



# 2016 ASCE Spring Technical Conference

## Conference Speakers

General Session

***Leo Frigo Bridge Corrosion Monitoring &  
I-41 and WIS-441 Updates***

**Tom Buchholz, P.E.  
Wisconsin Department of Transportation**

Keynote Address

***Improving Safety and Recreation at Montello Dam***

**Jim Botz, P.E. and Marty Kemps, P.E.  
Mead & Hunt**

Dinner Session

***Ethical Rationales in a World that May not Give a Damn***

**Chris Martin  
UWGB & St. Norbert College**



## **WELCOME / GENERAL SESSION**

**9:00 A.M. – 10:30 A.M. (One PDH)**

### **WELCOME / GREETINGS AND REMARKS / VENDOR INTRODUCTIONS**

**Speaker:** Tom Buchholz, P.E., Wisconsin Department of Transportation Northeast Region

**Topic:** **Leo Frigo Corrosion Monitoring / I-41 & WIS 441 Updates**

**Abstract:** The Leo Frigo Bridge was repaired and back open 102 days after the events of September 25, 2013. WisDOT continues to monitor corrosion on the piling to gain an understanding on the rate of corrosion on the structure. Corrosion instrumentation is in place to continue to monitor the effects of the soil on the piling.

Interstate Conversion began its discussion in 2005 from a bill authored by U.S. Representative Tom Petri. Nine years later, the blue signs have now been installed from the Illinois state line to Green Bay.

The Interstate 41 Project (formerly the US 41 Project) is in the home stretch of final completion. The \$1.4-billion reconstruction project upgraded 17 miles of highway in Winnebago County and 14 miles in Brown County. The Winnebago County portion opened in 2013 and Brown County is scheduled for opening at the end of 2016.

In 2014, work began on the \$482-million WIS 441 Tri-County project, with progress continuing towards a 2021 project completion. The 5.5-mile project will complete the missing movements of the I41/US 10/WIS 441 Interchange, construct a second Little Lake Butte des Morts crossing, and reconstruct and expand US 10/WIS 441 to enhance traffic flow in the Fox Valley area.

# TECHNICAL SESSION I

10:45 A.M. – 11:45 A.M. (One PDH)

## **Water Resources / Environmental Engineering**

**Speaker:** Abigail F. Cantor, P.E., Chemical Engineer and President, Process Research Solutions LLC

**Topic:** **Implications of the Flint, Michigan Water Crisis and Their Effect on Wisconsin and the Nation's Drinking Water Quality**

**Abstract:** The Flint, Michigan water crisis is an example of the complex perspective of drinking water quality that has been publically presented since 2002. And yet, the US Environmental Protection Agency (EPA) and the Federal drinking water regulations adhere to a very simplistic model, especially when regulating lead and copper release into drinking water.

In the city of Flint, lives have been lost and public health compromised while politicians dithered, but the public health threat could continue as water quality experts go down the wrong path to solving the problem based on the simplistic EPA perspective. This occurs as the key drinking water regulation, the Lead and Copper Rule, is being rewritten and the EPA continues their resistance to addressing the complexity of water quality.

The simplistic view of drinking water quality has implications on the approach water systems in the United States choose to take and are required to take in solving water quality issues. Such implications are magnified in Wisconsin where many ground water systems have water characteristics that are erroneously deemed "corrosive" to lead and copper.

This presentation puts the pieces of the drinking water puzzle together and shifts the paradigm for successfully controlling the drinking water quality delivered to the public.

## **Management and Leadership**

**Speaker:** Tom Pulse, P.E., President, Ayres Associates  
Lindsey Kaufmann, P.E., Transportation Manager, Michael Baker International

**Topic:** **Jump Start your Leadership Potential**

**Abstract:** ACEC WI is currently conducting its 10th year of Leadership Institute, with the 11th offering beginning in September 2016. This popular leadership and career development experience is tailored to launch professionals on a development track for successful project management and principal positions. While the series is designed for individuals with six to 12 years of experience, it is also a tremendous opportunity for current leaders to benefit from top-notch programming focused on the design profession. Participants gain a well-rounded training on the business side of the profession and the foundation they need to be an effective leader. This session will provide an overview of the program and benefits achieved from the perspective of a Class Advisor and a recent Graduate.

## **Structural**

**Speaker:** Kevin Wisniewski, S.E., P.E., Larson Engineering

**Topic:** **Introduction to Façade Engineering plus Extreme Example, New World Trade Center, NY, NY**

**Abstract:** All buildings require a facade to protect the occupants against the exterior weather conditions and these facades need to be designed to resist the environmental loads acting against them. There are many different facades that are used to develop the aesthetics of the building ranging from a panel systems to aluminum curtain wall systems and each of these systems are unique in their performance. By showing examples of different types of facades used on projects and their performance requirements the audience will understand the engineering challenges that are present and how they can be resolved. We will present an extreme example, an abbreviated look at the façade of the new World Trade Center.

## **Construction**

**Speaker:** Jeremy Craven, P.E., Vice President – Engineering, Edgerton Contractors

**Topic:** **Earthwork Modeling**

**Abstract:** Earthwork Modeling at Edgerton has followed an evolutionary progression. We made our first investment in GPS machine control to take advantage of cost savings and increased production in the field: less staking, ability to grade at night and underwater, operators not waiting for stakes. In order to get Operators to follow the design loaded into the machines, we needed to make sure the designs were the best possible interpretation of design intent. This forced us to go through the plans at a level of detail we had never done previously. We started seeing that the process helped us solve problems before they got to the field. This led to the realization that the real advantage of GPS machine control - the disruptive impact on our business - was the fast, detailed, accurate earthwork modeling required to make it all work.

The real benefit of GPS is its application as a planning tool. Once we adjusted our thinking to that realization, we started pushing the modeling up sooner and sooner in the process. Now, instead of waiting until we have a job to model it, we do some form of modeling as part of every bid. It turns out that the benefits of finding problems early apply to the bid process as well as construction. It has become apparent that the next frontier for Edgerton is to find a way to apply modeling even before the bid comes out. If the benefits are so significant in construction and bidding, surely they can have an even bigger impact in the planning process. This is where the engineers come in. Engineers and contractors now have a way to talk the same language, and communicate on the same platform. Whatever efficiencies of cost and time are enabled by this new capability will be forced on all of us by the market. Engineers and contractors should work together to leverage this technology to address the traditional pain points for owners in the design-bid-build process.

## **LUNCH, AWARDS / KEYNOTE ADDRESS**

**12:00 P.M. – 1:30 P.M. (One PDH)**

### **PLATED LUNCHEON / STUDENT PRESENTATIONS / AWARDS CEREMONY**

**Speaker:** Jim Botz, P.E., Marty Kemps, P.E., Mead & Hunt

**Topic:** **Improving Safety and Recreation at Montello Dam**

The embankment condition of an existing dam caused safety concerns after a major storm. The embankment and spillway was reconstructed to reduce the risk of failure using a vibrating beam slurry wall. The overview and gated spillways were also reconstructed and used granite stone facings to maintain the historical look and significance. Included with the reconstruction was a four-step fish ladder to allow migratory fish to pass through the dam. This project won the Association of Conservation Engineers 2015 Award.

## **TECHNICAL SESSION 2**

**1:45 P.M. – 2:45 P.M. (One PDH)**

### **Transportation**

**Speaker:** Dan Tyler, P.E., Design Oversight Liaison, Wisconsin Department of Transportation

**Topic:** **Value Engineering and Cost-Risk Tools to Make Your Project More Efficient**

**Abstract:** Value Engineering is a tried-and-true process for achieving more function for less cost. With its origins in WWII-era manufacturing, the 7-step V.E. job plan can improve projects and processes in all sectors. This presentation will overview V.E. and Cost-Risk studies, and illustrate how Wisconsin DOT has used these tools on its projects to reduce costs, shorten schedules, and develop more reliable estimates.

### **Geotechnical**

**Speaker:** Greg Grenlee, P.E., Principal, Engineering Partners International

**Topic:** **University of Minnesota Northrop Auditorium Renovation Underpinning and Micropile Foundation Case Study**

**Abstract:** The recent renovation of Northrop Auditorium required much of the original 1929 interior structure be removed and replaced, or augmented, while none of the exterior building walls were removed or modified in order to maintain the historic look of the building. All of the construction activity was done within the confines of the existing building perimeter walls, which presented many logistical challenges operating in a crowded work area. This case study will focus on the underpinning and foundation construction process used to achieve the required aggressive renovation. For the underpinning, a multi-phased construction sequence was developed to install a new foundation pile cap and micropiles up to 12 feet directly below the original spread footing. Column loads up to 760 kips had to be transferred from the existing spread footing to the new foundation. The presentation will discuss the underpinning process, design criteria, construction coordination, and construction challenges encountered during the project.

### **Structural Engineering**

**Speaker:** Mark Rapant, P.E., AIA, Structural Engineer, Milwaukee County  
Sam Crawford, Engineers Without Borders Student Member, UW-Platteville

**Topic:** **Out of Africa – Engineers Without Borders & UW-Platteville**

**Abstract:** A new primary school is rising near the village of Nsumia in Ghana, Africa. Thanks to the fundraising, design, and construction efforts of the University of Wisconsin – Platteville student chapter of Engineers Without Borders, a four building, 9,600 square foot, 14 room school is under construction. A total of about 50 UWP students and 6 professional mentors have traveled to Ghana 8 times, over a period of 4 years, to work on all aspects of the project. Mark Rapant, an Architect and a Structural Engineer with Milwaukee County Architecture, Engineering, and Environmental Services Section has traveled with three different Student Teams to Ghana to provide mentoring and support. Mark will provide an informational, educational, and fun-filled presentation on this school project, and on the wonderful people and culture of Ghana, Africa. Sam, a Civil Engineering junior at UW-Platteville, will provide a student volunteer's perspective of how the student engineers worked with the Ghanaians and with their P.E. Mentor.

## **Construction**

**Speaker:** Ziad Salameh, P.E., Ph.D., Principal in Charge, ZS LLC  
Dan Parks, Divisional Safety Manager, JF Ahern

**Topic:** **Fall Protection and Facilities Management**

**Abstract:** The presenters will provide an introduction to fall protection as it relates to facility management and construction projects. The presentation will introduce fall protection regulations for general industry (OSHA 1910) and construction (OSHA 1926), types of fall protection, identification of fall hazards, and the use of personal fall protection systems.

## **TECHNICAL SESSION 3** **3:00 P.M. – 4:00 P.M. (One PDH)**

## **Water Resources / Environmental Engineering**

**Speaker:** Davina Bonness, Director of Land and Water Conservation, Kewaunee County

**Topic:** **Groundwater Quality in Kewaunee County**

**Abstract:** Throughout Wisconsin, underlying a number of counties is the Silurian dolomite bedrock aquifer, which contains a vast network of interconnected cracks, fractures, and sinkholes. These features can quickly transport contaminants from the surface to our groundwater aquifer that residents solely rely on for their drinking water. This presentation will discuss Kewaunee County's groundwater quality, well testing results, and how the County is moving forward to protect our groundwater resource.

## **Geotechnical**

**Speaker:** Mark Meyers, P.E., UW-Platteville

**Topic:** **Slope Stability Analysis Using Residual Shear Strengths: The Development of a New USACE Design Criteria**

**Abstract:** The soils in Eastern North Dakota and Western Minnesota are the legacy of glacial activity 9000 years before present. Once the glacial activity ceased, the Red River of the North cut a path through the landscape, leaving a meander belt high, long riverbanks supported by soft, weak lacustrine clays, resulting in slope movements throughout the valley. The development of the region led to efforts to control spring flooding, many times resulting in Government assisted emergency flood fighting efforts; the primary agency is the US Army Corps of Engineers (USACE) St. Paul District Office. This presentation will present the evolution of a new methodology used to design flood control levees at Grand Forks and East Grand Forks, taking into account the soft, weak clays present in the region, using residual strengths and lower minimum factors of safety than typically required for USACE projects.

## **Transportation**

**Speaker:** Larry Barta, P.E., Wisconsin Department of Transportation  
Eric Hanson, P.E., Project Manager, Strand Associates, Inc.

**Topic:** **Madison Beltline Corridor – Analyzing Capacity Expansion Alternatives**

**Abstract:** The Madison Beltline is a 20 mile freeway serving the Madison metropolitan area and greater Dane County. The Wisconsin Department of Transportation Southwest Region (WisDOT SW) began the process of investigating long-term multimodal solutions for the corridor in 2012 with the start of the Beltline Planning and Environment Linkages (PEL) study. WisDOT SW and their consultant partners are nearing completion of the PEL and moving into the Environmental Impact Statement stage of the project. This presentation will summarize the process used by the PEL and EIS teams to develop, evaluate, and make recommendations regarding motor vehicle capacity expansion alternatives for the Beltline mainline and interchanges.

## **Construction**

**Speaker:** Jon Chapman, Shane Zodrow, R.A. Smith National, Inc.

**Topic:** **3D Laser Scanning and UAV Use**

**Abstract:** Jon and Shane will discuss the use of static 3D laser scanning for survey-accurate reality capture of a multitude of different projects including bridges, roadways, sites and buildings for use in engineering, improvement and redevelopment processes. Specific project examples and how the service provides our clients with return-on-investment will be shared.

With R.A. Smith's recently approved Section 333 Exemption from the FAA, we will briefly discuss how we are currently using this technology, including some specific project examples. Interactive discussion on other potential use will be encouraged.

<h2><b>TECHNICAL SESSION 4</b></h2> <p><b>4:15 P.M. – 5:15 P.M. (One PDH)</b></p>
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## **Water Resources / Environmental Engineering**

**Speaker:** Richard Feeney, P.E., Vice President, Tetra Tech, Inc.  
Dustin Bauman, Project Manager, J.F. Brennan Company, Inc.

**Topic:** **Update on PCB Remediation of Operable Units 2-5 of the Lower Fox River**

**Abstract:** The speakers will provide an overview of the remedy types being designed and equipment and techniques used to implement them, in describing the status and progress made in remediating PCBs deposited in the Lower Fox River. The project is nearing completion after the initial year of design and construction of the sediment desanding and dewatering facility (2008) followed by seven years of steady progress implementing remedies in the river. Dredging and capping/cover techniques used to remove or confine and isolate PCBs in-place will be described. Some unique challenges of this project include:

- Sampling to determine areas requiring remediation and interpreting the sample data to produce efficient remedial designs;
- Minimizing turbidity during remedial actions to prevent contaminated sediment from migrating and re-depositing elsewhere in the river;
- Identifying and managing in-river work around any historically significant objects;
- Accommodating large commercial vessels that utilize the river;
- Interacting with riparian property owners;
- Obtaining approval to beneficially reuse sand separated from dredged sediment to conserve landfill space;
- Executing the project under the auspices of a diverse group of USEPA, WDNR and private industry consultants known as the Agencies/Oversight Team (A/OT);
- Working among several entities that are funding the remedial work; and,
- Ensuring safety in planning all aspects of the work, especially dredging or the use of spuds to stabilize project equipment near utilities that cross the river below the mudline.

## **Geotechnical**

**Speaker:** Doug Bath, P.E., GESTRA Engineering, Inc.

**Topic:** **Wick Drains on the I-41 Project in Brown County**

**Abstract:** Soft clay under planned tall embankments and retaining walls presented concerns with settlement and global stability if standard construction methods were used. Evaluation of potential design solutions

first considered if changing the cross section to a more favorable geometry with flattened slopes or stability berm could produce an acceptable result. Other low complexity solutions were also considered such as surcharge, excavation and replacement, or the use of a toe trench excavation backfilled with breaker run. If these methods were not acceptable, the use of wick drains (also known as vertical strip drains) were considered. For tall embankments, this typically required staged construction, requiring close coordination with planners for the project so that there was adequate time in the schedule. In some cases, wick drains and staged loading were also completed in combination with other methods to improve stability.

The presentation will include a general discussion of how wick drains are installed and the function of a wick drain and drainage blanket system. The advantages and disadvantages of wick drains and a few specific locations will be discussed. The presentation will also describe typical geotechnical instrumentation used to monitor and evaluate consolidation for staged construction.

## **Structural**

**Speaker:** Matthew Brady, P.E., Upper Midwest Regional Engineer, Am. Inst. of Steel Construction (AISC)

**Topic:** **Multi-story Residential; Structural Steel Framing Solutions**

**Abstract:** Structural steel framing systems maximize space for occupant comfort, create versatile buildings for ease of design, and enhance the quality of construction to provide safe and healthy buildings. This presentation provides an overview of structural steel framing systems in mid-rise projects and includes case studies which support efficient and economical methods of construction. Objectives are to explore structural concepts that maximize space and promote occupant comfort with structural steel systems; discuss the versatile nature of structural steel and its ability to adapt to multiple functions, understand how to achieve higher quality buildings which provide healthy environments for end users; analyze the impact of fast, economical, and environmentally-conscious methods of construction; learn the advantages which make structural steel framing an economical and structurally sound solution for multi-story residential buildings; and discover best practices for multi-story residential buildings when using the selected structural steel system to deliver a sound, safe and efficient building.

## **Ethics**

**Speaker:** Chris Martin, Adjunct Associate Professor of Business Ethics, UWGB & St. Norbert College

**Topic:** **Exercises in Ethics (One Ethics PDH)**

**Abstract:** The speaker will explore ethical case studies. This session will count for one Ethics PDH, and the Dinner presentation will count for a second Ethics PDH. Attendance at both Ethics sessions is not mandatory.

## **DINNER / ETHICS TRAINING**

**5:30 P.M. – 7:00 P.M. (One PDH)**

**Speaker:** Chris Martin, Adjunct Associate Professor of Business Ethics, UWGB and St. Norbert College

**Topic:** Ethical Rationales in a World that May not Give a Damn

**Abstract:** The speaker will describe a few different ethical theories that give us different pictures of what ethics is about, discussing how we might use these theories to broaden and improve our ethical decisions, considering the costs and benefits of doing so, and looking more closely at a few specifically applied instances of this to you, the engineer.

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