

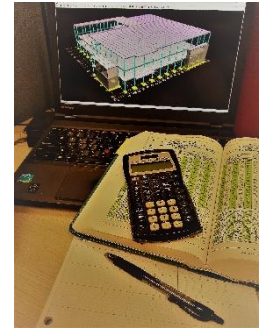


## Structural Engineering Technology: Past, Present, & Future

### SESSION 1 – THE PAST

#### Verifying Computer Analysis Results with Hand Calculations

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.



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### SESSION 2 – THE PRESENT

#### UAVs, Mixed Reality, and 3D Laser Scanning

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

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.



[www.totalkustom.com](http://www.totalkustom.com)

See page 3 for speaker biographies.

The seminar will provide 3.0 PDH/0.3 CEU credits. Certificates will be distributed at the end of the seminar.

**TRADE SHOW:**

Suppliers from many areas of the construction industry ranging from fabricators to providers of design tools will be available to update us on products and services. Suppliers will be happy to answer your questions and provide solutions for your every-day challenges.

**AGENDA: MNSEA MAY SEMINAR TRADE SHOW**

|           |  |            |                            |
|-----------|--|------------|----------------------------|
| 7:00 a.m. | Registration, Start of Trade Show, Breakfast | 10:00 a.m. | Session 2                  |
| 7:40 a.m. | MNSEA General Meeting                        | 11:00 a.m. | Trade Show Wrap-up, Snacks |
| 8:10 a.m. | Trade Show Introductions                     | 11:45 a.m. | Session 3                  |
| 8:30 a.m. | Session 1                                    | 12:45 p.m. | Raffle and Prizes          |
| 9:30 a.m. | Trade Show Break                             |            |                            |

**LOCATION:**

[Marriott Minneapolis West](#) / 9960 Wayzata Blvd, Minnetonka, MN 55426 / 952.544.4400  
(Located on the north frontage road of I-394 between Hwy 169 & Hopkins Crossroad – directly across from the ACEC/MN office)

**COST:**

MNSEA or SEAWI member \$100  
General Attendees (non-member) \$150  
Student \$40  
Includes General Meeting, Breakfast and Snack/Refreshment Breaks, Morning Seminars, and Trade Show

**REGISTRATION:**

By Internet:  
[Online Registration Link](#)

By Fax or E-mail: Please return this form to Melissa Langowski at the American Council of Engineering Companies of Minnesota by fax 952.593.5552 or e-mail: melissa@acecmn.org no later than Friday, April 26, 2019. **Space is limited, so register early.**

**\*\*for registration refund – 48 hours minimum cancellation required\*\***

If you have any questions about this seminar, please contact Greg McCool with Ericksen Roed & Associates at 651.414.6181 or e-mail: gmccool@eraeng.com

| Name  | Firm  | Email | Registration | Total |
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## **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 has 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.