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#### ISSUE No. 012

### November 2010

- SEABC's Newsletter is both edited and managed by The Communications Committee. newsletter@seabc.ca
- Submissions to the newsletter are encouraged and all members of the SEABC are asked to actively participate in contributing to our newsletter. Submissions letters to the Editor, questions and comments can be sent to: newsletter@seabc.ca
- SEABC editing staff reserve the right to include or exclude submitted material and in some cases edit submitted material to suit overall space requirements. If submittals are not to be edited, please advise editor at submission time.

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### Message from the President

November 2010 By Dave Davey, P.Eng.; SEABC Charter President



### THE ONLY THING CONSTANT IN LIFE IS CHANGE.

This thought has been traced back through various translations to the ancient Greek Philosopher, Heraclitus, a resident of Ephesus in 500 BC, a hundred years before

Plato. It has certainly been true for structural engineering over the years. You might argue that the bending moment in a simply supported beam was, and still is,  $wl^2/8$  but we know that 'w' can be a variable amount and the degree of beam fixity can be troublesome.

So it behooves us to keep ourselves up to date. APEGBC has, for some years, been trying to introduce mandatory reporting of professional development. Holders of the Struct. Eng. designation are already required to report their professional development activities. The last general membership vote, in 2009, was a 57.7% vote in favour but a 67% vote was necessary for the motion to pass. New proposals to bring APEGBC's program more in line with that of our neighbour, Alberta, are in the works. Mandatory reporting is required, not only by our neighbouring provinces, but by many US States and other countries around the world.

SEABC neither supports nor opposes mandatory reporting of professional development. However, we should all be ready for it.

The purposes of SEABC include both promoting the highest standards of structural engineering and assisting members in their professional development. Certainly, our recent survey of members showed us that educational programming is the most wanted service. We are doing our best to provide this with regular monthly evening seminars, with larger scale, one or two day, events and with the Certificate in Structural Engineering Program. Our ability to provide quality webcasts and video recording has improved immensely over the past two years. The CSE courses are now being regularly offered by webcast to many out-of-province registrants and all our main seminars are being recorded for future transmission or for distribution on DVD. This means that we are now better able to serve those members who reside outside the main metropolitan areas and who would find it more difficult to fulfill mandatory CPD requirements.

As an example of the above, we invite members to sign in to the SEABC website and view our most recent seminar, presented by Andrew Metten on October 25 at the Robson Square Centre on "Changes to CSA Standard S16 – Design of Steel Structures" (see the report in this newsletter). In the near future, this will be located on the website under "Events" then "Seminar Downloads". Attendance at the 1 hour seminar qualifies for one PDH. At this time we cannot confirm that the viewing of a video presentation qualifies the viewer for a PDH. This is something that would need to be resolved with APEGBC.

Feedback on SEABC services and suggestions for improvement are always welcome. Call one of our Directors or simply email to <u>info@seabc.ca</u>.

## IStructE News

By David Harvey, P.Eng, Struct Eng Institution Representative in BC



As the Institution approaches the yearend, we can reflect on the hard work that Norman Train has done during his 2010 presidency. Norman, who visited Vancouver last summer and met with local engineers, has championed the drive to inform structural engineers about

sustainable design practices and encourage their implementation. In a world increasingly dominated by large international corporations, Norman has also strongly represented the voice of the sole practitioner and enhanced Institution services to the smaller firms. Next year the Institution will be led by incoming president Dr Roger Plank, emeritus professor at the University of Sheffield. Roger is a colourful character with a background in fire engineering, a topic on which many will recall his informative presentation at the 2008 Structures Congress in Vancouver. A personable and

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dynamic individual, Roger's task will be to move the Institution further forward and implement its strategic international initiatives.

After 12 years as Managing Editor of the Institution's much-loved publication *The Structural Engineer*, Kathy Stansfield has stepped down. Kathy has done a fantastic job keeping the publication ahead of other international structural engineering journals, while carefully preserving IStructE's core values and traditions. Lee Baldwin has recently assumed Kathy's responsibilities, and with his strong background of publishing and innovative ideas, Lee will soon be taking *The Structural Engineer* and other Institution publications to new heights. I met Lee during my visit to London earlier this month and was impressed by the great enthusiasm he expressed for his new post.

While at the Institution headquarters I attended a meeting of the Executive Board, which is IStructE's Board of Trustees and controls its operations. After seven years on the Board this was to be my last meeting. I will greatly miss the deep involvement in the business of running the Institution and all the wonderful people I have had the distinct pleasure of working with. I can feel gratified that I have brought an international perspective to Institution affairs - an area that will receive much attention in future as IStructE seeks to extend its worldwide influence. Those taking over the reins are impressive, free-thinking individuals, who will grow the business while preserving the traditional values. I can now move my attention elsewhere knowing that both the Institution and its nerve centre are in good hands.

My London visit culminated with the 43rd IStructE Structural Awards, widely acknowledged as the premier global event in structural engineering. This year the event was even more impressive than previously with superb audio-visuals; and fantastic emceeing by BBC's broadcasting anchor Jeremy Vine, assisted by IStructE President Norman Train, and IStructE Chief Executive Martin Powell. As an awards judge again this year I can confirm that the over 100 entries were of a very high standard and testified to the breadth and quality of structural engineering practice across the world. It was a tough but intriguing task selecting winners from the stack of entries. From the many winning and commended projects, the outstanding ones for me were the very beautiful Royal Botanic Gardens Edinburgh's John Hope Gateway building; the elegant Serpentine Gallery Pavilion; New York's eye-catching Apple Store Upper West Side; and Dubai's towering Burj Khalifa.

These amazing projects were among the worthy winners announced at the Structural Awards night. Finally, after much anticipation, came the announcement of the winner of the Supreme Award – Hong Kong's stunning Stonecutters Bridge. This massive span and impressive construction achievement represents a dramatic example of cutting-edge technology applied to bridge engineering. Altogether this was a fantastic showcase of structural engineering, which had those attending eagerly anticipating the 44<sup>th</sup> IStructE Structural Awards.



Dubai's towering Burj Khalifa by Skidmore Owings & Merrill LLP

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Hong Kong's Stonecutters Bridge, winner of the Supreme Award for Engineering Excellence, received by Arup Director Naeem Hussain.



IStructE Gold medalist for 2010, Bill Baker, proudly displaying the Award for Commercial or Retail Structures won by the Burj Khalifa [I-t-r Norman Train, Bill Baker, Jeremy Vine]

### *Communication Committee Update*

### By David Harvey, P.Eng, Struct.Eng. Chair, SEABC Communication Committee

Do you enjoy reading SEABC's quarterly newsletter? Your communications committee strives to provide the

membership with informative articles on topics of interest to structural engineers which are enjoyable to read. The committee looks after the newsletter and web site, but is also responsible for membership matters. We are pleased to report that newsletter is widely read, and the web site is much visited (see the Webmaster's report elsewhere in this issue). Encouragingly, membership is now over 800 and is steadily growing. Our members interested in structural engineering recognize the value in supporting SEABC and accessing its many member services. At only \$75 plus \$9 HST for individual or associate membership, and no change for student membership, the annual dues are unchanged. This represents excellent value as you can recoup your membership fee by attending a single seminar, while enjoying the many membership benefits and staying in touch with the structural community. Please remember to renew your subscription for 2011 before year-end in order to retain your membership privileges. You can find full details of membership rates and how to renew your subscription by visiting the SEABC web site at www.seabc.ca

To make our newsletter even better we are looking for your help. We need stories and photographs which describe what makes your favourite subject of interest to you. So please send details of your projects, activities or research, as well as giving your opinion on current issues affecting structural engineers. We publish articles, photographs, papers, and letters to the editor - thank you for your contribution. We look forward to having you back with us next January - and please encourage your colleagues to join too.

### 2011 Membership

Your SEABC membership expires on December 31, 2010 – to retain your membership privileges, please remember to renew your membership for 2011 at your earliest convenience. Your options are to renew online at <u>www.seabc.ca/members</u> Or, complete the application form at www.seabc.ca/renewal

Corporations can submit a bulk application for all their staff members by mail. The membership fee is unchanged at \$75, plus \$9 HST. Student members can join at no charge but also must renew their membership each year. Please remember to keep your contact information up to date in order to receive all SEABC communications!

### *Structural Practice Committee Update*

### By Thor A. Tandy, P. Eng, Struct. Eng. Chair, SEABC Professional Practice Committee



Report Period: July to November, 2010

Review and Response by Committee:

#### Consulting Practice Committee:

### Use of Computer Generated Stamp

The City of Vancouver will be meeting with Notarius to further discuss the acceptance of the technology and arrangements are being made for a meeting with the City of Burnaby.

### Shop Drawing Review

Task force has reviewed the existing guidelines and proposed some changes. Final committee approval is pending.

### **Quality Management By-Laws**

The draft Bylaws were approved by the committee and endorsed by Council. A formal bylaw vote was sent to the membership.

### **ASTTBC Issue**

APEGBC and ASTTBC are in the process of establishing a joint task force that will look at improving the limited license process.

### **Guidelines for Direct Supervision**

Guidelines were reviewed by the committee and forwarded to Council for endorsement pending final legal and editorial review.

### APEGBC Code Committee:

- a) New letters of assurance rules including use of Schedule S
- b) AIBC practice note 12/15 conditional letters of assurance - APEGBC and AIBC have been

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unable to reach a consensus on this (not sure if you are aware of any of these issues).

- c) Structural Design of Glass standard needs updating - I am struggling with how to proceed with this issue.
- d) Temporary structures working group has prepared a draft guideline.

Revised quality management by-law was passed following recent voting.

#### APEGBC Issues:

No items

### Sustainability Design Education

By Mark Porter, P.Eng., LEED AP

#### Modernizing APEGBC's Sustainability Guidelines :



In 1995, APEGBC published its Guidelines for Sustainability, which formally recognized the Association's commitment to supporting and incorporating sustainability in member's professional practice. Since that time, issues of economic, environmental and

social responsibility in engineering have evolved and those guidelines, now fifteen years old, need to be revisited to ensure their relevance to the practicing professional engineer and geoscientist.

This year, APEGBC's Sustainability Committee began creating the framework for the revised guidelines. We have developed the five key statements shown below and are seeking comment from members through an on-line survey. (link provided at the end of this article).

### The Sustainability Guidelines

Professional Engineers and Geoscientists (APEGBC Members and Licensees) have a responsibility to:

### 1. Integrate Sustainability into Professional Practice

Integrate sustainability considerations into professional practice as required by our Code of Ethics to maintain public safety, health and welfare and to protect the environment.

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### 2. Maintain a Current Knowledge of Sustainability

Maintain a level of competence on sustainability issues related to their area of expertise, and seek additional expertise as necessary. The knowledge, concepts and opportunities for sustainable solutions are rapidly evolving and members should strive to keep skills up to date and advance the understanding of sustainability in their field of practice.

### 3. Use Peer Reviews

Use peer reviews to solicit feedback and expert guidance from colleagues at key stages during a project development to avoid unsustainable options and minimize the risk of lost opportunities to achieve more sustainable results.

4. Develop Reasonable Options and Prepare Clear Justifications to Implement Sustainable Solutions. Develop reasonable project options starting from the earliest stages of development which incorporate environmental, social and economic metrics. Provide clear justifications that enable clients to make an informed decision to implement the most efficient, effective and sustainable solution.

**5. Measure Performance against Sustainability Goals and Identify Opportunities for Improvement.** Measure actual sustainability performance of

implemented sustainable solutions against the original design goals to ensure results were achieved and identify opportunities to improve knowledge and professional practice.

Your participation will provide essential information on the expectations of professional engineers with respect to incorporating and supporting sustainability in their practice. Your feedback will assist us to identify areas of particular relevance and to distinguish areas for enhancement.

Survey responses will be reviewed, considered and incorporated as further drafts are developed. We encourage you to take part in this survey to help shape the future of sustainability in your professional practice.

To access the survey :

www.apeg.bc.ca/sustainabilitysurvey

### *Structural Use of Glass II – Advanced Course*

Event Summary By Andrew Seaton, P. Eng, M.A.Sc.



On October 8, 2010, an audience of 45 people attended the SEABC seminar Structural Use of Glass II: Advanced Course. Held at the Sutton Place Hotel in downtown Vancouver, this full-day seminar was a follow-up to the introductory course in September 2009.

The speakers were two glass experts visiting from the Technical University of Dreseden (Germany): Dr. Bernhard Weller and Mr. Philipp Krampe. Topics covered included structural sealant glazing, impact loads on insulated glass units, triple glazing, glass beams and fins, point fixed glazing, and experimental testing of glass structures. At the end of the day a panel of local engineers lead by Leonard Pianalto, P.Eng., of Read Jones Christoffersen moderated an open discussion on specialized topics and local practice.

SEABC thanks Stella Custom Glass Hardware Inc for their generous sponsorship of the three-course plated luncheon.





Photo by Michael Roberts, P.Eng.

First & Main Building, Portland OR: Uniquely features multiple 30-ft High IGU Glass Walls supported by 20-ft long, soffit-cantilevered glass fins, point supports and bolted glass bearing connections.

### Vancouver Island Branch

### Thor A. Tandy, P. Eng, Struct. Eng.

#### 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 items of technical interest.

#### **Displacement-Based Seismic Design:**

### September 17, 2010

The Island Chapter organized a group attendance of the webcast. Although initial response was low, by the time the day arrived we had thirteen attendees. We rented a local restaurant and we are encouraged that this is a workable solution for those who cannot attend these seminars in person.

#### Future Webinars:

The Chapter will be obtaining membership in ASCE so that we can organize more participation in those webinars

### The Blue Bridge:

### Comment from a Member:

"I find it very annoying that the Save-the-Blue-Bridge crowd (who are probably clinging reverently to their heritage shingles) can over and over accuse the City of hiring engineers to give them the answer they (the City) want and in general call three sets of engineers liars. They malign our professional integrity and ethics. It is unfortunate that this is happening in Victoria and thus not on APEGBC's doorstep; else perhaps they (APEGBC) would stand up for the profession on the topic. If not APEGBC, then SEABC should ..."

Editor's note: We encourage and are pleased to publish debate on this controversial subject but request those who hold passionate views to be respectful of the opinions of others.

### 2010 Aims:

- 1) Continue to provide economical CPD opportunities to the local membership.
- 2) Maintain communication with Board
- 3) Have more general meetings.

### *New SEABC Okanagan Branch*

### By SolomonTesfamariam PhD, PEng.



On October 4, 2010, the SEABC Directors approved the formation of new SEABC Branch in the Okanagan region (SEABC Okanagan Branch). We are excited about this as it will give us the opportunity to closely work with the practicing engineers within the Okanagan region, and cater to

their need with the facility we have at the UBC's School of Engineering at the Okanagan campus. The SEABC Okanagan Branch activities will follow the spirit and mission of SEABC, such as:

- Providing a forum for the discussion of technical matters related to structural engineering.
- Organizing evening presentations on topics such as projects of interest to structural engineers, code revisions by code committee members, new equipment and techniques relating to design or construction of engineering works by industry groups.
- Webcasting or inviting presentations by visiting engineers of national or international stature.
- Creating networking opportunity between the consulting firms and undergraduate and graduate students.
- Creating a venue to share and exchange experience.

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### Young Members Group

By Kevin Riederer, MASc, P. Eng. LEED AP and Ilana Danzig, EIT



Over the past few months the YMG has organized and held two successful professional development opportunities for SEABC Young Members. On October 21<sup>st</sup> the YMG went on a site tour of BC Place (see photo below), led by EIT



Adam Patterson. The tour was full of structural engineering eye-candy from the impressive new roof masts to upgrades of the existing structure for gravity and lateral loads. We wove our way through BC place with stops for many thoughtful questions and to discuss

upgrade details or new construction. The tour ended at the base of the masts shortly after sunset, looking out over Vancouver and the masts being assembled in the Stadium below.

In early November, the YMG held a professional development seminar on the fundamentals of computer modelling. The speaker was Bob Schubak, the Structural Engineering Team Lead in Generation Engineering at BC Hydro and who has been active in the education of engineers for many years with UBC, BCIT and SEABC. His presentation focused on the key concepts that are critical for building a computer model that gives useful results and reasonable understanding of the structure being modelled. Both the tour and the seminar sold out quickly and unfortunately not everyone who expressed interest was able to attend. However, the YMG will continue our efforts to bring valuable seminars and events to SEABC young members.



The site tour of BC Place

### BCIT and CSCE Update

### By Jonathan Klop



The Canadian Society for Civil Engineering,(CSCE), Student Chapter at BCIT, is hosting a Civil Engineering "Professional Night" on February 24, 1010. We extend an invitation to all engineering professionals to attend this year's event.

It is an opportunity to mingle with Civil Engineering students and faculty and to meet prospective employees. There will be several 2<sup>nd</sup> and 4<sup>th</sup> year students nearing the end of their studies who will be looking for technologist and EIT positions, respectively. Each year we receive positive feedback from all parties on this event. Please visit <u>www.cscebcit.ca</u> or email <u>foaadsm@gmail.com</u> for more information. We look forward to your attendance.

CSCE BCIT Chapter is having an active and successful year, thanks in part to the generous funding contribution from SEABC. Our Chapter goals this year include maintaining our members' high level of engagement and incorporating charity events into our activities. We frequently host technical talks for students where respected industry experts present on topics such as the Chile Earthquake and Richmond Olympic Oval. These talks are intended to give students a real world engineering perspective and to motivate and inspire them. Each year, we sponsor several student groups who enter design competitions across North America. This year's planned events include the ACI FRP Beam Competition and the Canadian Wood Council Wooden Catapult Competition.

Students, Faculty, and Professionals mingle at CSCE's 2010 Professional Night



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### *Technical Committee Update*

### By Renato Camporese, P.Eng. Struct.Eng. Chair



Three Task Groups are currently active and generating some progress after a slow summer. Recent activities are as follows:

#### The Guards Task Group

The Guards Task Group draft report is under final review and will hopefully be issued shortly. The group chair, Robert Jirava, has recently met with many building officials in Ontario to help in advising them of requirements to ensure that guard projects are properly executed. He will be speaking at the 'Building Officials of BC' AGM in November, providing a seminar on the problematic issues with the design, construction and responsibility for guards and how the building inspectors can help address some of the problems. He also plans to speak to heads of all 'Canadian Province's Building Officials' associations in this regard.

### The Seismic Design of Basement Walls Task Group

The Seismic Design of Basement Walls Task Group was presented. It has continued its analytical work with the assistance of a UBC Grad student. Additional parameters including friction angle of backfill material, soil stiffness, backfill slope angle, and input ground motions have been studied. The first draft of a summary report on this work is anticipated by mid-November.

#### The Temporary Structures Task Group

The Temporary Structures Task Group has developed a 'Draft Guideline for Tent Structures'. Comments on the document are also being obtained from Building Officials and will be reviewed by the group at their next meeting in mid-November.

Local building officials have also expressed an interest in guidelines being developed for engineers involved in demolition projects. The task group is considering expanding its activities to take this on as well as continuing development of guidelines for temporary structures.

### APEGBC Council 2010-2012

### By David Harvey P.Eng. Struct. Eng.

At the 2010 APEGBC Council elections, two structural engineers, Andy Mill and Mark Porter, ran for office and both were successful. Andy has served on Council three times previously, however, we believe this is the first time we have seen two structural engineering APEGBC Councillors who will now be serving us for the next two years. Mark Porter writes the sustainability column for the SEABC Newsletter. Andy and Mark were sworn into office at the APEGBC AGM at Whistler on October 23<sup>rd</sup>.

Andy's election statement lists his objectives as helping APEGBC to better advise government and industry; improve mobility; reform professional liability; and reengage with disaffected members. Mark's objectives are to help our profession lead in sustainable design; to ensure that APEGBC is consistent in evaluating applications and negotiates good mobility agreements; and to dialogue with members so that their voices can be heard.

With representatives like Andy and Mark working for us, structural engineers will be well served and APEGBC well governed. Congratulations, Councillors!



APEGBC Council for 2010-11 at the Whistler Conference Centre. Mark and Andy are in the back row, third and fourth from the left.

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### *Changes in S16-09 Steel Standard*

### Summary of Seminar By Andrew Seeton P. Eng, M.A.Sc.

On October 25, 2010, an audience of 100 SEABC members enjoyed a free evening seminar by Andy Metten, P.Eng, Struct. Eng. of Bush, Bohlman & Partners. Andy's talk covered changes in the CSA-S16-09 steel standard that will come into effect with the upcoming revisions of the building codes NBCC 2010 and BCBC 2011.

The changes include changes to static design of unsupported beams and single angle compression members, as well as revisions to seismic provisions including: significant changes to "conventional construction" requirements, addition of a section on buckling restrained braces, and modifications to brace bay design. Andy provided handouts of a clause-byclause summary of the changes as well as a paper from the recent 9<sup>th</sup> US National and 10<sup>th</sup> Canadian Conference on Earthquake Engineering (July 2010, Toronto) titled 'Seismic Design of Steel Structures in Accordance with CSA-S16-09' (R. Tremblay, M. Bruneau, R.G. Driver, A. Metten, C.J. Montgomery, and C.A. Rogers). Both of these documents are available for download at http://seabc.ca/seminar downloads (member login required). Additionally, the event was recorded and is available for viewing by SEABC members in high-quality webcast from the SEABC website.

SEABC thanks the Canadian Institute of Steel Construction for their generous sponsorship of the refreshments. Two CISC representatives were on hand to answer questions about CISC and take orders for the new 10<sup>th</sup> edition of the Handbook of Steel Construction which contains S16-09 as well as updated commentary and a new section on design for fire conditions.





Andy Metten giving his seminar

## Corporate Member's Breakfast

By Adrian Gygax, P. Eng. Struct. Eng. Director SEABC

On 22 September 2010, the Corporate Membership



Committee hosted what is hoped to be the first of a series of regular early morning events for any SEABC members interested in corporate issues. A glance at the SEABC website will show that the Corporate Member designation is currently inactive. However, the fact that

SEABC even has such a membership category should be an indication of things to come.

The last two and a half years, since SEABC formed in early 2008, have mainly been a time of building the SEABC "brand" and strengthening professional development opportunities for the membership. However, the SEABC Board of Directors felt the time had now come to start turning our attention to some of our other activities, such as serving the needs of our corporate members. The focus in this regard will mainly be issues of interest to principals of structural engineering firms, structural engineering managers and sole structural practitioners.

The Corporate Member Committee decided to kick this initiative off with a series of simple events to both gauge

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and grow interest in corporate membership services. The current plan is to hold breakfast gatherings, each featuring a keynote speaker, every three to four months and build from that.

The keynote speaker at our inaugural event was Wilma Marais and the topic was "Gen Y Recruitment and Retention - a Strategic Approach". Wilma is a Human Resources professional with over 15 years' experience in both the consulting and corporate environment. Her specialty is providing 'Human Resources Consulting Services' to companies that value their employees, see them as the companies' biggest asset and are ready to act on it. She also focuses on performance and productivity improvement within companies, using training, facilitation, coaching, performance management and other human resources processes and programs.

During her excellent and informative hour-long presentation, Wilma summarized some of the issues facing employers of our young Generation Y colleagues. Highlights of her talk were:

- Each generation is shaped by the times during which they grew up and beliefs of their parents. This forms their perspectives, hence influences career and work / life balance choices.
- There are currently four generations in the workplace: "Veterans" (10%), "Boomers" (50%), "Gen X" (30%) and "Gen Y" (10%).
- Gen Y will echo the Boomers in numbers somewhat.
- Gen Y did not suffer many hardships, relative to their parents, growing up and are perceived as being spoiled in the traditional sense. They seek personal attention and one-on-one relationships.
- Gen Y takes the stand that a "job first" mentality is not worth it. Social and environmental issues are very important to them. They want a flexible workplace that is a less structured, informal, environment. They are loyal as long as everything fits.
- In the late 70's and early 80's the labour markets shifted to the advantage of employers. Due to declining birth rates and boomer retirements, a seller's market is returning.

As well as these nuggets, Wilma provided attendees with a number of valuable pieces of advice to take away, such as:-

- To see mentoring as a two-way street, with Boomers (us employers!) passing on in-depth work skills in return for work-life balance perspectives from our young Gen Y employees.
- Being aware of Gen Y's ability to "e-network" and branding our companies honestly, both on and off-line, while projecting our companies in a modern way; featuring our companies' nonprofessional values, such as re-cycling programmes, LEED certification or support of transit use.
- Making sure job descriptions are creative and exciting and focusing on skills and attributes; using employees for branding and advertising, realizing that they are constantly keeping their peers informed of their workplace on Facebook and Twitter.
- Creating a "work-community" not a work-place and fostering friendships between co-workers, thus giving them something to lose if they leave.
- Always providing feedback and rewards and keeping the dialogue going.
- Finally, realizing that some turnover is normal, but making sure employees go positively when they do leave.

Following Wilma's presentation, an animated discussion of the topic was kicked-off by Nick de Ridder and Grant Fraser, two young structural engineers who had been asked to provide their generation's perspective. Both found much agreement with Wilma's insights and stressed continuing professional development, mentoring, being taken seriously and being given interesting work as core aspects of what they look for in a job. Also important were free time, with additional vacation time just as important as extra pay when salary-review time comes around.

All in all, this was a very successful event that all attendees found a worthwhile use of two hours of their morning. The next one is planned for some time in the early new year, so be sure to look out for it in upcoming SEABC event e-mailings.

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### *Council Meetings in Whistler*

### By David Harvey P.Eng. Struct. Eng.

For 2010 it was SEABC's turn to host the Western Round-Up, the combination of Northwest and Western Council meetings, along with the Western Conference. As SEABC's predecessor, the DSE, had done in 2004, we elected to hold the event in combination with the APEGBC Annual Conference at Whistler, for which SEABC was organizing the structural stream of the professional development program. Delegates from our counterpart SEAs in the Western United States joined us for the Council meetings, the Delegate Luncheon, the Oktoberfest Fun Night, and the structural presentations. SEABC President Dave Davey then hosted the President's Dinner at the Keg Restaurant with some 26 guests, to round off the occasion.

The Northwest Council comprised a very strong showing from the host organization, SEABC, with six Directors present. They were joined by representatives from Washington, Oregon, and Idaho. The meeting agenda started with delegate introductions, and a welcome from Chair Ed Huston from SEAW. With the 2009 minutes approved, attention turned to plans for the 2011 Northwest Conference, to be hosted by SEAW – Spokane. Plans are well underway and a venue has been selected on favourable terms. In 2012 the event will be hosted by SEAO who have already booked a resort for the conference.

The Council then discussed the disappointing 2009 event which had suffered badly from the effects of the recession. Only 34 delegates attended and the event lost about \$10,000 – the first time in its history a loss had been recorded by a Northwest Conference. The organizers expect a better turn out in 2011 but are limiting the financial risk by being frugal. The Council agreed to draw down the seed money used to fund future conferences by \$4,000; to assess dues of \$1 per member per year for three years; and to rebuild the seed money fund to an appropriate level as soon as possible using excess event revenue. This was a quite a challenging topic for the Council, but was handled professionally and with sensitivity. Because it absorbed much of the meeting time available, the other items were moved to the later WCSEA meeting.

For the Western Council meeting we were joined by Arizona and Hawaii delegates, and Ed Huston chaired the meeting on behalf of 2010 WCSEA President Dave Davey. The agenda included the treasurer's report and a report from the WCSEA representative on the Applied Technology Council. Ed Huston then gave a summary of plans for the 2011 structural exam which will be prepared by NCEES. Mutual recognition of qualifications was discussed and it appears likely that work will continue despite the recent setback which occurred in Washington State.

The bulk of the discussions centred around continuing education, webinars, and shared resources, with encouragement for event organizers to extend "member" pricing to all members of WCSEA member organizations. A number of pre-prepared presentations were offered to the other SEAs to include in their events calendar.

Many of the visiting delegates brought along their partners who much enjoyed the mountain resort, and who took back home many fond memories of SEABC's hospitality and Whistler's dynamic charm.

*SEABC Seminar Displacement Based Seismic Design* 

### By Didier Pettinga PhD, P. Eng.



Glotman Simpson Consulting Engineers and SEABC co-hosted the seminar on Displacement-Based Seismic Design held at the SFU Woodward's campus in Vancouver on September 17<sup>th</sup>-18<sup>th</sup> 2010. The presenters were Emeritus Prof. Nigel Priestley, formerly of UC San Diego and current co-Director of the European

School for Earthquake Engineering; and Prof. Mervyn Kowalsky of Carolina State University, both well-known figures in the field of seismic design. The two-day seminar was attended by over 210 engineers on site and 45 online viewers. We would like to acknowledge

the generous assistance we received in hosting the seminar from the UBC Student Chapter of EERI.

The Performance-Based Seismic Design movement that originated on the West Coast of North America in the 1990's has generated a number of "displacementbased" design approaches. The particular form of Direct Displacement-Based Design developed by Priestley, Kowalsky and Michele Calvi, plus a number of their colleagues and students over the past 15 years, has been steadily growing in recognition and is starting to be accepted in seismic design codes in a number of countries, including New Zealand and Italy.

The opening session laid out the fundamental inconsistencies and contradictions inherent to current seismic design approaches that are common to most modern seismic codes around the world. In particular, the so-called "refined" three-dimensional multi-modal elastic analyses based on rather arbitrary stiffness properties, will generally lead to inappropriate distributions of strength among the elements of a seismic lateral-force resisting system. The result of this is that under design-level ground motions, structures will not perform as expected, often with unfortunate consequences that our analyses will not capture.

Following this, the principles and intent of Displacement-Based Seismic Design were described, with emphasis given to the fact that using the DDBSD method, a target deformation commensurate with a chosen performance limit-state is selected, which then serves as the primary design criterion driving the required base-shear strength. As noted by those in attendance, this turns current practice in Canada around. Currently displacements are "checked" at the end of the design, however, no consideration is given to directly evaluating the interaction of stiffness and strength. The DDBSB method is based upon a great number of research theses produced over the past 15 years with more underway at the present time.

The Friday afternoon sessions rapidly moved forward into design-orientated presentations on moment-frame, shear-wall and coupled-wall design, behaviour and analysis. Much of this built on the well-known Capacity Design principles that are adopted in our codes, however, with drifts and strain limits now the primary design objective, a number of new and provocative findings were identified. The result is a seemingly simple approach to vertical and in-plan force distribution that aims to *achieve* the target structural response, rather than *satisfy* a limiting value. The DBSB method has been verified by extensive non-linear time history analyses over many years, predominantly on theoretical structures. Therefore, to complete the process, a nonlinear time history analysis of each project is required to confirm the design details.

Indicative of the captivation of the seminar, Saturday morning saw the theatre quickly fill as the first session explored bridge design and response in significant detail. Much of the Direct Displacement-Based Design method has been developed following issues identified with current bridge design practices. As a result, the impact of the new design approach and the range of design considerations were extensive, which reinforced the need to update current practices. This was underscored by the fact that Australia, and likely New Zealand, is now preparing to implement a displacement-based seismic design code for bridges.

The final session covered port facilities, supplemental damping and isolation devices in displacement-based seismic design, and included assessment of existing structures in a displacement-based context.

Offering the DDBSD seminar to Vancouver structural engineers is timely given that our design codes have already taken the first steps towards performancebased philosophies. While it will likely take more than one code revision to see our codes fully adopt a displacement-based approach, many of the findings presented can be used in current practice. Becoming familiar with these ideas and philosophies, and interpreting how they reflect on our current design methods is the first step towards seeing our codes becoming truly performance-based.



Professor Kowalsky describes how the DDBSD method is applied to bridges.

### November 2010



Seminar sponsor Rob Simpson introduces the speakers



Professor Priestley reflects on how the more realistic DDBSD method prevents undesirable modes of inelastic deformation.

### *Good News for UBC's Okanagan Campus!*

### By SolomonTesfamariam PhD, PEng.

Civil Engineering Program at UBC's Okanagan campus School of Engineering receives full accreditation

UBC's School of Engineering at the Okanagan campus received full accreditation for three years, the maximum accreditation period attainable for new programs from the Canadian Engineering Accreditation Board (CEAB). The Civil Engineering graduates of June 2010 learned the news at their convocation ceremony.

"This is a significant achievement," says Tyseer Aboulnasr, Dean of the Faculty of Applied Science. "Accreditation indicates the strength of our programs and their acceptance within the professional community. We are very proud of what has been achieved by the School of Engineering over the past five years and the support and excellent relationships we have with industry."

"Our faculty, staff and students have accomplished a great deal through the accreditation process," says Spiro Yannacopoulos, Director of the School of Engineering. "We have developed a remarkable set of programs, taught by extraordinary professors who work with



bright young students destined to become tomorrow's engineers."



The photo shows the Civil Engineering graduating Class of 2010 which included 27 students receiving the first-ever UBC Bachelor of Applied Science degrees conferred in the Okanagan.

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## November 2010

### *Kevin Riederer wins APEGBC Young Professional Award*

By David Davey, P. Eng.

I am pleased to report that Kevin Riederer was the winner of the 2010 APEGBC Young Professional Award. Kevin has been a long-time volunteer with APEGBC, starting as treasurer of the Vancouver Branch in 2005. Subsequently he has served as the branch vice chair and chair, and currently sits on the APEGBC nominating committee.

In 2009, Kevin took on the task of chairing the Young Professional's Group of SEABC, and has organized several technical and social events. Under his leadership, the group has become an organized body with an ongoing program that can enhance the knowledge of younger engineers and develop a network of professionals. Both aspects are important in developing professional and management skills in the field of structural engineering.

It is truly a pleasure to work with a self-motivated and enthusiastic member who can be relied upon to develop and conduct a program that is at the heart of the purpose of the SEABC



Kevin (right) receives his award from APEGBC Past-President, Russ Kinghorn.

## Update on Chile

By Rob Simpson, MBA P.Eng. Struct. Eng. LEED AP

#### Chile is BC in Fast Forward



The lessons are numerous from our 10 day tour of central Chile, but most affecting of all is a deeper appreciation of our future here in BC. We are living next door to the eye of the tectonic storm of this world. The subduction zone along the west side of South America is virtually the same as that of the Juan De Fuca plate as it

passes under the North American plate offshore of BC, the main difference being the strain rate at which the two plates approach each other. The strain rate offshore Chile is roughly 10 times that of the interface along BC, Washington State and Oregon. Looking back at the history of subduction events along this southern plate interface, we see the following major events since the beginning of the last century:

M8.2 1906; M8.5 1922; M8.2 1943; M9.5 1960; M8.0 1985; M8.0 1995; M7.8 2005; M8.8 2010.

The frequency is regular at around 15 years average and when strain rates are accounted for, the future is ominous for BC. While it's true that differences in subduction mechanisms might cause differences in return periods, the comparison is still very simple. We are in for a major shake sometime soon. How soon? The chances increase yearly. In geologic time the "big one" will occur about, "any time now". Currently, seismologists are pegging our chances at around 1 in 3 over the next 50 years, and rising quickly. The last North American plate subduction event is recorded January 1700 by tsunami records in Japan. Our return period is roughly 300 to 350 years by strain rates. Do the math!



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## November 2010

#### Subduction vs Crustal: Structural Engineering Concerns

Crustal earthquakes offer much more severe shaking in a more localized zone for a shorter period of time when compared to subduction events. Our Building Codes, design methodologies and academic research on seismic engineering of buildings are all derived from crustal events that are aimed at building survival under 4 or 5 peak excursions beyond yield. It is thought that the severity of these crustal events will control the design problem. Unfortunately, there are some cases where this may not always be the case:

**Case 1:** Columns and walls can progressively deteriorate under moderate lateral drifts after a few pulses past the yield point. Damage done in the yield excursion can create a minor hinge that is vulnerable during the following dozens of cycles.

**Case 2:** Columns and walls spall their cover at 0.8% to 1% drift. We design for 2.5% drift in our design level crustal earthquake. Continuous reverse cyclic loading of a column beyond 1% drift could easily occur in a subduction earthquake causing gradual deterioration of the core of the column and risk of failure when not confined.



**Case 3:** Eccentricity of gravity dead load imposed upon a lateral force resisting system can probably be sustained in a short duration earthquake with counterbalanced strength within the system; however, it's not the same for long duration earthquakes. Even at lower peak loading, a ductile system will yield under a subduction event that can lead to one-way yielding which will lead to a one-way collapse if the number of cycles cause sufficient movement for P-delta effects to take over.



**Case 4:** Some steel braced structures are noted in current research to experience increased lateral drift with long duration earthquakes leading to potential instability especially in systems with heavy gravity load.

**Case 5:** Brittle structures such as unreinforced masonry may tend to rock and sway under short duration earthquakes, but after some time they will lose integrity and fail. Similar to adobe construction in Chile, our brick and unreinforced concrete block structures will crumble with sufficient duration of moderate shaking.

Recent changes to our Codes have improved matters, but we have some ways to go to address long duration shaking. Changes made in design practices today that are specifically aimed at improved building survival in long duration earthquakes <u>will provide benefits in the</u> <u>near future</u>. How could we ignore such a return on investment?



## Bridge Dynamic Testing 2010

### By David Harvey P.Eng. Struct. Eng.

Dejan Erdevicki, structural engineer with Associated Engineering, has come up with a novel solution to measuring bridge dynamics, involving an i-Pod, free software, and his daughter! After Ivana Erdevicki had installed the software on her i-Pod, for 'Take Your Child to Work Day 2010', she accompanied her father to the Port Moody Pedestrian Bridge, designed by Dejan in 2004. The 120 m long cable-stayed structure crosses the CP main line rail tracks in downtown Port Moody, and is very popular with the local community. Always wanting to know if his design calculations for pedestrian comfort were correct, helped by his daughter, this would be Dejan's chance to find out. It was also a good opportunity for Ivana to check out her father's handiwork first hand.

With ten runs using Dejan's 115kg mass completed, the results were in. Maximum acceleration from walking/running was measured at 0.5m/s2, which compares very favourably to the design figure of 0.7. For reference, BS5400 and CSA-S6 values are 0.72 and 0.45 m/s2 for a 70 kg pedestrian walking across the bridge.

However, acceleration caused by Dejan jumping on the span is much higher and was measured at the resonant frequency of 2.25Hz (compared with a calculated value of 2.1 Hz). Clearly jumping/ vandalism is a concern, and Dejan believes that to minimize the risk of damage to pedestrian bridges without dampers, the frequency range from 1.9 -2.5 Hz should be avoided.

Good work, Dejan and Ivana!



Dejan, Ivana, and i-Pod!



Typical trace from a test run across the bridge deck.



Port Moody Pedestrian Bridge

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### November 2010

### *Portland Bridge Festival*

### By Michael Roberts, P.Eng Speciality Structural Engineering



#### 2010 Inaugural PDX Portland Bridge Festival

Held between July 23<sup>rd</sup> and August 8<sup>th</sup>, 2010, this unique first festival focused on celebrating Portland's many Historic Bridges and associated culture. One of the focal points of the festival was a

birthday celebration for the Hawthorne Lift Bridge which turned 100 this year: The US's oldest and still in service working vertical lift bridge. During the 16-day event, all of Portland's eleven Willamette River bridge crossings became the topic for dance parties, bridge tours, art displays, and yes, even brunch on the bridge!



Photo by Aaron Rogosin

The Hawthorne Bridge was dressed up with a custom light and sound that transformed the Historic Bridge into its own art installation. Lighting technology interacted with nightly vehicular traffic to display changing LED light effects and demonstrating the rhythm of the traffic over it. On the 31<sup>st</sup> of July, the bridge became the stage for a massive party that included a marching band, historic images projected onto stretched canvases, and a DJ-led 'after party' on the Lift Span portion. Harmonic motions created by the marching band and effects of synchronized dancing movements on the lift span caused the party to be briefly interrupted and the ODOT representative expressing concern for possible damage to the historic bridge due to dancer-induced vibrations: Songs with less sync were then played to encourage those (including myself) to return onto the lift span to feel a little more secure.



Other events included guided bike and walking tours of all the bridges, bridge art museum and performance shows, discussion forums, the largely-favourite jet boat tours and guided tours on the river which stopped under each bridge to offer background and history lessons between spins of soakings and high speed. The festival was wrapped up with a massive "Brunch on the Bridge" that included installation of over 13,500 square feet of lush sodded lawn with picnic tables and potted trees where over one thousand people were able to stroll bare foot and enjoy the vehicular-free bridge event.



Photo by Aaron Rogosin

### November 2010

### *Bridge Subcommittee*

### By Alfred Kao, P.Eng.



The inaugural meeting of SEABC Bridge Subcommittee took place on October 14. The meeting was wellattended with representatives from the consulting industry, B.C. Ministry of Transportation and Infrastructure and TransLink.

The group initiated discussion on the possibility of producing a professional practice guideline for bridge engineering, similar to the APEGBC's Guidelines for Structural Engineering Services for Building Projects. There was debate on the need for such a guideline and its value to practicing bridge engineers, but no consensus was reached on either of these issues. The chairman will review the practice of other jurisdictions and circulate to members for future consideration and discussion.

No date has been set for the next meeting. For more information, please contact Alfred Kao at kaoa@ae.ca.

Bridges of Interest

By Michael Roberts, P.Eng Speciality Structural Engineering

#### Belize City Swing Bridge, Belize

Constructed in 1922 in Liverpool (UK) and shipped to Belize City by Jefferson Construction Co of New Orleans Company who erected it in 1923 for \$84,000, this bridge is the only functioning, manually operated Swing Bridge left in the world. A simple solution to a complex waterway and vehicular traffic problem that connects the city, the bridge once swung twice each day to allow traditional fishing boats through. Since 2007, the bridge is now only opened on Tuesdays and Thursdays at 6pm by four city workers who hand crank it through 90 degrees for a process taking about an hour. Locals are very proud of their bridge which received an 8-month, \$430,000 US refurbishment in 1998 and consider it one of their major tourist destinations and most historic structures in the Country.



Hawksworth Suspension Bridge, San Ignacio, Belize

Connecting the sister towns of Santa Elena and San Ignacio, the Hawksworth Bridge is the Highest, longest (Over 170m), and only traffic suspension bridge in Belize. Imported from Middlesbrough, UK and erected in 1949, the bridge accommodates one lane and a pedestrian side walk. Although very rare and infrequent, water levels in the Macal River have risen to within a few feet of the bridge's deck soffit.



### November 2010

### *Structural Stream at APEGBC Annual Conference*

Summary of Seminar By Andrew Seeton P. Eng, M.A.Sc.

This year's APEGBC Annual Conference & AGM took place at the Whistler Conference Centre on October 21-23, 2010. The program included the Structural Stream technical sessions on October 22, coordinated by SEABC. The Structural Stream featured four presentations, all of which were very well attended – in some cases with standing room only!

SEABC thanks all of the stream speakers who volunteered their time to present at the conference. A summary of the presentations follows:

#### Whistler/Blackcomb Peak 2 Peak Gondola Warren Sparks, P.Eng, Executive VP & GM at Doppelmayr CTEC Ltd.

Mr. Sparks delivered an entertaining overview of the highlights and challenges involved to design and build this record-setting piece of recreational infrastructure at a cost of \$53M over a two-year construction period. Featuring the longest unsupported span for a lift of its kind, the Peak 2 Peak Gondola travels a distance of 4.4 km over four towers ranging in height from 35m to 65m. The eleven-minute journey can be experienced by 28 people per cabin, yielding a transportation capacity of 4100 persons per hour. At its highest point near midspan, the gondola is suspended 415 m above Fitzsimmons Creek.

Mr. Sparks described the construction process which included relocating the Solar Coaster and Catskinner chair stations, and transporting the new cables from Switzerland to Whistler via Washington. Details of the bullwheel, pistons, and cabins were presented, as well as the evacuation system and state-of-the-art obstacle collision avoidance system which uses tower-mounted radar scanning to avoid aircraft collisions with the cables.

Mr. Sparks acknowledged the contributions of Cannon Design Architects and Glotman Simpson Consulting

Engineers for their design of the gondola terminals and foundations.



Warren Sparks describes how the Whistler Peak 2 Peak gondola was built to an attentive audience.

Art Gallery of Ontario - Timber Connection & Erection Engineering Robert Malczyk, MASc, PEng, StructEng (Principal, Equilibrium Consulting Inc.)

Mr. Malczyk described his company's experience in designing the timber connections for this \$200M art gallery renovation and expansion envisioned by renowned architect Frank Gehry. The feature 200m long enclosed façade (Galleria Italia) is a glass and glulam curvilinear form devoid of symmetry or regular pattern. Through 5000 engineering hours, Equilibrium Consulting designed the 2500 connections between 1000 curved glulam members, each connection having a unique geometry and multi-axial loading.

The structural system consisted of a primary layer of "vertical" curving arch ribs with horizontal link beams, and a secondary layer of mullion grid framing. The architectural desire was to conceal all connection hardware to the extent possible. State-of-the-art solid modeling software was used to detail the connections and control the CNC machining performed by Structurlam Products Ltd.

Due to the varying geometry throughout the structure, erection tolerances including ambient movements during construction were critical; each node location was surveyed in three-dimensional coordinates during the erection process. Mr. Malczyk remarked that this was the first project of such complexity in North



America, proudly achieved with BC wood products engineered and manufactured in BC.

Robert Malczyk explains the intricacies of timber connections

### November 2010

Lessons Learned from the 2010 Chile Earthquake Sharlie Huffman, P.Eng. (BC M.O.T.) and Dr. Perry Adebar, P.Eng. (UBC Civil Engineering)

Mrs. Huffman and Dr. Adebar were part of a reconnaissance team that visited Chile shortly after the Magnitude 8.8 earthquake of February 27, 2010.

Mrs. Huffman began her presentation with an overview of the seismo-techtonic environment in the affected region in Chile, identifying similarities to the Cascadia subduction zone in BC. She then described the observed damage to bridges and roads. While most of the damage was to older structures on the government road system, new bridges also suffered from ground and embankment failure and unseating due to large displacements and rotations, inadequate bearing seat widths and lateral shear block restraints and inadequate continuity of the structural systems.

Dr. Adebar's presentation began with a summary of the devastation caused by the tsunami associated with the earthquake. Indeed, the majority of the ~500 deaths reported in relation to the event were drowning due to tsunami.

He then discussed the earthquake damage to nonengineered buildings from adobe and unreinforced masonry. In reviewing damage to modern engineered buildings, Dr. Adebar highlighted the compounding influences of "Bad Architecture" (building forms with inherent irregularities and weaknesses from a seismic perspective), "Bad Engineering" (poor seismic detailing and poor structural systems in general), and "Bad Construction" (construction quality, which appeared to be generally adequate in most instances observed in Chile). These factors were illustrated with examples of structural failures including:

- -A commercial warehouse type building that suffered from failed epoxy anchor connections between the concrete wall panels and the steel roof system, leading to subsequent wall panel collapses.
- -Several examples of building irregularities concentrating damage in localized areas, which increased the flexibility and displacements in these areas, exacerbating the irregularity and leading to further damage localization.

 -Damage at the compression side of wall buildings in which inadequate support at the compression side of the wall was provided, and particular damage to thin concrete walls.

Dr. Adebar's subsequent research suggests that our assumed unconfined concrete compression strain capacity of 0.0035 is unconservative for thin walls without zone ties. He noted that the four building collapses and 50-150 badly damaged buildings represents a small fraction of the total building stock, but questioned whether collapse prevention is an adequate standard for our modern buildings.



Presenters Sharlie Huffman (left) and Perry Adebar (right) are joined by Stream Coordinator Andrew Seeton after giving a gripping first-hand account of the impact of the M8.8 Chilean earthquake.

#### Design of Piles in Liquefiable Soils Dr. Mustapha Zergoun, P.Eng. (Senior Geotechnical Engineer, Thurber Engineering Ltd.)

For new construction projects on liquefiable sites, it is common to undertake ground improvement measures to mitigate the liquefaction hazard. However, many existing structures are founded on piles at liquefiable sites and for such structures an assessment of pile performance during liquefaction may be required.

Dr. Zergoun explained the techniques that are available to undertake such an analysis, describing observed case histories, failure mechanisms, design criteria and methods and recent empirical and analytical research. Analysis methods described and compared included limit equilibrium analysis, lateral load-deflection (P-Y) analysis, centrifugal modeling, and numerical (finite element and finite difference) analysis. He also made reference to a new book on this complex topic by Gopal Madabhushi (University of Cambridge, UK), Jonathan Knappett (University of Dundee, UK), and Stuart Haigh (University of Cambridge, UK)

## November 2010

### On the Web

### By Stephen Pienaar, P.Eng; SEABC Webmaster



Business continues to be brisk on the SEABC website:

- The number of **website visitors** average about 1,500 per month. Most visitors are local, with noticeable hits also from the USA and Europe.
- We regularly add new content to the website. An example is the **multimedia recording** of the recent evening seminar on the "Changes in the Steel Standard S16-09".
- Members are embracing online registration for SEABC seminars and CSE courses. The recent evening seminar "Changes in the Steel Standard S16-09" attracted over 150 bookings.
- Email announcements of industry events and seminars, and the SEABC Newsletter is reaching nearly 800 active members and approximately 400 friends of the Association.
- Member activity on the **SEABC Forum** is growing, but not quite at the rate we had hoped for. We invite all SEABC members to participate in the Forum and help it evolve into the preferred place for discussing current technical issues.

Please send your comments and suggestions for improving our website to webmaster@seabc.ca or post it on the SEABC Forum.

### Follow us on Twitter!

Receive timely announcements of upcoming events on your cellphone. http://twitter.com/SEABC

### Forum Digest

### By Stephen Pienaar, P.Eng, SEABC Webmaster

The **SEABC Forum** is gaining popularity among members as a way to share their technical expertise. The range of discussion topics continues to expand. Here is a summary of recent topics discussed in the **General Technical Discussion** forum:

- Neil A is inquiring about lateral wind deflection of pre-fabricated steel buildings. <u>Read more ></u>
- Tejas G wonders about the history of ground snow load in bylaws of the City of Vancouver. <u>Read more ></u>
- Discussion continues on the topic raised by Paul M back in March: Registering as S.E. or P.Eng. in the USA. <u>Read more ></u>
- Tarek E wants to know more about Chilean steel and concrete design codes.
   <u>Read more ></u>
- Li S raises the issue of initial design eccentricity for steel columns. <u>Read more ></u>
- Michael R asks an interesting question about the new roof truss for BC Place Stadium. <u>Read more ></u>
- Tejas G is inviting comments on field-cutting of existing W-shape sections. <u>Read more ></u>
- Stephen P is soliciting feedback on RSCI Manual of Standard Practice. <u>Read more ></u>

### Not using the SEABC Forum yet?

Your Forum membership is automatically included with your SEABC membership. If you are not using the Forum yet, you are missing out on a great opportunity! Don't delay, <u>log in</u> and start using the SEABC Forum today!

## November 2010

## Ask Dr. Sylvie

CISC published Ask Dr. Sylvie articles in Advantage Steel up until Edition 34 available at: <u>www.cisc-icca.ca/content/publications/</u> <u>publications.aspx</u>

See also the list of CISC technical resources at: www.cisc-icca.ca/content/technical/default.aspx



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- Foundations for Metal Building Systems Tuesday November 23. More info...
- Design of Moment-Resisting Foundations for Pre-Engineered Buildings Tuesday, November 30. More info...
- Renovation of Wood Trusses Thursday December 2. More info...
- Design of Wood Diaphragms and Shear Walls Tuesday December 7. More info...
- ASCE 7-10 Snow Load Provisions Thursday December 9. More info...
- Deciphering Building Code Provisions for Structural Renovation Tuesday, December 14. More info...

Most ASCE webinars allow site registrations. Feel free to use the SEABC Forum to arrange a get-together with other SEABC members and share the costs with a single site registration fee.



#### Luncheon Conferences

Wood WORKS! BC is inviting SEABC members to a series of luncheon conferences:

### BC's WOOD FIRST ACT - WHAT IT MEANS TO YOU

This series of seminars, offered through the Canadian Wood Council and sponsored by Forestry Innovation Investment under the Wood WORKS! BC project, will provide essential information on the Wood First Act, among other wood-related topics. Learn about the rationale, the legislation, the implementation and the benefits for your community. Free admission and complimentary luncheon to all pre-registered guests:

- informative seminars on wood design and construction
- the latest information about wood products
- exhibits devoted to wood products

### Luncheon dates and venues:

- Wednesday, November 24: Delta Grand Okanagan Resort, Kelowna
- Thursday, November 25: Kamloops Convention Centre, Kamloops
- Tuesday, November 30: Delta Ocean Pointe, Victoria
- Wednesday, December 1: Vancouver Island Conference Centre, Nanaimo

For more information and online registration, please visit the <u>Wood WORKS! BC website</u>.

### Timber Connection Design Workshop

Wood WORKS! BC invites SEABC members to a two-day course:

### TIMBER CONNECTION DESIGN WORKSHOP

This workshop is intended for experienced structural engineers looking for an opportunity to do hands-on designs of wood connection systems, starting with connections found in the CSA 086 Wood Design Standard and moving on to those connections found in timber frame and log structures.

The course will take the participants into the workings of traditional timber frame connections, timber bents and trusses, and both moment connections and moment frames, touching on the connections that will be used with cross laminated timbers. With educators, engineering practitioners and connections suppliers from up to six firms on hand, this interactive workshop will place the participant in front of such connections as tight fit pins, burchess, CLT clips and other European style connections not yet included in CSA

086 but appearing in the market more and more.

### **Course information:**

- Date: December 13 and 14, 2010
- Venue: Marriott, Vancouver Airport, 7571 Westminster Highway, Richmond, B.C.

For more information and registration, please visit the <u>Wood WORKS! BC website</u>. **SEABC members qualify for a 10% discount.** 

#### Green Roof and Wall Conference – CitiesAlive 2010

Event: CitiesAlive - 8th Annual Green Roof & Wall Conference Date: November 30 - December 3, 2010 Venue: Vancouver Convention Centre

Green Roofs for Healthy Cities and the British Columbia Institute of Technology (BCIT) are co-hosting *CitiesAlive: 8th Annual Green Roof and Wall Conference and Trade Show* from Nov. 30 to Dec 3, 2010 at the Pan Pacific Hotel and Vancouver Convention Center. More than 50 expert speakers will share the latest design integration, economic, social and environmental research - including acoustical benefits, green wall thermal benefits, life cycle cost/benefit studies, and solar PV/green roof integration. CitiesAlive will recognize outstanding green roof and wall projects at the Awards Luncheon, as well as local design gurus *Cornelia Oberlander* and *Theodore Osmundson* with Lifetime Achievement awards. The tradeshow will feature the latest technologies and services, local and regional firms, and there are multiple tour opportunities. Check out new, leading edge courses on urban rooftop food production, integrative/holistic design, and integrative building and site water management. See <u>www.citiesalive.org</u> for agenda and registration information.



### ADVANCING THE ART OF INTEGRATED SUSTAINABLE DESIGN URBAN AG • BIODIVERSITY • NET-ZERO WATER • SOLAR PV INTEGRATION





STRUCTURAL ENGINEERS ASSOCIATION 2011 NW CONFERENCE SEAW SEAO SEAI BC Hosted by: Spokane and South Central Chapter SEAW

Thurs Sept. 22<sup>nd</sup> & Friday Sept. 23<sup>rd</sup>, 2011 Red Lion Inn at the Park Spokane, WA

EARN UP TO 10 PDH'S INNOVATIVE TECHNICAL TOPICS PROFESSIONAL NETWORKING YOUNG MEMBER'S FORUM FEATURED PROJECT EXHIBITORS

Would your firm or organization like to participate? Contact seaw@seaw.org

#### THE COMPETITION

The Steel Bridge Competition is an annual design challenge for university students sponsored by the American Society of Civil Engineers (ASCE) and the American Institute of Steel Construction (AISC).

Each year student teams from universities all over North America design and fabricate modular steel bridges that must satisfy a specific set of dimensional and performance criteria. During competition, bridges are judged on the following four categories:

- Overall structural weight
- Aggregate deflection after loading
- Construction speed
- Aesthetics

A rigid set of rules and criterion, which change each year, forces the teams to be creative and original in order to remain competitive against the other teams.

In addition to the demands of the design portion of the competition, all teams are required to produce a technical paper and present to a team of judges during the competition. The topic for the paper presentation generally touches on specific trends and concerns within the industry of construction and civil engineering.





This year's regional competition for the Pacific Northwest is being hosted in Anchorage, Alaska at the beginning of April, with the national competition taking place in May at Texas A & M at College Station, Texas.



#### FOR MORE INFORMATION:

If you have any further questions, feel free to contact us anytime.

Kurtis Topping & Jared Duivestein 2010-2011 Team Captains ubcsteelbridge@gmail.com

UBC Steel Bridge c/o UBC Department of Civil Engineering Room 2010, 6250 Applied Science Lane Vancouver, BC V6T 1Z4

#### TEAM WEBSITE:

www.ubcsteelbridge.com

#### COMPETITION WEBSITE:

www.nssbc.info



### ASCE/AISC STEEL BRIDGE DESIGN COMPETITION



### 2010/2011 UBC STEEL BRIDGE DESIGN TEAM

#### THE TEAM

This year marks the eleventh year that the UBC Steel Bridge Design Team has been in existence. We are an extra-curricular club that attracts civil engineering students of all years and backgrounds. This year the team consists of several first and second year students curious to learn about the design process and the competition, as well as a number of returning senior students.

The team provides students the opportunity to apply their technical knowledge from the classroom to a unique design challenge, as well as a chance to foster relationships with other students in their program and professionals within the industry.





Last year the team competed at the regional level in Pullman, Washington at Washington State University. UBC placed 3rd at regionals and advanced to nationals at Purdue University in Indiana. At nationals, UBC ranked 35th out of the 46 qualifying teams. Not bad, considering that nearly 200 teams competed in last year's competitions!



As a 100 % student-run team we are responsible for all of our funding. We accomplish this through various fundraising initiatives, university grants and through student contributions. However, we are always in need of assistance from companies like yours to ensure that our team is a success.

As a corporate sponsor, your company would be promoting an international, educational competition and will receive extensive exposure leading up to, and during, the competition. In addition, you will be encouraging and supporting a new generation of engineering students to use their technical skills in inventive ways.

#### SPONSORSHIP LEVELS

Platinum Sponsor	\$1,000+	<ul> <li>- 4" SQUARE COMPANY LOGO ON TEAM SHIRTS</li> <li>- LARGE COMPANY LOGO ON TEAM WEBSITE</li> <li>- LARGE COMPANY LOGO ON TEAM TECHNICAL DISPLAY</li> </ul>
GOLD Sponsor	\$750- \$999	<ul> <li>- 3" SQUARE COMPANY LOGO ON TEAM SHIRTS</li> <li>- MEDIUM COMPANY LOGO ON TEAM WEBSITE</li> <li>- MEDIUM COMPANY LOGO ON TEAM TECHNICAL DISPLAY</li> </ul>
SILVER Sponsor	\$500- \$749	<ul> <li>- 2" SQUARE COMPANY LOGO ON TEAM SHIRTS</li> <li>- SMALL COMPANY LOGO ON TEAM WEBSITE</li> <li>- SMALL COMPANY LOGO ON TEAM TECHNICAL DISPLAY</li> </ul>
BRONZE SPONSOR	<\$500	<ul> <li>COMPANY NAME ON TEAM SHIRTS</li> <li>COMPANY NAME ON TEAM WEBSITE</li> <li>COMPANY NAME ON TEAM TECHNICAL DISPLAY</li> </ul>