Over the years, practices and techniques for the design and construction of drilled-in caissons in the Philadelphia area have changed and evolved. In particular, there are differences of opinion regarding appropriate design and bearing support values, and there are suggestions that even larger bearing values are appropriate. Also, caisson construction has become more problematic with frequent delays and cost extras, and some designers and contractors are reluctant to utilize caissons. Reports of caisson loading tests indicate different aspects of the supporting capabilities and load deformation behavior of the schist and gneiss rock in Philadelphia. These rocks are similar to the crystalline metamorphic rocks formations throughout the Piedmont Province that extends from New York City to Birmingham, Alabama. The results from loading tests elsewhere in the Piedmont provide additional data relevant to the load supporting capabilities of caissons in Philadelphia.

The concepts of bearing capacity and settlement with respect to rock materials, including the transitional and variable zone of weathered rock, will be reviewed for caisson bearing support. Also, characterizing the properties of the rock materials, such as by strength, core recovery, RQD and other rating systems, or as a single-value intermediate geomaterial, will be assessed. Finally, some of the construction and construction evaluation practices will be reviewed. All of these testing results indicate that it is possible to utilize greater supporting capacities and more efficient caisson designs. Some of the analysis and design methods, such as LRFD, that are related to strength and elastic deformation provide a means for evaluating and using higher bearing capacities for caissons in Philadelphia.

About the Speaker:
Mr. Richard E. Mabry specializes in geotechnical engineering and has performed investigations and consultations for more than 2,000 projects encompassing a broad range of design and site conditions and utilizing an extensive variety of geotechnical techniques and applications. Some of these projects where Mr. Mabry provided the geotechnical engineering services received design awards from several professional organizations. The projects where Mr. Mabry performed investigations and consultations include major buildings and other facilities, commercial and industrial developments, transportation structures, and energy facilities. He has also directed field inspection and construction monitoring for site development, foundation construction, and embankment projects. Mr. Mabry has particular expertise with geotechnical practice related to mine and sinkhole subsidence, and refuse and waste engineering, and has been a consultant to other engineering organizations for special problems and for application reviews. In addition, Mr. Mabry has been retained to perform forensic investigations related to insurance claims and litigation matters.
MSE Walls and Reinforced Soil Slopes - Best Practices
Jerry DiMaggio, P.E.

The DVGI breakout session at the April Join ASCE meeting featured Jerry DiMaggio, P.E., formerly of FHWA, presenting: “MSE Walls and Reinforced Soil Slopes - Best Practices.” This presentation provided an outline and review of the history and current practices with geosynthetically reinforced soil structures and a review of the paradox between best practices and reality. The presentation covered selection of wall and slope type for earth retaining structure applications, design of walls and slopes, construction and monitoring, and asset management.
2nd Annual GeoWall Competition

Congratulations to all students who participated in the 2nd Annual Mid-Atlantic Regional (MAR) GeoWall competition, held at Drexel University on April 23rd, 2016. The competition was once again championed by members of DVGI. Four schools from the region participated: Bucknell University, University of Delaware, Lafayette College, and Villanova University. The teams designed a scale retaining wall made from poster board facing, packaging tape, and a minimal amount of kraft paper reinforcement to hold back hundreds of pounds of backfill and a surcharge load. On competition day, the students displayed a poster with the details of their designs, and manufactured, built, and tested their MSE walls. Points were based on the quality and content of information presented in design poster, reinforcement quantity, and construction time. The Lafayette College team won the competition!

A special thank you to all of the judges, all of the sponsors for the MAR competition, and to Drexel as the host school. If you have any questions or would like to get involved with the 2017 competition, please get in touch with Eric Backlund (ebacklund@kleinfelder.com).

2016 RESULTS
1st Place: Lafayette College
2nd Place: Villanova University
3rd Place: Bucknell University

Images Courtesy of M. McGuire
Engineering Ethics for Professionals (3 PDHs)

PRESENTER:
Anthony S. Potter, Esq.

Tuesday, May 17th
Time: 1:30 PM to 5:00 PM
Cost: $150 per attendee
Register online @ www.dvgi.org

This will be a 3-hour Ethics Short Course and ASCE/DVGI will offer 3 PDH credits. Course Outline is satisfactory for recognition in the states of PA, NJ, and DE.

Tentative Outline Agenda
1. Examine the NSPE Code of Ethics
2. Protecting public health, safety, and welfare
3. Working in areas of competence
4. Review of various statutory and regulatory frameworks
5. Review/discuss Case Studies
6. Understanding the nature of contracts
7. Questions and Discussions

INSTRUCTOR INFORMATION:
Anthony S. Potter is an attorney at law practicing in the Harrisburg Office of Powell, Trachtman, Logan, Carrle, & Lombardo, P.C. Mr. Potter focuses his practice on representation of design professionals in all phases of the construction process including contracting, allocating risks, pre-claim resolution, mediation, arbitration, and construction litigation. In addition, Mr. Potter provides counsel and representation to architects, engineers, and others on administrative law questions including professional licensing matters. In his position with Powell Trachtman, Mr. Potter currently acts as general counsel to AIA Pennsylvania. He is a member of the Advisory Board for the Civil Engineering and Structural Design and Construction Engineering Technology Programs at Penn State Harrisburg.
ANNOUNCEMENTS

3rd ANNUAL DVGI GOLF OUTING

You are invited to participate in the 3rd Annual Delaware Valley Geo-Institute Golf Outing on June 24, 2016. Proceeds from the outing will benefit the scholarship fund. This event is an excellent opportunity for you to demonstrate your continued support for the DVGI.

Come join us to get some fresh air, network, and have a good time!

Who: ASCE and DVGI Members, Friends, Clients
All Skill Levels Welcome
Prizes for Best and Most Honest Team Scores

Where: Jeffersonville Golf Club
2400 W. Main Street
Jeffersonville, PA 19403

When: Friday, June 24, 2016
Tee times starting at 12:30 pm, Scramble Format

Cost: Golf Registration: $100/person
Cost includes Cart along with Beef and Beer Buffet following Golf

Sponsorships: Individual Hole $125
Closest to the Pin $150
Long Drive $150
Back By Popular Demand! Shortest Driver $150
Beverage $150
Dinner $200
Prize Donations Always Appreciated

Sponsorships include Company Signage at the Tee Area

Registration: Online at www.DVGI.org
Earn PDHs at 2015-2016 DVGI Events

Upcoming Dates for 2016 Dinner Meetings and events are as follows:

- **May 17th**: Ethics Short Course
- **May 17th**: SEI Joint Meeting
- **June 24th**: 3rd Annual DVGI Golf Outing

*One PDH will be awarded for most dinner meetings that you attend.*

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**HAVE DVGI PUBLISH YOUR ARTICLE**

*Do you have an interesting article on a project or individual in your organization that you would like to have published in the DVGI newsletter? Please submit your articles for consideration in an upcoming edition to Theresa Loux at theresa_loux@golder.com*

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**DVGI Merchandise Available for Purchase**

Coffee mugs ($8) and lapel pins with the DVGI logo ($5) are available for purchase. See Russ Preuss if you are interested in purchasing either of these items.

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**ASCE/G-I Members:**

Read past and present issues of Geo-Strata magazine online at www.asce.org
After the Fires: Hydrophobic Soils

Randy Brooks

Fire is a natural and important environmental factor that has affected virtually all western U.S. forests at one time or another. However, there are situations where fire can be catastrophic. Aside from property and aesthetic loss, this can include situations where highly erodible soils are exposed by burning the organic material on the soil surface. The burning of litter and organic material can reduce infiltration, increase surface runoff and erosion, and lead to hydrophobicity, or hydrophobic soils.

Hydrophobic soils repel water. A thin layer of soil at or below the mineral soil surface can become hydrophobic after intense heating. The hydrophobic layer is the result of a waxy substance that is derived from plant material burned during a hot fire. This waxy substance penetrates the soil as a gas and solidifies after cooling, forming a waxy coating around soil particles. The layer appears similar to non-hydrophobic layers.

Hydrophobic soils repel water. A thin layer of soil at or below the mineral soil surface can become hydrophobic after intense heating. The hydrophobic layer is the result of a waxy substance that is derived from plant material burned during a hot fire. This waxy substance penetrates the soil as a gas and solidifies after cooling, forming a waxy coating around soil particles. The layer appears similar to non-hydrophobic layers.

Why is hydrophobicity important? Fire induced water repellency can affect the soil and the watershed in the following ways:

- Hydrophobic soils repel water, reducing the amount of water infiltrating the soil.
- Decreased soil infiltration results in increased overland and stream flow.
- Erosion increases with greater amounts of runoff and fertile topsoil can be lost.
- Increased runoff carries large amounts of sediments that can clog stream channels and lower water quality.

- Depending on the intensity of the fire, hydrophobic layers can persist for years, especially if they are thick.

Very high temperatures are required to produce the gas that penetrates the soil and forms a hydrophobic layer. Soils that have large pores, such as sandy soils, are more susceptible to the formation of hydrophobic layers because they transmit heat more readily than heavy textured soils (clays). Coarse textured soils also have larger pores that allow deeper penetration of the gas.

Hydrophobic layers are generally ½ inch to 3 inches beneath the mineral soil surface and are commonly up to 1 inch thick, though some layers can be several inches thick. The thickness and continuity of the layer varies across the landscape. The more continuous the layer, the greater the reduction in infiltration.

To detect these layers, scrape away the ash layer and expose the mineral soil surface. Place a drop of water on air-dry soil and wait one minute. If the water beads, the soil layer is hydrophobic. The upper few inches are generally not hydrophobic. In these cases, it is necessary to scrape away a layer of soil ½ to 1 inch thick and repeat the test until you find the upper boundary of the water repellent layer. Once the layer is found, you can determine its thickness by continuing to scrape and use the water drop method until the water no longer forms a bead.

Thicker hydrophobic layers will persist for more than a year and will continue to impact infiltration and plant growth during that time. Plant roots, soil microorganisms, and soil fauna help break down hydrophobic layers.
(Continued from Page 7)

However, reduced water infiltration will decrease the amount of water available for plant growth and soil biological activities that break down hydrophobic layers.

To treat hydrophobic layers you can:

- Place fallen logs or fall trees across slopes to slow runoff and intercept sediment.
- On level or gentle slopes, rake or hoe the upper few inches of soil to break up water repellent layers, allowing water to infiltrate soils for seed germination and root growth.
- On gentle to steep slopes, scatter straw mulch to protect soils from erosion. If possible, anchor straw to hold it in place.
- Use seeding, straw bale check dams, silt fences, and other practices that control erosion and reduce runoff.

For more information on erosion control, contact your local County Extension Office or Natural Resources Conservation Office.

This information first appeared in Woodland NOTES, Vol. 13, No. 1.

About the Author: Dr. Randy Brooks is an Area Extension Educator - Forestry and Professor at the University of Idaho.

Article has been reprinted with permission from the author.
JOB POSTING

Staff/Senior Staff Engineer – West Chester, Pennsylvania

The West Chester, PA office of Schnabel Engineering is currently seeking a Staff or Senior Staff level Engineer to support our geotechnical and geostructural engineering groups.

Minimum qualifications for the position include a Bachelor's Degree in Civil Engineering from an accredited four-year program and 2 to 5 years of professional experience. Candidates with a Master's Degree in Civil Engineering are preferred. Successful completion of the E.I.T., along with a variety of both field and analytical experience, are required to fulfill the responsibilities of this position. Demonstrated experience with transportation projects is highly desired, including successful completion of PennDOT’s boring inspector certification exam.

Good oral and written communications skills, positive attitude, and computer literacy are a must. Experience with AutoCAD and/or MicroStation is preferable. Field work and travel will be required, possibly including assignments lasting up to several months at sites away from the office. Candidates must be able to lift 60 pounds and be physically able to negotiate construction sites, enter trenches, climb ladders and work outside.

The successful candidate for this position will gain practical knowledge and experience while solving real engineering problems under the supervision of senior engineering personnel. Responsibilities for this position include geotechnical analysis, geotechnical and geostructural design support, preparation of field reports, and preparation of geotechnical recommendation reports.

For 60 years, Schnabel Engineering, an employee-owned company, has been focused on solving problems related to the earth and environment through specialization in geotechnical, geostructural, dam and tunnel engineering. We are an ENR Top 250 engineering firm dedicated to excellence in client service, high quality, and value added solutions. If you have an interest in joining our team, please apply via our website at:

http://www.schnabel-eng.com/careers/opportunities/

Or alternatively, forward your resume, along with a cover letter, to Bill Petersen at wpetersen@schnabel-eng.com.

No visa sponsorship will be provided. Candidates must undergo a background check which may include criminal history, motor vehicle record and credit check, plus a drug screen.

EOE AA M/F/Vet/Disability
37TH ANNUAL SHORT COURSE

Grouting Fundamentals and Current Practice

JUNE 13 - 17, 2016 | 3.5 CEUs

Since 1979 this course has covered pressure grouting as a method to improve geotechnical characteristics of soils and rock masses.

MAJOR TOPICS
Major topics include rheological properties of cementitious and chemical grouts, cement and chemical grouting procedures, grouting of rock under dams, grouting of rock anchors and micro piles, deep mixing, jet grouting, cutoff walls and composite seepage barriers, compaction grouting, slab jacking, structural grouting, grouting for underground structures, overburden and rock drilling methods, and field monitoring/instrumentation.

A half-day field demonstration is included in the curriculum, focusing on compaction and permeation grouting, penetration of ultrafine cements, hydraulic fracturing, computer monitoring, grout mixing, uses of cellular grouts, overburden drilling methods, grouting of rock anchors, and use of borehole packers.

WHO SHOULD ATTEND
Owners, Regulators, Consultants and Contractors having interest in the applications of pressure grouting to a broad array of geo-structural construction and remediation techniques. The course is also for petroleum engineering personnel involved in well drilling and operations.

INSTRUCTORS
The course faculty includes recognized international authorities and leaders in the grouting industry, with several instructors having dedicated their efforts to this course for more than 30 years.

FOR TECHNICAL INFO CONTACT:
Scott Kieffer
kieffer@tugraz.at

For more info & registration, visit:
WWW.UTCLEE.ORG/GROUTING
EVENTS AND CONFERENCES

**YMF Election Happy Hour**
Join the YMF to vote and determine the 2016-2017 Board Members!

LOCATION: Llama Tooth, 1033 Spring Garden St, Philadelphia, PA 19123
DATE: Thursday, May 26th, 2016
TIME: 5:30-8:30 PM
COST: FREE!

**Annual YMF Phillies Game**
Join the YMF for the Annual YMF Phillies Game and Tailgate!

LOCATION: Citizens Bank Park, 1 Citizens Bank Way, Philadelphia, PA
DATE: July 21, 2016
TIME: 7:05 PM game time
(Tailgate information to follow!)
COST: $20 per person (includes food/soda)
RSVP: By June 10th

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**SuperPile’16**
Piling Design & Construction Conference
June 7 - 9 • The Westin Michigan Avenue Chicago


**GEO-RISK 2017**
Geotechnical Risk from Theory to Practice
Denver, Colorado | June 4-6


**Geotechnical Frontiers**
March 12-15, 2017 | Orlando, Florida USA

University of Delaware
Drexel University
Lafayette College
Rowan University
Widener University