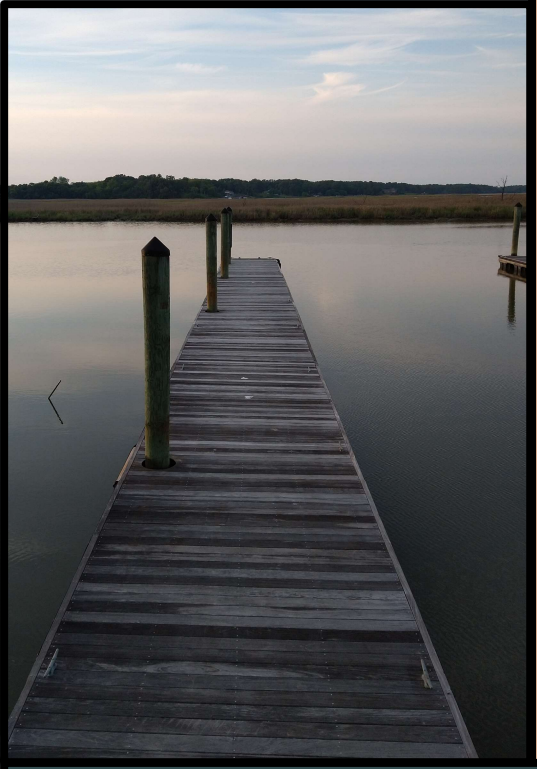


GeoVirginia 2025

Lessons Learned in Geotechnical Engineering





Smithfield Center

220 N. Church Street
Smithfield, Virginia

March 17-19, 2025

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

G-I
ASCE
GEO-INSTITUTE
Virginia Chapter

PLATINUM EXHIBITORS

KELLER



In-Situ Soil Testing, L.C.

SEQ DRILLING

NATIONAL DRILLING ASSOCIATION

WAGMAN
General Construction | Heavy Civil | Geotechnical

WEDNESDAY MORNING BREAK

OUR SPONSORS

Schnabel ENGINEERING

TUESDAY AFTERNOON BREAK

Bob Taylor Engineering, Inc.

GEOVIRGINIA CAKE

CATAWBA VALLEY ENGINEERING & TESTING

KEYNOTE SPEAKER

DGMTS
Dulles Geotechnical
A Certified SWaM and MBE/DBE Firm

TUESDAY MORNING BREAK

GMS PILING PRODUCTS

GOLF BEVERAGE CART

SGI
STABLE GROUND IN-SITU
ENGINEERING INVESTIGATIONS & CONSULTING
BUILD CONFIDENTLY

TUESDAY EVENING DINNER

ECS

MONDAY EVENING RECEPTION

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PROGRAM

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<tr><th colspan="3">Monday | March 17, 2025</th></tr>
<tr><th>TIME</th><th>GOLF OUTING
Cypress Creek Golfers Club
600 Cypress Creek Parkway
Smithfield, VA 23430</th><th>SMITHFIELD GUIDED TOUR
Smithfield Center
220 N. Church Street
Smithfield, VA 23430</th></tr>
<tr><td>8:00 AM</td><td rowspan="8">Shotgun Starts at 9:00 AM</td><td rowspan="2"></td></tr>
<tr><td>9:00 AM</td></tr>
<tr><td>10:00 AM</td><td rowspan="4">Meet at Smithfield Center at 10:30 AM</td></tr>
<tr><td>11:00 AM</td></tr>
<tr><td>12:00 PM</td></tr>
<tr><td>1:00 PM</td><td rowspan="4">Tour Ends at 2:00 PM</td></tr>
<tr><td>2:00 PM</td><td>Lunch & Raffles at 2:00 PM</td><td rowspan="3"></td></tr>
<tr><td>3:00 PM</td></tr>
<tr><td>4:00 PM</td></tr>
<tr><td>5:00 PM</td><td colspan="2">No Planned Activities</td></tr>
<tr><td>6:00 PM to 9:00 PM</td><td colspan="2">EXHIBIT HALL RECEPTION/REGISTRATION/
WELCOME DINNER: SURF AND TURF – SMITHFIELD STYLE</td></tr>
<tr><td>9:00 PM to 11:00 PM</td><td colspan="2">HOSPITALITY SUITES OPEN AT SMITHFIELD STATION</td></tr>
</table>

Technical Program - Smithfield Center

Tuesday | March 18, 2025

7:30 AM	**BREAKFAST**
8:30 AM	**Welcome Remarks** **Jose N. Gómez, PE, MSCE, BC.GE, F. ASCE, Conference Co-Chair** **Intertek-PSI**
8:35 AM	**Thanks to the Exhibitors** **Swapna Danda, Conference Exhibits Manager** **Wiss, Janney, Elstner Associates, Inc.**
8:40 AM	**Remembering a Legend – Jim Mitchell** **Russell Green, PhD, PE, Professor** **Virginia Tech**
8:55 AM	**Design Build – Industry Trends, Red Flags, and How to Protect your Company from Unexpected Liability** **Garry Boehlert, Esq., Partner** **Saul Ewing LLP**
9:45 AM	**Lessons Learned from Tunneling And Urban Infrastructure Construction** **Chris Menkiti, PhD, Senior Principal** **Geotechnical Consulting Group, United Kingdom**
10:35 AM	**BREAK**
11:00 AM	**Lessons Learned from Four Decades of Being a Geotechnical Consultant** **Gregory Fischer, PhD, PE, BC.GE, F.ASCE, President** **Shannon & Wilson, Inc.**
11:50 AM	**Geosetta**
11:55 AM	**GeoVirginia Short Course 2025**
12:00 PM	**LUNCH**
1:15 PM **Keynote Speaker**	**Turning Disasters into Knowledge** **Jonathan D. Bray, PhD, PE, NAE, Faculty Chair in Earthquake Engineering Excellence** **University of California - Berkeley**
2:45 PM	**Lessons Learned from 25 Years of Soil-Structure Testing at Full Scale** **J. Brian Anderson, PhD, Professor** **Auburn University**
3:35 PM	**BREAK**

Tuesday | March 18, 2025 (Cont'd)	
4:00 PM	Lateral Resistance of Pile Groups Behind MSE Walls – Lessons Learned Kyle Rollins, PhD, Professor Brigham Young University
4:50 PM	A Geotechnical Engineer's Guide to Climate Change Lawrence Roth, PE, GE, BC.GE, BC.WRE, F.ASCE Consultant
5:40 PM	RECEPTION WITH EXHIBITORS
6:40 PM	DINNER
8:40 PM to 10:40 PM	HOSPITALITY SUITES OPEN AT SMITHFIELD STATION (Desserts and After Dinner Drinks)
Wednesday | March 19, 2025	
7:30 AM	BREAKFAST
8:30 AM	Best Projects, Selected by the GeoVirginia Conference Committee from projects in Virginia, Maryland, Delaware, New Jersey, Pennsylvania, West Virginia, North Carolina, South Carolina, and the District of Columbia
9:10 AM	Geotechnical Lessons Learned from Pittsburg's I-579 "Cap" – Urban Connector Project Sebastian Lobo-Guerrero, PhD, PE, BC.GE, Senior Geotechnical Engineer/Laboratory Manager American Geotechnical & Environmental Services, Inc.
10:00 AM	The Influence of Geology on Tunnel Design and Construction Elizabeth Dwyre, PE, BC.GE, Senior Vice President, Geotechnical & Tunneling WSP, USA
10:50 AM	BREAK
11:15 AM	Lessons Learned in Ground Improvement Rick Smith, PE, Principal Schnabel Engineering
12:05 PM	Remote Sensing of GeoHazards for Distributed Infrastructure Systems Juan Perri, PhD, PE, GE, Principal Exponent
12:55 PM	CLOSING REMARKS Roger Failmezger, PE, BC.GE, F. ASCE, Conference Co-Chair, In-Situ Soil Testing, L.C.

ORGANIZING COMMITTEE

	Jose N. Gómez, PE, MSCE, BC.GE, F. ASCE **Conference Co-Chair** Chief Engineer **Intertek-PSI** jose.n.gomez@intertek.com		Roger Failmezger, PE, BC.GE, F.ASCE **Conference Co-Chair** President **In-Situ Soil Testing, LC** raf@insitusoil.com
	Tariq B. Hamid, PhD, PE **Secretary** Principal **Dulles Geotechnical & Materials Testing Services, Inc.** thamid@dullesgeotechnical.com		Jon Bennett, PE, BC.GE **Treasurer** Design-Build Manager **Wagman Heavy Civil, Inc.** jkbennett@wagman.com
	Qamar A. O. Kazmi, PE, F.ASCE **Speaker Chair** Senior Consultant **Schnabel Engineering** qkazmi@schnabel-eng.com		Swapna Danda **Exhibits Manager** Regional Geotechnical Engineer **Wiss, Janney, Elstner Associates, Inc.** SDanda@wje.com
	Sara Beth Everheart **Marketing Director** Lead Geologist/Lead Geotechnical Project Manager **Bob Taylor Engineering, Inc.** Sara@BobTaylorEngineering.com		Ross Cutts, MSCE, PE **Webmaster** President **Geosetta** ross.cutts@geosetta.org
	Oscar R. Merida, Jr., PE **ASCE Committee Advisor** Principal Engineer **ECS Mid-Atlantic, LLC** OMerida@ecslimited.com		Eddy, MSCE, PE **Golf Outing Chair** Vice President **Steele Foundation, LLC** morgan@steelefoundationllc.com
			Glenn Cooke, PE **Student Outreach** Project Manager **Hurt & Proffitt, Inc.** gcooke@handp.com

A CELEBRATION OF LIFE

James K. Mitchell, PhD, PE



James (Jim) K. Mitchell passed away peacefully at home in Massachusetts on December 17, 2023.

Jim was born in Manchester, NH, on April 19, 1930. He received a B.C.E. degree from Rensselaer Polytechnic Institute in 1951, an S.M. degree from MIT in 1953, and an Sc.D. from MIT in 1956. He worked as a Soil Engineer at the US Army Engineer Waterways Experiment Station (now part of ERDC) in Vicksburg, MS, in 1955 and spent 1956-1958 as an officer in the US Army Corps of Engineers. He joined the Civil Engineering faculty at University of California, Berkeley in 1958, rising through the ranks to become the Edward G. Cahill and John R. Cahill Professor of Civil Engineering in 1989. He retired from UC Berkeley in 1993 and joined the faculty at Virginia Tech in 1994, where he held the rank of University Distinguished Professor. He retired from Virginia Tech in 1999, but remained active in guiding research, co-teaching courses, and presenting seminars until very recently. Jim advised/co-advised 77 doctoral students over his career: 69 at UC Berkeley and 8 at Virginia Tech, and a countless number of MS students. Jim's scholarly work included more than 500 journal publications, conference papers, reports, keynotes, and invited lectures. However, Jim's most notable publication is his textbook entitled Soil Behavior; he was working on the fourth edition of this text along with co-authors Kenichi Soga, UC Berkeley, and Professor Catherine O'Sullivan, Imperial College London. The book is scheduled to be released later this year.

Jim received many awards and recognitions over the years for his research and teaching; too many to list. However, a few highlights are as follows. He was elected to both the National Academy of Engineering (1976) and the National Academy of Science (1998), an honor granted to very few Civil Engineers. He received the ASCE Norman Medal twice (1972, 1995), was both an ASCE Terzaghi Lecturer (1984) and a British Geotechnical Society Rankine Lecturer (1991). Jim was elected an Honorary Member of ASCE in 1993.

Jim was a great friend and mentor to many. Despite his accomplishments, he was humble and always ready to learn something new. He had a good sense of humor and never took himself too seriously. His passing is a loss for all who were fortunate to know him. Jim is survived by his wife of 16 years, Holly Taylor, five children (Rick, Laura, James, Don, and David), and their spouses. Jim and his late wife Virginia "Bunny" Mitchell raised their family in Moraga, California, while Jim was a professor at UC Berkeley. He is also survived by nine grandchildren, five of whom are married, and nine great-grandchildren, as well as being a wonderful later-life father and grandpa to Holly's two daughters and grandson.

ABSTRACTS

Design Build – Industry Trends, Red Flags, and How to Protect Your Company from Unexpected Liability

Garry L. Boehlert, Esq.
Partner
Saul Ewing LLP



Abstract

Discussion of design-build construction often starts with reference to famous Master Builders responsible for the design and construction of such notable structures such as Filippo Brunelleschi's Cathedral in Florence or Thomas Jefferson's Monticello. Such Master Builders offered project sponsors a single point of contact for the architectural, engineering, and construction skills needed for project delivery. Today's version of design-build is often a far cry from the design-build approach of the classic Master Builders – leaving design and engineering participants at increased risk. This presentation addresses concerning trends in design-build contracting, red flags for design and engineering firms to watch for, and offers recommendations for how to protect your company from unexpected claims and liability.

Although organizations such as the Design Build Institute of America have developed and urge utilization of design-build best practices, often the trust, collaboration, cooperation, and teamwork essential for successful projects are absent because of the way many modern day design-build projects – especially contractor-led teams – are being bid with the uncertainties of 30% design and performed for a fixed price. Instead of design and engineering being seen as valued and integral components from start to finish, there is an alarming trend of subcontracted design teams being presented large professional negligence claims toward the end of the project for having allegedly caused contractor cost over-runs which cannot be recovered from the owner. That trend is exacerbated by the types of excess design errors and omissions insurance coverage available for purchase by construction contractors – almost ensuring substantial professional malpractice claims as contractors seek to recover under those excess policies which require exhaustion of the limits of the design team's coverage.

Garry Boehlert *is a partner in the Washington, DC offices of the law firm Saul Ewing LLP. He recently acted as lead counsel for the design team responsible for extension of the Dulles Silver Line Metro Project from Reston to Ashburn, VA. He similarly served as lead counsel for Montgomery County, Maryland by successfully resolving the claims and disputes arising from the Silver Spring Transit Center project. Garry regularly represents owners, contractors, geotechnical engineers, and engineering/design firms with contractual issues and the resolution of disputes that arise on infrastructure projects such as subsurface claims and demands associated with delay, defective work, extra work, and incomplete or defective design. When it comes to geotechnical matters, Garry has addressed the full gamut of issues – tunneling, foundation/slurry wall work, subsurface profiles, differing site conditions, ground water, highway construction, bridge design/construction, and structural failures. Prior to entering law, Garry worked on complex infrastructure projects such as the Trans-Alaska Pipeline and construction of an interstate highway, gaining hands-on construction experience.*

Lessons Learned from Tunneling and Urban Infrastructure Construction

Christopher Menkiti, PhD
Senior Partner
Geotechnical Consulting Group LLP
United Kingdom



Abstract

Drawing on case histories from around the world, the presentation will discuss challenges faced and overcome in tunnelling and infrastructure projects. The talk will explore ground hazards and geotechnical risks associated with both bored and cut and cover tunnelling, and will highlight lessons learned, while drawing out and the evolution of tunnelling techniques in Europe.

Christopher Menkiti *is a Senior Partner at Geotechnical Consulting Group LLP (GCG), a spin-off company from Imperial College London. He has 38 years world-wide experience in geotechnical engineering from all sides of the construction supply chain - owners, operators, consultants, contractors and subcontractors. Dr. Menkiti has also expertise in tunnelling and large infrastructure projects, trenchless technology, slope & earthworks, foundation systems, ground characterization and testing, instrumentation & monitoring and construction impact mitigation. He has undertaken forensic investigations and provided expert evidence at international hearings and arbitrations. Dr Menkiti served as Chairman of the British Geotechnical Association and is a voting member of ISSMGE's Technical Committees on the Observational Method (TC 206) and Underground Construction in Soft Ground (TC204).*

Lessons Learned from Four Decades of Being a Geotechnical Consultant

Gregory R. Fischer, PhD, PE, BC.GE, F.ASCE
President
Shannon & Wilson, Inc.

Abstract



Many of us attend engineering school with a desire to work on civil engineering projects and see our analyses constructed. We learn the science of our profession through numerous courses, including those frustrating courses in chemistry, physics, mechanics, and advanced math, intertwined with other classes in cultural studies and the humanities and arts. When we graduate, we often work as consultants or agency engineers putting our education into practice. While most of us stay engaged in the practice of engineering throughout our careers, we eventually transition into non-scientific roles that include report writing, project management, employee oversight and performance reviews, business development, contracts review, financial review, business practices, and legal issues, among others. While some of us resist the shift towards the non-engineering aspects of our business, many embrace these different responsibilities as a natural progression towards promotion and greater opportunity. However, how do you plan for this "eventuality?" How do you position yourself to become the engineer of the future (who doesn't just do engineering)? Who provides the runway lights to show us the way? Dr. Fischer's presentation reflects on his 40 years of geotechnical consulting experience, offering lessons on his pathway from entry level engineer to President/CEO, and he shares some thoughts on best practices in geotechnical engineering.

Greg Fischer *is President of Shannon & Wilson where he oversees the operations of Shannon & Wilson's 15 offices. He stepped into this role in 2020 and, since then, has overseen acquisitions of two firms into Shannon & Wilson. He has served on the Board of Directors since 2002, and was Board Chair up until 2020.*

Greg is also a Senior Project Manager with nearly 40 years of geotechnical and civil engineering experience. His consulting experience includes managing the geotechnical services on large, fast-track projects in a wide range of geological conditions under a variety of delivery methods. His experience includes providing foundation recommendations for structures and bridges; designing cut-and-fill retaining walls; evaluating slope stability; designing mitigation measures for landslides and rockfall hazards; and designing embankments over soft ground.

Greg's projects have been completed in 30 states and 5 countries. He is also the author of more than 25 technical papers and has taught geotechnical and foundation engineering classes at several universities.

Turning Disasters into Knowledge

Jonathan D. Bray, PhD, PE, NAE – Keynote Speaker
Faculty Chair in Earthquake Engineering Excellence
University of California, Berkeley



Abstract

Advancing hazard-resistant design demands an understanding of what happens when a disaster occurs. Documenting and sharing the key lessons learned from extreme events around the world contributes significantly to advancing research and practice in hazards engineering. Unanticipated observations from major events often define new research directions. As an example, the recent studies of the liquefaction of fine-grained soil have been largely motivated by observations in post-earthquake reconnaissance efforts.

Field observations are particularly important in geotechnical engineering because it is difficult to replicate in the laboratory the response of soil deposits built by nature over thousands of years. Detailed mapping and surveying of damaged and undamaged areas provides the data for the well-documented case histories that drive the development of many of our design procedures.

Data must be collected quickly and completely before it is lost. Systematic collection of quantitative data is required. Technologies, such as Light Detection and Ranging (LiDAR), Structure-from-Motion (SfM), and Unmanned Aerial Vehicles (UAVs), can capture ground deformation and its effects. Important advancements are possible through research of extreme events if their effects are captured and shared effectively. Thus, engineers should be ready to investigate the next important extreme event.

Jonathan Bray *is a registered professional civil engineer and has served as a consultant on important engineering projects and peer review panels. He has authored more than 450 research publications on topics that include liquefaction and its effects on structures, seismic performance of earth structures, earthquake ground motions, and earthquake fault rupture propagation. He created and led the Geotechnical Extreme Events Reconnaissance (GEER) Association. Dr. Bray is a member of the US National Academy of Engineering and has received several honors, including the H. Bolton Seed Medal, Terzaghi Award, Ishihara Lecture, Peck Award, Joyner Lecture, Middlebrooks Award, Huber Research Prize, Packard Foundation Fellowship, and NSF Presidential Young Investigator Award.*

Lessons Learned from 25 Years of Soil-Structure Testing at Full Scale

J. Brian Anderson, PhD, PE
Professor and Associate Chair for Research
Department of Civil and Environmental Engineering
Auburn University

Abstract



In many disciplines, prototype testing is an essential part of proof-of-concept, product development, and quality assurance. In the case of civil infrastructure, the costs (time and money) associated with testing at full scale are often difficult to justify. For example, it is not practical to build a test bridge to evaluate the performance of a permanent bridge. Therefore, civil infrastructure designers utilize theoretical, analytical, and numerical approaches to predict the response of systems. Only when the cost benefit ratio is significantly more than one, are full scale tests justified. Even then, such programs are limited in scope.

Full scale tests in civil works are often a "one shot deal" where there is one chance to get it right. Engineers must carefully plan testing and document the response by multiple means with sufficient redundancy to mitigate errors or omissions. This usually involves instrumentation and data acquisition in many forms.

This presentation examines instrumentation and testing of soil-structure systems over a 25-year period. Case studies of instrumented soil-structure systems including shallow and deep foundations, excavation support systems, and MSE walls will be presented . While the objective of each test was to demonstrate the engineering response of a system, there were lessons learned about experimental design, construction/installation, and overall best practices, from successes and failures alike.

Dr. J. Brian Anderson *is Professor and Associate Chair for Research in the Department of Civil and Environmental Engineering at Auburn University. He holds PhD and Master of Engineering degrees in Civil Engineering from the University of Florida and a Bachelor of Science in Civil Engineering from North Carolina State University. Brian has over 22 years of faculty service, most recently at Auburn since 2010. He conducts research within the broad themes of foundation engineering, earth retention, soil properties, pavement geotechnics, infrastructure monitoring, soil erosion, and public policy. His research has generated around $13 million dollars of external funding. Dr. Anderson has published over 40 peer reviewed journal and conference publications, edited three books, and prepared numerous engineering reports. He is a registered professional engineer in North Carolina.*

Lateral Resistance of Piles and Pile Groups Behind MSE Walls – Lessons Learned

Kyle M. Rollins, PhD
Professor
Department of Civil and Construction Engineering
Brigham Young University



Abstract

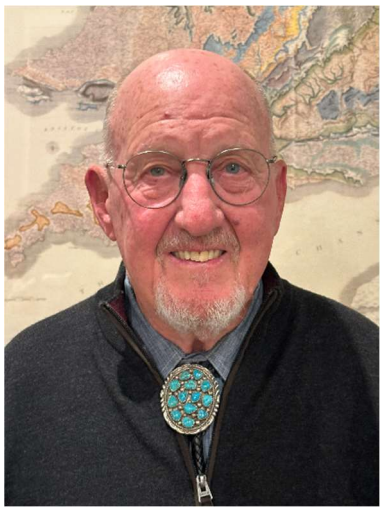
Pile foundations for bridges must often resist lateral loads produced by earthquakes and thermal variations, and other forces. In addition, space constraints are also leading to vertical mechanically stabilized earth (MSE) walls at abutment faces. Available test results indicate that lateral pile resistance can decrease significantly as piles are placed closer to MSE walls. However, no design procedure has been available for assessing the decrease in resistance or predicting the force induced in the reinforcements. In this study, full-scale tests were conducted on 24 12-inch piles located at 2, 3, 4, and 5 pile diameters behind 15 ft and 20 ft high MSE walls. Lateral pile resistance was unaffected by the wall when piles were located more than about four pile diameters behind the wall and decreased significantly at closer spacings. Measured tensile forces in the MSE reinforcements increased as the load on the pile increased and decreased rapidly with transverse distance from the direction of loading. A multiple linear regression equation was developed to predict the tensile force in the reinforcement during lateral pile loading. Back-analysis using a p-y curve approach was successful in matching the measured load-deflection curve for the piles at the greatest spacing. The soil properties were then held constant, and P-multipliers were used to account for the reduced resistance. This simple approach was successful in providing reasonable agreement with measured response for a wide range of displacements. More recent testing has involved lateral resistance of larger piles, fixed-head piles, and pile groups.

Kyle Rollins *received his BS degree from Brigham Young University (BYU) and his PhD from the University of California at Berkeley. After working as a geotechnical consultant, he joined the Civil Engineering faculty at BYU in 1987, following his father who was previously a geotechnical professor. His research has involved large-scale field testing related to deep foundation behavior, geotechnical earthquake engineering, soil improvement techniques, gravel liquefaction, bridge abutment resistance, and collapsible soils. He pioneered the use of blast-induced liquefaction testing to evaluate ground improvement effectiveness and pile performance in full-scale field tests. ASCE has recognized his work with the Huber research award, the Wellington prize, the Wallace Hayward Baker award, and the H. Bolton Seed Medal. He was Cross-Canada Geotechnical lecturer for the Canadian Geotechnical Society in 2009 and Cross-USA lecturer for the ASCE Geo-Institute in 2023-24.*

A Geotechnical Engineer's Guide to Climate Change

Lawrence H. Roth, PE, GE, BC.GE, BC.WRE, F.ASCE
Consultant

Abstract



Ready or not, climate change is now a climate crisis. Record heat alters weather patterns and creates weather extremes that affect infrastructure performance by causing damage, deterioration, service interruptions, and failure. Because we design and build the infrastructure that shapes people's lives, the climate crisis is the most significant challenge and opportunity the engineering profession has ever faced. Geotechnical engineers are especially well-positioned to respond to the challenge of adapting new and existing infrastructure to be more resilient in a changing climate. We are familiar with managing uncertainty and analyzing risk, and we are experts at identifying potential geologic hazards and applying risk and life-cycle cost analyses to reduce risk. We pioneered the observational method, now called adaptive management. The tools we've used for decades to analyze and manage geologic hazards can also be applied to climate hazards and extreme weather. We must use our problem-solving skills and influence to lead transformational change so that new and existing infrastructure performs safely and reliably in a changing climate. Doing so enables us to take advantage of a new market opportunity to design, build, and operate climate-resilient infrastructure. Failing to do so threatens our ability to protect public health, safety, and welfare and may expose us to negligence claims.

Lawrence "Larry" Roth *retired from Arcadis as vice president in 2021 and is currently a consulting civil and geotechnical engineer in private practice. He holds BS and MS degrees in civil engineering from the University of Wisconsin-Madison. His career spans over five decades, specializing in water resource projects, including dams, levees, and water conveyance. Recently, Larry has focused on the role of civil engineers in developing sustainable infrastructure and dealing with climate change effects on infrastructure performance and reliability. Larry chaired ASCE's Geotechnical Engineering Division and served as founding president of the Geo-Institute. He also served as President of the Geoprofessional Business Association (GBA), then known as ASFE. Larry served on ASCE's San Francisco Section and Engineers Without Borders-USA boards. He received the ASCE President's Medal, the Distinguished Service Award from the University of Wisconsin-Madison College of Engineering, and the Outstanding Civilian Service Award from the US Department of Defense. He is a licensed professional engineer in Arizona, California, and Washington and a licensed geotechnical engineer in California. Larry is board-certified (retired) by the Academy of Geo-Professionals and the Academy of Water Resources Engineers.*

Geotechnical Lessons Learned from Pittsburg's I-579 "Cap" – Urban Connector Project

Sebastian Lobo-Guerrero, PhD, PE, BC.GE
Senior Geotechnical Engineer/Laboratory Manager
American Geotechnical & Environmental Services, Inc.



Abstract

The I-579 Cap Urban Connector Project (the Cap Project) consists of a new "cap" structure spanning over a portion of I-579 (Crosstown Boulevard) In Pittsburgh downtown. The Cap Project is bounded by Washington Place, Centre Avenue, Chatham Street, Bigelow Boulevard and land to the north of Bigelow Boulevard. The surface provides a new 3-acre public open space with accessible pedestrian pathways and bicycle routes. It includes improvements to adjoining intersections, provides for recreation and educational areas, performance areas, rain gardens for storm water management, design elements developed by artists from the neighborhood and other public amenities. The project reconnects a fragmented downtown that was divided by the construction of the interstate highway decades before. The Geotech aspects center on the design, construction and testing of the 42 drilled shafts and 220 micropiles with resistance values that are now records values in the city of Pittsburgh for transportation projects. Other significant impacts and lessons from this project are perhaps how sustainability, green infrastructure, and community development can be integrated to Geotechnical projects. The "cap" became an example of "highway caps" in downtowns across the US and around the world. It received 15 major awards in the last 2 years (including National Project of the year for both AASHTO and ASHE).

Sebastian Lobo-Guerrero *is a Geotechnical Project Manager and Laboratory Manager with AGES Inc. Pittsburgh, PA. He has 23 years of experience in Geotechnical Engineering, specializing in the design of deep/shallow foundations, earth retaining structures and landslide stabilization. Sebastian has authored more than 200 technical papers and presentations published in scientific journals, geotechnical magazines, and conference proceeding worldwide. He is the co-author (and implementation instructor) of the State of Delaware LRFD Bridge Design Manual. He has served Chair of the Pittsburgh ASCE Geo-Institute, Director of the ASCE Pittsburgh Section, member of the DFI Anchored Earth Retention Committee, and Conference Chair for DFI-45 in 2020, and DFI-47 in 2022. Sebastian serves on the Board of Trustees of the Academy of Geo-Professionals ASCE and is an Adjunct Professor at the University of Pittsburgh. He has received numerous recognitions, including 2022 DFI President's Award, 2021 ASCE Lifetime Achievement, 2020 ASCE Civil Engineer of the Year – Pittsburgh Section, 2016 ASCE Geo-Institute Distinguished Reviewer, and 2006 ASCE Geo-Institute Best Paper on Numerical Modelling.*

The Influence of Geology on Tunnel Design and Construction

Elizabeth Dwyre, PE, BC.GE
Senior Vice President, Geotechnical & Tunneling
WSP, USA

Abstract



Geology has a profound influence on the successful design and construction of many major civil works, and this is particularly true for tunneling, where the geologic setting influences every aspect of the project from alignment selection through long term performance of the completed facility. This presentation will review geologic considerations, and their influence on tunneling design and construction considerations, for three tunnel projects in the eastern and central US. The recently completed Lower Meramec Tunnel in St. Louis, Missouri is a 7-mile-long regional interceptor sewer constructed by tunnel boring machine (TBM) tunneling in limestone bedrock with an 8-ft ID carrier pipe. Groundwater was a significant consideration, particularly at the geologic contact between two limestone formations, where a previous tunnel had encountered significant unexpected groundwater inflow. Locations for aquifer tests (pump tests) were selected with consideration of this known geologic risk, facilitating the development of reliable tunnel inflow estimates.

During a major expansion of the Indianapolis Airport, a utility tunnel at the was constructed below a runway and two taxiways by earth pressure balance (EPB) tunneling and liner plate methods. Ground conditions were glacial till with interbedded water-bearing sand strata. Based on the geologic setting, cobbles and boulders were anticipated and were sampled and tested from excavation spoil from a nearby highway project; this testing facilitated the contractor's successful optimization of the TBM disc cutters.

The Enbridge Great Lakes Tunnel Project is a 4-mile long 21-foot ID tunnel to be constructed below the Straits of Mackinac, which will house a 30-inch petroleum pipeline, replacing two 20-inch pipelines currently located on the lakebed. The tunnel will be mined through the Mackinac Breccia, which formed during the middle Devonian by dissolution of anhydrites, collapse of overlying rock strata, and subsequent re-cementation of the fragmented rock mass. Hydrostatic pressures of up to 17 bar are anticipated, requiring state-of-the-practice pressurized face TBM technology.

Elizabeth "Liza" Dwyre *is a Senior Technical Principal and Senior Vice President with WSP USA. She is based in Pittsburgh and serves in project leadership in the firm's Geotechnical & Tunneling National Business Line. She has over 40 years' experience in geotechnical engineering practice, primarily in tunneling and major infrastructure projects. Her areas of expertise in geotechnical practice include the assessment and management of geologic risk; geotechnical contract documents for conventional and Alternative Project Delivery projects; deep foundations; and tunnels and underground structures. She has served on ASCE Geo-Institute conference and technical committees, including as past chair of the underground construction technical committee, and has published case histories in Geo-Institute and tunneling conferences. She received both her bachelor's degree in civil engineering and her master's degree in Geotechnical Engineering at Cornell University, and is a registered professional engineer in Pennsylvania, New York, and Michigan.*

Lessons Learned in Ground Improvement

Rick Smith, PE
Principal
Schnabel Engineering

Abstract



Lessons can come from anything and everything. We just need to be aware when there is a lesson to be learned. Underground design and construction can be risky; however, successful underground projects proactively confront risk. A robust risk management (or, risk allocation) plan is a key element of successful underground projects. The presentation will focus on lessons learned in areas that contribute to risk of underground construction and how to effectively manage them.

Rick Smith *has more than 30 years' experience in geotechnical engineering for major infrastructure projects. His experience includes large infrastructure projects for light rail, conveyance and storage tunnels (for combined sewer overflow, water and wastewater) and Class 1 railroads. His expertise includes design and implementation of subsurface exploration programs, subsurface risk assessment and management, construction impact assessment of underground works, design and construction of temporary support of excavation, tunnel lining design, trenchless technologies, design and construction of deep foundations, retaining structures, and embankments on soft ground. Rick has project experience in North America, Australia, and New Zealand, including: Brightwater Conveyance, University Link Extension, Northgate Link Extension, Ship Canal Water Quality Project (all in Seattle); Shoreline Storage Tunnel (Cleveland); Evergreen Line Tunnel, Second Narrows Main Water Supply Tunnel, Port Mann Main Water Supply Tunnel (Vancouver, BC); Hobson's Bay Sewer Tunnel (Melbourne, Australia); Blue Plains Tunnel and Potomac River Tunnel (Washington, DC). Rick earned a Bachelor of Science in Civil Engineering from University of Washington, and a Master of Engineering degree from Virginia Tech. In his spare time, Rick enjoys long-distance cycling and yoga as a student and teacher.*

Remote Sensing of GeoHazards for Distributed Infrastructure System

Juan F. Perri, PhD., PE, GE
Principal Engineer
Exponent



Abstract

Technological advancements in remote sensing allow unprecedented potential for evaluating and monitoring the way distributed infrastructure systems respond to environmental stressors such as human activity, natural hazards, and climate change. Technologies such as Global Navigation Satellite Systems (e.g., Global Positioning System, or GPS), Light Detection and Ranging (LiDAR), and Interferometric Synthetic Aperture Radar (InSAR) are powerful tools that can be used for monitoring and can be integrated into a system-wide Hazards Assessment Framework. In the evaluation of GeoHazards, remote sensing has become commonplace especially for large, distributed infrastructure systems such as pipeline and transportation corridors. A significant advantage of remote sensing is the ability to contemporaneously collect and archive vast amounts of relevant data quickly, efficiently and with little intrusion. Furthermore, remote sensing data is often collected on an automated and regular basis and can be used to assess present and past conditions, such as ground displacements. Thus, remote-sensing tools can be used to monitor surface and structural deformations to explain past performance, evaluate existing conditions, analyze potential future behavior, assist in diagnosing the cause of past performance problems or failures, and to demonstrate compliance with regulatory requirements in certain industries. Remote-sensing tools are also useful when controversies arise following the manifestation of undesirable events such as landslides and ground subsidence. Because of these significant advantages and the ubiquities of the data, remote sensing is more regularly becoming a fundamental part of designs, risk assessments and mitigation strategies, construction monitoring, and expert opinions in disputes. As a result, findings that rely on remote sensing data are increasingly a subject of scrutiny. This presentation will cover examples where remote sensing data has been used for the evaluation of GeoHazards focusing on the use of LiDAR and InSAR. The examples will show the use of remote sensing data in GeoHazards assessments, failure analyses, and expert opinions in disputes.

Juan Perri *is a Principal in Exponent's Civil and Structural Engineering Practice. He is licensed as a Civil Engineer in nine states and as a Geotechnical Engineer in California and Oregon. Dr. Perri received his PhD from the University of California, Berkeley and has over 20 years of experience conducting civil engineering studies in United States and around the World. He has extensive experience in the evaluation of underground pipelines and buried structures, ground movement, earthquake loadings and risk assessments and mitigations of failures.*

For several utility owners and operators in the United States and South America he has provided technical consulting services for the evaluation and prevention of failures. He recently completed studies for two large utility operators for the identification of potential ground movement and seismic threats to their underground gas transmission or distribution pipelines.

LIST OF SPEAKERS



Garry Boehlert, Esq.
Partner
Saul Ewing LLP



Chris Menkiti, PhD
Senior Partner
Geotechnical Consulting Group
United Kingdom



Gregory R. Fischer, PhD, PE
President
Shannon & Wilson, Inc.



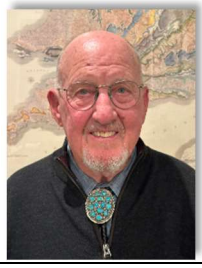
Jonathan D. Bray, PhD, PE, NAE
Keynote Speaker
Faculty Chair in Earthquake Engineering Excellence
University of California – Berkeley



J. Brian Anderson, PhD
Professor
Auburn University



Kyle M. Rollins, PhD
Professor, Civil Engineering
Brigham Young University



Lawrence H. Roth, PE, GE, BC.GE, BC.WRE, F.ASCE
Consultant



Sebastian Lobo-Guerrero, PhD, PE, BC.GE
Senior Geotechnical Engineer/Laboratory Manager
American Geotechnical & Environmental Services, Inc.



Elizabeth Dwyre, PE, BC.GE
Senior Vice President.
Geotechnical & Tunneling
WSP USA



Rick Smith, PE
Principal
Schnabel Engineering, LLC



Juan F. Perri, PhD, PE, GE
Principal Engineer
Exponent

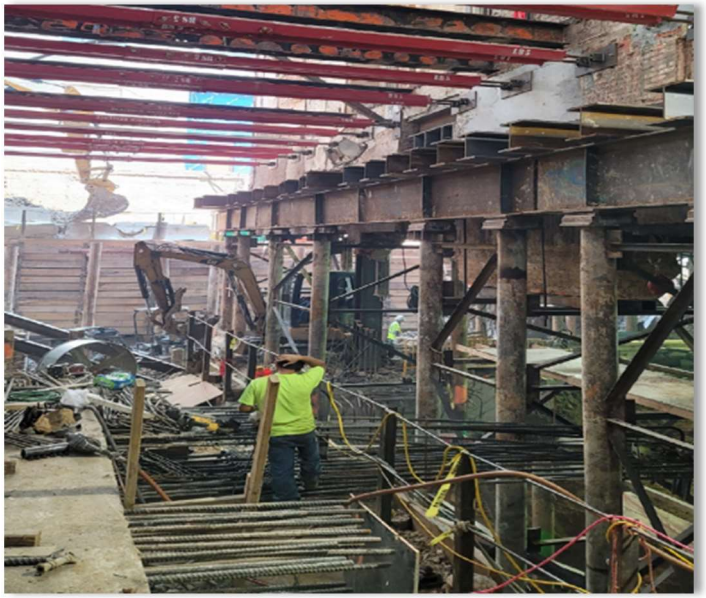
BEST PROJECTS

First Place:

The Milken Center for Advancing the American Dream in Washington, DC

Berkley & Company Contractors, Inc.

INTRODUCTION: The Milken Center for Advancing the American Dream (MCAAD), located at 1501-1505 Pennsylvania Ave NW, Washington, D.C., is housed in a historically significant structure built in 1904. Listed on the National Register, the five-story building required extensive renovation, including adding two new levels and lowering the basement by 4.5 to 20 feet. The project's challenge was stabilizing the existing structure while preventing excessive movement during excavation and construction.



Key structural support phases included:

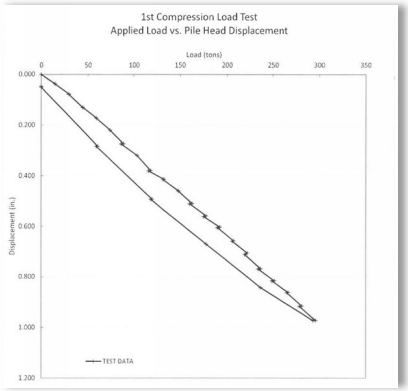
- Installation of permanent micropiles for column support
- Temporary masonry bearing wall and load transfer system
- Internal basement excavation support
- Underpinning with lateral bracing

SUBSURFACE PROFILE AND FOUNDATION SELECTION: The site's subsurface profile included man-made fill, Coastal Plain Terrace deposits, the Potomac Formation, and partially weathered rock (PWR). Engineering analysis led to the selection of micropiles due to their minimal vibration impact and ability to support variable soil conditions.

Findings included:

- **Man-made Fill:** Loose, up to 23.5 feet deep, SPT N-values of 0 to7
- **Coastal Plain Terrace Deposits:** SPT N-values ranging from 0 to 50
- **Potomac Formation:** Varied deposits with an average SPT N-value of 18
- **PWR:** Strong residual material with SPT N-values over 60





ENGINEERING SOLUTIONS: Micropiles, ranging from 9-7/8 to 11-7/8 inches in diameter, were installed as the foundation system. Construction involved precise coordination due to limited space and required hoisting materials with a tower crane. A trussed tower system supported the interior bearing walls using over 300 micropiles.

Load tests verified micropiles' ability to withstand compression loads with a safety factor of at least 2. Preloading with hydraulic jacks was carefully monitored to prevent structural settlement during load transfer.

CONCLUSION: Despite logistical challenges, including COVID-19 delays and confined workspaces, the MCAAD renovation successfully combined historical preservation with advanced geotechnical engineering. This project serves as a model for integrating modern construction techniques into historic structures while maintaining structural integrity and aesthetic value.

Second Place:

Coal Ash Removal in Virginia

Haley & Aldrich

In 2019, Virginia's General Assembly mandated the removal of 14.9 million cubic yards of coal ash from two ponds under the EPA's 2015 CCR Rule. Closure efforts began in 2021, involving groundwater cutoff, aquifer depressurization, ash dewatering, excavation, transport to a lined landfill, and backfilling after clean closure verification.





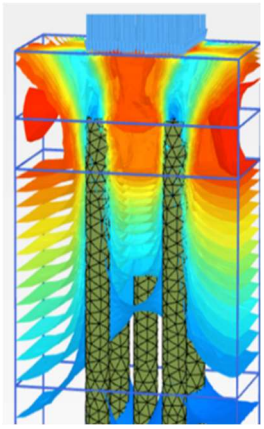
The project commenced with geotechnical and hydrogeologic investigations, stability and seepage analyses, and the installation of geotechnical supports, including micropiles and structural CSM walls. By late 2023, a 6,000 LF cutoff wall—comprising TRD and sheet piles—was completed around three embankments.

Ash excavation and dewatering began in April 2023, using rim ditches, sumps, and a vacuum well point system to ensure safety and efficiency. Real-time "Go/No Go" decision-making tools help optimize daily operations. The project is expected to conclude by 2035 after both ash ponds are excavated, verified clean, and backfilled.

Third Place:

The Navy Base Intermodal Facility (NBIF) Project

Menard





The Navy Base Intermodal Facility (NBIF) project is a rail development by the South Carolina Ports Authority at the former Charleston Naval Complex, covering 118 acres in North Charleston, SC. It includes the construction of wide-span gantry cranes mounted on 3,250 ft of rail line. The site has soft, highly variable soils overlying the Cooper Marl, posing geotechnical challenges.

A Controlled Modulus Column (CMC)® rigid inclusion ground improvement system was implemented to control settlement and enhance bearing capacity. The system includes 12.5-inch and 15.6-inch diameter CMCs extending into the Cooper Marl, complemented by a cement-treated Load Transfer Platform (LTP). To refine the CMC design, an extensive CPT program with 75 soundings was conducted along the rail alignment. Finite element modeling assessed soil-structure interaction, optimizing CMC depth (45-70 ft) and spacing. On-board instrumentation ensured proper embedment during installation, and multiple load tests confirmed the system's performance, including a multi-stage test that showed increased stiffness upon reloading.

Seismic considerations required site response and pseudo-static spring analyses to evaluate induced moments in the CMCs and determine the necessary steel reinforcement. By December 2024, CMC installation was completed, and gantry crane assembly was underway.

Fourth Place:

Riverside Smithfield Hospital in Smithfield, Virginia – Keller North America, Inc.



The Riverside Smithfield Hospital project includes an 80,000 sq. ft. 4-story hospital and a 10,000 sq. ft. CUP building on undeveloped land in Smithfield, Virginia. Ground improvement was required to achieve a 6,000 psf allowable bearing capacity and limit settlement to 1" post-construction, accommodating maximum column loads of 1,400 kips.

Originally, Aggregate Piers were considered, but further analysis of loading and geotechnical conditions led to the selection of a Rigid Inclusion solution. The site, located in the Coastal Plain Physiographic Province, is underlain by the Tabb Formation, consisting of upper coarse-grained and lower fine-grained alluvium, with the Yorktown Formation beneath.

As new data emerged, Aggregate Piers proved infeasible, while deep foundations were cost-prohibitive. Keller conducted CPT testing to compare results with existing SPT and lab data, refining the Rigid Inclusion design into a technically and economically viable solution for the project.

A GLIMPSE OF THE PAST















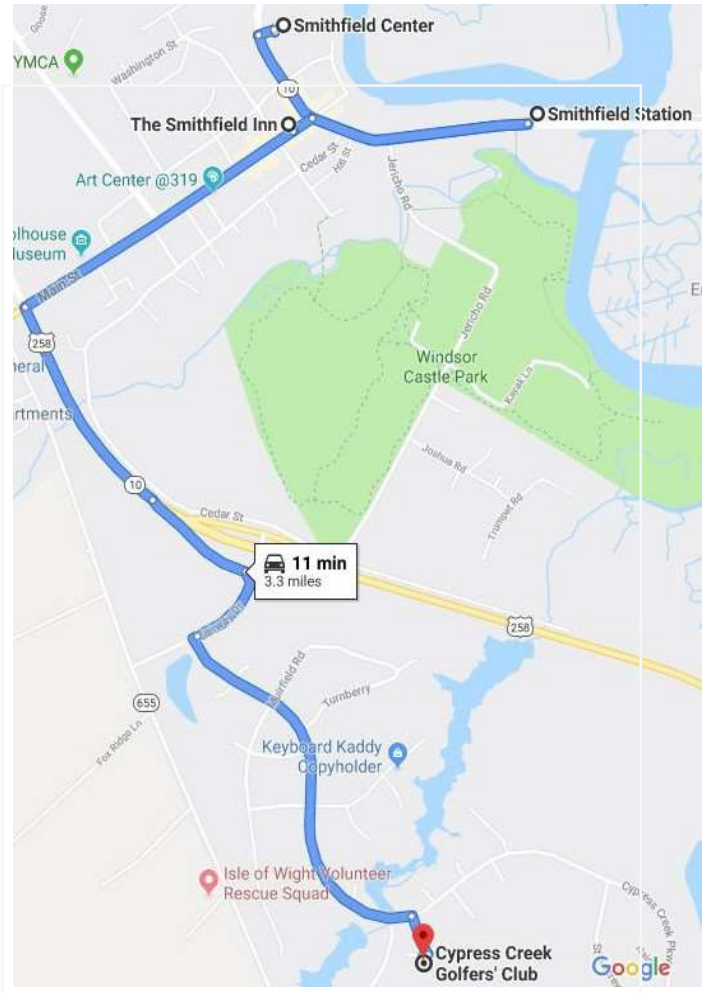






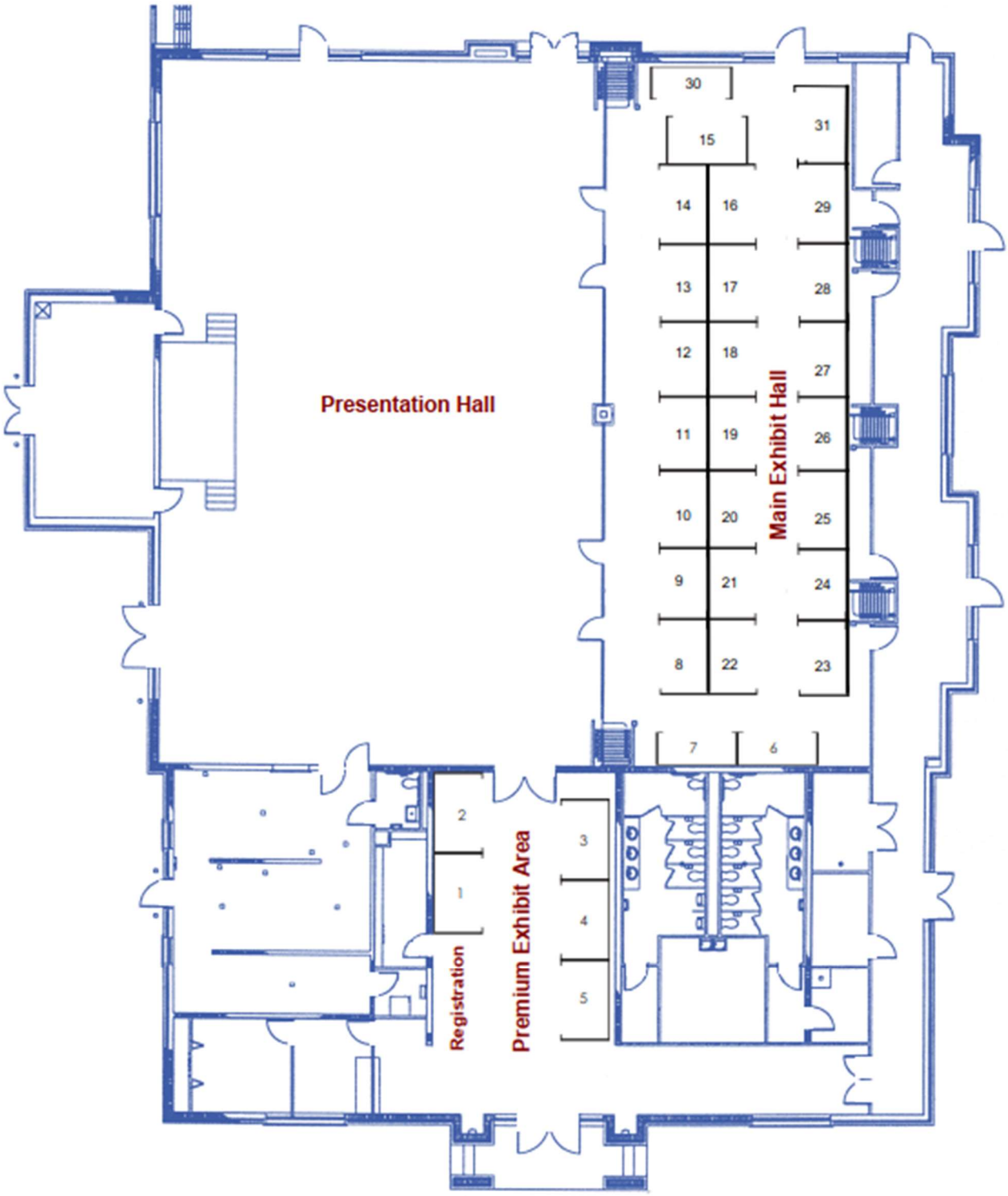
MAPS


Smithfield Center
Smithfield Foods
N Church St
Luter Dr
Smithfield Packing Co., Inc
Pagan River
Pagan River
Smithfield Winery
10
The Smithfield Inn
Smithfield Station
1750 Isle of Courthouse
The Bank of Southside Virginia
10
Windsor Park North


Smithfield Center
YMCA
Washington St
The Smithfield Inn
Smithfield Station
Art Center @319
Cedar St
Jericho Rd
Main St
258
Windsor Castle Park
Joshua Rd
Trumpet Rd
10
Cedar St
11 min
3.3 miles
258
655
Turnberry
Keyboard Kaddy Copyholder
Isle of Wight Volunteer Rescue Squad
Cypress Creek Golfers' Club
Google

EXHIBITOR LAYOUT

Smithfield Center



LIST OF EXHIBITORS

Booth	Company	Booth	Company
1	In-Situ Soil Testing, L.C.	16	Michels
2	Froehling and Robertson	17	Catabwa Valley Engineering and Testing
3	Keller	18	Stable Ground In-Situ
4	SEQ Drilling, Inc./International Drilling Equipment	19	River Shore Marine
5	GeoStructures, Inc.	20	National Drillers Association
6	Menard	21	Tensar
7	GRL Engineers / Pile Dynamics	22	Williams Form Engineering Corp.
8	Wagman Heavy Civil, Inc.	23	CJ Geo
9	NCFI Polyurethanes	24	Penndrill Manufacturing
10	Subsurface Construction	25	GeoDin / Fugro
11	Conetec	26	Ishebeck USA, Inc.
12	Berkel and Company Contractors, Inc.	27	Subsurface Constructors, Inc.
13	Duro Terra	28	ECS Mid-Atlantic, LLC
14	Morris Shea	29	Geo-Technology Associates, Inc.
15	Aero Aggregates	30	Terra Insights
31	Geo Instruments		

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