2014 Groundhog
2014 Groundhog

In this Issue:

2013 - 2014 Officers .......................................................... 3
President’s Message ........................................................................ 4
2013 - 2014 Event Schedule .................................................. 6
Spring Seminar and Short Course Update .................................. 7
2013 Distinguished Service Award ........................................... 8
Public Relations ........................................................................... 9
UW GIGSS .................................................................................. 10
Local Firm Summaries ......................................................... 11
2013-2014 Officers

Back: Bob Metcalfe, Todd LaVielle, Tyler Stephens, and Lynn Salvati
Front: Elizabeth Lundquist, Mike Lach, and Fadzilah (Dila) Saidin

PRESIDENT
Mike Lach, P.E.
CDM Smith

PRESIDENT-ELECT
Tyler Stephens, P.E.
Shannon & Wilson

SECRETARY
Lynn Salvati, PhD, P.E.
Jacobs Associates

TREASURER
Fadzilah (Dila) Saidin, PhD, P.E.

MEMBERSHIP CHAIR
Bob Metcalfe, P.E., L.E.G.
GeoEngineers, Inc.

EDUCATION CHAIR
Todd LaVielle, P.E.
Shannon & Wilson

PUBLIC RELATIONS CHAIR
Elizabeth Lundquist
Parsons Brinckerhoff

WEBMASTER
Elizabeth Lundquist
Parsons Brinckerhoff
President’s Message

Happy Groundhog’s Day and welcome to the 2014 edition of The Groundhog! The ASCE Seattle Section Geotechnical Group and Seattle Geo-Institute Chapter (SSGG/SGIC) produces this publication annually to share group announcements, provide our member firms with a forum to share their achievements over the previous year, and discuss our group’s activities and goals.

As President of the SSGG/SGIC, I get to be the face of the group – welcoming you to meetings, sending out all of the group announcements, and writing these introductions, to name a few. However, the real work of this group is done by our officers and volunteers, and I would be remiss not to recognize them here.

Tyler Stephens, our group’s President-Elect, is hard at work organizing this year’s Spring Seminar, to be held March 29th at the University of Washington. This year’s seminar will cover the topic of Geotechnical Instrumentation, and should not be missed!

Our Secretary Lynn Salvati has been taking the minutes at our meetings and has worked diligently to produce this publication.

The group’s Treasurer, Dila Saidin, is the first face many of you see at the dinner meetings, making sure your payments accounted for, so that our finances are always in order.

Education Chair Todd LaVieille organized all of our dinner meetings as well as our Fall Technical Short Course on steel sheet piling. He is also organizing another short course to be held the day prior to the Spring Seminar.

Membership Chair Bob Metcalfe maintains our membership list and acts as a senior-level advisor to the board. His past experiences as President of the group help guide our decisions as we move the group forward.

Elizabeth Lundquist is pulling double duty this year, taking on the roles of Public Relations Chair and Webmaster. She has been coordinating our outreach activities with the ASCE Seattle Section and maintains the SSGG/SGIC website.

The year 2013 officially marked the ASCE Seattle Section’s centennial anniversary and unofficially marked the Geotechnical Group’s 30th Anniversary. The Seattle Section held a number of events in
In honor of the occasion and produced the “Civil Engineers who Built Seattle” exhibit, which was fea-
tured at Sea-Tac Airport and the Museum of History and Industry, among others. Our group got in on
the Centennial theme in November, when Bob Holtz provided a historical presentation on the Cedar
River Dam failure.

Over the years I have been involved with SSGG/SGIC, I have seen our relationship with the University
of Washington’s Geo-Institute Graduate Student Society (GIGSS) Chapter flourish and grow. We’ve
seen an increase in the number of students attending our meetings, several of the students are volun-
teeering to help put on our events, and we have been able to provide financial assistance to their group
to support their meetings.

Thanks largely to this great relationship, the SSGG/SGIC and the UW GIGSS have been selected as
co-hosts for the Geo-Institute’s cross-country lecture for the second year in a row. This year’s lecture
will be given by Tom O’Rourke. This lecture is only given in five cities annually, so it is a great honor
to be selected two years running! The lecture will serve as our April meeting – more details will be
coming as we get closer to the event.

Once again, we have been able to make a contribution this year to the Robert D. Holtz Endowed Fel-
lowship at the UW. Our contributions have enabled a graduate student to be funded for the 2013-14
academic year. Alex Grant is a Master’s student in the Geotechnical program where he is pursuing re-
search in natural hazards and earthquake engineering.

As evidenced by our continued support of the Endowment, our financial position remains strong. We
are covering our costs with the dinner meetings, and continue to see income from our short courses and
Spring Seminar. This income gives us the freedom to support the Endowment as well as other local
non-profit organizations, such as the GIGSS and Engineers Without Borders.

Our group continues to grow and thrive, thanks to the dedication and support of each and every
member. The officer board is always looking for volunteers to serve on committees, plan events, and
get involved! I would encourage everyone reading this to consider helping us out and making your
group even stronger.

Thanks for reading, and we’ll see you at the meetings!

Mike Lach, P.E.
President
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Speaker</th>
<th>Topic</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/26/2013</td>
<td>DM, joint with AEG</td>
<td>Boris Caro Vargas</td>
<td>Tunnel Monitoring</td>
<td>Best Western, Seattle</td>
</tr>
<tr>
<td>10/24/2013</td>
<td>DM</td>
<td>Mark Koelling</td>
<td>Working in New Zealand and Australia</td>
<td>Best Western, Seattle</td>
</tr>
<tr>
<td>11/7/2013</td>
<td>SC</td>
<td>Richard Hartman</td>
<td>Steel Sheet Piling Structures</td>
<td>Kiewit</td>
</tr>
<tr>
<td>11/21/2013</td>
<td>DM</td>
<td>Norman Norrish</td>
<td>I-90 Widening</td>
<td>Best Western, Seattle</td>
</tr>
<tr>
<td>12/12/2013</td>
<td>DM</td>
<td>Thomas Badger</td>
<td>Management of Unstable Slopes along Washington State Highways</td>
<td>Best Western, Seattle</td>
</tr>
<tr>
<td>1/30/2014</td>
<td>DM</td>
<td>Susan L. Bednarz</td>
<td>Deep Geotechnical Borings Drilled in Bellevue and Issaquah, Washington, Provide New Information on Local Geology and Rock Tunnel Constructability</td>
<td>Best Western, Seattle</td>
</tr>
<tr>
<td>3/6/2014</td>
<td>DM, joint with ASCE General Section</td>
<td>William Finn</td>
<td>Seismic Slope Stability</td>
<td>Best Western, Seattle</td>
</tr>
<tr>
<td>3/28/2014</td>
<td>SC</td>
<td>Shaun Dustin - Campbell Scientific</td>
<td>Geotechnical and Structural Instrumentation</td>
<td>TBD</td>
</tr>
<tr>
<td>3/29/2014</td>
<td>SS</td>
<td>Keynote Speakers: W. Allen Marr (Geocomp) Martin Beth (Soldata)</td>
<td>Geotechnical Instrumentation</td>
<td>Kane Hall, UW</td>
</tr>
<tr>
<td>5/8/2014</td>
<td>GI Cross Country Lecture, DM</td>
<td>Tom O'Rourke</td>
<td>Earthquake Effects on Critical Infrastructure</td>
<td>TBD</td>
</tr>
<tr>
<td>5/29/2014</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

DM Dinner Meeting  
SC Short Course  
SS Spring Seminar
2014 Spring Seminar and Short Course Update

Once again we asked our membership to tell us which topics you were interested in learning about for our annual Spring Seminar. The vote counts were very close for several topics including *geotechnical earthquake engineering*, *drilled foundations*, and *instrumentation*. The board voted and instrumentation was the selected topic for the 2014 Spring Seminar. The ASCE Seattle Section Geotechnical Group / Geo Institute Seattle Chapter is pleased to announce the 31st Annual Spring Seminar titled *Geotechnical Instrumentation*. This year’s seminar will be held on Saturday, March 29th, 2014 at the University of Washington Kane Hall.

This year’s seminar is organized into four subtopics: *Subsurface Monitoring Technologies and Instrumentation, Data Acquisition, Management and Presentation, Surface Monitoring Technologies, and Remote Sensing*. We are pleased to announce our keynote speakers will be W. Allen Marr of Geocomp Corporation and Martin Beth of Soldata Group. In addition to these keynote speakers, we have confirmed a number of local, regional and national experts who will give presentations about their specialty topics. This year’s speakers represent many sides of the project dynamic, including owners, contractors, consultants and academia. The Spring Seminar will include exhibitor displays and hosted lunch and breaks. Seminar attendees will be eligible to receive 0.8 Continuing Education Units (CEU) or 8 Professional Development Hours (PDH).

We are also planning a 1-day short course on Friday before the seminar, March 28th, 2014. The short course is tailored for audiences of all levels of engineering practice, including contractors, owners, and designers in the geotechnical, civil, structural, and other disciplines. The short course will be taught by Shaun Dustin of Campbell Scientific, and will cover data acquisition, considerations for field deployment, networking and programming. To reinforce the concepts covered, a hands-on exercise will be included. Course attendees will be eligible to receive Continuing Education Units (CEU) or Professional Development Hours (PDH).

Seminar program details, short course details, and registration information will be available soon. Please visit our website [www.seattlegeotech.org](http://www.seattlegeotech.org) for updates and information.

Tyler Stephens, P.E.
President-Elect 2013-14
2013 Distinguished Service Awards

Presented at the Spring Seminar - April 20th, 2013

ASCE Seattle Section Geotechnical Group’s mission:

“to advance geotechnical practice in the Puget Sound Region by providing leadership on Public issues, sharing professional experience, and promoting education”.

The ASCE Seattle Section Geotechnical Group recognized one individual at our April 20, 2013 Annual Spring Seminar who provided support to our mission during our early years. Our 2013 Distinguished Service Award was presented to John Newby.

John E. Newby

John relocated to Seattle in 1980, about 4 years after our Geotechnical Group was founded. He immediately became active with our small but growing Seattle Section and served as Chairman of the Geotechnical Group from 1982 to 1983, while we was President at AGI Technologies. John was also one of our early pioneers with respect to our annual spring seminars. He was one of the leaders in the planning and overseeing of our first spring seminars including the 1984 seminar on Soft Ground Tunneling and our 1985 seminar on Ground Anchors. As past-President of our Group, John served on the Spring Seminar Planning Committee for several years.

In addition to his run through the ranks in our Geotechnical Group, John served as Chairman of the ASCE Seattle Section Professional Practices Committee from 1983 to 1984 and again from 1992 to 1995. He also served as Chairman of the ASCE Ports and Harbors Committee in 1987. John was also a representative for ACEC Washington and served on the Board of Directors from 1990 to 1993 and worked his way up the ranks before serving as the President from 1999 to 2000.

The ASCE Seattle Section Geotechnical Group appreciates John’s early leadership and inspiration to the Group, as well as his many achievements to advance the practice of geotechnical engineering in the Seattle area.

Bob Metcalfe, P.E., L.E.G.
Membership Chair
Public Relations

The chapter has had another year of public outreach to increase awareness of the geotechnical profession and educate the public regarding local geotechnical challenges. Chapter outreach has been through collaboration with several organizations.

City of Seattle DPD

The chapter has continued its support of the City of Seattle DPD landslide awareness meetings, attending both events this year. We staffed a booth, answered questions, and provided informational materials to attendees.

American Society of Civil Engineers (ASCE) Seattle Section

In 2013, the ASCE Seattle Section celebrated its centennial year. The centennial year celebration honored the People, Projects and Policies that are monumental to both the advancement of the civil engineering profession and development of the Seattle area. The Marquee Centennial Gala was held at the new Museum of History and Industry (MOHAI) in Lake Union Park on Saturday October 5th, 2013. Greg DiLoreto, ASCE National President, presented the keynote speech, and Kathleen Flenniken, the Washington State Poet Laureate, presented the Centennial Poem.

Civil Engineers that Built Seattle – Centenary Exhibit is a museum quality display consisting of 10 panels spotlighting the “people” aspect of civil engineering, focusing on the civil engineers who have built projects and created organizations that have contributed to the growth of Northwest Washington state.

The exhibition was displayed in the following locations throughout 2013:

- Sea-Tac International Airport, Gate B4
- National Student Steel Bridge Competition (Hec Edmundson Pavilion, UW)
- Snohomish County Administration Building
- Pioneer Association of the State of Washington, Pioneer Hall
- Bellevue City Hall
- Ports '13, COPRI Conference
- Museum of History and Industry (MOHAI)

Elizabeth Lundquist
Public Relations Chair
Geo Institute Graduate Student Society (GIGSS) is students made up of students in the Geotechnical Engineering department at University of Washington. The purpose is to complement the education received with lectures from professional engineers, scholars and professors. We also have social get togethers such as barbeques and “GeoBeers”. These events are often hosted and attended by our geotechnical faculty members (Professors Pedro Arduino, Steve Kramer and Joseph Wartman).

Last Geo Congress, we had a team of students compete in Geo–Predictions led by Graduate student Collin McCormick. The problem was to predict the water level before a landslide. Their report earned them a student stipend to go to the Congress but they did not place in the final competition.

Over the last year we have had speak at our meetings: Dan Mageau from Soil Freeze, Tim Kovacs, Mark Rohrback, Mike Swanson from Hart Crower, Lynn Salvati from Jacobs Associates, Todd Wentworth from AMFC, Red Robinson, John Christian as our Hennes Lecture, Boris Cargo Vargas from Soldata, Jim Schmidt from Terracon, and Dave Baska from Terracon.

We thank all of this last year’s lecturers and our upcoming lectures. We have appreciated the insight into the field that you have given and have helped to complete our education here at University of Washington. And if you are interested in giving a lecture, please contact Lisa Dunham.

In the coming year, GIGSS is hoping to continue the lecture series, send representatives to Geo-Congress for Geo-Predictions and Student Leadership Council, make a liquefaction tank that can be used as a demonstration tool during Engineering Discovery Days hosted by University of Washington Engineering Department and host a graduate student seminar along with the Hennes Lecture in April.

This past year we have set up a list serve for anyone that would like to have information about upcoming lectures, geo-beers and updates on GIGSS activities, you can join at: http://mailman1.u.washington.edu/mailman/listinfo/gigss-alumni.

The GIGSS officers from 2013-2114 are: Lisa Dunham (President), Andrew Makdisi (Vice-President), alex grant (Secretary), John Schober (Webmaster) and Kerem Kalkay (Treasurer).
## Local Firm Summaries

ASCE Seattle Section Geotechnical Group would like to thank the following companies for volunteering to submit articles for the 2014 Groundhog publication. The Groundhog is published to inform group members and others of the group’s achievements, recent activities, goals, changes in the group and other significant issues in the local geotechnical community.

Each local organization represented by the group’s membership is invited to submit a brief article summarizing their organizations services and trends over the past year, plans for the coming year, changes in the organization and promotions.

The company articles are arranged within the Groundhog publication in alphabetical order.

<table>
<thead>
<tr>
<th>Aspect Consulting</th>
<th>Holt Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMEC</td>
<td>HWA GeoSciences</td>
</tr>
<tr>
<td>CDM Smith</td>
<td>Jacobs Associates</td>
</tr>
<tr>
<td>CH2M Hill</td>
<td>Kleinfelder</td>
</tr>
<tr>
<td>Condon Johnson &amp; Associates</td>
<td>Landau Associates</td>
</tr>
<tr>
<td>Crux Subsurface</td>
<td>Malcolm Drilling</td>
</tr>
<tr>
<td>DGSI Slope Indicator</td>
<td>MWH Americas</td>
</tr>
<tr>
<td>GeoEngineers</td>
<td>Northwest Cascade</td>
</tr>
<tr>
<td>Geopier Northwest</td>
<td>Shannon &amp; Wilson</td>
</tr>
<tr>
<td>Golder Associates</td>
<td>SoilFreeze</td>
</tr>
<tr>
<td>Hart Crowser</td>
<td>Soldata</td>
</tr>
<tr>
<td>Hatch Mott MacDonald</td>
<td>SubTerra</td>
</tr>
<tr>
<td>Hayward Baker</td>
<td>Terracon Consultants</td>
</tr>
<tr>
<td>Holocene Drilling</td>
<td>URS Corporation</td>
</tr>
</tbody>
</table>
2013 at Aspect Consulting: What a year!
New employees, new projects, new opportunities!

After a couple of years’ “sabbatical” working on the Seattle Seawall (and other projects) with Tetra Tech, Henry Haselton rejoined Aspect as a principal and leader of our burgeoning infrastructure practice. Geotechnical engineer Nick Szot joined Aspect’s Wenatchee office to provide a local source of geotechnical expertise to our central and eastern Washington clients. We rounded out the year welcoming Erik Andersen into the firm.

Keeping our growing geotechnical group busy has been easy -highlights of our 2013 project work include:

**Port Angeles Landfill.** Moving 250,000CY of refuse from a landfill cell perched precariously at the top of a coastal bluff, we're providing slope stability of native soil, refuse and an innovative membrane liner system, design of a 130-ft high MSE buttress, and design/testing of a bentonite amended soil cover system.

**Utility projects.** We wrapped up our work on the SPU Madison Valley Stormwater Project with MWH, while our work for SPU continues on geotechnical studies for infrastructure retrofits in 5 CSO basins with CDM. We also began the geotechnical study for a 12-mile long, large diameter irrigation water supply pipeline on Columbia River with JUB for DNR.

**Fish Passage/Ecosystem Restoration.** In Kitsap County, we supported culvert removal replaced by a 3-span bridge over estuary deposits on Bucklin Hill Road with OTAK, and are currently working on three more fish barrier projects involving undersized culvert removal / bridge replacement. In Sequim, we oversaw completion of Washington Harbor restoration with ESA, replacing culverts and a causeway with a multi-span bridge for the Jamestown S’Klallam Tribe.

**Transportation projects.** On Bainbridge Island’s Rockaway Beach Road stabilization we provided coastal protection using combined soldier pile wall and MRE slope, while in Okanogan County we provided geotechnical support for Old 97 road widening and the Loup Loup Bridge replacement.

**Green Stormwater Infrastructure.** Offering the infiltration expertise of Scott Kindred, we’re completing stormwater infiltration studies for King County CSO reductions with HDR, and providing construction management support for deep infiltration well installation on King County’s Barton CSO project.

We continue to provide more than just infrastructure support; Aspect employees were involved in community support efforts year-round: digging sod and removing river debris on Duwamish Alive!, spring and fall cleanup projects; biking, cheering, or sponsoring Aspect riders in a summer ride to raise money to defeat ALS; and a winter raffle of employee-created items to benefit a water project in a Guatemalan village.

CONDON · JOHNSON & ASSOCIATES, INC.
CONTRACTORS AND ENGINEERS

Heavy Civil Engineering
- General Contracting
- Site Packages

Shoring
- Shotcrete
- Soldier Pile & Lagging
- Sheet Piling
- Soil Nailing
- Underpinning

Ground Improvement
- Compaction Grouting
- Stone Columns
- Geojet
- Jet Grouting

Deep Foundations
- Drilled Shafts
- Micropiles
- Augercast

Four Locations Throughout the West

OAKLAND
(510) 636-2100
kbizzack@condon-johnson.com

LOS ANGELES
(909) 390-0268
gburrough@condon-johnson.com

SAN DIEGO
(858) 530-9165
gburrough@condon-johnson.com

NORTHWEST
(425) 988-2150
dparmantier@condon-johnson.com
AMEC Environment and Infrastructure

AMEC’s Geotechnical Group worked on a variety of interesting local projects: including transportation and infrastructure improvements for cities, redevelopment of schools, retail/commercial development, landslide repairs, and stream and shoreline restorations.

Our Seattle, Bothell and Lynwood offices collaborated on a waterfront restoration project that kept Bill Lockard, Konrad Moeller, and Koorus Taghighi busy nearly full time during the year. Jim Dransfield has been working on dam rehabilitation, dam removal/stream restoration, levee/floodwall, and slope stabilization projects in the Pacific Northwest and Hawaii. Todd Wentworth is serving as a company-wide advisor for AMEC’s geotechnical engineering practice, which involved attending AMEC’s Technical Summit in Las Vegas. He also presented a landslide-repair case history at the Geosynthetics 2013 Conference in San Diego. Carlo Evangelisti completed construction monitoring of two community aquatic centers, and has been conducting specialty geotechnical testing for bridge design, assisted by Alek Harounian from our Los Angeles office. Henry Brenniman has been busy working on slope stabilization projects, infiltration studies and a variety of other local projects. Pat Reed assisted our Tacoma office with construction monitoring of developments in Pierce County and Bremerton. Minjae Park reduced his work hours in order to pursue his graduate degree in Geotechnical Engineering at UW. And last but not least, we hired Ryan Barnes to the group this year to help with our work load.

Contact: Michael Lach
LachMA@cdmsmith.com

CDM Smith provides lasting, integrated solutions in water, environment, transportation, energy and facilities to public and private clients worldwide. In the Northwest, CDM Smith has offices in Bellevue, Seattle, Portland, Helena, and Libby.

John Newby, P.E., leading our Geotechnical Services Division in the Western U.S. and Asia from the Bellevue office, served as program lead, lead practitioner, or senior geotechnical consultant on major infrastructure projects throughout the Western U.S., Singapore, and Vietnam. Joe Souther, P.E., leading the geotechnical group in Bellevue, provided assistance to public works applicants in New Jersey in the aftermath of the Hurricane Sandy disaster under our contract with FEMA. He also performed geotechnical design for the water and wastewater infrastructure of a new industrial city in Saudi Arabia.
Ulf Gwildis, L.E.G., led a geologic survey for planning a dredging operation at a St. Lawrence tributary, worked on rock slope design in Arizona, performed rock core logging for a water supply tunnel to New York City, and provided geotechnical design for improvements of Seattle’s West Point treatment plant. He developed the winning feasibility study concept for a paper mill sludge lagoon in Oregon. Mike Lach, P.E. conducted subsoil investigation and geotechnical design for a flood protection levee system in Queensland, Australia. He provided shoring design for the new North Transfer Station in Seattle and he continued with his task of impact evaluation and monitoring of existing utilities and structures along the Alaskan Way Viaduct tunnel alignment for minimizing the risk of any disruptions. Karen Irby-Smith, managing our geotechnical laboratory, was also involved in the subsoil investigation for a major sewer infrastructure improvement program in New York City. Morris Wainwright provided civil design services for a new U.S. Army water treatment facility in California and for an asbestos remediation project involving a 125 acre site in Oregon.

Our Geotechnical Services Division had a successful year. In the Northwest we contributed presentations to the technical community highlighting innovative solutions and successful projects. The resources provided by our geotechnical professionals in fifteen states cover the whole range of geotechnical engineering. In addition, we can turn to the internationally acknowledged expertise of our affiliated colleagues in Germany in specialty fields such as ground freezing design, geothermal energy concepts, and high-speed-rail infrastructure expansion.

We continue seeking to add geotechnical professionals to our team working on numerous technically exciting and challenging projects throughout the Western U.S. and beyond.

Contact: Michel Bouchedid
Michel.Bouchedid@CH2M.com

Geotechnical staff from CH2M HILL’s Bellevue office have been working on a variety of challenging projects, including:

- Phases 1 and 2 of the Port of Anchorage Suitability Study for the USACE, involving a major assessment of seismic stability for the Open Cell Sheetpile System (OCSP®) being constructed at the Port.

- Support of the Seattle Public Utility (SPU) Buried Reservoir Seismic Program, involving a major seismic assessment of four of SPU’s buried concrete reservoirs. Working with Shannon & Wilson and SC Solutions, the CH2M HILL team is performing seismic hazard and soil-structure interaction assessments.

- Support during final design of the APM Container Terminal in Moin, Costa Rica. The facility is located in an area of high seismicity and soft seafloor soils. Design dealt with high liquefaction potential within hydraulic fill, as well as soil-pile-embankment interaction studies using FLAC.
- Design of a groundwater collection and treatment system involving a 9,000 foot long groundwater cutoff wall, 3,000 gpm well system, conveyance pipelines, and expansion of a mine-impacted water treatment plant in northern Idaho.
- Pile load testing design and evaluation at sites in Washington, New Jersey, and Manitoba for American Piledriving Equipment in support of their high strength grouted and ungrouted helical piles.

Michel Bouchchedid has been supporting the CH2M HILL’s Program Management team on the King Abdulaziz Project for Riyadh Public Transport in Saudi Arabia. This Program includes six automated light rail lines, comprising some 181 kilometers, and extensive sections of elevated guideway and bored tunnels where 6 TBMs are planned to be boring simultaneously. At a cost of about $30 billion, this Program is one of the largest transit infrastructure programs being delivered in the world today.

Senior principal technologist Don Anderson continues as:
- Committee member for TRB Committee AFF50 on Seismic Design and Performance of Bridges, as well as subcommittee on GeoSeismic Subcommittee for Foundation Design Issues
- Board of Trustees for Academy of GeoProfessionals
- An invited speaker at the National Research Council Workshop on State-of-the-Art and Practice in Earthquake-Induced Soil Liquefaction.

We look forward to 2014 with our role in CH2M HILL’s new Tunneling and Earth Engineering practice group which combines our legacy geotechnical staff in the US with former Halcrow capabilities to create a combined geotechnical staff world-wide of about 450.

Contact: Dominic Parmantier
dparmantier@condon-johnson.com

Condon-Johnson & Associates Inc. (CJA) is a diversified heavy civil engineering construction company whose core competencies included Drilled Shafts, Micropiles, Displacement Piles, Anchored Earth Retention, Dewatering, Grouting, and Ground Improvement.

In 2013, the Seattle Office of CJA added five key personnel:
- Vaughn Cuffe - Field Superintendent. Vaughn brings over two decades of career experience in oscillated large diameter shafts and anchored earth support.
- Ken Ver Hage - Field Superintendent. Ken has an extensive experience in the construction of diaphragm walls, slurry walls, CIDH drilling, and shoring work.
- Simon Chavez - Field Engineer. Simon is a recent Washington State University civil engineering graduate.
- Dustin Taylor - Field Engineer. Dustin is an Oklahoma University graduate.
Project Highlights from 2013:

**U-220 Remedial Grouting.** Spark Johnston headed up an emergency grouting program in the North Link Light Rail Tunnel to seal up an array of dewatering holes previously drilled through the tunnel liner to allow construction of a cross passage. CJA utilized its limited access drilling equipment and grouting expertise to safely complete the work with over a 100-ft of water head acting on the outside of the liner.

**Genesee Combined Sewer Overflow (CSO) Reduction Project.** Condon Johnson was hired by Hoffman Construction to install the shoring and dewatering required for two new below grade, storm water retention tanks. The excavation walls were formed secant piles, sheet piles, and steel bracing.

**South 200th St. Light Rail Extension.** As a subcontractor to PCL, CJA installed over 60 2.5-meter and 3-meter oscillated drilled shafts up to 111 feet deep. When completed, the light rail will be extended by 1.6 miles from Sea-Tac Airport to the new Angle Lake Station on South 200th Street.

**UPRR Bridge Reconstruction.** After 106 years of service, the mainline Union Pacific Railroad bridge across the Willamette River at Harrisburg is being replaced. CJA was selected by Hamilton Construction to install 18 each 2.2-meter diameter oscillated drilled shafts up to 150 feet deep. All of the work is being accomplished working over the water on a temporary trestle with live rail traffic within 5 feet of the drilled shaft casing.

CJA is committed to serving its clients and the engineering community. During the design phase of your next project, please feel free to contact Dominic Parmantier (DParmantier@condon-johnson.com), Ty Jahn (TJahn@condon-johnson.com), or Spark Johnston (SJohnston@condon-johnson.com) for assistance with conceptual design, feasibility studies, and budget pricing.

Contact: Scott Tunison

scott@cruxsub.com

Crux Subsurface, Inc. had a busy and successful 2013, completing a number of challenging exploration and construction projects. It was also another year of expansion for us, including an office move and some significant employee additions.

2013 was a milestone year for Crux, as it marked our first Canadian transmission project. BC Hydro’s **Northwest Transmission Line** (NTL) entailed 214 miles of new 287 kV transmission line crossing rugged terrain in northern British Columbia. Seven structures on this alignment were accessible only by helicopter and required a foundation alternative. Crux provided design-build micropile foundations at these seven sites. Following the success of this project, BC Hydro contracted Crux to design and install micropile foundations for the **Forrest Kerr Hydroelectric Project** as well.

Another notable transmission project in 2013 was the **Troy Meadows Segment** of the Susquehanna-Roseland Electric Reliability Project. This segment crossed a Priority Wetland in Morris County, NJ
and consisted of replacing seven heavily loaded structures in soft soils. Crux introduced a unique closed-cell cofferdam setup to install specialty foundations, which acted both as a platform for drilling and as a means of containing fluids from entering the protected habitat.

Notable 2013 exploration projects include the Blue Lake Hydroelectric Expansion Project near Sitka, AK, involving helicopter-supported drilling and sampling services for proposed upgrades, and the U.S. 89 Landslide Project, involving emergency core drilling and instrumentation at a landslide site causing the closure of U.S. 89 near Page, AZ.

Increased operating demands have also allowed us to expand internally. New hires in 2013 include: Project Manager Michael Davidson, Senior Engineer Kevin Haiar, and Human Resource Manager Tim Horlacher. Michael Davidson previously worked as a Project Engineer for Kiewit Infrastructure Co., and brings a wealth of experience to Crux after more than 10 years in the heavy civil construction industry. Kevin Haiar provided outside engineering services on a number of Crux projects during his time at DCI Engineers and is a valuable addition to our Engineering department. Tim Horlacher has more than eight years of experience in Human Resource Management and has already been instrumental in implementing new policies in his short time at Crux.

In October, the Crux headquarters relocated within Spokane Valley. We are now located at 4308 N Barker Road, Spokane Valley, WA 99027. The new building was designed specifically to meet company needs, and features an open-office concept to promote internal communication and collaboration. Overall, office space increased from 8380 to 13,000 sq ft and shop space increased from 15,500 to 36,500 sq ft. Unique features of the building include a 100% recycled water wash bay, and a 1600 sq ft training center to enhance safety and operational training.

Contact: Ronda Benbrooks
Rbenbrooks@dgeslope.com

Durham Geo Slope Indicator (DGSI) has had an exciting 2013. We enjoyed steady growth both domestically and internationally. Our Slope family has grown with the addition of a new engineering manager. This last year was highlighted by the successful release of our new AT Inclinometer System and DigiPro2 software.

Some of the places we’ve been this year:
- Burswood Sports Stadium, Perth Australia
- Pilbara Iron Ore Mining, Australia
- Da Phuoc Landfill Expansion Project, Ho Chi Minh City Vietnam
- Phu Kham Tailings Facility, Lao PDR
- Porce III Hydro Dam, Columbia
- Union Pacific/Texas A&M, Track-monitoring, Texas
- Jefferson Ave. Covered Canal, New Orleans
People:
We are pleased to announce the addition of Thatcher Harvey as Engineering Manager in our Mukilteo factory. Thatch comes to us with over 30 years of experience in Design and Quality Engineering with companies such as Hewlett Packard, Philips, and Intermec/Honeywell. In a very short period of time, he has become an excellent student of the industry, developing strategies for success and growth through product innovation. Thatch earned his BSME at Colorado State University and has spent most of his career right here in the Northwest.

New Products:
The highlight of 2013 was the successful release of our new AT Inclinometer System. This is a MEMS-based inclinometer probe with integrated cable and reel. Wireless blue-tooth communication connects the system to an android tablet to take readings. This system shares the same accuracy specifications as our classic system, with the flexibility of using an open-market device for the reader.

Along with the AT Inclinometer System, we released the next generation software, DigiPro2. The new software combines DMM and DigiPro functions in one package. The basic features of DMM are standard features in DigiPro2. The advanced plotting and analysis tools of original DigiPro are available with a license. The new software was designed to be immune to technical issues that typically arise with Microsoft updates and operating system changes.

2014
We are looking forward to the New Year with excitement and anticipation. We will continue to add engineering resources in our WA factory and additional sales staff nationwide. We will be focusing on innovation and new product design, using digital and wireless technology.

Contact: Bob Metcalfe
rmetcalfe@geoengineers.com

GeoEngineers welcomed some new faces this year and worked on exciting projects around the region, several of which are continuing into 2014. Here is a roundup of some highlights from 2013.

Project Highlights
Development
- Geotechnical work on Amazon Block 14 project with the Seneca Group, 815 Pine with Security Properties and numerous other downtown high-rise projects (Seattle, WA).
- Providing geotechnical and environmental services to UW Tacoma for the University of Washington Tacoma University Y and the Prairie Line Trail (Tacoma, WA).
• Providing geotechnical, environmental and wetland services for the Niagara Bottling Facility (Frederickson, WA) with The Keith Corp.
• Providing geotechnical and construction observation services for the MultiCare Rainer Tower Expansion (Tacoma, WA).

Water and Natural Resources
• Using trenchless construction methods for a cast-in-place shotcrete tunnel for the U.S. Navy Culvert Replacement and Fish Passage Design (Belfair, WA) with Reid Middleton.

Transportation
• Ongoing services for the WSDOT/SR 520 Evergreen Point Floating Bridge (Bellevue-Seattle, WA) with Kiewit/General/Mason, a Joint Venture.
• Providing permitting and geotechnical services on the Tacoma Avenue South Bridge Rehabilitation (Tacoma, WA) with TranTech Engineering, LLC.
• Doing soils and geologic studies and construction support for the Icy Strait Point Cruise Terminal (Federal Way, WA) and the Port of Tacoma - Pier 3 Crane Rail Upgrade (Tacoma, WA) with BergerABAM.
• Provided geotechnical services on the WSDOT I-90 - Snoqualmie Pass East - Hyak to Keechelus Dam (Kittitas County, WA) with Jacobs Engineering Group Inc.

Energy
• Providing design recommendations and seismic analysis for Seattle City Light, CR-DU H-Frame Replacement project (Tukwila, WA) with HDR, Inc.
• Providing geotechnical services for the Tacoma PUD, Potlatch Transmission Line North Bay Crossing (Mason County, WA) with Electric Power Systems.
• Providing geotechnical and environmental services and alignment studies to Puget Sound Energy (PSE) for the PSE St. Clair 230kV Transmission Line (Thurston County, WA) and the PSE Alderton to White River Transmission Line (Sumner and Orting, WA).

Promotions and Hires
• There were five promotions to senior geotechnical engineer positions, including: Lindsay Flangas (Redmond), Sean Cool (Bellingham), Tim Bailey (Seattle), Morgan McArthur (Tacoma) and Lyle Stone (Tacoma).
• Others receiving promotions were Zack Simpson (Redmond), Heidi Disla (Redmond), Craig Jordan (Tacoma), Brett Larabee (Tacoma), Hamilton Puangnak (Redmond), Erik Ventura (Tacoma), Carla Walton (Tacoma), Steven Godes (Redmond), Jason Sanford (Redmond) and Stu Swenson (Redmond).
• Joining GeoEngineers were Tyler Coy (Redmond), Devon McLay (Redmond) and Jim West (Tacoma).

Learn more about our people and projects at GeoEngineers.com.
WE HELP YOU FIX BAD GROUND.

Work with engineers worldwide to solve your ground improvement challenges.

For more information contact David VanThiel at 425-646-2995, email dvanthiel@geopiernorthwest.com or visit geopier.com.

THE GEOPIER SRT™ SYSTEM STABILIZES SLOPES & SLIDES

ENGINEERED SOLUTIONS FOR VIRTUALLY ALL SOIL TYPES & GROUNDWATER CONDITIONS

©2013 Geopier Foundation Company, Inc. The Geopier® technology and brand names are protected under U.S. patents and trademarks listed at www.geopier.com/patents and other trademark applications and patents pending. Other foreign patents, patent applications, trademark registrations, and trademark applications also exist.
2013 was a year of continued growth and expansion of services for Geopier Northwest, Inc. We were fortunate to be included on many design-build where we could offer value added ground improvement solutions for issues ranging from organic soils to undocumented and contaminated fills to liquefiable soils. Our continued growth is a direct result of geotechnical engineers thinking outside of “the box” in order to come up with innovative and cost effective solutions for their clients. A special thank you goes out to the following geotechnical firms that included us on their projects: AMEC Earth & Environmental, Associated Earth Sciences, Columbia West Engineering, GRI, GeoDesign, GeoEngineers, GeoTest Services, Golder Associates, Hart Crowser, Hayre McElroy & Associates, Kleinfelder, Lachel & Associates, PanGEO, PSI, Robinson Noble, Ins., Shannon & Wilson, Strata, Terra Associates, Terracon, URS, and Zipper Geo Associates.

Our growth has been driven by continued increasing awareness of seismic performance of structures and liquefaction hazard by owners. Many of our projects in 2013 included some form of liquefaction mitigation. The patented Geopier-Impact™ displacement system is perfectly suited to mitigate hazards and provide foundation support by installing stiff Geopier® elements to depths of up to 40 ft. beneath the water table while creating no spoils and not utilizing air or water jetting during installation!

We are looking forward to teaming with old and new professionals in 2013. We are also looking forward to our Slope Reinforcement Technology, Inc. (SRT) patented Plate Pile™ method for slope reinforcement and repair gaining traction with many new projects planned in the Pacific Northwest. Cheers to 2013 and we are excited about continued growth and exciting opportunities for ground improvement in 2014! If you would like to discuss potential projects or schedule a Geopier seminar please contact David Van Thiel, P.E., G.E., at dvanthiel@geopiernorthwest.com or (425)646-2995.

Contact: Andrew Walker
awalker@golder.com

Golder Associates Inc. (Golder) enjoyed a successful 2013, and continues to be ranked by Engineering News Record as one of the consulting industry’s top design and engineering firms.

Golder’s Redmond office has been involved in Sound Transit’s East Link project, South Bellevue to Overlake Transit Center, throughout 2013 as the prime geotechnical consultant for H-J-H Final Design Partners. Work continues into 2014. The project includes a sequential excavation method (SEM) mined tunnel in downtown Bellevue and several elevated guideways, including a long-span bridge over I-405.

We completed additional transportation work for Western Federal Lands’ projects in southeast Alaska,

Contact: David Van Thiel
dvanthiel@geopiernorthwest.com
including challenging rock cut designs and embankment construction over muskeg on Prince of Wales Island and in Kake. Closer to Seattle, we are involved in a seismic retrofit assessment of a bridge in Redmond. Golder also completed rock and soil slope stabilization for the I-90 Snowshed to Keechelus Dam and will continue construction monitoring in 2014.

Golder’s geotechnical group provides support on a variety of projects in the mining and waste sectors. In particular, 2013 saw significant growth in our landfill projects in the Northwest. We anticipate that 2014 will also bring significant growth in the power sector.

The land development services group has seen increased client activity in urban and rural site development. In 2013, we completed several high-rise projects in Seattle and Bellevue. In 2014, we will be monitoring excavations up to 90 feet deep.

Golder’s Redmond office is also supporting pipeline clients in the Northwest and throughout North America, using innovative technology and unique approaches for route planning, trenchless crossing designs, geohazard assessments, and landslide hazard assessments.

People
Golder has experienced steady growth in the local market. Our Pacific Northwest Operations added 30 new staff members in 2013. Our new geotechnical engineers in the Northwest include Hamidreza Nouri, who holds a PhD from Texas A&M; Ali Khoja, who earned a Master’s degree from the University of Washington; Richard Buhler, who has a Master’s degree from Utah State University; and Karen Moffitt, an Associate who transferred from our Burnaby office. Karen has 15 years of experience on underground rock engineering projects for the mining industry worldwide.

We look forward to a strong 2014, and plan to continue building strong relationships with our industry colleagues and growing our business with unique project opportunities. For more information on our projects and Golder job openings, visit www.golder.com.

Contact: Doug Lindquist
Doug.Lindquist@hartcrowser.com

2013 was another year of growth for Hart Crowser with major new project work and a growing staff. We continue to work on high-profile projects in challenging environments throughout the Puget Sound region and worldwide.

Many of our projects were recognized by the industry for their value, sustainability, and engineering excellence. Selected projects include:

King Street Station Restoration, Seattle, WA. The Seattle Section of the American Society of Civil
Engineers awarded Hart Crowser the **Local Outstanding Civil Engineering Achievement Award**, the top award in the geotechnical category.

**Federal Center South, Seattle, WA.** Hart Crowser and Sellen Construction won a **2013 Best in State: Silver Engineering Excellence Award** from the Washington American Council of Engineering Companies (ACEC) in the value to client category. The new headquarters building for the Seattle District US Army Corps of Engineers is the most energy-efficient government building in the United States.

**Crystal Creek Suspension Bridge, Olympic National Park, WA.** Hart Crowser and OTAK won a **2013 Best in State: Engineering Excellence Honor Award** from the Oregon ACEC in the structural systems category.

Other notable projects from 2013 include:

**Transportation**
- SR99 Bored Tunnel (largest diameter bored tunnel in the world)
- SR520 Floating Bridge (longest floating bridge in the world)
- SR167 Puyallup River Bridge
- I-405 Bellevue to I-5 Widening and Express Toll Lanes
- Sound Transit South Link

**Development**
- Husky Stadium Redevelopment
- Insignia – Twin 40-Story Residential Towers, Seattle
- 2030 Eighth Ave. – 41-Story Residential Tower, Seattle
- University Village South Building, Seattle
- Costco Warehouse Stores, Japan and Taiwan

**Government**
- Holden Mine Site Cleanup (USDA Forest Service)
- Van Stone Mine Tailings Pile Evaluation and Rock Slope Stability, Colville, WA
- Explosives Handling Wharf 2: Naval Base Kitsap-Bangor

2014 promises to be an exciting year as we look to expand our geotechnical groups in Seattle and Portland (see advertisement). In 2013, we added **Chris de la Torre**, a recent graduate from the University of Washington, to our Seattle office geotechnical group.

Hart Crowser is an employee-owned consulting firm headquartered in Seattle with offices in Edmonds, Vancouver (Washington), Portland, and Anchorage. We specialize in geotechnical and environmental engineering, natural resources, and environmental assessment and remediation. For more information visit [www.hartcrowser.com](http://www.hartcrowser.com)
Hart Crowser, Inc. is a multi-disciplinary earth and environmental consulting firm headquartered in Seattle. Our staff of engineers and scientists provide a wide range of services, from initial site studies through regulatory permitting, design, and construction oversight. We continue to have challenging projects with significant backlog, and are pleased to announce opportunities to grow with our Geotechnical Engineering group.

Successful candidates for our Seattle Staff level Geotechnical Engineer will possess a MS in Geotechnical Engineering with 0-3 years of experience in construction monitoring, field exploration and sample collection, interpretation of subsurface data, engineering calculations and analyses, and report writing.

Our Portland area Project level Geotechnical Engineer will also have an MS in Geotechnical Engineering, with 3-5 years of professional experience, and be a PE, or be PE eligible (preferably OR or WA). This individual will be responsible for providing project management, completing geotechnical analysis and design, preparing geotechnical reports, and completing field work for a variety of commercial development, industrial development, transportation, and port/harbor projects.

Our Project level Geotechnical Engineer will have proven project experience in geotechnical analysis. Experience with environmental projects and/or engineering geologic projects, in particular related to geomorphic interpretation and slope processes, are highly desirable.

Strong communication, technical report writing, and interpersonal skills are critical for each of these roles. Individuals must be equally comfortable working with contractors at construction sites and participating in client presentations. While work will primarily be within the northwest, the ability to travel and work in remote areas and other locales throughout the US, possibly internationally, is necessary. Experience working with multiple site exploration methods and equipment (drill rigs, CPT, trackhoes, etc.) and completing geotechnical laboratory tests is required. The ability to lift 40-50 lb and have a current drivers' license with good driving record is required.

Proficiency with MS Office Suite is required; experience with the LRFD design method and multiple geotechnical software programs is a plus. As a condition of employment, successful candidates must be able to provide documentation of eligibility to work in the US.

Hart Crowser has a strong commitment to provide an environment that fosters creative thinking and opportunities for professional development. As an employee-owned company, each individual contributes to the success of the firm. Interested candidates are encouraged to submit their confidential cover letter and resume to: staffing@hartaether.com.
Hatch Mott MacDonald (HMM) enjoyed a busy and successful 2013. Over the past year, we successfully met key project milestones, and proudly provided design and construction management expertise for exciting and challenging geotechnical-oriented projects across the U.S. and Canada. We look forward to shaping the engineering landscape in the Pacific Northwest in 2014. Ongoing projects by our local staff in Seattle and Vancouver include:

- **Alaskan Way Viaduct Replacement Program, Seattle, WA:** HMM is providing Program Management Assistance to WSDOT on the $3.1 Billion program to replace the aging viaduct with what will be the largest boring machine driven tunnel.
- **East Link Light Rail Project, Bellevue and Overlake, WA:** HMM is providing detailed designs for the project, especially for the most technically and politically challenging aspect—the Downtown Bellevue Tunnel. The tunnel will be constructed using sequential excavation methods (SEM), and approximately 0.5 mile in length, under 110 Avenue NE between Main Street and NE 6 Avenue.
- **Evergreen Line Rapid Transit Project, Vancouver, Canada:** As the Owner’s Engineer, HMM is responsible for reviewing and monitoring the contractor’s soil mixing works and tunneling. The project includes the challenging installation of deep soil mix columns to support the guideway. HMM is also preparing to monitor the 27 foot diameter earth-pressure-balance (EPB) tunnel boring machine (TBM) drive on behalf of the owner.
- **Port Mann and Second Narrows Water Supply Tunnels, Vancouver, Canada:** HMM is the construction manager for the challenging 3,300-ft.-long, 165-ft.-deep Port Mann tunnel in saturated soil beneath the Fraser River. The EPB TBM is currently being set up for tunneling to begin in February 2014. Preliminary design is continuing on the challenging Second Narrows alignment where profile depths approaching 250 feet below sea level have been considered for seismic considerations.
- **Kemano Back-up Phase 1, British Columbia, Canada:** After two construction seasons, HMM and our parent company Hatch successfully completed Phase 1 in December 2013. The work involved tying into existing 9 foot diameter steel-lined penstock tunnels with wyes and new steel lined penstock tunnel extensions to a large underground valve chamber at the existing 1,000 MW Kemano hydroelectric project owned and operated by Rio Tinto Alcan.
- **Forrest Kerr Hydroelectric Project, British Columbia, Canada:** This is North America’s first recent construction of a new run-of-river hydroelectric project with an underground powerhouse. HMM provided the tunneling design for this project working alongside Hatch. Excavation was completed in 2013 and the facility, which is owned and operated by AltaGas, is scheduled for completion in mid-2014.
- **Northern Gateway Pipeline Project, British Columbia and Alberta, Canada:** HMM is leading the front-end engineering design of two 23,000-ft.-long, hard rock, TBM-bored tunnels beneath the coast range mountains.
Geotechnical Environmental Construction

- Direct Push
- Hollow Stem Auger
- Mud Rotary
- Air Rotary/ODEX
- Rock Coring
- Construction Dewatering
- Well Jetting

When it comes to calculating N-values,

properly calibrated auto-hammers are an essential part of your design process.

Rope cathead SPT hammers produce varying results; rig to rig, operator to operator, job site to job site, or day to day weather conditions. A non-calibrated auto-hammer can be equally inconsistent and unreliable.

That is why every drill rig in our fleet has an auto-hammer that is regularly inspected, calibrated, and certified by a Professional Engineer.

Call us. Let us explain how Holocene’s auto-hammers are different from the rest.

LEARN MORE → www.holocenedrillinginc.com

North America’s Leader in Geotechnical Construction
Grouting ● Ground Improvement ● Structural Support ● Earth Retention Design-Construct Services

Seattle 206-223-1732
Vancouver 604-294-4845
Edmonton 780-465-3200
www.HaywardBaker.com

For a complete list of our techniques and offices, visit www.HaywardBaker.com
Hayward Baker Inc. (HBI) is proud to announce 2 achievements in 2013. HBI again earned the #1 ranking in the 2013 ENR Top 600 Specialty Contractors list-Foundation category. In addition, HBI continues to advance its ThinkSafe safety program and was recognized by the ADSC-IAFD as the 2013 Rick Marshall Commitment to Excellence Award recipient. Closer to home here in the Seattle Metro region, HBI continues to grow our group and offer a wide range of specialty geotechnical design-build solutions, in particular our core ground improvement technologies of various grouting techniques (cement, jet, compaction, compensation, chemical), vibro ground improvement, wick and earthquake drains, dynamic compaction, and soil mixing in the Pacific Northwest and western Canada. For a complete look at all that HBI offers and current HBI news from around the country, please visit our website www.haywardbaker.com.

In HBI’s Seattle branch office the following Management/Engineering personnel can be contacted for any questions/needs that arise: Adam Gerondale, Andrew Malinak, Claude Berard, Mark Koelling, Robert Carnevale and Mike Blanding.

Your HBI Seattle team wishes all a safe and prosperous 2014.

Contact: Andrew W. Berg
dberg@holocenedrillinginc.com

Puyallup, WA: Our work on major area projects included Sound Transit’s East Link and South Link Extensions, SR99 Bored Tunnel, and Asarco Ruston Slag Armoring and Everett Lowlands Projects. Projects with barge drilling components included Chester Morris Reservoir and Naval Base Kitsap.

We attended the ASCE Spring Seminar, Washington Hydrogeology Symposium, and AEG National Conference. HDI, Landau Associates, and Tupper-Mack-Wells, LLC hosted the Take a Swing Against Hunger Golf Tournament benefiting Northwest Harvest.

HDI’s Direct Push Drilling & Testing (DPT) group now has several probe rigs and licensed drillers working in concert with conventional drilling operations. We added a new track-mounted, limited access DPT for work in tight spaces.

Each of HDI’s auto-hammers is regularly calibrated by a Professional Engineer. During this process, each sampling rod is fitted with strain gauges. Impact and force measurements of the auto hammer are
taken during sampling to record the energy being transferred by each blow. Our clients use this data report to formulate more accurate N-values.

*HDI was recently awarded a 5-year contract in support of Boeing’s EHS Remediation Group in Washington and Oregon. Boeing has granted our employees a permanent ID badge. This allows us to support each of Boeing’s environmental and geotechnical sub-consultants working directly for Boeing.*

We also support clients who provide construction dewatering and design services. Our Construction Dewatering service line includes Vacuum Wellpoint Pump Installation, Development, Operation, and Maintenance. Working with area Hydrogeologists allows us to support General Contractors with effective dewatering solutions.

Jay Graham, President, manages HDI’s Dewatering Operations. Clay Griffith, Vice President, manages HDI’s Geotechnical and Environmental Operations. Jon Root manages HDI’s DPT operations, and Donna Thrall, Project Coordinator, manages HDI’s Administrative Operations. Each HDI Project Manager is committed to superior client service and attention to detail.

HDI crews also completed HAZWOPER 40+8 Refreshers. Project Managers work directly with Steve Andrews of Signature Safety Consultants, who provides safety oversight and training, and ensures insurance coverage and safety programs exceed industry standards.

We thank you for your confidence and trust in our abilities. We are committed to offering you superior drilling solutions. We plan to continue to offer you Safety, Innovation, Excellence, and Value on each drilling project.

Holocene Drilling, Inc. offers drilling, soil sampling, and monitoring well installation solutions for Geotechnical, Environmental, and Construction Applications. We operate in Washington and Oregon providing Direct Push, Hollow-Stem Auger, Mud Rotary, Air Rotary, Rock Coring, and Construction Dewatering. Please visit www.holocenedrillinginc.com.

**Contact: Dale Abernathy**  
DAbernathy@holtservicesinc.com

Holt Services Inc. is a full service provider of Environmental, Geotechnical and Clean Water drilling services throughout the Pacific Northwest. Our capabilities include Direct Push, Auger drilling, Mud Rotary drilling, Diamond Core drilling, Sonic Core drilling, Cable Tool drilling, Pump Testing, Pump Services and Well Rehabilitation/Repair. We are licensed in Washington, Oregon, Idaho, Montana, Alaska and are willing and able to expand our territory! Our EMR is 0.81 and Safety is our highest priority.

Holt Services Inc. was established in 2007 by Barbara and Randy Holt and has continuously grown.
NEED TO DRILL ON THE EDGE?

Holt Services is the premier clean water, environmental and geotechnical contractor in the Pacific Northwest dating back to 1979. Our experienced, highly competent, management and field crews are the best in the industry and are able to complete tasks on time and under budget with safety as the highest priority. We offer the newest and most diverse drill rigs and support equipment available in the region and are rapidly expanding our fleet of new drilling rigs.

Visit our new web page for more information or call.

253-604-4878

WWW.HOLTSERVICESINC.COM
each year. 2013 marked a year of phenomenal expansion and growth! Our Team grew from twelve to thirty-six Employees and our Drill Fleet expanded from nine to fourteen drills with the acquisition of another 2010 7822DT Geoprobe, a 2013 LDS 75 HT Compact Crawler auger, mud rotary and diamond core drill, a 2013 CME 85 high torque auger, mud rotary and diamond core drill and two 2013 TSi 150 Compact Crawler Sonic Drills as well as eight new service trucks, four trailers and three Bobcat skid-steer support units! Holt Services Inc. has highly experienced Crews, the most diversified line of services and the newest fleet of equipment in the Pacific Northwest market!

Our leadership team is composed of Barbara Holt - President, Dale Abernathy - Operations Manager, Dale Smith – Environmental/Geotechnical Manager, Randy Holt – Clean Water Manager, Stephanie Kamenzind – Contracts Administrator and Karmen Helle – Administration. Our expertise allows us to help develop scope and troubleshoot technical issues on your projects.

Holt Services Inc. performed many highly technical, interesting and exciting projects over the course of 2013 – too many to recognize individually. At McAllister Springs we drilled a 24-inch well to 400 feet and test pumped the completed well at 5000 GPM – yes five thousand gallons per minute! Our Auger/ Mud Rotary fleet stayed very busy early in the year drilling thousands of feet of geotechnical explorations for the Sound Transit East Link Alignment. Projects later in the year included Seattle Central Waterfront Pier Replacement Project, SR 167 Puyallup River Bridge Replacement and some confidential environmental studies at Superfund sites in Washington and Oregon. Our new Sonic fleet put some miles on this year traveling to Montana for a large environmental project and to Alaska for a slope stability study along the Trans-Alaskan Pipeline. Our Sonic team also tested and proved our high speed rock coring head option from a barge 140 feet above mud line on a remote lake in central Washington where they sonic cored the overburden, switched to diamond rock coring to about 300 feet and performed packer testing of the rock formation – all from a 20 ft x 60 ft anchored barge.

Holt Services Inc. appreciates the opportunity to have worked with you in 2013 and we look forward to working with you again in 2014. You can expect more growth from us and as always can count on us to safely deliver quality services and results at value pricing. Please visit our web site www.holtservicesinc.com or call us at 253 604-4878 for more information.

Overall, 2013 was a successful year for HWA GeoSciences Inc. We hired Sandybell (Sandy) Ramos Martinez, EIT, in May. In December we celebrated Sandy obtaining her Professional Engineer License! Sa Hong and Tom Kinney continue to ease into retirement, working on projects when their expertise is needed.

HWA’s geotechnical, environmental, lab and inspection groups have continued to be involved with the City of Bothell’s projects to improve traffic, clean up, redevelop, and revitalize the City’s downtown
corridor. Project Manager Arnie Sugar led the effort, with assistance from JoLyn Gillie, Tori Hesedahl, and Vance Atkins.

Our pavement group, under the direction of Bryan Hawkins, stayed busy with the Falling Weight Deflectometer (FWD), pavement design and construction inspection throughout the year on both sides of the mountains. They also ventured down to Oregon completing several projects there including Cornelius Pass Road, Evergreen Parkway and Cornell Road in Hillsboro, Portland International Airport and Troutdale Airport in Portland and US 101 in Tillamook. HWA continues to advocate non-destructive FWD testing for subgrade evaluation and pavement design.

HWA’s embassy work continues under the direction of Ralph Boirum. We wrapped up our efforts in Kabul, Afghanistan in Fall 2013 and have moved on to the new U.S. Embassy compound in Nouakchott, Mauritania. Thus far, Ralph has made one site visit to perform geotechnical observations. He returned from Nouakchott shortly before Christmas 2013.

One of our most interesting projects is the ongoing Fairview Avenue Bridge Replacement project, led by Project Manager, Donald Huling. The design team is currently completing final design and the bridge construction is scheduled to begin in 2015.

The Geotechnical Group has two other bridge projects keeping them busy as well including the West Sammamish River Bridge in Kenmore and the Forbes Creek Bridge in Kirkland.

2014 is off to a great start, with HWA being awarded two on-call geotechnical engineering contracts in the first two weeks; one from the City of Monroe; the other from the City of Bothell.

Contact: Lynn Salvati  
Salvati@jacobssf.com

From 50 feet below Salmon Bay in Seattle’s Ballard neighborhood to over a mile high at Moffat Tunnel in Colorado, Jacobs Associates’ Pacific Northwest offices continues to provide detailed design, design services during construction, and construction management (CM) services on landmark regional underground projects as well as dispute resolution on all types of construction throughout the Pacific Northwest and beyond.

2013 was marked by the continued evolution of our Seattle office with several strategic hires (Judy Cochran, Andrew Engel and Julian Franco) a remodel and expansion of our office, and the achievement of key milestones on major long term projects. On Sound Transit’s University Link Light Rail project, construction of the Capitol Hill and University of Washington Stations commenced, and on the Northgate Link Extension Light Rail project the project’s largest civil construction contract, Contract N125, was awarded and the advance utility contracts were completed. Our staff continues to provide CM services to WSDOT on the tunnel and ancillary underground structures on the Alaskan
Way Viaduct Replacement Program, while on King County’s Ballard Siphon Replacement Project, our CM team helped manage the completion of the tunneling portion beneath Ballard’s Salmon Bay. Further east, in the mountains of Glacier National Park near Essex, Montana, Jacobs Associates designed and managed the construction of a unique drainage basin and culvert system to capture surface water over snowsheds protecting BNSF railroad tracks. Five miles east of Sitka, Alaska, Jacobs Associates is a part of the team providing overall engineering management services and serving as the owner’s engineer during construction of the Blue Lake Hydroelectric project. Works include raising the height of an existing concrete arch dam, and constructing a new intake structure, intake tunnel, gate shaft, surge shaft, and a new powerhouse.

Firm-wide, Jacobs Associates formed two new divisions, Jacobs Associates Construction Managers (JACM) and the Jacobs Associates Railroad Services Group. These divisions ensure efficient client access to our best resources. We also moved up to #248 on the Top 500 Design Firms by Engineering News-Record (ENR), and were #26 on the Top 50 Trenchless Firms of 2013 by Trenchless Technology Magazine.

We were also honored with the 2013 ENR Northwest Regional Award for Best Project in the Airport and Transit Category for Contract U230 on the University Link Light Rail project. U230 is the tunnel portion connecting downtown Seattle to Capitol Hill. In addition, we were very proud to serve as a Platinum sponsor during the ASCE local chapter centennial celebrations.

Contact: Marcus Byers
mbyers@kleinfelder.com

2013 brought continued growth in the US and abroad for Kleinfelder. Our local team remains very busy serving both local and national clients on a wide variety of interesting projects.

Chad Lukkarila continues his role as Kleinfelder’s Rock Engineering Technical Practice Leader and is the chair for the AEG Washington Section. In September, he presented at the AEG National Meeting in Seattle. Chad was involved in highway realignment projects in Nevada, Utah, and California, dam removal projects in Washington and California, and traveled to the island of Guam to assist with transportation projects involving rock cut slopes and landslides.

Jason Washburn continues to serve a variety of large commercial, local government, and energy projects. Notable projects include Snoqualmie Falls Redevelopment in Snoqualmie, WA; a five-level, 530,000 square-foot parking garage in Issaquah, WA; levee evaluations in Sacramento, CA; and aircraft hangar construction.

Steve Lewis spent much of 2013 performing geological mapping and drilling oversight for many projects including dam removals, highway realignments, and landslide explorations, several of which required helicopter-only access. Back home, he worked on a variety of local government and large
Tristan Anderson is currently involved on local bridge and transportation projects. Earlier this year, he spent a month in West Virginia to support a natural gas site development project. Tristan enjoys retaining wall design and recently represented Kleinfelder at the Earth Retaining Structures Conference in San Diego.

Steven Flowers enjoyed May snow showers and slogging through wet clays in Alberta while overseeing drilled shaft excavations. Back home he worked on a variety of projects ranging from lift stations to large commercial developments, and recently he headed to the hills of West Virginia to support the natural gas site development project.

Nikki Woodward transferred from Cambridge, MA in September 2013, bringing over 4 years of geotechnical experience, primarily east of the Mississippi. Nikki quickly jumped into local commercial projects and forensic investigations. Nikki is part of Kleinfelder’s 2013 Right Start program – an internal development program designed for high-initiative, early-career professionals, and we are very excited to have her with us in Redmond.

Marcus Byers continues working on a variety of projects in Washington, Oregon, Western Canada, and South Korea. His favorite projects of the year included several forensic investigations, observing test shafts in sub-zero temperatures in Alberta, and working with a South Korean engineering firm to develop grading and wick drain plans.

Contact: Dennis Stettler
dstettler@landauinc.com

Landau Associates continued a moderate pace of growth in 2013. Corporate accomplishments in 2013 included the acquisition of Bay Townes Geotechnical, LLC in March, based in Olympia. Bay Townes founder Calvin McCaughan, P.E., and geologist David Rupert enhanced the firm’s opportunities to serve clients in the south Puget Sound area and southwest Washington. In July, Landau Associates was once again selected by Washington State Department of Transportation (WSDOT) to provide on-call geotechnical engineering services statewide. Engineering Director Dennis Stettler, P.E., manages the firm’s eighth WSDOT geotechnical contract, which in 2013 included projects in Friday Harbor, Tacoma, Seattle, and Vashon Island.

Many of the firm’s geotechnical staff in Edmonds, including Principal Steve Wright, P.E., Brian Christianson, L.E.G., and Chad McMullen, P.E., were busy in 2013 supporting the construction of King County’s Ballard Siphon Replacement, a project Landau Associates has been involved with since 2007. Birkan Bayrak, Ph.D., of the Edmonds office earned his Professional Engineer license in February. Birkan has expertise in geotechnical earthquake engineering and soil-structure interaction, and was busy on seismic analyses for several Washington State Ferries terminal projects in 2013. Scott
Pawling, P.E. joined the Edmonds office in July and brings over 10 years of experience on dam safety and stabilization, railroad infrastructure, and retaining wall projects. Principal Dave Pischer, P.E., also of the Edmonds office, moderated a technical session at COPRI ASCE PORTS ’13 conference in Seattle in August and co-authored a technical paper presented at the conference, Beneficial Reuse of Dredge Spoils from Squalicum Harbor, with our clients Reid Middleton and the Port of Bellingham.

Principal Ed Heavey, P.E., Brian Bennetts, P.E., and Josh Elliott, P.E. of our Tacoma office were busy providing geotechnical services to local city and county governments, including Olympia, Tacoma, Federal Way, Fife, and Pierce County.

Calvin McCaughan, P.E., of the firm’s new Olympia office, managed design services for a marine dock and tank farm in Oregon, an energy efficiency design-build project at Puget Sound Naval Shipyard, peer review for a critical bridge at a major aerospace manufacturer’s facility in Renton, and design and/or construction services for six new K-12 schools in Pierce and Thurston Counties.

Several of the projects mentioned above are featured at the recently redesigned Landau Associates website, www.landauinc.com. Established in 1982, Landau Associates is an employee-owned firm that specializes in geotechnical engineering, environmental remediation and engineering, permitting, and compliance services.

Contact: John Starcevich
jstarcevich@malcolmdrilling.com

Malcolm Drilling has been a leader and innovator in the deep foundation industry for more than 50 years. We provide geotechnical construction services including: drilled shafts, micropiles, excavation support systems, cutoff and secant pile walls, chemical grouting, jet grouting, deep soil mixing, Cutter Soil Mixing, underpinning, and dewatering. These services have been applied on complex and technically challenging projects throughout North America. Malcolm Drilling’s ever-growing Dewatering and Ground Improvement Divisions have been instrumental in keeping Malcolm the most sought-after, full service geotechnical contractor.

Based in San Francisco, California, with offices throughout the western United States, Malcolm has expanded to the eastern seaboard with an office in Florida, and is actively pursuing work throughout the US and Canada. Malcolm’s fleet of equipment has also grown from a single truck-mounted drill rig, to the most extensive fleet of state-of-the-art drilling equipment in the United States, valued at over one hundred million dollars. Our fleet includes low overhead and limited access equipment capable of passing through interior doorways, to equipment capable of excavating shafts up to 18 feet in diameter and up to 300 feet deep. Recent equipment acquisitions include the world’s largest casing oscillator (3.8m OD), a 3.3m OD casing oscillator, and two Bauer BG-50 top-drive drills (the world’s largest top-drive crawler drill).
Some of our notable recent projects completed or acquired include:

- **Sellwood Bridge**, Portland, OR - Drilled Shafts.
- **Columbia River Crossing Test Program** – Drilled Shaft Load Test Program.
- **Willamette River Bridge**, Portland, OR – Drilled Shafts
- **Nalley Valley Interchange**, Tacoma, WA – Drilled Shafts and Soil Nails.

Malcolm continues to advance geotechnical construction through active participation in ADSC, DFI, Geo Institute and ASCE. For assistance with conceptual design and budgeting, please contact Al Rasband (arasband@malcolmdrilling.com), for Ground Improvement contact Rick Hanke (rhanke@malcolmdrilling.com), and for Construction Dewatering contact John Starcevich (jstarcevich@malcolmdrilling.com). For a complete list of our services and contact details please visit our newly updated website (www.malcolmdrilling.com).

MWH Americas, Inc. geotechnical group had a busy year in 2013 with assignments on hydropower upgrades, dams, tunnels, and water/wastewater facilities to build a better world.

For King County WTD, MWH has completed design of the Fremont Siphon Replacement and Odor Control Facility Project. The project includes two shafts and twin 60” diameter microtunnels beneath the Lake Washington Ship Canal to replace the existing sewer siphon. For the Sunset Heathfield Project, MWH evaluated the feasibility of a new storage and conveyance tunnel alternative, including a three or six-mile long tunnel, instead of upgrading the existing pump stations. Key staff on both projects included Jeff Schmidt, Mike Dupont, Mike Bruen, and Christian Meinhardt.

MWH has completed post-earthquake deformation analyses of the earthen embankments at Priest Rapids and Wanapum Dams, as well as an alternatives analysis for mitigation of liquefiable soils in the foundations. MWH is also assisting GCPUD with early trials of FERC’s Risk Informed Decision Making (RIDM) process for the Priest Rapids earthen embankments and the Wanapum’s spillway gates. Key staff included Greg Rollins and Maddie Heidari with Nelson Kawamura, Munit Bector, and David Johnson.

MWH is continuing geotechnical and seismic studies in support of FERC licensing and preliminary design of the 600 MW Susitna-Watana Hydroelectric Project for the Alaska Energy Authority. Geotechnical studies include geologic characterization, foundation and tunnel design, and a seismic hazard assessment for the Project area. Key personnel included Mike Bruen, Paul Richards, and
Jennifer Van Pelt.

MWH is completing a seismic retrofit design for the Ruskin Hydropower Facility for B.C. Hydro. Geotechnical tasks include stabilization of the earthen slope between the abutment and powerhouse, seismic improvement of the penstock tunnels, and anchoring of the existing penstock intake structures. Greg Rollins, Maddie Heidari, Nelson Kawamura, David Johnson, Terry Arnold, and Kent Pease have all contributed to this project.

The City of Portland’s is replacing a 10MG above ground steel reservoir with a 25MG below grade reservoir at Kelly Butte. MWH was involved with foundation design, slope stability and infiltration evaluations, retaining wall design, and engineering services during construction. Staff include David Johnson and Paul Richards.

Mike Bruen has been involved in construction review of the NEORSD’s Tunnel Dewatering Pump Station underground cavern (Cleveland), review of tunnel and trenchless designs for the Tarrant Water District’s IPL conveyance project (DFW), and construction procurement for the Greater Beirut Water Supply Project that includes 24km of tunnel and 8km of twin pipelines.

For career opportunities see www.mwhglobal.com.

Contact: Doug Watt
dougwatt@nwcascade.com

In 2013 Northwest Cascade continued our goal to be a premier provider of civil construction services. Based out of Puyallup, WA we provide full service geotechnical and heavy civil construction services. We specialize in deep utility installation, mass excavation, landslide stabilization, foundation support, ground improvement, and design/build wastewater treatment systems. Our dedicated employees work to create innovation solutions and highly satisfied customers.

Many interesting projects were awarded or completed in 2013, including:

- **Sellwood Bridge** - Portland, OR: Design and installation of high capacity tiedown anchors (850kip) for landslide stabilization.
- **Mile Post 57 Sinkhole Mitigation** - Arlington, WA: Compaction grouting for ground improvement around existing pipelines.
- **SR99 Bored Tunnel Project** - Seattle, WA: Installation of micropiles for foundation support.
- **BART R-Line South** - Oakland, CA: Design and installation of micropiles for foundation support of existing rail bridges.
- **1100 Eastlake Avenue Connector Tunnel** - Seattle, WA: Barrel vault grouting to support tunnel excavation.
- **Greentown Gaskins Project** - Lancaster County, VA: Design, construction, and operation of a wastewater treatment system in rural Virginia.
• Parkland/Brookdale Interceptor - Pierce County, WA: Installation of over a mile of 72” diameter sewer interceptor up to 30 deep.

We look forward to a successful and safe 2014!

As we begin 2014 by celebrating our 60th anniversary, Shannon & Wilson would like to thank our clients for helping us finish another successful year. We continue to grow our Seattle and national offices by working on challenging infrastructure, transportation, development, and environmental projects.

2013 started on a positive note with ACEC Washington honoring Chris Robertson, PE, LEG with the 2013 Engineer of the Year Award for his technical and community service accomplishments. Chris, a Vice President and Geologist/Geotechnical Engineer, has focused on infrastructure, deep foundations, slope stability and landfills during his 32 year career.

Our staff continues work on high profile, visible projects: City of Seattle’s Seawall Replacement, SR 520 Bridge Replacement, Sound Transit’s East Link. Notable awards in 2013 include:
• Seattle/Walla Walla District Corps Geotechnical AE Services
• WSDOT Statewide On-Call Geotechnical Engineering Services
• Pike Place Market PC-1 North Development
• PacifiCorp On-Call Geotechnical Engineering Services across seven western states
• Smith Island Estuary Restoration Levee Setback - Snohomish County
• Fir Island Farm Restoration Feasibility Study - Skagit County for WDFW
• Whatcom County Levee System-Wide Improvement Framework

Shannon & Wilson’s staff are the main reason for our success and several professionals earned promotions:
• Martin Page, PE, LEG, LEED AP - Vice President
• Steve McMullen, PE, LEG - Senior Associate
• Wendy Mathieson, PE – Associate and Group Leader
• Tyler Stephens, PE - Senior Principal Professional Engineer
• Erik Blumhagen, LHG - Principal Professional Hydrogeologist

We also welcomed new geotechnical engineering talent:
• Jason Funk
• Kevin Wood
• Rex Whistler
In May, Shannon & Wilson shareholders elected **Katie Walter, PWS** to the firm’s Board of Directors. A Vice President and Natural Resources Group Leader, she joins re-elected members Gerard Buechel, Greg Fischer, Hollie Ellis, Gary Peterson, Matt Hemry, and Russ Schwab in this leadership role.

**Neal McCulloch, PE, LEG** was promoted to **Director of the Railroad Services Group**. He is responsible for business development, project management, and emergency response efforts for our railroad clients throughout the country.

**Stan Boyle, PhD, PE**, was appointed **Corporate Technical Director** where he oversees the firm’s technical capabilities and helps Shannon & Wilson’s professional staff tap into our companywide technical knowledge bank to best support clients.

**Brian Reznick, PE** has taken a larger role in Business Development, in addition to his geotechnical engineering responsibilities.

In February, over 200 professionals from 11 offices nationwide gathered in Seattle for Shannon & Wilson’s **2013 Winter Training Session** focused on building our company culture, exchanging technical information and case histories, and cultivating business growth.

Working in the public and private sectors, Shannon & Wilson provides geotechnical, environmental, natural resources, surface/groundwater expertise for the design and construction of transportation, waterfront, military; development; infrastructure, dams/levees, and restoration projects. Shannon & Wilson’s Northwest presence includes our Seattle headquarters plus offices in the Tri-Cities and Portland.

Contact: Dan Mageau  
dmageau@soilfreeze.com

SoilFreeze has been successfully freezing the ground since 1998. Since we are based in Seattle, most of our earlier projects were in the Pacific NW and California. However, as our reputation and experience has grown, so has our project sizes and locations. Currently, we are freezing the perimeter of a city block in Hoboken, NJ for a large scale remediation project. We are also starting a cross passage tunnel freeze project in downtown San Francisco. Boosted by our recent successes with the Brightwater tunneling project (freezing outside of the Ballinger Shaft portal and freezing outside the stuck TBM 300 feet below ground surface), ground freezing with the SoilFreeze method is quickly becoming the go-to solution for temporary soil stabilization for all types of tunneling and shaft projects. We still continue work on more conventional frozen soil shoring projects for below-ground excavations at high groundwater sites and are pursuing such projects in Honolulu, Miami and other parts of the country.
Shafts & Tunnels

The Process

Most tunnel projects include access shafts for tunnel boring machine (TBM) jacking and receiving. These typically extend 100 feet or deeper below ground surface and need to be designed to resist high soil and hydrostatic pressures. Frozen soil is essentially impermeable and can be very strong, particularly in circular-shaped shafts that take advantage of the high compressive hoop strength. These qualities make frozen soil an ideal choice for temporary shoring of access shafts. It has been successfully used for access shafts well over 1,000 feet deep in parts of the world. Other uses of ground freezing in the tunneling business include stabilization of poor or variable soils for safe egress and ingress at the shaft portals. It can also be cost-effective for the rescue, retrieval or repair of TBMs that have become stuck for whatever reason.

The Skills

Ground freezing is very flexible and can be implemented in almost any type of soil or groundwater conditions, when engineered properly. We thoroughly analyze each project using sophisticated finite element computer programs, including thermal, structural and seepage. Frozen soil integrity is verifiable using numerous thermal sensors embedded in the shoring zone. We are continually developing new methods to increase the effectiveness and reduce the cost of freezing. We now have a patented “Zone Freeze Pipes” that allows us to create a center frozen soil plug beneath the excavation level without freeze soils above this level, making excavation for the shaft much easier.

The Experience

- Tolt Pipeline – Receiving Shaft #2, Seattle Public Utilities, Redmond, Washington
- L.A. Harbor – Four Micro-Tunnel Access Shafts, City of Los Angeles, San Pedro, California
- Brightwater Ballinger TBM Portal Stabilization, King County, Shoreline, Washington
- Brightwater BT3 TBM Rescue, King County, Lake Forest Park, Washington
- Tulalip Water Line HDD Rescue, Tulalip Tribe, Marysville, Washington
- San Francisco Water Line Receiving Shaft, City of San Francisco, Newark, California
The SoilFreeze System provides a cost-effective alternative to other shoring methods. We have a number of distinct advantages over many conventional shoring/soil stabilization methods, such as sheet piles, secant piles, jet grouting, etc., including:

- Freezing can be used for nearly any soil type, including sand, gravel, clay, and peat
- Excellent where a 'dry hole' is needed or where dewatering is difficult or not allowed
- Good at sites where ground vibration or noise are issues
- Great for low-overhead or complex geometric projects
- Can be installed beneath, around and over buried utilities
- At the end of the job, the ground thaws out to its pre-construction condition - the freeze pipes can be removed so nothing is left in the ground, if needed
- Because frozen soil is impermeable, it is very effective at cutting off groundwater at contaminated sites, thus reducing or eliminating the need for expensive water treatment.
- We can freeze an impermeable bottom below the excavation level using our new patented Zone Freeze Pipe (ZFP).

Call Dan, Larry or Aaron for any questions regarding ground freezing for your project.

**Contact: Boris Caro Vargas**

[SOLDATA logo]

Boris.carovargas@soldatagroup.com

Soldata has now become the major player for instrumentation and monitoring in the Seattle area. After finishing the installation of the more than 3000 monitoring points and sensors on the SR-99 tunnel project, Soldata is now working full speed on another Mega Tunnel Project. Soldata was awarded in July the global monitoring of the geotechnical instrumentation on the Sound Transit Norhtgate link Extension. But Soldata also works on smaller size projects in the Northwest and anywhere in the US and Canada, with its base operations located in Seattle. Soldata is for example working in LA during the construction of the tallest building West of Mississippi, the Wilshire Grand, the Ohio River Bridge project in Kentucky and will soon start working on the CSO Murray in West Seattle.

Soldata provides high-end instrumentation and monitoring services for all kinds of construction projects. Soldata specializes in real-time data acquisition instruments and is expert in the installation of any type of standard geotechnical instruments (inclinometers, piezometers and extensometers, etc…) structural instruments (tiltmeters, strain gages, crackmeters or liquid levels, etc…), but is also leader and pioneer in more advanced remote monitoring techniques, such as AMTS (Automatic Motorized Total Stations) and Satellite Interferometry among others. Soldata also develops all its data acquisition and reporting software in-house, providing specific answers to all the different needs of the project stakeholders.

Soldata has hired local Seattle Engineers and geologists in the past year and will continue to do so. An
experienced instrumentation Engineering Geologist has also joined Soldata to respond to the increasing requests of our services in the mining industry.

With its growing team, Soldata is looking forward to serve its Seattle customers and to help building the next major infrastructure projects, such as the extension of the 520 bridge or the East Link for Sound Transit, but is also committed to provide excellence in service on the smaller size projects. With the increasing need of building a risk free project, the solutions Soldata provides for real time monitoring of geotechnical and structural instrumentation are becoming a necessary part of each urban underground project.

Due to the increase of our activity we’ll soon be relocated in a larger office near the Seattle downtown area in the first quarter of 2014. Soldata is very happy to be part of the Geotechnical community in Seattle and hopes to continue to develop a sustainable activity in the years to come!

**Contact: Chris Breeds**

chrissubt@aol.com

SubTerra, Inc. had very successful 2013 with projects throughout the Seattle area and elsewhere in WA, OR, ID, AK, UT, CO, TX, CA, Canada, and Israel. Invited technical presentations were made at WATEC (Israel), ARMA (San Francisco) and at the UIM conference in Arlington, VA.

We added new blast consulting projects in Prince Rupert (transportation corridor expansion) and Kitimat (shoreline LNG plant construction) both in BC along with projects in Alaska (Ketchikan, Sitka and Coopers Landing) with ongoing work at the Elwha and Glines Dams removal project in Port Angeles, and Snoqualmie Falls Hydropower project which completed in 2013.

We continued to provide Geotechnical Instrumentation and AMTS support for WSDOT’s I-90 road widening project at Hyak and at the Merwin Dam in Woodland, WA, adding AMTS and tiltmeter monitoring of the SR520 floating bridge and monitoring the I5 - Skagit River Bridge during bridge replacement in 2013. Vibrating wire, MEMS and AMTS data are reported via MyDataView and ARGUS mounted on SubTerra’s servers at the Equinix data center.

Our SubTWarden automatic vibration monitoring fleet saw over 90% utilization with automated systems installed throughout the US and Canada. Our monitoring stations had 999 or better rated availability, including at remote locations in Alaska and Canada. Dynamic VW projects, reporting through MyDataView, will compliment vibration monitoring in 2014.

We saw growth in our tunnel and micro-tunnel design work with the Martin Hill and Boggy Creek projects located in Austin, TX in construction during 2013 and continuing through 2014. Tunneling services were also provided for the Fremont project and for a lake tap, shafts and a 19,000-ft rock tunnel at Snoqualmie Pass.
Geotechnical services continued in support of Issaquah’s Major Design Review Team with over a decade of projects completed for the Issaquah Highlands and Talus Master Developments.

Finally, we added a challenging new, coal mine subsidence project in Colorado that involves evaluating impacts to roads, rail lines, alluvial creeks and four, 230 to 345 KV power lines that will be undermined by 5 or more, 1,500-ft wide longwall panels over the next decade. Our work on local abandoned mine projects will also continue in 2014 with new projects located east and west of the cascades.

Thanks to all our Clients! SubTerra, Inc. is a registered small business providing services directly to Owners and Contractors and as a teamed Subcontractor on Engineering Design and Construction projects. Please visit our website at www.subterra.us. Thank You.

Contact: David A. Baska
DABaska@terracon.com

2013 started slowly for the Seattle and Tacoma offices of Terracon. By the end of the year however, we had a strong backlog of work and 2014 looks very promising. The change during the year is primarily attributable to attraction of more urban infill projects in the Puget Sound region and the success of our National Transportation Sector.

Local project sites where the Terracon banner currently flies include Bellevue Way & Main Street, West Seattle Beach Drive, Stone Way and NE 40th Street, Ballard, Mercer Island, Olympia, and across from Key Arena. Some of these project sites have included all three of Terracon’s service lines: geotechnical, environmental, and construction materials testing.

Other local projects include the Google campus in Kirkland, Big Gulch Wastewater Treatment Plant, Kent-Auburn Conveyance System for King County, the Dubuque Inter Tie Water Main for Snohomish County PUD, and numerous retail projects.

On the national front, Seattle engineers participated in several design/build transportation projects from the comfort of their Mountlake Terrace offices. The list includes I-35E in Dallas, Paseo Del Norte in New Mexico, and SR-520 East in Bellevue.

New talent in the geotechnical group includes geologist Heather Gadwa and geotechnical engineer Brett O’Brien. Heather graduated from Western Washington University and Brett from the University of Washington.

Terracon is an employee-owned corporation and will celebrate 50 years of business in 2015. Although we have more than 130 offices nationwide and a workforce of over 3000 employees, the Mountlake Terrace office of 40 professionals has the feel of a local consulting firm and we invite you to learn more at www.terracon.com.
URS geotechnical engineering and related geological sciences staff of Seattle and Bellevue have been busy with activities like the following, listed by market sector:

**Infrastructure - Air Transportation:**
Geotechnical support for URS Aviation Group led by Abhijit Bathe, PE were involved in airport projects in US, Canada and New Zealand. Design and/or construction work was performed at Vancouver International Airport, Bellingham International Airport, Snohomish County Airport, King County International Airport, Seattle Tacoma International Airport, Oakland International Airport, and Wellington International Airport. Other key personnel included Martin McCabe, Brian Rapalee, Joshua Alcantara, and Andy Carpenter.

**Infrastructure - Surface Transportation:** URS provided assistance to WSDOT in addressing construction issues associated with the I-90 Snoqualmie Pass widening. Design work continued and construction work began with Flatiron Construction on the WSDOT Design-Build project to widen I-405 in the Bellevue to Lynwood corridor. Key personnel were Martin McCabe, Todd Parkington, Markus Walbaum, Pam Craig, Abhijit Bathe, and Ken Yang.

**Infrastructure – Water Resources and Wastewater:** Set-back levee and stormwater control dam studies continued for King County and the City of Kent (coordination by Rod Denherder). Provided support to Seattle Public Utilities to upgrade the pumping facilities at the Morse Lake and Masonry Lake locations.

**Infrastructure – Ports and Harbors:** Design work continued on modified plans for the Terminal 5 potash storage and shipping facility at the Port of Vancouver, WA. Dave Walker coordinated, with FLAC modeling by Suren Balendra.

**Industrial – Mining:** Mining activity was again very strong with design and construction work at the Red Dog Mine in AK, planning for the Buckhorn Mountain mine in WA, reclamation at the Transalta Centralia Mine in WA, and new work started in Mexico. Cecil Urlich directed the mining activities with assistance from Kris Fabian, Todd Parkington, Kranti Maturi, Toby Clarkin, J.R. Sugalski, Dave Walker and Keith O’Connell.

**Industrial – Oil and Gas Refining:** The usual equipment and tank projects at refineries in western WA this year included large crude rail delivery facilities, with multiple tracks, platforms, bridges, support buildings and pump stations. Planning for a storage facility along the Columbia River has begun with URS assistance.

**Power:** C.B. Crouse and Mark Molinari performed seismic and geologic hazard studies for new LNG facilities in British Columbia and Tanzania, as well as for oil and gas facilities near Fort Greely, AK and in the Tengiz Field, Kazakhstan. Suren Balendra provided analysis support.

Geotechnical services were also provided on a variety of projects at the Boeing Everett facility, and on commercial and institutional building projects in the South Lake Union area.