

70th Annual Concrete Conference

Program

December 3, 2020

Sponsored by: College of Continuing and Professional Studies, University of Minnesota
Department of Civil, Environmental, and Geo-Engineering, College of Science and Engineering, University of Minnesota

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College of Continuing
& Professional Studies

UNIVERSITY OF MINNESOTA

7:30 a.m. | Log on

8:00 | Welcome

Rachel Detwiler, Beton Consulting Engineers

8:10

ELEVEN

Ryan Hopeman, Meyer Borgman Johnson; *Luke Vollmer*, Ryan Companies

Soaring 43 stories, ELEVEN is a stunning new Art Deco high-rise overlooking the Mississippi River, Gold Medal Park, Downtown Minneapolis, and the Stone Arch Bridge. ELEVEN marks the first residential condominium tower in the heart of Minneapolis by Robert A.M. Stern Architects and developed by Ryan Companies. ELEVEN will be the tallest residential building in Minnesota at 550 feet. This presentation will cover technical engineering challenges and the contractor solutions required to make this tower a reality.

Moderator: *Joshua Edwards*, AVR, Inc. and Affiliates

9:10 | Break

9:15

Recent Developments in Building Information Modeling (BIM) for Concrete Structures

Christopher Brown, Consultant; *David Grundler, Jr.*, Applied Systems Associates, Inc.; *James Barr*, Bentley Systems, Inc.

This session will inform professionals in the concrete design and construction industry on the progress being made to advance Building Information Modeling (BIM) for concrete structures. The presentation will include a brief history of ACI's Technical Committee 131 on BIM for Cast-in-Place Concrete, through the creation of the initial road map describing the common tasks related to concrete design and construction, to a brief outline of digital data exchanges that are part of the vision that may one day transform the use of BIM applications for concrete construction. The presentation will showcase current use of one of the ACI exchanges, which supports the transfer of rebar data from detailing software to fabrication and shipment to the job site, highlighting the potential for true project collaboration and project efficiencies as models and data exchanges become automated between parties and their software applications. BIM/VDC has been around for more than a

decade and presents a lot of options to contractors. Today, BIM is covering the entire spectrum, from 3D visualization to full integration into nearly every aspect of the construction business. The presentation will utilize some recent building and bridge projects to identify efficiencies being gained through the use of BIM for various aspects of construction including design validation, clash detection/coordination, material take-offs, rebar detailing, fabrication and installation, scheduling, 4D/5D modeling, etc., providing an overview of real-world applications for construction using BIM. The final part of the presentation will focus on two new data exchanges under development by ACI 131 that have the goal of engaging more participants of the design and construction team in leveraging BIM to achieve higher value.

Moderator: *Cathy French*, University of Minnesota

10:15 | Break

10:20

The Search for Alternative Supplementary Cementing Materials

Michael Thomas, University of New Brunswick

The use of supplementary cementing materials (SCM) as a partial replacement for Portland cement in concrete is a common practice worldwide, and the benefits of their use, especially in terms of improved concrete durability, are well established. In many countries the most widely used SCMs are fly ash and slag as they are industrial by-products which renders them relatively economic alternatives. However, in many countries the long-term supply of these materials is in jeopardy as they are not produced locally. The use of pozzolans is somewhat challenging as different sources produce materials with widely varying properties, making it difficult to classify such materials in terms of concrete performance. This presentation discusses the use of pozzolans particularly in relation to methods for evaluating potential sources and determining their suitability for use in concrete.

Moderator: *Rachel Detwiler*, Beton Consulting Engineers

11:05 | Break

11:10

New Developments in Chemical Admixtures for Sustainable Concrete Construction

Charles Nmai, Master Builders Solutions US LLC

Admixtures are essential to meeting the demands of the concrete industry with respect to sustainable construction. This concise presentation will focus on recent developments in admixture technologies and the benefits they provide.

Moderator: *Joshua Edwards*, AVR, Inc. and Affiliates

Noon

Concrete Award Presentation

2020 Award Presented to *Kevin Western*, American Association of State Highway and Transportation Officials

Kevin is the State Bridge Engineer for Minnesota. He has 32 years of experience in bridge design, standards, and construction. He has also served as State Bridge Design Engineer, Major Projects Bridge Engineer, and Design Manager for the post-tensioned concrete box St. Croix River Bridge, and he was the Deputy Project Manager for design of the concrete box girder 35W St. Anthony Bridge project. Kevin was also heavily involved with the Highway 53 relocation project in Virginia, Minnesota and the Red Wing Bridge replacement over the Mississippi River in Red Wing, which was designed by MnDOT Bridge Office staff. Kevin currently serves as the chair of the American Association of State Highway and Transportation Officials (AASHTO) Concrete Committee (T-10) and as vice-chair of AASHTO Bridge Culvert Committee (T-13). Over Kevin's career he has been involved in the design and construction of a very broad range of bridge structures and was instrumental in the early development and implementation of Load Resistance Factor Design (LRFD) for all Minnesota bridges.

Presented by: *Paul Rowekamp*, Minnesota Department of Transportation

12:15 p.m.

Lunch/Concrete Conference History Video

1:00

Beyond Failure: Engineering Analysis of Structures

Norb Delatte, Oklahoma State University

Structures are not supposed to fall down or otherwise fail. In many cases when failures do occur, they result from a number of causes. Our speaker, Dr. Norb Delatte, is a leading forensic investigator, as well as a respected educator. Dr. Delatte will discuss the forensic examination of bridges and other structures. He will examine them from code, fundamental, and ethical perspectives.

Moderator: *Kevin MacDonald*, Beton Consulting Engineers

This conference awards 0.65 University of Minnesota College of Continuing and Professional Studies CEUs to those attending all sessions. One University of Minnesota College of Continuing and Professional Studies CEU is defined as 10 contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction. A CEU certificate will be sent to each participant after the conference. A permanent record of CEUs earned will be maintained by the University of Minnesota Admissions and Record Transcript Office.

1:45 | Break

1:50

Update on ACI Current Initiatives and Legal Issues in Concrete Construction

Jeffrey Coleman, American Concrete Institute

Mr. Coleman is the current president of the American Concrete Institute (ACI). He will give the attendees an update on ACI activities including their response to the pandemic. Mr. Coleman will also present a program on "Legal Issues in Concrete Construction" that presents information from select chapters of his book by the same name.

Moderator: *Mike Ramerth*, Meyer Borgman Johnson

2:35 | Break

2:40

Basics and Implementation of the Strut-and-Tie Method

Gary Klein, Wiss, Janney, Elstner Associates, Inc.

The strut-and-tie method is a very useful tool for proportioning and evaluating discontinuity regions in structural concrete elements. The presentation will review the basics of the strut-and-tie method, including modeling methods; node details; and strengths of struts, ties, and nodes. The presentation will then describe how the strut-and-tie method is implemented for various types of discontinuity regions such as deep beams, corbels, and post-tensioning anchorage zones. Finally, a real-world example will be briefly described.

Moderator: *Michael Murphy*, Wiss, Janney, Elstner Associates, Inc.

3:25 | Break

3:30

US Cement/Concrete Outlook for 2021

Dave Zwicke, Portland Cement Association

The presentation will discuss implications from the election on the cement/concrete industry, as well as likely economic growth scenarios that may unfold under differing assumptions regarding COVID-19.

Moderator: *Rachel Detwiler*, Beton Consulting Engineers

4:15 | Adjourn