
CANADIAN CIVIL ENGINEER
L'INGÉNIEUR CIVIL CANADIEN

civil



**Engineering Practice:
Civil Engineers in the Workplace**
**La pratique du génie :
l'ingénieur civil en milieu de travail**

SPRING / PRINTEMPS
2010

27.1

Group home and auto insurance

Insurance as simple as 1-2-3

► for members of the **Canadian Society for Civil Engineering**

Insurance doesn't need to be complicated. As a member of the **Canadian Society for Civil Engineering**, you deserve – and receive – special care when you deal with TD Insurance Meloche Monnex.

First, you can enjoy savings through preferred group rates.

Second, you benefit from great coverage and you get the flexibility to choose the level of protection that suits your needs.¹

Third, you'll receive outstanding service.

At TD Insurance Meloche Monnex our goal is to make insurance easy for you to understand, so you can choose your coverage with confidence. After all, we've been doing it for 60 years!

Request a quote
and you could



Endorsed by



Engineers Canada is the business name
of the Canadian Council of Professional Engineers



1 866 269 1371

Monday to Friday, 8 a.m. to 8 p.m.

www.melochemonnex.com/csce



TD Insurance Meloche Monnex is the trade-name of SECURITY NATIONAL INSURANCE COMPANY who also underwrites the home and auto insurance program. The program is distributed by Meloche Monnex Insurance and Financial Services Inc. in Quebec and by Meloche Monnex Financial Services Inc. in the rest of Canada.

Due to provincial legislation, our auto insurance program is not offered in British Columbia, Manitoba or Saskatchewan.

¹Certain conditions and restrictions may apply.

*No purchase required. Contest ends on January 14, 2011. Total value of each prize is \$30,000 which includes the Honda Insight EX and a \$3,000 gas voucher. Odds of winning depend on the number of eligible entries received. Skill-Testing question required. Contest organized jointly with Primum Insurance Company and open to members, employees and other eligible people of all employer and professional and alumni groups entitled to group rates from the organizers. Complete contest rules and eligibility information available at www.melochemonnex.com. Actual prize may differ from picture shown.

Honda is a trade-mark of Honda Canada Inc., who is not a participant in or a sponsor of this promotion.

Meloche Monnex is a trade-mark of Meloche Monnex Inc., used under license.

TD Insurance is a trade-mark of The Toronto-Dominion Bank, used under license.

civil

features

page 12

Career Development — A Personal Perspective

page 14

The New Civil Engineer

page 18

Responsible and Registered: The Value of the Engineering Licence in a Changing World

page 22

Foreign Competition: A Challenge to Canadian Engineering

columns

4 from the editors / mot des rédacteurs

6 presidential perspective / perspective présidentielle

8 profiles / profils

10 membership matters / question d'appartenance

21 the career development committee / le comité de perfectionnement

21 lifelong learning / l'éducation permanente

25 coming events / calendrier des activités

28 history notes / notes historiques



The *Canadian Civil Engineer* (CCE) ISSN 9825-7515 is published bi-monthly by the Canadian Society for Civil Engineering (CSCE).

L'Ingénieur civil canadien (ICC) ISSN 9825-7515 est publié bi-mensuellement par la Société canadienne de génie civil (SCGC).



CSCE / SCGC

4920 de Maisonneuve W., Suite 201
Montréal, QC H3Z 1N1
Tel: 514-933-2634 Fax: 514-933-3504
E-mail: info@csce.ca
www.csce.ca

CSCE Office / Office de la SCGC

President / Président
Gordon Jin, P.Eng., FCSCE (St. Johns, NL)

Senior Vice-President / Vice-président senior
Vic Perry, P.Eng., FCSCE (Calgary, AB)

CCE Board / Conseil de l'ICC

CSCE Publications Committee Chair
Présidente, Comité des publications de la SCGC
Dagmar Svecova, MCSCE (Winnipeg, MB)

CCE Editor / Rédactrice de l'ICC
Louise Newman (Montréal, QC)

Editorial Committee Members / Membres du comité éditorial
David Lau, P.Eng., FCSCE (Ottawa, ON)
O. Burkan Isgor, Ph.D., P.Eng., MCSCE (Ottawa, ON)

Annual Subscription Rates / Abonnement annuel

Canada & U.S.A. \$35.00
other countries / autres pays \$45.00
single copy / au numéro \$7.50
agency discount / rabais aux distributeurs 10%

Design / Production

AN Design Communications (Ottawa, ON)
613-744-0444
www.an-design.ca

Advertising / Publicité

Dovetail Communications Inc.
T: 905-886-6640
F: 905-886-6615
Janet Jeffery 905-886-6641 ext. 329
E: jjeffery@dvetail.com

The opinions expressed in the papers are solely those of the authors and the Canadian Society for Civil Engineering is not responsible for the statements made in this publication.

Les opinions exprimées dans les articles sont la seule responsabilité de leurs auteurs et la Société canadienne de génie civil n'engage pas sa responsabilité dans les propos exprimés.

All commentaries and questions about this publication should be forwarded to the Editor:
Pour vos commentaires ou de plus amples informations, contactez la rédactrice :
Louise Newman, louise@csce.ca 514-933-2634 ext. 23

Return Address / Adresse de retour :
The Canadian Society for Civil Engineering
La Société canadienne de génie civil
4920 de Maisonneuve W., Suite 201
Montréal, QC H3Z 1N1

FROM THE EDITORS / MOT DES RÉDACTEURS

LOUISE NEWMAN LOUISE@CSCE.CA

BRIAN C. BURRELL P.ENG., FCSCE—CHAIR, CSCE CAREER DEVELOPMENT COMMITTEE; PRÉSIDENT DÉVELOPPEMENT PROFESSIONNEL.



This issue of CIVIL is on the theme of Engineering Practice: Civil Engineers in the Workplace. Practising engineers in consulting firms, government offices, and industry are the core of the profession. Therefore, learned societies, such as the CSCE, need to address issues related to the civil engineering practice.

The intrinsic nature of engineering as an applied science is the use of knowledge for practical ends. Despite this, engineering learned associations traditionally emphasized engineering education over workplace issues. The intent of engineering education is to provide qualified engineers who can successfully practice civil engineering for the betterment of society. It is the application of knowledge not its acquisition that ultimately is important.

The status of the engineering profession in Canada has fallen relevant to law and medicine, with which it had a comparable

ranking in the 1950s and 1960s. The public no longer perceives engineering as one of the top five professions in Canada, and its ranking among the professions probably would have fallen further if not for the influx of immigrants from countries where engineering is still held in high esteem. There are hopeful signs that Canadian engineering associations are becoming increasingly aware of the need to promote the profession.

Civil engineers in essence sell knowledge, and this knowledge only has a commercial value if deemed worth purchasing by a client. If potential clients are unsure what civil engineers provide relevant to other groups or if they believe other professions have more appropriate, relevant or updated knowledge, then they will seek expertise elsewhere. This applies not only to the consulting community but also to employer-employee relationships.

Le présent numéro de l'ICC est consacré au thème *la pratique du génie : l'ingénieur civil en milieu de travail*. Les praticiens au service des ingénieurs-conseils, des gouvernements et de l'industrie représentent le cœur de la profession. C'est pourquoi les sociétés savantes comme la SCGC doivent se préoccuper des problèmes reliés à la pratique du génie.

L'utilisation du savoir à des fins pratiques constitue la nature intrinsèque de cette science appliquée qu'est le génie. Malgré cette réalité, les sociétés savantes du secteur du génie ont toujours privilégié les questions de formation plutôt que les questions reliées au milieu de travail. Le but de la formation est de produire des ingénieurs diplômés en mesure de pratiquer efficacement le génie pour le mieux-être de la société. En dernière analyse, c'est la mise en œuvre du savoir qui est importante, et non son acquisition.

Le statut de la profession au Canada a diminué par rapport au droit et à la médecine, alors que ce statut était comparable dans les années cinquante et soixante. Le

public ne perçoit plus le génie comme étant l'une des cinq plus hautes professions au Canada, et le statut de la profession serait probablement tombé encore plus bas sans l'arrivée d'immigrants issus de pays où le génie jouit toujours de la faveur publique. Il y a des indices encourageants selon lesquels les associations regroupant la profession sont de plus en plus conscientes de la nécessité de faire la promotion de la profession.

Au fond, l'ingénieur civil vend un savoir, et ce savoir n'a de valeur commerciale que dans la mesure où un client désire acheter ce savoir. Si des clients en puissance sont incertains quant à ce qu'offre le génie, comparativement à d'autres professions, ou s'ils pensent que d'autres professions offrent un savoir plus pertinent, plus approprié ou plus à jour, ces clients iront vers d'autres savoirs. Ceci est valable pour le génie-conseil comme pour les relations employeur-employés.

Employeurs et clients appuient les professions qui, selon eux, offrent des services comparables, surtout si elles coûtent moins cher. D'autres professions ont graduellement

Employers and clients will employ and support the profession or occupations they consider have comparable skills, especially if cost savings may accrue. Other professions and occupations have occupied gradually the fringe areas (sometimes called the gray areas of civil engineering practise) thereby gradually eroding the scope of civil engineering practise. The loss of peripheral areas of engineering work may eventually lead to a loss of employment opportunities for engineering graduates, particularly during economic downturns.

Many of these soft engineering topics relate to the management of infrastructure and resources. These include traffic management, water resources planning and management, urban planning, and transportation planning. These “management functions” often involve decision-making that directly affects engineering, such as infrastructure prioritization and budgeting, and the individuals holding these positions often become the higher-paid supervisors of engineers. Some civil engineers still work in these areas, the trend is towards the hiring

of other professions or occupations to do this work.

Engineering underemployment and cyclical unemployment in different sectors of civil engineering seem to be subjects largely ignored by engineering associations. Employment issues of civil engineers need to be better studied and the demand (relative to supply) for civil engineers, both in the short term and long term, needs better quantification.

Although individual engineers may be able to isolate themselves from societal change, the profession as a whole cannot. The individual engineer may be able to afford being uninvolved with professional issues, but collectively such an attitude is detrimental to the future of civil engineering in Canada.

The authors of the four articles in this issue on civil engineering practice take differing approaches to the subject of *civil engineers in the workplace*, but each article provides insights and perspectives that deserve further consideration and discussion within the profession.

Ken Peck provides the benefit of 30 years of experience in his article. He highlights the changes in the workplace he experienced during his career.

In their article, Alan Perks and Reg Andres describe how social, economic and financial pressures affect the set of skills and abilities that civil engineers need in the workplace.

In his article, William Meyer reminds us that the holders of a professional licence are legally and morally responsible for the safety of their work.

Rishi Gupta and Brian Burrell contend the future success of Canadian civil engineering in the international market for engineering services requires market research, strategy development, and financial investment.

Practising engineers need to be involved with the professional associations. The CSCE provides opportunities to serve on committees, such as the Career Development Committee, for the betterment of the profession. ■

occupé certaines zones limites (parfois appelées les zones grises de la pratique du génie), réduisant ainsi le champ du génie civil. La perte de ces zones périphériques pourrait éventuellement provoquer une perte d'emplois pour les diplômés en génie, surtout lorsque la conjoncture économique est mauvaise.

Plusieurs de ces secteurs sont reliés à la gestion des infrastructures et des ressources, comme le contrôle de la circulation, la planification et la gestion de l'eau, l'aménagement urbain et la planification des transports. Ces « fonctions de gestion » comportent souvent des décisions qui affectent directement le génie, comme l'établissement des priorités et des budgets en matière d'infrastructure, et les détenteurs de ces fonctions deviennent souvent les superviseurs (mieux payés) des ingénieurs. Certains ingénieurs civils travaillent toujours dans ces domaines, bien que la tendance actuelle soit d'embaucher d'autres professions pour ces travaux.

Le sous-emploi des ingénieurs et le chômage cyclique dans divers secteurs du génie civil semblent des sujets oubliés par les associations d'ingénieurs. Le dossier des débouchés pour les ingénieurs civils mérite plus d'attention, et la demande (par rapport à l'offre) pour les ingénieurs civils doit être évaluée de façon plus précise.

Même si chaque ingénieur civil, au niveau personnel, est en mesure d'éviter les conséquences des mutations de la société, l'ensemble de la profession ne peut s'y soustraire. L'ingénieur civil, peut, à titre individuel, se permettre de ne pas s'occuper des enjeux professionnels, mais une telle attitude, pour l'ensemble de la profession, ne peut que nuire à l'avenir de la profession au Canada.

Les auteurs des quatre articles publiés dans ce numéro portant sur la pratique de la profession examinent divers aspects qui méritent plus d'attention de la part de la profession.

Ken Peck profite de ses 30 années d'expérience pour commenter les changements qu'il a vécus dans le milieu de travail.

Alan Perks et Reg Andres décrivent comment les pressions de nature sociale, économique et financière affectent les qualifications dont l'ingénieur civil a besoin en milieu de travail.

William Meyer nous rappelle que les détenteurs d'un permis de pratique professionnelle ont une responsabilité morale et juridique en ce qui a trait à la sécurité de leurs œuvres.

Rishi Gupta et Brian Burrell soutiennent que le succès futur du génie civil canadien sur le marché international des services de génie exige des recherches de marché, une stratégie de développement et un investissement financier.

Les praticiens doivent participer à la vie de leurs associations professionnelles. La SCGC leur donne l'occasion d'être membres de comités comme le comité de perfectionnement afin d'améliorer l'avenir de la profession. ■

Our first issue of CIVIL for 2010 focuses on *Professional Practice—Civil Engineers in the Workplace*. As the bells ring in 2010, we bid farewell to an unforgettable 2009 and welcome a promising New Year. The world has experienced the greatest economic downturn since the Depression. As we lead into the next decade, civil engineers have an obligation to help our country and further the goals of our Society. We look forward to renewed success as we forge ahead in our mission.

We will be in the midst of National Engineering and Geoscientist Month by the time you read this issue. It's an opportunity for all civil engineers to celebrate our accomplishments and promote our major achievements. Too often, the engineering profession has been deemed the "silent" profession. We do not do enough to promote ourselves. Proclaiming the true value of our contributions to society makes us uncomfortable. Our preference is to let our built works and infrastructure speak for us. Unfortunately, that approach does not always work and adequately inform others about the value that we provide every day.

Among our recent accomplishments, the highly successful CSA S16 structural steel design code course was offered in ten (10) cities across Canada last fall. Due to an overwhelming demand, the S16 course was offered again in Vancouver early this year.

At the 139th Annual ASCE Civil Engineering Conference held in Kansas City, Missouri last October, I met with my colleagues from around the world and discussed issues of relevance to all civil engineers. I also had the opportunity to attend the Order of the Engineer ceremony (the American equivalent of the Iron Ring ceremony in Canada)—see attached photo. As an Alternate Warden of Camp 20, it was indeed a humbling experience to be part of this event.

The CSCE Fall Board workshop on Vision 2020 led by Vic Perry, Senior VP; was a success. It provided the Society further direction and priorities going forward into the next decade. We have captured the feedback from all participants and will initiate further action.



Order of the Engineer Ceremony (Oct. 31, 2009). From left to right: Pat Natale, ASCE Executive Director; Gordon Jin, CSCE President; Blaine Leonard, ASCE President; and Wayne Klotz, ASCE Past-President.

We saw the departure of Mr. Peter Casquinha, Executive Director; from CSCE following our Fall Board. Peter joined the CSCE in early 2006 when the Society was facing severe financial restraints. As a result of Peter's fiscal management practices, our Society fared reasonably well, but we are still suffering from a decline in membership. We have much to be proud of as a learned Society and must maintain our fiscal management approach and plan for long-term sustainability of programs and services. We wish Peter every success in his new endeavours.

In early fall, an Executive Search Committee for our new Executive Director was formed under Vic Perry's leadership. Extensive work was undertaken in the subsequent months and in mid-January, the Executive Search Committee recommended Mr. Doug Salloum to the position of Executive Director effective January 18, 2010. I hope you will have the opportunity

to meet with Doug during his travels to your respective Section/Region in the coming months.

I shall also be visiting as many of our Sections/Regions where possible during my term as President. A Presidential Visit to meet with our colleagues in the CSCE Hong Kong Branch and our sister engineering Societies in China is scheduled for mid-April. I hope to strengthen our existing relationships and develop new ones while waving the CSCE flag overseas.

We will continue our efforts to bring new programs and services to our members, present ourselves on the international stage, broaden our perspectives and dedicate ourselves to the goal of making the Canadian Society for Civil Engineering the voice of civil engineering in this country. I look forward to hearing from you on what ideas you have to offer. Please drop me a note at president@csce.ca. ■



Le premier numéro de L'ICC en 2010 est consacré au thème suivant : *la pratique du génie : l'ingénieur civil en milieu de travail*. En ce début d'année, nous laissons derrière nous une année 2009 marquée par la pire crise économique depuis la grande dépression. À l'aube d'une nouvelle décennie, l'ingénieur civil hérite du devoir d'aider le pays et de souscrire aux objectifs de notre Société. Nous espérons accumuler les succès dans la poursuite de notre mission.

Lorsque vous lirez ces lignes, nous serons en plein mois national du génie et des sciences de la terre. C'est l'occasion, pour les ingénieurs civils, de célébrer nos réussites et de faire connaître nos œuvres. Trop souvent, notre profession pêche par excès de silence et ne fait rien pour faire connaître ses œuvres. On dirait que nous sommes gênés par l'idée de faire connaître nos réussites, en croyant que nos œuvres vont parler d'elles-mêmes. Malheureusement, cette discrétion ne nous sert pas et n'informe pas les gens de la valeur des services que nous rendons à chaque jour.

Parmi nos réussites, mentionnons le fait que notre cours sur le nouveau code CSA S16 sur les charpentes en acier a été offert dans 10 villes du pays au cours de l'automne. Suite à une forte demande, ce cours a de nouveau été offert à Vancouver en début d'année.

Lors du 139^e congrès de l'ASCE, à Kansas City, au Missouri, en octobre dernier, j'ai rencontré des collègues du monde entier et j'ai discuté de questions qui préoccupent tous les ingénieurs civils. J'ai également eu l'occasion d'assister à la cérémonie de l'Order of the Engineer (l'équivalent de la cérémonie de remise de la bague, au Canada). (Voir photo ci-jointe). Ce fut toute une expérience!


L'atelier d'automne du c.a. de la SCGC sur « Vision 2020 » a été animé par Vic Perry, premier vice-président, et fut un succès. Cet atelier a contribué à l'orientation et à la définition des priorités pour la prochaine décennie. Nous avons enregistré les commentaires de tous les participants et nous poserons des gestes concrets.

Notre directeur exécutif, Peter Casquinha, nous a quitté peu après la réunion d'automne du c.a. Peter s'était joint à nous au début de 2006, alors que la SCGC devait affronter une situation financière délicate. Grâce à sa gestion serrée, la SCGC se porte relativement bien, malgré une légère diminution du nombre de membres. Nous sommes fiers de notre statut de société savante et nous devons poursuivre cette gestion serrée, tout en élaborant des programmes et des services durables pour l'avenir. Nous souhaitons bonne chance à Peter Casquinha dans ses nouvelles fonctions.

Au début de l'automne, un comité pour le recrutement du directeur exécutif a été créé, sous la direction de Vic Perry. Ce comité a bien travaillé, de sorte qu'à la mi-janvier, il a été en mesure de recommander l'embauche de Douglas Salloum, à compter du 18 janvier 2010. J'espère que vous aurez l'occasion de le rencontrer dans votre région/section au cours des prochains mois.


Je rendrai également visite à plusieurs sections/régions au cours de mon mandat. Une visite est prévue à la section de Hong Kong et à nos homologues de Chine à la mi-avril. J'espère raffermir nos relations et en créer de nouvelles, tout en faisant connaître la SCGC à l'étranger.

Nous poursuivrons nos efforts en vue d'offrir de nouveaux programmes et services, d'être plus présent sur la scène internationale, d'élargir nos horizons et de faire de la SCGC la voix de la profession au pays. Je vous invite aussi à me faire parvenir vos idées et suggestions, à l'adresse president@csce.ca. ■



R.V. Anderson Associates Limited

engineering · environment · infrastructure



water supply

wastewater

municipal infrastructure

transportation

structures + tunnels

urban development

architecture + building services

environmental management

electrical, SCADA and telecommunications

toronto

niagara

ottawa

sudbury

london

moncton

fredericton

mumbai

tel 416 497 8600

www.rvanderson.com



Greetings fellow Civils! This is my first contribution to the CSCE magazine. It will also, without a doubt, be my least informed contribution. The deadline for this article was the end of my fifth day on the job.

I have a great deal to learn as I take on the role of Executive Director and I thank you in advance for the understanding and patience I know I can expect from you, the members and staff of the Society, as I get caught up on the structure, services and processes of the CSCE.

Peter Casquinha, my predecessor, focused his attentions on reducing operating costs and establishing an efficient administrative structure for the Society. With a shoestring budget, he and the National Office staff worked with willing and able member volunteers across the country to maintain and develop member services. I am in the fortunate position of being able to step in at a time when the CSCE is on a stable financial footing. The ground is prepared for the future of the Society as we turn our attention to a new set of priorities.

As I was interviewing for this position I was told the Executive Director, in addition to maintaining a close eye on the bottom line of the Society, now needs to work creatively with the Board of Directors to develop membership growth strategies and then to manage the implementation of these strategies. I realize the key to membership growth is to provide benefits and services to more and more civil engineers in Canada. Increasing member benefits will result in more civil engineers renewing their memberships or joining the Society for the first time. Increased membership means more revenue (which will result in more services for members) and a higher profile for our Society and our profession in Canada. More profile will allow the Society to represent the Civil Engineering profession as this country faces critical national issues and trends, including a need for sustainable infrastructure renewal, increasing urbanization and national energy supply and utilization policies.

I bring to this position experience in municipal infrastructure, business and international development in both the public and the private sectors. I will draw on lessons learned in all these arenas as I find ways to benefit CSCE members and develop the image of the profession. I am looking forward to justifying the confidence placed in me by the Board.

I also look forward to meeting and talking to many of you in the months leading up to our Annual Conference in Winnipeg. I welcome your suggestions and advice as well as your pent up frustrations and complaints. You can expect me to listen closely and respond to the full extent of my abilities. I work for you so don't hesitate to tell me what is on your mind. ■

“I realize the key to membership growth is to provide benefits and services to more and more civil engineers in Canada.”

Bonjour à mes confrères civils ! Ceci est ma première contribution à L'ICC. Ce sera aussi, sans doute, ma contribution la moins fouillée, dans la mesure où j'ai dû rédiger cet article après seulement cinq jours en fonction.

J'ai beaucoup à apprendre dans mes nouvelles fonctions de directeur exécutif et je vous sais gré à l'avance pour votre compréhension et votre patience, à l'heure où je m'initie aux structures, aux services et aux façons de faire de la maison.

Mon prédécesseur, Peter Casquinha, s'est employé à réduire les frais d'exploitation et à instaurer une structure administrative efficace. Avec un budget particulièrement modeste, lui et les permanents ont réussi, avec l'aide des bénévoles à travers le pays, à maintenir et à développer les services aux membres. J'ai la chance d'arriver à un moment où la SCGC jouit d'une base financière saine et se retrouve prête à assurer son avenir en adoptant de nouvelles priorités.

Lors de mon entrevue de recrutement, on m'a dit que le directeur exécutif, en plus de surveiller le budget de la SCGC, devait œuvrer de façon créative avec le c.a. pour élaborer des stratégies de croissance et assurer la mise en œuvre de ces stratégies. Je me rends compte que la clé, en matière de recrutement, est d'offrir des avantages et des services à un nombre croissant d'ingénieurs civils au Canada. L'accroissement des avantages offerts aux membres

« L'accroissement du nombre de membres signifiera une hausse des revenus (et des services aux membres) et une présence plus marquée de la SCGC et de la profession au Canada. »

fera en sorte que plus d'ingénieurs civils renouvelleront leur appartenance ou se joindront à la SCGC. L'accroissement du nombre de membres signifiera une hausse des revenus (et des services aux membres) et une présence plus marquée de la SCGC et de la profession au Canada. Ce rayonnement permettra à la SCGC de mieux représenter la profession au pays, face à des dossiers critiques et à un monde en pleine évolution, et notamment à des dossiers comme le besoin de renouvellement des infrastructures durables, l'urbanisation croissante et les questions d'offre et d'utilisation de l'énergie.

J'apporte à ces fonctions mon expérience en matière d'infrastructures municipales, d'affaires et de développement international, dans les secteurs public et privé. Je profiterai des enseignements que je retiens de ces expériences pour trouver des façons d'offrir des avantages aux membres et de faire rayonner l'image de la profession. J'entends bien honorer ainsi la confiance que m'a accordée le c.a.

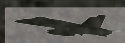
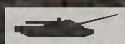
J'ai hâte de rencontrer et de travailler avec vous au cours des prochains mois, d'ici au congrès annuel de Winnipeg. Il me fera plaisir d'écouter vos suggestions et vos conseils, aussi bien que vos plaintes et vos frustrations. J'essayerai d'y répondre le mieux possible. Je suis à votre service. ■



WANTED: CIVIL ENGINEERS

"I've always enjoyed helping others. Now I have the opportunity to do just that. Whether helping out with flood relief, or building a school where there was none, I know I'm making a difference."

2nd Lieutenant **JAMES KIM**



RECHERCHONS: INGÉNIEURS CIVILS

« J'ai toujours voulu venir en aide aux autres. Et c'est exactement l'occasion qui m'est donnée ici. Que ce soit en participant aux efforts de reconstruction après une inondation ou en érigeant une école où il n'y en avait pas avant, j'ai la chance d'exercer un métier que j'aime. »

Sous-lieutenant **JAMES KIM**

FORCES.CA
FIGHT WITH THE CANADIAN FORCES



1-800-856-8488
COMBATTEZ AVEC LES FORCES CANADIENNES

Canada 



VISION2020

I have been a member of the CSCE continuously since I was a student in the 1970's. I joined the Society because I believed I had an obligation to give back to the organization that helped develop civil engineering into a profession that is highly recognized as honorable, dependable and provides planning, design, construction, and maintenance of infrastructure—infrastructure that allows Canadians the ability to safely and efficiently move people and goods: the fundamental networks that support our quality of life and our standard of living.

Of course my philanthropic beliefs were also a little selfish: what is in it for me? As a young graduate I realized that I had just received a good technical foundation in civil engineering; however, I didn't feel I was fully competent in the "soft-skills"—negotiating, effectively dealing with people, leadership or public speaking. What better place to learn and refine these soft skills than by being on a committee with other civil engineers, where I could practice without my employer being judgmental. At the same time I could build my networks, which would provide immediate and future opportunities for developing business in my current job or future employment prospects. Now that I am nearing the other end of the employment life cycle I am constantly observing bright young engineers, serving on CSCE Committees, as future potential employees.

So in 2009, when I was asked by the CSCE to let my name stand for Senior Vice-President, I was honored and humbled; however I also realized that this position comes with a large responsibility—to serve Canadian civil engineers.

Over the past several years that I have been involved with the CSCE on the Board and on various committees, I have noticed that our membership has become stagnant and has even seen a slight downward trend—a trend that is alarming! Since the CSCE Annual Meeting in St. John's, NL in May 2009, I have traveled coast to coast meeting with both CSCE members and non-members, volunteers and non-volunteers, civil engineers and non-civil engineers, to better understand what CSCE means or should mean to people. Why do some civil engineers choose to join our Society while others choose not to?

When asked "What image of the CSCE brand do you have?", the response is not an image of a vibrant organization where young engineers feel they need to be seen or belong. This is well supported when you review our membership statistics. Associate Members (< 4 years since graduation), the future of CSCE, total less than 100 (< 2%); and the 10-year trend is downward. However, over the same period the number of civil engineering graduates was

continued on page 25

VISION2020

"The image of the CSCE brand has to change if CSCE expects to exist beyond 2020!"

« L'image de marque de la SCGC doit changer si nous tenons à exister encore au-delà de 2020! »

"Civil engineers and CSCE need to raise their profile."

« Les ingénieurs civils et la SCGC doivent rayonner davantage. »

Je suis membre de la SCGC depuis mes années d'université, vers 1970. Je suis devenu membre de la SCGC parce que j'estimais devoir faire quelque chose pour l'organisme qui avait contribué à faire du génie civil une profession reconnue contribuant à planification, à la conception, à la construction et à l'entretien des infrastructures qui permettent aux Canadiens de transporter de façon sécuritaire les personnes et les marchandises. Ces infrastructures constituent les réseaux qui garantissent notre niveau de vie et notre qualité de vie.

Mes préoccupations altruistes n'allaient pas sans un certain égoïsme, et j'espérais bien y trouver quelque avantage! Jeune diplômé, j'étais conscient d'avoir reçu une bonne formation technique de base en génie civil, mais je sentais que je manquais de compétence dans les aspects non-techniques comme la négociation, les rencontres avec les gens, le leadership ou l'art de parler en public. Il n'y a pas de meilleure place pour apprendre et améliorer ces aspects que d'être membre d'un comité, avec d'autres ingénieurs civils, sans risque d'encourir les jugements de mon employeur. En même temps, je créais mes réseaux, ce qui m'assurait des possibilités, dans l'immédiat comme pour l'avenir, de faire de meilleures affaires. Étant maintenant plutôt en fin de carrière, j'observe souvent de jeunes et brillants ingénieurs qui se dévouent au sein de nos comités et qui pourraient devenir de futurs employés...

Lorsqu'en 2009, la SCGC m'a invité à poser ma candidature au poste de premier vice-président, j'ai éprouvé des sentiments à la fois de fierté et d'humilité. Ce poste me conférait une importante responsabilité, celle de servir les ingénieurs civils canadiens.

En travaillant, au cours des dernières années, dans les comités et au c.a., j'ai remarqué que le nombre de nos membres était stagnant, accusant même une légère baisse, ce qui constitue un signal d'alarme. Depuis l'assemblée générale annuelle tenue à St. John's (TNL), en mai 2009, j'ai traversé tout le pays et rencontré des membres et des non-membres, des bénévoles et des non-bénévoles, des ingénieurs civils et des non-ingénieurs, afin de mieux saisir ce que la SCGC représente ou devrait représenter pour les gens. Pourquoi certains ingénieurs civils choisissent-ils de devenir membres de la SCGC alors que d'autres ne le font pas?

À la question « quelle image de marque avez-vous de la SCGC? », on ne m'a pas dit que la SCGC était un organisme débordant de vie, auquel les jeunes ingénieurs éprouvaient le besoin d'appartenir. Les statistiques sur nos membres reflètent cette constatation. Les membres associés (< 4 ans depuis l'obtention du diplôme) sont l'avenir de la société et il n'y en a pas 100 (< 2%). Et les projections sur 10 ans indiquent une baisse. Cependant, au cours de cette même période,

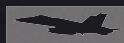
suite à la page 25



WANTED: ENGINEERS

"My job is constantly evolving, but I was given the training to deal with whatever comes my way. Updating our technology, repairing heavy machinery, solving problems. It's all in a day's work."

Lieutenant (Navy) **AMY O'RIELLY**



RECHERCHONS: INGÉNIEURS

« Mon métier est en constante évolution mais heureusement, j'ai été entraînée pour faire face à l'inattendu. En une seule journée, je peux effectuer la mise à niveau de nos technologies, résoudre une variété de problèmes ou même réparer de la machinerie lourde. »

Lieutenant de vaisseau **AMY O'RIELLY**



FORCES.CA
FIGHT WITH THE CANADIAN FORCES

1-800-856-8488
COMBATEZ AVEC LES FORCES CANADIENNES

Canada 



Development A Personal Perspective

Ken Peck P.Eng.

Senior Geotechnical Engineer, AMEC Earth & Environmental,
Fredericton, NB

I volunteered to write this article on career development with the intention of offering some direction to today's younger engineering talent. To that end, I offer the following career story for your consideration even though it might interest you to know that I have three grown sons and not one of them is intending to be an engineer!

Let me begin by saying that I am one of those dam engineers. My interest in dams and soils started when I was a kid constructing small crib works out of sticks and branches on soil slopes at my family's summer cottage. After filling the back side with earth and rocks, a few fire crackers made the whole thing go away with a "Bang!" and a minor landslide. That fun of a childhood summer was an ingredient in for my life-long interest in how things work.

Perhaps more fundamental to my early destiny for an engineering career was my Dad's desire to move every boulder on our cottage property into the lake. This was done using logs for rollers and small trees as pry-bars for leverage. Grade school science didn't have a lot more to teach me about mechanical advantage after several summer vacations doing that kind of work. There was also the unspoken lesson from my father that chores needed to get done. They should get done safely and with satisfaction. He had started his career as a town labourer digging for ditches and underground services with hand tools during the Depression. He understood manpower and

teamwork in a very real sense and knew how useful it was for my brothers and me to develop practical skills.

Neither of my parents discussed career development with us. Unlike today, there weren't that many careers to consider and fewer options about being able to select one. Their advice related more to the need to get an education, then a good paying job with a pension. That's what taking the best career path was about to them, so going to university was very much expected of me.

My first degree was in science. Although I majored in geology, I also took some chemistry and I threw in two classes of engineering math for good measure. After graduation it took one seasonal job for me to realize that, as much as I liked being outdoors, geology had its limitations as a career. Perhaps I lacked sufficient imagination to be able to take the geological training to something beyond field work. Maybe it was because I did so much of my geology work alone without senior guidance.

I do not consider my studies in geology a wasted effort—quite the contrary. As a geotechnical engineer, my geology background has helped me greatly to understand site conditions and the geological field work helped refine my observation powers. It has allowed me to venture into projects that involve engineering geology, environmental engineering, geomorphology, rock mechanics, as well as the more traditional soils and foundation engineering. It was

a great introduction into projects associated with the mining industry dealing with tailings management and the development of mine infrastructure. Experience in the soils lab, in a variety of field situations and several graduate courses in soils and geology allowed me to understand the bigger picture of geotechnology. I compare this to junior soils engineers nowadays who must learn the trade in the absence of access to a soils lab, or sufficient field training.

While I was a geology student, learning seemed to be an individual pursuit. Each one of us was expected to study the material and then explain relevant parts of it during an exam. In contrast, engineering students often work as a team to complete assignments. It took me a long time to understand the value in this “engineering team” approach and I only grasped it solidly once it became so evident to me, as a professional engineer, how engineers working on a particular project are dependent on one another. I now know that having the ability to share a work load and break down tasks into components is a true art form. Good project managers gain this artistry at the university level, if not before.

After I graduated from engineering, my first job was as a junior member in a local office of a multi-national company. I soon learned that designation as a “local office” meant a variety of projects with limited staff to do the work. The “multi-national” part meant that you could expect to connect with individuals at the senior level who might be elsewhere in the country but who had lots of experience to share with you. Once a rapport was established, the senior cadre was an ongoing source for good advice and technical guidance.

My first reports were typed by a secretary using carbons to make multiple copies. I remember using colored pencils to highlight different soil strata in the final borehole logs and stratigraphic sections before the reports were sent out. Reports were often delivered by mail. It may have taken a month or more for a client to review a draft so that the final version could be produced. Compare that to today when this cycle is often expected to be completed within a single working day thanks to email!

Development of my engineering career followed a journey that was probably not unlike others seeking a variety of project experiences and increased levels of responsi-

“Instead, for career advancement, you need to move yourself into situations where you can excel with the capabilities and training that are part and parcel of your own professional repertoire.”

bility. I had positions that sent me to remote northern outposts for weeks and months while my wife was home with a young family. With time, I moved into positions where I supervised others doing that type of regular travel and then I moved onward to senior management. It surprises me to this day how little training senior management offers to middle managers in how to run business operations and develop team work, company loyalty and leadership. It seems the required management skills have to be acquired from experience, hard work and self-initiative.

The next phase of my career involved nearly a decade running my own business out of my home as an engineering consultant. This included several stints as a contract employee. The basics of the work environment are the same: keeping on budget, spending less than the earnings, doing good work for reliable clients, providing cost effective, efficient designs and being in the right place at the right time with the necessary talent. A lot of business can be developed based on who you know. Networks, connections, recommendations and cordial relationships are indispensable. Not all of the networking happens through the business world either. I made connections that ended up providing me with contracts through being a scout leader, serving on local committees and attending events of local professional associations. Overall, as a self-employed engineer, I learned that effort needs to be expended before you can expect rewards.

Thinking back on these past thirty years of my life as a professional engineer has made me realize that even during my first engineering projects I was aware that the way to succeed is not just showing up and trying to do good work every day. Instead, for career advancement, you need to move yourself into situations where you can excel with the capabilities and training that are part and parcel of your own professional repertoire. You can make a reasonable living and feel satisfied in a supporting role, but professional fulfillment comes more often from contributing fully in a situation where your experiences, knowledge and

background are sought after. This is how you garner respect from your fellow employees and associates.

Engineers are facilitators. We take an idea or a problem and move it to a workable outcome or solution. We understand the mechanics of systems and have training in how to build and construct things. Individually, we might focus on different aspects of a job and we are likely better at some things than others. Some of us write reports well. Some of us are good at client relations and business development. Others of us are experts at estimating project costs. It takes many different talents to complete an engineering project.

Every team has a leader. Some engineers are naturals at this while others are not. Influencing and directing others is a subtle talent. A successful senior manager not only recognizes and develops leadership skills of his or her junior staff but provides opportunities and funding to support individual growth and fostering of leadership skills. A good leader sees this as an investment in the future.

Change inevitably happens and sometimes it is hard to understand how we can move forward in a career given the changing conditions. Changes in technology, environmental awareness, and socio-economic demands on the profession are matters that force civil engineers to seek the continuing education and project experience that would keep them near the forefront of engineering practice. Not all change is seen for the better, but nevertheless, we sometimes are faced with the need to adjust to new (and sometimes what we feel as backward) approaches. As professional engineers, we have to develop engineering knowledge that is compatible with previous learning and marketable to employers and clients. This is not easy in an era of globalization where technological growth and communication of ideas is increasing rapidly.

Hopefully my story may be of some benefit in helping you write yours. There is an old saying: “Good judgment comes from experience. Much experience comes from bad judgment.” ■



Alan R. Perks P.Eng., FCSCE

Past President CSCE, Senior Consultant,
R.V. Anderson Associates Limited, Ottawa, ON

Reg Andres P.Eng., FCSCE

Vice President, R.V. Anderson Associates Limited, Toronto, ON

The New Civil Engineer

How should civil engineers be prepared for the workplace today? What is the right balance between “number crunching” and “management skills”?

Preparing new graduates for the world of infrastructure involves such questions as:

- What will new graduates face?
- What do they need to know? and
- What qualifications will make them “saleable”?

After graduation, engineers need lifelong learning to gain the skills and experience required to be successful in the workplace today.

In an increasingly populated and technology dependant world, civil engineering strategies and solutions are subject to more social, economic and financial pressures than ever before. Technology is more complex, decision-making is multi-dimensional, and the public does not readily accept imposed solutions. The most cost-effective, environmentally benign, easiest to operate infrastructure solutions that achieve the desired level of service may be the most sustainable in the end.

The civil engineer now has to focus on functionality as well as design standards/criteria in order to present the most appropriate solutions for the stakeholders and the community involved. This necessarily involves integrating civil technologies in ways the public can understand, and

providing innovative management and operational strategies for improved, sustainable solutions. Instead of jumping to the latest, highest technology, lower cost-demand management solutions may in fact be preferred.

The question civil engineers must answer has changed; it is not only about “how”, it is about “why”. In the modern public environment, the “why” question (justification, effectiveness, relative cost, public acceptability and downstream impacts) has to be clearly explained and communicated to the public long before the “how” question can be addressed (design, construction and operation). The implications of that new question have been rippling through civil engineering over the last two decades. Foremost among those implications are the skills and abilities civil engineers need in the workplace.

For example, public consultation is paramount in virtually every environmental assessment protocol. The function, cost and impacts of public infrastructure projects have to be communicated in very clear, understandable terms, and the public’s views and opinions must be factored into the planning and design process in a very transparent manner. The French use the term “vulgarization” to describe the translation of detailed technical information into clear, concise writing the public can

comprehend. This is an important skill, as demonstrated by the public discourse over civil engineering projects in any city newspaper these days. For example, a combined sewer overflow into the Ottawa River was described as “350 Olympic sized swimming pools of sewage”. At the minimum flow in the Ottawa river, some 226,000 Olympic sized swimming pools would flow past the same overflow point during that spill, a perspective that was never mentioned in the newspapers.

Increasingly stringent environmental regulations and standards, such as water quality and effluent discharge criteria, quite often determine the size, cost and complexity of a civil engineering project. The civil engineer needs to question and assess imposed standards and explain their impact to the public, and sometimes devise innovative options that may be more cost-effective. For example, to reduce phosphorus discharge into a river, investing in on-farm agricultural improvements may be much less costly than building a tertiary treatment plant for an adjacent town or village. This is called water-quality trading.

The instant electronic access to technical information at every stage of project delivery has also changed the public’s perceptions of civil infrastructure. The civil engineer is no longer the main interpreter of technical information on the function and design of public infrastructure, certainly at the planning stages. He or she is usually one of a team of disciplines involved in project development, and must accept input and advice from many other stakeholders. That role is very different from the role civil engineers have been trained for in past.

The design criteria and assumptions underlying every infrastructure project are no longer being accepted without question. Demand projections, peaking factors, historical trends, material performance specifications (i.e. hydraulic friction factors) and modelling criteria are all questioned vigorously in the public environment. The civil engineer needs to examine and assess these assumptions at the earliest stages of a project. In a recent value engineering exercise, consideration of strategic, short term storage of peak wastewater flows resulted in the reduction of the cost of a conventional sewage pipeline from \$60 million to \$40 million.

Civil engineers must now also be concerned with the very long term, life cycle impacts of projects and engineering activities—indeed with sustainable development. This involves a much wider knowledge and understanding of non-technical skills like economics, public affairs, government and regulations in order to contribute fully to project development. They need to consider what the civil project is enabling to occur over the long term. For example, the City of New Orleans is situated below sea level. The levees and dykes to protect the city from flooding were all designed according to accepted standards of the day, but engineers failed to consider the effects of piecemeal development and environmental changes that aggravated the flood condition over time. The present-day rehabilitation costs now involved would likely have gone a long way in the past towards a fail-safe solution.

Many young people likely enter civil engineering because they did well in math, and perhaps were not interested or exposed to the humanities, arts and literature. They may have been motivated more towards the applied aspects of civil engineering seen in the buildings, roads bridges, dams and waterways civil engineers designed and built over the decades. The technical skill sets honed through five years of post secondary education, and perhaps longer, may not be enough to enable a professional to deal with the pressures and public issues discussed above.

The distinction between the skill sets needed for a technical career versus a project management career is now sharper than ever. After university, younger civil engineers need to become more proficient in areas such as public communications, strategic thinking, and economics by means of continuing education programs and “on-the-job” training.

What are the attributes of a new graduate that make them saleable in the workplace today?

- Good interpersonal communication skills—oral & written and listening;
- The practical application of new technologies using traditional engineering analysis;
- Effective problem solving—with the freedom to think out of the box;
- Strategic thinking so that all options can be identified and explored;

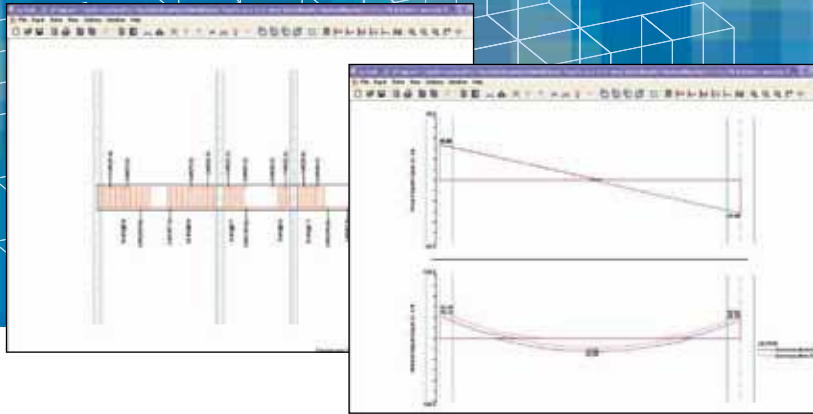
- Multi disciplinary teamwork & consensus building;
- Facilitation and group dynamics;
- Public consultation & communications;
- Ability to factor in social, economic and environmental factors in design; and
- Understanding the process of “learning” and application of learned knowledge to new situations.

Civil engineering has indeed contributed greatly to human development and quality of life through the provision of public infrastructure for water supply, pollution control, transportation, industrial/commercial developments. Such infrastructure makes life more comfortable, convenient, rewarding, healthy and longer for all. However, as urban settlements have increased far beyond the natural carrying capacity of the earth, humanity has become technology dependant, and the impacts upon the global environment are becoming increasingly obvious. The CSCE was one of the first learned societies to adopt guidelines for sustainable development to inform its members about these issues and trends. The CSCE’s 2005 Sustainable Development Guidelines highlighted the emerging issues.

“The sheer size and scale of that same infrastructure is contributing to environmental degradation. There are increasing signs that the human population is seriously impacting the global environment, including the atmosphere. The unintended consequences of modern infrastructure, such as resource consumption, waste discharges and gaseous emissions, now threaten the global environment and our life-support systems.

Civil engineers are thus faced with an increasingly complex and interrelated world; a world that is growing rapidly in population, and becoming more urbanized and economically developed. Infrastructure development can no longer be done in a microcosm on a project level—a more holistic consideration of the complex interactions of human society, and the environment upon which we depend, is needed.”

The “new civil engineer” has to develop the broad skills and experience to function well in the interrelated world we now live in, just like the early civil engineers who developed the infrastructure centuries ago that enabled us to enjoy the quality of life we now have. ■



Formerly **pcaSlab & ADOSS**

spSlab is highly efficient in helping engineers analyze, design and investigate reinforced concrete floor systems.

Like its predecessor ADOSS and pcaSlab, it analyzes both two-way slab systems as well as one-way slab and beam systems.

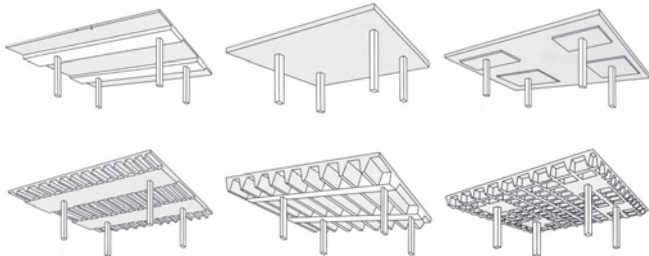
spSlab continues to support ACI 318 (American) and CSA.A 23.3 (Canadian) codes in both English and metric units, including the latest editions 318-08 and 23.3-04.

Analysis and design tools in spSlab are provided for the following systems:

- > Simple and continuous beams
- > One-way slabs
- > Two-way flat plates
- > Two-way flat slabs (with drop panels)
- > Two-way flat slab with slab bands
- > One-way pan joist systems (standard modules)
- > One-way skip joist systems (wide modules)
- > Two-way joist systems (waffle slabs)
- > Two-way slab band systems

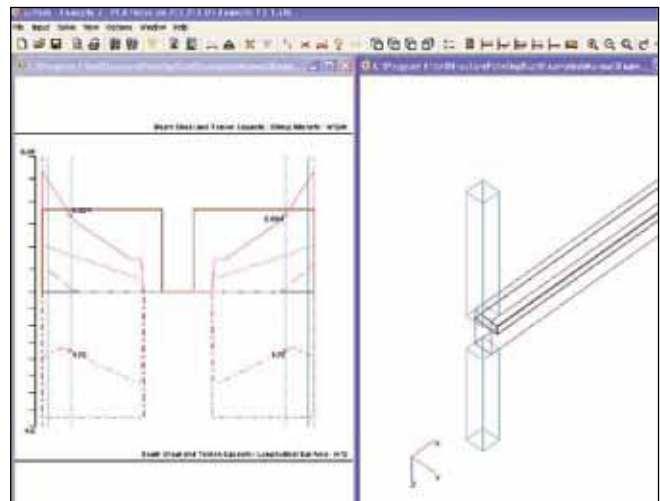
This program incorporates torsion into shear design and investigation of beam systems. Shear capacity including torsion is represented in terms of required and provided area of transverse and longitudinal reinforcement.

Additional savings in both material and labor can be achieved using the moment redistribution feature. It allows up to 20% reduction of negative moments over supports reducing reinforcement congestions in these regions.



www.StructurePoint.org
847.966.4357

Many new features and options allow users maximum flexibility in achieving optimal and economical designs. spSlab can perform strength investigation for evaluation and/or modifications of existing structures saving users time crosschecking designs with design code provisions.



spBeam includes only beam and one-way slab system capabilities and is available as a limited version of spSlab.

Flexible licensing options include both hardware and software protection for standalone and network licensing. Commuter and corporate licensing along with maintenance subscription provides a wide spectrum of enhanced customer service, engineering services and technical support to help you keep your projects profitable and on schedule.

Designed with the engineer in mind, spSlab, combines beam and slab design tools to help you work more quickly, simply and accurately.

Work quickly.
Work simply.
Work accurately.

StructurePoint's Productivity Suite of powerful software tools for reinforced concrete analysis & design

sp wall

Finite element analysis & design of reinforced, precast ICF & tilt-up concrete walls

sp beam

Analysis, design & investigation of reinforced concrete beams & one-way slab systems

sp column

Design & investigation of rectangular, round & irregularly shaped concrete column sections

sp slab

Analysis, design & investigation of reinforced concrete beams & slab systems

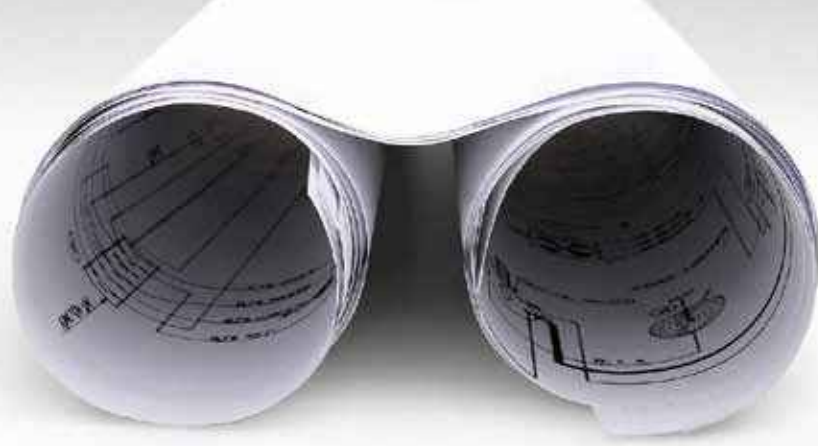
sp mats

Finite element analysis & design of reinforced concrete foundations, combined footings or slabs on grade

StructurePoint's suite of productivity tools are so easy to learn and simple to use that you'll be able to start saving time and money almost immediately. And when you use StructurePoint software, you're also taking advantage of the Portland Cement Association's more than 90 years of experience, expertise, and technical support in concrete design and construction.

Visit StructurePoint.org to download your trial copy of our software products.

For more information on licensing and pricing options please call **847.966.4357** or e-mail info@StructurePoint.org.



A PROFESSIONAL ENGINEER CAN SEE WHAT OTHERS CAN'T.

Because their licence means they have the education and experience to give them a more comprehensive perspective. Every professional engineer is committed to public safety and health, and to the highest standards set by the profession.



VISIT HIREAPENG.CA FOR MORE REASONS WHY HIRING A PROFESSIONAL ENGINEER PROVIDES AN EXCELLENT RETURN ON YOUR INVESTMENT.

William Meyer

Manager—Communications, Engineers Canada
Ottawa, Ontario

Responsible and Registered: The Value of the Engineering Licence in a Changing World

A woman sues a fast food chain because her coffee is too hot... and wins.

A politician mis-states the facts... a junior staffer is fired.

A company stock showing tumbles... a CEO blames the media.

At a time when the idea of personal responsibility seems to be fading, engineers stand out for the opposite reason. Millions of Canadians go about their daily routines safely because an engineer has taken personal and professional responsibility for engineering work such as the design of a

bridge, medical equipment or a sewage treatment process. It is an aspect of the profession that is not well understood by those outside it; the professional licence, as symbolized by the P.Eng. (or ing. in Quebec and New Brunswick), means that the holders are legally and morally responsible for the safety of their work.

Yet most of us can point to someone working in an engineering environment who doesn't have their licence and many would say that those most affected—the public—don't appreciate the safety promise inherent in the licence. So has the time come to consider putting it aside? Does the practice of engineering still need the P.Eng.?

“There is a wide-spread misconception—even among some in the engineering community—that graduating with a bachelor of engineering degree from a university program is sufficient to call yourself an engineer.”

There is a wide-spread misconception—even among some in the engineering community—that graduating with a bachelor of engineering degree from a university program is sufficient to call yourself an engineer. In fact, a solid education is only one aspect. After that, graduates must gain three to four years of on-the-job experience, register with a provincial or territorial licensing body and successfully complete a professional practice examination. The result is the licence that allows an engineer to practise engineering in the province or territory where it was granted.

Obtaining an engineering licence is a rigorous process and some may question whether it's worth the trouble. Chantal Guay, M.Env., ing., P.Eng., is not one of them. “Having the engineering licence says so much about the person who holds it,” says Ms. Guay, chief executive officer of Engineers Canada, the national organization of the 12 provincial and territorial associations that regulate the practice of engineering in Canada and license the country's more than 160,000 professional engineers. “It says that they are a professional bringing more than their education to bear on the problems they are hired to solve—they bring along with it experience, solid ethics and a commitment to public safety.”

That combination of education, skills and experience is crucial for the increasingly complex problems that engineers are being called upon to solve. Whether it's adapting infrastructure to withstand the impacts of climate change or helping developing countries secure their food systems, engineers are addressing broad societal issues. It's a role that John Gamble CET, P.Eng. feels the profession is more than ready to embrace. “Engineering was a renaissance profession in the early 1900s,” says Mr. Gamble, President of the Association of Consulting Engineering Companies-Canada. “Engineers developed public transportation systems, were involved in environmental protection, sanitation and a number of other areas. Then we became

very focused on the science and technology part of the equation. Over the past ten years I think we are stepping back into the renaissance role and valuing soft skills as well as the science and tech.”

Employers certainly value having well-rounded engineers on their teams. The Canadian Engineering Accreditation Board, which accredits undergraduate engineering programs to ensure that their graduates have the necessary engineering skills, places a balanced emphasis on hard topics (i.e. engineering, science, technology) with so-called soft topics such as communications and leadership skills.

Hiring a person with their engineering licence gives an employer confidence that they are hiring someone who's responsible to their licensing body and is required to maintain high standards of engineering practice. Many employers look for this ‘seal of approval’, especially when they are considering a candidate who received their engineering education outside of Canada. Such was the case for Bhewandeep Bindra, P.Eng., a civil engineer from India, who received his licence from Professional Engineers Ontario in 2006. He had received his engineering degree in India and felt that Canada offered more opportunities to ‘grow’ his career. “When I started applying for jobs, I didn't get any response the first three months,” he recalls, “so I talked to people and found out that employers are looking for Canadian experience and the licence.”

On average, one-third of all those who apply for an engineering licence in Canada received their engineering education abroad. In some provinces, the percentage of internationally-educated applicants is even higher. In British Columbia and Ontario, for instance, roughly half of those applying for licensure received their education outside Canada. In 2007/08, approximately 10,000 international engineering graduates across the country applied for engineering licences, and many licensing bodies expect this number to rise.¹

One result of this rise in internationally-educated applicants was a recognition that the licensing system can be difficult to understand, so a few years ago the profession undertook an initiative to integrate international engineering graduates without compromising public safety or lowering professional standards. The result has been a series of wide-ranging changes to the licensing system that underline its responsiveness and relevance.

Those changes are making a difference:

- Professional Engineers Ontario issued more licences to international engineering graduates in 2006 than to graduates of accredited Canadian engineering programs.²
- Ninety-two percent of international engineering graduates who applied to the Association of Professional Engineers, Geologists and Geophysicists of Alberta between 1997 and 2006 became licensed.³
- The Association of Professional Engineers and Geoscientists of Saskatchewan has cut in half the number of applicants who need to write academic qualifications exams.
- Engineers Nova Scotia received an award from MISA, the immigrant serving agency in Nova Scotia, for its leadership and work with international engineering graduates.

“The changes that have been put in place by the licensing bodies have had a direct and positive impact on the system and on those who want to be licensed and work as professional engineers in Canada,” says Ms. Guay, the CEO of Engineers Canada.

Helping international engineering graduates reach their full potential is now part of the everyday business done by the engineering licensing bodies. For example, the licensing body in British Columbia created an on-line self-assessment tool for international engineering graduates, established registration information sessions and re-designed its website to make it easier to navigate. Professional Engineers Ontario permits applicants to work through the whole licensing process while still overseas and adjusted its process for assessing academic credentials. Approximately two-thirds of the international engineering graduates are exempted from having to

write technical exams thanks largely to a significant increase in Confirmatory Exam Program interviews conducted by PEO's Experience Requirements Committee. The committee treats the interview as a prior learning assessment tool and this has benefited many international engineering graduates. "The licensing process is very good," says Bindra. He's now licensed in both Ontario and Alberta, and is working in Alberta as an estimator with Fluor Canada.

The educational value represented in the licence doesn't end as soon as one receives it, however. Part of a licenced engineer's commitment is to continuous professional development. Specific requirements vary from province to province but are based on the fact that engineers have a responsibility to practice only in areas where they are competent. Given that technology is continuously advancing, professional development is ethically mandatory for all engineers.

Advanced technology, climate change, globalized markets—what does the future hold for engineering practice? For many Canadian engineers it will mean working

abroad. Canada is the world's fourth largest exporter of engineering services, and its engineering expertise is internationally recognized. Engineers Canada promotes rigorous international engineering standards and qualifications, and facilitates international mobility for Canadian engineers. The P.Eng. designation is a recognized credential internationally and makes a difference in securing engineering work in other countries given its link to mobility agreements.

A current campaign is designed to raise engineering's profile. "We want parents to encourage their children to consider engineering as a career," says Ms. Guay, "and employers to see the tremendous value that professional engineers bring to the workplace." The campaign features a series of print and online advertisements, encouraging parents to think of engineering as they do other professions such as law and medicine—viable and exciting career options. Parents are also encouraged to log on to a website where there will be a range of information about what it means to be an engineer, the education required, the

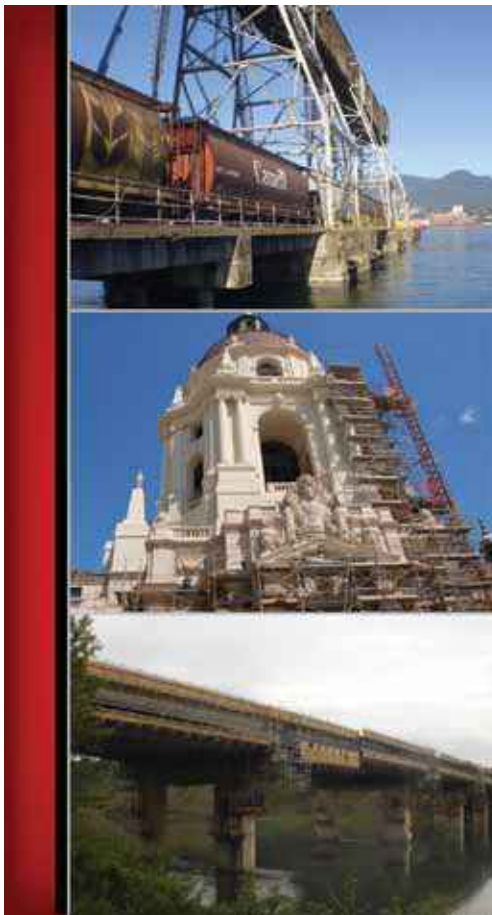
schools that offer engineering degree programs, and the types of work that engineers do, including pay ranges. Parents aren't the only target, however, as it is vital to inform Canadian employers of the full value of the licensed professional engineer.

A commitment to public safety and environmental responsibility is at the core of engineering—emphasized in engineering education, practice, licensing and ongoing professional development. It is also integral to the manner in which engineering is regulated. As a self-regulated profession, engineers themselves determine the profession's values, and standards for education and practice. In turn, the public trusts that the profession will undertake competent and safe work. The licence is at the core of this trust relationship and will be at the heart of the engineering profession for years to come. ■

¹ Engineers Canada statistics.

² *Ibid.*

³ Source: APEGGA, Annual Report, 2006–2007.



Over 20 years ago we created an industry.

Today we set the standard as the premier installer of the Fyfe Company, Tyfo® Fibrwrap® Carbon Fiber Reinforced Polymer (FRP) system.

Fyfe pioneered the invention of the Tyfo® structural strengthening products, and to date has over 6,000 installations and a worldwide organization dedicated to excellent service.

Fibrwrap Construction offers innovative, turn-key solutions for structural strengthening, pipeline repair & renewal, and concrete restoration projects.

Call today for a no-obligation consultation.

FIBRWRAP CONSTRUCTION, INC.

The Future of Construction Technology

CANADA

(604) 541-5429

www.fibrwrapconstruction.com

Vancouver | Toronto | Halifax

THE CAREER DEVELOPMENT COMMITTEE

Huixi Xie, Deputy Chair, Career Development Committee

The Career Development Committee is charged with:

- promoting the profession by the preparation and distribution of public information on the role of civil engineers in fulfilling the needs of society,
- reviewing and summarizing information concerning ethical civil engineering practice, engineering employment, and opportunities for professional development, and
- encouraging the professional development and career development of civil engineers.

In carrying out its responsibilities, the Career Development Committee may:

- liaise with engineering bodies, unions, and government concerning issues affecting professional practice,
- develop guidelines with respect to continuing education standards and distance learning, and
- review distance learning programs for civil engineers and CSCE professional development courses.

The Career Development Committee can include up to 12 CSCE members-in-good-standing. The membership term is two years, renewable at the discretion of the Committee Chair. The Committee Executive Chair, Deputy Chair, Secretary and Past Chair is responsible for overseeing Committee operations and providing direction, but decisions usually are made by consensus following the input of Committee members. The Chair of the Career Development Committee is a member of the Programs Coordinating Committee (PCC) and reports to the Vice-President of Technical Committees.

In 2010, new projects are to be identified to benefit CSCE members. CSCE members interested in serving on the Career Development Committee should contact the Deputy Chair, Mr. Huixi Xie, at Huixi.xie@rogers.com. ■

LE COMITÉ DE PERFECTIONNEMENT

Huixi Xie, président du comité de perfectionnement

Le comité de perfectionnement a les responsabilités suivantes :

- Faire la promotion de la profession en élaborant et distribuant de l'information publique sur le rôle de l'ingénieur civil dans la satisfaction des besoins de la société;
- Étudier et résumer les informations relatives à l'aspect éthique de la pratique de la profession et aux occasions en matière de perfectionnement;
- Encourager le perfectionnement des ingénieurs civils.

Dans l'exécution de ses tâches, le comité de perfectionnement peut :

- Faire la liaison avec les organismes, syndicats et gouvernements pour les questions relatives au perfectionnement;
- Élaborer des principes directeurs en matière de normes pour la formation permanente et la formation à distance;
- Étudier les programmes de formation à distance pour les ingénieurs civils ainsi que les cours de perfectionnement de la SCGC.

Le comité de perfectionnement peut compter jusqu'à 12 membres en règle de la SCGC. Le mandat des membres est d'une durée de deux (2) ans, renouvelable à la discrétion du président du comité. Le président exécutif du comité, le vice-président, le secrétaire et l'ex-président sont responsables de la surveillance des travaux du comité et de son orientation, mais les décisions sont généralement prises par voie de consensus, après intervention des membres du comité. Le président du comité de perfectionnement est membre du comité de coordination des programmes (CCP) et relève du vice-président des comités techniques.

En 2010, de nouveaux projets seront élaborés pour le mieux-être des membres de la SCGC. Les membres de la SCGC intéressés à devenir membres du comité de perfectionnement doivent s'adresser au professeur Huixi.xie@rogers.com. ■

LIFELONG LEARNING

—National Lecture Tour—

Climate Change and Water Management The Renaissance of Systems Approach April 2010



This year's National Lecture Tour is a presentation which will focus on two examples of using a systems approach in addressing the practical issues related to climate change and its impact on water resources engineering practice.

The *first example* is aimed at answering the question of how the expected paths of climate, environmental, and economic variables change when feedbacks between the economy and the environment are more fully modeled.

The *second example* will deal with the impacts of climate change on water resources management on a local scale. An original inverse approach is developed to assess these impacts

This National Lecture Tour will be presented by Slobodan Simonovic, PhD., P.Eng., a Professor of Civil and Environmental Engineering and Director of Engineering Studies at the Institute for Catastrophic Loss Reduction at the University of Western Ontario. Dr. Simonovic has over thirty years of research, teaching and consulting experience in water resources engineering.

It is offered in the following cities:

Saskatoon
Calgary
Edmonton
Victoria
Vancouver
Hamilton
Fredericton
St. John's

For further details, please visit www.csce.ca or contact your local CSCE Section.



Foreign Competition: A Challenge to Canadian Engineering

INTRODUCTION

Globalization is often portrayed as providing opportunity for business to export services, but this applies also to the engineering firms in foreign countries wishing to expand their markets to Canada. Traditionally, the use of foreign engineering expertise in Canada has been limited to larger projects, but this has been changing, as computer technology has advanced allowing more rapid and reliable electronic transfer of large amounts of information. As trade liberalization of services and telecommunication networks continue to develop, Canadian engineering will be increasingly under threat from foreign competition, either by the direct involvement of foreign engineering firms in the Canadian market or by the employment of foreign nationals outside Canada by Canadian engineering firms. There is an immediate need to understand better the effects of this foreign competition, especially since the Canadian economy heavily relies on exports and is currently facing many economic challenges.

THE CHALLENGE

Developed countries have long been capable of exporting professional services, but recently the capability of some developing countries to carryout aspects Canadian infrastructure projects has increased substantially. Governments in several develop-

ing countries have rapidly developed civil engineering education to provide the expertise needed to design and construct the infrastructure necessary to support their rapid economic development. Furthermore, many of their engineers have worked on major and challenging (often international) engineering projects, and therefore have expertise that Canadian engineers who have not had similar opportunities lack. Many foreign engineering companies now have internal resources that are high quality and exportable.

Outsourcing is the undertaking of an activity by an organization (government or private business) using resources other than those resident within the organization. Outsourcing may allow a firm to use lower cost services, and perform activities it could not otherwise do because it lacks specialized assets, and/or staff with the specialized knowledge, expertise and time to successfully carryout the work. Outsourcing of work outside the country is termed as “offshoring.”

Like many other professions, the engineering profession in Canada is not immune to potential negative impacts associated with increased offshoring. First, as Canadian companies and multinationals transfer parts of their operations to countries with lower production and operating

Rishi Gupta Ph.D., P.Eng.

Program Coordinator—Department of Civil Engineering,
School of Construction and the Environment, British
Columbia Institute of Technology, Burnaby, British Columbia

Brian C. Burrell P.Eng., FCSCE

Senior Engineer, R.V. Anderson Associates Limited,
Fredericton, New Brunswick

costs, they might be more apt to use engineering services in their areas of operation. Second, Canadian governments and businesses resident in Canada may choose engineering services that can be provided at lower costs by foreign providers of engineering expertise. Third, many aspects of civil engineering work can be done anywhere in the world that has access to global telecommunication networks. A wide range and great amount of engineering analyses, design work and even construction planning can be done outside of the nation in which the project will be carried out.

Offshoring of engineering work can result in job displacement in developed countries like Canada. Furthermore, it can create a significant downward pressure on engineering salaries, which is likely if engineers in developed nations are unable to produce significantly greater value than their lower paid counterparts in developing nations (Kennedy and Dossani, 2005). Baldwin and Gu (2008) report that offshoring of services (which includes engineering work) has a negative relationship with wage growth in the service sector.

Efforts to protect engineering jobs in Canada by residency or special licensing requirements likely would run counter to recent government policy towards more open markets and become in conflict with bodies responsible for overseeing trade agreements. As Canadian engineering licensing bodies mandated under legislation by provincial and territorial governments, they probably will comply with government policies supporting globalization.

For a few highly educated, brilliant engineers fortunate to have had an opportunity to acquire highly specialized and marketable knowledge, offshoring likely will have little, if any, affect. There will always be positions for them, either in Canada or overseas, and they will continue to be rewarded in the nations where they are based with high salaries and benefits. The majority of Canadian civil engineers, however, will be vulnerable to outsourcing of services to highly qualified engineers in foreign lands, whose salaries are considerably lower and whose services are therefore competitive with their Canada-based counterparts.

CANADIAN COMPETITIVENESS

The education of undergraduate engineering students in relatively advanced developing

nations, such as India and China, follow a curriculum roughly comparable to the one taught in developed nations. Therefore, a massive amount of conventionally trained engineers is growing globally at the same time as barriers to performing conventional engineering work remotely are eroding (Kennedy and Dossani, 2005).

Canadian engineering must remain competitive to take advantage of foreign markets for engineering services or to respond to the challenges of foreign competition and offshoring. A lot of effort needs to be put into keeping the Canadian professionals competitive and current in the global markets. Rollin (2007) recommends various actions that need to be implemented, such as continued education, organizing international workshops and seminars, and student international exchange programs. Large multinational and transnational engineering firms will employ civil engineers from Canada, as long as Canadian civil engineers can provide marketable education and experience at competitive salaries.

According to the ASCE Body of Knowledge Committee (BOK), engineers will need to deal with ever-increasing globalization and find ways to prosper within an integrated international environment (ASCE Body of Knowledge Committee, 2008). They will need to deal with challenges that cross cultural, language, legal, and political boundaries while respecting critical cultural constraints and differences (ASCE Body of Knowledge Committee, 2008). Civil engineers of the 21st century will have to have the education and experience to deal with the impacts of globalization on professional practice, infrastructure development and renewal, environmental protection and management, and information technology. With respect to their professional practice, civil engineers will have to adapt to a multicultural and diverse environment, practice ethics in a global environment, bring innovation back from overseas, overcome administrative barriers, and fundamentally continue to acquire new and marketable knowledge-based skills (ASCE Body of Knowledge Committee, 2008).

It should be recognized that the impacts of globalization on Canadian engineering could be mitigated by better training our nation's engineering students and young professionals, since they are relatively adaptable to globalization. Existing peda-

gogical goals can be met while helping students explore international perspectives by expanding students' awareness of cultural and international dynamics in engineering practice. The most important skills may be those that are adaptable but durable despite the dynamics of shifting social and economic circumstances.

The engineers most threatened by foreign competition are not those who are freshly out of college, but those in midcareer who may be replaced by newly trained engineers, whether in their own country or foreign lands (Kennedy and Dossani, 2005). There needs to be developed a coordinated national strategy in providing affordable, meaningful, helpful and accommodating programs for mid-career and late-career civil engineers wishing to maintain their professional competency or develop new areas of marketable expertise. Moreover, participation of civil engineers in these programs needs to be encouraged and financially supported by employers, if not voluntarily then perhaps as a requirement for company licensure to provide engineering services.

A resource available to many Canadian engineering firms is the immigrant engineer. To utilize immigrant engineers as a resource to increase Canadian competitiveness on a global stage, changes have been initiated to allow Canadian firms to use these resources effectively.

When the service being provided is knowledge, then it is often the customer's perception of the provider of the knowledge that is initially important in deciding who to consider as a consultant, contractor, or educator. To maintain a good international reputation, Canadian engineering should strive toward high standards, and resist other factors associated with globalization (sometimes arising from trade agreements) that tend to degrade the application of knowledge to a commonly-accepted lower base (in other words, the lowest common denominator).

Another factor affecting Canadian competitiveness is related to Canadian society and national identity. Although the international perspective of many Canadians contributes to their awareness of foreign geography and international socio-economics, Canadians have in general been slow to use this knowledge to full economic advantage. This is due to a lack of a unified,

coordinated and comprehensive international business strategy that encourages Canadian firms to reflect national identity to their advantage and to be supportive of other Canadian enterprises in foreign countries. It behooves Canadian engineers working in foreign markets not only to advance their interests but also the interests of their fellow citizens when not in conflict with their own ambitions.

THE ROLE OF ENGINEERING BODIES

Licensing bodies are the gatekeepers to the profession. Their primary responsibility is to protect the public from unqualified engineers. As globalization changes the political and economic landscape, it seems reasonable that there will be pressures on the licensing bodies with respect to acceptance of foreign qualifications and international competition that may adversely affect the Canadian engineering scene.

Mutual agreements of recognition of engineering qualifications are products of increasing globalization of economic systems and corporate structures. These agreements generally provide for engineering professionals in one country to be recognized as qualified to practice in a foreign country. This opens up new opportunities for individual Canadian engineers to seek employment and to work on infrastructure being built in dynamic growing economies, and for foreign engineers to seek employment and to work on infrastructure being built in Canada. Canada-based engineering firms would have a greater opportunity to use more of their Canadian engineering staff when working on foreign projects, but they will also have an opportunity to outsource design work on Canadian infrastructure to foreign-based engineers who may be able to do the majority of the analyses and design at a reduced rate compared to Canadian competitors. Like many aspects of globalization of engineering services, mutual agreements of recognition are a two-edged sword.

Business organizations involving civil engineering companies will become increasingly important mechanisms for promoting Canadian engineering, as they are less constrained by legislation and mandates than licensing bodies. For example, the mission of the Association of Canadian Engineering Companies (ACEC) is to promote and safeguard the business and profes-

sional interests of the Canadian consulting engineering industry in Canada and abroad (ACEC, 2008).

Learned societies also need to be involved with governments in developing strategies that keep civil engineering profession relevant and competitive. The CSCE, as Canada's foremost civil engineering learned society, should play a leading role in educating Canadian engineers to be "globally minded" and to demonstrate leadership. Technical transfers may be becoming less important with an increasing number of immigrant engineers, but helping Canadian engineers acquire short-term exposure to foreign engineering practices is still an activity that learned societies should consider as part of an overall strategy to keep Canadian civil engineering competitive internationally.

CONCLUDING REMARKS

Improvements in communications, the increased mobility of engineering personnel, and a more accessible international marketplace for engineering services associated with globalization may provide Canadian engineers with employment prospects outside of Canada, and Canadian firms with greater opportunities to earn profits from foreign work. On the other hand, greater ease in communication and information transfer over greater distances enables competition from foreign engineering companies and greater outsourcing of professional services. Uncertainty exists as to magnitude of the potential negative impacts on the employment and remuneration of Canadian civil engineers and on educational institutions in Canada who train engineers primarily for the Canadian market. Over the long-term, importing foreign expertise in excess of our country's export of such services means that opportunities to educate and employ Canadians as civil engineers in their own country could be lost. This is not in the national interest or in the interest of the civil engineering profession in Canada.

Knowledge is transient and transferable. What is an economic advantage today may be loss tomorrow unless continuous efforts are made to keep abreast of foreign competition. Continuing education for civil engineering, especially mid-career and late-career professionals, needs to be enhanced in technical depth and coverage, and participation of civil engineers in these programs

needs to be encouraged and financially supported by their employers.

Canadian engineering is too important to entrust its future solely to market forces assuming that a positive outcome will result. Preparation, market research, strategy development, and above all financial investment are needed to allow Canadian engineering to compete globally.

ACKNOWLEDGEMENT

This article is based upon the discussion paper titled "The Impacts of Globalization on Canadian Engineering" presented at the CSCE Forum on Professional Practice and Career Development, CSCE 2009 Annual Conference, St. John's, Newfoundland and Labrador, May 27-30, 2009. The paper was prepared by Rishi Gupta, Brian C. Burrell, Fayi Zhou, and Todd Chan, members of the Task Force on Globalization established under the CSCE Career Development Committee. ■

REFERENCES

- ACEC. 2007. Who We Are (web page), Association of Canadian Engineering Companies, Ottawa, Ontario, <http://www.acec.ca/en/who/> (Last accessed: January 10, 2009).
- ASCE Body of Knowledge Committee. 2008. Civil Engineering Body of Knowledge for the 21st Century, 2nd edition. Body of Knowledge Committee of the Committee on Academic Prerequisites for Professional Practice, ASCE, New York, USA.
- Baldwin, John R. and Gu, Wulong. 2008. Outsourcing and Offshoring in Canada. Economic Analysis (EA) Research Paper Series, Micro-economic Analysis Division, Statistics Canada, Ottawa, Ontario.
- Kennedy, Martin and Dossani, Rafiq. 2005. Offshoring and the Future of U.S. Engineering: An Overview. The Bridge. Vol. 35, No. 3, Fall 2005, National Academy of Engineering, obtained from Website <http://www.nae.edu/nae/bridgecom.nsf/weblinks/MKEZ-6G6R4D?OpenDocument>.
- Rollin, Andre L. 2007. "Career Development: A global perspective," CIVIL Canadian Civil Engineer, Fall 2007, vol. 24.4, pp. 12-15.

continued from page 10

rapidly growing. CSCE needs to change and become more relevant to civil engineers and, in particular, to young engineers. The image of the CSCE brand has to change if CSCE expects to exist beyond 2020!

Another interesting point, raised by many, was that civil engineers and infrastructure are mostly invisible to the public, yet the public depend on a reliable infrastructure. Civil engineers and CSCE need to raise their profile.

On a Sunday in November 2009, the CSCE Board of Directors met in Montreal to conduct the business of the CSCE. On the Saturday before the Board meeting, all Board members attended a workshop to review the current membership data and trends, and to debate where the Society is today and where it could be in the year 2020. It became evident that the CSCE did not have a clear vision for the future nor did it have an acceptable brand image. The CSCE has lost its way! The Board also recognized that this is an exciting time to be a civil engineer. This is also an opportune time for civil engineers to take a leadership role in defining a more sustainable infrastructure—how we plan, design, construct and maintain infrastructure!

The Board decided a new vision was required—VISION2020!

Building on the input from the cross-Canada meetings between May and December 2009, and the Board workshop in November, a process has commenced to develop a new vision for CSCE. The CSCE is soliciting input from a large cross section of civil engineers and non-civil engineers across Canada and we hereby invite your participation. The CSCE plans to roll out the CSCE VISION2020 at the June Annual Meeting in Winnipeg.

Thank you in advance for your valued input into this very interesting and important strategic guidance for the CSCE.

Please provide your feedback to my attention at the following coordinates:

Vic Perry, FCSCE, SVP CSCE

Via email: vic.perry@lafarge-na.com

Via Phone: 403 292-9423

Via Post: CSCE, 4920 de Maisonneuve Blvd. W., Suite 201, Montreal, Quebec, H3Z 1N1

suite de la page 10

le nombre de diplômés en génie a rapidement augmenté. La SCGC doit changer et doit devenir plus importante aux yeux des ingénieurs civils, et notamment chez les jeunes ingénieurs. L'image de marque de la SCGC doit changer si nous tenons à exister encore au-delà de 2020!

Autre aspect intéressant soulevé par plusieurs : les ingénieurs civils et les infrastructures sont généralement invisibles aux yeux du public. Et pourtant, la vie du public dépend d'infrastructures fiables! Les ingénieurs civils et la SCGC doivent rayonner davantage.

Un dimanche de novembre 2009, le c.a. de la SCGC était réuni à Montréal pour expédier les affaires courantes. Le samedi précédent, tous les membres du c.a. avaient participé à un atelier pour étudier les données de l'heure relatives au nombre de membres et aux tendances sous-jacentes, dans le but de discuter de la situation de la SCGC et de ce que pourrait être sa situation en 2020. Il est vite devenu évident que la SCGC n'avait pas une idée précise de son avenir, et n'avait pas non plus une image de marque acceptable. La SCGC s'était égarée! Le c.a. a également constaté que c'était une excellente période pour être ingénieur civil. C'est également l'occasion par excellence, pour les ingénieurs civils, de prendre l'initiative et de définir les infrastructures de l'avenir, de décider comment nous allions planifier, concevoir, construire et entretenir ces infrastructures!

Le c.a. a décidé qu'il fallait une nouvelle vision de l'avenir : VISION2020!

À partir de l'apport des réunions tenues à travers le pays entre les mois de mai et décembre 2009 et de l'atelier du c.a. de novembre 2009, une démarche a été amorcée pour élaborer cette nouvelle vision pour la SCGC. La SCGC sollicite la participation d'un vaste éventail d'ingénieurs civils et de non-ingénieurs à travers le pays, et nous vous demandons, par les présentes, de se nous fournir votre contribution. La SCGC entend dévoiler sa VISION2020 lors de l'assemblée annuelle du mois de juin, à Winnipeg.

Je vous remercie à l'avance de votre contribution à cet intéressant et important effort d'orientation stratégique de la SCGC.

Domestic Venues

2010 Construction Research Congress (2010 CRC)

Banff, AB

May 8–11, 2010

<http://www.2010crc.com/>

CSCE 2010 Annual Conference

Winnipeg, MB

June 9–12, 2010

<http://www.csce.ca/2010/annual>

International Conference on Medium and Short Span Bridges (SMSB-8)

Niagara Falls, ON

August 3–6, 2010

<http://www.csce.ca/2010/smsb/>

International Venues

6th International Conference on Concrete under Severe Conditions—CONSEC'10

Mérida, Yucatan, Mexico

June 7–10, 2010

<http://www.consec10.com/>

2nd International Conference on Sustainable Construction Materials and Technology SCMT 2010

Ancona, Italy

June 28–30, 2010

<http://www.cbu.uwm.edu>

2nd International Conference on Waste Engineering and Management (ICWEM 2010)

Shanghai, China

October 13–15, 2010

E-mail: icwem2010@163.com

6th International Structural Engineering and Construction Conference

Zurich, Switzerland

June 21–25, 2011

http://www.isec-society.org/ISEC_06/

Faites-moi parvenir vos commentaires et suggestions à l'une des adresses suivantes :

Vic Perry, FSCGC

Courriel : vic.perry@lafarge-na.com

Tél. : 403 292-9423

Lettre : SCGC, 4920 ouest, boul. de Maisonneuve, bureau 201, Montréal, Québec, H3Z 1N1

REPORT OF THE CSCE NOMINATING COMMITTEE (2010–2011)

CSCE By-Laws require that all members of the Board of Directors be voting members of the Society. The Nominating Committee is responsible for submitting nominations for vacant positions to the membership in sufficient time to allow additional nominations. Nominations have been put forward as per the By-Laws. An asterisk beside a position indicates that it is a Board position.

Position	Incumbent	Proposed	Term
President*	Jin, finishing term	Vic Perry	1 yr
President Elect*	New position	Randy Pickle	1 yr
Senior Vice-President & Chair, Regional Coordinating Committee*	Perry, finishing term	Jim Kells	1 yr
Past-President*	Gosselin, finishing term	Gordon Jin	1 yr

REGIONAL COORDINATING COMMITTEE

Atlantic Vice-President*	Sparks, finishing 3rd yr	Sherry Sparks	1 yr
Quebec Vice-President*	Bégin, finishing 4th yr	Stéphane Roy	2 yrs
Ontario Vice-President*	Yanful, finishing 1st yr	James Garland	2 yrs
Prairie Vice-President*	Lalach, finishing 3rd yr	Patrick Lalach	1 yr
Western Vice-President*	Smid, finishing 1st yr	Brad Smid	1 yr
Vice-President International*	Thompson, finishing 3rd yr	Kirk Thompson	1 yr

ADMINISTRATION COORDINATING COMMITTEE

Vice-President*	Kells, finishing 1st yr	To be determined	2 yrs
Honorary Treasurer*	Garland, finishing 5th yr	Jeff Rankin	2 yrs
Chair, Communications and Publications	Svecova, finishing 3rd yr	Dagmar Svecova	1 yr
Chair, History	MacKenzie, finishing 1st yr	Alistair MacKenzie	1 yr
Chair, Business Development	Pickle, finishing 1st yr	Tony Bégin	2 yrs
Chair, Membership Services	Lanyi, finishing 1st yr	Dan Dankewich	2 yrs
Chair, Honours and Awards	Waugh, finishing 1st yr	Lloyd Waugh	1 yr
Chair, Student Affairs	Straka, finishing 2nd yr	Marc Bourassa	2 yrs
Chair, Life Members	Wright, finishing 5th yr	Peter Wright	1 yr

PROGRAMS COORDINATING COMMITTEE

Technical Divisions & Committees

Vice-President, Technical Divisions*	Isgor, finishing 1st yr	Burkan Isgor	1 yr
Chair, Cold Regions Division	Wong, finishing 3rd yr	To be determined	2 yrs
Chair, Construction Division	Attalla, finishing 1st yr	Mohamed Attalla	1 yr
Chair, Engineering Mechanics/Materials Division	Shehata, finishing 1st yr	Medhat Shehata	1 yr
Chair, Hydrotechnical Division	Nistor, finishing 2nd yr	Ioan Nistor	2 yrs
Chair, Environmental Division	Hettiaratchi, finishing 2nd yr	Patrick Hettiaratchi	2 yrs
Chair, Structures Division	El-Badry, finishing 4th yr	Khaled Sennah	2 yrs
Chair, Transportation Division	Fu, finishing 2nd yr	Liping (Lee) Fu	2 yrs
Chair, Infrastructure Renewal Committee	Andres, finishing 6th yr	Reg Andres	1 yr
Chair, Sustainable Development Committee	Mulligan, finishing 2nd yr	Catherine Mulligan	2 yrs
Chair, Innovation and IT Committee	Akhras, finishing 3rd yr	George Akhras	1 yr

Technical Programs

Vice-President Technical Programs*	VACANT	Brian Burrell	2 yrs
Chair, Career Development	Burrell, finishing 4th yr	Nives Pecar	2 yrs
Chair, International Affairs	Chan, finishing 3rd yr	Todd Chan	1 yr
Chair, Education and Research	Brown, finishing 2nd yr	Tom Brown	2 yrs
NLT Coordinator	Feldman, finishing 2nd yr	Lisa Feldman	2 yrs
Conference Coordinator	Faisal, finishing 3rd yr	Kamran Faisal	1 yr
Editor, CJCE	Mavinic, finishing 11th yr	Don Mavinic	1 yr
Editor, JEES	Smith, finishing 8th yr	n/a	

BoD Members at Large

Representing Corporate Members*	Pickle, finishing term	Glenn Hewus	2 yrs
Representing Council of Chairs and Heads of Canadian Civil Engineering Departments*	Rasmussen, finishing term	Roberto Narbaitz	1 yr

RAPPORT DU COMITÉ DES CANDIDATURES (2010–2011)

Les règlements généraux de la SCGC exigent que tous les membres du conseil d'administration soient membres de la SCGC. Le comité des candidatures a comme responsabilité de présenter des candidats à tous les postes vacants dans un délai suffisant pour permettre d'y ajouter d'autres candidats. Chaque candidature doit avoir été proposée tel que stipulé dans les règlements. L'astérisque indique un poste sur le conseil d'administration.

Position	Titulaire	Candidat	Durée
Président*	Jin, fin de mandat	Vic Perry	1 an
Président désigné*	Nouveau poste	Randy Pickle	1 an
Premier vice-président et président du comité des régions*	Perry, fin de mandat	Jim Kells	1 an
Ancien président*	Gosselin, fin de mandat	Gordon Jin	1 an

CONSEILS RÉGIONAUX

Vice-président, Atlantique*	Sparks, fin 3 ^e année	Sherry Sparks	1 an
Vice-président, Québec*	Bégin, fin 4 ^e année	Stéphane Roy	2 ans
Vice-président, Ontario*	Yanful, fin 1 ^e année	James Garland	2 ans
Vice-président, Prairie*	Lalach, fin 3 ^e année	Patrick Lalach	1 an
Vice-président, Ouest*	Smid, fin 1 ^e année	Brad Smid	1 an
Vice-président, International*	Thompson, fin 3 ^e année	Kirk Thompson	1 an

COORDINATION DE L'ADMINISTRATION

Vice-président*	Kells, fin 1 ^e année	A déterminer	1 an
Trésorier honoraire*	Garland, fin 5 ^e année	Jeff Rankin	2 ans
Publicité et communications	Svecova, fin 3 ^e année	Dagmar Svecova	1 an
Histoire	MacKenzie, fin 1 ^e année	Alistair MacKenzie	1 an
Développement des affaires	Pickle, fin 1 ^e année	Tony Bégin	2 ans
Services aux membres	Lanyi, fin 1 ^e année	Dan Dankewich	2 ans
Distinctions honorifiques et fellows	Waugh, fin 1 ^e année	Lloyd Waugh	1 an
Affaires étudiantes	Straka, fin 2 ^e année	Marc Bourassa	2 ans
Membres à vie	Wright, fin 5 ^e année	Peter Wright	1 an

COORDINATION DES PROGRAMMES

Divisions et comités techniques

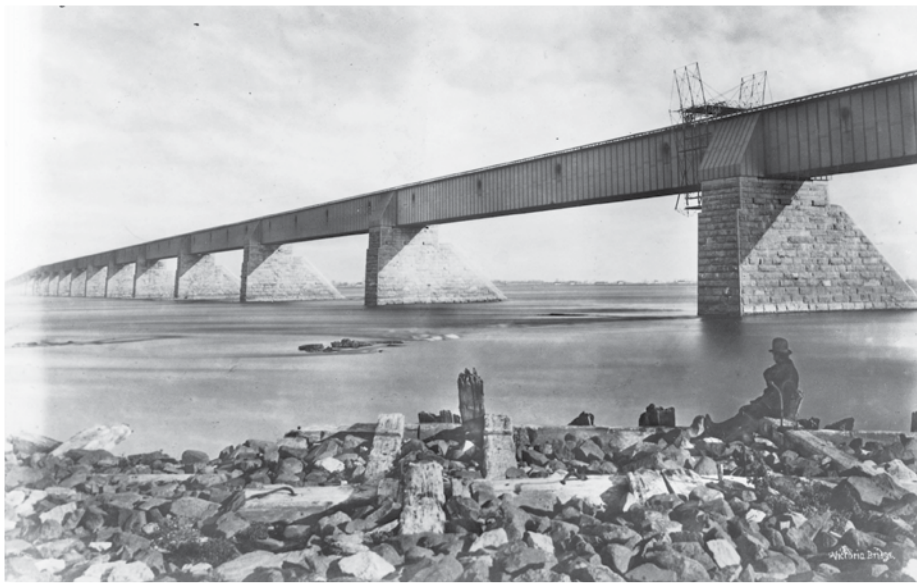
Vice-président, divisions techniques*	Isgor, fin 1 ^e année	Burkan Isgor	1 an
Régions froides	Wong, fin 3 ^e année	A déterminer	2 ans
Construction	Attalla, fin 1 ^e année	Mohamed Attalla	1 an
Mécanique appliquée et génie des matériaux	Shehata, fin 1 ^e année	Medhat Shehata	1 an
Hydrotechnique	Nistor, fin 2 ^e année	Ioan Nistor	2 ans
Environnement	Hettiaratchi, fin 2 ^e année	Patrick Hettiaratchi	2 ans
Structures	El-Badry, fin 4 ^e année	Khaled Sennah	2 ans
Transport	Fu, fin 2 ^e année	Liping (Lee) Fu	2 ans
Renouvellement des infrastructures	Andres, fin 6 ^e année	Reg Andres	1 an
Développement durable	Mulligan, fin 2 ^e année	Catherine Mulligan	2 ans
Innovations et technologies de l'information	Akhras, fin 3 ^e année	George Akhras	1 an

Programmes techniques

Vice-président, programmes techniques*	VACANT	Brian Burrell	2 ans
Développement professionnel	Burrell, fin 4 ^e année	Nives Pecar	2 ans
Affaires Internationales	Chan, fin 3 ^e année	Todd Chan	1 an
Éducation et recherche	Brown, fin 2 ^e année	Tom Brown	2 ans
Coordonnateur des tournées nationales	Feldman, fin 2 ^e année	Lisa Feldman	2 ans
Moniteur des conférences	Faisal, fin 3 ^e année	Kamran Faisal	1 an
Directeur, RCGC	Mavinic, fin 11 ^e année	Don Mavinic	1 an
Directeur, RGSE	Smith, fin 8 ^e année	n/a	

Membres du conseil à titre spécial

Représentant les entreprises membres*	Pickle, fin de mandat	Glenn Hewus	2 ans
Représentant les chefs de départ. De génie civil*	Rasmussen, fin de mandat	Roberto Narbaitz	1 an



The Victoria Bridge in 1859. McCord Museum, Montréal.

Civil Engineering Anniversaries

Over the past few years, several members of the National History Committee joined with our colleagues of the ICE and the ASCE in celebrations commemorating the anniversaries of the birth of four internationally famous Civil Engineers.

The first three were 200th anniversaries: Robert Stephenson in 2003, followed by Isambard Kingdom Brunel and John A. Roebling in 2006; Thomas Telford's 250th anniversary was in 2007.

Of these four engineers, Brunel had no involvement in Canada and Roebling only marginally through his suspension bridge over the Niagara Gorge. Although Telford never visited Canada he acted as a consultant on several canals and harbour works. Robert Stephenson, however, did make a significant contribution to Civil Engineering in Canada.

These celebrations generally included a Symposium on the works of these engineers and the I.K. Brunel commemoration even included a re-creation of the first journey on Brunel's Great Western Railway by the steam locomotive "King Edward I" pulling "orient Express" coaches.

What of our own Canadian Civil Engineers? Surely we too have some anniversaries to commemorate.

Regrettably, we have missed a number of opportunities to recognize significant Canadian Civil Engineers such as the 150th anniversaries of Sir John Kennedy (1988), H.G.C. Ketchum (1989) and Sir William Cornelius Van Horne (1993) and the 200th anniversaries of Francis Hall (1992), and N.H. Baird (1996).

Looking to the future, we must surely correct this and prepare to celebrate the 200th anniversary of the birth of Samuel Keefer in 2011 and of Casimir Gzowski in 2013.

However the anniversaries of the completion dates of significant Historic Civil Engineering Works are surely also worth commemorating. In 2009, our first National Historic Civil Engineering Site, T.C. Keefer's Hamilton Pump House was 150 years old and the National History Committee participated in a celebration organized by the City of Hamilton.

This year, 2010, another National Historic Site, the Victoria Bridge in

continued on page 29

Les Anniversaires du génie

Au cours des dernières années, plusieurs membres du comité des affaires historiques se sont joints à nos collègues de l'ICE et de l'ASCE pour commémorer l'anniversaire de naissance de quatre ingénieurs civils de réputation internationale.

Il y avait d'abord trois 200^{es} anniversaires : Robert Stephenson (2003), suivi d'Isambard Kingdom Brunel et de John A. Roebling (2006). Il y eut également le 250^e anniversaire de Thomas Telford (en 2007).

Sur ces quatre ingénieurs, Brunel n'a eu à peu près rien à faire avec le Canada, et Roebling n'a eu qu'une présence marginale avec son pont suspendu sur la gorge du Niagara. Bien que Telford n'ait jamais visité le Canada, il a agi comme conseiller dans le cas de plusieurs canaux et ports du pays. Toutefois, Robert Stephenson a apporté une importante contribution au génie civil au Canada.

Ces commémorations comportaient généralement un symposium sur les œuvres de ces ingénieurs, et la commémoration de I.K. Brunel comportait même une reconstitution du premier voyage de la locomotive à vapeur « King Edward », tirant les wagons de l'Orient express sur les rails du Great Western.

Nous avons sûrement des ingénieurs civils canadiens à célébrer!

Malheureusement, nous avons raté certaines occasions de rendre hommage à de grands ingénieurs canadiens, comme les 150^{es} anniversaires de Sir John Kennedy (en 1988), de H.G.C. Ketchum (en 1989) et de Sir Cornelius Van Horne (en 1993), et le 200^e anniversaire de Francis Hall (en 1992) et de N.H. Baird (en 1996).

Pour l'avenir, nous devons corriger cette situation et célébrer le 200^e anniversaire de la naissance de Samuel Keefer, en 2011, et celui de Casimir Gzowski en 2013.



The then Presidents of ASCE, ICE and CSCE prepare for the Brunel Anniversary Train Ride. CSCE Archives.

Toutefois, les anniversaires du parachèvement d'importants travaux de génie méritent aussi d'être commémoré. En 2009, notre premier lieu historique national, la station de pompage de Hamilton, créée par T.C. Keefer, a eu 150 ans, et le comité des affaires historiques a participé à une fête organisée par la ville de Hamilton.

En 2010, un autre lieu historique national du génie civil, le pont Victoria, à Montréal, célébrera son 150^e anniversaire, ce qui nous ramène à nos autres anniversaires, puisque dans sa forme « tubulaire » originale, ce pont était une conception du premier ingénieur civil mentionné, Robert Stephenson. Ce pont marquait la fin de deux importants chapitres dans l'histoire du génie civil : la fin des ponts « tubulaires », déjà désuets lors du début des travaux (aucun autre pont « tubulaire » ne sera désormais construit), et le décès de Robert Stephenson, peu avant le parachèvement de la construction du pont Victoria.

Le comité des affaires historiques se penche en ce moment sur la meilleure façon de célébrer cet anniversaire, ainsi que les anniversaires de Keefer et Gzowski. ■

2010 ANNUAL GENERAL MEETING OF THE CSCE

The 2010 Annual General Meeting of the Canadian Society for Civil Engineering will be held during the Annual Conference of the Society on Friday, June 11, 2010 at the Fairmont Hotel in Winnipeg, MB. This meeting will receive the Annual Report of the Society including that of the President, the reports of the Technical Divisions, Regional Coordinating Committee, Administration Coordinating Committee, Programs Coordinating Committee, Official Auditors and will consider such other business as may come before the meeting.

ASSEMBLÉE GÉNÉRALE ANNUELLE 2010 DE LA SCGC

L'assemblée générale annuelle 2010 de la Société canadienne de génie civil aura lieu pendant le congrès annuel de la société, vendredi le 11 juin 2010 à l'hôtel Fairmont à Winnipeg, MB. Lors de cette assemblée seront soumis le bilan annuel de la société, incluant le rapport du président, les bilans des divisions techniques, des conseils régionaux, des comités de coordination de l'administration, des comités de coordination des programmes, du vérificateur et tout autre sujet soumis à l'assemblée.

continued from page 28

Montréal, celebrates its 150th and takes us full circle on our review of anniversaries as the designer of the Victoria Bridge in its original "Tubular" form was none other than the first mentioned Civil Engineer, Robert Stephenson. This bridge was to signify the closure of two significant chapters of Civil Engineering History: the first was the demise of the "Tubular" Bridge design methodology which was already obsolete by the time construction had started and no further bridges of this type were ever built: the second was the death of Robert Stephenson in 1859 just before the bridge was completed.

The National History Committee is currently considering how best to celebrate this anniversary and those of Keefer and Gzowski. ■



2010 CSCE Annual General Meeting and Conference

Winnipeg, June 9-12, 2010
Engineering a Sustainable World

- Annual General Conference
- 11th International Environmental Specialty Conference
- 2nd International Structural Specialty Conference
- 8th International Transportation Specialty Conference
- 2nd Specialty Conference on Disaster Mitigation



For registration information and technical program, visit us at:

www.csce.ca/2010/annual

MAJOR PARTNERS / ASSOCIÉS PRINCIPAUX



PARTNERS / ASSOCIÉS



The Federal Bridge Corporation Limited



La Société des ponts fédéraux Limitée

AFFILIATES / AFFILIÉS



CSCE SECTIONS SCGC

Newfoundland

Contact: Gordon Jin, FCSCCE
T: 709-737-8816 F: 709-737-2537
E-mail: gjin@mun.ca

Nova Scotia

Contact: To be determined

East New Brunswick and P.E.I. (Moncton)

Contact: Gérard Poitras, MSCGC
T: 506-858-4759
E-mail: gerard.poitras@umoncton.ca

West New Brunswick

Contact: Andy Small, MCSCCE
T: 506-458-1000 F: 506-450-0829
E-mail: andy.small@amec.com

Montréal

Contact: Stéphane Marcouiller, MSCGC
T: 450-967-1260, ext. 3636 F: 450-639-8737
E-mail: stephane.marcouiller@tecsult.com

Sherbrooke

Contact: To be determined

Québec

Contact: Francis Labrecque
T: 418-623-3373, ext.192
Courriel: francis.labrecque@cima.ca

Capital Section (Ottawa-Gatineau)

Contact: Gary Holowach, MCSCCE
T: 613-745-2213, ext. 110
E-mail: gholowach@dillon.ca

Toronto

Contact: Peter Langan, FCSCCE
T: 416-497-8600, ext. 301 F: 416-497-0342
E-mail: plangan@rvanderson.com

Hamilton/Niagara

Contact: Mike Tait, MCSCCE
T: 905-525-9140, ext. 26469 F: 905-525-9688
E-mail: taitm@mcmaster.ca

Northwestern Ontario

Contact: Gerry Buckrell, MCSCCE
T: 807-623-3449 F: 807-623-5925
E-mail: gerry@enl-tbay.com

Durham/Northumberland

Contact: Amie Thérien, ASCSCE
T: 905-882-1100 ext. 3024
E-mail: therriena@mmm.ca

London and District

Contact: Ernest Yanful, MCSCCE
T: 519-661-4069 F: 519-661-3492
E-mail: eyanful@eng.uwo.ca

Manitoba

Contact: Dagmar Svecova, MCSCCE
T: 204-474-9180 F: 204-474-7513
E-mail: svecovad@cc.umanitoba.ca

South Saskatchewan

Contact: Harold Retzlaff, MCSCCE
T: 306-787-5642 F: 306-787-4910
E-mail: hretzlaff@highways.gov.sk.ca

Saskatoon

Contact: Marc Bourassa, ASCSCE
T: 306-665-6223
E-mail: Marc.Bourassa@genivar.com

Calgary

Contact: Dan Dankewich, MCSCCE
E-mail: ddanke2@telus.net

Edmonton

Contact: Eva Cheung, MCSCCE
T: 780-944-7678
E-mail: eva.cheung@edmonton.ca

Vancouver

Contact: Shiva Tiwari, ASCSCE
T: 778-386-5740
E-mail: dambartiwari@gmail.com

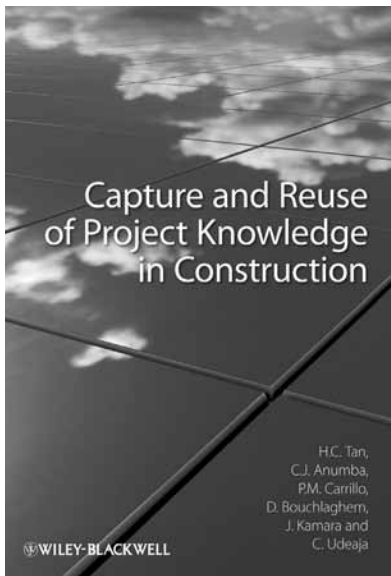
Vancouver Island

Contact: Kevin Baskin
E-mail: kevin.baskin@gov.bc.ca

CSCE Hong Kong Branch

Contact: Moe M.S. Cheung, FCSCCE
T: (852) 2358-7152
E-mail: mscheung@ust.hk

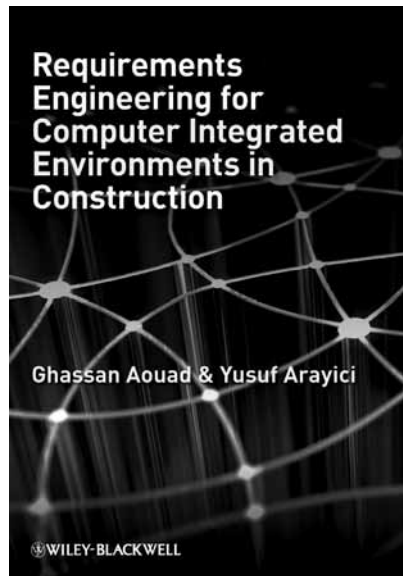
Stock Your Shelf With New Civil Engineering Titles From Wiley-Blackwell!



Capture and Reuse of Project Knowledge in Construction
Chimay J. Anumba

This text describes a methodology for the 'live' capture of reusable project knowledge, utilizing current technology. Developed in response to the shortcomings of current practices. Outlines the organizational benefits of reusing knowledge within a project-based environment.

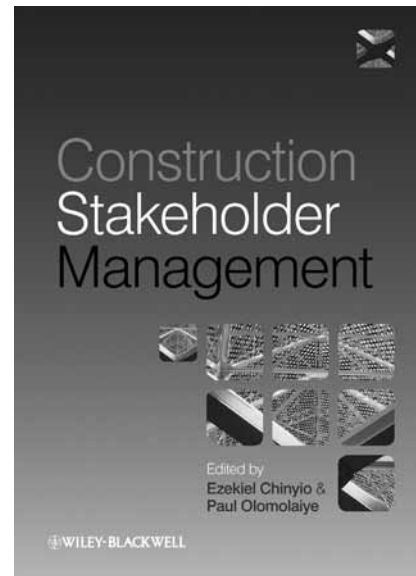
**978-1-4051-9889-9 | Cloth
208 pp. | Feb 2010 | \$153.99**



Requirements Engineering for Computer Integrated Environments in Construction
*Ghassan Aouad ,
Dr. Yusuf Arayici*

Requirements Engineering provides a way of bridging the gap between developers and users to enable user-informed developments and implementation of Computer Integrated Engineering.

**978-1-4051-8945-3 | Cloth
256 pp. | Jan 2010 | \$192.00**



Construction Stakeholder Management
*Ezekiel Chinyio,
Paul Olomolaiye*

This book captures best practice in construction stakeholder management using a range of international case studies. Demonstrates stakeholder mapping, presents the power/interest matrix and analyzes a model for the timely engagement of stakeholders.

**978-1-4051-8098-6 | Cloth
416 pp. | Dec 2009 | \$142.99**

To browse and order bestselling civil engineering titles, please visit
www.wiley.ca/go/engineering.

 **WILEY-BLACKWELL**

ENGINEERS SEE THE WORLD DIFFERENTLY.
INCLUDING THEIR RETIREMENT PLANS.



At Great-West Life, we know your standards extend well beyond your engineering career. And when it comes to your retirement, while you may be relaxing, you won't be relaxing those standards. That's why you should consider the only retirement plan officially sponsored by Engineers Canada. Our group retirement plan offers an impressive array of investment options combined with lower-than-typical retail management fees and personalized assistance with investment selection. We understand that as an engineer you expect more and Great-West Life has the strength and stability to deliver.

For details, go to
www.engineerscanada.ca/e/pr_member_7.cfm
or call 1-800-724-3402.

Sponsored by



THE
Great-West Life
ASSURANCE  COMPANY

Engineers Canada is the business name of the Canadian Council of Professional Engineers.

Great-West Life and the key design are trademarks of The Great-West Life Assurance Company (Great-West), used under licence by its subsidiaries, London Life Insurance Company (London Life) and The Canada Life Assurance Company (Canada Life). Group retirement, savings and payout annuity products are issued by London Life and Canada Life respectively, and marketed and serviced by Great-West.