

# SCMs – what do you know about them?

The environment continues to be in the forefront for Canada's ready mixed concrete industry. It seems this space in recent issues of the Ready Mix News was consumed in one way or another by the topic, and rightfully so. Few topics are as important to your personal and financial well-being as the environment. It figures into your daily lifestyle, the state of your business and its future, and the country's economic status.... and so on!

It's right that the environment remains a high priority. After all, we are the ones who messed it up, so shouldn't we now be responsible for the clean up? Or at least find methods to cope with our nasty state of affairs?

The Canadian Ready Mixed Concrete Association (CRMCA) is seeking to grab the attention of groups and organizations proposing or now working towards much higher supplementary cementing materials (SCM) replacement of cement in concrete than typically practical or constructible under current industry standards.

There are several key proponents for a greater use of SCMs in Canada. There's the Government of Canada via the department of Public Works and Government Services (PWGSC), which owns, operates and builds institutional facilities; and Natural Resources Canada through its mineral and metals branch and associated agencies, notably the International Centre for Sustainable Development of Cement and Concrete.

Additionally, organizations such as the EcoSmart™ Concrete Project out of Vancouver, B.C., which is funded primarily by government with some industry financial support, have

as their purpose the creation and utilization of technology to support increased use of SCMs in concrete to reduce greenhouse gas (GHG). EcoSmart isn't a proprietary brand or a specific product formulation. EcoSmart is, "a government-industry partnership pledged to reduce the greenhouse gas signature of concrete by maximizing the replacement of portland cement in the concrete mix with supplementary cementing materials while maintaining or improving cost, performance and constructability."

If you're not entirely certain what is meant by the term supplementary cementing materials, "they are materials that when used with portland cement contribute to the properties of the hardened concrete through hydraulic or pozzolanic activity or both. Typical examples are fly ash, ground granulated blast furnace slag (GGBFS) and silica fume." (Source: Current Situation on the Production and Use of Supplementary Cementitious Materials (SCMs) in Concrete Construction in Canada — N. Bouzoubaâ, B. Fournier). High-volume supplementary cementing materials (HVSCM) concrete is concrete containing levels of SCM significantly above typical use levels for normal construction.

There's now a comfort level among ready mixed concrete producers, developed over the past 20 or so years, for SCM replacements in the range of 15 to 30 per cent. The concern now is regarding the concept for medium-volume (MVSCM — up to 30 to 45 per cent), and high-volume (HVSCM — 45 to 60 per cent) supplementary cementing materials being utilized in the cause of GHG reduction. A new CSA standard is just in the process of being developed, but in the



## Connely's Dura-Notes

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absence of specifications based on accepted standards and practical experience, the fear is that confusion will lead to product or project failures and huge liabilities.

There are more than 1,000 ready mixed concrete facilities in Canada producing on the order of 25 million cubic metres of concrete annually. These operations are all small power houses of economic activity, important to the communities where they're located, and essential to the viability of local construction markets. The main market breakdown for ready mixed concrete are: residential (32.1 per cent), commercial-industrial-institutional (49.7 per cent), infrastructure (7.6 per cent), and other-special (10.6 per cent). Typical SCM replacements are 10 to 25 per cent for fly ash, 15 to 40 per cent for slag, and five to 12 per cent for silica fume (Source: Current Situation on the Production and Use of Supplementary Cementitious Materials (SCMs) in Concrete Construction in Canada — N. Bouzoubaâ, B. Fournier).

There are good reasons to use supplementary cementing materials, but it's preferable to optimize rather than maximize SCM replacement of cement powder. SCMs in the cement and concrete industries can be divided into three categories: engineering, economic and ecological benefits (Source:

Malhotra and Mehta, 1996). The engineering benefits are to improve the workability and reduce water demand of the mix; to enhance ultimate strength, impermeability and durability; and to improve resistance to thermal cracking.

The economic perspective is based on portland cement being an expensive component of a concrete mixture, as it's a highly energy-intensive material to manufacture. Most SCMs are industrial by-products with little or no direct energy-related costs whose economic advantage may be reduced due to the transportation costs when sourced far from their point of use. Three of the four types of SCMs used are produced in Canada, namely fly ash, slag and silica fume, and all are in common use by the

construction industry.

Ecological benefits are due to a savings in GHG emissions. Every tonne of portland cement produced causes the release of approximately the same amount of carbon dioxide into the environment. Therefore, for every quantity of portland cement replaced by SCMs, there's a saving of CO<sub>2</sub> by almost the same quantity. CRMCA members contend Canada would be much better served by encouraging greater usage of SCMs at today's commonly accepted "comfort zone" of 15 to 30 per cent in larger market areas, especially residential, rather than promoting HVSCM applications with many more limitations.

The CRMCA applauds the work being done for the promotion of SCM use in concrete. However, the apparent lack of attention by the proponents for the folks who ultimately manufacture and deliver the product, within the parameters of virtually any specification created, must change. Suppliers must be kept in the loop, but this doesn't seem to be the case.

There is a perceived, if not real, sense among members of CRMCA that its member asso-

ciations were left out of the equation for the most part. The planning and implementation of this new SCM technology and appropriate standards can only achieve success when all the key partners are involved. In the end it's "our product" that's being modified. Consequentially, the associated day-to-day problems and liabilities will inevitably land in the laps of ready mixed producers.

We need to be clear that we're very much in favour of new and improved technology. We have a keen interest in playing a role in bettering our environment through the use of SCMs. We think our input can be significant.

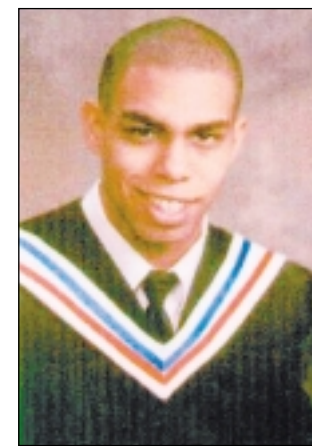
Most important, we welcome the opportunity to work with the many potential partners in our industry, to build better for the benefit of everyone. However, we expect to be consulted and listened to in the first instance, not after the fact. We aren't intransigent and inflexible, but rather we're experienced and reasonable. Our experience can be invaluable to the many players who may have less than full appreciation for the daily realities of the construction business.

## APRMCA's announces winners of third Memorial Scholarships

APRMCA is pleased to announce the results of its third Memorial Scholarships awards. Two \$1,000 entrance scholarships were awarded to Daniel Lucas of Lucasville, NS and Hector MacQuarrie of Halifax, NS. APRMCA extends sincere best wishes for academic success to each of the recipients.

The APRMCA Memorial Scholarships were instituted to assist dependents of employees of APRMCA member companies to further their studies in post-secondary education. The scholarships were funded this year by APRMCA (\$1,000), Lafarge Canada Inc. (\$500) and St. Lawrence Cement Inc. (\$500). The scholarships commemorate the lives and contributions of former APRMCA members who committed their time and resources for the improvement of their industry and the growth of APRMCA. This year the scholarship recipients were chosen from a field of 6 qualified applicants, a decrease in the number of applicants in 2002.

The 2003 Scholarships are named in memory of David R. Yeadon who passed away in June 2002. He was employed for the last fifteen years with Jacques Whitford and Associates Ltd., Dartmouth, Nova Scotia, as a concrete technician. He was well known and respected among contractors and ready mixed producers for his work at Nova



Hector MacQuarrie (left) and Daniel Lucas, winners of the APRMCA Memorial Scholarships.

Scotia project sites.

Our graduates represent the promise of a strong future and the hope that they will be equipped to make our world a better place. They deserve our support and encouragement. All applicants for the APRMCA scholarships were very qualified, making the choices difficult. The results speak for themselves.

Daniel Lucas, sponsored by Mel Fiander of Quality Concrete, graduated from Millwood High School, Sackville, NS. His academic success was coupled with a love of sports and an active involvement in school activities. Daniel entered Dalhousie University's Engineering program in September.

Hector MacQuarrie, sponsored by Marcie MacQuarrie, Precision Concrete Services Ltd., is a graduate of Halifax Grammar School, Halifax,

NS. Hector maintained excellent standing throughout his high school years while participating in many extracurricular activities. He captained his school hockey team, took part in the annual school musical, taught and played guitar. He is an accomplished professional bagpiper who teaches piping, plays in local pipe bands and has won several prestigious national and international piping awards. Hector began the first year of the Engineering program at St Francis Xavier University this year.

The APRMCA Memorial Scholarships were established as an ongoing initiative of the Association. The scholarship committee will begin planning soon for the 2004 awards. Information and application forms for the 2004 Memorial Scholarships will be available in the New Year.



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