



The Challenge

THE NEWSLETTER OF THE WESTERN CANADA GROUP OF CHARTERED ENGINEERS

Message from the Chairman



Firstly, I would like to congratulate our Past Chairman, David Harvey, on being the recipient of the prestigious R.A.McLachlan Memorial Award. If you read the article in the ***B.C. Professional Engineering Magazine, "Innovation"***, you get

some idea of the breadth of his knowledge and experience in Structural Engineering. As the article points out, this is the highest award that the Association of Professional Engineers & Geoscientists of B.C. presents to a Professional Engineer.

One of the highlights this year was the organization by Past Chairman David, of a Strategy Meeting to determine the path ahead for WCGCE. The meeting was held in the Holiday Inn, Metrotown and a number of younger members wrestled with the various problems that the Group faces. The final result will be the development of a number of paths that we could follow in order to meet the present day challenges.

We had a number of interesting meetings arranged by our new Technical Meetings Co-ordinator, James Canova. We had speakers talking about the problems and solutions in putting on the Olympic Games, tours of facilities of interest, a visit to meet with our Members in Victoria and, once again, the Annual Barbeque and phone box inspection hosted by the Price's.

Contrary to other years, this season was graced by a first class lightning storm. Michael Thornley, our former Events Co-ordinator, was again in attendance in his wheelchair. The phone box was inspected and was found to be in its

usual pristine condition.

At this time I hasten to remind our Members that the **Association of Professional Engineers and Geoscientists of B.C.** Code of Ethics emphasizes the importance of Continuing Professional Development (CPD) for its members. CPD may well become an APEGBC requirement in the future.

All WCGCE Technical Meetings qualify as reportable CPD activities.

Dick Perry

Message from the Editor

I would like to thank everyone who has contributed reports on our technical meetings and other activities.

Between Issues of Challenge, Members may consult our web site www.wcgce.org where webmaster Ian Price provides up to date information on our meeting schedule and other items of interest.

If you wish to contribute a report on a technical event, an article or an announcement, please contact me; my contact details are listed below.

Chris Richardson, C.Eng., MIET.

email: backwater@telus.net

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Technical Program Notes

Bio-transportation Fuels and bio-products

May 27th, 2009

The speaker was Chris Scott-Kerr, P.Eng of Amec Americas Ltd, who spoke on Second and Third Generation Bio-transportation Fuels and bio-products; B.C.'s potential. Chris used a power point presentation to outline the amount and types of bio resources available in B.C. that can be converted into a variety of fuels from ethanol to wood pellets.

He discussed that quantities of various sources such as wood waste, wood cuttings and bark that are available in the province and the various ways that they can be converted. As each method requires energy to heat and cook the waste and then convert the liquor to the end product the overall efficiency is very dependent on what the end product is for, and where it will be used. The use of wood waste in the pulp and paper industry is efficient because the product is used on site and any waste heat from the conversion can be employed for drying the raw material.

The biomass in B.C is in the order of some 21 million dry tons, in addition there is the pine beetle kill which is some 32 million tons. One project doing something with this material is the Williams Lake power project which burns waste wood and generates some 240 megawatts of power. The pulp and paper industry



BC's Pine Beetle – Ravaged Forests

also uses waste wood and bark to provide steam and heat for their processes. A byproduct is Black Liquor which is also burned.

Agriculture produces some 10 million tons per year of canola oil and is planning on increasing this to 15 million tons.

The Canadian Government has set goals of 5% bio-gasoline and 2% diesel. The B.C. Government has set a goal of 5% renewable fuels. Both governments are providing incentives to achieve these goals.

Another process of note is the growing of algae in ponds to convert to fuels, this is still in the

experimental stage.

The big advantage of the bio fuels is that any CO2 generated in burning the fuel can be re-used by the forest to assist tree growth.

We had a turnout of 12 members and guests, and there were many questions and a lively discussion on the areas covered.

Arul Raja on behalf of the group thanked Chris for a very interesting and thought provoking talk and presented him with a token of our appreciation.

Report by Bob Martin

Visit to the ATI Truck Repair Ltd

June 17th, 2009

The speaker was **Ian Price, C.Eng, P.Eng**, who escorted us on a site visit to the **ATI Truck Repair Ltd facility** where he had assisted in designing a paint spray booth for trucks.

Ian pointed out that fire safety, occupational health and safety, and atmospheric emissions of paint spraying operations had to be carefully designed and installed to meet the requirements of the regulatory bodies.

The booth in question was about 60' x 20' x 20' high to accommodate large vehicles. For safety the ventilation air is driven by a 20,000 cfm fan heated by a 2,500,000 btu directed fired gas burner and then pushed through the end wall, which is a bank of filters, before entering the space. The exhaust air is also filtered at the opposite end of the space through a column of filters on either side of the double doors. These filters are backed by perforated plates to even out the pressure difference and thus, to even out the flow through the filters so that the air does not go through the ones closest to the exhaust fan.

There are 2 compressed air outlets in the long walls to provide power to the paint spray guns.

There are safety switches on the doors to prevent operation unless the doors are closed, and the automatic control panel is mounted on the exterior of the long wall adjacent to the side door. Air temperature is

adjusted from this panel to suit the drying requirements of the paint being applied.

We had a turn out of 12 members and guests, but there were many questions and a lively discussion on the areas covered.

Bob Martin on behalf of the group thanked Ian for a very interesting review of the Spray Booth and its operation.

Report by Bob Martin

WCGCE Vancouver Island Visit

20th September 2009

On Sunday 20th September an enthusiastic group of Vancouver engineers took a ferry to Vancouver Island where they joined their Island counterparts for a site visit to the Hartland Landfill.

Hartland Landfill and Recycling, the largest on Vancouver Island, has been in service for about 15 years with an expected 25 years remaining. It is located 14km north of Victoria BC serves over 366,000 people in the Capital Regional District.

The Capital Regional District had organized an open day at the site to showcase its features and functions to local citizens. The site's function is the disposal of waste in an ecologically friendly manner. To accomplish this demands an eclectic series of disciplines from electrical engineering, chemical engineering, materials handling, experts in ecology and in the ancient art of falconry.

A string of buses was available with guides for the twenty minute tour over the 125 hectare site, 48 of which are landfill area.

The departure point was the sorting area where metals, plastics and toxic chemicals were separated from the main garbage stream. Capital Regional District has a well



Covering land fill with membrane and aggregate

supported service where such things as paints and solvents can be accepted free of charge for separate safe disposal.

Remaining garbage is deposited and compacted in designated areas where leachate can be captured. Our first stop was at such an area now closed since 1998. This area of fifty meters depth was topped with a plastic liner and soil cap, and replanted with native species of flora.

Here methane gas extraction wells could be seen. The gas was piped from these wells to a processing plant where it was cooled to 6 degrees C and the moisture was removed. This gas powered an on-site Caterpillar G3520C generator set which produced 1.6 KW of power to be purchased by BC Hydro for the grid – enough to service 1,600 households. Previous normal practice was to flare off the gas.

We were shown the system of ponds the leachate passed through. It typically contained high levels of ammonia and chloride compounds. It was analyzed and once below the acceptable levels usually without treatment being necessary, was drained into the sanitary sewer. Great pains had been taken to ensure leachate could not contaminate normal ground water.

Our tour continued past the bio-solids curing buildings to the active site. Here, the land is filled and compacted four meters at a time, followed by a meter of crushed gravel. A system of sprinklers controlled the dust, and all vehicles were cleaned off before leaving the site.

Back at our departure point were ecological displays concerning the treatment of waste water and conservation of the water table. Here, displayed beside a native falcon, was a falconer with a Harris Hawk which is valued for its aggressive qualities amongst seagulls. Harris Hawks



Harris Hawk with falconer

are employed successfully at the Hartland Landfill to discourage seagulls. Airports also use dogs, but a landfill is unsuitable terrain for dogs.



The End of the Tour

The tour completed, our group repaired to the Stonehouse Pub for lunch and a tankard before boarding the nearby ferry for home. A very enjoyable and informative day was had by all in perfect sunny weather.

Report by Chris Richardson

Communications Solution for the Vancouver 2010 Olympic and Paralympic Games

27th October 2009



James Canova with Richard Brodowski

The speaker for the meeting was **Richard Brodowski** (on right in photo), Director of Bell Canada's Olympic Project Management Office. He outlined how Bell Canada, approached the Vancouver Olympic Committee and offered to arrange for all communication links including phone, and television links for the Winter Olympics to be held in Whistler and Vancouver in February, 2010.

Bell provided VANOC with some \$200 million in funding and paid for all the communication links between the two cities. One of the areas that required some ingenuity was the cell phone tower locations on the Sea-to-Sky highway between Vancouver and the skiing location at Whistler. An island in Howe Sound about halfway between the two locations was used as a site and by careful location it is barely seen from the highway. In addition the tower is powered by solar cells with a small diesel generator back up.

Richard was involved in all aspects of the project and used various programs to set up the project management requirements. For small programs the use of Excel spreadsheet was adequate while the more com-

plex ones used Microsoft project planning software.

His talk used a Power Point presentation emphasizing key points and photos of applications at other Olympic venues in the past.

The small audience of some 20 members and guests appreciated his presentation and asked him a number of questions on the process and success of the goals that had been set out.

James Canova thanked the speaker and presented him a token of our appreciation.

Report by Bob Martin

Current Activities

2009 BBQ and Inspection of the Phone Box

25th July 2009

The Summer BBQ/Technical Program was attended by about 25 members and guests. Dinner was provided with a selection of vegetables to go with the barbeque meat provided by the guests, plus a cake to celebrate our 17th year having our summer get together at the Price's.

A select team of engineers conducted the annual review of the salvaged red British Telephone box which was found to in full working order.



The Phone box Shines through the storm

Both the booth and gazebo were weather tested when nature provided a spectacular display of *son et lumière*. A thunderstorm hit the area just as the barbequing was finishing with heavy rain and lighting.

A welcome return special guest at the meeting, Michael Thornley, our previous Meeting Committee chairman, with his wife Joan managed to get to our meeting yet again, up the Price's very steep driveway up to the house. A second committee of engineers estimated the dynamics involved, assuring him a cooperative operation could get him and his heavy wheel chair up and back down in safety, and so it did.

Another visitor of note was Chris Pinnock who travelled from Ladysmith on Vancouver Island on his motorcycle to join us and rode home through that thunderstorm.

Everyone had a great time made all the more memorable by the weather.

Ian and Jane were thanked for their hospitality.

Report by Chris Richardson

WCGCE Planning for the Future

8th August 2009

At the Holiday Inn, Burnaby BC, WCGCE Past Chair **David Harvey** introduced member **Mark Porter** to the committee and other WCGCE participants who responded to our general invitation. Mark had volunteered to act as Facilitator for a **strategic planning session**.



The Discussion Continues

The approach adopted for the session was a SWAT (Strengths, Weaknesses, Opportunities, Threats) analysis adapted to suit the unique nature of WCGCE. The purpose of the session was to identify what adaptation of WCGCE was needed after

more than 20 years of successful operation, to serve its members in 2010 and beyond. Constitutional amendments could be proposed, if required.

Our Purpose, strengths and weaknesses, modes of communication, attractions for younger members, and the perceived interests of members in general once identified, were consolidated, discussed and evaluated by small discussion groups.

All enjoyed the process. Valuable insights were gained. We all owe Mark a debt of gratitude for organizing such a productive session.

A report of the meeting by David Harvey was circulated to the WCGCE committee for review. They are working on an action plan for our future. The committee welcomes member contact and feedback on this and any other issue.

Chris Richardson from David Harvey report

Richmond Olympic Oval Garners Prestigious International Award

The Richmond Olympic Oval Roof was the winner of the Award for Sports or Leisure Structures at the Structural Awards in London on October 9.



Richmond Olympic Oval
(photo credit Hubert Kang)

Designed by **Fast & Epp of Vancouver**, the Oval took top honours 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 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 ably supported by his partner, **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 concrete portion of the building.

British Columbia was well represented at the



Roof Beam Detail of
Richmond Olympic Oval
(photo credit Hubert Kang)

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 some of our local structural engineers.

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 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 there.

Enjoy a presentation by Paul Fast featuring this outstanding example of local engineering by attending the **WCGCE AGM and Dinner at the Royal Vancouver Yacht Club on Saturday January 23, 2010** (see separate announcement in this issue).

by David Harvey

Upcoming Events

The Biannual ICE Americas Convention will be coming to Vancouver in June 2010

The ICE Americas Convention 2010, hosted by the Institution of Civil Engineers, and open to ALL WCGCE members and their guests, will be held at the brand-new state-of-the-art facility at the Westin Wall Centre Airport Hotel, in Richmond, BC, in early June 2010.

Thursday, June 3, 2010

6:30 PM to 9:00 PM
ICE President's Welcome Reception

Friday, June 4, 2010

7:00 AM to 8:00 AM
Breakfast
8:00 AM to 5:00 PM
Convention Seminars
12:00 PM to 1:00 PM
Lunch
6:30 PM to 9:30 PM
Gala Dinner

Saturday, June 5th, 2010

1:00pm-5:00pm
Site Visits

The theme of the ICE Americas Convention 2010 will be **"Engineers at the Heart of Society: Collaborating and Innovating for Our Common Future"**.

A lineup of some very high profile speakers will engage participants with discussion on these hot topics of our time:

- o Engineering innovations & sustainability
- o Project delivery methods, community engagement & social impact
- o Climate change mitigation & adaptation
- o Accountability - a hallmark of professionalism

Please register early to benefit from the early bird rate.

For further details and to register, please visit <http://ice-americasconvention2010.weebly.com/> or contact

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David Harvey Receives R A McLachlan Award

David Harvey P Eng, Struct Eng has had a long and prestigious career in structural engineering, spanning 40 years in Canada and the United Kingdom.

David Harvey is Presented the RA McLachlan Award by APEGBC President Dr Margaret Li



As Senior Bridge Specialist with **Associated Engineering**, Mr. Harvey has participated in the design of thousands of bridges, from resource industry structures to major transportation bridges.

Known for his ability to develop innovative and cost-effective solutions, his bridge designs have helped to advance the local bridge engineering industry.

His designs have won a number of awards, most notably the **2005 Consulting Engineers of BC Lieutenant Governor's**

Award of Excellence for the Sea to Sky Highway Test Section.

His pioneering spirit, knowledge and experience helped to revolutionize the design and construction of BC forestry bridges. His tireless volunteer work with **APEGBC, the Institution of Structural Engineers** and other professional organizations has helped to advance the profession of engineering, and establish the visibility of BC consulting engineers internationally. For dedicating a career to bridge design and construction in BC, Canada, and around the world, David Harvey is a most deserving recipient of APEGBC's highest honour for professional engineering, the R A McLachlan Memorial Award.

Quoted from the Association of Professional Engineers and Geoscientists of BC. Congratulations—the editor

AGM AND DINNER EVENT

The **Annual General Meeting** will take place at the **Royal Vancouver Yacht Club**.

Date: Saturday 23rd January 2010

Time: 5:45pm

The **Dinner** will follow at **7pm**.

Guest and spouses of members attending the AGM may join an informal reception prior to another enjoyable evening of excellent food, interest, entertainment and fun .

Contact **Alan Kay** for tickets at 604-922-6150 or alan.akay@shaw.ca

-SEE ENCLOSED FLYER-

Thomas B. Stamp

We note with regret, the passing of WCGCE member

**Thomas B Stamp FIMechE
of Brentwood Bay, Vancouver Island**

Other Business

James Gordon Memorial Fund:

Has been established according to Jim's wishes with an endowment from his estate. The interest will be used to assist a student who is financially challenged to continue his studies in Engineering at BCIT. WCGCE donated \$1,000 in Memory of it's late founding committee member.

The Commander S M Terry Award

Congratulations are due to **Jason Fuller** of Pitt Meadows BC, a graduate of **BCIT Mechanical Engineering Program**, seen below (right), being presented the **Commander S M Terry Award for 2009** by IMechE Rep. and WCGCE Hon. Sec. **Bob Martin**.



The Book Prize (Marks Handbook for Mechanical Engineers) is presented by the **Institution of Mechanical Engineers** annually to the top Student in Mech. Engineering

Design on the recommendation of the faculty at BCIT.

WCGCE Awards

Congratulations are due to the following third and fourth year **UBC** students who are recipients of the WCGCE awards for 2008:

**Mr. Sean Gill Harsharan: Langley BC
(Civil Engineering)**

**Mr. Xinyu Tony Jiang: Richmond BC
(Electrical Engineering)**

**Mr. Samuel Paul Mason: Richmond BC
(Mechanical Engineering)**

**Ms. Megan Elizabeth Hodder: Victoria BC
(Chemical Engineering)**