Minnesota Structural Engineers Association

Annual Seminar and Trade Show

May 14, 2019

Structural Engineering Technology: Past, Present & Future

Marriott Minneapolis West

Schedule of Events

Time	Location	Event
7:00 am	Waterford (Registration in hallway)	Registration Breakfast on the Trade Show Floor
7:40 am	Galway	MNSEA General Meeting
8:10 am	Galway	Trade Show Introductions
8:30 am	Galway	**Session 1** THE PAST: Verifying Computer Analysis Results with Hand Calculations
9:30 am	Waterford	Trade Show Break Coffee, Fruit, and Yogurt
10:00 am	Galway	**Session 2** THE PRESENT: UAVs, Mixed Reality, and 3D Laser Scanning
11:00 am	Waterford	Trade Show Wrap-up, Snacks Sandwiches, Popcorn, Chips, Dessert
11:45 am	Galway	**Session 3** THE FUTURE: 3D Printed Structures: Vision and Opportunities
12:45pm	Galway	Prizes CEU Certificates - Adjourn

MNSEA General Meeting Agenda

I. TREASURER'S REPORT AND ACEC UPDATE – Dave Oxley
II. MNSEA COMMITTEE UPDATES
    I. Steering Committee – Andrew Agosto
    II. YMG – Lauren Piepho
    III. SE3 Committee – Lauren Piepho
    IV. MNSEER Committee – Douglas Fell
III. LIAISON UPDATES
    I. National Council of Structural Engineers Associations (NCSEA)
        I. NCSEA Delegate Update – Doug Woolf
        II. Code Advisory Committee: Wind Engineering – Doug Woolf
        III. Code Advisory Committee: General Requirements and Resilience – Mustafa Igdelioglu
IV. OLD BUSINESS:
    I. Announcement of New MNSEA Officers
        I. Past President: Andrew Agosto
        II. President: Greg McCool
        III. Vice President: Quoc Le
        IV. Secretary: Justin Saterbak
V. NEW BUSINESS:
    I. Year-End Acknowledgments – Greg McCool

Presentation Sessions

SESSION 1 – THE PAST: Verifying Computer Analysis Results with Hand Calculations

Sam Rubenzer, PE, SE

Structural Engineers are relying more and more on structural engineering software for analysis and design. Understanding the different options available for modeling is paramount in ensuring the best model is created to imitate reality and give engineers the best possible design. This presentation reviews various hand calculation methods for verifying the loads defined on models, and verifying the analysis results. Lastly, we will verify the design checks made for members within the model. It is easy to assume that all structural engineering software solves engineering problems correctly. Unfortunately, there can be errors from programming and user mistakes. Engineers must have a good understanding apart from software to spot these errors.

SESSION 2 – THE PRESENT: UAVs, Mixed Reality, and 3D Laser Scanning

Matt Schwartz and David Hyland

Few technologies in the construction industry are more talked about and have more potential for disruption than UAVs, mixed/augmented reality, and 3D laser scanning. UAVs have made tasks like inspections safer and easier than ever before. Mixed reality devices are changing the way we view the jobsite. 3D laser scanning has the most exciting applications for structural engineers: these systems can capture existing and as-built conditions more accurately and completely than any other method. Join us for an overview of UAVs and mixed reality, followed by a deep dive into 3D laser scanning, including case studies and examples of “real world” uses for the devices that are easily implemented into structural engineering workflows.

SESSION 3 – THE FUTURE: 3D Printed Structures Vision and Opportunities

Jan Olek, PhD, PE, M.ASCE, FACI

The presentation will examine both the challenges but also innovation opportunities offered by 3D printing technology in the field of structural concrete. The opportunities range from the ability to create complex and architecturally unique structures without the need for intricate formwork to the ability of creating an “internal architecture” of the elements that can result in novel mechanical responses. The challenges involve compliance with the existing building codes, integration of reinforcement, and durability. The current focus areas of the industry and the research communities will be critically examined and illustrated by examining the relationships between processing parameters, structure and performance characteristics of 3D printing as a way to customize the response of the printed elements.

Speaker Biographies

Sam Rubenzer, PE, SE

Sam Rubenzer is the founder of FORSE Consulting. The FORSE team assists other structural engineers with designs on a variety of projects and complex structures in steel, concrete, PT concrete, masonry, wood, and connection design. With 20 years of experience in structural engineering, Sam has worked on projects all across the USA, designing a wide variety of structures. Sam also spent 5 years at RAM / Bentley Systems providing software training to structural engineers. Sam has a MBA from Marquette University, a Bachelor of Civil Engineering from the University of Minnesota, and is a licensed structural engineer (SE) in Illinois and a professional engineer (PE) in many of the Midwestern states.

Matt Schwartz and David Hyland

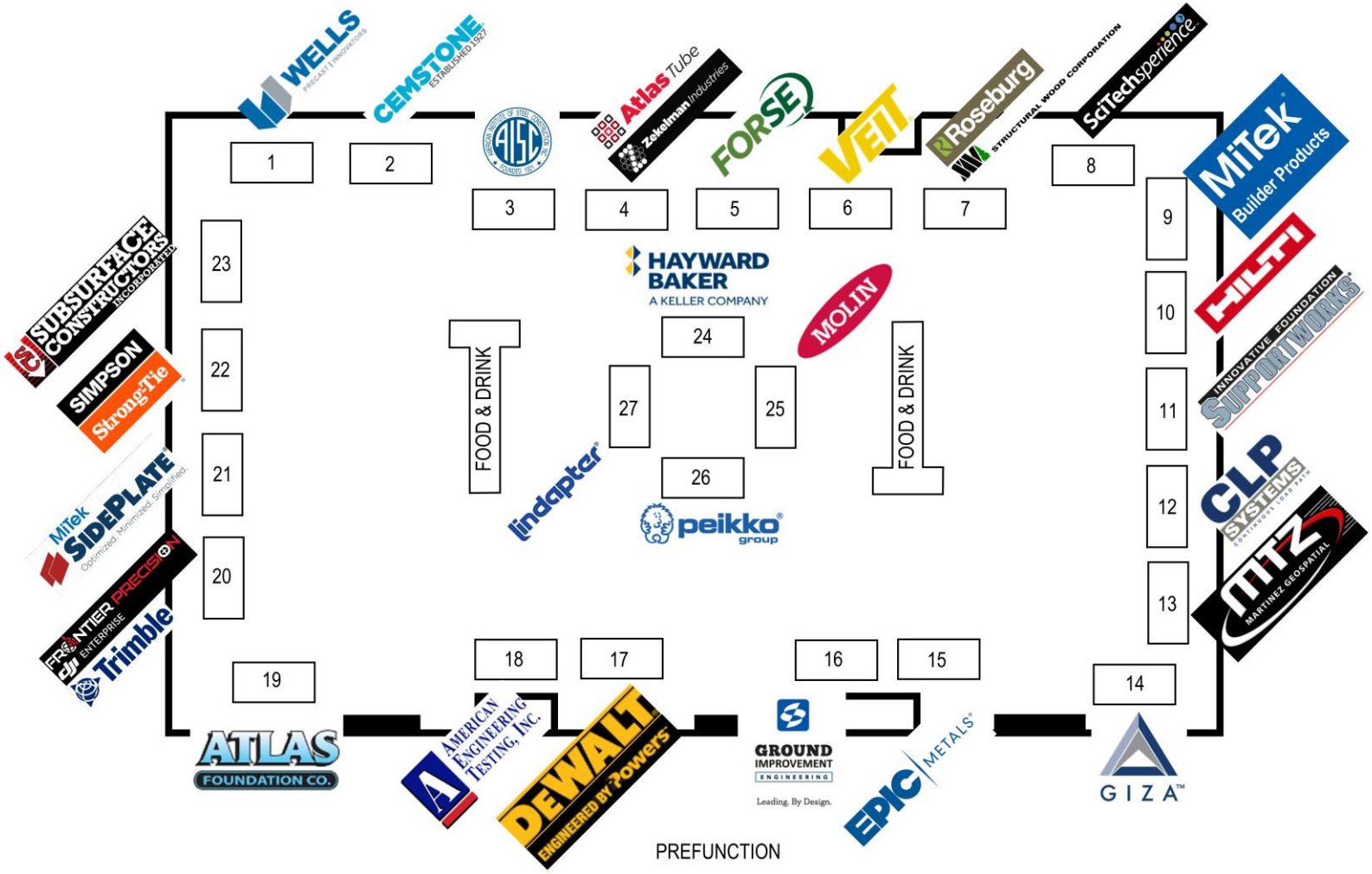
Matt Schwartz is a construction sales representative with Frontier Precision, handling the territory of Minnesota and North Dakota. Frontier Precision is a Trimble distribution partner for the geospatial and building construction markets. Matt graduated from Dunwoody College of Technology with a degree in Electronics and has 15 years of experience working with construction instruments, the last 10 of which were focused on the vertical construction/buildings market. He assists customers as they adjust to increased use of field technology in operations. Matt has helped customers complete projects of all sizes including many high profile buildings such as the US Bank Stadium.

David Hyland graduated from Dublin Institute of Technology in 2012 with a BSc Honours degree in Geomatics. With multiple years of experience in both Engineering and Hydrographic surveying, David has a very knowledgeable background in the Building lifecycle phase, from Design and Engineering to Fabricate and Construct. David is currently based in Denver Colorado with the Trimble Buildings group as a Sales Engineer, where the primary focus is on Trimble's Scanning portfolio. Previously David was a Product Manager with Trimble's MEP division. During this role, he provided industry knowledge to the MEP Field Layout Solutions as well as managing the scanning portfolio.

Jan Olek, PhD, PE, M.ASCE, FACI

Jan Olek is a professor of Civil Engineering at Purdue University, Indiana, USA. He been actively involved in teaching undergraduate courses in engineering materials, graduate courses in corrosion of reinforcement, advanced concrete and aggregates, sustainable binders and experimental methods in construction materials research. His research interests include properties and use of supplementary cementitious materials, durability of concrete and aggregates, high performance concrete and concrete recycling. He has over 200 technical publications in scientific journal and conference proceedings and graduated 22 MS and 32 PhD students. He is a fellow of the American Concrete Institute and the recipient of the ACI Robert E. Philleo research award and the ACI Delmar L. Bloem Distinguished Service Award.

Vendor Map



MN SEA

MINNESOTA STRUCTURAL ENGINEERS ASSOCIATION

ACEC

3	American Institute of Steel Construction	**20**	Frontier Precision/Trimble	**25**	Molin Precast
18	American Engineering Testing, Inc.	**14**	GIZA	**26**	Peikko
19	Atlas Foundation Company	**16**	Ground Improvement Engineering	**7**	Roseburg Forest Products/Structural Wood Corp.
4	Atlas Tube, a division of Zekelman Industries	**24**	Hayward Baker	**8**	SciTechsperience
2	Cemstone Products Company	**10**	Hilti Corporation	**21**	Sideplate Systems, Inc.
12	CLP Systems	**11**	Innovative Foundation Supportworks	**22**	Simpson Strong-Tie
17	DeWalt/Powers Fasteners	**27**	Lindapter	**23**	Subsurface Constructors, Inc.
15	EPIC Metals Corporation	**13**	Martinez Geospatial	**6**	Veit Companies
5	FORSE Consulting	**9**	MiTek Builder Products	**1**	Wells Concrete

Upcoming Events

ACEC Annual Meeting & Awards Presentation

May 16 @ Bell Museum, St. Paul

Sponsors: Barr Engineering Company, Michaud Cooley Erickson, McGough Construction, Braun Intertec Corporation

Engagement & Equity: What do the SE3 Survey Results Mean for Engineering in MN?

May 29 @ HGA, Minneapolis

First in a series of presentations hosted by SE3 and ACEC/MN. $10 for ACEC members, $20 non-members.

RISA Tips and Tricks (and PE Recognition)

June 5 @ Barr Engineering, Bloomington

Learn best practices for the software, and be recognized if you passed the PE exam!

MINNESOTA STRUCTURAL ENGINEERS ASSOCIATION

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American Council of Engineering Companies
of Minnesota

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Certificate of Attendance

For The Following ACEC/MN Educational Program:

Structural Engineering Technology: Past, Present, & Future

Verifying Computer Analysis Results with Hand Calculations
UAVs, Mixed Reality, and 3D Laser Scanning
3D Printed Structures: Vision and Opportunities
(MNSEA Annual Seminar & Trade Show)

Presenters:

Sam Rubenzer, PE, SE / Matt Schwartz and David Hyland / Jan Olek, PhD, PE, M.ASCE, FACI

Presented: 5/14/19
Location: Marriott Minneapolis West, Minnetonka

3.0 Professional Development Hours (PDH)
0.3 Continuing Education Units (CEU)

[ ] - I attended the entire 3 hour seminar.
[ ] - I attended _____ hours of this seminar.

To the best of our knowledge, this educational program meets the requirements of the Board of AELSLAGID for continuing education. ACEC/MN makes no warranty, directly or indirectly, that this program meets the standard established by the Board of AELSLAGID for continuing education.

Note: This certificate was distributed at the end of the educational program and only to those who were in attendance for the entire program. If there are any questions regarding this certificate, or if confirmation is needed to verify the authenticity of this document, please contact the ACEC/MN office.

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