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Message from the President



David Harvey, P.Eng.
SEABC President

Structural Engineering in a Pandemic

In the February 2020 Newsletter, I commented on the March 5, 2018 tragic collapse of the Florida International University Bridge, noting several parties could have acted differently and possibly prevented the failure or mitigated the outcome.

Since then, much has happened. The Government's restrictions imposed in response to the Covid-19 pandemic have impacted everyone. Various measures have been applied in almost every part of the globe, not least of which have been the 'confined to vessel' restrictions, with no end in sight, imposed on two cruise ships where outbreaks have occurred. So, if we are feeling constrained by the current restrictions, we should reflect on the freedoms we still enjoy which are not available to others.

Likewise, it is instructive to examine BC's pandemic stats, which currently show us holding steady, with declining new cases and hospitalizations and growing total recoveries. This contrasts with US and Eastern Canada stats which show higher incidence rates and lag behind recovery patterns from Western Canada.

Prompt action by the BC Government and Provincial Health Officer, Dr. Bonnie Henry, cited for her model work in itemizing resources available, presenting the data and outlining public health measures taken has helped. We can be grateful for Dr. Henry's clear, careful and transparent demeanour which inspired public confidence – exactly what was needed.

So how has this affected us structural engineers? Most if not all employers appear to have permitted or encouraged their staff to work from home. Some employees doing facility or equipment work or working on a construction site are not able to work from home, but most offices now have limited staff showing up in the building.

Working from home has caused us to rethink how we do everything. While emailing has not changed much, the use of Skype for Business, Zoom and other meeting platforms for communication has expanded enormously. On-line platforms seem to work well, even with a large number of meeting participants, especially if all those involved know each other.

We are all looking for the 'light at the far end of the tunnel,' which will signal a return to normal. But, what will the new normal look like? No one knows, however my guess is that it will take some time before we re-establish our previous habits, if in fact we ever do. I anticipate us travelling less and meeting on-line more. Maybe we will eat out less and attend less events. There has certainly been an explosion of on-line webinars which will quite likely continue. We have seen on-line schooling develop – should that not be part of future education? Time will tell us.

Other significant changes have occurred. Airports, largely silent these days, will likely see significant changes. Will terminals ever be as crowded? Will business be conducted more 'hands off' in future? One thing that does seem likely is that there will be a large demand for new infrastructure to adapt to the new future and that will require structural engineers. Infrastructure is still aging and demand for new facilities will fuel the economic recovery.

Astonishingly, Italy, a country hit hard by the pandemic, suffered its third bridge collapse in two years on April 8, 2020, when the five arched spans of the 260 m long SS330 road bridge (or Albiano Bridge) in Caprigliola, fell into the Magra River, fortunately inflicting only minor injuries. The unusual failure may have been progressive, possibly precipitated by displacement of a scour-weakened river pier. The slender reinforced concrete bridge was built in 1908 and repaired following World War II. More infrastructure investment is clearly needed.



Bridge of Caprigliola in 1914

2020 Annual Dinner



David Harvey, P.Eng.,
Struct.Eng.

Director SEABC

The 2020 Annual General Meeting was held on March 11, 2020, at the Sutton Place Hotel, Vancouver. There were five Directors among the 12 members present. President David Harvey called the meeting to order at 4.50 pm. The 2019 AGM minutes were approved, and the annual reports were presented.

Candidates standing for election as Directors were profiled in the February Newsletter – later they were joined by new candidate Robert Bourdages. Those nominated equalled the number of vacancies available on the Board and so all candidates were duly elected as Directors of the Association by acclamation. The AGM was held before the Annual Dinner to provide more time for those present to hear the keynote speaker presentation.

Following a short networking time, the Annual Dinner commenced at 6 pm with 90 guests attending. David Harvey thanked the 2020 Annual Dinner sponsors, Glotman Simpson Consulting Engineers, Gygax Engineering Associates Ltd, Metrix Professional Insurance Brokers, S-Frame Software and WoodWorks! BC. Connor Ferster reported on progress the YMG group has made in officially launching the SEABC Library.

Carlos Ventura next reported on SEABC's Certificate of Structural Engineering Program which offers top-notch training courses for professional development. The courses are offered in classrooms at UBC Robson Square and, increasingly, on-line. Carlos then named this year's six Mahmoud Rezai scholarship recipients, and one graduate of the Certificate in Structural Engineering program.

Perry Adabar then gave a tribute to Jim Mutrie who sadly passed away last December following a long illness. Jim had been a pioneer in the development of concrete building technology over many decades

and a long-time professional service volunteer. Jim was instrumental in launching SEABC in 2008 and he will be sadly missed in the Vancouver structural engineering community. Adrian Gygax followed with an update of current plans for the Peter Taylor Legacy Awards program.

The winner of this year's Young Members Group competition "*So You Think You Can Give a Seminar*" was Pia Abercromby of McElhanney. Pia gave her winning presentation "*Volunteering to Build a Bridge in Uganda – Donating Expertise and Elbow Grease*". Pia's fascinating talk took us through the construction of a life-saving community bridge in rural Africa and the organization and problem solving required.

Paul Fast then introduced the evening's keynote speaker, Ron Klemencic, PE, SE, NAE, Hon. AIA. Ron's keynote address was entitled "*You Can See the Future Standing on Top of a Tall Building! (Well, Almost)*"



Ron Klemencic

Ron is the Chairman and C.E.O. of MKA, a structural and civil engineering firm with offices in Seattle and Chicago. Ron earned his B.S. in Civil Engineering from Purdue University and his M.S. in Structural

Engineering from the University of California Berkeley. His work in 25 US states and 24 countries include multiple-block developments up to 11.5 million square feet and towers up to 112 stories.

Ron is sought after internationally by developers, architects, and contractors for his creativity, 'big picture' approach, and unique ability to consistently produce cost-effective, innovative designs. He continues to lead the advancement of performance-based seismic design of tall buildings through initiatives, such as the PEER TBI Guidelines and design of buildings such as the 1,070-foot tall Transbay Tower in San Francisco.

Ron kicked off by referring to his earlier talk to UBC students where he made a plea for greater collaboration between practitioners and research, which was the key theme of his presentation. Ron explored how the history of his firm with tall building design very much shaped where he and his colleagues are today and how they see the future. He noted the many challenges that characterize ultra-tall buildings, including the significant change in air density that occurs over the building height which profoundly affects the imposed wind load.

Referring to the history of MKA, Ron made a strong pitch for 'pragmatic' design which he felt characterized the building design his firm had produced since the 1950s. The manual design methods used resulted in clear, reliable load paths which he believes characterizes good design, radically different from the current desire for overly complex structures which are modellable but not easily understood. Ron explained the Columbia Center building in Seattle, at 284 m the City's tallest, designed by John Skilling. Ron noted that John's design was the first to employ 130 MPa structural concrete in an early composite building and was one of the first to use visco-elastic dampers to control wind oscillations – all of which informs current thinking.

The current trend he observed is towards tall shear wall buildings, commonplace in Vancouver, and rapidly appearing everywhere. Ron also pointed to the use of flow-through (open) floors to counter vortex-shedding in the ultra slender designs that are starting to appear in the Eastern United States.

Another key theme that Ron espoused was the adoption of performance-based design, in particular,

for seismic design where he felt that performance objectives were far more realistic and informative than the use of archaic R factors which are not scientifically based. PB design he thought, was a good way to sidestep outdated code-based methods. However, Ron was very clear that none of his clients had any interest in paying a premium for enhanced building performance. Ron made a strong request for PB methodology to be used for wind design – he is convinced that elastic design results in unnecessary overdesign of tall structures, citing existing building examples. Ron noted that inelastic response would trigger possible fatigue issues which is an area needing more research.



Columbia Centre, Seattle

Ron highlighted several areas where development is needed to advance future building design. Current timber buildings are restricted by a low material modulus which he felt could be addressed by growing trees from high modulus wood. Alternatively, manufactured wood products could be based on bamboo fibres which are twice as stiff as currently available materials.

Ron then explored fire engineering which is heavily restricted by existing empirical methods that do not necessarily apply to modern designs. He considers

that fire engineering should be another load case applied by structural engineers that informs the building design. Artificial Intelligence is an emerging technology which Ron feels is a useful way to model what is not fully understood, including weather patterns for example. Other promising areas where Ron believes development will bring changes in building design to mitigate future shortages of skilled labour are in robotics, and component modularity where larger prefabricated units replace current reliance on piecemeal construction practices. In his vision of the future, Ron was very clear on one point – that increased reliance on automated methods would not signal a reduction in the need for structural engineers and the innovation that they

bring to modern building design. seabc.ca/events-archive

After his visionary address, Ron was faced by several questions from his appreciative audience which challenged his more controversial statements. Ron thanked them for their interesting questions; however, he stood firm in the strong direction he sees for our profession. David Harvey wrapped up the evening by thanking Ron for his marathon effort and handing him a speaker gift on behalf of the SEABC membership.

Ron's address can be viewed by SEABC members at: seabc.ca/events-archive

SEABC's 50th Newsletter

You may not have been counting, but happily, the Communications Committee keeps a careful eye on the statistics. The committee is delighted to report that the SEABC Newsletter has reached an important milestone – you are now reading our 50th edition.

Our first edition was published in February 2008 – SEABC having been launched at the start of the year.

Since then, SEABC has published newsletters every quarter – great work, editorial team! And a big thank you to our readers for your continuing support and encouragement. Check out SEABC's 50 archived newsletters at: seabc.ca/newsletter



Committee Reports

Young Members Group



Amr Farag, E.I.T. M.Eng

The SEABC YMG continues to be very active during the first part of 2020 hosting a number of different events. Highlights of the recent YMG activities are as follows.

9th Annual Presentation Competition

The 9th Annual Young Members Presentation Competition was an incredible success. Five talented young engineers of our community gave presentations on topics of their choosing related to structural or bridge engineering. The topics were diverse, noteworthy, and were all well received by the audience. Presentations included:

- Transforming Construction Via 3D Rebar Modelling- Amrit Pal Singh, M.Sc., E.I.T, RJC Engineers
- Bridges to Prosperity – Uganda- Pia Abercromby, B.E., P.Eng, McElhanney
- Lessons Learned – Curtainwall PMU Testing in Malaysia- Edward Lau, P.Eng., Layton Consulting Ltd.
- 2020 ICD/ITKE Research Pavillion, University of Stuttgart, Germany- Arjun Prihar, BASc Candidate, UBC
- Development of a Reference-Free Vibration-Based Damage Identification Technique for In-Service Bridges- Mohammed Moravvej, Ph..D, EIT, COWI

It was a tough decision for the judges and there was high anticipation for a winner to be declared. After a collective decision, the judges ultimately declared Pia Abercromby the winner! Pia was awarded the coveted YMG SEABC presentation competition trophy, and \$1000 which was presented to her at the SEABC Annual General Meeting, where she delivered her presentation again to the attendees. The YMG

group of SEABC would like to thank all the people who submitted an application to the competition, the presenters, and the audience who came out to support our engineering community. Additionally, YMG would like to extend their appreciation to all volunteers of the event and the judges:

Owen Berg from Kiewit Infrastructure Engineers

Raj Singh from Spannovation Consulting Ltd.

Leonard Pianalto from RJC Engineers

Event MC: Eytan Fisman, MEng, EIT, RJC Engineers.

The incredible effort of the Lead Coordinators:

Hossein Bajehkian, EIT and Navpreet Bharaj, MEng, EIT.

Special thanks to the Keynote Speaker, Adrian Gyga, Principal of Gyga Engineering Associates Ltd., and SEABC YMG Chair, Stanley Chan, for their continued support for this event.



Pia Abercromby being awarded the Presentation Competition Trophy

This year's event was proudly sponsored by **Kiewit Infrastructure Engineers** and **Xradar**.



SEABC YMG 8th Annual Presentation Competition

A video recording of the contestant and guest presentations is available at: seabc.events-archive

University of British Columbia Engineering Teams Highlights

The following is a summary of the UBC Design Team progress over the 2019-2020 academic year. All of the design teams are greatly appreciative of the support the SEABC provides. They have detailed their successes over the past year and how the generous sponsorship SEABC provides each team has facilitated their growth and progress.

UBC Concrete Toboggan

UBC Concrete Toboggan is a student engineering design team that competes in the longest-running Canadian engineering design competition; the Great Northern Concrete Toboggan Race (GNCTR). Teams must build a toboggan with a running surface made of concrete that can seat 5 people. It must have a roll cage that can withstand a 5G impact and have a functional steering and braking system. This year, UBC took home a considerable number of awards, including:

- 1st Roll Cage Design
- 1st Steering Design
- 3rd Brakes Design
- 1st Superstructure (Combination of Roll Cage, Brakes and Steering packages)
- 4th Concrete Mix
- 1st Innovation
- 1st Sustainability
- 1st Safety, and awarded the PCL Excellence in Safety award again
- 1st Technical Poster

- 2nd Technical Presentation
- 1st Best Overall Toboggan, and
- 7th Overall.

Unfortunately, we had a rollover on our first run down the hill and the toboggan was damaged beyond repair which led to a poor race day performance. We are confident that with a stronger race-day performance we would have been on the podium for the overall competition results.



UBC Concrete Toboggan Team

UBC Earthquake Engineering Research Institute Team

This year's international EERI Seismic Design Competition was held in San Diego, California, and brought together over 40 teams from 8 different countries. This year the UBC Seismic team won 3rd Place overall, along with the coveted Egor Popov award for Structural Innovation, 5th place in Presentation and 3rd place in our poster. This record-setting score is the best any Canadian team has achieved in the competition history, and the team is gearing up to continue their streak as a Top 3 Team.

UBC Seismic is a rapidly growing design team in the Department of Civil Engineering but historically has relied on a small project budget due to the low material cost of balsa wood. As the team progresses, however, more sophisticated forms of fabrication with laser cutting and 3D printing formwork in conjunction with the shipping costs for the fragile tower to the competition destination necessitate the invaluable support and sponsorship the SEABC provides the team.



UBC EERI Team

UBC Concrete Canoe Team

The UBC Concrete Canoe team designs, constructs, and races a canoe made of concrete against top universities in North America. Every year, this team innovates to create a lighter, faster, and more durable canoe, while abiding competition rules. Through this process, students get a breadth of experience, from problem-solving to project management to hands-on skills. Last year, UBC Concrete Canoe achieved its highest placement to date in both competitions, placing 2nd overall at the ASCE Pacific Northwest Competition and 5th overall at the Canadian National Concrete Canoe Competition. This year, the team's aim was to clinch 1st place at ASCE Regionals and secure qualification for the ASCE National Competition.

Funding from SEABC last year went towards technical skills development, accommodations for the team at competitions, as well as materials and transportation of the concrete canoe. Unfortunately, this year's competition was cancelled due to the COVID-19 epidemic.



UBC Concrete Canoe Team

For UBC Steel Bridge Team

For 21 years, the UBC Steel Bridge Team has been representing the University of British Columbia at various international steel bridge competitions. We work to design, fabricate and build a new bridge that is defined by the competition rules every year. The team allows the student to take their in-class technical knowledge and apply it to a fun and challenging design problem. Last year, the Steel Bridge team came in 3rd Place in the Canadian National Competition in Montreal, and this year they planned to compete in Seattle, WA. The SEABC Funding goes directly towards the fabrication of the bridge, which is becoming increasingly complex and consequently expensive to manufacture.

This year's competition was unfortunately cancelled due to the COVID-19 epidemic, but we are gearing up for a triumphant 2021!



UBC Steel Bridge Team

UBC Chapter of the Canadian Society for Civil Engineering

The UBC CSCE had another successful year as one of Canada's best student chapters. Prior to the COVID-19 epidemic, the chapter had hosted 10 Lunch 'n' Learns with various industry members and disciplines ending with the hallmark Industry Night in late-January. This year's industry night had 350 people in attendance and was held for the first time at the UBC Nest with a catered dinner. The event was a huge success in bringing together students and industry, and the CSCE team itself felt a rejuvenated effort with an increase in event volunteers.

Another hugely successful event was the #RealTalk Speed Networking Night that alone brought over 80

students and industry members together for a never-seen-before speed dating style event. The generously donated SEABC funding was directly allocated for this event, for both the food and venue reservation, and was so successful the planning for the 2021 #RealTalk event is already underway. Ultimately, the CSCE Conference and conjoining Student Chapter Competition was cancelled due to COVID-19, but the UBC CSCE Chapter intended on sending roughly 7-8 delegates, the most the chapter has ever sent to the annual conference and a testament to the growing success of the team.



UBC CSCE Team

P.Eng Registration Workshop

The P.Eng registration workshop was offered in a virtual format and it was an innovative step YMG committee took to cope with the unprecedented situation. Weike Qu and Tina Wang led the event and covered topics on registration guidelines, processes, and experience sharing. Young professionals with different backgrounds gathered online and discussed their questions and understandings of each registration step. A short social session was offered in the end to let participants expand their network and connect with other peers in the special season.

Vancouver Island Branch



Thor Tandy, P.Eng, Struct.Eng,
MIStructE

Branch Chair

Mission:

To provide a focal point for SEABC members on the Island to meet, discuss SEABC issues and to take benefit in the form of exchange of items of technical interest.

2020 Branch Executive:

Thor Tandy
Dan Gao
Stephen Pienaar
Dan Weber
Dean Hynes

Branch Demographic:

- 1) Members in the local Victoria, Gulf Islands area.
- 2) A central Island group centred on the Nanaimo, Port Alberni area.
- 3) A small North Island group.

Recent Events:

- 1) **Branch Webpage:** The Branch now has a dedicated web link on the SEABC website. As the link is a new facility, we are currently in the process of finding and inserting content.
- 2) **Executive Meetings:** We meet every three months or so and we extend a warm invitation to join us. Please contact an executive member if you would like to be notified.

Proposed Events:

- 1) **Rammed Earth:** "Ancient art seeking technical rationalization". Under construction.
- 2) **Non-structural Components:** "What Not To Do". Aiming to be held in May, contingent on COVID-19.
- 3) **Impacts of Long-Duration EQ's:** Presentation on the impact of long-duration EQ's vs code

design. VI is probably a beneficiary of such a talk. In the process of seeking presenter(s).

- 4) **BCBC 2018 – Lessons Learned / Looking Ahead to NBCC 2020:** Under consideration. Planning for some time in 2020. Seeking presenter(s).
- 5) **Proposed Social events:**
 - Q&A events where networking and workshop/presentation of a code issue that is perhaps being misunderstood.
 - Events that will attract young members: follow up to intake numbers rising at both Camosun College and UVic.

We encourage members to submit comments to our executive on any matter that may concern or be of interest to structural engineers.

Contact:

Thor Tandy: vicpeng@telus.net

Communications Committee



David Harvey, P.Eng.,
Struct.Eng.
Director SEABC

As the Communications Committee, we are here to serve your needs. We present varied material including the President's Viewpoint, our committee reports, IStructE News, articles penned by members and local news items, along with occasional outside articles and advertisements. We really enjoy communicating with our members, but invite your feedback. That way, we will get better at it. At present our committee and our reporters write many of the articles; however, SEABC is a member-services organization and we need our members' contributions to keep our readers informed.

If you can submit something of interest to structural engineers – thank you, we need as much as we can get. We value our readers who look forward to receiving a readable and relevant newsletter. Kindly send information for publication to:
newsletter@seabc.ca

On the Web



Stephen Pienaar, P.Eng.
Webmaster

While SEABC has hit the pause button on many of its activities, our website provides opportunities you may not have tapped until now...

Catch up on SEABC presentations

The SEABC Board and Education Committee proudly announced the availability of two Annual Dinner Keynote Presentations:

- **You can see the FUTURE**
Ron Klemencic (Chairman and CEO of Magnusson Klemencic Associates)
(2020 Annual Dinner)
Tall buildings have always challenged our imaginations and pushed technology toward new advancements. Since the early 1960s, the unique challenges posed by the design and construction of tall towers has inspired new ways of thinking and new materials, engineering methods, and construction techniques. Today, with towers of unprecedented geometry, slenderness, and height spread around the globe, the velocity of advancement has never been greater. Looking back at what history has taught us provides some clues as to what the future might hold. In his presentation, Ron set the scene by reviewing some of the key advancements of the past, summarized current state-of-the-art practices, and provided a peek at what the future might hold.
- **Engineering Clarity**
James O'Callaghan (Director, Eckersley O'Callaghan, London, UK)
(2018 Annual Dinner)
In his keynote address, James explored the world of transparent structures – an owner and architect's dream come true. This masterful expression of art has been mastered by James with his iconic projects

spread across the world. In 2001 James was introduced to Steve Jobs. This led to his design partnership with Apple to develop glass as a key element in the identity of their stores. The evening provided his views on the creative urge that has translated into highly innovative designs for the glass stairs, bridges, facades, and other structural elements for Apple and many other notable projects such as the David L Lawrence Convention Center, Pittsburgh.

View these and many other video recordings:
seabc.ca/events-archive

Improve your firm's visibility

Let the SEABC website work for your firm:

- 1) **Directory of Structural Firms:** The Directory currently lists 80 firms across the province. Member feedback confirms that listings are generating valuable leads. Listing in the Directory is free and available for firms

that employ one or more SEABC members.
seabc.ca/directory

- 2) **Photo of the Month:** The SEABC website consistently receives more than 3,000 unique visitors every month. Your firm can get free exposure by featuring projects as the website's photo of the month.
seabc.ca/photo-of-the-month
- 3) **Newsletter:** Take out a paid advert in the quarterly SEABC Newsletter. With a circulation of over 1,000 (as of August 2019), the Newsletter is a great vehicle to get your message across to the B.C. structural engineering community.
seabc.ca/newsletter

We want to hear from you

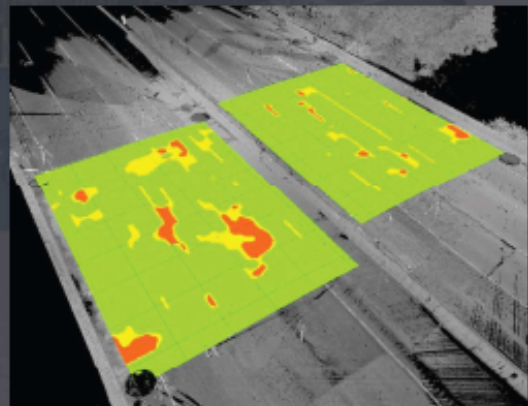
We welcome your comments for improving the SEABC's website and other online services. Please send your suggestions to webmaster@seabc.ca



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IStructE News



David Harvey, P.Eng.
Struct.Eng

As for engineering regulators in Canada, life in a pandemic has affected the Institution's operations. London is currently in lockdown in response to Covid-19's rapid spread in crowded UK. Staff are currently working from home and all meetings and events are now held on-line. Examination work continues as usual with currently only one planned change – the July 2020 Chartered Membership exam has been deferred until September.

It is unlikely that live events will occur until the fall, but the 2020 Structural Awards is still planned to take place in London on November 6. Because of world-wide disruptions caused by the pandemic, this year the entries were pushed back to May 13th.

This year will be an unusual one for IStructE President, Don McQuillan. Normally, he would be touring the domestic Regional Groups and visiting select groups overseas. Travel restrictions have forced curtailment of much of Don's itinerary, and his visits will not resume until the restrictions are eased. In the meantime, Don's meetings are virtual ones.

Meanwhile, the Institution has named its 2020 Gold Medalist – the winner is Mike Cook of Buro Happold, the Keynote Speaker at SEABC's 2015 Annual Dinner. Mike's career dates back to the formation of the company, when he worked with Ted Happold and Frei Otto on membrane and cable-net structures. A well-known teacher, Dr. Cook is Adjunct Professor of Creative Design at Imperial College London.

In a spectacular career spanning more than 40 years, Mike has become a leading designer of innovative buildings which includes many noteworthy buildings from across the world. Several of Mike's buildings have been awarded prizes for outstanding design by the Institution of Structural Engineers. These include the Khan Shatyr entertainment centre in Kazakhstan (2011 Award for Commercial or Retail Structures);

the Morpheus Hotel Macau (2019 Award for Construction Innovation) and the New Tottenham Hotspur Stadium (2019 Supreme Award for Structural Engineering Excellence). Mike will deliver his gold medal address on September 22 in Belfast, Northern Ireland, which can also be viewed on-line.



2020 Gold Medalist Dr. Mike Cook FISTructE



Tottenham Hotspur Stadium, London



Morpheus Hotel, Macau



Khan Shatyr, Kazakhstan

Temporary Stability of Structures - COVID -19



Robert Bourdages, P.Eng.
LEED AP

A common occurrence that has surfaced in light of the current pandemic is to suspend construction projects, largely in an effort to protect the health and safety of the workers. For short periods of time this may have no impact relative to the risk of instability for partially constructed buildings. Typically, the general contractor and its trades are responsible for interim stability until the structural systems are completely constructed. But what happens when the construction progress is temporarily suspended or deferred for an extended period of time? The issue of stability becomes a topic of concern.

The risk of instability for partially constructed structures increases when the construction duration increases, especially in regions of seismicity and high wind areas. As the risk of instability increases with time, accepting the status quo of temporary nominal measures to control stability may not be adequate.

A rational approach to understanding the increased risk is necessary. The Engineer of Record may need to participate, at least to the extent that the owner is advised of the increased risk of extended construction periods. They may even need to collaborate with the contractor's engineer to agree on the appropriate loading to investigate. In regions of active seismicity, such as British Columbia, the analysis could reflect a probability of exceedance for a much shorter duration than the building code requirements for permanent structures.

For example, on a partially constructed parkade in the lower mainland of BC, Reza Anjam, P.Eng. of RJC has recommended considering a serviceability seismic loading (frequent and occasional events) with a return period of 72 years (50% in 50 years) and another return period of 174 years (25% in 50 years). The 72-year return period has a probability of exceedance (PE) of about 2% in 1.5 years which is the same 2% PE that NBC 2015 uses for the 50-year assumed lifespan of a building (2475-year return period). Also, a PE of 2% over 3 years provides a return period of 149 years. These examples of probability and return period can be used as a guide for risk assessment and applied loading for extended periods of construction.

Kevin Bodnar, P.Eng. of GeoPacific Consultants Ltd. states that "the hazard at these frequent and occasional earthquake events is dominated by crustal sources, not subduction sources ... There is some amplification of the motion from firm ground to the surface of the site, which is opposite to what we normally see for rare, very large earthquakes (2% in 50 years)." Spectral accelerations could be developed as shown on the following page in Figure 1 and Figure 2.

Figure 2. Sample spectral acceleration at surface: 72-year return period (50% in 50 years). Relevant for periods less than 1.2 seconds. [Source: Geopacific Consultants Ltd.]

Similar approaches can also be adopted with wind loading. However, it may be more practical to use the building code defined annual maximum hourly-mean wind speed for a 50-year return period.

As interim construction stability is usually controlled by the contractor and supporting trades, the degree of rigor of structural analysis can be less than what is expected for permanent structures. Basic and rational load paths of partial systems may not be apparent. It is therefore recommended that during the current extended periods of construction, the Engineer of Record reviews the stability measures provided with the owners and clients.

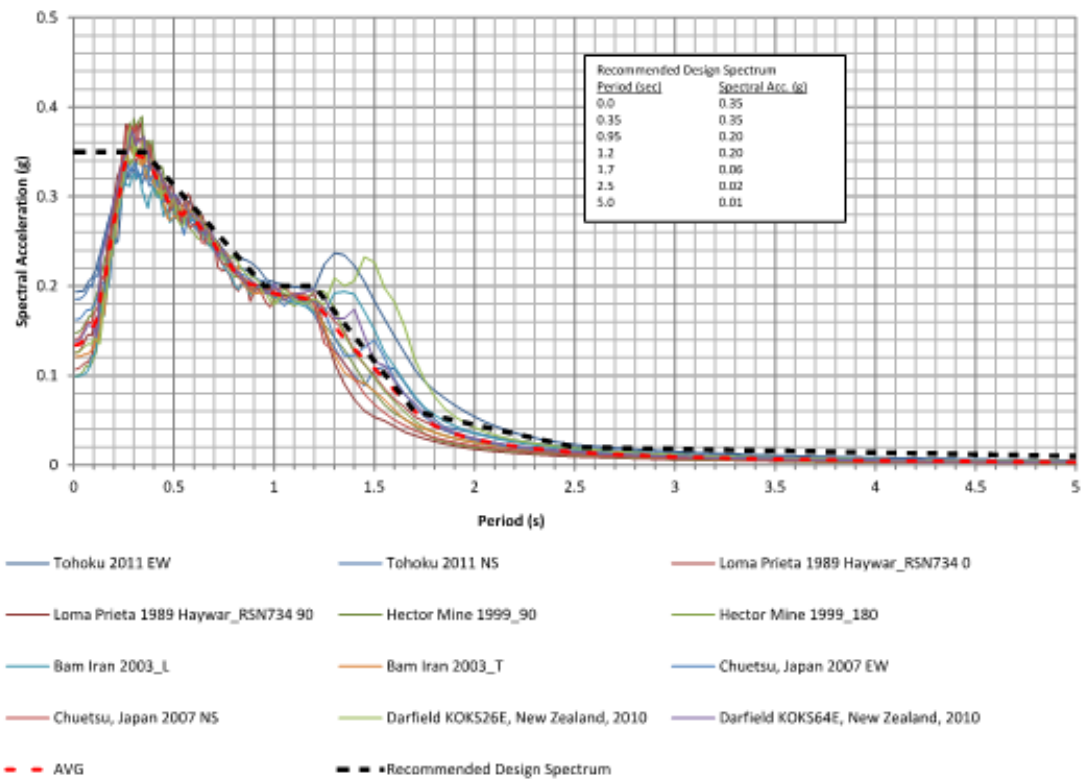


Figure 1. Sample spectral acceleration at surface: 174- year return period (25% in 50 years). Relevant for periods less than 1.2 seconds. [Source: Geopacific Consultants Ltd.]

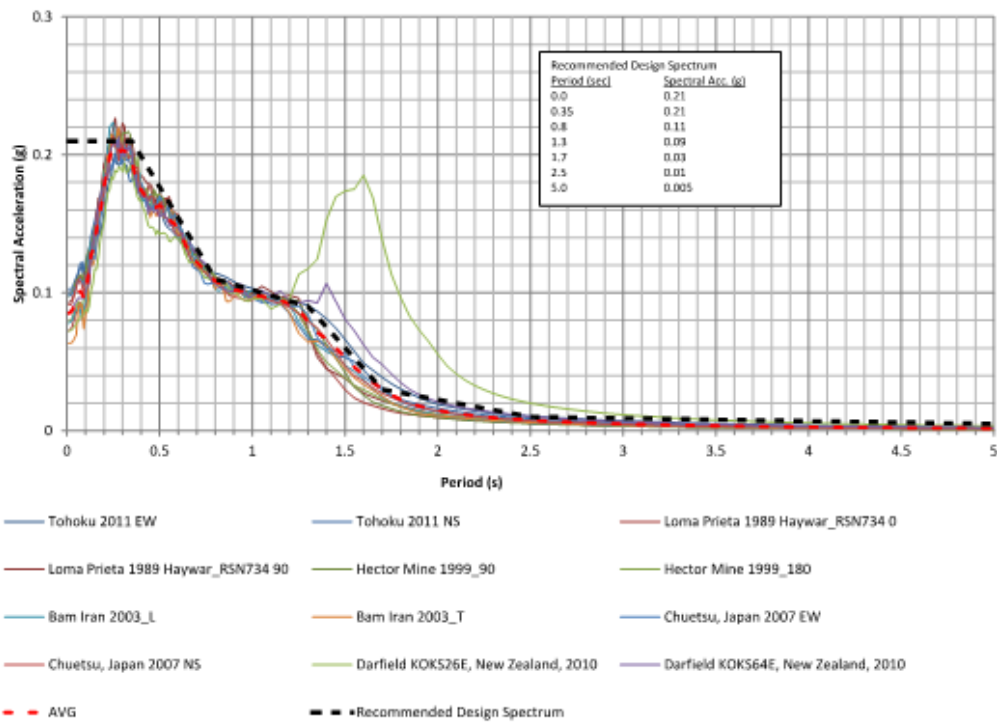


Figure 2. Sample spectral acceleration at surface: 72-year return period (50% in 50 years). Relevant for periods less than 1.2 seconds. [Source: Geopacific Consultants Ltd.]

Certificate in Structural Engineering Program



Shannon Remillong,
CSE Program Co-ordinator

This year at the SEABC Annual Dinner and Presentation on March 11, 2020 the Certificate Program Executive Committee awarded the \$500.00 Mahmoud Rezai Scholarships to six outstanding students who have taken a minimum of 2 courses over 2 consecutive years, with the highest grade point average.

The students who have accomplished this goal between 2018 and 2019 are:

- Erin Paquette (RJC Engineering)
- William Loasby (Fast + Epp)
- Daisy Ma (Bush Bohlman & Partners)
- Eric Lau (Advisian)
- Zhanchao Zhao (Zhao Engineering)
- Daniel Waine (Bush Bohlman & Partners)

Congratulations to you all, well done!

The April 2020 Term is a recent addition to the Certificate in Structural Engineering Program and in response to social distancing requirements it was necessary to offer all 4 courses through an on-line format. The term is going strong and although we miss seeing everyone in-person we are hopeful to be back at our usual UBC Robson location in the near future.

Speaking of near future, registration for the September 2020 term will open mid-July 2020 through the SEABC website:

seabc.ca/certificate-program

Early-bird rates and SEABC Member's discounts will apply at that time. Classes will be on either Tuesday or Thursday evenings beginning the week of September 8th and ending the week of December 4th.

The following courses will be offered in September 2020:

- E5-1 Seismic Design of Concrete Buildings
- E12 Design of Steel Structures for Seismic Resistance
- C6 Dynamic Analysis of Structural Systems
- E1 Masonry Design

Course fees, details and outlines will be updated with relevant information by the end of June 2020.

Last but not least, a very special **Thank You to the CSE Board of Directors**, some of the most gifted and dedicated engineers of our community, volunteering their time and expertise in developing and delivering practical and relevant courses to practicing structural engineers. It is their tireless commitment, a strong vision for the future, strength of integrity and years of applied experience that fortifies the foundational success of the CSE Program. ***Thank you and Congratulations to the Committee on 20 years of the Certificate in Structural Engineering Program!*** It is truly a pleasure to work alongside you all!

Keep safe and healthy everyone,

Shannon courses@seabc.ca

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Home working during Covid-19: Reader Tips

Reprinted from The Structural Engineer, May 2020
thestructuralengineer.org

With several weeks' experience of lockdown behind us, readers share their tips on how to make a success of home working in difficult circumstances.

Paul Bailey MStructE, a Director at Thomas Consulting, starts by advocating a structured approach to improve productivity and keep work and home life separate. Paul also stresses the need to maintain contact with colleagues, especially for those who live alone.

It is essential to establish, as quickly as possible, a regular and consistent daily routine. While it doesn't necessarily have to be based around the normal office core hours, keeping to a routine each day helps establish a regular pattern of work and helps personal productivity. The worst enemy of 'home working' is distractions – being mindful of these helps minimise downtime, which is not easy when family are living in the same space. My main tips for successful working at home are as follows:

1. Establish a regular daily routine of work. Where possible, set up your work area away from other areas of your home and think of it as your new office space. Don't use it for any other reason other than work.
2. Try to maintain a work-life balance and leave your workspace alone in the evenings, at night and at weekends.
3. Try to find a way of breaking your working mindset at the end of the day: going for a walk, doing gardening or exercise all help in differentiating work and home life.
4. Try not to become distracted: dedicate some 'block time' to achieve set tasks and then have a break, mow the lawn or go for a walk.
5. Talk to your software companies to see if they will allow you to use cloud-based, roaming or other

remote-type licenses to limit the network traffic to your office network. (I find working on my own work PC at home and accessing our company network via VPN to be the best solution.)

6. Consider using Microsoft OneDrive, Dropbox or another cloud-based secure file storage system (but don't forget to back these up!) This helps reduce network traffic to the work server and helps speed up workflow.

7. Use software such as Microsoft Teams for meetings, project reviews and checking of work. Being able to share screens is invaluable. This also helps develop a sense of community (albeit a remote one). I can't overstate just how important it is to feel like you are still connected to your colleagues when working remotely, particularly if you live alone.

Giulia Cavallar, MStructE, also recommends a simple but structured approach that includes some downtime between tasks. Divide your daily tasks into 1.5-hour focused sessions away from your phone, social media or news, and do some other activities in between sessions like stretching, cooking or reading.

Jacek Gabrielczyk, MStructE, of TWS, misses the productivity, learning benefits and rapport that come from sharing an office with colleagues, and recommends upgrading one's home computer setup to ensure it can cope with the demands of full-time work.

There is much to be said for the relevance of an office. Not only does it provide an intrinsic separation between work and private hours, but it also maximizes internal interaction between team members through speedy communication with instant responses and clarifications as necessary. It provides efficiency in terms of hardware and consumables (e.g. printer ink and paper), speeds up coordinated responses to external queries, avoids time wastage through duplication of work (e.g. reading and responding to emails) and guarantees compatibility of software, reducing potential for software security failures.

A lot of the above can be overcome by setting up a dedicated remote-working system, but video

conferencing will never replicate the rapport and 'passive learning' that occurs when people are physically present together.

What I have learned to date during my period of enforced isolation is that hardware and software that have been more than adequate for occasional use are not sufficient for concerted full-time use. I found it necessary to order a new fan, double my RAM and replace my hard drive with an SSD one. I unreservedly recommend the latter to everyone as a phenomenal improvement. Where possible, I also recommend engaging the services of someone well versed in computers to fit the above mentioned components, including saving and re-installing all your existing data.

Finally, Mike Dewar MistructE of Dewar Associates reminds us not to forget the need to unwind and maintain our relationships with colleagues. Technology ensures that distance is no barrier. I

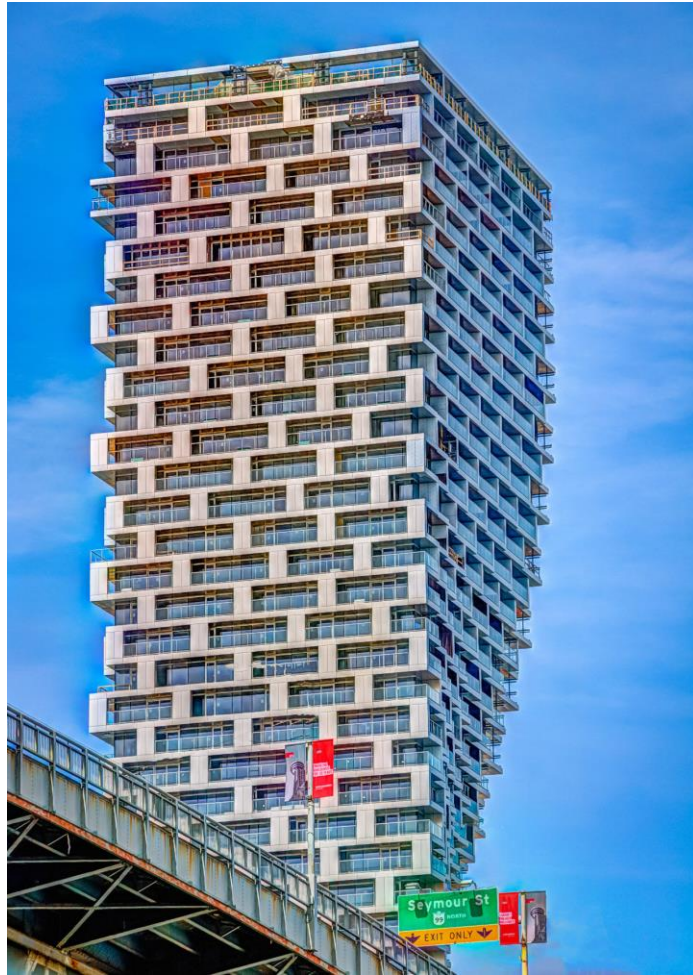
always take my colleagues to the pub for a beer at the end of the week. We do the same now, except on Zoom, and it is a great way to end a hard week.



Photos of the Month



Rocky Ridge Boardwalk, Calgary by Robin Zirnhelt (SEABC photo competition tied first place)



Vancouver House, Vancouver by Farya Pirbazari (SEABC photo competition tied first place)



Surrey City Centre Library, Surrey by Miguel Fraino (SEABC photo competition commendation)

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Chapter 2: Cross-laminated timber manufacturing

Chapter 3: Structural design of cross-laminated timber elements

Chapter 4: Lateral design of cross-laminated timber buildings

Chapter 5: Connection in cross-laminated timber buildings

Chapter 6: Duration of load and creep factors for cross-laminated timber panels

Chapter 7: Vibrations performance of cross-laminated timber floors

Chapter 8: Fire performance of cross-laminated timber assemblies

Chapter 9: Acoustics performance of cross-laminated timber assemblies

Chapter 10: Building enclosure design of cross-laminated timber construction

Chapter 11: Environmental performance of cross-laminated timber

Chapter 12: Lifting and handling of CLT elements

Chapter 13: Design Example



Final Words

Editorial Information

The SEABC Newsletter is published by the Structural Engineers Association of British Columbia. The current and past issues are available on the SEABC website at www.seabc.ca.

The Newsletter is edited and managed by the SEABC Communications Committee.

- Committee Chair: David Harvey
- Newsletter Editor: Catherine Porter
- Editorial Assistant: Mark Budd
- Webmaster: Stephen Pienaar

Submissions are welcomed and all SEABC members are encouraged to actively contribute to the Newsletter. Submissions, letters to the Editor, questions and comments can be sent to: newsletter@seabc.ca.

The Committee reserves the right to include or exclude submitted material and in some cases, edit submitted material to suit overall space requirements. If content is not to be edited, please advise so at submission time.

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