

NEU Carbon Neutral Concrete Specialty Day Lunch

Tuesday April 4, 2023

11:30am – 1:30pm

12:15 pm – 12:45 pm

Presentation Title: Overcoming Barriers to Adoption of More Sustainable Concretes

Presented By: Dr. Doug Hooton, University of Toronto

Description:

Standards and Codes are often seen as barriers to adoption of more sustainable concretes, but many of the levers for improving sustainability are already in Standards but are not widely adopted in practice. These levers include optimization of total aggregate gradations, use of Portland-limestone cement and use of sufficient levels of SCMs or blended cements. But in many cases, the barriers appear to be related perceived increased levels of risk by various parties in the construction value chain. In some cases, local or State specifications impose prescriptive requirements that add barriers and confuse roles and responsibilities; in some regions, suppliers have supply chain issues that limit local options (materials availability or facilities for handling multiple materials); contractors see risk if they are not provided with sufficient information to successfully bid and complete the project, and construction work forces perceive risk from not knowing how such changes might affect their placing, finishing, and curing practices. Some of these barriers can be overcome by collaborative demonstration projects, and by providing sufficient education/ technology transfer/ familiarization to explain how such changes may impact on construction processes and schedules. Also, the concrete supply industry needs to work closely with specifiers and contractors and provide more on-site support for the trades.

12:45 pm – 1:15 pm

Presentation Title: Proposed Carbon Reduction Strategies (Representatives from the industry)

12:45 pm – 12:55 pm

Presentation Title: Buildings as a Solution – A New Alternative to Carbon Capture

Presented By: Patrick McConnell, Atlantis Fiber

Description:

Carbon Capture and Sequestration technologies, such as the method of infusing CO₂ into freshly mixed concrete, have proven to be an effective method for reducing overall carbon with, in some cases, a 30% reduction in overall emissions. However, despite these significant advantages, this process still requires the generation of new concrete.

The proposed retrofit application is a highly ductile, thin-set, sprayed matrix which is carbon neutral and exhibits efficacy over a broad range of substrates. For this study, we will demonstrate this application on an Unreinforced Masonry school that will compare this application to the alternatives of shotcrete shear walls and the demolition and rebuild of this same school. Lastly, we will compare the carbon offsets of

this retrofit application to both demolition and rebuild as well as carbon capture and sequestration methods briefly described above.

12:55 pm – 1:05 pm

Presentation Title: Impact of UHPC to the total carbon footprint of a pre-cast bridge installation.

Presented By: Peter W Weber, ceEntek Pte Ltd

Description:

The construction and repair of bridges and raised highways is highlighted by a long construction cycle with related traffic interruptions and rerouting. The 'Accelerated Bridge Construction', ABC and 'Every Day Counts' programs of the Federal Highway Administration are addressing these issues and opening the market for new concepts. The use of pre-cast elements in combination with UHPC for connections and joints allows to reduce the amount of concrete required, cuts down the required curing time and increases durability. As a result, the total carbon footprint, the combination of concrete and traffic related CO2 emissions for the construction or repair of a bridge is reduced. In this presentation we will discuss two case studies that demonstrated carbon reduction using UHPC; Renovation of the van Wyck Freeway in New York and Construction of a 3-span bridge in Indiana.

1:05 pm – 1:15 pm

Presentation Title: Low Carbon Concrete Case Studies

Presented By: Mark A. Bury, Master Builders Solutions

Description:

Minimizing the overall environmental footprint of concrete structures is of significant interest, and in some cases, a stated goal in specifying and constructing many of today's concrete buildings and elements. The reduction in CO2, per volume of concrete produced, is a key part of this goal. While there are different options to consider, this presentation will focus on new and novel technologies, allowing for the reduction of cement contents in concrete mixture proportions, to help turn these environmental goals into realities. The use of advanced mixture optimization techniques and innovative chemical admixtures have permitted concrete producers to offer high quality, durable concrete that meets the demands for both structural and environmental performance targets. In practice, cement reduction of up to 70%. has proven to be successful. These technologies and their impact on concrete performance will be presented. Case studies will be shared that highlight several unique and iconic structures, that were designed for durability, aesthetics, and significant reduction in CO2.

1:15 pm – 1:25 pm

Presentation Title: Leading the Way to Net Zero Concrete – Heidelberg Materials Carbon Roadmap

Presented By: Larry Rowland, Sustainability Market Manager

Description:

Heidelberg Materials aims to be the industry leader on the path to low carbon, net zero concrete. As a major concrete, aggregate and cementitious materials supplier, Heidelberg Materials is an important stakeholder for achieving more sustainable concrete. This presentation will outline key facets of our sustainability roadmap, which details our commitment to achieve net zero concrete by 2050. Heidelberg

Materials is committing to a transparent approach throughout this process. The roadmap of our journey includes the use of innovative products and technologies and carbon capture utilization and storage, as well as inputs from the circular economy, to reach our ambitious goals.