

# 2022 Structural Engineering Webinar Series

Online

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College of Continuing & Professional Studies

UNIVERSITY OF MINNESOTA

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## Webinar Schedule

All webinars will be held from 1:00–4:15 p.m CST

### January 25, 2022

#### Ethics in Engineering Practice: Rethinking the Why and How!

*Scott A. Civjan, PhD, PE, University of Massachusetts*

Moderator: *Ali Mokhtarzadeh*

In this interactive session, Dr. Civjan will relate typical engineering decisions to ethical issues. He will provide a perspective on the importance of engineering ethics, insight into the ethical dilemma decision process, and strategies to improve decision skills and avoid ethical fading. Recent changes to the ASCE Code of Ethics, case studies, and recent news items will be used as the basis for the need for new perspectives. The lecture will discuss the individual decision process, impacts of everyday engineering decisions, and warning signs of unsupported justifications for questionable behavior. The new ASCE Code of Ethics clarifies some of these issues and can be seen as checks on the ethics of decisions rather than as the driving force for making decisions. An engineer can develop the skills to improve their ethical decision process through acknowledging their decision process, increasing awareness of ethical issues and wider effects of decisions, and paying attention to company culture. Through this session attendees will be encouraged to think about where their ethical standards have been upheld and where they could be improved in their engineering practice.

### February 1, 2022

#### How the Towers Fell: Lessons Learned from the 1993 and 9/11 Attacks

*Joseph M. Englot, PE, HNTB Corporation*

Moderator: *Stephen Clark*

To understand “How the Towers Fell” we first need to examine how and why the WTC Complex and PATH Station were first constructed, the existing “New Jersey Tubes” they replaced, the details of the 1993 WTC bombing damage, the forensic investigation by ATF and FBI, the recovery and repair effort, and the lessons learned on improving security and emergency response at the WTC complex that were factors during the 9/11 attack. This will be followed by a description of evacuation of the WTC complex after the first plane hit the towers and how the Twin Towers and 7 World Trade Center collapsed with a first-hand, in-depth description of the site damage.

We will examine the damage to lower Manhattan and the severe economic impact that the tragic event had on the community and will build upon the information presented on the 1993 bombing and the 9/11 attacks. This session will cover temporary shoring, flood protection, and site cleanup from the 9/11 attacks followed by the construction of the Temporary PATH Station, reconstruction, repairs to the PATH tunnels and Exchange Place Station in NJ. It will cover recommended improvements in building codes. It will foster discussion about whether a standard high-rise tower could have survived the 1993 bombing and why the Twin Towers and 7 World Trade Center all remained stable for different time periods, only to collapse later in a manner resembling controlled demolition.

**February 8, 2022**

## **Sustainable Structure through Embodied Carbon Reduction**

*Anthony Pak, PEng., MSc., Priopta; Michael Gryniuk, PE, LeMessurier; Frances Yang, SE, Arup*

Moderator: *Jon Wacker*

The extraction, fabrication, transportation, and construction of building materials are responsible for roughly 11% of global greenhouse emissions. This seminar will introduce the topic of embodied carbon, how it is measured, and its connection to greenhouse gas emissions. Material comparisons and case studies will be presented to show how engineers can make design and material sourcing decisions to reduce embodied carbon.

**February 15, 2022**

## **Emergency Repair of the Hernando de Soto Bridge**

*Daniel Baxter, PE, SE, Michael Baker International; Ted Kniazewycz, PE, Tennessee Department of Transportation; Aaron Stover, PE, SE, Michael Baker International*

Moderator: *Arielle Ehrlich*

On May 11, 2021, a partial fracture of one of the tie girders of the Hernando de Soto Bridge's arch span was found during a fracture-critical inspection, which required the immediate closure of highway and river traffic. The immediate challenge was to stabilize the bridge to allow the river traffic to resume. The team began both development of analytical models and repair plans for the removal of the fractured section and complete repair of the member to restore vehicular traffic. The phased approach allowed construction crews to safely perform repairs of the fracture and other areas identified in the ensuing follow-up inspections. This presentation will discuss the immediate response and the three-phased approach taken to stabilize the structure, repair the fractured tie, and assess the remaining structure before the bridge was reopened to vehicular traffic on August 2, just 83 days after the fracture was discovered.

**February 22, 2022**

## **Snow Loads: Drift Conditions, Solar Panel Roofs, and What's New for ASCE 7-22**

*Michael O'Rourke, Ph.D., P.E., FSEI, M.ASCE; Rensselaer Polytechnic Institute*

Moderator: *Greg Mosier*

The session will include discussion on three topics. First, snow drift loading on roof structures will be explored including a discussion on the background of key parameters. Next, snow loading on solar panels and the adjacent roof areas will be addressed. Finally, there will be a preview of upcoming snow load revisions coming in the ASCE 7-22.

**March 1, 2022**

## **Cold Regions Engineering**

*Hannele Zubeck, PhD, PE, University of Alaska, Anchorage*

Moderator: *Scott Snelling*

Dr. Hannele Zubeck will present issues of cold regions geotechnical engineering that are of interest to structural engineers. She introduces definitions and language relating to arctic and cold regions, climate, seasonally frozen ground, and permafrost. She will explain permafrost terrain features and thermal regime, and how they affect the design of foundations and structures. Topics such as foundation settlement due to creep of ground ice and the effects of warming permafrost on the bearing capacity of the foundations will be covered. Design challenges on seasonal frost areas, such as frost heave, differential frost heave, and frost jacking will be explained, and mitigation measures will be studied. After completing the session, participants will grasp the design challenges resulting from the effects of ground freezing and how these challenges will change some of the requirements of the design of the overlaying superstructures.

## **Registration**

Registration fee is \$95 for each individual webinar or a discounted fee of \$475 for the entire series. Fee includes tuition and any instructional materials.

## **Questions**

[ccapsconf5@umn.edu](mailto:ccapsconf5@umn.edu)

## **Continuing Education Units**

Each seminar awards 0.3 CEUs. The entire seminar series awards 1.8 CEUs. One CEU is defined as 10 contact hours in an organized continuing education activity under responsible sponsorship, capable direction, and qualified instruction.