraro, P.Eng., who has a background in structural and transportation engineering and extensive experience in underground construction, including previously on the Niagara Falls Tunnel project (see p. 52), works as a design manager with STRABAG on the project. Ferraro manages the engineering team and acts as the interface between the various design packages. She also plans construction operations and prepares designs to bridge the gap that can exist between

Photo: Metrolinx

The 401/409 twin rail tunnels are fully waterproofed. The waterproofing system consists of a PVC waterproofing membrane installed between the initial lining and cast-in-place final lining. Photo: Metrolinx

engineering drawings and their implementation onsite. Ferraro appreciates the skill and dedication of everyone who worked on the project, highlighting their ability to respond quickly to difficult problems as they arise in an unpredictable underground environment. "I can't stress enough the contribution everyone makes to the successful completion of complex underground construction projects," Ferraro says.

Major work on the tunnels began in April 2019 with construction of the portals and a shaft in the median between the 409 eastbound ramp and 401 eastbound express lanes. This was followed by the installation of a robust pre-excavation support pipe system using auger boring and pipes installed at four locations—the east and west portals, as well as the east and west sides of the shaft—running the length of the tunnel. In October 2019, crews began tunnel excavation below the pre-support pipes. Tunnelling was facilitated using large-diameter sequential excavation method (SEM), which splits the excavation into segments. "The top heading section is excavated first, followed by the invert section," Ferraro explains. Excavators, or roadheaders, dig out small sections that are stabilized with shotcrete and steel girders, and this is repeated until the tunnel has been completed.

Tunnel 1 excavation was completed in July 2020, and construction of the final cast-in-place concrete lining, which includes a waterproofing membrane, began in September of that year. The installation of the pre-support system required the procurement of specialized auger boring machines from Germany, featuring state-of-the art technology. Installation of the pipes to follow the profile of the tunnel roof required that each be installed at a unique position and height. This led to the development of a custom reaction frame system that was modular, movable and able to resist the 320 tonnes of thrust generated by the auger boring machines.

Maintaining safe operation of the highway was the primary concern during tunnelling. A major challenge was working with limited cover to the highway surface—a minimum of 2.5 metres—with strict settlement limits. The contractor was required to perform real-time monitoring of the highway surface and subsurface in order to measure the ground deformation that inevitably develops as a result of excavation works. "The surface is measured using a series of automated total stations, and the subsurface is measured using shape arrays—with the data accessed via web-based software," Ferraro explains. Crews are contractually obligated to stop work when any monitoring point measurement exceeds settlement limits. The installation of the pre-support pipe canopy was critical to protecting the integrity of the highway above. Another challenge was presented because of the close proximity to an active adjacent railway corridor. Complex geometry of the new tunnel and surrounding structures required the construction of a detailed 3D model to ensure tight tolerances were met. "This is the first project I worked on that would have been very difficult to build without 3D models. Despite these challenges, tunnel excavation was executed successfully with minimal impact to the operation of the highway," Ferraro points out. "The team is very proud of this accomplishment."

OTTAWA'S COMBINED SEWAGE-STORAGE TUNNEL PROVIDES DOUBLE SOLUTION

According to Steven Courtland, P.Eng., program manager, design and construction for the City of Ottawa, the Combined Sewage Storage Tunnel (CSST), which opened last fall, originated in two separate projects. "There was a project looking at reducing sewage overflows to the [Ottawa] River, and a separate project looking at basement flooding in the downtown core area," Courtland says. "These two projects were making different recommendations, and it was during design that we pulled [them] together. We realized that we could create…a single tunnel with a dual purpose and solve both of those issues. We probably saved over $50 million on this project."

The City of Ottawa states that the t-shaped CSST, which spans the historic downtown near well-known sites such as the Supreme Court of Canada, Parliament Hill and the United States Embassy, will greatly reduce the frequency of sewage overflows during storms from entering the Ottawa River by adding 43,000 cubic metres—the equivalent of 18 Olympic-sized swimming pools—of sewage storage capacity to Ottawa's existing decades-old sewage system. The tunnels can store untreated sewage until it is ready to be sent to a sewage plant for treatment; *Water Canada* notes that the CSST will also reduce the risk of flooding to 7000 residences in the Glebe and in Centretown. The CSST consists of two tunnels, one running east-west through the downtown core from LeBreton Flats to New Edinburgh Park and the other a north-south tunnel that runs along Kent Avenue from Chamberlain Avenue to existing infrastructure behind the Supreme Court. The tunnels' total length is six kilometres; they are three metres in diameter and 10 to 31 metres below the ground.

"We had two launch sites," Courtland observes. "One was in a large park. The other was right beside the Queensway. It was a parcel of land that was a slope. We took it away and flattened it." But besides the obtrusiveness of the tunnel launch sites, the actual drilling by the tunnel boring machines went largely unnoticed by Ottawa's residents, despite drilling just metres underneath homes. However,

Courtland admits that Ottawa's residents were patient during the four years of construction. "We had 13 other drop shaft sites where we had connections or access to the sewer," Courtland says. "We would have to drop a shaft down through rock that could be 30 metres—or 10 storeys—deep and it would be mere metres from people's homes. Some of these sites took years to construct, and we were right in front of people's front porches and driveways. It was very intrusive for those homes."

The genesis of the CSST lies in the City of Ottawa's *Ottawa River Action Plan*, a series of 17 projects "aimed at enhancing the health of the Ottawa River and protecting Ottawa's water environment for future generations." The project followed a 2008 fine by the provincial Ministry of the Environment against the City of Ottawa for over $562,000 after the city flushed millions of litres of raw sewage into the Ottawa River. According to prosecutors, the city poured 764 million litres into the Ottawa River in the summer of 2006, for which it was fined. Prosecutors also took into account other discharges between 1998 and 2008; to combat the issue, the city, province and federal government spent a combined $232.3 million on the CSST.

"In Ottawa, a lot of people use the river [for outdoor activities]. It certainly wasn't very good publicity for the city, letting people think that we put sewage in the river every time it rains," concedes Courtland, who worked on the project for 10 years. "Almost every time it rained in the summer, we had an overflow." Courtland notes that the city typically saw 20 to 30 overflows per summer. "Now we're going to reduce that to one or two a summer—that's a drastic improvement."

Consulting engineering company Stantec, which designed the CSST in co-operation with Jacobs Engineering, notes on its website: "A combined sewer system uses the same infrastructure to transport sewage and stormwater drainage in wet weather. So, when a big storm fills up that system, the water comes back up and discharges—relieving the system and reducing the risk of flooding…protect[ing] the environment while still protecting the community against flooding. Ottawa's goal was ambitious. They wanted to drastically reduce [combined sewer overflows] into the Ottawa River… the preferred solution was a deep tunnel storage. Basically, there would be tunnels acting as storage reservoirs inside the combined sewer system, which would capture overflow and hold it until the system could handle the excess."

Courtland admits that he was challenged by the project yet thrived. "We actually tunnelled under the [underground] LRT twice," Courtland notes. "We passed under the Rideau River. We passed under the Rideau Canal. We passed under the University of Ottawa, under Tabaret Hall. We had a shaft that was metres from the Supreme Court of Canada."

SUDBURY'S CREIGHTON MINE DIGS DEEP

The more-than-century-old Creighton Mine, located in Greater Sudbury, ON, and owned and operated by Vale, is the deepest nickel mine in the world, and among the deepest mines ever, at more than 2438 metres and counting. That's 4.5 times the length of the CN Tower if you were to put it in the ground. And as if that weren't deep enough, studies have been undertaken to explore mining at depths of up to 3000 metres. That's an impressive feat, considering the geography and geology of the Canadian Shield. Due to

An exterior shot of the tunnel boring machine used in the Combined Sewage Storage Tunnel in Ottawa
Photo: City of Ottawa

The installation of a pre-support canopy was a key component of the safe construction of the 401/409 twin rail tunnels in Etobicoke.
Photo: Metrolinx

Workers in an underground area at Creighton Mine in Greater Sudbury
Photo: Vale

The control room at Creighton Mine, which is famous for its ground control—a critical part of mitigating seismic activity at the mine
Photo: Vale

its unique depth, Creighton is also home to SNOLAB, a world-class research facility that houses the Sudbury Neutrino Observatory. Research conducted at the facility was recognized with the Nobel Prize in Physics in 2015.

Operations at Creighton tap into what is thought to be the largest nickel ore source in the world, situated within the Sudbury Igneous Complex—a section of rock that dates back nearly 1.9 billion years. Vale, a global mining company headquartered in Brazil, is the world's largest producer of nickel, and their Canadian operations near Greater Sudbury produce almost 65,000 metric tonnes of nickel annually. Nickel is a highly sought-after and versatile mineral used in a wide variety of applications and can be found in everything from batteries to car parts. In addition to nickel, a significant amount of copper is extracted from the poly-metallic ore mined at Creighton, along with platinum, palladium, rhodium, ruthenium, iridium, gold and silver.

Mining operations began as an open pit in 1901, with underground stoping beginning soon after in 1906. Operating at extreme depth presents unique challenges, including the need to mitigate high rock stresses, sub-surface seismic activity and native rock temperatures that sit at 42 C in areas. These factors necessitate the use of appropriate mining methods, both bulk and selective, and the use of cooling networks through which air is pumped to provide adequate ventilation to workers. Creighton employs a simple yet effective method in which 45,000 cubic metres per minute of fresh air is drawn from the surface through rock that sits at close to 3 C year-round and acts like a heat exchanger, cooling the air during summer and warming it during winter. As operations move deeper and ventilation needs increase, other cooling options have been considered, including the implementation of a mechanical refrigeration plant and the expansion of the open pit to increase the catchment area and cooling surface available for air that's being drawn underground.

Over the span of more than 100 years, mining methods at Creighton have evolved considerably and have included shrinkage mining, square-set stoping, cut-and-fill mining, block caving, post-pillar mining, mechanized undercut-and-fill mining and large-diameter blasthole method combined with vertical retreat mining. Managing seismic activity—the sub-surface seismic occurrences triggered by mining and excavation operations—is a critical job for Creighton's mining engineers, who employ a series of monitoring and support systems to keep workers safe. Ground control is a key element of defense: "Creighton Mine has become famous for its ground control. Most of the world's dozen or so experts in mining ground control have visited Creighton to find out what goes on there or offer advice on how to improve ground control," Kelly James Strong, P.Eng., then-vice president, Ontario and UK operations for Vale, told *The Sudbury Star*. Seismic events are par for the course with mining operations digging deeper to extract ore and more pressure builds up in the rock near the surface—and events are expected to increase as mining goes even deeper. Most events occur during or soon after production blasts and are often due to the presence of slip faults. An event that registered 3.6 magnitude was reported at Creighton in April 2020 and was thought to be the result of blasting at 2450 metres deep.

The future of Creighton is going deeper, with opportunities anticipated

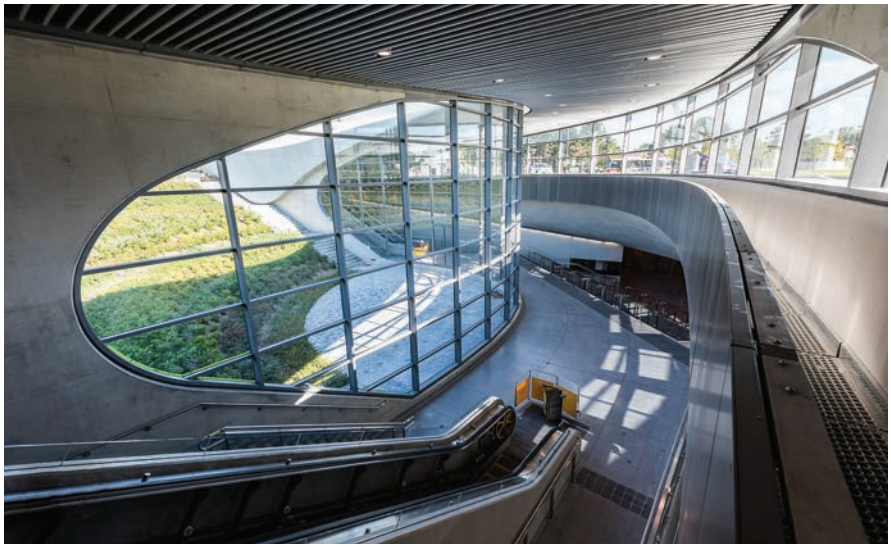
not just in untapped areas, but for remnant ore that was passed over during the previous century due to limited technology and resources—ore that can now be mined safely and efficiently. "The deeper workers go, the richer the ore body is becoming," Strong told *The Sudbury Star*. Creighton is also going greener. The mine is home to an underground greenhouse at the 1463-metre level that grows approximately 100,000 pine trees year-round for use in reforesting activities across the Sudbury Basin, and Vale is also investing in the Clean Atmospheric Emissions Reduction Project, which aims to cut sulfur dioxide emissions from the nickel smelting process by 85 per cent.

"HOLEY" KEY TO TORONTO SUBWAY EXTENSION PROJECT

Tunnel boring machine (TBM) Holey began the first northern tunnel drive for the Toronto-York Spadina Subway Extension (TYSSE) in June 2011, with the first train roaring through the completed TYSSE on December 17, 2017. The Toronto Transit Commission (TTC) TYSSE project consists of an 8.6-kilometre extension from Sheppard West station running northwest through York University within the City of Toronto, before heading north and terminating at the Vaughan Metropolitan Centre in York Region. It's a journey that takes approximately 14 minutes through new twin tunnels and six additional stations. "The TYSSE included 6.2 kilometres of twin tunnels constructed using four TBMs, triple track cross-over structure constructed by the sequential excavation method, and the stations were built using the cut and cover method," says Tony Baik, P.Eng., deputy chief project manager for the TTC. The TYSSE has been recognized with numerous awards, including the 2016 Engineering Project of the Year Award in the large sized company category by PEO's York Chapter.

With an estimated project cost of $3.18 billion, many stakeholders were involved, along with dozens of firms. Arup served as prime consultant for two of the new stations, York University and Vaughan Metropolitan Centre, and provided comprehensive multidisciplinary engineering and consulting services including civil, geotechnical, structural, facades, lighting, mechanical, electrical, communications, plumbing, fire and sustainability. Arup coordinated with many agencies and other consultants, including the tunnel designers and contractors to facilitate the interfacing of the stations with the tunnels. Both stations share innovative designs that presented unique challenges.

York University station, characterized by its boomerang-shape entrance structure and distinct, terraced and landscaped light scoop, features daylight that shines through the concourse down to the platform below through large openings in the concourse slab—a remarkable feat for an underground structure. Arup was tasked with making the station blend in with the existing commons—a green space—to create an architectural piece that was pleasing but not obstructing. Realizing this vision, in partnership with Foster + Partners and Adamson Associates Architects, required a high degree of integration between architectural and engineering design, explains Paul Paquet, P.Eng., associate structural engineer in the buildings team at Arup. Paquet's responsibilities included modelling and analyzing all the structural components that make up the station box, as well as interfacing with engineers across all disciplines to ensure everyone understood the behaviour of



An interior view of the light scoop feature at the entrance to York University subway station, which shines light all the way down to the platform level
Photo: Toronto Transit Commission

Toronto's York University subway station under construction
Photo: Toronto Transit Commission

New twin subway tunnels under construction for the Toronto-York Spadina Subway Extension
Photo: Toronto Transit Commission

the structure and its impact on surrounding areas. Another impressive structural feat was the construction of the top roof. It features an exposed underside that required a crew of 100 to apply concrete in one continuous 15-hour pour in order to ensure uniformity. The project won three 2017 Ontario Concrete Awards for its innovative use of concrete, including Architectural Merit, Material Development and Innovation and Structural Design Innovation.

The station is wedged between two existing buildings, one of which required compensation grouting to control damage from tunnelling and excavation settlement. Arup's team had to manage permanent unbalanced soil loading conditions in concert with the structural voids in the concourse, which added complexity to the design. "Our lateral resisting system in the station was somewhat different than what a standard station's is," Paquet explains. From a civil engineering perspective, the light scoop acted as a basin that presented some difficult drainage and stormwater management constraints the team needed to solve on the site works side. "Despite some existing overcapacity sewers, we were able to provide a passive stormwater management solution underneath the landscaped light scoop using high-volume underground storage chamber systems to help attenuate the water during storm events," explains Peter Preston, P.Eng., associate civil engineer, infrastructure, at Arup. "It was one of the more complex civil problems we needed to solve on the site, and of course it's buried."

Preston, who was involved with the design and coordination of road works, utility diversions, drainage and construction staging at both sites, highlights public, traffic and environmental impacts as a key consideration on such projects, which, he says, require clever design and sensitive construction planning. Mitigating these impacts was a major factor at both sites, particularly Vaughan Metropolitan Centre station, now a bustling transit hub adjacent to a busy regional highway, requiring a temporary traffic bridge over the excavation during construction. A significant effort during the design process goes into communicating and coordinating with the public, city departments and other stakeholders, such as environmental, transit and utility agencies, to minimize disturbances. "This is especially true for mega transit projects, which require complex construction techniques and large work zones," Preston explains. At Vaughan Metropolitan Centre station, where Grimshaw was the lead architect, futureproofing also came into play. As a multi-modal terminal station, it was designed with underground connections to two bus terminals and knockout panels for the ability to interface with future adjacent developments.

NIAGARA FALLS SEES MASSIVE TUNNEL BUILT TO ITS GENERATING STATIONS

Ontario Power Generation's (OPG's) Niagara Tunnel project, which saw the construction of a third tunnel to divert water downstream from the Niagara River to the two Sir Adam Beck generating stations in Niagara Falls, ON, was an enormous project. Completed in 2013, the tunnel is 10.2 kilometres long, 12.7 metres wide, and diverts 500 cubic metres of water per second to hydroelectric generating stations located a fair distance from the waterfalls from which they derive much of their power. Part of this may be due to the *1950 Niagara Treaty*, which protects the natural beauty of Niagara Falls. But, importantly, the location of the two stations downstream precipitated the construction of canals, and later tunnels, on top of the Niagara Escarpment, allowing water to drop 89 metres—higher than the 55-metre-tall falls—thus creating more power. This isn't lost on Mary Jane Ferraro, P.Eng. "The existing generating station already had the capacity to generate more electricity," Ferraro says. "The only thing missing was the water, so the tunnel was constructed to deliver this additional flow."

Ferraro is a design manager at STRABAG, for whom she is currently working on the 401/409 rail tunnels in Toronto, ON, for Metrolinx (see p. 47). But during the seven-year Niagara Falls project, Ferraro was a design engineer. "I was involved with the planning and execution of all of the major elements of the project," Ferraro asserts. "In-water work,

Concrete was dropped over 100 metres from the surface down to the Niagara Tunnel, where it was remixed and loaded into concrete trucks, which delivered it to the final lining operation.
Photo: STRABAG

An aerial photo of Niagara Falls, ON, showing the route of the Niagara Tunnel under the heart of the city's tourist area
Photo: STRABAG

tunnelling, drilling deep shafts, concrete lining work, grouting—all the things I've done since I did them at the Niagara Tunnel first. All of these elements were projects on their own, and I was lucky enough to be in a position where I was involved in almost every aspect of the job."

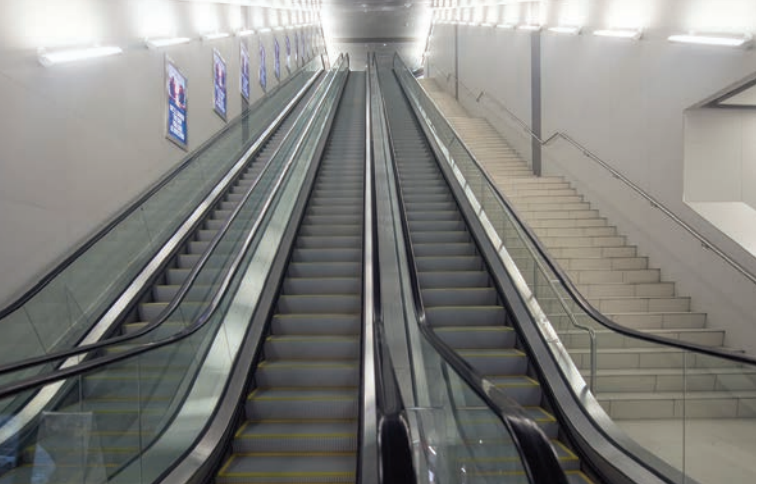
Ferraro says that many stages of the project encountered challenges that required modifications to the original plans. She cites the use of the 14.4-metre Main Beam tunnel boring machine (TBM), then the world's largest main beam hard-rock TBM, initially used to cut through Queenston shale. "The machine excavates the rock; then crews install rock bolts, wire mesh and steel ribs in the roof to initially support the rock," Ferraro explains. "And 40 metres back, there's a series of robots that spray shotcrete around the circumference of the tunnel to complete the temporary liner. The original plan was to excavate the entire tunnel, then start constructing the permanent liner, which is cast in place with concrete." But digging through shale proved to be problematic: "We had major problems with overbreak and falling rock," Ferraro recalls. "After a kilometre of trying to deal with these conditions, we changed the alignment of the tunnel. The design team collaborated with [OPG], and all agreed that the best solution was to move the tunnel into the upper rock layers, which were more competent. This involved extensive redesign on the engineering side, and we had to make a lot of modifications to the machine to be able to withstand all this falling rock and access the tunnel roof, which was three metres higher than it was meant to be, and to install pre-support pipe umbrellas. The mechanical team spent months and months rebuilding the main working platform, replacing nearly all of the original equipment on the machine so it could continue excavating." By the time the tunnelling was complete, the team had 60,000 cubic metres of overbreak and voids in the roof that had to be backfilled.

The design of the backfill system was one of the projects on which Ferraro played a key role: "The overbreak had to be backfilled before the final lining was placed," Ferraro says. "[We had to] come up with a system to fill all of these voids. We built prefabricated panels using wire mesh and steel ribs and hung them from rock anchors installed in the tunnel roof. Then we sprayed shotcrete from below and pumped the concrete above the panels. We did over two kilometres of backfilling with these panels. It was a very complex operation in itself. The equipment was custom designed and manufactured in Europe and then shipped here. It took a year to plan and procure the equipment and another year to execute."

The tunnel's lining, which consisted of membrane, unreinforced case-in-place concrete and prestress grouting, was done last. However, the tunnel was behind schedule. Ferraro recalls: "We couldn't finish excavating the tunnel before we started the tunnel lining system. We had to do up to seven major operations running concurrently, which isn't done very often, due to logistical issues. It's tricky to install a membrane and pour the lining around a conveyor belt transporting rock out of the tunnel. We had to custom design equipment to make this happen. In the end, we had hundreds of metres of bridges, ramps and multi-storey platforms that managed the logistics required to support the concurrent operations." Most of the concrete was delivered by truck with specially designed axels, but as work progressed deeper into the tunnel, the delivery time became too long. Ferraro assisted an innovative solution that drilled holes from 120 metres above, allowing them to mix the concrete and drop it to trucks waiting in the tunnel. "There were endless problems to solve, and the longer the job went on, the more there was to do," Ferraro recalls, adding that despite the enormity of the project, she looks back on her time there with fondness.

PASSENGERS ACCESS TORONTO ISLAND AIRPORT THROUGH UNDERWATER TUNNEL

When it opened in the summer of 2015, the Billy Bishop Pedestrian Tunnel gave travellers an option other than the ferry to arrive at the Billy Bishop Toronto City Airport. Yet the $82.5 million tunnel, funded through a $20 airport improvement fee that departing passengers pay, arrived with controversy. Toronto Mayor John Tory called it a "modern, practical connection between the airport and the mainland," while Tory's predecessor as mayor, then city councillor Rob Ford, noted: "Had it not been for the agreement reached in July 2011 between my administration and the Toronto Port Authority (now PortsToronto), we may have had to wait another 40 years." Ford, the late brother of current Ontario Premier Doug Ford, was, of



The Billy Bishop Pedestrian Tunnel has one of the longest escalator systems in Canada. Photo: PortsToronto

The Billy Bishop Pedestrian Tunnel under construction in Toronto, ON Photo: PortsToronto

course, referring to the aborted fixed link—a bridge—by his predecessor as Toronto mayor, David Miller, in 2003.

Toronto's island airport has been around since 1939, yet it is much smaller than Toronto Pearson International Airport. But by the end of 2006, regional airliner Porter began flying out of the airport, and by 2011, the airport was Canada's ninth busiest with 1.5 million passengers a year, making the 90-second ferry ride to the island impractical. Pedestrians can now access the tunnel from the foot of Bathurst Street by entering a one-storey building, taking one of six elevators to descend 30 metres to the tunnel, and walking across or using one of four automated sidewalks that move at 2.3 kilometres per hour. When they reach the island-side of the tunnel, pedestrians can access the airport by going up one of the longest escalator systems in Canada, one of two elevators or a staircase of 153 steps to the top. Interestingly, and perhaps unbeknownst to many of those same pedestrians, the tunnel has a double purpose—it also incorporated water and sewage mains to and from the Toronto Islands, saving the City of Toronto more than $10 million. (The Toronto Islands are home to parks, beaches and 600 year-round residents.)

As early as 1997, engineering firms Hatch and Mott MacDonald were retained by PortsToronto to build a connecting bridge; by 2010, the plan had changed to an underwater tunnel and Hatch was retained as PortsToronto's representative on the project. Arup was the lead design consultant delivering the geotechnical, structural, tunnelling civil, mechanical, electrical and plumbing engineering, fire and life safety and IT/telecom services on behalf of the design-build-finance-maintain consortium led by Forum Equity Partners and design builders PCL Constructors; Technicore Underground was the lead tunnelling subcontractor. Additional design services were provided by ZAS Architects, EXP and Isherwood Associates. Of the 260-metre-long tunnel, located more than 30 metres below the ground surface and constructed within the bedrock beneath Lake Ontario, Andrew Cushing, MS, P.Eng., senior engineer with Arup; Jon Hurt, PE (New York), a principal at Arup; and Mike MacFarlane, P.Eng., then an engineer and project manager with Technicore Underground, cowrote in a paper for the 2014 Tunnel Association of Canada conference that the Billy Bishop tunnel "is the first-known underwater pedestrian tunnel to an airport facility in the world. It was constructed in the [thin] horizontally bedded Georgian Bay Shale formation characteristic of southern Ontario and employed a unique pre-support technique comprised of seven 1.85-metre diameter interlocking horizontal secant drift bores, each sequentially drilled by tunnel boring machines and backfilled with mass concrete."

Part of the reason for the unique interlocking drift-arch design is to cope with the geology of Lake Ontario. "The 10-metre-cut diameter of this tunnel makes it one of the largest size tunnels to be constructed in shale bedrock of the Greater Toronto Area," notes Arup on its website. "The intact strength of the shale is relatively low. In addition, the rock mass is very thinly bedded in the horizontal direction and is under a rather high in-situ horizontal stress. These geologic factors present the risk of slabs of rock falling from above during tunnel excavation, especially for large diameter openings."

The conference article further details: "Once drilling and backfilling of the series of seven interlocking crown drift bores was completed, excavation of the main tunnel central cut commenced. This work was advanced from [the] mainland to [the] island portal over a two-month period using a Liebherr 934 excavator with [a] rockbreaker attachment. As a means of dust control, a positive air stream was induced toward the island portal through one of the two open drift bores at/below the main tunnel springline, with fans installed at both the mainland and island portals. The rock sidewalls were inspected by Arup staff on a regular basis, and the locations of vertical joints and water seeps were noted. The primary vertical joint set (coincident with the major horizontal stress direction) was oriented transverse to the tunnel axis."

Though the tunnel has been largely quiet over the past year and a half as a result of the COVID-19 pandemic—Porter hasn't flown a flight since March 21, 2020—the Billy Bishop Pedestrian Tunnel may once again be bustling with traffic when the airport resumes flights this summer. **e**

ONTARIO ENGINEERS HONOURED WITH PRESTIGIOUS AWARDS

By Marika Bigongiari

Franz Newland, PhD, P.Eng., an associate professor at York University's Lassonde School of Engineering, has been awarded the St. Lawrence Section Outstanding Teaching Award by the American Society for Engineering Education. Photo: Lassonde School of Engineering

Praveen Jain, PhD, P.Eng., professor and director of the Queen's University Centre for Energy and Power Electronics Research, has been awarded the 2021 Institute of Electrical and Electronics Engineers Medal in Power Engineering. Photo: Praveen Jain

Franz Newland, PhD, P.Eng., associate professor, teaching, and undergraduate program director in the department of earth and space science and engineering at the Lassonde School of Engineering at York University, has been awarded the prestigious St. Lawrence Section Outstanding Teaching Award by the American Society for Engineering Education. Newland has restructured several courses within the space engineering curriculum, enabling second- and fourth-year space engineering students to work together on a space mission project and is currently working with a group of undergraduate students, staff, faculty, alumni and industry partners to prototype a new way of supporting a space engineering education. Newland has received numerous academic innovation funding to develop blended material delivery and innovations, including the space engineering prototype program. As a faculty advisor for student-led curricular developments, Newland has supported a number of student clubs and activities. He is also a major collaborator with Engineering Change Lab, working to help the engineering community across Canada better prepare for the impacts of science and technology. Newland is an associate fellow of the American Institute of Aeronautics and Astronautics and a member of the Royal Aeronautical Society.

Slobodon Simonovic, PhD, P.Eng., engineering professor emeritus at Western University, has been named one of the world's 1000 most influential climate scientists by Reuters on their Hot List. Hot List rankings are based on how many research papers scientists have published on topics related to climate change; how often those papers are cited by other scientists in similar fields of study; and how often those papers are referenced in the lay press, social media, policy papers and other outlets. Simonovic, who specializes in water resource management and flood prevention, maintains that predicting future flood risks by looking back on previous patterns—such as the probability of a flood occurring in any given year, a metric known as the 100-year flood risk—has become too imprecise. He was surprised to have made the Reuters list. "We rarely have a very clear indication of how far our work reaches and what its impact is," Simonovic says. "So, I think this Reuters list is one way of learning how far and how widespread is the interest in the work that my group is doing." Simonovic began his work at the university in 1999 and has since become a leading research voice on the flooding resilience and vulnerabilities of infrastructure, such as pipes, floodways, roads, homes and sewage plants. Simonovic is director of engineering studies with the Institute for Catastrophic Loss Reduction and has received awards for excellence in teaching, research and outreach. He has also published more than 550 professional papers and three textbooks, was named a fellow of the Royal Society of Canada and inducted into the Canadian Academy of Engineering.

Praveen Jain, PhD, P.Eng., professor and Canada research chair in power electronics and director of the Queen's University Centre for Energy and Power Electronics Research, has been awarded the 2021 Institute of Electrical and Electronics Engineers (IEEE) Medal in Power Engineering for contributions to the theory and practice of high-frequency power-conversion systems. He is the third Canadian to receive this medal. The IEEE Medal in Power Engineering recognizes researchers who have made outstanding contributions to technology associated with the generation, transmission, distribution, application and utilization of electric power for the betterment of society. Medals are the highest honours the IEEE bestow on members. "This medal symbolizes 40 years of my life's work in the practical applications of power engineering," Jain says. "I am indebted to Queen's University for providing me a world-class platform to realize my dream. I dedicate this medal to my students and collaborators who have contributed enormously to my success." Over the past two decades at Queen's, Jain has helped transform the way society understands electrical energy, advo-

cating for its sustainable generation, distribution and utilization and contributing to innovations in applications for space, telecommunications, computer, induction melting and renewable energy industries. His innovative digital control techniques are a patented technology, adopted by most chip manufacturers, that has been incorporated in the development of digital power controllers with ultra-fast dynamic response for computer microprocessors. He has secured over $35 million in external research funding, and his work has resulted in over 600 publications and more than 100 patents. Jain has been named a fellow of the Engineering Institute of Canada, Canadian Academy of Engineering, Royal Society of Canada and IEEE.

Mohamed Bakr, PhD, P.Eng., a professor in the department of electrical and computer engineering at McMaster University, has been awarded the university's President's Award for Outstanding Contributions to Teaching and Learning. Bakr was recognized for his contributions and dedication to education through innovation, continued excellence in teaching and enhanced student learning. Bakr has developed a multi-faceted approach to teaching centered on what he considers a moral responsibility to his students. In 2013, he revolutionized the classroom model for his courses, transitioning theory-based components to online publicly available YouTube videos. Over 180 videos later, his work has attracted more than half a million views and counting. With theory-based components online, Bakr uses classroom time for active learning, which allows him to focus on student engagement by using practical, real-life applications to promote a better understanding of course content. In 2018, he received a McPherson Institute fellowship to apply virtual reality to the teaching of engineering courses and devoted his efforts to developing two tools that apply virtual reality to electronics and electromagnetics. Bakr's teaching style and adoption of modern technologies became especially relevant during the COVID-19 pandemic. "The initial foundation of this work was laid between 2018 and 2020. When the pandemic struck, I pushed harder in this area with support from the faculty of engineering, and I was able to construct a seamless transition to online learning," Bakr says. Bakr has received numerous awards for mentorship and teaching, including the Dean's Teaching Honour Roll from 2015 to 2019 and a Faculty Appreciation Award from the McMaster Engineering Society in 2020.

Stantec—a global architecture, engineering and design firm—has been recognized by the American Indian Science and Engineering Society (AISES) as one of the Top 50 STEM Workplaces for Indigenous STEM Professionals for the second consecutive year. AISES released its list in the Spring 2021 issue of *Winds of Change,* the organization's national magazine, which focuses on advancement for Indigenous Peoples of North America and the Pacific Islands in STEM studies and careers. Firms selected for the AISES Top 50 list must meet a set of criteria, including diversity recruitment efforts; recruiting for jobs in the STEM fields; actively recruiting within Indigenous audiences; and sustained support of the AISES mission. "We are thrilled to be recognized a second time by AISES for our efforts to create an inclusive STEM work environment," said Adam Leggett, Stantec's Alaska Native Program manager. "We're always looking for avenues and opportunities to build stronger connections with communities and deeper partnerships with Indigenous Peoples and businesses. We want to be a place where everyone feels free to be true to themselves—and considering the histories, cultures and values of Indigenous communities is vital to that mission." Stantec was also named one of America's Best Employers for Women by Forbes and one of Canada's Best Employers and has also been recognized on the 2021 Bloomberg Gender-Equality Index. Stantec recently launched the Stantec Equity and Diversity Scholarship to provide those in historically underrepresented and Black, Indigenous and people of color (BIPOC) groups with financial aid, with an aim towards contributing to the creation of a critical mass of talented students and more diverse workforce that is better represented in the industry.

ENGINEERING STUDENTS RECEIVE SPECIAL HONOURS

Andrea Chakma, a second-year mechatronics engineering student at the University of Waterloo, received the Canadian Engineering Memorial Foundation's 2021 Rona Hatt Award, which is named in memory of Hatt, the first-known female Canadian chemical engineer. Chakma was recognized for her leadership activities and community contributions. Although the $5,000 Rona Hatt prize is earmarked for a woman in a Canadian chemical engineering program, Chakma qualified this year in the absence of applications received from chemical engineering students. The foundation's annual Ambassador Awards program celebrates women in undergraduate engineering programs who have demonstrated leadership activities and are active in their communities and in extracurricular activities. Outside of the classroom, Chakma is a volunteer with Girl Guides of Canada, as well as an engineering ambassador for the faculty, the outreach commissioner for the Engineering Society and the living learning community leader for Waterloo's women in engineering program.

University of Toronto fourth-year materials science and engineering student **Morris Huang** has been named the first recipient of the Troost ILead Difference Maker Award, which was established in 2020 by the Bodhi Tree Fund, a private giving foundation. The $50,000 award was launched to accelerate the career of a graduating student with a vision to make a positive difference in their communities and beyond, with candidates evaluated on leadership experience, strength of vision and character. Over the past year, Huang helped lead Global Spark, a student-run education non-profit that seeks to bridge theory and practice within global development education by helping students connect what they learn in the classroom with on-the-ground work in areas like climate change, renewable energy and vaccine distribution. The program has reached more than 10,000 students to date. Next, Huang will bring his passion for education innovation to the Delft University of Technology, where he will pursue a master's degree in engineering and policy and analysis with

University of Toronto materials science and engineering student Morris Huang has been named the first recipient of the $50,000 Troost ILead Difference Maker Award, established in 2020 by the Bodhi Tree Fund.
Photo: Morris Huang

a vision to increase access to quality education for K-12 and post-secondary students around the globe.

A group of University of Windsor environmental engineering students won a student design competition held by the Water Environment Association of Ontario. **Cay-Yen Ang, Jordan Goddard** and **Fabianna Palacios** took top honours against schools from across the province to address a real-world challenge: reducing overflow of wastewater from the treatment and collection system in Port Dalhousie, a community in St. Catharines, ON. The team developed a design to eliminate overflow with minimal cost while taking into consideration the effects of climate change. The submission recommended adding chemicals to improve the settling of solids during storm events, implementing fine bubble diffusers to increase the capacity of biological treatment and the use of existing tanks on the site to disinfect water with chlorine. "Participation in such competitions is a great opportunity to help increase the visibility and profile of Windsor engineering," said faculty advisor and civil and environmental engineering professor Rajesh Seth, PhD, P.Eng. "Winning it is a bonus, as they now move on to the North American competition in Chicago this October."

NEW SCHOLARSHIPS SUPPORT BLACK AND INDIGENOUS STUDENTS

The University of Windsor faculty of engineering is offering new entrance scholarships to support Black and Indigenous students. The $1,000 Black Students in Engineering Entrance Scholarship will be awarded annually to 12 students who are admitted directly from high school to first-year engineering, and the University of Windsor is offering to match up to $50,000 in donations to the scholarship. The faculty is also offering an unlimited number of $1,500 entrance scholarships for Indigenous engineering students. Students will receive automatic consideration for these scholarships based on their entrance application profiles. For more information, contact Katie Mazzuca at katie.mazzuca@uwindsor.ca. **e**

INTRODUCING PEO COUNCIL 2021–2022

Executive Committee

Christian Bellini, P.Eng., FEC
President

Christian Bellini began his engineering career in 1995 at a small structural engineering firm called Blackwell. Today, he is a principal at the same firm, now with a staff of 60 and offices in Toronto and Waterloo, ON; Victoria, BC; and Halifax, NS, and an international portfolio of projects. A key characteristic of the firm is a high level of engineering engagement at all levels, allowing Bellini to carry out engineering design daily in addition to his administrative duties. His volunteer career at PEO began in 2005, when he joined the Experience Requirements Committee, serving in later years as vice chair and chair. Over the years he has served on (and in some cases chaired) many of PEO's regulatory committees and task forces. He was first elected to PEO Council in 2016 and is now serving as PEO's 2021–2022 president. In 2018, he was appointed to the board of directors of Engineers Canada and currently also sits on Engineers Canada's Finance Audit and Risk Committee, previously serving on the Canadian Engineering Qualifications Board. He has contributed to various Engineers Canada initiatives, including competency-based experience assessment, the Canadian Framework for Licensure and currently as vice chair of PEO's 30 by 30 Task Force, whose mandate relates to the Engineers Canada initiative to see 30 per cent of newly licensed engineers be female by 2030. On an academic front, Bellini has taught structures courses at the University of Waterloo and Laurentian University. He is also frequently invited as a guest critic at Architecture Studio Reviews at University of Toronto, Ryerson University and Dalhousie University.
cbellini@peo.on.ca

Marisa Sterling, P.Eng., FEC
Past president

Marisa Sterling is a distinguished engineer and academic administrator with over 20 years' experience working and volunteering in the engineering field, in the private and public sectors. Most recently, she served as president of PEO, helping to lead the Council's Governance Roadmap, implementation of continuing professional development and anti-racism exploratory work. Sterling is assistant dean and director of diversity, inclusion and professionalism at the University of Toronto's (U of T's) faculty of applied science and engineering. She previously worked in the consumer products industry in R&D, supply chain and brand management, and for PEO as manager of enforcement and lead of the repeal of the industrial exception. Her extensive strategic and operational stewardship has positively impacted students and engineers. Through the Ontario Professional Engineers Foundation for Education, where she served as president for eight years, she helped develop student knowledge and skills. Sterling also advanced EIT leadership development by helping create PEO's G. Gordon M. Sterling Engineering Intern Award, named after her late father, who was also PEO president. With advancements in digital technology, she has championed Engineering Change Lab to find ways to transform the engineering community to better serve the people of Ontario. A chemical engineer from U of T and member of Oxford Business Alumni Network, Sterling received the U of T Arbor Award in 2015, the Engineers Canada Meritorious Service Award for Community Service in 2016, was named a Woman of Distinction by the Canadian National Exhibition Association in 2016, made a fellow of Engineers Canada in 2017 and received the Canada 150 Heritage Pin in 2018. In her spare time, she enjoys being a Warden of Camp 1, annually obligating students and graduates who have the academic qualifications for the P.Eng. licence. msterling@peo.on.ca

Nick Colucci, MBA, P.Eng., FEC
President-elect

Nick Colucci received his engineering degree in civil engineering from the University of Waterloo in 1987. He is currently working as the director of infrastructure services and engineer at the Town of Erin, ON, where he manages the infrastructure, roads, recreation, water, wastewater and engineering departments. Colucci started his career 35 years ago at a consulting engineering firm where he was responsible for various stages of infrastructure projects, including design, construction management, contract administration and project management. Colucci went on to open his own firm, which he operated successfully until eventually moving to a municipality in 2008. He has volunteered for PEO throughout his 35-year career, including holding positions as East Central Region councillor and Eastern Region councillor. He currently holds positions on volunteer boards, including the Municipal Engineers Association, Ontario Public Works Association and Ontario One Call board of directors. In the past, Colucci held a number of volunteer board positions, including the Durham Public Works Association president, Canadian National Exhibition board of governors, National Spa and Pool Institute Toronto president, Bethesda House Ride for Refuge Committee, Waterloo Engineers in Toronto president, Emily-Omemee Skating Club president and St. Paul Catholic School Council. Colucci continues to volunteer his time for a number of philanthropic organizations and will be participating in the 2021 Wounded Warriors Canada Battlefield Bike Ride (BBR21) to celebrate, commemorate and reflect on Canada's considerable contributions to the liberation of the Netherlands.
ncolucci@peo.on.ca

Marilyn Spink, P.Eng., CSR-P
Vice president (elected)

Marilyn Spink is an award-winning professional engineer (1995) with extensive metallurgical processing expertise, having spent over 25 years managing the technical delivery of complex steelmaking and mineral development projects throughout the world. In progressive leadership roles of increasing responsibility, she has successfully managed multi-discipline engineering design teams to deliver projects located in North and South America, Africa and Southeast Asia ranging in value from $500 million to $9 billion (USD). Spink has served as a director on several corporate boards. Most recently, she completed two three-year term appointments as an Ontario lieutenant governor appointee to PEO Council, the largest engineering regulator in Canada with over 80,000 members. She has been a member of the Institute of Corporate Directors for over 12 years. She is currently on the Board of Avalon Advanced Materials Inc., a publicly traded Canadian mineral development company focused on minerals for use in clean energy and new technology and recognized for its sustainability and environmental stewardship as a "Future 40 Responsible Corporate Leader in Canada." Spink is also a sought-after speaker in the mining and engineering sectors, most recently being named a Canadian Institute of Mining Distinguished Lecturer in 2018. Spink earned her bachelor of applied science in materials and metallurgical engineering from Queen's University (1992) and is a certified sustainability practitioner. mspink@peo.on.ca

Chantal Chiddle, P.Eng., FEC
Vice president (appointed)

Chantal Chiddle holds a civil engineering technology diploma from St. Lawrence College (Kingston) and a BEng degree in civil engineering from Lakehead University (Thunder Bay). She was licensed by PEO in 2005 and is a member of the Ontario Society of Professional Engineers. Chiddle has over 20 years of experience in the water and wastewater industry. Five years were spent working at a smaller consulting engineering firm primarily involved in municipal projects, and over 10 years of experience was gained working for utility companies, including the multi-utility company Utilities Kingston. Chiddle's practice focus in design and project management for water and wastewater projects prepared her for her current role. In 2015, she moved to the heavy civil construction industry as a field engineer/senior engineer working on infrastructure reconstruction projects. Chiddle has spent 13 years as a volunteer in the PEO chapter system in Kingston as vice chair, chair and past chair. Her service in Kingston includes website admin, communications committee chair, the Scholarship Committee and the Education/Outreach Committee. Chiddle has assisted in organizing chapter events, as well as volunteering at more. She is an avid reader, a world traveller, a former army brat and enjoys listening to live music. She is looking forward to the challenge of giving back to the engineering profession while serving as the Eastern Region councillor and appointed vice president. cchiddle@peo.on.ca

Scott Schelske, P.Eng., FEC
Appointed councillor

Scott Schelske is a retired professional engineer in Ontario who worked for 45 years after graduating with a BSc in mining engineering from Queen's University in 1975. His extensive experience in operations, engineering, construction and consulting includes decades in a supervisory or managerial capacity of over $1 billion in capital projects. He has experience in education as both a high school teacher and headmaster of an underground mine training facility and was certified as an industrial and safety trainer. He has written contracts, specifications, training manuals and guidelines for both government and industry. Notable positions include chief engineer at the Griffith Mine, the largest mining operation in Ontario at the time; quarry manager of Cold Spring Granite Company, the largest granite quarrier in the world; regional mineral development consultant with the Ontario Ministry of Northern Development and Mines, where he was nominated for an Amethyst Award and was the Ontario Government's team leader for permitting of over 50 mining ventures; and manager of mining and engineering at the Lac Des Iles Mine, North America's largest palladium producer. Schelske left mining and transitioned into civil engineering with a local consulting firm and spent the last 13 years of his career working with Indigenous Peoples managing two Tribal Council technical services departments. As such, he was the professional project manager for over 100 capital projects, plus the construction or renovation of over 200 housing units for the Anishinaabe People. Schelske held various positions on the executive for PEO's Lake of the Woods Chapter for 22 years, was named a fellow of Engineers Canada and inducted to PEO's Order of Honour for 2020. He was also given a lifetime achievement award by the Worldwide Who's Who for technical and engineering professionals. sschelske@peo.on.ca

Patrick J. Quinn, PhD, P.Eng., C.Eng., FEC, FCAE, FIEI
Councillor-at-large

Patrick Quinn is a retired founding partner, Quinn Dressel Associates, consulting structural engineers, one of Canada's foremost structural engineering firms responsible for many award-winning landmark buildings throughout North America, Europe, the Middle East and Asia, including the CBC Broadcast Centre, Royal Bank Plaza and Scotia Plaza in Toronto; the Calgary City Hall; the Elf Aquitaine Tower, Paris; and the Stock Exchange Centre in Shanghai. Quinn has been involved in the affairs of PEO for many years, including president 1999–2000 and 2006–2007. His public affairs history includes: member of the board of the Montreal Federation of Catholic Charities, brief to the Ontario Government Legislative Committee on Separate School Funding, brief to the Ontario Government Judicial Committee on revisions to the *Professional Engineers Act* (PEA); and presentation to the Canadian Committee on Women in Engineering, presentation and brief to the Canadian Committee on Violence Against Women. Quinn has also taken a public position on the issue of women in engineering and has been a leader in the campaign to remove barriers and to provide a positive environment. He also led the successful legal challenge to the Ontario Government's interjection into the PEA. Quinn has published articles in major newspapers and professional magazines, including a major piece on safety in our universities published in the *Toronto Star*. He has also been a guest speaker at many universities and on radio programs and has appeared on CBC, CTV, TVO, Discovery, CBC Newsworld and Vision Networks Interviews and has been featured in profiles in newspapers across the country, including engineering publications, the US News and in business journals.
pquinn@peo.on.ca

Councillors-at-large

Michael Chan, P.Eng., FEC

Michael Chan is a former project manager with SHL Systemhouse, regional director with Olivetti Canada Limited and manager of chapters with PEO. As PEO chapter manager for eight years, Chan helped develop PEO's Government Liaison Program (GLP) and associated chapter GLP committees. He established principled administrative processes to effect the requisite changes, with an emphasis on fairness and transparency. His efforts led to many significant improvements and advancements in the chapter system. After retiring from PEO, Chan began volunteering for the association. He joined the executive of the Willowdale/Thornhill Chapter, where he helped improve the chapter's business plans, activity reports and operations. He also invigorated the chapter's government relations efforts while chairing its GLP committee for two years. Chan served on PEO's Advisory Committee on Volunteers, including three years as chair. He also served two years on PEO's Finance Committee as vice chair and chair and three years as lieutenant governor-in-council appointee. He currently serves as a member of the Discipline and Registration committees. Besides his volunteer commitments with PEO, Chan has served as a member and past president of the Federation of Chinese Canadian Professionals and a past co-chair of the Chinese Community Liaison Committee of Toronto Police Services 42 Division. He was awarded the OPEA Citizen's Award in 2007 and inducted as a Member of the Order of Honour in 2015 to recognize his contribution to PEO and the profession. He was selected as a recipient of a Canada 150 medal for outstanding contribution and service to the community and was also awarded the 20-year Ontario Service Award.
mchan@peo.on.ca

Leila Notash, PhD, P.Eng., FEC

Leila Notash is a professor in the department of mechanical and materials engineering at Queen's University. She was an assistant professor at the University of Windsor prior to joining Queen's. Notash grew up in Iran and received her BASc, MASc and PhD degrees in mechanical engineering from the Middle East Technical University, Turkey, University of Toronto and University of Victoria, respectively. Licensed by PEO in 1996, she joined PEO as a member of the Academic Requirements Committee (ARC) in 2003, served as the vice chair and then chair of ARC from 2015 to 2018 and was vice chair of Kingston Chapter from 2015 to 2019. Notash is an associate editor (AE) of the *Mechanism and Machine Theory*, AE (2014–2020) and guest AE (2021–2022) of the ASME *Journal of Mechanisms and Robotics* and was an AE of the CSME *Transactions* (1999–2017). She is an elected member of the ASME Mechanisms and Robotics Committee (2016–2024) and has been the symposium/program chair/co-chair of ASME IDETC. She was a member of the CCToMM executive (1998–2004) and International Federation for the Promotion of Mechanism and Machine Science Permanent Commission on Communications (2001–2011) and was the chair of PC from 2006 to 2011. Notash has served on the Queen's University Senate from 2009 to 2012 and 2013 to 2022. She is committed to equity, diversity and inclusivity (EDI) and has championed EDI among her students. She has been a member (2009–2011, 2018–2020) and chair (2010–2012) of the Queen's Senate Educational Equity Committee. She was the Canadian coordinator of an international capstone design project to provide collaborative international experience for undergraduate students (1997–2003). She is honoured to serve on PEO Council and contribute to the profession. leila.notash@queensu.ca

Patrick J. Quinn, PhD, P.Eng., C.Eng., FEC, FCAE, FIEI

(see Executive Committee)

Regional councillors

EASTERN REGION COUNCILLORS

Chantal Chiddle, P.Eng., FEC

(see Executive Committee)

Randy Walker, P.Eng., FEC

Randy Walker received his BEng from Ryerson University and was licensed by PEO in 1996. He started out working in an electrical department at a papermill in Trenton, ON, moved up to IT and plant engineering and then to department manager. In 2010, Walker went into construction and worked on many interesting projects at CFB Trenton and Kingston. His most recent position is automation engineer. Walker has spent 13 years in the chapter system, starting out as webmaster, moving on to chair for seven years and past chair for the previous five years. He is also a webmaster and GLP representative for the Quinte Chapter. Walker enjoys motorcycles, reading and being challenged. He is looking forward to the next year serving as Eastern Region councillor. rwalker@peo.on.ca

EAST CENTRAL REGION COUNCILLORS

Peter Cushman, P.Eng., ITIL V5

Peter Cushman is a well-recognized professional engineer with two decades of practical experience in private industry. He has contributed to the advancement of the fields of cellular networking, cybersecurity and fraud management with creative solutions to complex problems. Cushman is a visionary, passionate individual and a driven entrepreneur and proud owner of a green technology firm. He believes in voluntarism and giving back to Ontario's society and its engineering community. As a teacher, he shared his knowledge, educating the younger generation of engineers and technologists. With his leadership and understanding of governance, Cushman had a positive impact on the performance of several community-based organizations. He was vice president of advocacy at the York Region Parents Association, vice chair of Mohandes (engineers and architects) and vice chair of AlphaPlus (digital technology in adult education). As a member of the board of directors of the Markham Arts Council, he helped serve and enhance the community's well-being and quality of life. On the board of PEO's York Chapter, Cushman collaboratively initiated a constructive and structured approach, creating a positive impact on the public and greater engineering community. He has been an active debater on issues facing our profession for two decades. Cushman has gained valuable political experience as part of the core campaign teams of local political parties at all three levels of government. He is committed to contributing his political experience to PEO Council to defend professional self-regulation while preserving the public interest. Cushman is focused on identifying and addressing vulnerabilities to systemic racism and discrimination within PEO's licensing, complaints, discipline, enforcement and election processes as chair of the Anti-Racism and Anti-Discriminatory Exploratory Working Group. pcushman@peo.on.ca

Christopher Chahine, P.Eng., PMP, SSBBP

Christopher Chahine has 11 years of professional work experience at Toronto Hydro along with a handful of leadership certifications from several universities in Ontario, including University of Windsor, University of Toronto and York University Schulich School of Business. Alongside a P.Eng. licence, Chahine has a diverse experience and holds Project Manager Professional (PMP) and Six Sigma Black Belt Professional (SSBBP) designations and specializes in efficiency and leadership. He currently works as a system planner where he is the lead engineer for short- and long-term system reliability and strategic planning for transformer stations and feeders in Scarborough, ON. His recent work experiences include analyzing and innovating the electrical distribution system, assessing asset conditions and responding to customer loading requests such as Scarborough Town Centre, TTC Scarborough subway expansion, Metrolinx GO Transit Lakeshore expansion, Highway 401 road widening and feasibility studies in Scarborough, to name a few. Throughout his career, Chahine participated in countless committees, including Standard Design Practice and leading and writing a multimillion-dollar business case portfolio for electrical rate application to the Ontario Energy Board. Chahine is the current unit director of the Society of United Professionals Toronto Hydro Local, where he has volunteered in multiple roles, including contract negotiations, communications officer, deputy chief returning officer and executive council representative for local members. Chahine is an articulate and charismatic presenter and facilitator with years of motivational speaking experience and winner of a Toastmasters International Award. cchahine@peo.on.ca

NORTHERN REGION COUNCILLORS

Luc Roberge, P.Eng., FEC

Luc Roberge was raised in Verner, a small dairy community located in northeastern Ontario. He received his bachelor of engineering science (mechanical) from Queen's University in 1985, was registered with PEO in 1988, and has been a member of OSPE since its inception in 2000. Roberge started his career in the pulp and paper industry with MacMillan Bloedel Ltd, went on to work in the lumber industry with Weyerhaeuser and is presently employed by Ontario Power Generation as senior manager, special projects, in the renewable energy sector. Roberge's participation in the chapter movement started 17 years ago with the Algoma Chapter. He has also been a member of the Kapuskasing-Porcupine Chapter, where he was chair in 2019; and of the North Bay Chapter, where he was chair from 2012 to 2014. During his affiliation with the North Bay Chapter, he represented the Northern Region on the Chapter Leaders Conference Organizing Committee. Roberge was inducted into the PEO Order of Honor at the Member level in 2019. Before his involvement with PEO, he volunteered as a scout leader for four years. He is looking forward to the next few years serving as Northern Region councillor. lroberge@peo.on.ca

Ramesh Subramanian, PhD, P.Eng., FEC

Ramesh Subramanian received his PhD in chemical engineering from the University of New Brunswick, Fredericton in 1994, and completed postdoctoral fellowships at University of New Brunswick, University of Wisconsin-Madison and McMaster University before joining Laurentian University in Sudbury in January 2002. He was the director of the Bharti School of Engineering at Laurentian University (2010–2016), a member of the Council of Ontario Deans of Engineering (including serving as vice chair 2013–2015 and chair 2015–2016) and National Council of Deans of Engineering and Applied Science (including the Deans Liaison Committee 2013–2016). He is a fellow of Engineers Canada with volunteering experience at the Sudbury Chapter (including secretary, vice chair and chair), PEO's Academic Requirements Committee (member since June 2013 and chair since January 2019), and Canadian Engineering Accreditation Board (higher education institution visits since January 2014 and Ontario member on the board since December 2018). Subramanian, who returned as the director of the Bharti School of Engineering at Laurentian University in July 2019, is committed to the core principles of protecting public safety, engaging PEO membership, modernizing the governance of PEO to remain as a good self-regulator, engaging stakeholders through PEO chapters, advancing PEO's mission and seeing an increased relevance and value of a P.Eng. licence to the public, engineers and engineering graduates. As a passionate grassroots community-oriented engineering educator and mentor, he would like to see PEO establish successful outreach programs for recruiting and retaining engineers (especially women) and help them seamlessly proceed through the licensure process. rsubramanian@peo.on.ca

WESTERN REGION COUNCILLORS

Peter Broad, P.Eng., FEC

Peter Broad has two adult children and is married to a retired nurse-midwife. He graduated with honours from Manchester University (UK) in 1969 and, after a brief stint in Australia, opted to engage in metal extraction and environmental issues. He became a chartered engineer in 1975 while in South Africa and has remained a member of the Institute of Materials, Minerals and Mining, as it is now known, ever since. In 1985, he was licensed as a professional engineer in Manitoba and later moved to Ontario, where he joined PEO's Porcupine Chapter. After several years assisting with the local science fair and other duties, he became chapter chair (2000–2003). In 2004, he moved to London, ON, and in 2006 began working for Wardrop Engineering in Toronto, designing and assessing mineral process plants, both in Canada and overseas, before he transferred to BBA Engineering in 2012. He joined the Industrial Exception Repeal Task Force as chair in 2010 and later took over as chair of the Enforcement Committee, where he has continued to serve for the past 10 years, as well as serving briefly on a Professional Standards subcommittee regarding solid waste. Using the now-defunct PEO forum, he reached out to inform fellow members of changes in international technology and helped mentor new immigrants. He was inducted as an Officer in the Order of Honour in 2019. He volunteers with the Royal Canadian Legion and has led various scout troops, including one where a future Ontario's environmental ombudsman became his assistant. broadph@rogers.com

Susan MacFarlane, MSc, PhD, P.Eng.

Susan MacFarlane has a PhD in civil (environmental) engineering from the University of Toronto and a MSc and BSc(Eng) in biological (environmental) engineering from the University of Guelph. For the past 25 years, MacFarlane has worked and solved problems in the areas of water, waste, stormwater, wastewater, spills and contaminated sites. Her most recent position was general manager of Lambton Area Water Supply System (LAWSS), which supplies water to about 100,000 people in Lambton County. At LAWSS, she managed capital projects and oversaw the operations and maintenance of the water treatment plant, booster stations and distribution system. Prior to her work at LAWSS, MacFarlane worked for a variety of environmental consulting companies on projects across Canada. It is of note that she was on the board of directors of the Ontario Municipal Water Association from 2016 until she left LAWSS in 2018. MacFarlane has been a member of PEO since 1992. Her interest in joining PEO Council began when she became aware that PEO has a number of challenges to be addressed related to governance and regulatory performance, which will have lasting impacts on the profession. Her hope is that she can contribute positively and productively to resolving these issues and ensure that PEO remains a relevant and fair regulator moving forward. smacfarlane@peo.on.ca

WEST CENTRAL REGION COUNCILLORS

Lisa MacCumber, P.Eng., FEC

Lisa MacCumber currently works as a senior engineer at the Ontario Ministry of the Environment, Conservation and Parks. MacCumber has also worked in the private sector as a project engineer in the automotive industry and rubber industry. She graduated from Queen's University with a bachelor of applied science, chemical engineering degree. MacCumber is also a member of PEO and OSPE. She has volunteered with PEO at the chapter level in Mississauga and serves on the Complaints, Professional Standards and Regional Councillors committees. Her other volunteer interests include working with the Westies in Need dog rescue. In her spare time, she enjoys curling and gardening.
lmaccumber@peo.on.ca

James Chisholm, MEng, P.Eng., FEC

Jim Chisholm is a fire protection engineer working for Toronto Fire Services. Prior to that, he was a fire protection engineer with the Office of the Fire Marshal and Emergency Management, previous to which he was a senior review engineer in the air/noise and waste teams in the approvals branch of the Ministry of the Environment. Highlights of his activity in the engineering community include chair, PEO West Toronto Chapter (2011–2012) and vice president, Professional Engineers of the Government of Ontario (2013–2016). He is also the founding president of the following Toastmaster Speakers Clubs: Environmental Speakers (for Ministry of Environment engineers and other workers in the St. Clair corridor); Toronto Engineering Club of Speakers; and Speakers Club of Ryerson Engineering. Chisholm was also an OSPE board member (2016–2021), member of the OSPE Environmental Task Force and coordinator of its sub-task force on climate crisis. He believes priorities for PEO include more involvement in public interest regulatory/legislative issues, such as the *Occupational Health and Safety Act*, building code, *Environmental Protection Act* and the climate crisis. jchisholm@peo.on.ca

Appointed councillors

Arjan Arenja, MBA, P.Eng.

Arjan Arenja is a professional engineer, entrepreneur, investor and volunteer. A graduate of the University of Waterloo (civil engineering, 1992), Arenja was licensed in 1994. He spent his early career in consulting engineering focused on building science and structural testing. He later moved to Royal Group Technologies to focus on obtaining building code approvals for innovative new building systems in Canada, USA, Argentina, Poland and China. His tenure at Royal included starting up Royal Telecom Structures, a new division within Royal Plastics, and he later managed the Royal Rainware Products Division. In 2005, Arenja enrolled in the Executive MBA at the Ivey School of Business, Western University. He later joined Bruce Power, the world's second-largest nuclear power facility, where he spent nearly a decade in senior management roles. Currently, Arenja is a real estate investor in Grey and Bruce counties, developing high quality rental accommodations. His volunteerism includes board membership for a local charity, Telecare Direct (a local distress call centre in Brampton); co-founder of the Bruce County branch of Southwestern Chapter of the Project Management Institute; and various executive roles with PEO's Georgian Bay Chapter, including Government Liaison Program chair, treasurer, vice chair and chair. He was also co-chair of the 2018 Government Relations Conference, chair of the 2018 Queen's Park Day subcommittee, vice chair of PEO's Government Liaison Committee (2020), chair of the Nomination and Governance Committee and a member of the OSPE-PEO Joint Relations Committee. He's also a board member for the Electrical Safety Authority and a member of their People, Culture and Governance and Regulatory Affairs committees and a past member of the ESA's Audit Committee. He was recently elected by PEO Council to the Engineers Canada board of directors. **aarenja@peo.on.ca**

Todd Bruyere, P.Eng.

Todd Bruyere is a member of the Couchiching First Nation, which is located near the town of Fort Frances in northwestern Ontario. He graduated from the University of Manitoba in 1989 with a bachelor of science degree in civil engineering, specializing in structural design. Shortly thereafter, he began work for Public Works Canada, DIAND Dedicated Unit and acted as a junior and then a senior project manager, working directly for the Department of Indian Affairs Canada. Later, he worked as a tribal council engineer for Matawa First Nations Management in Thunder Bay, ON, and then in the same position for Pwi-di-goo-zing Neyaa-zhing Advisory Services, which is a tribal council near Fort Frances, ON. He worked in these two positions for over 20 years, providing engineered designs for both First Nation and non-First Nation communities, until starting his own company, Saulteaux Consulting and Engineering, in 2011. His present job has allowed him to travel to many First Nation communities throughout Ontario and assess the condition of their infrastructure. Bruyere is a member of PEO and a member of the Association of Professional Engineers and Geoscientists of Alberta. He is a founding board member of the Canadian Aboriginal Science and Engineering Association, a former advisory council member of the Native Access Program for Engineering at Lakehead University and a board member of the Rainy River District Festival of the Performing Arts. **tbruyere@peo.on.ca**

Robert Brunet, MESc, P.Eng.

Robert Brunet earned a BESc (1995) and MESc (1999) in chemical and biochemical engineering from Western University in London, ON. He is a licensed professional engineer in Ontario. He is registered to practise before the Canadian Intellectual Property Office and is a member of the Intellectual Property Institute of Canada. In the 1990s, Brunet worked in research and development and held senior management positions for a manufacturer of UV disinfection equipment, Trojan Technologies Inc., where he was listed as principal inventor on several US and international patents. He worked for a patent law firm for several years before founding Brunet & Co. in 2006. The firm represents Canadian and international clients ranging in size from SMEs to multinationals. His work currently focuses on intellectual property strategy, IP portfolio management and transaction due diligence. Brunet served as president of Biro Air Energy Inc., a manufacturer of patented wind turbines, from 2008 to 2011, prior to a transaction with a US company. He has served on or consulted with corporate boards in the biotech, renewable energy and water treatment space. **rbrunet@peo.on.ca**

Lorne Cutler, MBA, P.Eng.

Lorne Cutler graduated with a BASc in chemical engineering from the University of Toronto in 1979. He worked for Dow Chemical for four years in Fort Saskatchewan, AB, before returning to the Ivy School of Business at Western University, where he completed his MBA in 1985. In 1985, Cutler joined Export Development Canada (EDC), where he was responsible for signing loans in excess of $1 billion in India and the countries of central and eastern Europe and the former Soviet Union. In his capacity as senior advisor, Africa, Europe and Middle East in EDC's International Business Development Group, Cutler was primarily responsible for country and sector development strategies, relationship management with Canadian banks and exporters interested in the region and implementation of financing facilities with international financial institutions. Upon early retirement in 2009, Cutler started a consulting firm, LAC & Associates Consulting, which focused on the areas of policy analysis and development, training, personal finance, municipal finance, small business consulting, social finance and international business development. For the past several years, Cutler has delivered a Professional Practice Exam training course for international engineering graduates for OSPE. He received a Queen Elizabeth Diamond Jubilee Medal, Ontario 150 Award and Ontario Volunteer Services Awards for his volunteer work with such organizations as Ottawa Community Loan Fund, a microfinance institution and Jewish Family Services of Ottawa. For several years, Cutler has also been president of his local community association and treasurer of the Federation of Citizens' Associations, an umbrella group of Ottawa community associations. **lcutler@peo.on.ca**

Andrew R. Dryland, C.E.T.

Andrew Dryland is a senior associate, contract administrator with R.V. Anderson Associates Limited, with over 35 years of experience in inspection and contract administration. He has been involved with multi-discipline projects in the mechanical, electrical, SCADA and process works for both water and wastewater projects. He graduated from Cambrian College in 1986 with a diploma in civil technology and started his career with R.V. Anderson Limited. He then became an active member of OACETT and began volunteering with his local chapter. Dryland was elected as vice president, professional affairs and service (PASB) and on the OACETT administration board (OAB), from 2017 to 2019, working diligently on behalf of all members in Ontario. As PASB councillor for the northern region from 2009 to 2017, he served as a member of the Policy Committee and provided leadership to Northern Region Chapter executives and members. Dryland was vice chair of PASB from 2015 to 2017 and has over 10 years' experience in OACETT committees and on Council. He has been involved with the Sudbury Chapter in many different capacities, volunteering as chapter treasurer, secretary and chapter chair for eight years. Dryland has had the wonderful opportunity to acquire over 35 years' experience in managerial roles in large organizations, and his managerial experience has allowed him to be an excellent public speaker and to develop strong leadership skills. He looks forward to continuing to use these skills for OACETT and PEO to better the civil engineering industry for all professionals in the field. **adryland@peo.on.ca**

Scott Schelske, P.Eng., FEC

(see Executive Committee)

Qadira C. Jackson Kouakou, BA, BSW, LLB

Qadira Kouakou is the principal lawyer at Jaxon Law Professional Corporation, practising in the areas of wills, estates, corporate and real estate law. Kouakou holds a bachelor of arts degree in psychology, a bachelor of social work degree and a certificate in dispute resolution from York University and a bachelor of laws degree from the University of Windsor. She articled with the Canadian Union of Public Employees and was previously a social worker with experience at the Children's Aid Society, Toronto District Catholic School Board, Woman Abuse Council of Toronto and Wholistic Child and Family Services. Kouakou's community involvement includes serving as an executive board member with the Canadian Association of Urban Financial Professionals, Canadian Association of Black Lawyers, Black Pearls Community Services and serving on the Equity Advisory Group and as a community liaison for the Law Society of Ontario. **qjackson@peo.on.ca**

Sherlock Sung, BASc

After obtaining a bachelor of applied science degree from the University of Toronto, Sung held technical positions in both the public and private sectors domestically and internationally across different industries. His employment experiences include research and development, product design, system commissioning, test and validation, quality assurance, technical instruction, operations, infrastructure management, procurement, contract administration, metrology and team supervision. **ssung@peo.on.ca**

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Deadline for September/October 2021 is July 30, 2021. Deadline for November/December 2021 is October 7, 2021.

Continuing the French version tradition

Claude Laguë, PhD, P.Eng., ing., FEC,
Ottawa, ON

Past President Marisa Sterling, P.Eng., FEC, innovated last year with the publishing of the French translation of her President's Message in *Engineering Dimensions*. I respectfully ask our current president, Christian Bellini, P.Eng., FEC, to continue this refreshing new tradition.

I am sure that there are hundreds of francophone and francophile PEO members who appreciate reading from our president in both official languages. This has been the norm in Québec for a long time already: The "Message de la Présidente" is published in both French and English in the *PLAN* magazine published by the Ordre des ingénieurs du Québec.

LETTERS TO THE EDITOR are welcomed, but must be kept to no more than 500 words, and are subject to editing for length, clarity and style. Publication is at the editor's discretion; unsigned letters will not be published. The ideas expressed do not necessarily reflect the opinions and policies of the association, nor does the association assume responsibility for the opinions expressed. Emailed letters should be sent with "Letter to the editor" in the subject line. All letters pertaining to a current PEO issue are also forwarded to the appropriate committee for information. Address letters to editor@peo.on.ca.

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1 See full First-Time Applicant Offer eligibility and offer details at www.manulife.ca/newmember.
2 Statistics Canada, "Household spending, Canada, regions and provinces," November 25, 2019.
3 CMHC, "Mortgage and Consumer Credit Trends National Report – Q4 2019," December 2019.

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