

Ottawa's rapid bridge replacement

All involved in this project deserve our congratulations for a job that was well thought out and well done ("Presto change-o: A busy highway bridge gets an almost-instant overhaul," *Engineering Dimensions*, May/June 2008, p. 23). Both the use of rapid replacement technology (RRT) and the consideration of user delay costs warrant more widespread usage.

In this case, it appears the selected approach was less costly than the conventional approach, so the choice of approach was straightforward. However, the author makes only passing reference of the magnitude of delay costs that were avoided by RRT. It would have been illuminating and educational to have seen an estimate of these costs, as, I submit, the order of magnitude would have persuaded many more engineers and project planners to consider this factor in project selection.

In many different applications I have considered user delay costs as a guide to decision making. I realize their estimation is subject to a variety of assumptions, and not likely to be very accurate. Nevertheless, in my experience, using reasonable assumptions that are acceptable in the circumstances to knowledgeable peers will provide an order of magnitude figure that greatly eases the decision-making process. These estimates can be most useful when the choice is between a cheaper but delay-heavy option, and one that is more expensive but involves less user delay.

Finally, I made some assumptions about the Ottawa situation, just for fun, and I would suggest the user delay costs that RRT avoided could easily equal the actual capital cost of the project, and may possibly be twice as much. I think this shows that this approach should be taken more seriously to better reflect communal values and to select optimized projects paid for by tax dollars.

G.D. Fairless, P.Eng.,
Neumarket, ON

Focus on the positive

What a sad statement that PEO should choose to dedicate an entire issue to being "tough on enforcement" (*Engineering Dimensions*, March/April 2008). As a practising engineer, I am aware of the importance of a well-regulated profession and am supportive of PEO's mandate in this area. The PEO magazine's constant harping on this issue is, however, a negative take on the engineer's role in our society. We have no shortage of exciting challenges and opportunities for the engineering profession to face nowadays—infrastructure renewal, water issues, security, defense, to name just a few. I would like to see our organization maintain its focus on championing our role, and on advocacy for the importance of professional engineering in our society. Of all the engineering literature that arrives on my desk each month (ASCE, ICE, APEGBC, to name a few), *Engineering Dimensions'* constant emphasis on discipline and enforcement stands out as a unique, consistent and negative message. Sadly, *Engineering Dimensions* continues to be near the bottom of the pile when I find myself with time to read up on engineering issues.

Michael H. Davies, PhD, P.Eng.,
Ottawa, ON

For the common good

Michael Gerbis, P.Eng., seems to think one visit to www.climatechange.org will result in an epiphany for the AGW (anthropogenic global warming) apostates ("Key role seen for P.Engs in global warming debate," *Engineering Dimensions*, March/April 2008, p. 24). The real howler in this article was that the high point in Mr. Gerbis' indoctrination took place not at one of our respected institutions of higher learning but at the knee of a politician. "The debate is over." Where have I heard that before? Such a simple-minded statement about an incredibly complex and little understood phenomena.

I did not write this letter to excoriate or ridicule Michael Gerbis. The views he

holds are not only popular but politically correct. I think the principle here is that we should not invoke our professional status in promulgating views outside the realm of our professional expertise. Michael Gerbis, citizen, is free to hold opinions on AGW, politics and religion and whatever takes his fancy.

If government or business chooses to promote so-called green measures and the services of professional engineers are required to achieve their ends, we professional engineers will gladly be of service. That service would be deemed to be for the public good. If a professional was requested to design a state-of-the-art, coal-fired generating plant conforming to existing regulations and standards, that also could be construed as being for the public good. On the other hand, if we are urged to promote primitive science as established doctrine under the banner of our profession, even where the promotion is deemed to be for the common good, we should demur.

After all, if AGW turns out to be a crock, the excreta will wash right off our Teflon politicians. Not so for scientists and engineers. The public will want someone to tar and feather if they feel bamboozled.

Robert J. Austin, P.Eng.,
London, ON

The facts

I wish to add something to David Hepburn's letter ("A shameful viewpoint," March/April 2008, *Engineering Dimensions*, p. 10). Sometimes facts just don't matter, but here they are in a rough form: At, say, 10 C, the partial water vapour pressure in air at dew-point is 9.21 mm Hg—that means 0.012118 atm. The partial pressure of CO₂ is around 10 to the power of -3.5 (atm)—that means 0.00032 atm. It means that water vapour is 38.32 times more abundant than CO₂ at these conditions.

Now, calculating the heat content of each of these two gases (ignoring the correction for mixing, which is small) from their specific heats, we get that the heat absorption by water vapour is roughly 2.6

times higher than that by CO₂ per unit of mass of each gas.

It follows that the water vapour in each mass unit of air receives $38.32 \times 2.6 =$ roughly 99.6 times more heat energy from the sun than CO₂ does in the same amount of air.

If clouds form, the role of CO₂ is even smaller, as clouds reflect the solar energy into space. Maybe that's why they form (= Le Chatelier's rule!). Thus, the "eminence" of CO₂ as a heat absorber is, in fact, trivial. However, CO₂ is an essential building block for forests and all plants. It is a gas no species in the living nature can exist without. It is *not* a pollutant. Individuals and groups, if they really seek the well-being of the planet, and the truth, should have tried to embrace CO₂, instead of demonizing it. But then, the modern alchemy of converting CO₂ into gold wouldn't work, and there would be no

nobody—yet—dared to demonize the ubiquitous humidity as a greenhouse gas, a gas two orders of magnitude more effective than CO₂.

*Andrew Block-Bolten, P.Eng.,
Pittsburgh, PA*

Headquarters: let's not botch it

I have been reading with a good deal of pleasure about the predicament that PEO now finds itself in ("Location, location, location," *Engineering Dimensions*, January/February 2008, p. 12)! Do we wish to have our headquarters in an industrial park located on the outskirts of the city? Or do we wish to have an office located in the downtown core of a large urban centre?

The cost of real estate will be substantially different depending on the choice we make. Then there is the question of

competition and for the disparaging remarks made about the design. But it won and was built and is still standing! What does it stand for? Courage and conviction! And its image seems to find its way to appear on every piece of promotional material the city issues.

So we are now given the opportunity (once in a lifetime) to select an example of what PEO stands for, so let's not botch it! Build something that we can be proud of. Let's make PEO distinctive of this country's engineers. And let's build it in the downtown core of the city of Toronto!

*Edward H. Oldham, P.Eng.,
Dundas, ON*

Opinions from the north

As a member who has been away from Ontario since 1976, I am seriously concerned about the need for building a new edifice in downtown Toronto. It is not often that I disagree with Walter Bilanski, P.Eng., but this time I do ("Building establishes professional engineering image," *Engineering Dimensions*, January/February 2008, p. 13)! There is no need to be in an area of high-cost real estate. Aside from the parking problem mentioned, there is access for members who are outside the city. I suggest that more attention would be paid to engineers if they built a unique building anywhere—something that gets publicity and illustrates our abilities. It could be in the Toronto outskirts or even in another community where costs are less.

Now, I suppose this may create concern among PEO employees and those who work downtown but, really, what percentage of the membership is that? I would like to know. Taking it one step further, if the decision is made to increase fees just to build a new building, I would regretfully have to resign in protest, despite the fact that I have been a member since 1962 (even though at 75, I am still working!). PEO membership is basically irrelevant to me—I do not work there and am registered in the Northwest Territories as well as Alberta at this time. In the past, I was

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Andrew Block-Bolten, P.Eng., Pittsburgh, PA

point talking about a "carbon footprint" indulgence tax.

Rising temperatures (if any) are not the result, but the cause of the CO₂ increase. Warming-induced CO₂ increase in the atmosphere (dictated *mainly* by the sun's activity), is the result of CO₂ evolution (heat a soda!) from the oceans, seas, rivers and lakes, where it remains physically and chemically dissolved in large quantities.

Maybe my fact-based viewpoint will also be judged shameful. But perhaps I can escape this kind of accusation, as

image: What kind of an image do we wish to portray?

So it's with a good deal of trepidation that I write this letter. I have always considered myself an outsider when it comes to the affairs of Professional Engineers Ontario, even though I am a member of long standing, but I do have an opinion on the location of the head office.

If we want an example of leadership and a structure that makes a statement, we have to look no further than Toronto City Hall, as designed by Viljo Revell in the 1950s. I was around for the design

active in my local chapter, I was active in the Alberta association committees, and I have been on council as well as committees in NT, so I have tried to give back some to the organizations.

This brings me to another topic: Joseph Grubb's letter in the January/February 2008 *Engineering Dimensions* ("Comparing professions," p. 8) raised some thoughts. Here on the south side of Great Slave Lake (NT), I am one of only two independent engineers (i.e. not working for a government department or a large company) and this is the reason I still work—I am needed and, I think, respected by the community. I enjoy being able to help people with many things, not just engineering matters. I am slightly retired now but because of the perceived remoteness it is virtually impossible to get an engineer to look at this area as a potential career. I have been in the north now for almost 32 years and it has been a good time. We are not remote, since we have year-round paved access to Alberta in the south. Sure, it is a small town, but so are many in Ontario! In general, I feel I am the equal of local lawyers, accountants and doctors, most of whom I know well in this community and even in our capital, Yellowknife. One big difference is that the MLAs are readily available to discuss any matter, which is quite different to Ontario. I suppose what I am saying to Joseph Grubb is that if you make an effort to become known in your community, you will be appreciated, and when appreciated it is sometimes surprising that you get better recognition and are trusted more than some of the other professions.

I hope my comments may be found useful, uplifting, enlightening or whatever—and hope they encourage others to look north.

*Chris (Christopher) Robinson, P.Eng.,
Hay River, NT*

Education advantage

I wish to concur fully with Walter's thoughts in the January/February 2008 edition ("The international picture," *Engineering Dimensions*, p. 3).

Having worked abroad most of my career, I have always ascertained that engineers from other countries were and continue to be better educated in the engineering disciplines than their Canadian counterparts. In the case of the British graduates, this should be expected as they enter university with A levels and then do a four-year honours course in engineering.

I graduated from Nova Scotia Technical College (now Dalhousie University) in 1974 after completing a five-year program, which has subsequently been reduced to four years. The five-year program allowed students to acquire a BSc in engineering followed by a BEng in an engineering discipline. The advantage of this was that we had to take a requisite number of humanities and social science courses to qualify for the BSc, which is exactly the direction the Europeans are espousing now. I might add that this "rounded" education I received created my competitive edge when competing against foreign engineers, so I recommend it strongly but also recognize that we also need additional engineering courses, knowing full well our current high school students who enter engineering are inferior in the three Rs compared to students in the past. This will require going to a five- or six-year program.

*Kim Freeman, P.Eng.,
Oakville, ON*

Improving our education

I am writing in response to (Past) President Bilanski's "fix" for the engineering system, which includes an additional one-year master of science for licensing education requirements ("The international picture," *Engineering Dimensions*, January/February 2008, p. 3). It is obvious there is a concern for the poor social image engineers are given. However, should PEO increase the number of years to obtain an engineering degree, I can see students leaning towards a more socially esteemed degree. The reason I chose engineering is that I wanted a career that gives me personal satisfaction in terms of being

prestigious and well respected in society's eyes, and to reap these benefits in a shorter time than other professional degrees. Had PEO increased the number of years to obtain an engineering degree when I was applying for postsecondary, I would have chosen a profession of which these qualities are certain, as the number of educational years would no longer be an advantage.

But even before PEO begins tampering with the education system, focus first on comparing Ontario engineers to the rest of Canada. Requirements for remaining licensed in Ontario are far behind those of other provinces, such as not requiring professional development hours or annual reviews. How can we, as a profession, be expected to be taken seriously when PEO regulates only the young and upcoming engineers but not the experienced senior engineers?

*Noel Haynes, fourth-year McMaster
University engineering student*

Correction

The following Ottawa Government Liaison Program committee members were not included in the volunteer list of PEO's 2007 annual review (pp. 17-19), included with the May/June 2008 issue of *Engineering Dimensions*. We thank the following members for their service to PEO:

Ehab Armanious, P.Eng.

Amjad Farran, P.Eng.

Peter Green, P.Eng.

John Grefford, P.Eng.

Christopher Morris, P.Eng.

Nirmal Sinha, P.Eng.

Santokh Virdee, P.Eng.

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