SEABC NEWSLETTER

CONTENTS

PUBLISHED BY THE STRUCTURAL ENGINEERS ASSOCIATION OF BC

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- SEABC's Newsletter is edited and managed by Robert Smith (smithco@axion.net)
- Submissions to the newsletter are encouraged and all members of the SEABC are asked to actively participate in contributing to our newsletter.
- 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

November 10, 2009

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

MANDATORY REPORTING OF CONTINUING EDUCATION

YES OR NO

In October, APEG called for a vote on a bylaw change which would require all practicing members to complete and submit a record of their professional development hours each year as a prerequisite to their annual license renewal. It failed. Out of 5530 votes cast (only 27% of APEG membership), 57.6% voted in favour but 66 2/3% was required.

What does this mean? What is Continuing Professional Development (or CPD) anyway?

I realize that most of us are familiar with CPD requirements and the Struct. Eng. designation already requires mandatory reporting of at least 50 hours annually, but it bears repeating. Here in British Columbia, CPD can be loosely defined as education or activity undertaken to maintain or enhance the ability of the Engineer to practice. Under our Code of Ethics, it is incumbent upon all practicing engineers to maintain their competence. However, reporting of CPD to APEG is voluntary and not mandatory.

CPD is reported to APEG as a number of Professional Development Hours (or PDH) earned. It isn't difficult or time consuming. APEG recommends a minimum of 30 PDH per year and this is basically in line with those Canadian Provinces and US States which require reporting of PDH. PDH can be earned in various ways and not just by attending educational courses, so that all engineers including those working in non-technical positions can qualify. These ways include activities such as informal learning by, say, reading and studying technical publications, by coaching others, by engaging in community activities which relate to engineering or by writing technical articles.

All this is spelled out in much more detail and completeness in APEG's Continuing Professional Development Guideline, which can be found on the APEG website.

The objectives of SEABC, as set out in our bylaws, include professional development through education and professional activities and, by extension, improvement of the trust and respect of the public by ensuring that all structural engineers are fully competent. The results of our recent Zoomerang survey of members showed that they consider that education and development should be the most important activity offered by SEABC to its members.

So, did Structural Engineers vote for the bylaw change? I'd like to think that SEABC members voted in favour. The vote was by secret ballot conducted by a third party and so the answer is not readily available. I do urge APEG to have the results analyzed by discipline, by demographics or by physical location, based on APEG system ID numbers. It would indeed be unfortunate if one discipline is being dictated to by another contrary thinking group.

The APEGBC Act requires a vote of all professional members regardless of discipline so a minority group such as structural engineers are always governed by the majority view as long as it is a 2/3 majority!

As someone who retired and then renewed my license to practice, I am fully aware how quickly one's knowledge and skill becomes outdated. I know too, how difficult it can be to find time for professional development when you are really busy. Nevertheless, I hope that we are all interested in maintaining and improving the standard of structural engineering practiced in the Province and would like all structural engineers to be willing to prove that they have met a common standard for professional development.

When the question comes up again, and it will, I ask you to consider the question carefully and to express you opinion by voting. Most of us like to think that we are competent and up-to-date but most of us also know about someone else whom we believe is not.

IStructE News

By David Harvey, P.Eng., Struct.Eng.;
IStructE BC Representative

We are rapidly approaching the year end which is associated with holiday festivities and new year celebrations across the world. At the same time, the current Institution of Structural Engineers president, Dr Graham Owens, hands over to Norman Train. Local members will have been keeping track of Graham's presidential year by either reading articles in The Structural Engineer or the president's blog at:

http://www.istructe.org/president/blog.asp

Incoming IStructE president Norman Train graduated in Architectural Engineering from Leeds University in 1974. He then gained experience in Hong Kong and with West Yorkshire Metropolitan County Council before joining W G Curtin & Partners in 1978 and opening Baynham Meikle's London office in 1982. In 1992 Norman formed his current practice Train & Kemp. Norman will be fully familiar with the challenges to smaller-sized structural practices in the current economic climate.

IStructE members will have recently received their notice of dues for 2010. As a result of the Agreement between IStructE and SEABC signed in 2008, those individuals that are current members of both organizations can claim a discount of 10% of the IStructE dues. This is not shown on your invoice because IStructE does not know if your membership of SEABC will continue in 2010. If you do plan to continue with your SEABC membership, simply complete the declaration on the response form and amend the subscription by deducting 10%. You can do this whether sending a money order by mail or completing your membership renewal on-line.

Communications Committee Update

By David Harvey, P.Eng., Struct.Eng.;
Chair, SEABC Communications Committee

Your Communications Committee is constantly looking for newsletter articles which inform our members about structuring engineering. We routinely include committee reports, but are always seeking news items, research reports, papers, and new features to publish, so do let us know what is new in your area of interest. Letters to the editor are welcome, in particular those expressing concise, balanced viewpoints.

Advertising is available, both commercial and private, in our newsletter and on the website. Public service announcements and advertisements for unemployed structural engineers seeking employment are free. Send us your ads!

We trust you enjoy our newsletters, the continuously expanding website facilities, and our popular broadcast email service. Help us to better serve our membership by renewing your subscription, and maintaining your support for SEABC.

Education Committee Update

By Leslie Mihalik, M.S., P.E., P.Eng.
Chair, SEABC Education Committee

Since the last report to members, the Education Committee has, in collaboration with the Young Members Group, presented a Professional Registration Information evening seminar. The seminar was focused at young members as

well as foreign trained engineers. Jacques Granadino, P.Eng., Associate Director, Internship & Licensing at APEGBC provided information to members seeking professional registration in the structural discipline.

Our monthly evening seminar series recommenced after the summer hiatus. The committee used the summer break to plan events for the fall and winter.

On September 23, 2009, BCIT's Engineering Department hosted a Wine and Cheese reception in collaboration with the SEABC. The purpose of the event was to provide more information on the engineering program at BCIT to members.

On Friday, September 25, 2009, the Education Committee presented a day-long seminar on the Structural Use of Glass. This premier event will covered the design and implementation of structural glass elements and was presented by glass researchers from the Dresden University of Technology and local glass design experts from Vancouver.

The committee has increased the frequency of larger seminars organized for members. A half-day seminar was held less than a month later on October 23, 2009. The topic was Masonry Design with an emphasis on Seismic Aspects. [See seminary reports – this issue.]

The evening seminar series commenced on October 28th and began with a presentation on the Design of Pedestrian Structures.

The Committee recognizes that there is a desire for members outside the Lower Mainland to obtain access to our events. We currently plan to, when possible, video-record the free events and post them on the SEABC website for members to access. We will work at other means of making activities more accessible to members and will welcome suggestions in this regard.

We look forward to seeing you at our future events. If you are interested in giving a presentation, or getting involved with the Education Committee, please contact us through www.seabc.ca – your participation is welcome and indeed vital to the success of SEABC!

Structural Practice Committee Update

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

Structural Checking Guidelines: These are in the final stages of review and acceptance by APEGBC and are still expected to be issued for reference sometime in the fall.

APEGBC Code Committee: Leonard Pianalto P.Eng continues to attend those meetings and report on those code issues that are being dealt with by the committee and that may have an impact on professional practice.

APEGBC Consulting Practice Committee:

a) Fee guideline documentation is now complete and on APEGBC website. Guideline to be issued as a joint APEGBC/CEBC document.

b) Intellectual Property Guidelines are now posted on the website and are endorsed by AIBC, APEGBC and CEBC.

c) Presentation will be made to RPLC to promote electronically signed/sealed documentation.

d) 1990 APEGBC policy on Shop Drawings still valid but no inclusion of electronic submissions. Sub-committee to review.

e) "Guidelines for Professional Practice" has been developed to replace "Guidelines for Professional Excellence". This refers to the electronic storage of engineering documents.

Guideline for Design in Existing Buildings: Due to cutbacks in government budgets this initiative is on hold for the present.

Bridge Design Guidelines: There has been a request from MoTI to consider the development of a "Bridge Design Guidelines" similar to current building guidelines. The committee is awaiting a report back from discussions undertaken with MoTI representative(s).

APEGBC Miscellaneous: It is proposed to replace the current Schedules B1 & B2 format with a single Schedule 'B'. The new schedule will contain the same items as present but only signed by one "Registered Professional of Record". The proposal is yet in at 'comment' stage.

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

Contact: Thor Tandy; vicpeng@telus.net

MEMBER ITEMS

Professional Practice Musings

1. Tilt up building with 2 levels above grade and full basement. The panels extend down to the basement. The geotechnical engineer gives the seismic loads induced by the soil onto the building (static plus inverted dynamic load).

   Should these loads be reduced by RdRo as depending on the stiffness of the building, the building may react differently to the soil loads?

   As these soil loads are given as forces and are not part of the building mass, should they be part of the seismic redistribution?

2. Watch the Bay Bridge construction time-lapse:

   From Above (8.3Mb, 49 seconds)
   http://bbi-video.s3.amazonaws.com/timelapse/full-timelapse-earthcam-tunnel.m4v

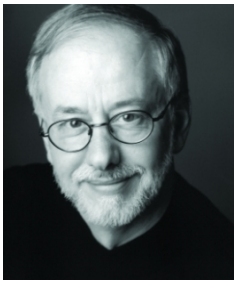
   From Below (7.3Mb, 66 seconds)
   http://bbi-video.s3.amazonaws.com/timelapse/full-timelapse-earthcam-underneath.m4v

3. The latest version of Hilti Profis DF V2 software, provides for buckling capacities that have increased substantially (buckling strength increased by 2.5).

   If using 0.75 panel buckling factor, it seems like buckling no longer governs …?

Technical Committee Update

By Renato Camporese, P.Eng., Struct.Eng.; Chair, SEABC Technical Committee



A new task group has been formed to look into the current requirements for the engineering of temporary event structures such as tents and bleachers, and temporary construction structures such as formwork and falsework, The goal of the task to group is to provide a set of guidelines and standards to assist structural engineers in providing an appropriate level of service for these types of structures. Jack Bogdnov of Bogdov Lerer is the chair of this task group.

The Guard Rails task group has advised that investigation into the issues surrounding the design of guard rails has been substantially completed and the task group is in the process of collating and developing a draft guideline document. It is planned to be ready for submission to the membership for comment before the end of the year.

The Seismic Design of Basement Walls task group has been conducting FLAC analysis of prototypical basement walls. Multi-level basement walls designed under prior code seismic loads have been analyzed to determine their performance under current code loading requirements. Preliminary analysis indicates that wall forces at the lower levels are similar to prior code requirements, however the top level forces and displacements appear to be significantly higher. Model refinements and further analysis is ongoing.

Vancouver Island Branch

Thor A. Tandy, P. Eng, Struct.Eng.; Director, SEABC

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.

Meetings: We had our first formal meeting of the Branch on November 6, 2009 at the offices of MoTI, Victoria. While we agreed to call the group a "Branch", it was decided to keep it informal until it developed into a well-attended body.

The following Scope & Objectives of Branch were established:

1. Primary emphases:
   a. CPD development
   b. Try to piggy back and complement larger groups where feasible
   c. Encourage discussion and camaraderie
2. CPD Focus:
   a. Bring Vancouver presenters to Victoria.
   b. Share presentations e.g. joint webinars from ASCE et al.
   c. Joint presentations with CSCE.
   d. Find local speakers on desired topics.
   e. 6-story building seminar – put on in Vancouver in Sept. Kevin Baskin and Bruce Johnson have agreed to organize a half day seminar in Victoria on this topic. This will probably take the form of a joint CSCE & SEABC event approx Feb 2010.
   f. ASCE webinar on Glulam Beams This will also probably take the form of a joint CSCE & SEABC event.
   g. MoTI can offer venue for webinars they are involved in subject to room availability.
   h. Otherwise there are hotels around the town that have reasonable arrangements for webinar venue but need someone to bring equipment.
   i. The Branch will investigate developing links up Island in the Nanaimo and Comox areas.

Invitation: Please join us or send us your contact information with comments and/or suggestions.

Contact: Thor A. Tandy; vicpeng@telus.net

Interim Working Executive:
Chair: By rotation at meetings
Secretary: Sharlie Huffman

Young Members Group

By Kevin Riederer, MASc, P.Eng., LEED AP with contributions from Michael Roberts & Dominic Mattman

Since our last report, the SEABC Young Members group has had a number of successes.

In August, a group of SEABC young members attended a tour of the Con-Force pre-cast concrete plant in Richmond. The tour consisted of a presentation and a question and answer session, which was followed by a tour of the plant.

The event provided a detailed overview of the products, services and manufacturing facilities that Con-Force can provide as one of the largest manufactures of pre-cast concrete products. This unique professional development opportunity was a great experience for all who attended.

Early October's seasonal transition from summer to fall and the month of Halloween marked the first official SEABC Young Members Group Community outreach effort, which was a group effort at the local Habitat for Humanity build site in Burnaby.

Leaving behind the fancy computer analysis software, calculators, and design manuals, a group of SEABC young engineers helped with the building (that's right, building, not designing) of a wood framed-structure with their own bare hands!

In addition to actually installing (not just specifying) a joist hanger and correctly laying a wood-joist floor or installing a roof truss, this group also had the opportunity to put their savvy practical skills and RFI problem-solving acumen to instantaneous use, gaining a quick appreciation for construction work first-hand, while also helping towards the greater good and building affordable housing for financially struggling families.

This event was a tremendous success and the YMG hopes to be involved with Habitat for Humanity again in the near future.

The YMG is excited to announce that we also have our first social event planned for the first week of December. We will be hosting a night of food, fun and bowling in Burnaby on Wednesday, December 2nd.

Everyone is welcome to come out and join your professional colleagues in a few friendly games of bowling, engaging in some frank discussion of the goings-on in the world of structural engineering and expanding your professional network. You should receive an email announcement shortly, if you haven't already, with all the necessary information. We also have a number of other events planned for the New Year so please let us know if you'd like to help organize one of our events or if you have ideas for initiatives that the group could pursue.

Recently, the Young Members Group page was launched on the SEABC website. We encourage everyone to check out www.seabc.ca/ymg. There you will find information on the YMG including summaries of our previous events and information on any upcoming events. Also on the webpage, you can sign up for the young member email list and receive updates on the activities of the YMG as well as find our contact information so you can reach us if you would like to get involved.

As always, your comments, questions and feedback are appreciated. You can reach us at ymg@seabc.ca.

Sustainability Design Education

By Mark Porter, P.Eng., LEED AP

In the last publication we highlighted the upcoming changes to the LEED® Exam.

Cascadia Green Building Council as our Chapter of the Canada Green Building Council has just witnessed its most intense ever uptake in memberships as LEED® Exam takers rushed to get in before the system changes.

Cascadia BC Director Jessica Woolliams writes the following on the new tiered system for LEED AP's.:

LEED® AP

New specializations are being introduced as part of the new, tiered system of LEED AP's. The three tiers (Green Associate, LEED AP+ and LEED Fellow) apply only to individuals becoming LEED AP's after January 2010, after the new system has been introduced. Those who have already achieved their LEED AP (or will do so by the end of the year) are under no obligation to take further exams in the coming years to maintain or upgrade their designation or obtain continuing education credits.

Professionals who will be receiving their LEED designation after the new year should be aware of new eligibility requirements, and also know they will need to maintain their AP status through a system of continuing education. New LEED AP's will also have to take two tests to achieve equal or greater designation, due to the introduction of the intro-level "Green Associate" designation, which is more generalized to the entire LEED system. Existing LEED AP's can choose to opt-in to the tiered system if they so choose.

For further information on this accreditation and Cascadia's own **Living Building Leader™ Program** which moves beyond LEED, visit http://www.cascadiagbc.org

The **Cascadia Region Green Building Council** is one of three original chapters of the U.S. Green Building Council and, a chapter of the Canada Green Building Council as well. Cascadia Chapter Branches have been established to provide networking and continuing education opportunities for members and industry professionals in their immediate marketplace. Regularly scheduled meetings within each Branch provide access to green building research and emerging issues that are pertinent to our region and locale.

On the Web

By Stephen Pienaar, P.Eng;
SEABC Webmaster

We are fast approaching the end of the year, and that means that it is time for membership renewal for 2010. The previous two years we had help from APEGBC, and members had the option to pay their SEABC dues together with their APEGBC dues. This arrangement has now expired, and starting this year things will work differently.

All membership renewals for 2010 will be dealt with directly by SEABC. Members will receive their renewal notices by email, and have the option to renew online (credit card payment) or offline (cheque payment). More information is available at www.seabc.ca/renewal. [See Subscription Renewal – this issue.]

Online Member Services

The SEABC website currently provides the following services to members:

- Email Lists: News about upcoming SEABC seminars and other industry events are broadcast to members once every week or two.
- Online Membership System: Members can log in to the online database at any time to update their contact details and manage their email list subscriptions. This time of year, members can also log in and pay their membership fees by credit card. Log in at www.seabc.ca/members.
- Member-only Content: Some information on the SEABC website is considered privileged and accessible by SEABC members only. These include technical reports and minutes of SEABC Board and Committee meetings.
- Monthly Seminars: PowerPoint presentations and videos of some recent seminars are available for download on the SEABC website.
- Seminar and Course Registration: The SEABC has hosted several seminars in recent months. Online registration is simplifying administration and allow members to easily claim their member discounts. The SEABC website also handles online registrations for CSE courses.

To ensure you continue to have access to these online services, please renew your 2010 membership before December 31.

Monthly Seminar Swamped!

We recently sent an invitation to members to attend the monthly seminar for November (CSA-A23.3-04 Appendix D - Anchorage Systems). Expecting a stronger than usual demand and wanting to prevent overcrowding, the Education Committee thought it wise to require attendees to pre-register online. Lo and behold, within two hours of announcing the seminar, it was fully subscribed! This just confirms again that the SEABC email announcements and online registration service are working for members.

The Education Committee are currently arranging a larger venue. Kudos to them for doing an outstanding job!

New SEABC Forum

The recent Member Survey showed a significant interest in a online technical forum. The SEABC Board recognises the potential of such a forum where members can ask questions and share ideas on technical and structural practice issues. Such a forum can be an invaluable mechanism for members to discuss relevant day-to-day structural issues and share information.

The SEABC website has had a forum section since inception, but it has not attracted any significant interest to date. That is so because we have simply not marketed this service to our members. But all of this will change soon... we are readying the service for re-launch with new features and improved security. Even more important is the people that will be involved: we have volunteers (some of our distinguished colleagues) lined up to act as forum moderators to ensure that high technical and social standards are maintained. We are looking forward to providing a first-class service.

We will announce the readiness of the new SEABC Forum very soon, and hope all members will jump in and participate. Don't miss this opportunity to be part of something very special!

Feedback

The Communications Committee is pleased with the positive feedback received from members with regards the our website and email announcement services. Please continue to send you feedback and suggestions to webmaster@seabc.ca.

Fall Events

By Martin E. Bollo, P.Eng., S.E.;
SEABC Education Committee

SEPTEMBER – WINE & CHEESE RECEPTION

The SEABC Fall Wine and Cheese Reception was held on the Burnaby BCIT campus on September 23, 2009.

Traditionally this event has doubled as both an opportunity for attendees to network with other structural engineers as well as providing a means of connecting practicing engineers with the structural engineering-related activities of local civil engineering educational institutions.

Instead of the traditional event location of U.B.C., this event was held at BCIT for the first time in recognition of its ongoing Bachelor of Engineering in Civil Engineering program that has now produced forty engineering graduates. The event location will return to U.B.C. next year and it is anticipated that BCIT will host the event every four or five years.

Photo: Rammed Earth Column Testing

The technical portion of the evening featured presentations by three BCIT Faculty members on different applied structural engineering research activities. Research by faculty at BCIT is conducted along with interested students as part of second, third or fourth-year courses, and often involves partnership with Industry.

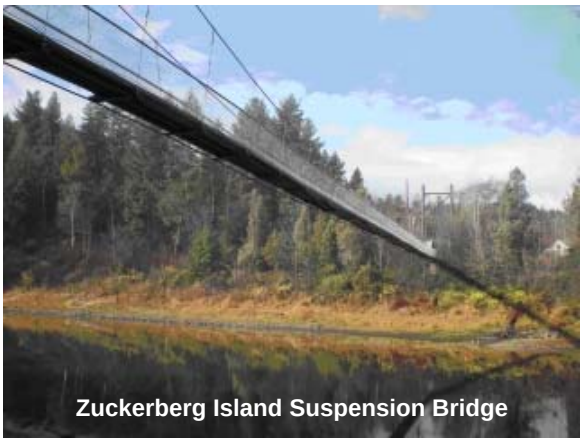
Dr. Svetlana Brzev, P.Eng., discussed four representative applied research projects performed in conjunction with the masonry industry (Masonry Institute of B.C.). These four separate projects involved masonry lintel beams, FRP overlays, and brick masonry mortar bond properties, and each involved testing in the BCIT structures lab. Dr. Bryan Folz, P.Eng., discussed two applied research projects involving detailed seismic analysis of a six-storey wood-frame building located in Vancouver, and the educational use of nonlinear static procedures in course work. Dr. Rishi Gupta, P.Eng., discussed applied research projects in the areas of fibre reinforced concrete (FRC), structural health monitoring (SHM) and sustainable/green concrete.

Following the technical portion of the evening, participants were able to tour the BCIT structures lab, and several of the lab-tested specimens discussed in the presentations were available for viewing and further discussion with the presenting Faculty members.

Photo: Masonry Beam Testing in the BCIT Structures Lab

OCTOBER – BC PEDESTRIAN BRIDGE PROJECTS, HIGHLIGHTS

The October 28, 2009 monthly SEABC evening seminar featured two recent pedestrian bridge projects – the Zuckerberg Island Suspension Bridge upgrade project in Castlegar, B.C., and the Stawamus Chief Pedestrian Bridge over the upgraded Sea-to-Sky Highway near Squamish, B.C.



Zuckerberg Island Suspension Bridge

Keith Holmes, P.Eng. discussed the Zuckerberg Pedestrian Bridge, which is a popular link to a local heritage park and a tourist destination for the West Kootenay Community. The project arose when field inspections and accompanying engineering assessment identified deficiencies with the original design and installation. A three-dimensional model with geometric nonlinearities was required for the assessment and identified that the timber tower poles were overstressed under nominal live load. A number of conceptual repair options for replacement of the tower were evaluated, necessitating consideration of environmental constraints, the geometry of the bridge, the load magnitudes and availability of access. The chosen scheme took advantage of the presence of an adjacent berm for crane access and involved installation of new steel towers. Mr. Holmes showed some fascinating slides of the construction process, which allowed for replacement of the main towers while leaving the main structure fully intact and the surrounding environment essentially untouched.

Photo: Cable Relocation to New Towers

Schaun Valdovinos discussed the design and construction of the signature steel arch Stawamus Chief Pedestrian Bridge over the Sea-to-Sky Highway. The bridge provides Provincial Park pedestrian access and is carefully designed to respect the beauty of the natural setting. Two un-braced steel arches support a thin concrete deck using stainless steel hanger rods. The steel pipes were bent in Grande Prairie and then shipped in four pieces to site. The cross-sectional shape was maintained during the bending process by

After completing the remaining welding on-site, a road closure was used for erection of the arches. Erection proceeded smoothly, helped by the test-fitting that had been performed in the fabrication shop, and the road was able to be opened ahead of schedule. The walkway consisted of cast-in-place concrete on precast panels. The concrete curing process was complicated by lower than normal temperatures, necessitating the use of blankets and heaters.

The nearby town of Squamish means “strong wind”, and therefore careful consideration had to be given to wind-related effects on the bridge such as vortex shedding. The bridge uses concealed Stockbridge-type tuned mass dampers tuned to 0.9T of the arches to provide vibration mitigation. Mr. Valdovinos discussed the manual excitation procedure and field measurements that were performed to verify the effectiveness of the dampers. The observed vibration mode periods matched almost perfectly with the calculated values.

NOVEMBER – SEABC SCHOLARSHIP

Fourth year BCIT Civil Engineering student Brent Bergman was the recent recipient of the Structural Engineers Association of British Columbia Award in Structural Engineering at a ceremony held on Wednesday, November 4, 2009 at the Willingdon Conference Centre. Along with two other awards for UBC students, these awards are offered to students entering their fourth year of studies in Civil Engineering who have demonstrated academic proficiency and an interest in structural engineering. The awards are funded through proceeds from the SEABC Certificate in Structural Engineering Program.

*BCIT Faculty member, SEABC Certificate in Structural Engineering Program Committee member and SEABC Education Committee member **Martin Bollo** (pictured left) presented the award to **Brent Bergman** (pictured right).*

Historic Structure or Structural History?

By Michael Roberts, P.Eng

Since being built over 80 years ago, the Johnson Street Bridge (JSB) in Victoria, BC has structurally performed its purpose in the community by fulfilling a daily routine of providing a link for cars, pedestrians, and trains, while also accommodating marine traffic.

As is the case with many other structures, the JSB is now technically deficient and in need of repair. As a result the bridge needs to be either replaced or rehabilitated in order for the facility to continue serving the community. Should the fate or future of public domain structures like bridges or dams, that primarily fall into the civil engineer’s realm, be determined based solely on an engineering assessment, or should there be triggers in place similar to the City of Vancouver’s Heritage Register that require an evaluation process for retaining the historic elements of structures?

Victoria’s Johnson Street Bridge Replacement Project has recently joined the ranks of Canadian capital works projects that will benefit from Canada’s Economic Action plan. As a result of the up to $21M of federal funding, the City of Victoria is now poised to undertake its largest-ever project. This will be the design and construction of a new multi-purpose bridge to replace the existing, ailing 85-year old structure otherwise known to locals as “Big Blue”. As it stands, the JSB is the last-remaining Strauss-designed twin bascule bridge in the world, patented by the noteworthy engineer Joseph Strauss (1870-1938), who is most famous for the design and construction of the Golden Gate Bridge.

Johnston Street Bridge, Victoria, BC
"Big Blue"

Completed in January 1924 at a cost of $918,000, Strauss's Johnson Street Bridge originally had a timber deck. By 1966, the lifting function of the bridge was affected by the weight of moisture absorbed by the timber and the deck was replaced by a steel grillage.

Extensive repairs to the superstructure were carried out in 1979 as a result of the highly corrosive marine environment.

In 1995, abnormally high temperatures caused the steel deck to expand to the point the bridge would not open or close properly which prompted deck modifications.

Due to structural degradation, heavy vehicles were banned from the bridge in 1998 following an inspection which estimated that $900,000 worth of repairs were needed to keep it in service for another 20 plus years.

A major component of the success of the JSB to meet all of the prerequisites for the Federal Stimulus program was a recent 'Condition Assessment Engineering Report' that was submitted to the City of Victoria to provide a comprehensive technical and quantitative measure by which the structure could be financially assessed as needing either upgrading or total replacement.

Evident in the report, the engineer took multiple approaches in assessing and quantifying the possible solutions that ranged from doing nothing, through repair/rehabilitation methods, to a complete replacement.

The report also noted that although there are decision-making elements such as the value gained from a new landmark bridge, the value gained from improved access with a new bridge, and values associated with preserving historic elements of the Bridge, that are "beyond the scope of the study and not associated with structural engineering".

When our clients make decisions primarily based upon cost comparisons, should we as engineers not have a tool by which we assess value beyond structural assessment?

The absence of such a tool may leave decisions open to political and agenda-based biases. Our engineering reports are highly valued and are sometimes the sole basis for major decision-making by our clients.

In the case of JSB with the federal funding timeline pressures, this project is now being fast tracked. The decision to replace the bridge may therefore have been made in the absence of thorough assessment of its historical significance.

This evaluation was excluded from the engineering report which nevertheless noted that the aging structure was of historical interest.

Although the JSB is unique and one of the oldest bridges in Western Canada, surprisingly it is not on any historical register. Equally surprisingly only one bridge in BC actually appears on a historic register. The following questions then arise: should the JSB and other, lesser prominent structures be included in a historical register, and do we engineers value our historic structures enough to want to register them even if other groups do not?

The American Association of Civil Engineers (ASCE) has a 'History and Heritage' committee which lists over 100 landmark projects in the United States

and around the world, and recognizes Joseph Strauss as one of over 50 Notable Civil Engineers. In Canada, the National History Committee of the CSCE is an established group whose mandate it is to "record and preserve whatever tangible evidence remains of the significant works of earlier generations of civil engineers...".

The committee has designated a total of nine bridges, a further nine buildings, eight railways, two roads, and eleven water supply and control systems among Canada's 'National Historic Civil Engineering Sites'. Notable examples include the Lion's Gate Bridge and Ogden Point. The JSB; BC Place Stadium; the Alex Fraser, Patullo, Port Mann, and Hell's Gate Suspension bridges; and the W.A.C. Bennett Dam are not currently listed among the CSCE's notable historic structures. As a result the JSB would be unlikely to appear on any municipal historic register.

The City of Vancouver has listed thousands of notable homes, buildings, and even trees that the public have deemed 'historically relevant'. Does this then leave unregistered projects vulnerable to fast-track decisions associated with federal stimulus money?

Assigning a value to historical structures and equating them with modernizing our infrastructure is a complex process which may not be routinely undertaken. Decisions may then become subject to political choice without any dialogue with the engineering community. Rather than assume that a technically-unqualified neighbourhood advocacy group, heritage society, or business group will assess the cultural value of a new or existing landmark, we as a professional body are the appropriate group to competently and systematically address the matter. We can facilitate the decision-making process by thoroughly assessing all attributes of alternative strategies, and thereby enable our clients to make informed project decisions.

Is it timely to engage in this discussion? Do we otherwise risk being unprepared and losing a historic structure which may well be the case with the JSB? Perhaps a process should be in place whereby local engineers can obtain guidance on assessing structures which may be historically important. We clearly need a process for evaluating the historical significance of our structures before these valued icons become a piece of history.

Names in the News

SEABC Director **David Harvey** was named as the 2009 winner of the R.A. McLachhlan Award by the Association of Professional Engineers and Geoscientists.

David is the 35th recipient of the award which is APEGBC's premier award for professional engineering. This award was established in 1965 in honour of R.A. McLachlan, P.Eng., a highly respected engineer who served as President of the Association in 1951.

A senior bridge engineer with Associated Engineering, David is well known for designing innovative, cost-effective and aesthetically pleasing bridges.

David was also recently awarded a Fellowship by Engineers Canada for services to the profession.

David Harvey accepts the 2009 R.A. McLachlan Award from APEGBC President Dr Margaret Li

SEABC Member **Ron DeVall** was named as the 2009 winner of the A.B. Sanderson Award by the Canadian Society for Civil Engineering.

Established in 1977 in honour of UBC graduate and distinguished structural engineer Adrian Barclay Sanderson who was responsible for many notable Canadian bridge designs, the award is made to a CSCE member who has made an outstanding

contribution to the development and practice of structural engineering in Canada.

Now Senior Consultant to Read Jones Christoffersen, Ron has had a distinguished career focusing on seismic design and assessment.

He is currently Chairman of CANCEE, a member of the NBCC Standing Committee on Structural Design, and a member of the APEGBC Peer Review Committee for the seismic assessment of BC schools.

SEABC Seminar: Structural Use of Glass

By Andrew Seeton, SEABC Education Committee

On September 25 at the Sutton Place Hotel in Vancouver, a full-day seminar on the Structural Use of Glass was presented by SEABC in collaboration with the Technical University of Dresden (Germany).

Speakers included Dr. Bernhard Weller, Philipp Krampe, and Stefan Reich from the Institute of Building Construction at Technische Universitat Dresden, as well as BC-based consultant Gary Berkeley of Berkeley Engineering Ltd.

Above (left to right): Gary Berkeley, Stefan Reich, Sebastian Thieme, Philipp Krampe, Bernhard Weller. Photo by Michael Roberts.

The audience of 80 people consisted primarily of structural engineers, but there were also architects, contractors, fabricators, and suppliers in the crowd. This diverse audience, and the questions and comments that were generated by the group, was representative of the multi-disciplined approach that is required for the successful design of glass structures. The attendees enjoyed a full day of learning complemented by a three-course lunch break sponsored by Stella Custom Glass Hardware Inc.

The seminar covered the design and implementation of structural glass elements.

Discussion of the material properties, failure modes, and construction principles were given.

Detailed structural design examples were presented, covering fundamental first principles through advanced state-of-the-art techniques, including an overview of some built examples from Western Canada. The seminar explored the complexities involved with the design of this unique material and highlighted the room for improvement in codes and standards to deliver a safe and uniform approach to the design of glass structures.

SEABC Seminar: Seismic Design for Masonry Buildings

By Farshid Borjian, SEABC Education Committee

On October 23, 2009 at the Sutton Place Hotel in Vancouver, a half-day seminar on Seismic Design for Masonry Buildings was presented by SEABC in collaboration with the Masonry Institute of BC (MIBC).

The material was presented by Dr. Svetlana Brzev, P.Eng., of BCIT, and Bill McEwen, P.Eng., of MIBC.

Mr. McEwen started off the seminar with an introduction to the role of MIBC as well as a brief overview of masonry production and a history of masonry construction in the world. He then covered some common reinforced masonry design details for walls including lintel beams, bond beams and joint reinforcement. Constructability issues were explored, such as maximum rebar sizes and placement (generally 20M or smaller, maximum 2 bars in bond beams and preferably only one vertical bar per cell), and grout pour heights (typical practice being 2.4m maximum). Mr. McEwen also reminded the audience that stack pattern should be strictly avoided for structural walls. Later in the morning Mr. McEwen discussed issues about seismic retrofit of clay brick buildings including some case study examples of connection of existing wood beams to walls and restraint of parapets. He also discussed design considerations for masonry veneer including deflection tolerances for backing walls and veneer tie specifications.

Dr. Brzev covered technical aspects related to seismic design, making reference to the Seismic Design Guide for Masonry Buildings, a new document authored by Dr. Brzev and Dr. Donald Anderson. The guide is complementary to S304.1-04 and can be downloaded for free from www.masonry.org. This guide has 4 chapters and 5 appendices.

Dr. Brzev discussed the relevant seismic provisions of NBCC 2005 including the force modification factors masonry buildings:

Shear walls with conventional construction	Rd=1.5, Ro=1.5
Limited ductility Shear walls	Rd=1.5, Ro=1.5
Moderately ductile Shear walls	Rd=2.0, Ro=1.5
Moderately ductile Squat Shear walls	Rd=2.0, Ro=1.5

The common approach for masonry buildings is the equivalent static force procedure with minimum seismic reinforcement, designed as Conventional Construction. Following this approach, the maximum height of the masonry buildings for Vancouver would be 15m. Dr. Brzev discussed maximum height/thickness ratios and minimum reinforcement ratios, and carried through some detailed design examples for reinforced masonry shear walls of different types. It was noted that Chapter 4 of the Guide includes 13 worked examples covering seismic load calculations, squat walls, flexural shear walls, out of plane resistance, veneer ties and masonry infill walls.

MASONRY INSTITUTE OF BRITISH COLUMBIA

SEABC thanks the Masonry Institute for their support of the Seismic Design for Masonry Buildings seminar.

Development of Technical Guidelines

for the Seismic Assessment and Retrofit of BC Schools

By Thor A. Tandy, P.Eng., Struct.Eng.; Director, SEABC

The program is progressing with only minor changes to the schedule. The proposed workshop to cover the developments and results of the intensive research, testing and an in-depth presentation of the Technical Guidelines (Version 3) for use by Engineers is still planned for Spring 2010.

The masonry tests for development of repair prototypes have now been completed and results are expected shortly for release to the members.

Wood framing tests are also under way.

Clay brick studies have progressed but results have yet to be collated for presentation.

The Peer Review Committee has already fielded a number of technical questions that are submitted for review. In turn, the Technical Review Board has considered these questions and developed answers/responses to the posed questions.

Subscription Renewal

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

Our membership survey earlier this year indicated a high level of satisfaction among SEABC members.

Your directors and committee members, who volunteer their efforts to serve the membership, are delighted that you see the value of a strong association to represent structural engineers.

However, to continue to provide and enhance the services that you currently enjoy, we need your support. The best way you can do that is to maintain your SEABC membership!

Your current membership expires on December 31, 2009. To maintain continuity of membership you will need to renew your membership before year end.

The interim agreement for APEGBC to collect SEABC membership dues has expired, therefore, you can no longer renew SEABC membership along with your professional registration.

You have several options available including individual renewals on-line or off-line, and bulk renewals which are suitable for corporations. We are actively encouraging corporations to use the convenient bulk renewal service, and to include all the structural engineers on their staff.

For full details of membership renewal for 2010 go to:

http://www.seabc.ca/membership.html#renewal

Note also that members should keep their contact information current by using the on-line membership system, and that new users and new members will need to activate their on-line accounts.

Thank you for your ongoing support of SEABC. Please provide us with your comments to help us serve you better.

Points of Care

By Thor A. Tandy, P.Eng., Struct.Eng.; Director, SEABC

Replacement of Engineers on Projects

Recent case of engineer replaced on a project and all on-going documentation complete. Client arbitrarily wanted to change engineer in order to economize, allegedly using second engineer to “rubber stamp” final documents. The Act allows the client to change engineers so it is necessary to exercise caution when faced with this type of situation.

Award Winning BC Projects

**By David Harvey, P.Eng., Struct.Eng.;
Director, SEABC**

A number of BC's high profile projects have hit the headlines recently…

VANCOUVER CONVENTION CENTRE EXPANSION

The Vancouver Convention Centre Expansion is a most impressive addition to Vancouver's waterfront.

Coined as "a gleaming jewel with a fuzzy top", the dramatic steel, glass, and wood sculpture features a "green" roof - a novel feature on a building of its size.

Photo courtesy of VCCEP Project Office

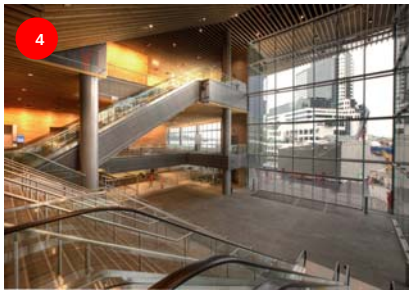
Green roof vegetation and finishes nearing

The massive structure which sits on nearly 1000 steel pipe piles has just won an Award of Excellence in the Buildings category of the 2009 Canadian Consulting Engineers Awards. It was also named as the Overall Winning Project in the 2009 CISC BC Region Awards.

Providing 130,000 sq.m. of floor space to accommodate up to 15,000 visitors at a time, the building consumed nearly 16,000 tonnes of structural steel and provided an excellent example of the significant benefits of using Building Information Modeling. BIM was used not only for effective inter-discipline coordination but also for fabrication and for verifying the temporary stability of numerous erection stages.

The building which enjoys a spectacular vista of Vancouver's North Shore mountains, was height-restricted to avoid blocking views from adjacent residences and City streets.

Photos below courtesy of Bob Matheson



1 ***Skyline view of Vancouver from Stanley Park with the Vancouver Convention Centre Expansion***

2 ***Eastern view of the Vancouver Convention Centre Expansion Project showing five story large format building construction with exterior glazing, sloped roof and deck lines and leaning columns***

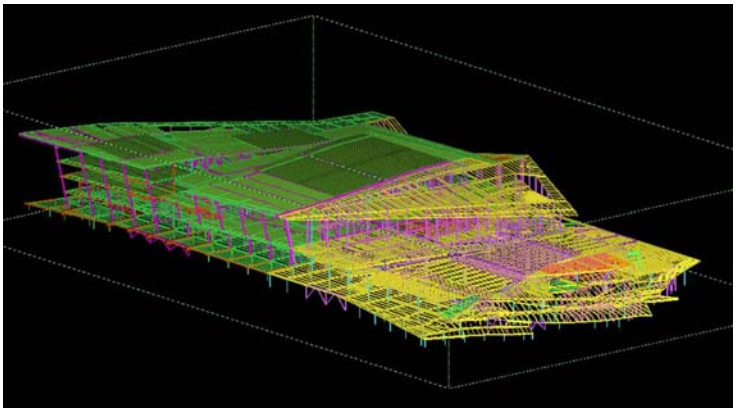
3 ***Exhibition Hall main foyer with access to meeting room levels showing interior wood finishes and clear exterior glazing***

4 ***Southwest entrance foyer with access to meeting room levels***

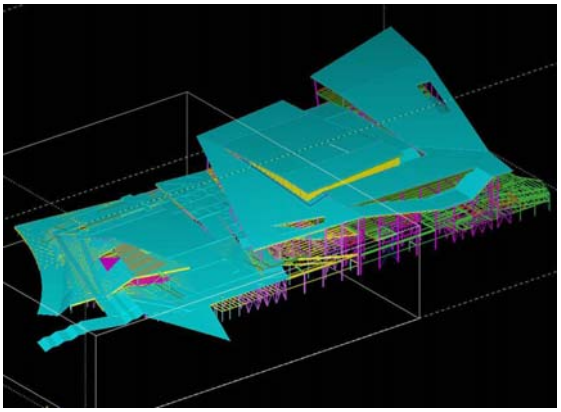
When combined with the need for large spans and heavy floor loads, this challenged Glotman Simpson, the building designers, to develop an efficient structural system.

The solution was storey-height trusses which also accommodated 443 parking stalls in the interstitial space between the exhibition hall and the main floor.

Further challenges were posed by the inclined columns of the north facade, overhanging the seawall and extending up to the highest point of the building, 44 m above. The total cost of the building, which was completed in early 2009, was $885M. Many congratulations to SEABC Director Rob Simpson and his colleagues!



Tekla 3D steel model prepared in the design office by Glotman Simpson for design, visualization, materials tracking, tender and coordination. Model was given to the steel fabricator for their use in commencing the shop drawing model.



Architectural Revit 3D planes input into Tekla design model for geometric compatibility with design.

Editor's Note: A more complete description of the Vancouver Convention Centre Expansion project was included on Page 7 of SEABC Newsletter No.6, May 2009.

WILLIAM R. BENNETT BRIDGE WINS AWARD OF EXCELLENCE

A much-needed replacement for the aging Okanagan Lake floating bridge, the new W.R. Bennett Bridge provides five lanes of enhanced traffic capacity and eliminates the former lift span with its associated traffic disruptions. Opened on May 25, 2008 108 days ahead of schedule, the W.R. Bennett bridge is the most recent of the dozen or so non-military floating bridges across the world. A combination of fixed structures and pontoon-supported deck, the new $144M facility received an **Award of Excellence** in the Transportation category of the 2009 Canadian Consulting Engineers Awards. The 1km crossing's 700m long floating section is linked to the fixed portions of the bridge by two 54m long transition spans, which accommodate the vertical displacements resulting from varying lake surface elevations, as well as the pitching and yawing motions from dynamic loading.

A novel concept adopted as part of the design was to reuse the original bridge pontoon's anchors.

This required a staged approach whereby new pontoon sections were floated into position and temporarily attached with weighted anchor lines to the original floating structure. At the same time the north side anchor cables were then shortened and attached to the new pontoon. When the traffic had been detoured over the new structure, the original pontoon sections were removed and the lengthened south side anchor cables were attached to the new floating structure. The elaborate procedure required 18 stages and careful execution.

Congratulations to Darrell Matson and his colleagues on a very successful project.

RICHMOND OLYMPIC OVAL WINS AT STRUCTURAL AWARDS

The Richmond Olympic Oval Roof was named as the winner of the **Award for Sports or Leisure Structures at the Structural Awards in London** on October 9. It also received an **Award of Excellence as part of the 2009 CISC BC Region Awards** in which the Oval was the winning project in the Engineering Category.

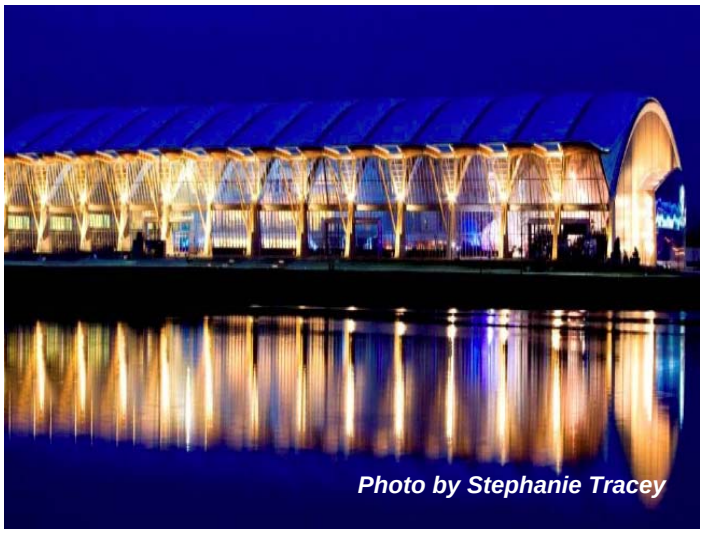


Photo by Stephanie Tracey

Designed by Fast & Epp of Vancouver, the Oval took top honours in London against world class competition from the Beijing National Stadium (Bird's Nest) and the Wimbledon Centre Court Roof in London. This stunning achievement crowned the 2009 annual awards gala hosted by the Institution of Structural Engineers which in 1968 established this as the main event in the worldwide structural engineering calendar.

"To be acknowledged as exceptional among some of the world's premier structural engineers is truly a privilege" noted Oval roof designer, Paul Fast, who accepted the award from IStructE President, Graham Owens. Paul was accompanied by colleague, Gerry Epp, who accepted the commendation for the David Alsop Sustainability Award, which was also won by the Richmond Olympic Oval Roof. Also present were project team members Marion LaRue, Cannon Design Architecture; Greg Scott, City of Richmond; and Rob Simpson, Glotman Simpson, who engineered the Oval's concrete base structure.

British Columbia was well represented at the 2009 Structural Awards with three projects out of 40 shortlisted entries. The Oval, which was shortlisted in two categories, was joined by the Kingsway Pedestrian Bridge, also designed by Fast & Epp (Pedestrian Bridges); and the Vancouver Convention Centre Expansion, designed by Glotman Simpson (Arts or Entertainment Structures). This exceptional representation speaks well of the standard of local engineering practice and the outstanding abilities of BC's prominent structural engineers.

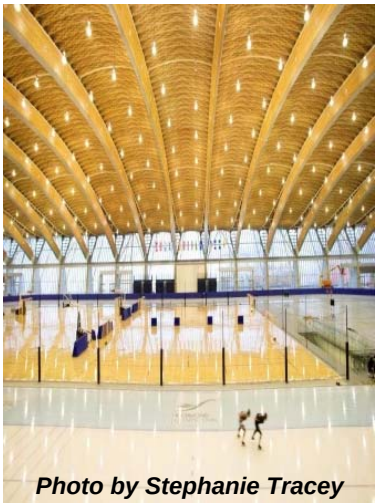
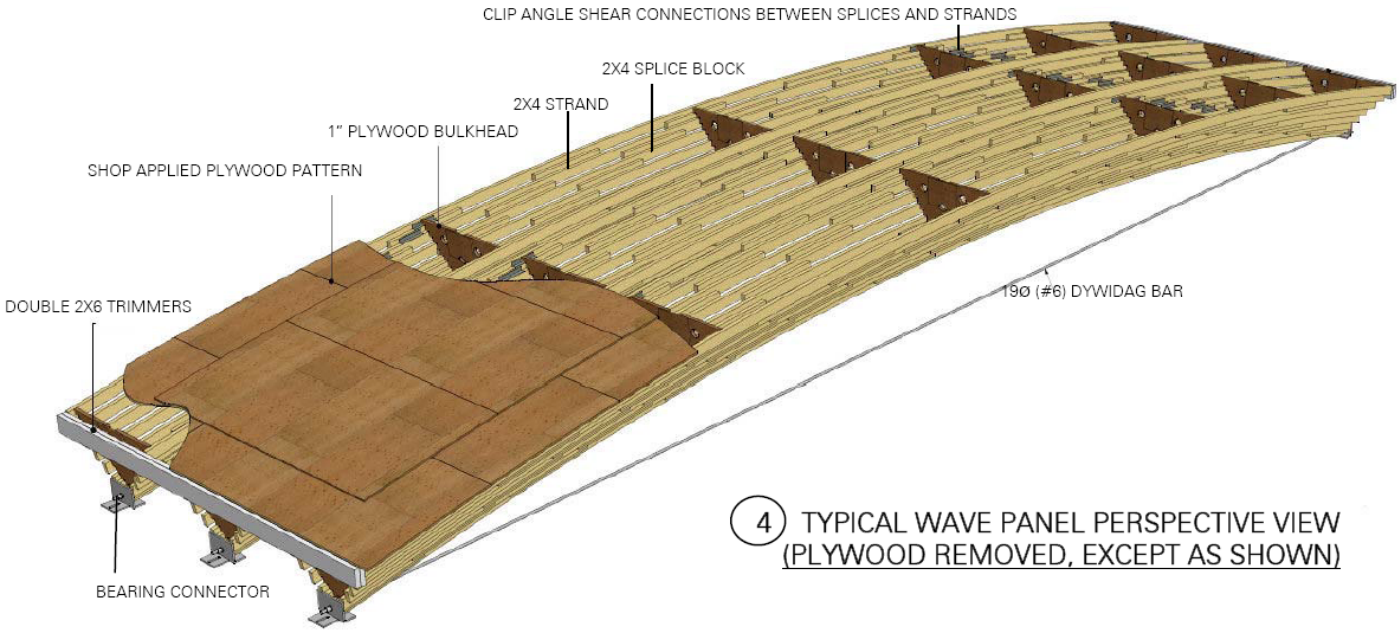


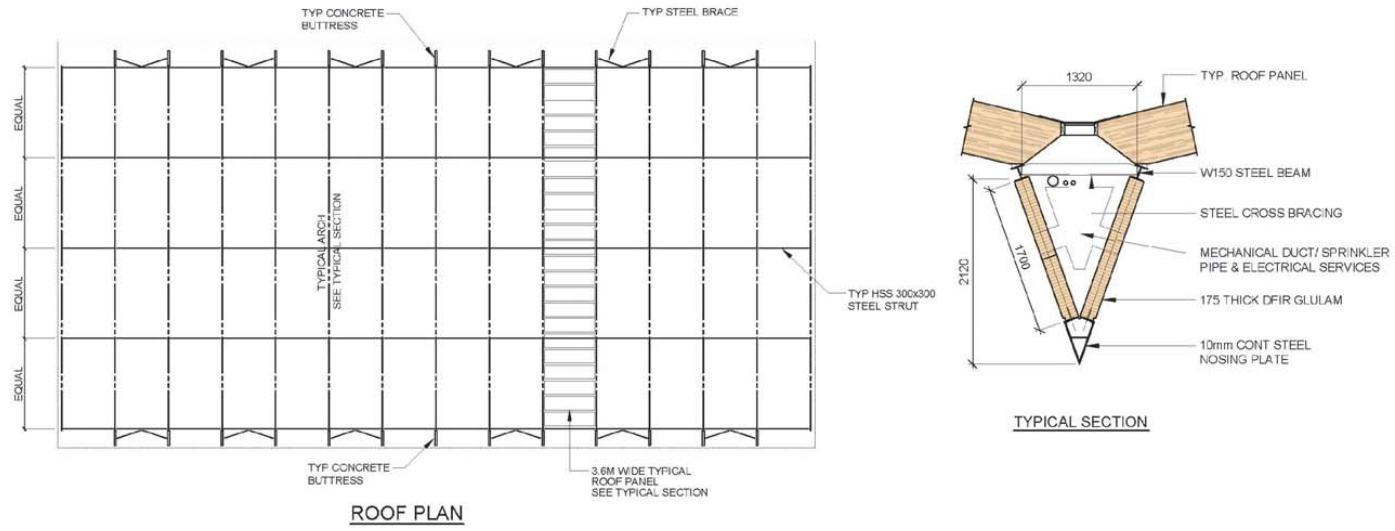
Photo by Stephanie Tracey

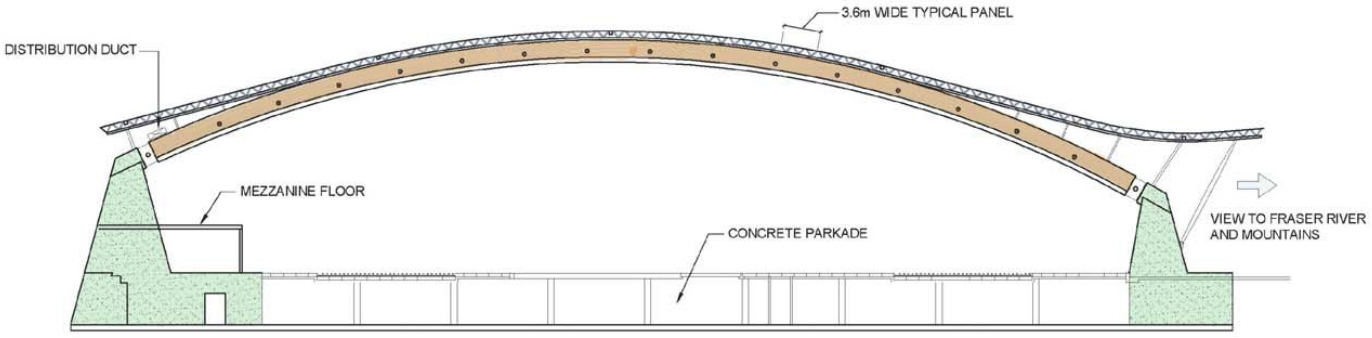

Photo by Hubert Kang

With the Olympic Games upcoming in February 2010, winning this award is timely for the Richmond Olympic Oval Roof which now has the Structural Awards plaque added to its growing collection of trophies. Importantly, the building functions extremely well and is much appreciated by building users, in particular the Canadian speed skaters who love competing at the Oval. There will be much excitement there next February for the 10,000 spectators who will be able to see the world's best speed skaters in this magnificent structure. Following the Olympics much of the seating will be removed and the Oval will be converted to a community wellness centre. The massive interior will provide ample room for no less than three sports facilities with turf, hardwood and ice surfaces which will provide a lasting legacy for the community.

Above: Prefabricated Wave Panel being positioned between arches.







TYPICAL SECTION AT ARCH

Announcement

SEABC ELECTIONS - 2010

You are invited to stand for election as a Director of SEABC in 2010. All interested members in good standing are eligible to stand for election for a one year term of office. If you are interested in becoming a candidate, look for a call for candidates in the near future which will provide you with the necessary information. Elections will take place electronically early next year and the results will be announced at the AGM in March. We look forward to hearing from you.

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:
http://www.cisc-icca.ca/content/publications/publications.aspx

Advertising

If you would like to advertise in our newsletter and our website, our pre-paid rates per edition are $270, $360 or $450 for a quarter, half, or full page advertisement, respectively. Advertisements will be available for purchase through the SEABC website.

Mark Your Calendars

Educational Events
From your Education Committee

Check http://www.seabc.ca/events.html for upcoming educational events

Afternoon Seminar: CAN/CSA-A23.3-04 Appendix D - Anchorage Systems

Date: Nov 26
Venue: To be confirmed – please watch your email for updates or visit www.seabc.ca
Time: 3:30am - 5:00pm

Presenter: Richard J McGrath P Eng., Cement Association of Canada

Description:
The presentation will provide a general overview of the Concrete Capacity Design (CCD) Method for anchorage to concrete that appears in Annex D of the CSA A23.3‑04 Standard. The various failure modes that are addressed by the CCD method will be examined along with the modifications made to the design procedures to accommodate the Limit States Design Procedures found in the CSA A23.3 Standard. The presentation will include a worked example of a group anchor arrangement, demonstrating the failure mode calculations of the CCD method.

2009 ATC & SEI Conference
Improving the Seismic Performance of Existing Buildings and Other Structures

Date: December 9-11, 2009 in San Francisco, CA
Register Now: http://www.atcouncil.org/index.php?option=com_registrationpro&Itemid=56&func=details&did=7