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In this Issue

- 2 Message from the President
- 3 Structural Engineering Properties of Wood: Fire
- 12 2018 Executive Board - Candidate for Elections
- 14 Certificate in Structural Engineering Program
- 15 EGBC President's Award, Seminar Report - Design with HSS

Association News

- 7 Committee Reports
- 11 IStructE News
- 17 Mark Your Calendar

Final Words

- 18 Editorial Information
- SEABC Board of Directors
- Advertising

Photo Credit: Associated Engineering



Message from the President



David Harvey, P.Eng.
SEABC President

SEABC's First Decade

Putting together the nominations for the 2018 Board elections, I realised that a decade ago, we were doing this for the very first time! Reflecting how quickly time has passed, consider how much has happened during the past ten years. It is especially gratifying to note that four of SEABC's founding Directors serve on the current Executive Board.

Back in 2008, we finally agreed to pool the resources of the three founding organizations and establish a new board to oversee the full breadth of SEABC's activities. The goal was to serve local structural engineers more efficiently and more effectively – a goal we have most certainly met. The work of the Board is critical to our operation – we operate many programs and maintain close links with several external organizations. To do so, we have set up a network of committees which look after education, communications, structural practice and technical issues. We also have a Young Members Group to manage the programs specifically aimed at EITs and young professionals, and two Branches – on the Island and in the Okanagan. We also have arms-length committees that look after the Certificate in Structural Engineering program, and the 2017 IABSE Symposium. SEABC is a complex operation, but fueled by the good will of our many volunteers, we deliver amazing results.

Here are just some of our successes. The CSE courses continue to run very effectively under the SEABC banner. We continue to see a high demand for courses, an increase in the proportion of on-line participants. Fortunately, the CSE program is financially self-supporting. Thank you for your continued commitment to learning and to the local employers who support participation by their staff.

Our Education Committee does impressive work. The committee members work hard to deliver a series of evening presentations on technically interesting subjects, most of which are offered at no cost to members. This is a great program for delivering current information to the membership. The committee also plans seminars on an as-needed basis, and arranges speakers for the structural engineering stream at EGBC's Annual Conference.

The Communications Committee keeps the website running, publishes the newsletters and looks after the members. Our Structural Practice Committee is responsible for maintaining contact with EGBC regarding regulatory matters. SEABC's Technical Committee is not continuously active but handles technical issues as they emerge. These are all critical elements of delivering a comprehensive service to members of a professional association and by any measures SEABC provides an unparalleled service.

However, organizing the 2017 IABSE Symposium must surely rank as the 'icing on the cake' of SEABC's achievements. Looking back, it is hard to realize what a leap of faith the Board took in backing that initiative. With a budget of \$1.2M, the Symposium is the largest activity SEABC has undertaken by a country mile. And, truth be told, the Organizing Committee members had limited experience with organizing anything similar. OC members were carefully chosen for their skills and enthusiasm, and collectively, covered off most experience areas.

Thanks to the commitment of each OC member, and stellar efforts from chairs Peter Taylor, Katrin Habel and Adam Lubell, the symposium was a huge success. Interest in participation was high. Some 450 papers were selected from the 800 abstracts submitted. Attendance by over 800 delegates, in addition to the exhibitors, volunteers and guests, maximized participation in the exceptional technical program. Particularly gratifying was the high number of young members participating. Many other key features were included in the symposium, including a fun-filled 'Pecha-Kucha' session, several networking events, a spectacular Gala Dinner, and some excellent technical tours.

We can now all look back with pride at a decade of amazing achievements, and leverage our learning experience to do even better. Clearly, a very bright future awaits SEABC – thank you for your support.

Structural Engineering Properties of Wood: Fire



Joel Alexander Hampson,
MAsc, PEng, LEED® AP



Kellie Allen,
CFEI, CCFI-C, CFII, CVFI, ECT

Wood behaves differently in a fire when compared to other structural engineering materials, and its behaviour can be surprisingly better, too. With an understanding of how the structural-engineering properties of wood change in thermal decomposition, an engineer can evaluate its capacity once it is burnt and predict its performance in a fire.

Wood's thermal decomposition happens in two stages. The first is pyrolysis. The second is combustion of the resulting char.



Figure 2. Post bottoms heated to pyrolysis so to reduce hydroscopicity for wood in contact with soil in traditional construction

Pyrolysis is the material's depolymerization when heated. The structural engineering properties of wood change in pyrolysis: reduced strength, lower hydroscopicity, lighter weight and less dimensional sensitivity.¹ Non-engineering properties change too, like the colour change of the exposed wood surface. In pyrolysis, the exposed wood surface releases water vapour and volatile gases; these gases ignite, and flame, if there is the right combination of ambient oxygen and external heat source—like a pilot light. The depth of this heated-affected layer is called the pyrolysis front.

As pyrolysis proceeds, the wood is converted into charcoal. This is the thick layer of black char that is familiar to anyone who has burnt a piece of wood. The char has no structural engineering properties but has excellent insulating (transpirational cooling) properties.² As the char thickens, the quantity of insulation increases; the member's internal temperature remains colder than the temperature needed to produce the volatile gasses or change the wood properties; and without the right external heat source, the flame dies and the member cools. This self-insulating characteristic of wood is why timber outperforms unprotected steel and other metals in fire-resistant construction.

Given the right combination of ambient oxygen and external heat source, the char itself will burn. This second-stage combustion does not flame (as with the gases of pyrolysis). The combustion of char is characterized by smoldering and is the same seen in a charcoal barbecue. Under the right conditions, the heat of this combustion can induce self-sustaining thermal decomposition; the fire will continue until all available wood—as fuel—is consumed. Finally, all that remains is wood's inert minerals; this is ash.

¹ "Wood: Its Structural Properties" by FF Wangaard, Forest Product Laboratory (1979)

² "Timber: Its nature and behaviour" by JM Dinwoodie, E & F Spon (2000) p. 216



Figure 2. A char-damaged glulam beam surrounded by failed steel framing

There are too many unquantifiable variables in structural applications to accurately define the thermal-decomposition stages: the intensity and duration of the external heat source, the quantity of ambient oxygen and the member's moisture content, size, density, number of exposure surfaces and inherent level of natural extractives.³ For example, large waterlogged timbers will not ignite, but dry airborne sawdust will explode. Table 1 provides guideline temperatures, T , for the stages of thermal decomposition.

Stage of decomposition	T , °C
Pyrolysis slowly starts	100
Lignin starts to degrade	175-500
Hemicellulose starts to degrade	200-260
Volatile gases ignite	250
Cellulose starts to degrade	260-350
Char starts to form ⁴	300-365
Volatile gasses self-ignite	500

Table 1. Guideline for externally applied temperatures of thermal decomposition⁵

³ "Ignition and Charring Temperatures of Wood" by Forest Products Laboratory, Report No. 1464

⁴ "Components and Consequences of Cross-Laminated Timber Delamination" by R Emberley, A Inghelbrecht, N Doyle & JL Torero, Fire Science and Technology 2015: The

Proceedings of 10th Asia-Oceania Symposium of Fire Science and Technology (2015) p. 273

⁵ "Timber: Its nature and behaviour" by JM Dinwoodie, E & F Spon (2000) p. 215

Char forms quickly in the beginning, but the rate of formation slows as the char thickens. Once in a quasi steady-state of charring, the temperature gradient of thermal penetration can be described by the following equation⁶:

$$T(x) = T_i + (300^\circ\text{C} - T_i)(1 - x_t/a)^2$$

Where the temperature, $T(x)$, is a function of the initial temperature, T_i , pyrolysis-front depth, x_t , and the thermal penetration depth, a . This thermal penetration depth is found empirically and is 38 mm for Southern Pine.⁷ Use this equation to assess the cross section that retains its pre-fire properties: scrape the member to find the char depth, x_c , and subtract the pyrolysis front, x_t , for the given degrade temperature.

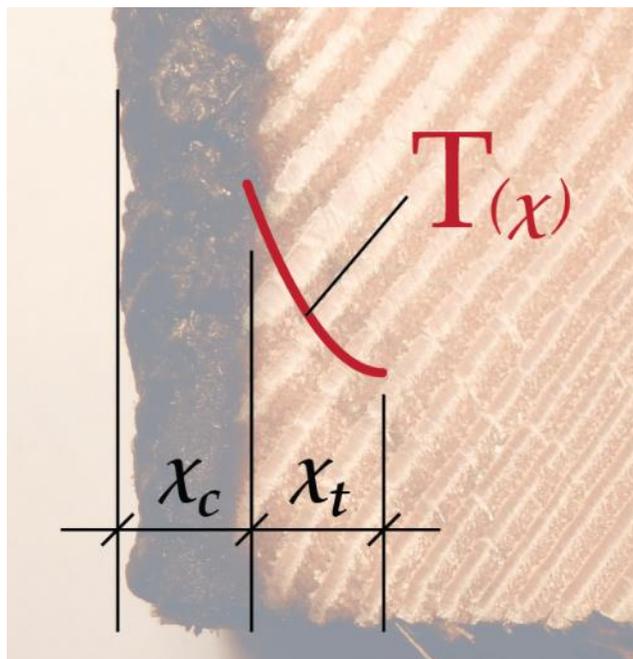


Figure 3. Horizontal temperature profile, char depth and pyrolysis front (image by N-Q Chang)

The building codes and standards have a fire-endurance perspective: how long a fire before a member loses its load-carrying capacity. The wood design standard provides information for calculating the remaining cross-section given the duration of a fire.⁸ (As already discussed, the remaining cross-section retains its original structural-engineering properties.) The design charring rates for wood and wood-based products, β , depends whether the effect of corner-rounding is considered.⁹ One-dimensional char, β_o , is fire on one surface—without corner rounding—like a timber deck. Notional char, β_n , is fire on multiple surfaces—with corner rounding—like a beam.

⁶ “Temperature Profiles in Wood Members Exposed to Fire” by ML Janssens & RH White, *Fire and Materials* (1994) Vol 18, p. 263

⁷ “Wood Handbook: Wood as an Engineering Material” Forest Products Laboratory (2002) p. 389

⁸ “O86-14: Engineering design in wood” CSA Group (2014) pp. 236—240

⁹ “Nail-Laminated Timber Canadian Design & Construction Guide” by the Binational Softwood Lumber Council and Forestry Innovation Investment Ltd. (2017) p. 33

<u>Wood-based lumber product</u>	$\beta_{0,t}$ mm/min	$\beta_{0,t}$ mm/min
Solid sawn timber	0.65	0.80
Glulam timber	0.65	0.70
Structural composite lumber	0.65	0.70

Table 2. Design charring rates¹⁰

The design standard gives depth of the char layer as:

$$x_c = \beta \cdot t$$

Where the fire exposure duration, t , is in minutes. The depth between the char and the pyrolysis front is referred to as the zero-strength layer, x_t . For fire less than twenty minutes, the depth is:

$$x_t = \frac{t}{20 \text{ min}} \times 7 \text{ mm}$$

For fire longer than twenty minutes, the zero-strength layer is taken as a constant 7 mm. Therefore, the remaining cross-section is:

$$d' = d - (x_c + x_t)$$

In conclusion, wood thermally decomposes in two stages: pyrolysis and char combustion. Wood has self-insulating properties that can preserve a member's structural engineering properties. An engineer can evaluate the burnt member's cross section to find its load-carrying capacity prior to, or after, being exposed to fire.



JA Hampson is a structural engineer and practices post-disaster investigation in Vancouver. He contributes regularly to this publication and co-authored the series "A Practical Guide to Wood-Frame Design". K Allen is a senior fire and explosion investigator and practices in British Columbia.

While we have tried to be as accurate as possible, we cannot be held responsible for the designs of others that might be based on the material presented in this article. The material covered in this article is intended for the use of professionals who are competent to evaluate the significance & limitations of its content and recommendations and who will accept the responsibility for its application. We and the sponsoring organizations disclaim all responsibility for the applications of the stated principles and values and for the accuracy of any of the material presented in the article.

¹⁰ Ibid p. 238

Committee Reports

Technical Committee



Kevin Riederer, M.A.Sc.
P.Eng.,
Director SEABC

SEABC was recently approached by Engineers and Geoscientists British Columbia to develop a professional practice guideline for the “Structural Condition Assessments of Existing Building and Designated Structures”. The Board of Directors has agreed to take the lead on this initiative. This month, the members of the task group will be finalized and work will begin on the development of the guideline.

Anyone with interest in participating on a Technical Subcommittee is encouraged to contact SEABC. Any member with an issue or concern that they would like to have the Technical Committee consider is also encouraged to reach out to the committee.

Communications Committee



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

I’ve been asking members to join this committee for many years – unfortunately with little to show for it. Notwithstanding the fact that most local structural engineers cast their eye over the SEABC Newsletter, and some are avid readers, not very many of our members contribute to the flow of information. We certainly appreciate those of our members who take the time to prepare articles or send us photographs describing their professional activities or interests.

Yet it is worthwhile, and fun to do. Working to inform readers about our engineering designs or research lifts our professional standing, and inspires

others. Contributions from structural engineers are always interesting and we want to see them. So, please forward your submissions – we look forward to hearing from you. Kindly send information for publication to:

newsletter@seabc.ca

Even more important is the receiving end! Would you like to volunteer for SEABC? Are you interested in publishing? Do you like writing articles about structural engineering? How would you like to edit the SEABC Newsletter? Let us know if you are keen to join our team – we’d love some help and are looking for your contribution.



Vancouver Island Branch



Thor Tandy, P.Eng, Struct.Eng,
MStructE
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.

2018 Branch Executive:

Thor Tandy, Dan Weber, Dan Gao, Lee Rowley.

Inter-Branch Liaison as best we can: Meagan Harvey (Okanagan), Ralph Watts (North Island)

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.

Proposed Events:

- 1) **Rammed Earth:** *“Ancient art seeking technical rationalization”*. Still on the table..
- 2) **Non-structural components:** – *“What Not to Do”*. Case studies and acceptable solutions. To be confirmed.
- 3) **Social event(s):** We had planned a social/get-together for August, 2017 but with everyone so busy, this has been moved into 2018. We plan to make this happen so we look forward to comment/interest from the membership.
- 4) **Executive Meeting:** Early February. Our meetings are open so anyone wishing to attend and contribute is welcome.

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

Point of Concern:

It recently occurred that a (residential) guard rail installation was completed without the appropriate shop drawings and engineering assurance. When the EOR requested the applicable paperwork, a copy of a generic 1-page signed and sealed detail was submitted to the EOR. The detail was in no way associated with the current project and when pressed for the correct documents (Schedule S etc.), the same generic detail was presented again together with a list of jobs that the signing engineer was said to have assured. When the EOR contacted the engineer about the detail, it was discovered that the guard rail contractor had, in the past, requested the engineer to issue such a detail, however, it was further discovered that the contractor had used the same generic detail for all the jobs listed without

contact with, or assurance by, the engineer. We caution everyone to make sure that guard rail details received are applicable to the current project. We also suggest that, where the detail seems generic or odd, the contractor(s) be questioned on the presented documentation.

Young Members Group



Thomas Duke, EIT.

The SEABC YMG is excited to kick-off another action packed year. The YMG have several events in the near future including the annual YMG “So You Think You Can Give a Seminar?” Presentation Competition, as well as various outreach opportunities such as EG-fest and EP week.

SEABC YMG 7th Annual Presentation Competition: So You Think You Can Give a Seminar?

The annual SEABC YMG presentation competition is just around the corner and everyone is encouraged to come out and watch as five young engineers and a keynote speaker present on a diverse line-up of innovative structural engineering related topics.



Date: Wednesday, February 21, 2018

Time: 6:00 pm – 9:00 pm

Venue: Room C100, UBC Robson Square, 800 Robson St., Vancouver, BC V6Z 3B7

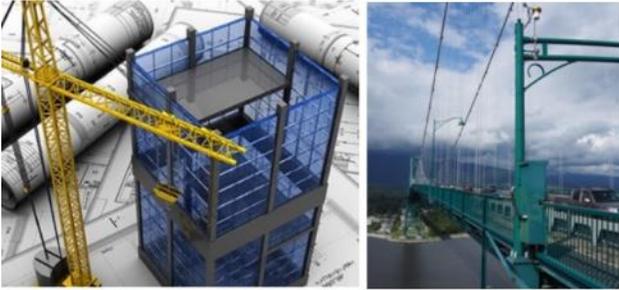
Keynote Speaker: Bergman Don, Vice President, Senior Project Director, Cowi Bridge North America

More information and registration:

www.seabc.ca/event/young-members

SO YOU THINK YOU CAN GIVE A SEMINAR?

7th ANNUAL PRESENTATION COMPETITION



APPLICATION DEADLINE

January 15th, 2018

Email title and description (250 words max) to ymg@seabc.com

COMPETITION DATE

February 21st, 2018

GET READY

A project you would like to talk about?
Want to take the stage?
Get your 10-15 minute presentation ready for the next year's competition!

REQUIREMENTS:

SEABC members with less than 10 years experience.
Participation in previous years' event does not disqualify you from participating again!

PRIZE

Up to \$1,000!
Invitation to present at the SEABC AGM!
SEABC trophy!

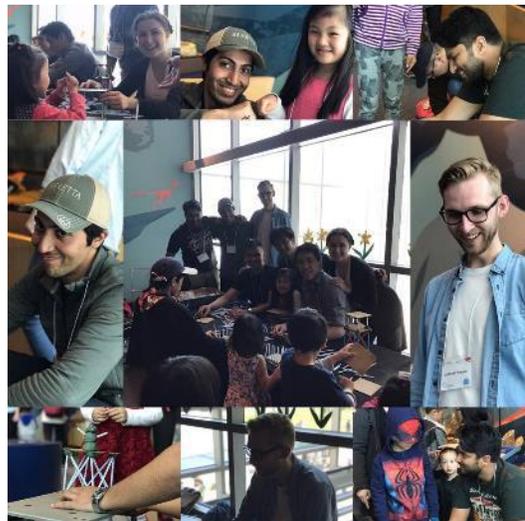
GVR Science Fair 2018:

The 36th Annual Greater Vancouver Regional Science Fair will be held from April 12 to April 14, 2018. Every year, 300+ students from all over the Greater Vancouver area gather to showcase their impressive scientific minds as they vie to win one of the many awards, ranging from \$75 to \$2000 in value. Prizes include trophies, general monetary awards, and even UBC entrance scholarships! This year SEABC YMG will be taking part in sponsoring one of these special awards meant for the up-and-coming mad scientist or brilliant engineer. Members are encouraged to enter anyone they know to participate in this exciting event. For more details regarding the event, please visit the Greater Vancouver Science Fair website at www.gvrsc.ca.

EGBC EG-Fest and EP Week:

2018 is already shaping up to becoming another successful year for outreach activities as the SEABC Young Members Group (YMG) is starting off the year strong with two busy events. In the month of March, the group will build upon their strong partnership with the UBC EERI Student Chapter to participate in Engineering and Geoscience Fest (EG-Fest) hosted by EGBC and the Vancouver Public Library. This event will be followed up by the YMG's involvement in Emergency Preparedness (EP) week in May,

coordinated by Public Safety Canada and hosted by Telus World of Science. Through these two events, the SEABC YMG members are able to successfully engage the general public, while raising emergency preparedness by explaining fundamental seismic and structural engineering concepts. These objectives are achieved by having the audience build small scale building models to be shaken with a miniature shake table, in conjunction with discussions related to ground motions and how engineers are able to keep the public safe. Both events draw hundreds of participants from the public and industry. YMG members are encouraged to participate as these events are not only great networking opportunities, but are sure-fire ways to have fun-filled days! YMG members looking to participate are asked to contact ymg@seabc.ca.



On the Web



Stephen Pienaar, P.Eng.
Webmaster

Video recordings of recent seminars

- **Performance-based Seismic Design of Tall Buildings:**
June evening seminar presented by Dr. Farzad Naeim, Ph.D., (Farzad Naeim, Inc.). This seminar discussed performance-based earthquake engineering practice for tall

buildings in United States, and presented lessons learned from peer reviewing more than a dozen of such buildings.

- **Design with Hollow Structural Steel:**
October evening seminar presented by Brad Fletcher, S.E. (Atlas Tube). Discussion topics included: the new ASTM A1085 specification, areas of HSS connection design often overlooked or misunderstood, and concrete-filled HSS tubes.
- **NBC 2015 Commentary L:**
November evening seminar presented by Andy Metten, P.Eng., Struct.Eng. of Bush Bohlman & Partners, and panel discussion with Ron DeVall, PhD, P.Eng. (Read Jones Christoffersen) and John Sherstobitoff, P.Eng. (Ausenco). The seminar presented the repair and seismic upgrading of several heritage buildings in Vancouver over the past five years along with the need for and the development of guidelines for doing this type of work. The position of present Canadian building codes on heritage upgrading and the development of NBC 2015 Commentary L were discussed with examples.

Members can view these and past seminar recordings at seabc.ca/events-archive.

StructureCraft Opens New Facility

With all the hustle and bustle of launching a new facility and introducing DowellLam™, NorthAmerica's first all wood mass-timber material to the market, 2017 was a busy year for StructureCraft. The Abbotsford BC-based manufacturer of timber products held its grand opening ceremony on November 16 to thank the industry for its support and for building with wood. StructureCraft principal Gerry Epp and Head of Engineering, Lucas Epp were especially pleased to welcome guest speakers Mayor Braun, City of Abbotsford who welcomed StructureCraft to the community; Michael Heaney, CEO of Surrey Development Corp who reflected on innovation between StructureCraft Builders and Bing Thom Architects; and Michael Green of Michael

Current activities on the website

- **So You Think You Can Give A Seminar?**
Registration is open for the seventh annual **Young Members Presentation Competition** on February 21. Come out and experience the seventh annual SEABC Young Members Presentation Competition! Everyone is invited to join us as six young engineers each give a 10-minute presentation on a topic of their choosing. Don't miss out on this chance to take in what the talented young structural engineers in our community have to offer!

Read more about this and other upcoming events at: seabc.ca/events.

Be first the first to know

Follow us on **Twitter** for announcements of SEABC events:

twitter.com/seabc

We welcome your suggestions for improving the SEABC website. Please send your comments to: webmaster@seabc.ca



Green Architecture who talked about the potential use of DowellLam™.



StructureCraft's photo showing the exposed flat face of DowellLam™.

IStructE News



David Harvey, P.Eng.
Struct.Eng.

Several SEABC members have contributed strongly to IStructE activities in recent years. You will recall that **Bill Alcock** represented IStructE's British Columbia Regional Group on the Council of the Institution for five years, and spent a three-year term on the IStructE Executive Board which he completed in 2016.



Bill's Institution work drew much praise from headquarters, including offshore representatives serving on the International Interest Group. The IIG ensures that overseas members have a communication forum which provides input to the Institution as part of the

twice-yearly Council meetings. With its shift in focus to the global stage, IStructE greatly values the input from its international representatives.

Another member of the British Columbia Regional Group who was active in London was **Lucas Epp** who served on Council as a Young Member Group representative.



A current Young Member Group representative on Council is SEABC's **Robert Jackson** the winner of the 2016 Kenneth Severn Award, and Young Structural Engineering Professional of the Year. Robert also served as the YMG

representative on the Structural Awards Judging Panel last year which provided him with a unique experience judging the best structural engineering projects from across the world.

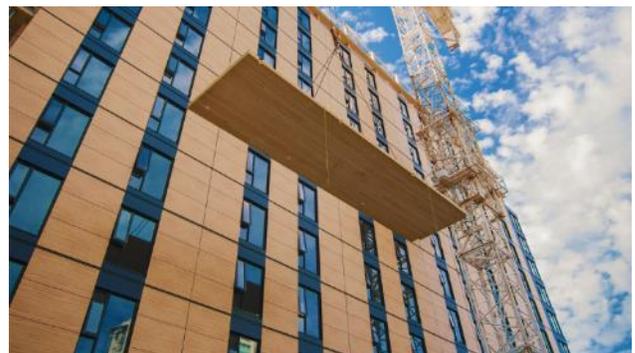
Young members representing British Columbia see great value in travelling to London. They not only contribute to the debate, in networking with other

young members, they build international relations. In sharing ideas, they cross-pollinate design thinking and help to build global structural engineering.

Several other individuals have served on various Institution panels. Fast + Epp's **Duane Palibroda** has served on the Papers Awards Judging Panel since 2014 – Duane helps tease out the very best work for recognition. **Mark Porter** continues to offer specialist expertise to the IStructE Sustainable Construction Panel on sustainability and climate change matters.

Paul Fast has played a valuable role by serving on the Structural Awards Judging Panel for the past several years, which enables him to judge the merits of worthy structural designs from across the world. Fast + Epp have submitted projects for the Structural Awards for more than a decade. Paul's BC-based global firm has received several wins and commendations, most notably, the Grandview Heights Aquatic Centre which won the prestigious Supreme Award in 2016.

So, having won the big prize, how would Fast + Epp fare in the 2017 competition? Not too badly as it turned out! Paul and Robert submitted their latest creative venture in mass-timber – TallWood House at Brock Commons, UBC. The world's first high-rise mass-timber frame and concrete shear-wall hybrid won the Structural Award for Construction Innovation. The unique design wowed the judging panel, who commended the use of standardized components to optimize constructability and building efficiency. The judges commented on the use of full-scale testing to validate the unique timber flat-slab design and gain regulatory approval. Many congratulations, Fast + Epp!



TallWood House at Brock Commons

2018 Executive Board - Candidate for Elections



Perry Adebar, Ph.D., P.Eng., University of British Columbia

Professor in the Department of Civil Engineering at the University of British Columbia, Perry has served as a Director of SEABC for five years. If elected, Perry will continue to serve in that capacity.



Stanley Chan

A design engineer with Read Jones Christoffersen Ltd., Stanley currently chairs SEABC's Young Members Group. He has been involved with the Young Members Group since 2011. If elected, Stanley will serve as a Director.



Paul Fast, P.Eng., Struct.Eng.

Managing Partner with the firm he founded, Fast + Epp Structural Engineers, Paul has served as a Director of SEABC for eight years. If elected, Paul will continue to serve in that capacity.



Tejas Goshalia, P.Eng., SE

A Senior Associate with Stantec, Tejas has served as a Director of SEABC for five years and currently chairs its Education Committee. If elected, Tejas will continue to serve as a Director.



Adrian Gygax, P.Eng, Struct.Eng.

A Principal with his own firm, Gygax Engineering Associates Ltd., Adrian has served as a Director of SEABC for eight years. If elected, Adrian will continue to serve in that capacity.



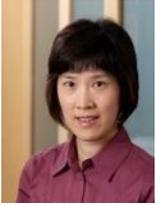
David Harvey, P.Eng., Struct.Eng., President

A Principal with Associated Engineering, David was a founding Director of SEABC. David currently chairs the SEABC Communications Committee and is currently serving as President. If elected, David will continue to serve in that capacity.



Cameron Kemp, P.Eng., LEED® AP, Past President

A Principal and Chairman of Omicron Canada Inc., Cameron was a founding Director of the SEABC. Having served five years as SEABC President, Cameron is currently Past President, and if elected, will continue to serve in that capacity.



Kitty Leung, P.Eng., Struct.Eng.

A structural engineering principal and manager, working for Vancouver-area firms, Kitty has served as a Director of SEABC for three years. If elected, Kitty will continue to serve as a Director.



Surinder Parmar, P.Eng., PMP

Manager- Portfolio Capital Projects with BC Hydro, Surinder was a founding Director of the SEABC and has served as Secretary/Treasurer since its inception. If elected, he will continue to serve as a Director.



Kevin Riederer, P.Eng.

Project Structural Engineer with Read Jones Christoffersen Ltd., Kevin has served as a Director of SEABC for three years and currently chairs the SEABC Technical Committee. If elected, Kevin will continue to serve as a Director.



Andrew Seeton, P.Eng.

A senior structural engineer with Glotman Simpson Consulting Engineers, Andrew was a founding Director of the SEABC and former chair of its Education Committee. If elected, he will continue to serve as a Director.



John Sherstobitoff, P.Eng.

A senior structural engineer specializing in earthquake engineering and a Principal with Ausenco, John has been an SEABC Director for three years. If elected, John will continue to serve as a Director.



Certificate in Structural Engineering Program



Shannon Remillong,
CSE Program Co-ordinator

Registration Inquiries and Requests/Suggestions:
Please contact Shannon Remillong, Certificate
Program Administrative Assistant, at email:
courses@seabc.ca

January 2018 term is underway!

The following four courses are offered this January 2018 at UBC Robson Square:

- **C4-2** Advanced Concepts in Earthquake Engineering and Seismicity
- **C54** Seismic Bridge Analysis for Force-Based & Performance-Based Design
- **E12** Design of Steel Structures for Seismic Resistance
- **E15** Applications of Dynamic Analysis for Seismic Design of Structures

Registration for the **September 2018 term** will open mid-July 2018 through the SEABC website. Early-bird rates and SEABC Member's discounts will apply. Classes will be on either Tuesday or Thursday evenings beginning the week of September 11th and ending the week of December 6th with a mid-term break in the week of October 22nd.

The following courses are offered with a 4th course still to be determined:

C1 Analytical Methods in Structural Engineering

C3/ C5 Blend Topics in Practical Structural Design/ Conceptual Design of Building Systems

E10 Structural Analysis Fundamentals: A Refresher
4th course TBD

Courses fill up fast so not to be disappointed, register early and take advantage of the savings!

The Executive Committee would also like to congratulate Cillian Finn who recently graduated from the SEABC Certificate Program, successfully completing 12 courses. He will be awarded a certificate at the upcoming SEABC AGM held on April 18, 2018.



CSE Board of Directors

John Pao, M.Eng., P.Eng., Struct.Eng., Bogdonov Pao Associates Ltd. (Chair)

Shannon Remillong (Administrative Assistant)

Farshid Borjian, M.A.Sc., P.Eng., C.Eng., M.I.Struct.E., Struct.Eng.

Svetlana Brzev, Ph.D., P. Eng.,

Anthony El-Araj, P. Eng, Struct Eng, PE, SE, LEED AP, Glotman Simpson Consulting Engineers

Andreas Felber, Ph.D., P.Eng.,(on temporary leave), BC Hydro

Darrel Gagnon, M.Sc., P. Eng., Cowi N.A. Engineering

Chris Jacques, P. Eng., MStructE, LEED AP, Read Jones Christoffersen Ltd

Saqib Khan, M.A.Sc., P.Eng., SE., PE, McElhanney Consulting Services Ltd

Bishnu Pandey, Ph.D., P. Eng., British Columbia Institute of Technology

Carlos Ventura, Ph.D., P.Eng., University of British Columbia

EGBC President's Award



David Harvey, P.Eng.
Struct.Eng.

Nominate a Colleague

Do you have a deserving colleague that has contributed strongly to the profession and/or the community? Is that person serving as a role model and inspiring others? If so, consider nominating him/her for the 2018 President's Awards, recently announced by Engineers and Geoscientists British Columbia. The President's Awards are B.C.'s premier awards for professional engineers and geoscientists. To nominate an individual, you will need to prepare a letter of nomination, or support for a nomination, outlining that person's outstanding achievements. To streamline and standardize the process, nominations are currently made on-line.

The President's Awards include awards for meritorious achievement; community service; professional service; young professionals; and the R.A. McLachlan Memorial Award – BC's top award for professional engineers. Nominations must be received by Friday April 13, 2018.

Full details of the awards and the nomination procedures are available at:

www.egbc.ca/Member-Programs/Awards-Recognition

For further information or assistance on any aspect of the EGBC President's Awards, contact **Laurel Buss**, Communications Officer at: lbuss@egbc.ca



Seminar Report



Farshid Borjian P.Eng.,
Struct.Eng.

Design with HSS

On Tuesday, October 17, 2017 SEABC educational committee in collaboration with Atlas Tubes held an evening seminar on Design with HSS at Room C300, UBC Robson Square. More than 35 structural engineers from different groups (industrial, residential, commercial and bridge) attended the seminar.

Bradlee Fletcher, SE from Atlas Tubes presented technical design topics with HSS. He is a registered structural engineer in Illinois with 26 years of experience. Brad is active in many industry groups and committees including the AISC, ASTM, the Structural Engineers Association of Illinois (SEAOI), the CISC Education and Research Council (formerly SSEF) in Canada and the S16 Technical Committee for the Canadian Standards Association (CSA).

He talked about the New ASTM A1085 Specification adopted in early 2013. With tighter material tolerances, a higher minimum yield stress, a required Charpy V-Notch test, and cap on the minimum yield stress, this new specification makes designing with HSS easier and more economical, especially for buildings and bridges subjected to fatigue and seismic loads. He talked about round shape and square shape HSS and presented a comparison chart of HSS with different standards.



HSS Spec Comparison Chart

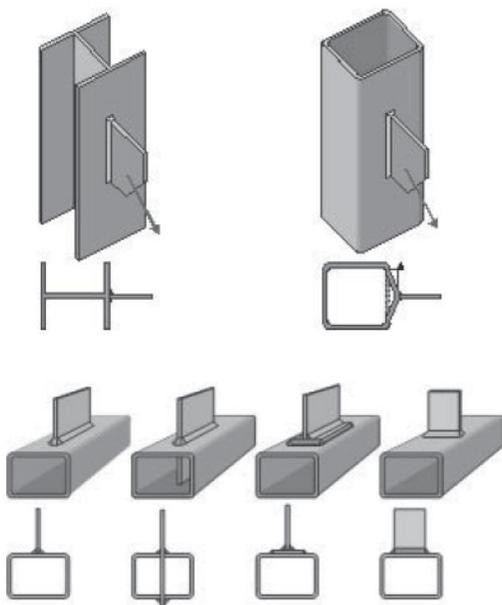
	Yield Strength ksi, min	Tensile Strength ksi, min	Elongation %, min	CVN	Tolerance (Wall Thickness)	Tolerance (Mass)	Corner Radius
ASTM A500 Grade B	Rnd 42 Sq/Rec 46 No Max	58 No Max	23	NA	-10% +10%	NA	3t Max
ASTM A500 Grade C	Rnd 46 Sq/Rec 50 No Max	62 No Max	21	NA	-10% +10%	NA	3t Max
CSA G40 50W Class C & Class H	50 No Max	65 - 90	22	Cat 1: 20 ft-lb @ 32° F Cat 2: 20 ft-lb @ 0° F	-5% +10%	-3.5% +10%	< 6x6x.5 Varies (2t-4t) > 6x6x.5 3t max
A53 Grade B	35 No Max	60	-	NA	-12.5%	-10%	NA
ASTM A1085	50 - 70	65	21	25 ft-lb @ 40° F	-5% +10%	-3.5% +10%	t < .4" 1.6t - 3.0t t > .4" 1.8t - 3.0t

The highlighted areas of HSS connection design which are often overlooked or misunderstood and discussed similarities and the subtle differences between HSS connections and other types of connections for tension, shear, moment and truss applications.

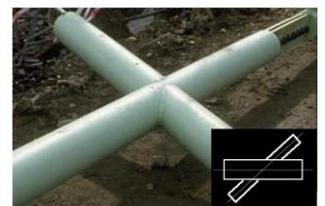
Samples of welded plates vs. slotted through plate connections, gusset plate connections and cast connections were shown.

Concrete filled HSS tubes and composite design details applications were also discussed.

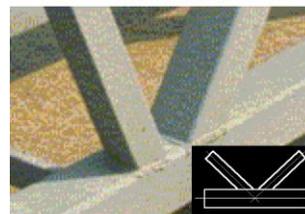
At the end, it was an interactive Q+A with other experienced engineers provided their feedback.



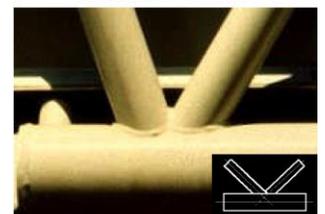
T or Y-Joint



X-Joint or Cross



Gap K-Joint
(includes N)



Overlap K-Joint

Mark Your Calendar

Upcoming Seminars/Webinars and Industry Events

SEABC AGM and Dinner

Dates: Wednesday April 18th, 2018

Venue: Sutton Place Hotel, Vancouver, BC

Time: 5:30-9:00pm – Dinner 6:00pm

So you Think you can give a Seminar?

Date: Wednesday, February 21, 2018

Time: 6:00 pm – 9:00 pm

Venue: Room C100, UBC Robson Square, 800 Robson St., Vancouver, BC V6Z 3B7

Keynote Speaker: Bergman Don, Vice President, Senior Project Director, Cowi Bridge North America

Presentation List:

- Seismic Upgrade of a Steel Moment Frame: Amir Garekani
- Design and Erection of the Veer Kunwar Singh Bridge: Brook Robazza

- Is SRG the New NBCC?: Julia Halipchuk

- Performance Based Design in Bridge Engineering, A State of art Review: Qi Zhang

- A Building Made of Bridges, Jamarat Bridge, Saudi Arabia: Reza Saiedi

Distinguished Guest Speaker: Don Bergman P.Eng., P.E., Vice President Major Projects, COWI Bridge North America. Don will present the St Croix extradosed bridge, its concept development, design and construction.

Reducing the Risks of Nonstructural Earthquake Damage- Webinar

Date: Wednesday 7 March 2018

Time: 12:00-1:30pm

Presenter: Michael J. Griffin, P.E. Principal and partner at CCS Group, Inc.

Registration: www.register.gotowebinar

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
- 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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