



# Building Partnerships

LINKING CIVIL ENGINEERING FACULTY, STUDENTS, ALUMNI & INDUSTRY

Summer 2004

## HEADLINES

It has been an exciting year and fun year in the department. We have made major renovations to the department with increased graduate space, as well as updated labs including the new Geo Engineering lab at west campus, with more to come.

The pursuit of university research is very competitive and we are fortunate to have so many faculty in our department who have won prestigious international awards and research funding that reflects so highly on their research abilities. You can read about these success stories in the following articles.



Ed Watt, Bob Mitchell, Ivan Campbell and Dave Turcke

Our success with our undergraduate and graduate programs is reflected by significant enrollment increases. This year our graduate program will have 26 new students, which will bring our total enrollment to 86. The Undergraduate program will have the largest second year numbers in the past 15 years with close to 90 students.

As my retirement on July 1, 2005 draws near, I will be reflecting on the past as well as the future. While looking at the picture of Department Heads above serving over the past 2 decades, it truly feels like the end of an era. Check our website to see who the next Head will be. It should be decided by early 2005. You may also feel the same nostalgia while seeing familiar names and faces in the following articles.

Enjoy the Newsletter and if you have any questions, ideas about ways in which you can help the department please contact me at 1-613-533-2126 or [Turcke@civil.queensu.ca](mailto:Turcke@civil.queensu.ca).

*Dave Turcke*

## REMEMBER HOMECOMING 2004 –

### There's No Place Like Homecoming

The Civil Department will be hosting its annual homecoming Open House on Saturday, October 23 from 10 am to noon, second floor Ellis Hall. Faculty and students will be there to welcome alumni and friends. Please join us for coffee and refreshments and renew old acquaintances.

# COMPETITIVE TEAMS

The team would like to thank the following sponsors for their continued support.

## Gold Level Sponsors:

Queen's Alma Mater Society, Queen's Engineering Society, Faculty of Applied Science, Civil Engineering Department, Cruickshank Construction Ltd.

## Silver Level Sponsors:

CH2M, Halsall Associates Ltd., Mr. Josh Keatley, O'Connor Associates Environmental Inc., Peter Kiewit Sons Co. Ltd., Stantec Consulting, XCG Consultants Ltd.

The Queen's Concrete Toboggan Team 2004 would like to thank our sponsors for their support this year: Anchor Concrete, Kiewit, J.L. Richards and Associates Ltd, Cruickshank Construction, AMS of Queen's University, Queen's Department of Civil Engineering, Queen's Engineering Society, Sullivan and Sons, Cement Association of Canada, Halsall, O'Connor and Associate and Kingston Metal Marine.

## QUEEN'S CONCRETE CANOE TEAM

This past May, the Queen's Concrete Canoe Team ventured to Moncton, New Brunswick for the 10th annual Canadian National Concrete Canoe Competition. The competition judges the teams based on a technical report, an oral presentation, the quality of the canoe itself, and the team's performance in the races. This year, Queen's was up against 10 strong teams from Ontario, Quebec, Manitoba and the Maritimes.

At the competition all the hard work paid off as the team performed strongly in many categories and arrived with one of the nicest looking canoes. In the races, Queen's came in 3rd overall against some very strong competition, despite paddling in a canoe that began showing some serious signs of fatigue.

## BRIDGE BUILDING COMPETITION 2004

The annual Concordia Popsicle Stick Bridge Building Competition was staged in Montreal this past March. This competition consists of teams competing to design and build a 1 meter span bridge made entirely out of Popsicle sticks, glue, and dental floss. The bridges are loaded to failure, and teams are judged on loading, design, and aesthetics. Five Queen's civil engineering teams, consisting of 24 students, participated in this year's event. Results obtained were very positive with one team finishing a strong 7th out of a total of 36 teams. All teams would like to thank the Department of Civil Engineering and the Faculty of Applied Science for their financial and technical support.

## QUEEN'S CONCRETE TOBOGGAN TEAM



The Great Northern Concrete Toboggan Race was hosted this year by Carleton University in Ottawa, Ontario. The Carleton team did a great job organizing the event

and should be commended for their efforts.

The toboggan design consisted of a light weight concrete slab, reinforced with a steel bar reinforcement cage and topped with a layer of carbon reinforced polymer. The role cage was constructed of aluminum, which gave the toboggan a sleek look on race day.

The race was by far the most exciting day of the event. The first run was a thrilling ride as the toboggan slid hard to the left and almost rolled over. Due to our innovative role cage design the toboggan stayed upright. Except for some scared spectators on the left side of the race course, there were no injuries to report. The second run went



All in all, the team ended up in 5th place. The 15 students that represented Queen's came away with great satisfaction from the weekend and learned a great deal from some of the more experienced schools. The returning members are already looking forward to great things at next year's competition in Windsor.



**Brendan Callery, Morgan Bickerdike, Matt Wilson, Andrew Hoskin, Kim Read, Michael Ranger**

straight down the course reaching a top speed of 45.5 km/h, one of the fastest of the day. The brakes worked flawlessly at the bottom of the course combining to make one of the best runs of any school at the competition.

On awards night Queen's took home the "best esthetics award" for most professional looking concrete slab and role cage and placed fourth overall at the event.



# HONOURS AND ACHIEVEMENTS

## PRESTIGIOUS RANKINE LECTURE AND 2004 KILLAM PRIZE – DR. KERRY ROWE

Dr. Kerry Rowe has been invited by the British Geotechnical Association to deliver the prestigious 2005 Rankine Lecture in London, England. He is only the fourth Canadian to be selected since the lecture's inception in 1961. Rankine lecturers are chosen on the basis of their interna-



tional standing and reputation, their technical expertise and contribution to geotechnical engineering, their ability to deliver an outstanding lecture, and to produce a published paper that would serve as a landmark to industry. Renowned for his seminal contributions

to the creation of safer landfill designs, Dr. Rowe has developed computer software and engineering procedures that are used worldwide.

The Killam Prize was created to honour eminent Canadian scholars and scientists actively engaged in research, whether in industry, government agencies or universities. The awards recognize outstanding career achievement in engineering, natural sciences, health sciences, social sciences and humanities and are accompanied by a \$100,000 prize.

Dr. Rowe is a recognized leader in both theory and practice related to the design of safe waste disposal sites. He has extensive research and consulting experience in the geotechnical and geoenvironmental engineering field. His expertise spans several areas, from tunneling to soil reinforcement, geosynthetics and waste management and contaminant containment. The results of his research have had a profound impact on both international research and engineering practice in his field. Congratulations Kerry.

## 2004 RECIPIENT OF CHANCELLOR'S RESEARCH AWARD

Dr. Amir Fam was one of five recipients of this year's Chancellor's Research Award. His research focuses on structural applications using fibre-reinforced polymers. He is currently working with concrete-filled fibre composite tubes. Durable in corrosive environments, these structures may be used in bridge columns, hydro poles, light poles, and highway traffic signs.

## "NEW OPPORTUNITIES"

Dr. Colin MacDougall has been awarded \$96,816 from the Canada Foundation for Innovation (CFI) New Opportunities Fund. This award will help support his work on the modeling and testing of innovative construction materials that can better withstand Canada's natural elements and the stress of long-term use. These materials may contribute to upgraded roads, bridges, tunnels, ports, harbours, airports, and other critical infrastructure projects.



## DR. RICHARD BRACHMAN RECEIVES PREMIER'S RESEARCH EXCELLENCE AWARD

Dr. Richard Brachman has been selected as a recipient of a Premier's Research Excellence Award (PREA) for a project titled "Resolving two critical buried municipal infrastructure issues".

Ontario's aging and growing cities need viable economic techniques to repair deteriorated buried structures and durable landfill barriers to prevent contamination of the environment. In response to these challenges, Dr. Brachman and his graduate students will quantify the structural capacity of deteriorated manholes repaired with polymer liners, and assess the physical response of drainage pipes in landfills. PREA is intended to help gifted researchers attract talented graduate students, post-doctoral fellows or research associates to their research teams and is administered by the Science and Technology Division, Ministry of Economic Development and Trade of the Government of Ontario.



Dr. Brachman (right) with PhD students Simon Gudina (left) and Ryan Krushelnitzky (centre).

Dr. Ian Moore and Dr. Richard Bathurst were inducted as Fellows of the Canadian Academy of Engineering in Toronto on June 4, 2004 in recognition of their outstanding contributions to engineering design practice, research and education in Geotechnical Engineering.

# INDUSTRY OPEN HOUSE

## 7TH ANNUAL INDUSTRY OPEN HOUSE – JANUARY 29, 2004

The Industry Open House seems to get bigger and better each year and this year was no exception. We had 21 companies participating and many alumni present, as well as a large student turnout. It was almost like homecoming.

After welcoming everyone Dave Turcke updated the participants on the changes going on in the department and how we are continuing to build collaborative links between our industry partners and our undergraduate and graduate programs. Christian Dover and Mike Sutherland spoke about two of our design teams, the Concrete Toboggan and the Concrete Canoe teams. Each outlined what was involved in being a

member of these teams with regard to preparing technical reports, making oral presentations, working together as a team and competing in the races.

John Pelow, on behalf of Andrew McGillis, who currently works with Baird & Associates in their Oakville Office, gave a presentation on Andrew's perspective of our Industry Design Project Course – CIVL 467. He outlined his experience as a student and now as an Industry Partner. Carole Champion from MMO outlined the connections program which focuses on Industry based Education and Training.

Once again, many thanks to MMO for sponsoring our dinner at the University Club. It was enjoyed by all who attended.



Information about next year's open house will be sent out at the end of October 2004. For more information contact Cathy Wagar, 613 533-6000 ext 74227 or email: [wagarc@civil.queensu.ca](mailto:wagarc@civil.queensu.ca)

**REMEMBER OUR JOB NETWORK IF YOU HAVE EMPLOYMENT OPPORTUNITIES FOR OUR STUDENTS. Check our the website [www.civil.queensu.ca](http://www.civil.queensu.ca). To have your company linked to our website please contact Jolanda de Groot at 613 533-2708 email: [deGroot@civil.queensu.ca](mailto:deGroot@civil.queensu.ca)**

## NEWS FROM OUR FOURTH YEAR DESIGN COURSE

CIVL 467 is a year long course where teams of students together with a faculty member and an industrial partner experience a real world design project. We are grateful for the involvement of this year's industrial partners: **Stantec Consulting, Kimco Steel, Cataraqui Region Conservation Authority, Cruickshank Construction, Golder Associates, Yolles Engineering, Mattamy Homes, CH2MHill, Lynlea Corporation, Baird** and the support provided by **Materials and Manufacturing Ontario**. If your company would like to suggest a design project for 2004-05, please contact **Dr. Kent Novakowski** at [kent@civil.queensu.ca](mailto:kent@civil.queensu.ca).

## AND THE 2004 STANTEC AWARD GOES TO ...

**Jen Lavoie, Kimberly Read, Nick Stoute and Alex Williams** (BSc 2004) were selected as the recipients of the 2004 Stantec Consulting Ltd. Award for the *BEST* student project in our 4th year design course CIVL 467. The award winning team worked with **Dr. Paul Dittrich** (BSc 1991) of Golder Associates and faculty advisor **Dr. Richard Brachman** on a challenging project called the Sinking Causeway. The students produced settlement predictions and conducted stability assessment investigating several construction options. This is the inaugural presentation of this now annual award generously sponsored by Stantec Consulting Ltd. for excellence in industry design.



Presentation of the 2004 Stantec Award at June convocation. L to R: **Dave Turcke, Jen Lavoie, Kimberly Read, Nick Stoute, Alex Williams** and **Richard Brachman**.

## AWARD FOR THE BEST STUDENT REPORT IN 2003

Last year, a team of CIVL 467 students supervised by Dr. Kent Novakowski won the 2003 Canadian Geotechnical Society prize for the best Canadian undergraduate team-based report for 2003. This award was provided by the Canadian Foundation for Geotechnique. **Lauren MacKay, Bronwen Smith, Michael West, Anna Westlund and Grace Yungwirth** (BSc 2003) conducted a feasibility study for phytoremediation of a contaminated site. They completed an extensive literature review, conducted field-testing and performed numerical analysis as part of this yearlong Design Project. Grace accepted the award on behalf of her team members at the Canadian Geotechnical Conference in Winnipeg. The students were very grateful for the interactions with **Mr. Dave Malcolm** of **Malroz Engineering** who served as the industry partner on this project.



**Grace Yungwirth and Mike West** pose with a certificate presented to their student design team for the best group report of the Canadian Geotechnical Society.

# NEWS AND NOTES

## THE ROBERT W. FULLER AWARD IN CIVIL ENGINEERING

Established in October 2003 by the family in memory of Robert W. Fuller, B.Sc. (1946) and will be awarded to a 2nd year Civil Engineering student based on financial need, academic achievement and demonstrated leadership.

**Dr. Luke Bisby** won a "Golden Apple Teaching Award" from the Queen's Engineering Society for 2003/2004.

**Heather (Moroz) Worts, (Sc' 99)** won the Toronto Construction Association's Young Construction Leadership Award for 2003.



## ROBERT AND JOYCE JONES CIVIL ENGINEERING FORUM

The engineering forum gives rise to the following expression "you learn something new everyday". This is one reason why undergraduate students, graduate students, faculty and staff alike continually look forward to the weekly presentations put forth by the Robert and Joyce Jones Civil Engineering Forum. Thanks to the ongoing support of Robert and Joyce Jones, these presentations have been no less than outstanding each year.

Civil Engineering is a very broad profession, which is why the forum brings in experts from all over Canada and around the world covering a wide range of disciplines. This past year informative sessions were given by CEO's, consultants, entrepreneurs, and academics.

Presenters for this upcoming year are beginning to roll in. If you are interested in participating in the forum, or would simply like more information, please contact either Scott Munro at (613) 533-2144 or Titia Praamsma at (613) 533-2130 or via e-mail at [forum@civil.queensu.ca](mailto:forum@civil.queensu.ca).

## THE ROBERT J. MITCHELL PRIZE

This year's winner is **Aaron Dent**. The prize valued at \$5000 is awarded to a graduate student in Civil Engineering who has demonstrated outstanding leadership ability either within the University or in extra-university activities.

Over the past few years here at Queen's, Aaron has been involved with the Graduate Club, the Robert and Joyce Jones speaker series, the Undergraduate Concrete Canoe Competition, the American Concrete Institute Undergraduate Competition, initiated the Green Office Committee made up of representatives of graduate and undergraduate students, faculty and staff in the department and serves to help set an example of environmental responsibility for Queen's. He was involved with the Integrated Learning Centre examining issues related to energy efficiencies and indoor air quality and he chaired the Queen's Sustainability Coalition. He won a Halsall Scholarship and spent time at Halsall Associates where he initiated their involvement in the Emerging Green Builders competition. The team finished in the top 10 in the world, out of over 300+ teams.

Outside of Queen's he was involved with the Special Olympics baseball team, the Seventh Generation Community Group and Home Alive! (a straw bale house that was constructed for the Toronto Home Show.)

Truly remarkable Aaron – we are proud of you.

**Maxine Wilson** has now joined our team as our new Financial Assistant from the Department of Philosophy. Maxine came to the Department at the beginning of January 2004, with the promotion of **Fiona Froats** to Graduate Program Assistant, which was left vacant after Darlene Gaffney's retirement. We look forward to Maxine working in our Department in the years to come.

**Ana da Silva** will be on sabbatical for the period of July 1, 2004 to June 30, 2005. While on leave she will continue her research program on river morphodynamics. She plans to travel to Germany and the Netherlands.

**Ian Moore** will be on sabbatical from January 1, 2005 to December 31, 2005. He will be spending his time equally between Kingston and Australia.

**Kevin Hall**, professor in the Department of Civil Engineering, recently competed as a member of the Canadian National Triathlon Team at the



2004 World Triathlon Championships in Madeira Portugal. The world championships are an Olympic distance (sprint) race consisting of a 1500 m swim, a 40 km bike and a 10 km run. Swimming with the sharks in the cold mid-Atlantic was a great experience, says Kevin.

**Bruce Anderson** who was recently promoted to Full Professor will be on sabbatical for the period of July 1, 2004 to June 30, 2005, part of the time will be spent in China. He has been awarded a Senior Researcher scholarship from the China-Canada Scholar Exchange Program, which will allow him to spend up to 6 months at Fudan University in Shanghai. He also hopes to bring the family over for some "tourist time" during this stay.



**Dr. Richard Bathurst** gave the keynote Mercer Lecture at the 4th European Geosynthetics Conference in Munich in November 2003 and at GeoAsia 2004 in Seoul Korea in June 2004. He was also awarded runner-up for the Gzowski Medal of the Canadian Society of Civil Engineering for the best paper published in Civil Engineering in 2003.

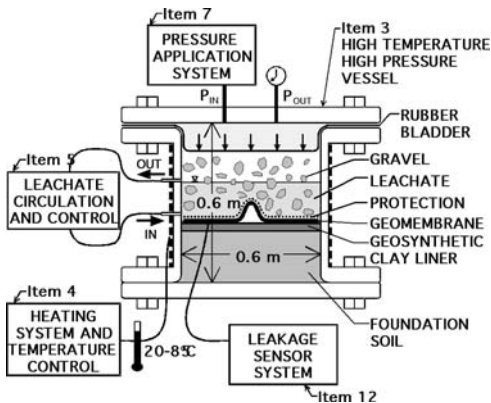
# RESEARCH EXCELLENCE

## GEOSYNTHETICS UNDER EXTREME CONDITIONS

Drs **Rowe, Moore, Bathurst and Brachman** were recently awarded funding of \$1.65 Million to develop new laboratory facilities – second to none in the world – to permit research on the performance of geosynthetic materials (e.g., geomembranes, geotextiles, geogrids and polymer pipes).

The proposed design guidelines resulting from the research will provide improved design and construction methods to: ensure long-term performance of geosynthetic “protection” layers in landfill liners to prevent escape of contaminants from landfills; provide long-term strength for new and replacement polymer pipes in municipal sewers, and water and gas supply lines (minimizing future sewer and road reconstruction costs); and improve performance of earth retaining structures, water, gas and sewer pipes and landfills during earthquakes.

Funding for the new facility and research equipment was provided by the Canadian Foundation for Innovation and the Ontario Innovation Trust.



### Illustration of a Geosynthetic Liner Longevity Simulator to examine performance of landfill liner systems.

Three new laboratories will be developed: (1) A High-Capacity Shaking Table to examine the behaviour and performance of geosynthetics during earthquakes, (2) Specially designed Geosynthetic Liner Longevity Simulators to conduct accelerated ageing tests on geosynthetic landfill components in extreme chemical and loading conditions, and (3) Large-Scale Polymer Pipe testing equipment (high-temperature baths with water pressure-controllers and load frames) to examine long-term strength of many different polymer pipes. This new equipment permits large-scale simulations of field conditions (rather than simplified laboratory conditions), not previously possible, greatly improving understanding and performance of geosynthetics engineering.

## OUR NEW LARGE-SCALE GEOTECHNICAL TESTING LABORATORY

Construction is nearing completion of Queen's new Large-scale Geotechnical Laboratory. The principal feature of this facility is an 8 m wide, 16 m long and 3 m deep test pit to permit full-scale testing of buried structures by Drs Moore, Brachman, Rowe and their research teams. The first experiments will occur later this summer.

The test pit was designed to permit real construction practices to better reproduce expected field conditions – all within the confines of controlled experimental conditions. The static response can be studied by driving real loaded vehicles over the test pit, or testing to the ultimate limit state can be conducted with a 2000 kN actuator. The new laboratory will also house specialized pressure vessels used to simulate large earth pressure loading of buried structures and geosynthetic liner systems.

Funding for the new facility and research equipment was provided by the Canadian Foundation for Innovation, the Ontario Innovation Trust, and the Natural Sciences and Engineering Research Council of Canada.



## ONTARIO RESEARCH AND DEVELOPMENT CHALLENGE FUND – WATER FROM SOURCE TO TAP

Kevin Hall is the principle investigator on an \$8.1 million multi-disciplinary research project involving Queen's University, University of Ottawa, University of Toronto and Waterloo University. Joining Kevin are Ana da Silva and Kent Novakowski of the Department of Civil Engineering. Together, along with a team of four graduate students, one post doctoral fellow, several summer research assistants and over 200 local volunteers in the Tay River Watershed, they are developing new tools for the assessment of the movement of ground and surface waters, the interaction of these fluids and the transport of contaminants throughout the watershed. The research program will continue for 3 years. This summer, researchers are busy undertaking collection of field data to develop an understanding of the movement of water in the Tay Watershed. The Tay was selected due to its diverse hydrogeology, complex surface water hydrodynamics and controversy over the recent permit issued for water taking to a large multinational corporation. The researchers are working in collaboration with the Rideau Valley Conservation Authority. Additionally, the researchers are being assisted by a strong local volunteer force, which will be carrying out

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tests developed specifically for this project that will produce relevant scientific data using special testing protocols developed for ease of use by volunteers. Volunteers are able to upload data through a project computer portal, via phone or via regular mail, depending on their requirements. Additionally, a number of automated test units will be deployed to collect data and relay the results back to the numerical modelling platform at the university for "real-time" verification and calibration.

Further details of the study can be obtained from Kevin Hall (hallk@civil.queensu.ca or (613) 533-2127)

## PATENT FOR RAPID AUTOMATED E-COLI DETECTION

Kevin Hall is part of a multi-disciplinary team from Queen's University who were recently awarded a North American and European patent for the development of testing protocol and test equipment for a rapid automated test for detecting levels of e-coli and total coliforms in water. The technology is currently being commercialized and will be available to the public by September, 2004. There has been significant interest from municipalities, water regulators and public health officials across North America.

# CONGRATULATIONS

**Dave L. Walters** graduated with a PhD (Geotechnical) in May 2004 and is now with Alston Associates in Markham, ON.

**Magdy El-Emam** graduated with a PhD (Geotechnical) in July 2003 and is now Assistant Professor at Zagazig University in Egypt.

**John Ford** (MSc Eng 2004) is working for Halsall Associates in Toronto, ON

**Kyle Stephenson** (MSc Eng 2003) is working for Golder Associates in Ottawa, ON

**Brea Williams** graduated with a PhD (Structures) in June 2004 and will begin working with Halsall Associates in Ottawa, ON.

**Abigail Easton** (MSc Eng 2004) is currently working for Dr. Bernie Kueper.

**Anna Charbonneau** (MSc Eng 2004) is living with her husband Byron in Belleville, ON.

**Andreanne Roy-Perrault** (MSc Eng 2003) has recently moved to Belgium.

**Bob Putzlocher** (MSc Eng 2004) is working for MTO in Kingston, ON.

**Brendan Buggeln** (MSc Eng 2003) is working for Acres International in Niagara Falls, ON.

Please send comments and/or news to:

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## WHERE ARE THEY NOW???

### Phillipe Bernier Sc '02

After graduation Phillippe moved to Edinburgh, Scotland and joined Bredero Shaw's international engineering team. Bredero Shaw is the largest applicator of anti-corrosion, flow, and weight-coatings for major pipelines. Phillip has worked on the Saudi Arabia's Persian Gulf Coast conducting engineering cost analysis. He found Saudi Arabia to be a fascinating cultural experience. In June '03 he visited Iran and in July 03 he moved to Farsund, on the south coast of Norway and became Project controller over a sizeable contract to provide natural gas from halfway up Norway to the South of England.

This fall he will become the

civil/environmental engineer for the health/safety/environmental department where he will be involved in environmental issues at Bredero Shaw's facilities world-wide. Phillippe plans to undertake grad studies in the UK either in the fall of 2005 or 2006.



**David Tryon** celebrated 45 years of service in the Department in February 2004.



### STAFF RETIREMENT

After 18 years in the Department, **Darlene Gaffney**, took early retirement on September 20, 2003. Throughout these years Darlene was the Head's secretary for Dr's Watt, Mitchell, Campbell and Turcke. She was a hard worker, took great pride in organizing special activities in the department and was always willing to help out during the very hectic times in the department. Thanks Darlene and all the best.