SEABC NEWSLETTER

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- 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.

Message from the President

August 2010

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

HOW GREEN ARE WE?

I would have to say that Structural Engineers have not been too concerned, up to now, about matters such as carbon footprint and sustainability. After all, the factors giving the quickest return, like the efficiency of heating systems, level of insulation, orientation of buildings and even the choice of building materials are basically the responsibility of mechanical engineers or architects or owners.

Now that the low-hanging fruit has been picked, we need to give more concern as to what Structural Engineers can do to address climate change.

So what can we do? We design and construct with a prime concern of safety. Our choice of materials, if not already chosen by others, is based on cost and durability. It could be argued that an efficient, cost-saving design results in a saving of materials and therefore energy. It could also be argued that a durable design will reduce the need for early replacement and thereby save energy in the future. But this is not enough.

What we need to do, is to make Structural Engineers more aware of the energy consumed in the construction of their designs. We all know that cement is made (in basic terms) by driving carbon dioxide out of limestone, iron is produced by firing in a blast furnace and wood comes from trees that take carbon dioxide out of the air. But we do not normally calculate the amount of energy consumed by our designs, nor make recommendations based on that information.

How much energy can be saved by increasing the flyash replacement of cement in our concrete? Is a warehouse roof, constructed in wood, more energy efficient that a light weight steel roof? Is a reinforced concrete retaining wall more energy efficient than a stacked block wall? Is prestressed concrete more energy efficient than reinforced concrete? Does the construction of a “green” roof have a carbon footprint greater than the regeneration provided by the vegetation?

This is a big and complicated topic, but one that is worthy of being studied, so that Structural Engineers can be provided with guidelines in order to become more efficient in their use of energy.

IStructE News

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

Much is happening at IStructE, which despite the world economic picture, continues from strength to strength. Significantly, we were honoured with another presidential visit in July - the seventh since 2000, (although John Hill's scheduled arrival on September 11th, 2001, was actually precluded by the terrorist activity of that infamous date). A group of local members met up with the 2010 IStructE President, Norman Train, at the Terminal City Club, and exchanged information on what is happening in structural engineering circles around the world. It was a most enjoyable occasion, and maintained the quality of the former presidential visits we have enjoyed in recent years. While in Vancouver, Norman toured some of our flagship projects, starting with the Richmond Oval where the Oval roof designer, Paul Fast explained how the award-winning, record-breaking timber span was built. Norman also visited the Canada Line Operations and Maintenance Centre where Grant Bailey, Protrans BC Director, described the huge success of the first airport-to-city-centre transit project in Canada.

Following the visit, Norman and I headed to London for IStructE's annual assembly which included meetings of the Executive Board and Council, along with the AGM. This year the event was held aboard HMS Belfast, a Second World War cruiser, now permanently anchored in the River Thames near Tower Bridge. The unique location, combined with a colourful mix of delegates from across the world made for some interesting and very useful discussions. The Council meeting kicked

off with a tough challenge, laid down by the UK Government Construction Industry Advisor, Paul Morrell, to find ways, in a rapidly changing world, to achieve more with less. This was followed by a lively discussion on ways to expand the international membership by developing a new approach to attract qualified structural engineers from other countries to the Institution. During the meeting it was announced that IStructE will shortly be publishing a guide to members on embodied carbon. As structural engineers are responsible for most of the carbon used in construction, and embodied carbon is becoming an increasingly significant consideration for sustainable design, publication of the guide is timely. With information on embodied carbon in short supply, the Institution has stepped forward to provide its members with the best information available from which to make informed choices in designing sustainably.

This month will also see the results published from the 2010 Chartered Membership Examination. Some 900 candidates from across the world attempted the exam this year, including 23 who applied through APEGBC. Good luck to our local candidates! Note that the CM Exam will be held again next April, and APEGBC will be arranging an exam training seminar and workshop on February 4th and 5th, 2011.

Look out for details in a future APEGBC Upcoming Professional Development Events Update.

IStructE 2010 President, Norman Train, with Paul Fast at the Richmond Olympic Oval

Education Committee Update

By Andrew Seeton, P.Eng., M.A.Sc.

Since our last report in the May Newsletter, the Education Committee has presented two educational seminars for SEABC members. On May 28th, Dr. Constantin Christopoulos, P.Eng. travelled from Toronto to give an evening seminar on recent developments and applications of steel castings for buildings. The talk was held at the BCIT downtown Vancouver campus, and was free to attend for SEABC members. Cast ConneX Corporation generously sponsored the refreshments. On June 25th & 26th, SEABC collaborated with the UBC Department of Civil Engineering to present a 1.5-day seminar on Soil-Structure Interaction at UBC. Please find a summary article on this event, elsewhere in this month's newsletter.

Over the summer months the Education Committee has been busily organizing an impressive line-up of events for fall of 2010:

On September 17th-18th, we are looking forward to a 1.5-day short course on Displacement-Based Seismic Design, presented by earthquake engineering experts Dr. Nigel Priestley and Dr. Mervyn Kowalsky. The event is sponsored by Glotman Simpson Consulting Engineers. You can find more information on this event elsewhere in this month's newsletter.

On October 8th, we will have a follow-up seminar to last year's 'Structural Use of Glass' seminar. This year's seminar will treat advanced topics and will once again feature visiting glass design experts from Germany. This year the event will include an open forum discussion at the end of the day with participation from the audience and a panel of local glass design professionals.

Please refer to the Mark Your Calendars section for additional event listings, including details of the SEABC-organized Structural Stream technical session at the APEGBC Annual Conference on October 22nd. The Education Committee is undergoing some changes to our team roster. We thank our Chair, Leslie Mihalik of Associated Engineering for steering our committee over the past year. Committee member Cam Smith of Allnorth Consultants will be taking over the role of Chair starting this September, with Leslie continuing to participate as a committee member (Past-Chair). We are pleased to welcome Lawrence Chan of Fast+Epp to our committee. Our long-time secretary Fran Abbuhl will be stepping down from our committee and focusing her efforts with the SEABC Certificate in Structural Engineering Program. Fran has dedicated countless hours of hard work to our committee, including its predecessor: Vancouver Structural Engineers Group Society. Thank you Fran! We are pleased to announce that our professional event planner, Melanie Fung, has been enlisted to fill Fran's shoes – no easy task!

Communication Committee Update

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

Your Communications Committee trusts that you are happy with our service. We distribute the quarterly newsletter, broadcast emails and keep the SEABC website regularly updated. We believe that SEABC members are kept well informed of structural engineering activities and events.

However, to maintain this level of service we need your help. Kindly report on your projects, your research, or other structural engineering matters and send your material to newsletter@seabc.ca We'd love to hear from you and learn from your experiences. Please also give us feedback on how we are doing.

Structural Practice Committee Update

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

Contact: Thor Tandy, P.Eng., Struct.Eng. (Chair)

Report Period: May to June, 2010

Review and Response by Committee: No items.

Member Comment: Members are encouraged to submit any issues that affect their, or the general, practice of structural engineering. Contact one of the committee members in your area.

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.

Chile Earthquake of February 27 2010 Observations and Lessons for BC: Monday June 28, 2010

Dr. John Cassidy of the Geological Survey of Canada, Dr. Carlos Ventura of UBC, Sharlie Huffman of the BC Ministry of Transportation and Infrastructure and Adrian Wightman of BGC Engineering were members of the Canadian Association of Earthquake Engineering Reconnaissance Team that spent 7 days travelling over 2,000 km in Chile the week after the earthquake. They presented examples of the similarities and differences between the locale conditions of Chile and BC, their observations of the performance of the ground and the infrastructure and the lessons they learned for BC. It was a well- presented talk that illustrated the value of first-hand observation of event sites and had a good turnout of attendees.

2010 Aims:
1) Continue to provide economical CPD opportunities to the local membership.
2) Maintain communication with Board.
3) Have more general meetings.

Technical Committee Update

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

As usual summer is a busy time for all, so progress by the task groups and technical committees has been limited. Current active task groups and committees are:

The Guards Task Group

'The Guards Task Group', under the chair of Robert Jirava have been preparing a report to publicize the design and construction-related issues pertaining to guards. A draft report has been prepared and is currently being reviewed by the task group.

The Seismic Design of Basement Walls Task Group

A summary of the work to date by 'The Seismic Design of Basement Walls Task Group' was presented by Ernie Naesgaard at the recent Soil-Structure Interaction Seminar. Analysis is ongoing and the task group is considering the application of ductility related force modification factors for the seismic loads on walls.

The Temporary Structures Task Group

'The Temporary Structures Task Group', has been developing guidelines for the engineering requirements of various types of temporary structures. A draft 'Guideline on Tents', has been prepared and is currently under review by the task group. Work on guidelines for other types of temporary structures is ongoing.

A number of bridge engineers representing many of the Bridge Design consultants as well as the Ministry of Transportation and Translink have expressed interest in forming a 'Bridge Subcommittee'. Alfred Kao is organizing the group with an initial meeting likely after summer vacation (see the article elsewhere in this month's newsletter). Initial topics for consideration include:

- Practice guidelines for bridge engineering
- EOR requirements for bridge projects

Young Members Group

By Kevin Riederer, MASc, P.Eng., LEED AP

Since our last report, the SEABC YMG has been active on many fronts. In May, members of the YMG Committee teamed up with the UBC EERI Student chapter to visit a Vancouver High School and give a presentation on earthquakes and structural design. The students then built their own structures out of cardboard, straws and moulding clay and shook them on the mini shake table provided by the EERI Student Chapter. Organizing and carrying out the event was a lot of work for those who volunteered their time to help with this important activity, and by all accounts the event was a tremendous success. Efforts such as these go a long way in promoting our profession to the next generation.

In June, the YMG held a P.Eng and Struct.Eng registration assistance seminar at the Vancouver Public Library. Approximately 40 SEABC members attended the presentation given by Dr. Steven Kuan, P.Eng. Dr. Kuan highlighted a number of particular requirements and expectations for structural engineers looking to become licensed as a P.Eng. in BC, and gave valuable insights and examples which are not readily available elsewhere. He also presented the requirements and process for registering as a Struct.Eng. This was the second time the YMG has held an event on registration assistance, and given its success we plan to continue with similar events in the future.

As part of our effort to improve the communication channels amongst members of SEABC, the Young Members Group has recently established a group on the professional networking website, "LinkedIn". The aim of this group is to encourage SEABC members to openly suggest ideas for YMG activities or initiatives, as well as connect with other SEABC young members. (www.linkedin.com)

If you're interested in getting involved with the YMG you can reach us at ymg@seabc.ca and remember to visit our webpage www.seabc.ca/ymg for summaries of our previous events and information on any upcoming events.

BCIT Civil Engineering Accreditation

By Habib Rahman, Ph.D, P.Eng

I n June 2010, the Canadian Engineering Accreditation Board (CEAB) granted national accreditation to BCIT's Bachelor of Engineering in Civil Engineering program. This is the first accreditation of a non-university Civil Engineering program in Canada, and hence represents a significant milestone for BCIT as well as Canadian engineering education.

The photo, taken during the convocation held on June 24th, 2010, shows the first batch of graduates from the just accredited Civil Engineering degree program.

SEABC Short Course

Displacement-Based Seismic Design
With Priestly & Kowalsky

SEABC is pleased to announce an upcoming short course "Displacement-Based Seismic Design" with speakers Dr. Nigel Priestley and Dr. Mervyn Kowalsky. The 1.5-day course will be held at the new SFU Woodward's Cinema in Vancouver on September 17th and 18th, 2010, and is also available by live webcast.

This course will show how displacement-based seismic design can be implemented in the structural design office as a simple and rational alternative to current prescriptive methods. It will show that serious conceptual problems with current force-based seismic design are resolved when the design is based on displacement considerations. Design examples, which could be carried out by hand or by simple spreadsheet, will be provided for different structural systems.

Dr. Priestley is Professor Emeritus of Structural Engineering at UC San Diego, and co-Director Emeritus of the European Graduate School for Earthquake Engineering in Italy. He has co-authored two previous best-selling texts, has published over seven hundred papers and reports and received over thirty international awards.

Dr. Kowalsky is a Professor of Structural Engineering at North Carolina State University. His research has largely focused on the seismic behaviour of structures and he is a member of several national and international committees on Performance-Based Seismic Design.

The course will follow the textbook '*Displacement-Based Seismic Design of Structures',* (Priestley, Calvi, Kowalsky, ISBN 88-6198-000-6). The textbook is available for purchase with your seminar registration (before August 23rd only) for in-person attendees, at a special price of $150+HST. The textbooks will be handed out at the event and therefore not available to webcast attendees. Webcast attendees can purchase the textbook themselves directly from the publisher – please see www.seabc.ca/displacement for details.

This event is sponsored by Glotman Simpson Consulting Engineers and presented with the assistance of the UBC EERI Student Chapter. SEABC members will receive a discounted registration rate of $375 (fees for live webcast and in-person attendance are identical). Additional discounts for early-bird registration by August 16th are available. Registration closes September 6th. Registration includes refreshments and lunch on September 17th refreshments only on September 18th and course notes for both days. For registration and details, please visit www.seabc.ca/displacement or complete the registration form included in 'Mark Your Calendars'.

Soil Structure Interaction Seminar

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

On June 25th & 26th, SEABC collaborated with the UBC Department of Civil Engineering to present a 1.5-day seminar on Soil-Structure Interaction at UBC. The event was well attended by 155 participants, 23 of whom participated via the live interactive webcast. While the majority of attendees were SEABC members, the event also attracted members of the Canadian Society for Civil Engineering, Vancouver Geotechnical Society, Canadian Geotechnical Society, IStructE, and SEA's from the western US. The panel of presenters was also diverse, featuring ten speakers from local firms and institutions as well as California engineers Mr. Craig Comartin, S.E. (CDComartin Inc), and Dr. Anoosh Shamsabadi, P.E. (California Department of Transportation).

A highlight of the seminar was the open forum discussion at the end of the second day, which generated a lively discussion of ideas with questions and answers coming from the presenters as well as the attendees in both the classroom and internet audiences. With participants from structural as well as geotechnical backgrounds, the event highlighted both technical and communication related aspects of soil-structure "interaction."

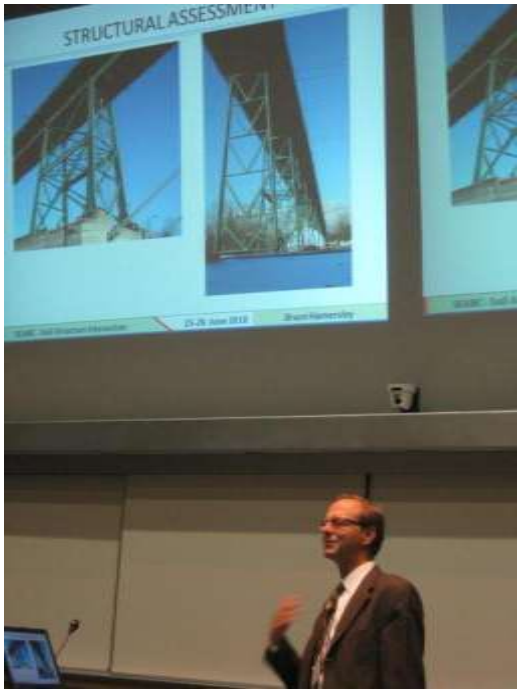
We thank the seminar organizing committee, led by SEABC Director and UBC faculty member Dr. Carlos Ventura, P.Eng., for their work on delivering this successful seminar. UBC student volunteers were also instrumental in executing the logistics of the event. An archived version of the seminar webcast will be made

available for stream-on-demand by SEABC members in the near future – stay tuned!

A captivated audience filled the Woodward Theatre at UBC

Dr. Carlos Ventura presents a visualization of SSI effects.

Dr. Anoosh Shamsabadi describes the SSI approaches used in California.



Bruce Hamersley finds the humour in a case study on the Lions Gate Bridge

UBC Steel Bridge Update

By Gwenda Sulem

Each year, the Steel Bridge Team from the University of British Columbia competes at the ASCE Pacific Northwest Regional Conference Student Steel Bridge Competition. The goal of the competition is to design and fabricate a steel bridge (approximately 21' x 3.5' x 3') which meets a strict set of rules laid out by the AISC and ASCE. Although faculty advisors are ready to help, we prefer doing things ourselves to get the most out of this experience. Industry sponsors, such as SEABC, make this student team possible and we're always looking for new sponsors to help.

This extra-curricular project requires year round work, starting with design and then quantity take-offs in the fall, fabrication in February, construction practices in March, Regional competition in April, and the National competition in May, (which is only for the top three teams from each Regional competition). The bridge is "priced" based on deflection (when loaded with 2500 lbs.), weight, construction time, and aesthetics; the lower the cost, the better the bridge.

This year UBC, the only Canadian team present, took 3rd place at the Regional competition held by Washington State University and advanced to the National level. Nationals were hosted at Purdue University in Indiana, with forty six top schools from all over North America competing (out of a total of one hundred and ninety two participants at the regional level). Ultimately, UBC placed 35th. This competition was our first time at the Nationals (UBC last qualified in 2006, with students who have since graduated), and we are aiming to build on our successes to date and improve our standing at the 2011 competition.

For more information about the team, the competition, or sponsorship opportunities, please contact 2011 co-captains Jared Duivestein or Kurtis Topping at ubcsteelbridge@gmail.com.

Construction of the bridge (Regional Competition).

Loading of the bridge (Regional Competition).

Team at 'National Competition'.

Entire team back at UBC.

New Assistant Editor

By David Harvey

Please welcome a new addition to the editorial team. Taking over as Assistant Editor of the SEABC Newsletter is Catherine Porter. If you think the name is familiar, Catherine is the wife of structural engineer Mark Porter who writes our Sustainability articles. Catherine is a trained teacher who hails from England. She is currently raising her two sons and enjoys desk-top publishing. Catherine has promised to maintain the established newsletter format and help us with syntax challenges. We appreciate you lending your expertise to SEABC, Catherine!

Items of Interest

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

Watch the Bay Bridge construction time-lapse

From above

http://bbi-video.s3.amazonaws.com/timelapse/full-timelapse-earthcam-tunnel.m4v

From below

http://bbi-video.s3.amazonaws.com/timelapse/full-timelapse-earthcam-underneath.m4v

Structural Hot Topic

https://secure.bluehost.com/~skghosha/onlineorder/show_book.php?isbn=200812088007

#5: Diaphragm: Rigid or Flexible? - A flow chart is presented and explained so that, given any diaphragm situation, its flexible, semi-rigid, or rigid classification according to the provisions of ASCE 7-05 can be determined conclusively and quickly.

ICE Americas Convention 2010

By David Harvey, P.Eng, Struct Eng.

The Institution of Civil Engineers Americas Convention is held every two years at different locations across the Americas. In June 2010, the ICE group in Vancouver hosted the convention at the Westin Airport Hotel in Richmond.

This year, the theme was climate change and sustainable development, with an exploration of the role of the engineer in mitigating the effects of the predicted change in our climate. The speakers came from a wide variety of backgrounds and were very well received by the 100 or so attendees. You can view their presentations and slide shows at:

http://ice-americasconvention2010.weebly.com/

I recommend that you take good advantage of this opportunity and view as many of these informative top-drawer presentations as possible.

CROSS

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

"CROSS" – Confidential Reporting on Structural Safety

'Structural safety,' relies on the strength, stability and integrity of a structure to withstand the conditions that are likely to be encountered during its lifetime. Structural safety is achieved through the proper procurement, design, construction and maintenance of the structure and the application of "best practices" and the identifying situations that comprise this ideal.

We have all seen situations that either should be reported or called to account. Most of us have a reluctance to blowing the whistle but at the same time we probably feel some guilt at not alerting either the entity in question, or an authority. "CROSS" is a way to alert each of us to conditions or practices that could be considered to compromise safety.

"CROSS" is what it says and its intent is to improve structural safety and reduce failures by using confidential reporting to highlight lessons that have been learnt, to generate feedback and to educate and encourage change.

CROSS uses reports on the concerns of Engineers and others for the benefit of the public and practitioners in the construction industry. For example, if you have had an experience that could or should be passed on, then CROSS provides a suitable avenue for expression. No concern is too small to be reported and nothing is too large.

Key points to providing CROSS reports are:

- Be non-judgmental
- Promote a positive attitude to learning from experience
- Be seen by all sides of industry as impartial
- Analyze and evaluate reports
- Provide advice and guidance in Newsletters or other publications
- Give feedback to industry and regulators
- Help to make changes to improve safety
- Provide complete confidentiality for reporters

Information from the reports would be used to draw attention to concerns that have been expressed and affect change. Patterns of behaviour or concentrations of particular issues should become visible as the database of reporting increases. The collation and dissemination of information relating to matters of structural concern is a vital element of achieving safe structures.

In the UK, the reporting concept was introduced by the Standing Committee on Structural Safety (SCOSS) - an independent body established in 1976, supported by the Institution of Civil Engineers, the Institution of Structural Engineers and the Health and Safety Executive to maintain a continuing review of building and civil engineering matters affecting the safety of structures.

In the case of SCOSS, the prime function is to identify, in advance, those trends and developments which might contribute to an increasing risk to structural safety. To that end, SCOSS interacts with the professions, industry and government on all matters concerned with design, construction and use of building and civil engineering structures.

A database has been set up that contains all the CROSS reports that have been published as well as extracts from SCOSS reports.

I propose that we introduce a similar reporting system here in BC.

Examples of hard copy and on-line reporting forms can be found at the end of the newsletter.

Triple-Jump for Tynehead

By Shane Cook P.Eng

A stunning design consisting of three arch spans has been selected for the new Tynehead Bridge which will cross the widened eight-lane Highway 1 near 168 Street in Surrey, BC. The bridge owner, the City of Surrey, was looking for a signature crossing for their multi-use pathway which will link the Fraser Heights neighbourhood with Tynehead Regional Park. The route will serve to advance community connectivity, and will form a key component of the City's rapidly expanding bicycle network.

The project is supported by the Building Canada Fund, the Government of Canada's flagship infrastructure program.

To design the crossing the City selected the team of Associated Engineering working with architects Busby Perkins + Will. Associated Engineering is currently designing the highway widening as part of the Port Mann Highway 1 project and is therefore familiar with the site and the challenges of building bridges along this busy traffic corridor. The team developed a novel solution which uses three arches with spans varying from 34 to 51 m to cross Tynehead Drive, the Highway, and the Kinder Morgan utility Right-of-Way, before making landfall on each side. The architects were keen to achieve visual continuity in the arch ribs above the intermediate piers and added a reverse curve extension to the arch ribs. The result is a flowing ribbon of steel that resembles the trajectory of a triple-jumper bolding leaping across the corridor!

The structure consists of square-tube arch ribs connected with a tubular tie. Hanger rods support steel floor beams and a concrete deck slab. The figure presents a three-dimensional image of the crossing which indicates a lightweight, elegant structural form, markedly different from the road bridges traversing the Highway. Seeking to emphasize the prominence of the new facility, which will be viewed by over 100,000 people every day, the City is exploring the potential use of creative lighting. They are considering a state-of-the-art interactive lighting system to visually highlight the structure, and create a point of reference on this heavily-trafficked corridor through the fastest-growing municipality in the Province.

Bridge Subcommittee

By Alfred Kao, P.Eng.

A new subcommittee is being formed to discuss topics of interest to bridge engineering and construction. Already, we have a number of bridge engineers from the Lower Mainland and Vancouver Island who have expressed interest in being a part of this subcommittee. The inaugural meeting is tentatively scheduled for mid-September and will take place at a location to be determined. If you're interested in joining, please contact Alfred Kao, Associated Engineering, 604-293-1411 or kaoa@shaw.ca.

Photography

By Michael Roberts, P.Eng
Speciality Structural Engineering

Michael Roberts has provided the SEABC newsletter with some of his photography.

"Triodetic Structure"

Opened in 1969, the Bloedel Conservatory was constructed through a very generous $1.25M community donation from Lumberman Prentice Bloedel, the same donation used to cover the water reservoir on top of QE Park and provide other park facilities. The structure is a class "A" heritage building on the city of Vancouver's 'Heritage Register' and is symbolically significant for its avant-garde triodesic structure that is an iconic dome design concept popularized by Buckminster Fuller's Expo 67 Geodesic Dome in Montreal. In addition to its unique futuristic structural and architectural style, the conservatory itself reflects a spirit of philanthropy of a time in the region's history when the resource industries were undergoing a post-war expansion and it was the first triodetic-domed floral conservatory in the world. The benefactors hoped that their names be associated with the cultural development of the city, and specified in an agreement that is was to be operated by the city as a place of education of the people of Vancouver. Recently, due to budget constraints at the city, the decision was made to close the building, however, both community and business interest from within the community helped overturned the city's decision and the structure now has a more optimistic opportunity to become a Vancouver Icon for future generations to enjoy and appreciate.

Note: reference for information is:-
www.heritagevancouver.org

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"Stairs to ..."

This unique spiral staircase which, is part function and part art statement, sits within the Atrium of the new Woodwards redevelopment project. Vertical travel from the fountain area at the base to the uppermost landing will ensure one needs to retrace their steps...

"The View"

Silhouettes of visitors on the public open house day of the new Vancouver Convention Centre expansion opening, take in the panoramic views of Burrard Inlet and the North Shore Mountains through sloped floor-to-ceiling curtainwall utilizing structural glass fin mullions.

"Steel Structure"

Dual tower cranes sit positioned within the partially completed steel skeleton of the New Vancouver Convention Centre Expansion Project to provide heavy lifting support to the construction workers.

Steel Castings in Buildings Seminar

By Farshid Borjian

On May 28th at BCIT Downtown campus in Vancouver, an afternoon seminar on the Steel Castings in Buildings; Recent Developments and Applications was presented by SEABC in collaboration with Dr. Constantin Christopoulos from University of Toronto and Cast ConneX Company. Around thirty five engineers attended this seminar.

In seismic design of structures, capacity design considers that the bracing yields and buckles first, and represents the weakest element in the chain of seismic resistant elements of a structure. Using this approach, the connection detail should be adequate and ductile enough to carry the seismic loads to the other Seismic Load Resisting Elements.

Cast steel nodes were first used in 1972 in Munich stadium in Germany, and were later developed through use in Europe. In North America, the potential for steel castings in structures is only now emerging due to better understanding of the advantages and limitations of casting manufacturing compared with regular steel fabrication practices.

In the presentation, an overview of the advantages of cast steel elements compared with standard fabrication was initially provided, and examples of the use of castings in building and bridge construction were shown. An in-depth discussion on the intricacies of conventional CBF connection design and how these can be improved using new seismically-resistant cast steel connectors that have been developed and tested at the University of Toronto were presented. New cast steel yielding elements, that are currently under development, to provide a higher performance response of braced frames, was also introduced.

The new products and services that are now available to the structural engineering community in North America via a University of Toronto startup company, Cast ConneX, was also presented.

Finally, the audience asked some questions regarding new product pricing and availability, and also expressed their concerns about CSA standard S-16. (The presenter is a member of the S-16 committee).

On the Web

By Stephen Pienaar, P.Eng; SEABC Webmaster

A lot is happening on the SEABC website:

- **Online registrations** are currently accepted for the "Displacement-Based Seismic Design" seminar that will be presented by the world-renowned Dr. Nigel Priestley and Dr. Mervyn Kowalsky.
- **Online registrations** for the September 2010 Term of the Certificate in Structural Engineering (CSE). The current term has four courses on offer, all of which will be available via live webcast as well.
- **A Young Members Group (YMG) section** on the SEABC website is showcasing the activities of our young members. The YMG are meeting regularly and engaging in educational excursions.
- **Email announcements** of industry events and seminars are reaching members a couple times a month. Responses from members indicate that most find the announcement service useful.

Website photos

We are always looking for good photos to use on the SEABC website. If you want to share some of you structural engineering pictures (preferably scenes in BC) with us, we will be thankful. Please send your submissions to webmaster@seabc.ca. We will give credit for all pictures used.

Online Member's Profile

We encourage members to keep their contact information and communication preferences up to date. To do so, please log in at www.seabc.ca/members. If you have not logged in before, you will need to first

activate your online profile by entering your membership number and email address on record (the address where this newsletter would have reached you).

IStructE website access

A reminder that SEABC members qualify to access the members area of the IStructE website for free. This includes access to The Structural Engineer Online and a wealth of other information. To arrange for an IStructE online account, write to webmaster@seabc.ca.

Keeping up to date

If you have not done so yet, please bookmark www.seabc.ca and check in regularly for upcoming events, seminars and courses.

Sincerely,
Stephen Pienaar, P.Eng.
SEABC Webmaster

Forum Digest

By Stephen Pienaar, P.Eng, SEABC Webmaster

The SEABC Forum continues to attract discussions on a wide range of topics related to structural engineering. Now that summer is here, member activity on the Forum has slowed down a bit, but please do not let that prevent you from participating!

Current Forum Topics

Recent topics in the **General Technical Discussion** forum include:

- EERI recently noted that a number of Italian scientists may be criminally prosecuted for not predicting an earthquake! We would be very interested to hear your opinion on this. Read more >
- Vincent L poses a question about design of lateral bracing members for URM walls. Read more >
- Neil A has a question about design of anchor rods in accordance with CAN/CSA-A23.3. Read more >
- Adrian G's questions on design of flexible diagrams has been a hot topic of discussion. Read more >
- Tejas G. has questions on the staggering and blocking of wood shearwalls. Read more >

Ongoing discussion in the **SEABC Technical Discussion** forum:

- James M requests comments from members on a Draft Proposal for Fire Resistance of Seismic Bracing. Read more >

Forum Tips

For general tips on improving your Forum experience, please see www.seabc.ca/forum-tips. Feel free to contribute your own tips.

Not using the SEABC Forum yet?

Your Forum membership is automatically included with your SEABC membership. Log in today at www.seabc.ca/forum – please participate and enjoy!

Ask Dr. Sylvie

To access Dr Sylvie's information, and to read the current or earlier issues of Advantage Steel, click on the following link:
www.cisc-icca.ca/content/publications/publications.aspx

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Mark Your Calendars

APEGBC Annual Conference at Structural Stream: October 22, 2010

Article by Andrew Seeton, SEABC Education Committee

The following presentations will be given at the Structural Stream technical session of the APEGBC Annual Conference in Whistler, BC, on October 22nd, 2010. The Structural Stream presentations are coordinated by SEABC. For more information please visit www.apeg.bc.ca/ac2010

Whistler/Blackcomb Peak-to-Peak Gondola

Warren Sparks, P.Eng.
Executive VP & GM, Doppelmayr CTEC Ltd.

The new Peak 2 Peak 28-Passenger Gondola at Whistler, BC surpasses several world records. This talk will present and explain the project and its many challenges and features.

- 3S Facts and Figures
- Installing the Ropes
- Terminal Designs
- Technical Highlights
- Rescue System
- Aircraft Warning System

Art Gallery of Ontario - Timber Connection & Erection Engineering

Robert Malczyk, MASc, P.Eng, StructEng, MIStructE, MBA
Principal, Equilibrium Consulting Inc.

This 180 metre long, 14 metre high glass and glulam façade wall is the main feature in Architect Frank Gehry's rejuvenation of the Art Gallery of Ontario. Equilibrium Consulting was retained by Structurlam Products, the glulam supplier, to develop concepts and carry out the detailed design and engineering for the hundreds of complex and geometrically different connections. The contract required that all connections be essentially concealed from view. In addition to the considerable challenges in geometry, many connections were also required to carry large axial and

bending forces along multiple axes in combination, while accommodating stringent construction tolerances and aesthetic requirements. Over 5,000 engineering hours were required to complete this work.

Lessons Learned From the 2010 Chile Earthquake

Sharlie Huffman, P.Eng
Bridge Seismic Engineer, BC Ministry of Transportation
Dr. Perry Adebar, P. Eng.
Professor of Structural Engineering, UBC Department of Civil Engineering

Chile and Canada have much in common – modern structural codes, high-rise buildings, busy coastal cities and ports, well developed emergency response plans and public expectations of engineering quality. The Canadian Reconnaissance Team drove thousands of kilometres observing what worked and what didn't for buildings and bridges in Chile following their 8.8 subduction earthquake on 27th, February, 2010. Dr. Perry Adebar and Sharlie Huffman will present observations from this trip and some lessons learned that we can apply to our own codes and practices.

Design of Piles in Liquefiable Soils

Dr. Mustapha Zergoun, P.Eng.
Senior Geotechnical Engineer, Thurber Engineering Ltd.

Pile foundations are the most common form of deep foundations that are used both onshore and offshore to transfer structural loads into competent soil strata. The design of pile foundations in liquefiable soils will be discussed, with reference to observed case histories, failure mechanisms, design criteria & methods, and recent empirical and analytical research. This presentation will make reference to the book on Pile Foundations in Liquefiable Soils published in 2009 by Gopal Madabhushi (University of Cambridge, UK), Jonathan Knappett (University of Dundee, UK), and Stuart Haigh (University of Cambridge, UK).

Seminars

Live Interactive Web Seminars

- Structural Considerations for Building Additions
  Tuesday, August 31st. More info...
- Seismic Bracing for Mechanical and Electrical Building Components
  Thursday, September 2nd. More info...
- Investigation and Repair of Fire-Damaged Framing
  Tuesday, September 7th. More info...
- Designing with Treated Lumber
  Wednesday, September 8th. More info...

Site Registration Option: Use the SEABC Forum to arrange a get-together with other SEABC members and share the costs of a single site registration fee.

Displacement-Based Seismic Design of Structures

This short course will introduce participants to displacement-based seismic design and demonstrate how it can be implemented in the design office as a simple and rational alternative to current prescriptive methods of seismic design. The course will show that serious conceptual problems with current force-based seismic design are resolved when the design is based on displacement considerations.

The course will follow the book, *Displacement-Based Seismic Design of Structures*, by MJN Priestley, GM Calvi, and M.J. Kowalsky. The book is available for order with your seminar registration at a seminar-only special price of $150 + HST.

Course Information:

Date : Friday and Saturday September 17th and 18th
Time : Friday - 8am to 4pm; Saturday - 8am to 12pm
Venue : SFU Woodward's Cinema, 149 W. Hastings Street, Vancouver, BC

This short course is also available via live webcast.

Online Registration:
For online registration with credit card payment, please go to **www.seabc.ca/displacement**. To qualify for the SEABC member rate, you will need to log in using your membership number and profile online password.

Offline Registration:
Should you prefer to pay by cheque, please use in the mail-in registration form available at **www.seabc.ca/displacement**. or print off the form at the end of the newsletter.

Breakfast Meeting – Employment Tips

SEABC Corporate Members Committee
Subject: Inaugural Breakfast Meeting: 07:00 - 09:00 hrs
Date: Wednesday September 22nd, 2010
Speaker: Wilma Marais, HR Consultant
Topic: Gen Y Recruitment and Retention – A Strategic Approach
Venue: Terminal City Club, President's Room, 837 West Hastings Street, Vancouver
Cost: $30.00 + HST (SEABC Members and Guests)
Registration: On-line on the SEBC website, until September 17, 2010

September 2010 Course Offerings

The SEABC Education Committee and the Executive Committee of the Certificate in Structural Engineering (CSE) Program are proud to announce the course schedule for the September 2010 Term.

- C1 Analytical Methods in Structural Engineering
- C4 (I) Introduction to Earthquake Engineering and Seismicity
- E2 Timber Design of Light Residential and Commercial Buildings
- E12 Seismic Design of Steel Structures

The September 2010 Term will run on Tuesdays and Thursdays from September 14th through December 9th, 2010, with mid-term breaks on October 21st and 26th. (Exception: the Thursday, November 11th class will be held on Wednesday, November 10th, due to the closure of the Vancouver Public Library for Remembrance Day.) Classes will be held at the main branch of the Vancouver Public Library, 350 West Georgia Street, Vancouver. All courses will also be offered via live webcast.

Available by Live Webcast!

1 1/2 Day Short Course:

MJ Nigel Priestley, PhD, BE Mervyn Kowalsky, PhD, PE

Displacement-Based Seismic Design

September 17 & 18, 2010

Sponsored by: Glotman·Simpson GROUP OF COMPANIES

Nigel Priestley - PhD, BE, Hon FRSNZ, DSc (Hon Causa), ETH Zurich DSc (Hon Causa) Cujo U, Argentina, FACI, FNZSEE.

Nigel is Professor Emeritus of Structural Engineering University of California, San Diego, co-Director Emeritus of the European Graduate School for Earthquake Engineering in Italy, and Principal of the consulting firm Priestley Structural Engineering. He has co-authored two previous best-selling texts on Seismic Design: *Seismic Design of Reinforced Concrete and Masonry Structures* (with Paulay), and *Seismic Design and Retrofit of Bridges* (with Seible and Calvi). He has also published more than 700 papers and reports, principally related to seismic design, and received more than 30 international awards. Over the past 15 years he and co-researchers have been developing displacement-based seismic design, culminating in the new text, ***Displacement-Based Seismic Design of Structures***.

Mervyn Kowalsky - PhD, PE.

Mervyn Kowalsky is a Professor of Structural Engineering in the Department of Civil, Construction, and Environmental Engineering at North Carolina State University. His research, which has largely focused on the seismic behaviour of structures, has been supported by the National Science Foundation, the North Carolina and Alaska Departments of Transportation, and several industrial organizations. He is a registered Professional Engineer in North Carolina and an active member of several national and international committees on Performance-Based Seismic Design.

Session 1: *Nigel Priestley*	**Introduction**
Session 2: *Nigel Priestley*	**Fundamental Considerations**
Session 3: *Mervyn Kowalsky*	**Application to Frames**
Session 4: *Mervyn Kowalsky*	**Application to Wall Buildings**
Session 5: *Nigel Priestley*	**Application to Dual Wall-Frame Buildings**
Session 6: *Nigel Priestley*	**Bridges; Structures with Isolation and Damping**
Session 7: *Mervyn Kowalsky*	**Displacement-Based Seismic Assessment**
Session 8: *Nigel Priestley*	**Other Structures and Technical Issues**

The course will follow the book, *Displacement-Based Seismic Design of Structures* by MJN Priestley, GM Calvi, MJ Kowalsky**.**

Textbook (seminar-only special price): $150 + HST

Why You Should Attend This Seminar

This short course will introduce participants to displacement-based seismic design and demonstrate how it can be implemented in the design office as a simple and rational alternative to current prescriptive methods of seismic design. The course will show that serious conceptual problems with current force-based seismic design are resolved when the design is based on displacement considerations.

Registration

Register on the SEABC website:
www.seabc.ca/displacement

Location:
SFU Woodward's Cinema
149 W. Hastings Street, Vancouver, BC

Dates & Times:
September 17, 2010 - 8am to 4pm
September 18, 2010 - 8am to 12pm

Professional Development Credits: 10 Hours

Seminar fees include:

Refreshments and Lunch on September 17
Refreshments only on September 18
Seminar notes for both dates

SEABC Member:	***$375 per person***
USA SEA Member:	***$375 per person***
EERI Member:	***$375 per person***
IStructE Member:	***$375 per person***
SEABC Student Member:	***$125 per person***
Non-SEABC Member:	***$450 per person***

(Includes complimentary SEABC Membership for the balance 2010)

Live Webcast: ***Prices as listed above***

Textbook: Displacement-Based Seismic Design of Structures $150
by MJ Nigel Priestley, GM Calvi, MJ Kowalsky

Note: Textbooks are available to in-person attendees only and will be handed out at the event. Textbook order deadline: Monday, August 23, 2010. SEABC reserves the right to refund textbook purchase if demand exceeds supply. See Registration for further details.

Applicable 12% HST not included in above fees.
All fees are in Canadian Dollars.

Register by August 16 for Early Bird Discounts

Structural Engineers Association of BC
Mail-in Registration Form:
Displacement Based Seismic Design Short Course
September 17-18, 2010

You can also register online!
www.seabc.ca/displacement
(secure credit card payment via PayPal)

Contact Information:

Name of Firm, Organization or Individual _____
(Receipt will be issued in this name to email provided below)

Mailing Address _____ _____ _____
Street Address | City, Province / State | Postal Code / Zip

Other Information _____ _____
Telephone | E-mail (receipt will be issued to this email)

Registration Fees: (All fees are in Canadian Dollars. Registration Closes September 6)

Name(s) of Attendees(s)	Check if Attendance by Live Webcast *	Membership Number	SEABC Member $375	USA SEA Member $375	EERI Member $375	IStructE Member $375	SEABC Student Member $125	No membership ** $450 (includes complimentary SEABC membership for 2010)	Fees
1. _____	☐	_____	☐	☐	☐	☐	☐	☐	$ _____
2. _____	☐	_____	☐	☐	☐	☐	☐	☐	$ _____
3. _____	☐	_____	☐	☐	☐	☐	☐	☐	$ _____
4. _____	☐	_____	☐	☐	☐	☐	☐	☐	$ _____
5. _____	☐	_____	☐	☐	☐	☐	☐	☐	$ _____

Check one box per attendee

Number of Attendees: _____ **SUBTOTAL REGISTRATION FEES:** $ _____

Textbook Purchase: (Before August 23 only. Not available to webcast attendees)
Textbooks will be handed out at the event to the 1st listed Attendee above ***

Displacement-Based Seismic Design of Structures, (721pp),
by MJN Priestley, GM Calvi, MJ Kowalsky (ISBN: 88-6198-000-6)

No. of textbooks _____ x $150 = $ _____

Early Bird Discount: (this discount is not available to students or after August 16) *deduct*

PAID registration *postmarked on or before* ***August 16, 2010***
deduct $25 per attendee

No. of attendees _____ x $25 = - $ _____

Group Discount: (this discount is not available to students or after August 16) *deduct*

Firms/Organizations registering 3 or more attendees on or before August 16, 2010
deduct $25 per attendee

No. of attendees _____ x $25 = - $ _____

SUBTOTAL OF ALL FEES: $ _____

ADD 12% HST: $ _____

Please make cheque payable to SEABC.
Mail this form and payment to:
SEABC SEMINARS
#201-288 West 8th Avenue, Vancouver, BC V5Y 1N5

TOTAL (PAYMENT ENCLOSED) $
Cheque payable to SEABC

Registration will be confirmed via e-mail. Registration closes September 6, 2010 and cannot be guaranteed if received after September 6.
An administration fee of $75 will apply to all cancellations received before September 6, 2010. No refunds after September 6, 2010.
* Instructions on how to access the webcast will be sent by e-mail prior to the seminar. Please provide a direct email address for each webcast attendee.
** Fees for non-members include complimentary SEABC membership for 2010. Please include a completed Membership Application form (attached).
*** SEABC reserves the right to refund textbook payment if textbook demand exceeds the available supply.

CROSS REPORT FORM

Please complete the shaded boxes and the description below
For more information see www.scoss.org.uk/cross

Name:	
Address:	
Telephone:	
Date of report:	**Approximate date concern was noticed:**

1. Your personal details are required only to enable us to contact you for further details about any part of your report
2. You will receive an acknowledgement
3. This original report will be returned to you

NO RECORD OF YOUR NAME, ADDRESS, OR TELEPHONE NUMBER WILL BE KEPT

Affiliation	IStructE	ICE	RICS	other			
please tick the small grey boxes ✓	**grade**	none	graduate	technician	associate	member	fellow

Location	England		Wales		Scotland		N. Ireland		elsewhere	

Your job title:		**Age of structure (approximate)**	

Organisation –check		**Project stage** – check		**Structure type** – check		**Material** – check	
approved inspector		appointment		domestic building		brickwork	
builder/contractor		design process		building structure		pre-cast concrete	
client/developer		construction		bridge		pre-stressed concrete	
consulting firm		temporary works		highway		reinforced concrete	
government		In use		tunnel		steelwork	
LA building inspector		during maintenance		marine		stonework	
project manager		de-commissioning		water related		timber	
research/academic		demolition		other		other	
supplier		vacant				where 'other' boxes are checked please describe in text	
utility company		other					
other							

Description of the reason for concern – use additional sheets if necessary

Post your report to: **CROSS, PO Box 174, Wirral CH29 9AJ** Complete confidentiality will be maintained and the technical content, without identification, will be given to SCOSS for analysis. An EMAIL REPORT form is available on the web site www.scoss.org.uk/cross for use when security of electronic transmission is not of concern.

CROSS
Confidential Reporting on Structural Safety

Sunday 28 December 2008

CROSS Online Report Form

Please complete and submit the form below. Your personal details are required only to enable us to contact you for further details about any part of your report. No record of your name, address, or telephone number will be kept.

Name: *

Address: *

Home Telephone No. *

Email address:

Date of Report: 28 December 2008

Approximate date concern was noticed: Select Year ☐ Before 1995 ☐ Not Applicable

Affiliation:
☐ IStructE ☐ ICE
☐ RICS ☐ Other

Grade:
☐ None ☐ Graduate
☐ Technician ☐ Associate
☐ Member ☐ Fellow

Location:
☐ England ☐ Wales
☐ Scotland ☐ Northern Ireland
☐ Elsewhere

Your Job Title:

Organisation:
☐ Approved Inspector ☐ Builder/Contractor
☐ Client/Developer ☐ Consulting Firm
☐ Government ☐ LA Building Inspector
☐ Project Manager ☐ Research/Academic
☐ Supplier ☐ Utility Company
☐ Other

Area of Concern

Project Stage: ☐ Appointment ☐ Design Process

- [ ] Construction
- [ ] Temporary Works
- [ ] In Use
- [ ] During Maintenance
- [ ] De-Commissioning
- [ ] Demolition
- [ ] Vacant
- [ ] Other

Construction

Age of Structure:

- [ ] Not yet built
- [ ] Under construction
- [ ] Less than 10 years
- [ ] 10-20 years
- [ ] 20-50 years
- [ ] 50-80 years
- [ ] 80-100 years
- [ ] 100+ years
- [ ] Not known

Structure Type:

- [ ] Domestic Building
- [ ] Building Structure
- [ ] Bridge
- [ ] Highway
- [ ] Tunnel
- [ ] Marine
- [ ] Water Related
- [ ] Other

Material:

- [ ] Brickwork
- [ ] Pre-cast Concrete
- [ ] Pre-stressed Concrete
- [ ] Reinforced Concrete
- [ ] Steelwork
- [ ] Stonework
- [ ] Timber
- [ ] Other

Description of the reason for concern:

Reset Submit

Notes:

1. If you need to keep a record save a copy of your description.
2. Where 'Other' is ticked in a box please include further details in the description field.
3. E-mail this to the CROSS Director by clicking on the SUBMIT button. Confidentiality will be maintained and the technical content, without identification, will be given to SCOSS for analysis. For greater security of transmission use the 'SEND BY POST' form which can be downloaded from this site.