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# Groundhog

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## From the Chair

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The 2002-2003 season for the ASCE Seattle Section Geotechnical Group is well underway with new officers, a dedicated planning committee, and the challenge of hosting our Spring Seminar in mid-March, nearly a month earlier than we have typically done in recent years. The Geotechnical Group planning committee has been meeting since September 2002 to organize this year's activities, including our monthly dinner meetings and our annual Spring Seminar.

A special thank you from the Geotechnical Group goes to **Keith Ward** (Seattle Public Utilities) and **Doug Lindquist** (Hart Crowser), who stepped forward and volunteered with me to take on the officer roles for this year's Geotechnical Group. Keith assumed the Vice-Chair role and is heading up the planning efforts for our upcoming Spring Seminar. Doug assumed the Secretary role and has organized and published this year's Groundhog newsletter.

The geotechnical community can be proud of the local response to the University of Washington (UW) Department of Civil and Environmental Engineering's request last May for about \$50,000 in "seed" money pledges for the UW Geotechnical Program facilities improvements fund. Obtaining more than \$50,000 in pledges from the Geotechnical Group and eight local firms in less than two weeks was quite an achievement for the planning committee. This special effort was

headed up by **Bob Metcalfe** (GeoEngineers), the past Chair of the group.

Our 2003 Spring Seminar will be held at the UW on Saturday May 15. This year's topic is "Geotechnical Engineering for Waterfront Structures." The Spring Seminar is the Geotechnical Group's biggest and most time-consuming event, thus all help is greatly appreciated. Please contact Keith Ward, Doug Lindquist, or me if you would like to volunteer.

The Geotechnical Group is continuing its tradition of providing financial support for small research projects in geotechnical engineering at the UW. The focus of the research project currently being planned is an evaluation of the load factors for soils used in the model codes for LRFD design. The Geotechnical Group is also participating in planning activities for preparation of an Earthquake Engineering Research Institute Seattle Fault Scenario document.

One of the main activities of the planning committee is to provide technical programs for the monthly Geotechnical Group dinner meetings. The committee has arranged a great lineup of speakers and once again has arranged for the Terzaghi Lecturer to visit Seattle in May. Upcoming dinner meeting programs, dates, and locations are summarized in the Group Dinner Meetings section.

I hope to see you again at our monthly dinner meetings and our 2003 Spring Seminar!

**Dave Pischer**

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**Dave Pischer, P.E.**  
*Chair*  
Landau Associates, Inc.  
130 2<sup>nd</sup> Avenue South  
Edmonds, WA 98020  
(425) 778-0907  
Fax: (425) 778-6409  
dpischer@landauinc.com

**Keith Ward, P.E.**  
*Vice-Chair*  
Seattle Public Utilities  
700 Fifth Ave., Suite 4900  
Seattle, WA 98104-5004  
(206) 615-0734  
Fax: (206) 233-1532  
keith.ward@seattle.gov

**Doug Lindquist, P.E.**  
*Secretary*  
Hart Crowser, Inc.  
1910 Fairview Avenue East  
Seattle, WA 98102  
(206) 324-9530  
Fax: (206) 328-5581  
doug.lindquist@hartcrowser.com

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## News and Comment

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### Group Dinner Meetings

Our initial dinner meetings of the 2002-2003 season included great presentations from speakers located along the west coast. Our Fall 2002 dinner meeting speakers included: **Dr. Stephen Dickenson** (Oregon State University) on "Seismic Performance of Pile Foundations in Waterfront Applications," **Dr. Derek Booth, Kathy Troost, and Scott Shimel** (University of Washington) on the "Seattle-Area Geologic Mapping Project," and **Mike Majchrzak** (Kleinfelder) on the "Millbrae Landslide Stabilization Project."

Our dinner meetings for the spring session are currently scheduled to include: **Dr. Conrad Felice** (C. Felice & Co.) on "Drilled Shaft Construction for the Bandra-Worli Sea Link Project," **Richard Hannan**, (USACE) on the "Cougar Dam Tunnel Tap and Rock Anchor Installation," **Dr. Jim Mitchell**, (Virginia Tech) on "Earthquake Performance of Improved Ground," **Dr. Robert Schuster** (USGS) on "Dams Built on Pre-Existing Landslides and the Usol Landslide Dam" and **Victor Milligan** (Golder Associates) presenting the 38<sup>th</sup> Terzaghi Lecture.

The following is a schedule of dinner meetings for this spring. Please note that some of the dates are not scheduled on our typical 4<sup>th</sup> Thursday of the month meeting nights due to speaker availability. This schedule is subject to change.

Meeting Date	Speaker	Location
January 23 (Thursday)	Dr. Conrad Felice (C. Felice & Co.)	Rock Salt Steak House
February 27 (Thursday)	Richard Hannan (USACE)	Hilton Bellevue
April 1 (Tuesday)	Dr. Jim Mitchell (Virginia Tech)	Rock Salt Steak House
April 24 (Thursday)	Dr. Robert Schuster (USGS)	Hilton Bellevue

Meeting Date	Speaker	Location
May 15 (Thursday)	Victor Milligan (Terzaghi Lecture)	Rock Salt Steak House

This year we have instituted a new policy for charging people that make a reservation but do not show up or send an alternate to our Geotechnical Group dinner meetings. The Geotechnical group has to pay for the dinner and can lose \$100 to \$200 per meeting due to no-shows. We instituted this policy as a way to reduce our losses due to no shows, while keeping dinner costs as low as we can for our attendees. We encourage you to RSVP (even if you miss the early reservation deadline) if you plan to attend. Please contact the reservation line by noon the day of the meeting if you must cancel your reservation; otherwise, **no shows will be billed**. We appreciate your understanding regarding the adverse effect that no shows at our dinner meetings can have on our Geotechnical Group budget.

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### Planning Committee Meetings

In order to continue to provide quality programs and seminars, as well as community outreach, it is important for a diverse group of individuals to be active in our Geotechnical Group planning committee. We encourage all of the Seattle area geotechnical firms/agencies to have a representative attend each monthly Geotechnical Group planning committee meeting. The Planning Committee is looking for your help in selecting topics of interest, identifying potential speakers, and identifying officers for the upcoming 2003-2004 year. Please contact one of the group officers if have any suggestions or would like to participate.

Please contact Dave Pischer, or one of the other officers, if you would like to attend the next planning committee meeting. Lunch will be provided.

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## ANNUAL SPRING SEMINAR

March 15, 2003

### GEOTECHNICAL ENGINEERING FOR WATERFRONT STRUCTURES

The 2003 annual ASCE Geotechnical Group Spring Seminar on the topic of "Geotechnical Engineering for Waterfront Structures" will be held on Saturday March 15, 2003, at the University of Washington HUB Auditorium. The seminar will include the following areas of interest as they pertain to waterfront projects: deep foundations, seismic considerations, state-of-the-art construction techniques, environmental issues, risk-based design, and structural issues.

Speakers for the morning sessions will include **Dr. Stephen Dickenson** of Oregon State University, who will return to the Geotechnical Group to focus on the seismic performance and analysis of pile-supported structures on sloping ground, **Jerry Serventi** of the Port of Oakland and **Dave Swanson** of Reid Middleton (lessons learned from three earthquakes); **John Verduin** of Anchor Environmental and **George Blomberg** of the Port of Seattle (environmental issues for the construction of waterfront structures), and **Mark Koelling** of Hayward Baker (waterfront ground improvement case histories). Afternoon speakers will include **Garry Horvitz** of Hart Crowser and **Dan Mageau** of GeoEngineers (lateral design of piles for waterfront structures); **Dr. Lee Marsh** of BERGER/ABAM (structural perspective for the design of waterfront structures); **Mike Huggins** of General Construction Company (construction of marine foundations – risks and rewards); and **Bob Maruska** of the Port of Seattle and **Doug Saathoff** of the Port of Tacoma (an owner's perspective on risk). A panel discussion of engineers, contractors, and owners will follow the presentations.

As always, volunteers are needed to help make the spring seminar a continuing success for the Geotechnical Group and the University of Washington. Please contact Keith Ward (contact info on page 1) for more details on how you can participate in this year's spring seminar.

## Controlling Expenses

### Use of E-MAIL Distribution

The Geotechnical Group has continued to reduce our mailing costs by greatly reducing the snail-mail list and relying primarily on e-mail distribution of our dinner meeting announcements, the **Groundhog**, the Spring Seminar announcement, and other mailings. Currently, over 95 percent of our announcements are made via e-mail! In addition to helping the Geotechnical Group save time and money, by receiving announcements via e-mail you have access to information that is sent only by e-mail. This information includes announcements for special seminars or conferences, Geo-Institute Graduate Student Society (GIGSS) seminars at the University of Washington, reminders to sign-up for the monthly dinner meetings, and occasional announcements from AEG, ASCE, VGS, and other organizations.

With each of the last three dinner meeting announcements that were sent out by snail-mail, the Geotechnical Group has included a notification letter asking the recipient to either provide an e-mail address to use for future announcements or confirm that they want to continue use of snail-mail. To date, only 5 of the 120 people on our Fall 2002 snail-mail list have indicated that they want to continue receiving our announcements by snail-mail! The 60 people that have not responded to our last three notification letters will be removed from our snail-mail list by the end of January 2003.

If you are not currently on our Geotechnical Group e-mail list, please provide your e-mail address to either Dave Pischer or Doug Lindquist (contact info on page 1). If your e-mail address changes, please e-mail us a notification with your new address. In addition, send us e-mail addresses for anyone you know that would be interested in receiving our Geotechnical Group announcements.

It is the policy of the Geotechnical Group not to distribute our e-mail list to others outside the group except for GIGSS at the University of Washington. The e-mail list is only used by the Geotechnical Group to distribute group-related information.

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## **City of Seattle Public Landslide Workshops**

The City of Seattle will be holding two Public Landslide Workshops within the next month. The ASCE Geotechnical Group is hosting a table with two representatives from our group who will provide one-on-one discussions with homeowners. The first workshop will be held on Saturday, January 25, 2003, from 10 a.m. to noon at North Seattle Community College. The second workshop will be held on Saturday, February 1, 2003, from 10 a.m. to noon at South Seattle Community College. For additional information, please refer to the DCLU website at [http://www.ci.seattle.wa.us/dclu/events/landslide\\_workshops.asp](http://www.ci.seattle.wa.us/dclu/events/landslide_workshops.asp).

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## **Update on Pin Pile Research**

The ASCE Geotechnical Group, the University of Washington, Creative Engineering Options, and Dochnahl Construction funded and worked together to complete the second phase of the local pin-pile research program.

One of the primary goals of the second phase was to determine if a relaxation of the one-inch of penetration during one minute of driving would provide acceptable load capacity results. This would allow for a reduction in the damage to the piles and the driving equipment, as well as wear and tear on the workers installing the piles. This phase evaluated the difference in load capacity for 2-inch diameter pin-piles driven to a rate of 1, 4, 8, and 12 inches per minute (ipm).

Courtesy of Dochnahl Construction a test (reaction) load weighing approximately 70,000 pounds was constructed of stacked-in-place concrete ecology blocks. It took an approximately 20,000 pound load to cause any significant movement in any of these piles. Essentially zero movement was observed until the test load was greater than approximately 8,000 pounds, even with a penetration rate of 12 ipm. (This indicates that at twice the design load little to no pile

<http://seattleasce.org>

movement will be recorded making the load test virtually worthless.) The team concentrated the load testing on the pile driven at 4 ipm. After two cycles of loading to just above 50,000 pounds a final pile penetration of about 0.25 inches was recorded. Higher loads were not achievable because the dead load was being “jacked” off the piles.

Final test results indicated that pile movements of about 0.33 and 0.34 inches were achieved for driving rates of 12 and 8 ipm, respectively. These movements were recorded for maximum loads of approximately 24,000 and 27,000 pounds, respectively.

In the researchers opinion, these data also indicate that a “refusal” driving penetration rate of 4 ipm is more than adequate to achieve a 6,000 pound capacity with little to no pile deflection from the test or design load. This still results in a factor of safety of at least 3.0 when the test load is raised to 20,000 pounds, even for a driving “refusal” criterion of 12 ipm. The final pile penetrations are also of such small magnitude they do not pose a threat of structural instability of building settlement. The research team hopes that these data help to persuade public agencies, particularly DCLU, that the current allowable axial capacities and driving “refusal” criteria are too conservative and their relaxation does not pose any threat to the supported structures.

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## **UW Geotechnical Department Facilities Improvements**

The University of Washington Geotechnical Program facilities have been in need of significant improvements for a long time. One item deemed very important to the Geotechnical Program was to improve the faculty/student atmosphere by uniting the faculty, which are presently in Wilcox Hall, with their graduate students and laboratories in More Hall. This would allow the faculty to work more closely with their students, a situation that will be more efficient for the faculty and provide a better education for the students.

The UW Department of Civil and Environmental Engineering approached the ASCE

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Geotechnical Group in May 2002 to alert us and the geotechnical community of the present situation in the Geotechnical Program, and to solicit support for facility improvements in the form of “seed” money for modest improvements to renovate existing space in More Hall. The renovations would allow the geotechnical faculty to be relocated to More Hall. The renovations are expected to cost about \$250,000 and the Department was looking for about \$50,000 in “seed” money to show community support for the Geotechnical Program. Pledges for the “seed” money were needed on a very short time frame. The ASCE Geotechnical Group planning committee pledged \$25,000, which is due in June 2004. Due to the success of the 2002 Spring Seminar, the ASCE Geotechnical Group is well on its way to meeting this goal. The remaining \$25,000 was solicited from many (but not all) of our member firms. Due to the short timeframe that was available to obtain pledges, several firms were not contacted. Member firms realized the importance of the UW Geotechnical Program and its faculty and in nine (that’s 9) days pledged in excess of \$27,000. Therefore, the desired “seed” money was pledged to the UW Department of Civil and Environmental Engineering for the Geotechnical Program improvements. We understand that the renovations are occurring at this time.

Firms that made pledges to the UW Geotechnical Program facilities improvements fund in addition to the ASCE Geotechnical Group pledge include: **GeoEngineers, Hart Crowser, Northwest Cone Exploration, Shannon & Wilson, Hayward Baker, Landau Associates, Aziz Engineering, and PanGEO.** The ASCE Geotechnical Group and the UW Department of Civil and Environmental Engineering thank these firms for their support of the program. Donations to the fund are still welcomed. If your firm is interested, please contact Dave Pischer at [dpischer@landauinc.com](mailto:dpischer@landauinc.com).

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**Larry Wade Scholarship Fund**

In support of the ASCE Seattle Section, the Geotechnical Group previously donated \$1,000 to the Larry Wade Memorial Scholarship Fund. As of January 15, 2003, the ASCE Seattle Section has collected \$43,000 and University of Washington solicitations have collected \$8,000 to exceed the \$50,000 minimum requirement to establish an endowment to fund a scholarship for an engineering student at the University of Washington. Additional donations are welcome to ensure that funds are available to make this an annual award. Donations can be sent to: The Larry Wade Memorial Scholarship Fund, c/o ASCE Seattle Section, P.O. Box 24925, Seattle, WA 98124. Thank you to all who have contributed to this fund.

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**ASCE Seattle Section and Geotechnical Group Website**

The Geotechnical Group has moved to a new website shared with the ASCE Seattle Section. Check it out at <http://www.seattleasce.org>. You can currently click on the “Committee” link and then select “Geotechnical.” The ASCE webmaster ([anand@westconsultants.com](mailto:anand@westconsultants.com)) is in the process of making some revisions that should make reaching the Geotechnical Group web page a little easier.

Our goal is to keep the web page updated with a schedule of activities as well as current and past issues of the **Groundhog**. The Geotechnical Group would also like to include your firm’s name, address, phone number, and URL on the website. To include your firm’s contact information on the Geotechnical Group’s website, send the information via email to Dave Pischer at [dpischer@landauinc.com](mailto:dpischer@landauinc.com).

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**Are You a Member of ASCE?**

If you are not a member of ASCE or are not current, we encourage you to join and help support the Seattle Section and the Geotechnical Group. In addition to joining ASCE, we encourage you to join The Geo-Institute (at no additional cost!) and you’ll receive the Geo-Strata publication. For

additional information on how to become an ASCE member, check out the ASCE website at: <http://www.asce.org/membership/>

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## Washington Section of AEG

Details for upcoming AEG Washington Section activities can be found at their website <http://www.aeg-wa.org/>. Upcoming meetings include:

February 20 - **Ted Hopkins**, Senior Principal Engineering Geologist with Shannon & Wilson, Inc. will speak on "Reservoir and Rock Mass Interaction: An Evaluation of Seepage Conditions at Lower Baker Dam." The talk will cover geologic mapping of the abutments from roped rappels and the assessment of the contributions of the reservoir pool, rock mass structure, power tunnel, and abandoned construction adits and bypass tunnel to abutment seepage.

March 20 - **Dr. Alan Hull** of Golder and Associates, Irvine, California, will speak on "Earthquakes, Faults and Ground Shaking: Understanding the Hazard." The presentation will cover: 1) techniques for the identification and characterization of the major geologic sources of earthquakes; 2) methods for estimating the timing and magnitude of past large earthquakes; 3) quantifying earthquake hazards for engineering projects; and 4) development of site-specific response spectra and acceleration time histories. The presentation will draw examples from the Pacific Northwest, USA, Philippines, New Zealand and other parts of the world. The presentation is designed for earth science and engineering professionals who are not earthquake specialists. Meeting will be in Seattle at location yet to be determined.

April 17 - 40th Anniversary celebration of the Washington Section of AEG.

May 15 - **Dr. Doug Stead**, of Simon Fraser University. Topic yet to be determined.

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## News About Geo-Town

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We use the **Groundhog** to inform the Geotechnical Community as to what is happening at area firms. If you are interested in announcing news in future issues of the **Groundhog** please contact Doug Lindquist (contact info is on page 1).

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## University of Washington Graduate Student Research

**Brian Bennetts**, a Masters student, is working with Steve Kramer on experimental measurement of the residual strength of liquefied soil. Using the UW Ring Simple Shear Device, a new testing apparatus capable of producing uniform shear strains of over 100%, Brian is looking into factors that influence residual strength.

**Changho Choi**, a PhD student under guidance of Prof. Pedro Arduino, is working to characterize three-dimensional behavior of gravelly soils using true triaxial device and to implement and calibrate an advanced constitutive model capable of reproducing the behavior of gravelly soils under general loading conditions. He is planning to graduate in August 2003.

**Michael Harney**, a Doctoral student working with Bob Holtz, is studying the long-term performance and design issues associated with the construction of reinforced soil retaining walls using poorer quality (cohesive and/or poorly draining) backfill. The research focuses on short- and long-term foundation and wall-slope face deformations, backfill and foundation drainage, and the development of practical guidelines and practices for design and construction. Additionally, appropriate testing protocols for determination of the soil and geosynthetic micro- and macroscopic properties and their correlations with soil classification and geosynthetic index properties are being developed.

**Eric Heller** has just completed his master's research with Dr. Pedro Arduino on the

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geotechnical aspects of tsunami-induced scour on beaches. He is currently looking for work in the northwest with a geotechnical engineering firm.

PhD student **Fu Jen Ho** has been working at National Chiao-Tung University in Hsinchu, Taiwan for the past year but will return to the UW to complete his research in September. His research, supervised by Prof. An-Bin Huang of NCTU and Steve Kramer of the UW, involves measurement of the response of liquefiable soils to transient loading. Fu Jen has developed a closed-loop, cyclic torsional shear device which uses a powerful stepper motor to produce any desired loading history very accurately. He is using this device to investigate temporal aspects of liquefaction with emphasis on the relationship between the time at which liquefaction is initiated and resulting damage.

**Allen Jones**, is completing his PhD under the direction of Steve Kramer. Allen has looked at the problem of liquefaction and sand boil development from a probabilistic viewpoint. He has developed procedures for estimating the probability of surficial evidence of liquefaction, and is using those procedures to study the paleoliquefaction problem and the problem of identifying conditions under which liquefaction can occur without producing surface evidence of liquefaction.

**Matt Malgesini**, currently with Golder Associates, recently completed his Masters thesis working with Steve Kramer and Pedro Arduino. Matt extended the UW sand constitutive model to more accurately represent stress-strain and pore pressure behavior after liquefaction has been initiated. Matt's work will lead to the development of improved procedures for estimation of lateral spreading displacements and post-liquefaction settlements.

**Roy Mayfield** is working on his Masters degree with Steve Kramer, looking at the liquefaction behavior of clean and silty sands with emphasis on experimental measurement of post-liquefaction stress-strain response. Roy is taking a close look at the phase transformation process to see how quickly a dilating soil regains stiffness and to identify the factors that influence that stiffness.

**Bob Mitchell** is completing his PhD research with Steve Kramer on ground motion

characterization for liquefaction and lateral spreading problems. Bob has identified ground motion parameters to which excess porewater pressure generation is related both efficiently and sufficiently. This work may provide the groundwork for more reliable methods of evaluating liquefaction potential, particularly with respect to sources such as the Cascadia Subduction Zone and Seattle fault, for which ground motion characteristics may be somewhat unusual.

**Sarah Paulsen**, a new PhD student working with Steve Kramer, will be looking at site response from a probabilistic viewpoint, specifically at the effects of aleatory and epistemic geotechnical uncertainties on damage to various types of structures. Her work will include identification of intensity measures that correlate well to damage, and on new methods for expressing those intensity measures.

**Kathryn Petek** recently returned to the UW to start her PhD under Dr. Holtz. Her research investigates the effect of construction defects on drilled shafts using the finite element modeling framework OpenSees. The goal of the project is to develop a validated computational tool that will permit direct assessment of the load carrying capacity and performance of drilled shafts where significant defects have been detected.

Doctoral student **Fadzilah Saidin**'s research is on the behavior of GRS walls with poor quality backfills. A finite difference program FLAC is used to simulate the construction of GRS walls and analyze the stresses and deformation induced. Model results are verified using instrumented and published data as well as established theories.

**Hyung-suk Shin**, a Doctoral student working with Pedro Arduino is working on research regarding the analysis of the laterally loaded piles with the OpenSees finite element program.

**Alison Stanley** graduated with her MSE in December. She is now working with Hart Crowser.

**Ben Upsall**, a first year Master's student, will be doing some research with Bob Holtz on the strength properties of a new type of soil nail. The project is in its preliminary stages, and will likely involve field and laboratory experimental work as well as numerical analysis.

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**C.H. Wang**, a PhD student working with Dr. Kramer, is investigating the residual strength of liquefied soil by explicitly considering the quality and quantity of data available in the case histories from which residual strengths are commonly backcalculated. By characterizing the uncertainty in each of the case histories, C.H. can perform Monte Carlo simulations that allow evaluation of the uncertainty in the backcalculated residual strength. Simulation of a group of case histories will allow probabilistic characterization of residual strength as a function of SPT resistance.

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**Anchor Environmental**

Anchor Environmental had another busy year in 2002. The company has grown to more than 50 employees and added a Portland, Oregon, office in this past year. Anchor now has offices in Seattle, Portland, and Oakland, Irvine, and San Diego, California. As part of this expansion, **Michael Whelan**, and **John Laplante**, have joined **John Verduin**, to supplement Anchor’s geotechnical engineering capabilities. The geotechnical group is off and running in support of several landscape architecture projects, including the Holly Street Landfill, Seahurst Park, and the Washington Park Arboretum. In addition, Anchor’s geotechs are working on several remediation projects in the Great Lakes, East Coast, Gulf Coast, West Coast, and Canada. More on Anchor can be found by visiting their web site <http://www.anchorenv.com>.

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**Aspect Consulting**

Aspect Consulting has just completed its first anniversary as an independent firm and the future looks bright. In August 2002, we opened a Seattle office for client access and staff commuting ease. With the addition of recent hires, Aspect Consulting now has 33 staff.

Water resources/hydrogeology and environmental carry the majority of projects with locations throughout the Northwest, southern California and Arizona. Recent and current geotechnical jobs included municipal storm and sewer support for the City of Seattle, City of Bainbridge Island, and Kitsap County; numerous

private residential and commercial jobs; and the Best Available Science review of the Critical Areas Ordinance for Bainbridge Island. We are just starting on the geology/groundwater segment of the Brightwater Project.

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**CDM**

CDM’s geotechnical group continues to provide geotechnical support for a number of our water resources and environmental projects in the Northwest, as well as providing services for several public and private sector clients in the area. We have just completed a busy year and look forward to another busy and exciting one with upcoming and continuing services for the City of Redmond, Seattle Chinatown-International District Preservation and Development Authority, Tacoma Water, Montana Department of Transportation, and many others. We expect to keep many staff very busy with the King County Brightwater Conveyence system project.

New faces around our office in Bellevue include **Mike Gilbert**, on loan from our Cambridge, Massachusetts, office; **Harald Leiendecker**, from our German subsidiary, CDM Consult A.G.; and a new hire, **Kirsten Leiendecker**.

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**CH2M HILL**

The geotechnical staff at CH2M HILL would like to wish everyone a successful 2003. This past year was a relatively good one for us, and we hope that it was the same for you.

Our staff remains essentially the same as we reported in the last edition of the Groundhog. **Mike Reibold** serves as the group leader for the geotechnical staff. For those who inquired about the whereabouts of **Kevan Sharp**, he is the staff manager for CH2M HILL’s Northwest Transportation Business Group – which comprises the transportation staff in Anchorage, Boise, Corvallis, Honolulu, Portland, Seattle, and Spokane. There are roughly 300 engineers in the business line. We appreciate having a geotechnical engineer involved in the big picture engineering activities like this. **Joan Stoupa**, the

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former group leader, manages the geotechnical work on King County’s Brightwater Wastewater Treatment Plant and also serves as the Business Group Leader for the Energy and Environmental Sciences Business Group in the Bellevue office.

This past year our geotechnical work focused on supporting our business groups for transportation, water, and energy and environmental sciences. The most challenging of our work involved a series of design/build projects – for the Cedar River Water Treatment facility and for three bridge projects in Oregon and Alaska. Other projects included construction of the Rocky Reach fish bypass project in Wenatchee and the Tacoma Pipeline project. These projects have provided excellent construction experience for **Karen Dawson, Joel Theodore, and Jen Schaeffer**. The Swift levee repair has kept **Ken Green** busy, while **Don Anderson** and **Dick Coon** continue to serve as senior advisors and consultants on projects nationwide and mentors to the local staff. **King Sampaco** returns in January after being in the Philippines for the past year.

In the area of professional activities, **Don Anderson** is a member of one of the committees involved in the next update to the NEHRP seismic regulations for new buildings, and he still serves on the Scientific Advisory Committee for the Pacific Earthquake Engineering Research (PEER) Center. **Jen Schaeffer** successfully passed her Professional Engineering exam.

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**City of Seattle**

Since the numerous landslides that occurred in the winter of 1996-97 storms the City of Seattle has assembled geotechnical expertise in varying city departments.

Geotechnical review within the Site Development Section of the Department of Design Construction and Land Use (DCLU) is being performed by **William Bou, Rob McIntosh, and Dean Griswold**. They review geotechnical aspects of permit applications and oversee the Geotechnical Special Inspection Program. The Department is pleased to announce the addition of **Scott Stevens** who recently joined the group as a Senior Site Development Inspector.

The Seattle Public Utilities (SPU) Materials Laboratory Geotechnical Group consisting of **Al Rice, Henry Haselton, Jeff Fowler, and Taryn Sass**, provides geotechnical support for design and construction of City capitol improvement projects. Typical projects include utility repairs, upgrades, and new installations; drainage studies; roads, bridges, and retaining walls; landslide investigations, monitoring, and mitigation; park improvements; and power distribution and transmission facilities. Design phase services include geotechnical investigations/design, preliminary engineering/feasibility studies, and plan/specification review. The Materials Lab Geotechnical Group supports SPU Construction Management (which administers SPU, Seattle Department of Transportation, and City Light construction projects) during the construction phase by reviewing geotechnical-related submittals and troubleshooting soil or groundwater-related problems.

SPU has also assembled a well-qualified staff of geotechnical engineers in response to the landslides that occurred in 1996/97. This group is staffed by **Bill Benzer** and **Jim Lee**. SPU is pleased to announce the addition of **Keith Ward** during the past year. The group is informally known as the Landslide Group. The primary goals of this group are to evaluate the risk to SPU drainage and wastewater facilities, manage the planning and design of capitol improvement projects involving protection of these facilities in landslide prone areas (LPAs), assist the SPU Operations and Maintenance division when emergency repairs involve slope instability, and respond to drainage complaints in LPAs.

Recently completed projects include an emergency repair of a broken combined sewer line in a steep slope and known landslide area. Due to difficult access and multiple property owners in an established neighborhood, the line was rerouted by directional drilling. Capitol Improvement projects on East Boston Terrace, SW Jacobsen Rd, Atlas Place, 47<sup>th</sup> Ave SW, are currently in the design stages.

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**Creative Engineering Options**

CEO enjoyed a busy and fruitful 2002, our thirteenth year in business. We had the opportunity to work on a variety of interesting and sometimes complex projects. One project of great interest included the design and construction of a 35-foot-high soil nailed wall along the edge of a regional landslide. This tested our abilities and generated considerable concern whilst being constructed. The final shotcrete wall was “sculpted” to look like it had been cut out of rock. This was an extraordinary finish that the client loves. Additionally, CEO was instrumental to the completion of the second phase of a local pin-pile research program (described in the News and Comment portion of this **Groundhog** issue).

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**Donald B. Murphy Contractors**

Since the Groundhog edition in February 2002, DBM has been involved with many significant projects stretching across the majority of the western United States. Some of our more unique projects included:

**Fort Greely, Alaska** – DBM was the design/build contractor for (6) 16-foot-diameter by 75-foot-deep drilled shafts for our countries Missile Defense System. To ensure shaft stability through the top 40 feet of loose silts/sands, DBM designed a secant pile system consisting of 36-inch-diameter shafts.

**SR-189 Provo Canyon, Utah** – DBM was the design/build contractor for over 100,000 square feet of a soil nail slope stabilization and very detailed sculptured shotcrete. DBM hired Golder Associates (Redmond) as the design engineer. DBM was awarded *Contractor of the Year* by Utah’s Department of Transportation.

**Hanford River Protection Hanford, Washington** – DBM was the design/build contractor for an anchored soil mixed/shotcrete temporary excavation support system for two new waste treatment facilities at the Hanford Nuclear Waste Site. This system consisted of mixing the in situ sand with water and cement to obtain “lean mix” shafts with compressive strengths of approximately 500 psi.

**Southwestern United States** – Our Southwest Regional Office (Sacramento) continues to expand our business capabilities in California, Nevada, Arizona, and New Mexico. Currently, we are constructing both design/build and owner-designed earth retention, micropile, and tiedown anchor systems.

Finally, DBM continues to actively market the professional engineering community and general contractors about the value of looking at design/build for earth retention, foundation support, and slope stabilization construction. Happy Holidays!!

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**GeoEngineers**

GeoEngineers recently made two staff additions to continue the firm’s strategic growth. **Jim Kleppe** (Redmond), Principal, has joined the firm as Corporate Business Development Director. Jim will lead the business development and client relations activities for the firm’s eleven offices. **David Winter** (Seattle), Principal, will lead our business development efforts in the Private Development and Federal sectors. David has been a part of some of the most recognizable projects in the Puget Sound region over the past 22 years and has worked with the Department of Defense for over 15 years.

**Galan McInelly** has been promoted to Office Manager for the Redmond, Seattle, and Everett offices. He replaces **Mary Rutherford** who left the firm to pursue her dream career outside of engineering.

GeoEngineers congratulates **Todd Colocino** (Redmond) who was promoted to Staff 2 Geotechnical Engineer and **Bob Metcalfe** (Redmond), promoted to Senior 2 Geotechnical Engineer. **Dan Campbell** has taken over as group leader of the Redmond office Geotechnical group. **King Chin** (Redmond), **Aaron McCain** (Bellingham), and **Tony Orme** (Redmond) each earned their Professional Engineers license in Washington State.

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## Groundhog GeoMetron

GeoMetron, in Bellevue, continues to specialize in monitoring and interpretation of instrumentation data for earth and rock structures. The firm was started in January 1999 by **P. Erik Mikkelsen**, a geotechnical consulting engineer, who is especially known for his contribution to inclinometer data management, trouble-shooting, and interpretation. Erik has published several papers on geotechnical instrumentation, regularly gives seminars on inclinometer data analysis and interpretation, and routinely serves as an instrumentation specialist/advisor to other geotechnical professionals and the legal profession. Currently there is no plan to expand beyond the basic one-person operation.

## Geopier – Northwest

Geopier Foundation Company Northwest worked closely with local geotechnical engineers this past year on over 20 projects in the Puget Sound and eastern Washington. The majority of the projects completed were in the public school, university, healthcare, and retail markets.

Geopiers were used to support foundations for public schools on sites typically underlain by 6 to 15 feet of existing fill or weak compressible soils. Projects completed include Evergreen Elementary and Tacoma Middle School (Associated Earth Sciences), and Midland Elementary School (AMEC).

Geopiers were also used for support of foundations and floor slabs on numerous retail projects, including Walgreens (Golder), Best Buy (Hart Crowser), Safeway (Earth Consultants), Albertsons (AMEC), and Home Depot (Kleinfelder).

Geopiers have recently been used in the “Palouse” silts in eastern Washington, where deep pile foundations have historically been used. Projects were completed at the University of Idaho (Strata) and at the Whitman County Hospital (GeoEngineers). Geopiers are planned for a project at WSU next year.

Geopier Foundation Company was recently acquired by the parent company of Tensar Earth Technologies and is evolving into the

transportation market. Upcoming transportation projects include a King County DOT project, where Geopier reinforced soils will support an MSE wall (Shannon & Wilson) and a City of Tacoma roadway project, where Geopiers will support a geogrid reinforced roadway section over peat (Hart Crowser).

## Golder

Golder Associates’ geotech group had busy, successful 2002. We hired staff engineers **Steve VanShaar**, who completed his Master’s studies at the University of Texas, Austin, and **Joe Schrank** (M.Eng at UBC) who has worked on numerous rock slope projects. Senior Project Manager **Don West** rejoined Golder, considerably strengthening our geologic hazard and earthquake engineering practice.

Golder co-founder **Vic Milligan** gave the Karl Terzaghi lecture at ASCE’s Washington, D.C. conference last November, one of the highest honors in geotechnical engineering. Chosen for his contributions to knowledge of soil mechanics and subsurface/earthwork engineering, Milligan presented case histories on the use of glacial till in embankment dams and cold weather earthwork.

Golder’s Redmond geotechnical team won two first place excellence awards from the Washington Aggregates and Concrete Association for value engineering a mat foundation for the 33-story Westlake Tower and for the pile foundation at the Bremerton Transportation Center. We also won the Engineering Excellence Award for 2002 from Utah DOT for the Provo Canyon Design-Build Wall Stabilization Project. Golder designed 160,000 sq. ft. of sculpted architectural retaining wall.

We continued to support Sound Transit, evaluating pile foundation options for a maintenance building over deep soft sediments. We completed the 5<sup>th</sup> & Jackson project, a challenging foundation and shoring project involving a mid-rise building constructed on piers over the Metro Bus Tunnel. Our FHWA Western Federal Lands contract with EarthTech has us providing geotechnical recommendations for 3

**Groundhog**

kilometers of new roadway in steep, rocky terrain in Southeast Alaska.

We helped expand and maintain the Northwest's natural gas pipeline infrastructure. Significant projects include geotechnical design and permitting for the Grays Harbor Lateral and Evergreen Expansion projects, both involving multiple HDD crossings.

In October we organized and co-sponsored a forum on Washington's transportation megaprojects, held at Seattle's Four Seasons Olympic Hotel. The forum drew more than 200 engineers, consultants, policy makers and transportation officials, and included a keynote presentation by Doug MacDonald, Secretary of Transportation for WSDOT.

At year end, Golder launched its new web site ([www.golder.com](http://www.golder.com)), which now features project highlights, technical papers and more related to the range of industries we serve, including Transportation, Land Development, and Water Resources.

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**Hart Crowser**

The Geotechnical group at Hart Crowser has just wrapped up another successful year and we're looking forward to even better and brighter things in 2003. **Barry Chen** was recently named our newest principal. Barry is one of the group's senior project managers and continues to be a real "go to" guy in the area of seismic design/earthquake engineering. Barry managed our involvement with the seismic retrofit of the Jackson Federal Building in downtown Seattle and is currently Hart Crowser's project manager for the Port Angeles Graving Dock for WSDOT. **Mike Bailey**, senior principal continues to manage Hart Crowser's work at Sea-Tac Airport. In addition to the Third Runway project that has been going on for several years now, Mike is heavily involved with projects dealing with outlying airport improvements. He served as Hart Crowser's proposal manager for the Sea-Tac Airport Stormwater Improvement Project. Hart Crowser is a key member of the recently named winning team for both the geotechnical and environmental contracts for that stormwater work. We look

forward to the start of that work in the upcoming months.

From the "old" to the "new"...Hart Crowser recently hired **Alison Stanley**, (M.S. '02, University of Washington) as a staff Geotechnical Engineer. Alison continues a strong run of University of Washington graduates that have found a home at Hart Crowser (**Doug Lindquist** M.S. '98, **Jostein Aasen**, M.S. '00). Alison is likely to get her feet wet (or at least her boots muddy) during the upcoming construction of the 2200 Westlake project in downtown Seattle. This project, managed by **Garry Horvitz** and assisted by **JoDee Celes**, will consist four mix-used buildings from 4 to 15 stories with 5 levels of below grade parking. The excavation (up to 60-foot deep) will be supported by a soldier pile/tieback shoring system.

The Bellevue Place Expansion will also start construction this fall adjacent to the existing Hyatt Hotel in Bellevue. It will include an 18-story high-rise hotel expansion with a 60-foot-deep excavation to accommodate below grade parking. **Wayne Adams** will lead Hart Crowser's effort on that soil nail shoring design.

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**HWA GeoSciences**

HWA's geotechnical group grew to 13 in 2002 with the addition of **Susan Robarge**, who completed her graduate geotechnical engineering studies at the UW. Our geoenvironmental group grew to 6 with the hiring of **Pete Pearson**, who has a B.S. in geology from Vanderbilt University; **Brendan Robinson**, who has a Bachelor of Engineering in Environmental Engineering and a B.S. from the University of Newcastle in Australia; and **Greg Emens**, who returned to HWA after a two-year stint in the area of materials research.

Our geotechnical group worked on a variety of projects including street improvements, sewer and water lines, bridges, and seismic retrofits to name a few. One of our most unique and challenging projects was the design-build work for a new US embassy in Conakry, Guinea, located on the Atlantic coast of Africa. Working in Guinea makes one appreciate the drilling services we have

## Groundhog

available in Seattle! Our geoenvironmental group is busy on several projects including environmental site assessments for Sound Transit, post-closure monitoring at the Everett Landfill, and remediation at the Unocal Site in Edmonds.

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## Kleinfelder

With a strong year of growth and achievement behind us, Kleinfelder continues to build our Bellevue branch office in all our service areas, including our geotechnical engineering department. Our geotechnical team was recently augmented by the addition of **Marlea A. Haugen**, who brings more than twenty years of engineering and project management service to Kleinfelder and joins us as a senior geotechnical and materials engineer. In addition to Ms. Haugen, we have brought ten more new members to our team over the past year, including **Jerry Gelder** and **Jonathan Pink**.

Our unprecedented increase in personnel has been the result of nearly doubling our net revenue, far exceeding our expected profit goals for the year. Our growth has opened up exciting opportunities for us, including the expansion of our laboratory capabilities, which was recently certified by WABO and the U.S. Army Corps of Engineers.

Corporate-wide, Kleinfelder continues to experience national growth, with new branch offices in nearly every state west of the Mississippi – over 65 operations total. Kleinfelder was ranked 60th in Engineering News Records list of “The Top 500 Design Firms,” up from last year’s ranking of 63rd, due to our diversification of services and our major move into design-build arenas.

Yet with all this growth, Kleinfelder remains committed to providing quality, personal service to our clients as well as a positive work environment for our employees. As a result of holding to our founding philosophies and providing continuous opportunities for advancement, we have been ranked as sixth in the nation as one of the “Best Firms to Work For” by Civil Engineering News.

The past year has brought us many successful projects and an excited and growing team. With

**January 2003**

the new year before us, Kleinfelder is ready for continued growth, geographically, professionally, and personally, in 2003.

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## Landau Associates

At Landau Associates, we continued a moderate pace of growth in 2002 despite the waning economy. We also celebrated our 20<sup>th</sup> Anniversary, introduced a fresher look with an updated logo and “brand,” and welcomed staff additions in three of our offices. Staff geotechnical engineer, **Ben Hoffman** joined our Portland office along with **Leslie Driver-Rowe**, staff geologist. In Edmonds, we added staff geotechnical engineer, **James Wilson**, and geotechnical laboratory technician, **Todd McKenney**. In Spokane, we welcomed **Seneca Cluck** who expands our asbestos services capabilities company-wide. Our environmental permitting and natural resources group continued to grow in diversity with the addition of **Diane Brewster**, senior wetlands biologist. As co-vice chairs of the ASCE Seattle Section Geotechnical Group, **Dave Fischer** and **Steve Wright** had a very busy spring coordinating the 2002 Spring Seminar. Dave continues on as this year’s chair of the Geotechnical Group.

Looking ahead at our client’s upcoming projects in 2003, the year promises to be a busy one again for Landau Associates. Work will continue on the Cedar Moraine Safety Study, which was a significant project award in 2002 with Seattle Public Utilities that will be supported by **Paul Ford**, **Reid Carscadden**, **Deb Ladd**, and **Sean Cool**. We are also on the CDM team for the King County Brightwater Conveyance System geotechnical engineering services contract, which will keep many of our geotechnical engineering personnel busy including **Dennis Stettler**, **Ed Heavey**, and **Brian Christianson**. A new industrial park design for a Boeing Realty project in Portland will keep **Dave Thielen** and **Julio Vela** active, in addition to several projects for Home Depot and PacifiCorp. With the disappointing failure of R-51 at the polls, our success with WSDOT for on-call geotechnical engineering services remains an elusive backlog! Continued

**Groundhog**

work with local governments, ports, developers, and our many A/E alliances will keep our staff occupied into 2004 and beyond.

**Nelson Geotechnical Associates**

Nelson Geotechnical Associates has added staff geologist **Alison Jackson**. **Thor Christensen** and **Mike Rundquist** have been promoted to Project Engineers, and **Bala Dodoye-Alali** has been promoted to Project Geologist. Thor Christensen has earned his Washington State PE license.

Nelson Geotechnical Associates continues to provide services for several municipalities, including various school districts throughout western and central Washington. We continue to provide services for several of the projects at the Issaquah Highlands development. Our professional staff looks forward to another successful year.

**Northwest Cone Exploration**

Northwest Cone Exploration, Inc. continues to serve the Northwest with *in situ* testing. **Keith Brown**, flew back to Washington D.C. the first week in January to check out the newest generation of CPT equipment. As a result of that trip, NCE is upgrading to a 24 bit digital cone and a Windows XP data acquisition system. This will provide better resolution than our current 12 bit analog system. We will retain the analog system as a backup.

The new data acquisition system will also be able to support the *Vision CPT* which will be able to take video images of the soil as the cone is pushed. The *Vision CPT* will be able to define layers as thin as 5 mm! This could also be helpful for defining peat and sand/silty sand layers. A neat site to look at is: <http://www-personal.engin.umich.edu/~romanh/viscpt/viscpt.htm>. This site shows a video clip of liquefaction caused by pushing the CPT in very loose sands.

Thanks to the Nisqually "shaker," this past year has seen an increase in the number of consultants using the CPT to evaluate liquefaction potential at sites. Most use the NCEER

methodology as published in the JG&GE, April 2001 and have adapted spreadsheets which incorporate the CPT data directly. We have also seen an increase in ground improvement with the CPT being the best method for pre & post evaluation.

**PacRim Geotechnical**

PacRim Geotechnical Inc. continues to provide geotechnical services on a variety of projects located throughout the Pacific Northwest. During the past year these projects have included: waterfront development at the Port of Seattle and Port of Vancouver; airport projects at Omak, Olympia, King County, and SeaTac; fish hatchery and ladder Projects for the Yakima Indian Nation, and infrastructure projects for Sound Transit, City of Seattle, City of Portland, and King County. PacRim is looking forward working on the East Side CSO Tunnel Project in Portland where we'll be completing rotosonic borings along the 5-mile-long tunnel alignment.

New team members at PacRim include **Jason Qiu**, who has a strong background in mine waste disposal, rock mechanics, numerical modeling, mine design, and laboratory testing of soil/mine tailings and cementing materials. Jason came on board in July and immediately went to work estimating lateral pile capacities for driven pile foundations at Terminal 18 on Harbor Island. Principal and Owner of PacRim, **Bans Chabra**, made it out to the field to oversee a vibration monitoring study for the City of Everett Pipeline Nos. 2 and 3 replacement across the Snohomish River Valley. **Kevin Lamb** completed the investigation for the City of Seattle Joint Training Facility, located near White Center, where Fire Department and SPU personnel will practice and refine their skills. **Andre Mare** continues to manage our Portland office and is currently completing an investigation for stabilizing a 20-foot-high seawall on the Columbia River for the Port of Vancouver. **Viola Lai** is providing geotechnical services to King County on the Henderson CSO Project, which is now under construction. **Alicia Musselman** continues to manage our AASHTO-certified Soils laboratory

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and is the Secretary for the Northwest Geologic Society. She's responsible for membership enrollment; contact her to find out the benefits of joining NWGS. **Robbie Hilal** and **Chris Nowak** continue to provide geotechnical support during subsurface investigations and construction activities. Chris Nowak obtained his Geologist License and had an exciting time traversing and performing geologic mapping inside a 6-foot-diameter fish ladder tunnel in Eastern Washington.

## PanGEO

PanGEO celebrated its third anniversary with a busy and productive 2002. As we begin the new year, we are excited to announce the addition of **Curtis Mathis** to the PanGEO family. Curtis spent the last couple years in Denver, where he was on the GEI staff working on design of dams, and at the same time completing his Master degree in geotechnical engineering from the University of Colorado at Boulder. Curtis also spent several years managing a Fedex station in Tacoma with a staff of 85 people. Look for Curtis to be making great strides in 2003 and beyond.

PanGEO continues to provide geotechnical and earthquake engineering support to a wide variety of interesting projects that are technically challenging. Some of our on-going and recent projects include the seismic evaluation of several elevated water-storage tanks, a seismic safety review for eight in-town open reservoirs, FLAC modeling of the seismic response of a railroad tunnel (Metrolink Tunnel 26), foundation evaluations for several libraries in Seattle including the new Central and Ballard Libraries, foundation evaluations for several bridges and river crossings in Washington, geological reconnaissance to support preparation of an EIS for a forest road in Nevada (where our senior geologist **Stephen Evans** had to brave the winter storms and trek through knee-deep snow to get the job done!), and foundation evaluation and design recommendations for the reconstruction of SE 8<sup>th</sup> Street in Bellevue, where we devised a geofoam roadway section to limit the settlement of 50 feet of organic soils. We also continue to provide construction support to the Port of Seattle to

replace an 80-year-old bulkhead and relieving platform at Fishermen's Terminal.

## Shannon and Wilson

The year 2002 – Shannon & Wilson's 48th in providing consulting services from its Seattle office – was one of high profile projects and award recognition offset by a troubled economy and the dismaying defeat of R-51 by skeptical voters in November.

Staff numbers remained fairly consistent in the Seattle office, as Portland firm **Fujitani Hilts** re-joined the Shannon & Wilson family to serve as our Portland branch. Seattle Office Manager **Gerard Buechel**, and Environmental Services Manager **Dan Clayton** were named senior vice presidents in the company. Our Natural Resources Group Leader **Katie Walter**, and our Groundwater Services Group Leader **Richard Martin** were named associates, while **Stan Boyle** and **Will Hultman** were promoted to senior associates. **George Lightwood** was also named an associate.

Shannon & Wilson geotechnical and environmental footprints can be found on projects completed this year including the Seahawks Stadium, the new Seattle Justice Center, West Galer Street Flyover, and Fisher Pavilion. Shortly after the Alaskan earthquake near Denali National Park one of our seismic experts, **Bill Perkins**, flew to Fairbanks to join our Alaska engineers in reconnaissance of earthquake-related ground failures and damages.

Work continues with PB on the Alaskan Way Viaduct and Seawall, with KCM at the Marysville Wastewater Treatment Plant, on the Snohomish County campus with NBBJ, and on the team for the new Tacoma Narrows Bridge. We are providing environmental on-call services for Verizon, and were just awarded a contract with Sound Transit for hazardous building materials surveys.

We received recognition for a couple of projects exemplary of our specialized expertise: the environmentally sensitive Oyster Creek Inn Landslide Repair was recognized by both ASCE and AGC, and our Probabilistic Seismic Hazard Analyses for the Washington State Legislative

**Groundhog**

Building was recently honored with a Gold Award by ACEC-Washington.

Co-sponsored by the UW's Civil Engineering Department, this year's Stanley D. Wilson Memorial Lecture attracted a standing-room only crowd to the Center for Urban Horticulture to hear Dr. Edward Cording speak on "Tunneling Under Control" in November.

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**Slope Indicator**

Slope Indicator is now owned by Durham Geo Enterprises in Atlanta, Georgia. Durham Geo specializes in Materials Testing and Groundwater Remediation and Sampling products. As a Division of DGE, Slope Indicator and its staff will remain in the Northwest. The main office and production facility are located in the Harbor Pointe area, of Mukilteo and they are doing business under the name "Durham Geo / Slope Indicator."

**Ronda Benbrooks** has joined Slope Indicator as the Northwest Sales Manger. She can answer questions regarding Slope Indicator products and applications, as well as, the Durham Geo product line. Also, Slope Indicator will be scheduling an inclinometer training course here in the Northwest in 2003. If you are interested in getting more information you can email Ronda at [rbenbrooks@slope.com](mailto:rbenbrooks@slope.com) or call her directly at 425-493-6249.

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**The Riley Group**

The Riley Group, Inc. is a Pacific Northwest - based environmental and geotechnical engineering consulting firm founded in 1996. Currently the company consists of 10 engineers, geologists, and environmental scientists specializing in providing engineering solutions for simple to complex projects. Our projects include local and national retails, shopping centers, mixed-use multi-story condominiums, waterfront housing, municipalities, bridges, and road improvements. Our main clients include national retailers, banks, industries, developers, architects, churches, and municipal governments.

Recently completed projects include Planned Parenthood, Green Lake Condominiums, Issaquah

Creek Bridge Replacement, Royal West Shopping Center in Eugene, Oregon, and Allen Creek Shopping Center in Grants Pass, Oregon. Currently, we are working on three condominiums sites in Seattle area that will start construction in early 2003.

Recently, **Bill Kück**, joined us in July 2002 and brought us 20 years of consulting experience in the Pacific Northwest. The Riley Group, Inc. had a wonderful 2002, and 2003 looks very promising to us.

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**Terra Associates**

Terra Associates, Inc. celebrated their 18<sup>th</sup> anniversary on September 21, 2002. We continue to offer geotechnical and environmental engineering and consulting services to our clients in the northwestern United States and Alaska.

Terra would like to welcome back and congratulate **Josh Venters**. Josh took a leave from our firm in August 2001 to complete his Geological Engineering degree at The Colorado School of Mines. Josh has been welcomed back and promoted to the position of Geological Engineer. Terra would also like to congratulate **Bernard P Knoll II** for passing the PE exam in April 2002. Bernie was promoted to the position of Geotechnical Engineer upon receiving confirmation of a passing score.

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**WSDOT Geotechnical Group**

The Washington State Department of Transportation's (WSDOT) Geotechnical Branch is pleased to announce the addition of two new project engineers to its fold, expanding our group to 10 geotechnical engineers. **Bill Hegge** comes to us from GeoEngineers of Bellingham and has over 15 years of experience in consulting. **Mark Frye** is an agency transfer and has 5 years of engineering experience. Among the many projects they are working on, Bill is providing geotechnical design for the new Hood Canal Bridge while Mark is working on bridges and retaining walls for the SR 18 widening project that extends from Issaquah to Maple Valley.

## Groundhog

The Branch also continues its work on other large projects such as the SR 16/I-5 Interchange, the North Spokane Freeway, the Royal Brougham Interchange in downtown Seattle, and the Yakima River Bridge. In addition, several members of the Branch are active in NCHRP Committee work. **David Jenkins** is the Chair of NCHRP Project Panel on *Economical and Performance Optimization for Using Wider Range of Backfill Materials for Retaining Wall Structures*. **Bryan Dias** is a member of the NCHRP Project Panel on *LRFD Soil Nailing Design and Construction Specifications*.

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## Zipper Zeman Associates

Like most geotechnical and environmental consulting firms, Zipper Zeman Associates (ZZA) was cautiously optimistic about the workload for 2002. As it turned out, it was another year of growth for our four-year-old firm. **Tim Roberts** relocated from our Lynnwood headquarters to open a new branch office in Fife and **Eric Lim** relocated to our Seattle office. Our total staff size is up to 25 people including the additions of engineer **Ed Garcia** from Tucson, AZ and project administrator **Michelle Iaci**. (Michelle keeps us in the know as one of the Seattle Section's newsletter editors).

In 2003, **Al Zeman** will be limiting his consultant and management activities and moving to Arizona. Through the combined efforts of **John Zipper, Jim Thompson, Dave Williams, Sean Donnan, Tom Jones, Dave Baska, Curt Thompson, Fred Becker, Rob Ross, James Georgis**, and the remainder of the ZZA staff, we will be continuing the tradition of client and employee satisfaction that has been the hallmark of Al's career.

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## Positions Available

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CDM has the following immediate openings in its Bellevue, WA office:

### Senior Geotechnical Engineer

Responsibilities include project management, staff management and development, business development, marketing and client maintenance. The candidate must have broad experience in the analysis, design and construction of a wide variety of geotechnical systems. Eight to ten years' experience and BSCE required. MSCE preferred. Washington PE required, or ability to obtain. Must have demonstrated ability in client service and excellent communication skills. Marketing experience desired. Some travel required.

### Geotechnical Engineer

Responsibilities include field exploration, in situ testing, construction quality assurance, laboratory testing and, analysis and design of a wide variety of geotechnical systems. Two years' experience and excellent writing skills required. BSCE required; MSCE preferred. Some travel required.

Please send resume and cover letter to:

**Michaela Carroll**

carrollmm@cdm.com

Fax: (617) 452-8791

EOE/AA

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### Geotechnical Engineer

Landau Associates, Inc., a leading regional environmental, natural resource, and geotechnical engineering consulting company, has an IMMEDIATE opening for a project-level geotechnical engineer to join our Tacoma office.

Successful candidate will possess at least a B.S. (required) or M.S. (preferred) in Civil/Geotechnical engineering or directly related field and a minimum of 4-5 years experience with geotechnical engineering projects. Professional registration strongly desired. The candidate should also possess a track record which demonstrates project management for single

**Groundhog**

discipline projects or principal investigator for project tasks, successful management and completion of technical projects within established budget and schedules, strong verbal and written communication skills, and an ability to work independently and within a team. Environmental engineering experience is a plus. We offer a competitive compensation and benefits package and a casual workplace. Please send a resume and cover letter ATTN: (TAC/PGE/SGH 0103) to Landau Associates,

[HumanResources@landauinc.com](mailto:HumanResources@landauinc.com)

Fax: 425-778-6409. EEO/M-F N/S Environment

Landau Associates is also interested in qualified geotechnical engineers at both entry and more senior levels in both their Tacoma and Edmonds Offices. Visit our website at [www.landauinc.com](http://www.landauinc.com) or send an email as noted above for more information.

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**Geopier soil reinforcement** is being widely used in the Northwest and the US as an alternate to deep pile foundations. The Geopier approach is also being used in transportation applications including support of MSE walls and embankments where Geopier reinforced soils reduce settlement and enhance global stability.

James Johnson, a geotechnical engineer with **Geopier Foundation Company Northwest** will be pleased to provide technical information, assist in the evaluation of projects where the Geopier approach may be feasible, and will conduct a lunch presentation in your office upon request.



**GEOPIER® Foundation Company Northwest**

(425) 646-2995  
**JAMES W. JOHNSON, P.E.** (425) 646-3118 FAX  
 E-MAIL: jamesj@geopier.com  
 40 LAKE BELLEVUE, SUITE 100  
 BELLEVUE, WASHINGTON 98005

*Geo-Tech  
Explorations, Inc.*

Dale Abernathy  
Washington Operations Manager

**Kent, Washington**  
 7405 S. 212th, #121 Kent, WA 98032 / (425) 235-4170  
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The **Groundhog** is the official publication of the **ASCE Seattle Section Geotechnical Group**.

The next issue of the **Groundhog** is scheduled for January 2004.

Articles are solicited from the Seattle Section membership as well as the general engineering community. The Society and the Section are not responsible for any statement made or the opinions expressed in this publication. This issue was prepared and edited by Doug Lindquist.

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c/o Landau Associates, Inc.  
130 2<sup>nd</sup> Avenue South  
Edmonds, WA 98020  
425.778.0907  
dpischer@landauinc.com

## **ADDENDUM TO THE JANUARY 2003 ISSUE OF THE GROUNDHOG NEWSLETTER ASCE SEATTLE SECTION GEOTECHNICAL GROUP**

A small group of geotechnical firms were not timely in preparing their submittals to the editor of the January 2003 issue of the Groundhog newsletter. Information that was subsequently submitted by these area firms in late February 2003 is provided in this addendum.

### **AMEC**

Two professionals have joined the Kirkland office of the international engineering firm AMEC, bolstering the company's materials testing and marketing expertise. Additionally, geologist **Keith Schrembs**, a 13-year employee, has been named manager of the Tacoma office. The newcomers are **Tyler McCormick**, new materials testing manager for Washington operations, and **Leslie Donley**, marketing coordinator.

Schrembs joined AMEC after receiving a bachelor's degree in Geology from Whitman College in Walla Walla in 1989, and has been involved in projects that include commercial structures, roads, bridges, pipelines, municipal waste disposal projects, and geologic hazards. He is a registered professional geologist and a member of the Association of Engineering Geologists and the American Institute of Professional Geologists.

McCormick recently relocated from Farmington, New Mexico where he had managed AMEC's materials testing since 1998. McCormick has worked for AMEC since 1989 and is experienced in laboratory and field testing of soils, concrete, and asphalt and with field logging of test holes and monitoring well installations for geotechnical and environmental projects. He has a Civil Engineering Technology Diploma from Saskatchewan Institute of Applied Science and Technology.

Donley's experience includes the past 7 years in Washington as marketing coordinator for architectural and engineering firms. She has bachelors degrees from California State University in Fresno and a public relations program certificate from the University of Washington.

### **Associated Earth Sciences, Inc.**

Associated Earth Sciences, Inc. (AESI) has seen many organization changes over the past six months. **Gary Flowers** has been appointed President of AESI. Mr. Flowers has been providing geological consulting services throughout the Northwest for the past 30 years. Mr. Flowers will also manage the daily operations of AESI's environmental department.

**Ronald Parker** has been appointed Chief Operating Officer and will manage the daily activities of the firm. Mr. Parker has also been the recipient of the Alumni Achievement Award from the Geosciences Department of Western Michigan University.

**Kurt Merriman** has been promoted to principal geotechnical engineer. Mr. Merriman's experience covers both public and private sector projects, including education, municipal, commercial, health care, and housing developments. Mr. Merriman's educational project experience includes over 150 new and modernization school projects for 35 school districts in King, Snohomish, Pierce, and Thurston Counties.

AESI has 55 employees and provides consulting services in the earth sciences, with departments in geotechnical engineering, geology, hydrogeology, biology and environmental sciences.

### **CIVILTECH CORPORATION**

2002 was a good year for CivilTech. We completed several interesting projects, and started several new ones that will keep us busy in 2003 and beyond. Our completed geotechnical projects included Pacific and Kirkland pump stations for King County, I-5/Ash Way and SR522/NE 195th HOV access projects for Sound Transit, Galer Street Slide Repair for SeaTran, 148th Street Improvements for City of Bellevue, SR5/2nd Street Bridge Replacement for WSDOT, Harris Creek and Cedar Mountain bridges for King County, and SeaTac Central Terminal Rehabilitation for the Port of Seattle. We also designed many shoring systems including one for the football field-size North Creek wastewater facility of King County.

New geotechnical projects for 2003 include the Brightwater Conveyance System project for King County Wastewater Division, the D755 light rail segment for Sound Transit, 1st NE Transfer Station for King County Solid Waste Division, and Landsburg Fish Passage Facilities construction phase for the Seattle Water Department.

CivilTech continues to provide geotechnical and construction services as well as geotechnical software. Our geotechnical software section did very well in 2002, both in off-the-shelf software and in custom programming. We recently developed two database programs for CDM's Brightwater team, and a dam operation program for the US Army Corps of Engineers in California. Our AllPile software now handles vertical, lateral (COM624), and group pile analysis, and our updated LiquefyPro program incorporates the recommendation procedures for SP117 Implementation.

### **GROUND SUPPORT**

Ground Support has been providing its usual suite of design services in the past year, including soil nail walls, anchored walls (soldier pile, secant pile, soil-mixed wall, jet-grouted), reticulated micropile walls, cantilevered walls, internally-braced and rakered walls, various proprietary wall systems, reinforced fill walls and slopes, and specialty foundation systems (pinpiles, micropiles). Most of the projects consisted of complete design packages, construction drawing sets, and specifications.

Within the last three months, we have executed approximately 20 projects, including:

- A 40,000 ft<sup>2</sup> permanent anchored retaining wall for the Alaska DOT.
- Several temporary soil nail walls in the 15,000 to 30,000 ft<sup>2</sup> range in northern California and Washington.
- Several temporary and permanent micropile projects in Washington.
- Temporary anchored soldier pile walls in the Seattle area, including underpinning of adjacent buildings.
- Several internally braced soldier pile and secant pile ring wall structures for temporary shoring in the Seattle area.

### **KRAZAN & ASSOCIATES**

Krazan & Associates continues to provide a wide range of site development services across the

Western United States. Our four Northwest offices, which serve Western Washington and Oregon, have remained quite busy during the past year. Despite the downturn in the local economy, we have continued to see significant growth in the demand for our geotechnical, environmental, and special inspection services.

In order to keep up with the demand for our services, we have bolstered our engineering staff in the past year. **Wesley Johnson**, staff engineer in our Poulsbo office, just received notification of a passing score on his Principals of Practice exam. Congratulations Wes! With the addition of **Todd Parkington** last March, we currently have five registered professional engineers in the State of Washington. Additionally, our staff geologists have been busy getting registered and we now have five Washington registered geologists on board.

### MILBOR-PITA & ASSOCIATES

Milbor-Pita & Associates, Inc. celebrated its 8<sup>th</sup> year in business by moving to a Woodinville address. We added **Carol Ravano** as a staff engineer and **Kelly Hibler** as bookkeeper & office manager. Our staff continues to provide our clients with geotechnical and tunnel engineering services throughout the Western USA and sometimes beyond. Our projects range from traditional geotechnical studies, to design drawings and specifications for A/Es, to the leading of design/construct teams for geotechnically-oriented projects. The firm currently has projects in Washington, Utah, New Mexico, Arizona, and California.

Both **Frank Pita** & **Gerry Millar** prepared and presented technical papers during 2002 at conferences and for smaller group meetings. The subjects were slope stability/maintenance and tunnel rehabilitation, respectively.

The prospects for 2003 look good as long as our traditional clients are successful in their work. As a result, we are cautiously optimistic about the future.

### URS CORPORATION

URS has now fully integrated partner firms Dames & Moore and Woodward Clyde Consultants into the organization, and has more recently acquired EG&G to expand its federal services activities. **Dr. Kris Fabian**, with help from **Craig Christian** and **Dolan McMillan**, has been expanding our sediment management services, with dredging projects in Ontario for DOW Chemical and in Washington associated with removal of dams on the Elwha River. **Cecil Urlich** has been coordinating our Program Management support to King County Metro for the Brightwater Project and is consulting to Red Dog Mine in Alaska regarding a tailings dam raise. **Dr. Charles Vita** has played a key role in assisting the EPA with cleanup of contaminated mine tailings in the Coeur D'Alene River Basin in Idaho, providing probabilistic analyses and design tools. **Rik Langendoen** is serving in a similar role representing the owner for handling of tailings at the Holden Mine near Chelan. **Dan Hawk** and **Greg Landau** are expanding their portfolio of cut-off walls for controlling contamination migration with two site remediation projects in the south Seattle industrial district, while **Koorus Tahghighi** has been coordinating the closure and capping of a paper company site in Oregon. **Calum Buchan** together with **Balin Strickler** and **Colin Turnbull** have been providing assistance to Skagit County in evaluating and retaining slide-affected roadways, and in expanding and upgrading the Phillips 66 and Shell refineries to the north. **Dr. C.B. Crouse** together with **Juan Carlos Ramirez** are continuously working on LNG terminal and offshore projects around the world. **Dick Clark** and **Zanna Satterwhite** have been monitoring construction work during expansion of the Fred Hutchinson

Cancer Research Center campus, with dewatering assistance from **Roy Elliott** and **Vance Atkins**. **Dr. Sri Rajah** has been addressing plant upgrades at Kimberly Clark in Everett and has also been busy designing retaining walls for landslide control. **Dr. Robert Burk** is providing senior oversight for geologic/geotechnical aspects of the new Elwha wastewater treatment plants. **Bob Wallace** and his team including **Ian Sutton**, **Arturo Ortiz** and **Chris Castro** have been working on landfill expansions and/or closures for King County and the County of Maui. **Joe Lamont** enters his 53<sup>rd</sup> year of geotechnical service, specializing in litigation support in semi-retirement and serving as the company local historian. URS continues its commitment to community service as **Dr. Marty McCabe** provides pro-bono services to low income housing developer Common Ground and others for a variety of projects intended to serve the homeless and low income population of the region.