

# PDH BOOT CAMP

Presented by

The Engineers' Society of Western Pennsylvania  
and the American Society of Civil Engineers | Pittsburgh Section

**Thursday, August 24, 2017 | 8:00 am–5:00 pm at the ESWP**

Pittsburgh Engineers' Building | 337 4th Avenue | Pittsburgh, PA 15222



## PDH BOOT CAMP

The Engineers' Society of Western Pennsylvania (ESWP) and the Pittsburgh Section of the American Society of Civil Engineers (ASCE) is pleased to present our "PDH Boot Camp" on Thursday, August 24, 2017. This day-long event affords attendees the opportunity to earn up to seven professional development hours (PDH's), offered under three concurrent breakout sessions. There are seven different sessions offered under each breakout, but attendees may attend sessions from any track. Each and every session is approved for a PDH credit by ESWP's Continuing Education Committee. ESWP is recognized as an approved Continuing Education Provider by New York State and the State of Florida Board of Licensure.

Attendees may choose a full-day registration, or to attend the morning, or afternoon session only. **All registration categories includes lunch, and morning and afternoon coffee breaks (respectively).**

## REGISTRATION

We suggest registering early to take advantage of our early-bird discount rates prior to August 1, and to not be left out! Seating is limited at this event and we expect to sell-out. Registration is easy - simply visit our website and look under the Events section. You can also register by hard copy, using the form in this brochure.

## PARKING

Parking in downtown is easier than ever before. There are several parking garages within easy walking distance of the Pittsburgh Engineers' Building, (337 4th Avenue, Pittsburgh, PA 15222). You can find the many parking options offered by the Pittsburgh Parking Authority here: <http://www.pittsburghparking.com/facility-locator>

Additionally, the Pittsburgh Parking Authority has introduced a new APP for subscribers to pay for metered parking from their hand-held device! It is super easy and convenient...no more running to the meter to throw in more quarters! Learn more and register for an account at <http://www.gomobilepittsburgh.com/>

In addition, there are numerous other privately owned parking lots within easy walking distance to ESWP. Visit <http://www.bestparking.com/pittsburgh-parking/> for additional information on parking in downtown Pittsburgh.

## PDH CERTIFICATION

All sessions are approved for a professional development hour by ESWP's Continuing Education Committee. ESWP is recognized as an approved Continuing Education Provider by New York State and the State of Florida Board of Licensure. Attendees will receive a Certificate of Attendance following the event, by e-mail. Attendees are required to submit a "PDH Request Form" indicating which sessions they attended. For credit with New York State, attendees must sign in and out of each session they attend (Please note that ESWP cannot provide certification for those who do not comply with this New York State requirement.)

## SCHEDULE-AT-A-GLANCE

	TRANSPORTATION TRACK	WATER TRACK	GEOTECHNICAL TRACK
8:00 am	TR1: ABC Decking of DelDOT BR 1-717, I-95 NB over SR1	W1: Rigid & Flexible Buried Piping Systems	G1: Geotechnical Reports: Proper Use in Design and Construction Contracting
9:00 am	TR2: Precast Substructure Elements for the Tappan Zee Bridge	W2: Comprehensive Approach to Stormwater Runoff Management	G2: Civil Engineers, What Rammed Aggregate Pier (Rap) Ground Improvement Means To You
10:00 am	TR3: South Tenth Street Bridge Rehabilitation	W3: The "Gray Area" of Green – Dellrose Street Case Study	G3: Advanced Design Methodology for Shallow Landslide Repair Using Launched Soil Nails
11:00 am	TR4: Accelerated Bridge Construction Techniques	W4: GIS Applications for Water, Wastewater, and Stormwater systems	G4: Controlled Modulus Column (CMC) Rigid Inclusion Support for Embankments and MSE Walls– Design and Full-Scale Test Results
12:00 noon	Luncheon Program:		
	TECHNOLOGY TRACK	INDUSTRIAL TRACK	LEGAL & ETHICS TRACK
1:30 pm	T1: Drones and society. Where do they fit in?	I1: Hi-Tech Floor Renovations	L1: Legal and Practical Consequences of Engineering Defects and Failures -ethical Issues
2:30 pm	T2: Technology and Standards for Condition Assessment	I2: Commissioning Industrial Systems	L2: Standard of Care when Specifying New Technologies
3:30 pm	T3: Autonomous/Connected Vehicles	I3: Harmonics and Power Factor	L3: Primer: Professional Liability and the Economic Loss Rule
4:30 pm	PDH Boot Camp Concludes - Optional Social Hour Cash Bar		

# TRANSPORTATION TRACK

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## ABC DECKING OF DELDOT BR 1-717, I-95 NB OVER SR1

*Jonathan Eberle, AECOM, Mechanicsburg, PA*

This presentation presents the design and construction undertaken for the replacement of the existing I-95 NB bridge deck using accelerated bridge construction (ABC) technologies. The bridge carries I-95 NB over a high-volume principal arterial roadway and consists of four simple spans (32'-70'-70'-36') on a nearly tangent alignment having a 35 degree skew. The existing c.i.p. concrete deck is composite and supported on rolled steel beams. The steel beams and the substructure units were reused as part of this bridge rehabilitation project. Preliminary engineering considered a variety of ABC technologies and after careful consideration, full-depth precast concrete deck panels with UHPC longitudinal and transverse deck joint details, expansion joints at piers/abutments and a polyester polymer concrete (PPC) overlay was selected for reasons to be explained. Replacement of the bridge deck required two stages of construction to accommodate the high traffic volume.

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## PRECAST SUBSTRUCTURE ELEMENTS FOR THE TAPPAN ZEE BRIDGE

*Nick Burdette, HDR, Pittsburgh, PA*

Precast substructure elements were widely used for the 3.1 mile long New NY (Tappan Zee) Bridge to speed construction, improve safety, and provide a durable final product meeting 100 year service life requirements. Massive precast concrete pile cap tubs and prestressed precast concrete pier cap shells are used for nearly 60 approach piers. Design features and challenges are presented for these precast elements made fully composite in the final structure.

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## SOUTH TENTH STREET BRIDGE REHABILITATION

*Stan Nalitz, AECOM, Pittsburgh, PA*

The South Tenth Street Bridge is a three-span cable suspension bridge. Built in 1933, the structure has a total length of 1,275 feet and links the City of Pittsburgh with its Southside communities.

The presentation will discuss methods and testing used to inspect, analyze and develop a strategy for the rehabilitation. AECOM conducted a thorough in-depth inspection, including an internal cable inspection, to accurately identify the exact location, extent, overall dimensions, and type of each necessary repair. Based on the results of the field inspection, materials testing program, and structural analyses, a comprehensive plan was developed that presents the evaluations, repair recommendations and detailed cost estimates.

One of the key elements of this structural rehabilitation is the inspection, analysis, and rehabilitation of the suspension cables. The cable rehabilitation will include a dehumidification system of both the anchorage and main cables.

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## ACCELERATED BRIDGE CONSTRUCTION TECHNIQUES

*Robert T. Elliott, CDR Maguire Inc., Pittsburgh, PA*

SR 0136-G10 over Little Chartiers Creek & CSX: this presentation will discuss the ABC of a 206' 2-span continuous integral abutment bridge. Numerous design challenges included constructability, longitudinal and transverse UHPC closure pours, negative moment reinforcing, deflections during precasting, and crane sizing. The presentation will also discuss the unique manner of the bridge erection based on the use of a conventional deck negative moment region rather than the span by span and link-slab approach.

# WATER TRACK

## RIGID & FLEXIBLE BURIED PIPING SYSTEMS

*Richard Hill, P.E., Rinker Materials, Oakdale, PA*

Reliable roadways and sound infrastructure has been essential to every major civilization since before the Roman Empire. To build a society, progress was dependent on the control of water and wastewater. Now more than ever before, it is important to understand the principles influencing the design and installation of the many types of piping material options available today. Different standards apply to rigid and flexible piping materials affecting how they are designed, installed, and inspected to ensure the expected design life. This presentation will cover; the design principles for both rigid and flexible pipe, the manufacturing process of reinforced concrete pipe, direct (PennDOT) & indirect design methods for reinforced concrete pipe, post installation inspection methods to verify proper installation.

## COMPREHENSIVE APPROACH TO STORMWATER RUNOFF MANAGEMENT

*John R. Smith, Ph.D., P.E., Corporate Environmental Solutions, LLC, Pittsburgh, PA*

To comply with increasing regulations per section 303(d) of the Clean Water Act, focused on reducing Total Maximum Daily Loads (TMDL) for impaired waters, point discharges of stormwater runoff from commercial and industrial facilities are now being regulated for site-specific pollutants. The focus of this course is to present three different, yet complimentary processes, for efficiently complying with such permitted discharges. The three processes are:

- stormwater runoff reduction via greening of areas;
- stormwater collection and temporary storage; and
- low cost passive treatment of collected stormwater.

A model approach focused on minimizing the overall cost of compliance, via the optimal combination of the three different processes will also be presented.

## THE “GRAY AREA” OF GREEN – DELLROSE STREET CASE STUDY

*Jason Borne, P.E., ms consultants, inc., Coraopolis, PA*

Stormwater management programs are traditionally tied to maintaining public safety, mitigating private land development, or addressing CSO consent orders. Not surprisingly, other opportunities to integrate green stormwater infrastructure into urban reconstruction seldom come to fruition, falling victim to a “gray area” in stormwater policy.

## GIS APPLICATIONS FOR WATER, WASTEWATER, AND STORMWATER SYSTEMS

*Sam Shamsi, Ph.D., P.E., F.ASCE, Jacobs Engineering Group Inc., Pittsburgh, PA*

More than 80 percent of all the information used by water, wastewater, and stormwater utilities is geographically referenced. While GIS applications for water, wastewater, and stormwater systems are not new, getting beyond the basic inventory and mapping functions is often challenging. Unless a utility GIS is taken to the operational level, it's just a pretty map. That is why, GIS emphasis is now shifting from computerized mapping to enterprise-wide mission critical applications. This seminar will focus on the four Ms that are of particular importance to water, wastewater, and stormwater systems: Mapping, Monitoring, Modeling, and Maintenance.

Learning Objectives:

- Define the components, functions, and types of GIS.
- Discover the meaning and power of GIS applications for water, wastewater, and stormwater systems.
- Identify examples of GIS applications in mapping, monitoring, modeling, and maintenance.

# TECHNOLOGY TRACK

## DRONES AND SOCIETY. WHERE DO THEY FIT IN?

*Seth Zora, AerdiA, LLC, Imperial, PA*

Drones are slated as the next big turning point for many industries and uses. As the smartphone was a revolutionary piece of history, they are projecting drones to be the next jump. Search and Rescue, Mapping, Inspections, Marketing, Real Estate, and more. Within my talk, we will discuss the many uses for drones, what it takes to be commercially certified, and what the future holds. The FAA has only recently published the regulation governing the use of drones for both hobbyists and commercial applications and they have quickly realized changes are needed. Join me to learn about this exciting new technological swiss army knife for many uses.

## TECHNOLOGY AND STANDARDS FOR CONDITION ASSESSMENT

*Matt Horton, Redzone Robotics, Pittsburgh, PA*

The November 2014 NASSCO performance Specifications and Guidelines for cleaning and CCTV inspection introduced a strategy of comprehensive fact based decision making for collections system operators and managers. Many system operators spend a significant amount of resources responding to problems that emerge because they do not understand the current condition of their system. This “fix as you go” approach only addresses short term problems and does not allow for the efficient long-term conditions based management or the effective use of limited resources. The 2014 guidelines recommend that system operators learn the current condition of their system and use the data collected to prioritize cleaning, repairs and replacements. This presentation will identify the environmental, economic, and social impact realized by technology and strategy early adopters by evaluating the outcomes of cctv inspections performed prior to any planned sewer jetting or root work, evaluating the statistical need for such work and preparing ROI analysis for benchmarking scenarios.

## AUTONOMOUS/CONNECTED VEHICLES

*Tom Bice and Keith Johnson, Gannett Fleming, Inc., Pittsburgh, PA*

Autonomous vehicles, those that travel without constant driver input, and connected vehicles, those that receive travel inputs from infrastructure and other vehicles, will change the future of transportation. Their implementation is inevitable – likely in the 2020's. Pittsburgh is central to the development these vehicles and the supporting technology through the presence and practice of CMU, Google, and Uber. Many facets of transportation will be changed, including:

- Land Use and Zoning
- Human Factors Engineering
- Design – capacity, geometry, system integration
- Safety
- Legal/Insurance
- Ethics

Many technologies are on newer vehicles that give us a glimpse of what the future will hold. The objective of this session will be to provide an overview of the technology and engage participants in the ongoing implementation process. Pittsburgh is the hub of AV/CV development and a wonderful environment for testing. With the variety of topography, traffic congestion and weather conditions, it is a perfect test area. CMU knows this. Google knows this. Uber knows this. That is why they are here. At the end of this session, we want the participants to be asking themselves and the developers of this technology, “What should I be thinking and asking about so that our profession helps to gets this right?”

# GEOTECHNICAL TRACK

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## GEOTECHNICAL REPORTS: PROPER USE IN DESIGN AND CONSTRUCTION CONTRACTING

*Douglas Clark, P.E., Civil & Environmental Consultants, Inc., Pittsburgh, PA*

Subsurface conditions represent some of the largest uncertainties and risks in civil construction. Fortunately, most owners recognize the need to perform a geotechnical investigation as part of the design development to obtain information pertinent to project design and construction. What is often less understood is how the geotechnical report and information should be used in design, and how it applies to the construction contract. Many assume, often incorrectly, that the geotechnical report serves as a “baseline” for establishing the site conditions. While this may be true in some cases, most standard contract general conditions (AIA, EJCDC, etc.) place the risks associated with subsurface conditions on the bidder, and provide the geotechnical report only as information, not as a contract document. This presentation discusses the issue of reliance on the geotechnical report by the parties involved, presents case-studies, and provides recommendations for owners and contractors to reduce risks.

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## CIVIL ENGINEERS, WHAT RAMMED AGGREGATE PIER (RAP) GROUND IMPROVEMENT MEANS TO YOU

*Keith J. Merl, P.E., GeoStructures, Pucellville, PA*

Have you worked on sites that had undocumented fills, soft soils, or adjacent structures? Difficult site conditions, variable subsurface conditions, and tight construction budgets can bring your project to a complete stand-still.

This session will focus on how civil, geotechnical, and structural information is synthesized during the schematic phase of your project to provide a comprehensive ground improvement design. By recognizing and seizing opportunities to integrate ground improvement during pre-construction, you can successfully aid your clients in the management of risk and cost on their projects.

Local case studies including support of the PPG Paints Arena and projects in the Strip District will be used to illustrate:

- ground improvement design;
- the benefits of performance based specifications;
- how sequencing of RAP installation and bulk filling operation affect the overall performance of the structure and construction costs; and
- best practices for reviewing ground improvement designs during construction.

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## ADVANCED DESIGN METHODOLOGY FOR SHALLOW LANDSLIDE REPAIR USING LAUNCHED SOIL NAILS

*Corey D. Mislinski, P.E., GSI, Pittsburgh, PA*

Ballistic soil nails have been used in the United States to repair shallow roadway landslides for nearly 20 years. The U.S. Forest Service/Federal Highway Administration “Application Guide for Launched Soil Nails” is the principal design manual for designing with ballistic soil nails and employs a simplified sliding wedge analysis using limit equilibrium concepts to determine the factor of safety of a slope reinforced with soil nails. The design methodology quantifies the tensile and shear resistance provided by the individual nails, but is simplistic and is limited to linear failure surfaces in homogenous materials.

The presentation will explain some of the recent advancements in launched soil nail design methodology using PC-based limit equilibrium programs, including the use of shear calculations in RocScience’s Slide 7.0 and GeoStudio’s Slope/W program, as well as a brief introduction to the program LSNAP (Launched Soil Nail Analysis Program). An improved method of estimating bond strength is presented. The shear contribution of ballistic soil nails, often ignored in conventional soil nail design, is shown to be an important contribution to the stability of ballistic soil nail landslide repairs.

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## CONTROLLED MODULUS COLUMN (CMC) RIGID INCLUSION SUPPORT FOR EMBANKMENTS AND MSE WALLS– DESIGN AND FULL-SCALE TEST RESULTS

*Nina Carney and Sarah Ramp, Menard, Pittsburgh, PA*

Controlled Modulus Column (CMC) Rigid Inclusions are grouted, auger-displacement elements that are installed using a specially designed tool at the working end of a high torque, high down-pressure drilling machine. The tool is hollow so that flowable cementitious grout can be placed from the bottom up once the tooling has advanced to the desired depth. The patented CMC system fits in the generic category of rigid inclusions. There are a number of other types of inclusions that are currently designed and constructed using stone, grout, and concrete. The design technology behind the development of the CMC rigid inclusions makes them uniquely efficient for the immediate support of MSE walls and embankments on soft, compressible soils for public transportation, other infrastructure facilities, large storage tanks, and building facilities.

CMC rigid inclusions are an ideal solution for the immediate support of fill walls and embankments for bearing capacity and settlement control, as compared to other solutions with long consolidation periods such as wick drains with surcharge. The CMC rigid inclusion system relies on a granular Load Transfer Platform (LTP) which efficiently distributes the load from the structure or embankment to the rigid inclusions, while limiting the amount of load transferred to the surrounding soils. CMC rigid inclusions are designed using special proprietary finite element techniques that include the effects of load sharing between the LTP, the columns, and the surrounding improved ground.

This presentation will include a technical overview of the design theory of CMC rigid inclusions for embankment support, case studies of projects completed in the region, and finally, the results of full-scale instrumented testing of CMC rigid inclusion projects. We will compare actual performance monitoring data to the key predictions of the finite element models.

# INDUSTRIAL TRACK

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## HI-TECH FLOOR RENOVATIONS

*Steven Reinstadler, Covestro, Pittsburgh, PA*

This course will cover high performance industrial and decorative concrete floor coating technologies. The sustainability drivers and aesthetic preferences which contribute to the satisfaction of the building occupants will be discussed in detail. The course will cover benefits/drawbacks, correct surface preparation and site considerations as well as the safe handling and use of the high performance components. The flooring renovation at an iconic Pittsburgh-area building, the Energy Innovation Center, will be shared to demonstrate the use of high performance floor coatings to preserve, adapt, or retask new or existing spaces as a seamless alternative to floor coverings or lower performance coatings.

## COMMISSIONING INDUSTRIAL SYSTEMS

*Don Olmstead, P.E., Venture Engineering, Warrendale, PA*

This session will focus on commissioning of industrial systems, addressing:

- Approaches – API vs CII vs ?
- Team Composition
- Planning
- Checklists
- Automation
- Contracts and specifications
- Performance guarantees and testing
- Budgeting
- Managing customer expectations
- Liability

## HARMONICS AND POWER FACTOR

*Robert MacFadyen, Kohler Power Systems, Sheboygan, WI*

This session will be present a discussion Power quality. Exploring the difference in types of loads we see in our distribution systems and how they affect the cleanliness of the voltage and current generated. Making correlations to Harmonics and Power Factor implications of the loads focusing on what creates them, how they affect power, and how they can be addressed. Intent of the presentation being to drive a conceptual understanding of these topics using visualization to describe transient reactance, system stiffness, and resonance frequency and allowing for real world examples to aid in appreciation of subject material.

# LEGAL & ETHICS TRACK

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## LEGAL AND PRACTICAL CONSEQUENCES OF ENGINEERING DEFECTS AND FAILURES -ETHICAL ISSUES

*Brian Davidson, Esq., Dingess, Foster, Luciana, Davidson & Chleboski LLP, Pittsburgh, PA*

The session will address:

- General Legal Consequences and Ethical Requirements at the time of a Failure
- Three Case Studies (1981 – Kansas City Hyatt Regency Skywalk Collapse; 2006 – Big Dig and the I-90 Connector Tunnel Ceiling Collapse; and 2007 – I-35W Bridge Collapse)
- Observations, Practical Considerations, Engineering Root Cause Analysis and Lessons Learned

## STANDARD OF CARE WHEN SPECIFYING NEW TECHNOLOGIES

*Jim Hamilton, P.E. \*, Esq. \*, GAI Consultants, Inc., Homestead, PA (\*Maine)*

In our world of design and engineering, many “new, unique or innovative technologies” have limited track records in the real world. This presentation will discuss the Engineer/Design Professional’s responsibility to analyze the pros and cons and identify prudent risk management techniques to use before specifying a “new or untested technology” with a limited track record or preparing a unique or innovative design.

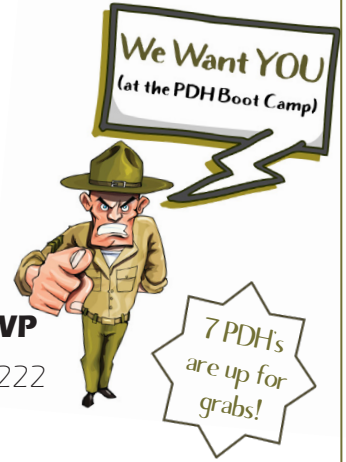
## PRIMER: PROFESSIONAL LIABILITY AND THE ECONOMIC LOSS RULE

*Michael Eveges, P.E., MASCE, Brashear Construction Consulting, Inc.*

Provides an introduction to the need for professional liability insurance and how it relates to the concept of Economic Loss. Presentation addresses topics such as: Who is a ‘Professional?’ What are the duties and liabilities associated with being a Professional? What are the typical sources of claims against design professionals? What factors contribute to claims? Other topics covered include: the concepts of contractual privity and liability defined by the Economic Loss Rule; existing options for Professional insurance and related exclusions.

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## REGISTRATION FORM



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**Thursday, August 24, 2017 | 8:00 a.m.–5:00 p.m. at the ESWP**

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ENGINEERS' SOCIETY  
of  
WESTERN PENNSYLVANIA



The Engineers' Society of Western Pennsylvania is an approved continuing education provider by NY and FL Board of Licensure

### Registrant Information

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Attendee Name (First/Last)

Familiar Name for Badge

Company or Organization

Address

City/State/Zip

E-mail

Telephone

I am a member of  ESWP  ASCE

Industry Type (please check all that apply):

- Government       Banking/Finance       Non-Profit/Community Group       Engineer       Legal  
 Developer       Academia/Research       Economic Development       Owner  
 Other \_\_\_\_\_

### Registration Type

	Before 8/1/17	After 8/1/17
<input type="checkbox"/> ESWP/ASCE Member ALL-DAY Registration	\$200	\$225
<input type="checkbox"/> ESWP/ASCE Member MORNING-Only Registration	\$125	\$150
<input type="checkbox"/> ESWP/ASCE Member AFTERNOON-Only Registration	\$100	\$125
<input type="checkbox"/> Non-Member ALL-DAY Registration	\$225	\$250
<input type="checkbox"/> Non-Member MORNING-Only Registration	\$150	\$175
<input type="checkbox"/> Non-Member AFTERNOON-Only Registration	\$125	\$150
<input type="checkbox"/> Government ALL-DAY Registration	\$125	\$125
<input type="checkbox"/> Government MORNING-Only Registration	\$75	\$75
<input type="checkbox"/> Government AFTERNOON-Only Registration	\$75	\$75

### Method of Payment

- ESWP Account       Check (payable to ESWP)       Visa\*       MasterCard\*       American Express\*       Discover\*

Authorized Signature

Account Number

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CVV Code

ESWP and ASCE Present the PDH Boot Camp

THURSDAY, AUGUST 24

MAIL TO: Engineers' Society of Western PA, 337 4th Avenue, Pittsburgh, PA 15222

FAX this form to: 412-261-1606

ON-LINE: www.eswp.com

# PDH BOOT CAMP SPONSORSHIP FORM

The PDH "Boot Camp", a joint program of the ESWP and ASCE Pittsburgh Section, provides engineering professionals with up to 7 professional development hours towards license renewal over a day-long seminar. Do not miss your chance to support these organizations and sponsor this great event.

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- Track Sponsor (Includes recognition in program and in the selected session / six available) \$300
  - Geotechnical
  - Transportation
  - Water
  - Legal/Ethics
  - Industrial
  - Technology
- Lunch Sponsor (Includes recognition in program and during event luncheon / one available) \$500
- Boot Camp Commemorative Portfolio (one available) \$750
- Lanyard Sponsor (for attendee name tags / one available) \$300
- Reception Sponsor (Includes recognition in program and during post-conference reception / one available) \$1,000

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