

**American Society of Civil Engineers
Pittsburgh Section: Geo-Institute**

**Practical Aspects of Tunnel Design and
Construction**

Last Name, First Name, Middle Initial

Organization / University

Mailing Address

City State Zip Code

Email Address

Phone Number

Early-Bird Registration (due by March 8, 2019)

☐ \$200 Pgh. GI Member/Government Rate

☐ \$250 Non-Member (Pgh. GI)

Regular Rate (due by March 27, 2019)

☐ \$225 Pgh. GI Member/Government Rate

☐ \$275 Non-Member (Pgh. GI)

☐ \$100 Full-Time Student

Total Amount Enclosed: \$_____.

Please detach this page and send to the address on the following page for receipt by March 27, 2019 with a check made payable to **ASCE Geotechnical Engineering Group**.

**Practical Aspects of Tunnel
Design and Construction**

7:30- 8:30	Registration/Continental Breakfast
8:30 – 9:00	Introduction to Tunnel and Underground Engineering
9:00-10:00	Tunnel Construction Methods
10:00-10:15	Break
10:15-11:15	Stress and Convergence in Soil and Rock Excavations
11:15-12:00	Ground Support
12:00-1:00	Lunch
1:00-2:00	Tunnel Liner Design
2:00-2:45	Deformation Analysis
2:45-3:00	Break
3:00-3:45	Instrumentation and Monitoring
3:45-4:45	Site Investigations and Characterization
4:45-5:00	Questions and Wrap-up

The seminar fee includes a continental breakfast, lunch, coffee, 7.5 PDHs, and an electronic or paper copy of the seminar notes (TBD). To register for the short course, please complete this form and mail it along with a check to the address on the left. Cancellations received after March 27, 2019 and no shows will be billed. If you have any questions, please contact Greg Rumbaugh at (412)386-6306.

The Geo-Institute highly encourages individuals to register online at <http://www.asce-pgh.org>. Registrations may also be made by mail. Registration will not be processed without payment. Checks should be made payable to ASCE Geotechnical Engineering Group.

Attn: Gregory Rumbaugh
MSHA Roof Control Division
626 Cochran Mill Road, Building 20
Pittsburgh, PA 15236



ASCE Geo-Institute

Pittsburgh Section Chapter
Presents a
One-Day Short Course:

**Practical Aspects of Tunnel
Design and Construction
(7.5 Professional Development Hours)**

Presented by:

Dr. Michael A. Mooney
Colorado School of Mines

Dr. Conrad W. Felice
C.W. Felice, LLC

Friday, April 5, 2019

Engineers' Society of Western Pennsylvania
337 4th Avenue
Pittsburgh, PA

Check-in begins: 7:30 a.m.
Course: 8:30 a.m. – 5:00 p.m.

Registration due by March 27, 2019

Practical Aspects of Tunnel Design and Construction

Why you should attend:

After completing this course, you should:

- Be able to identify the main elements of a tunnel project.
- Identify excavation methods with ground conditions and understand the prediction of event rates.
- Understand in situ stress conditions
- Recognize the impact of arching and the ability of tunnels to self-support
- Identify ground support objectives and recognize active and passive support systems.
- Understand the differences between permanent and temporary liners and be able to define different liner systems.
- Understand instrumentation and monitoring programs for tunnel construction projects.
- Understand the range and types of investigative techniques available for tunnel design.
- Be able to match investigative techniques to tunnel design and construction methods.
- Identify and select different ground characterization methods.

Course Instructors

Conrad Felice, Ph.D., P.E., P.Eng., D. GE., F. ASCE is serving as the Washington State Department of Transportation owners representative and Geotechnical Design Manager for the over \$2.5 billion I-405 Corridor Program. He is also the Managing Principal at C. W. Felice, LLC, an Adjunct Professor in the Department of Civil & Coastal Engineering at the University of Florida and a Research Professor in the Mining Engineering Department at the Colorado School of Mines. He is a professional engineer registered in 15 states and four Provinces in Canada. He has been involved in tunnel and underground projects for more than 30 years. He was the Department of Defense lead for the underground technology development program and involved in the design and construction of numerous underground Department of Defense protective structures. Commercially Dr. Felice has been involved with hard and soft ground tunnels on transit and transportations projects, dams and hydropower projects, and water and wastewater projects. Dr. Felice is a current trustee for the Deep Foundation Institute and the current Chair of the Tunnel and Underground Structures Committee of the Transportation Research Board. He is a Fellow of the American Society of Civil Engineers, a board-certified geotechnical engineer within the ASCE Geo-Institute, and a past member of the Committee on Geological and Geotechnical Engineering for the National Research Council, U.S. National Academy of Sciences. Academically he earned a B.S. and Ph.D., in civil engineering from Ohio University and the University of Utah, respectively and a M.S. in facilities management from the Air Force Institute of Technology.

Mike Mooney, Ph.D., P.E. is a Professor of Civil Engineering and the Grewcock Distinguished Chair of Underground Construction & Tunneling at Colorado School of Mines. He teaches courses in tunnel design and construction, support of excavations, infrastructure systems, instrumentation & monitoring, and intelligent geosystems. Mike also leads the four-day Tunneling short course held annually for industry professionals at Colorado School of Mines. Mike received his MSc in Civil-Structural Engineering from the University of California-Irvine and a PhD in Civil-Geotechnical Engineering from Northwestern University. He is a registered Professional Engineer and has been engaged as a consultant on a number of tunneling projects in North America and internationally. Recent projects include tunnels in Michigan, New York/New Jersey, Virginia and Seattle, Washington. He has authored/co-authored over 170 refereed journal papers, conference papers, and technical reports on instrumentation & monitoring, intelligent geoconstruction, and tunneling/heavy civil analysis, design and construction. Mike also has led, and currently leads, a number of research projects embedded at active project sites, e.g., ground deformation during Queens bored tunnels project in NYC, boulder detection on the Seattle Northlink tunnel construction project, probe hole monitoring for the NY Rondout bypass water tunnel, EPB soil conditioning on Seattle SR99 and Northlink tunnels, sequential excavation method inverse modeling for the Los Angeles Metro Regional Connector project, and artificial intelligence of TBM tunneling in Seattle, Los Angeles and Washington DC tunnels. In each case, working with owners, contractors, designers, etc.