

# Groundhog



## From the Chair

I'm happy to welcome you back to the **Groundhog**. In this issue, we'll be bringing you news from the local geotechnical community as well as information on the ASCE Seattle Section Geotechnical Group, including upcoming dinner meetings and the April 3, 2004 Spring Seminar.

I want to take this opportunity to recognize the outstanding officer team this year. **Doug Lindquist** (Hart Crowser) returned from last year and has taken over the reins of Vice-Chair. After helping out on the Spring Seminar last year, **Mark Rohrbach** (GeoEngineers) decided we were an okay bunch and volunteered for the Secretary position. We also added two new officer positions this year. I want to thank **Mike Harney** (University of Washington) and **John Bickford** (DBM Contractors) for volunteering for the Program Director and Liaison and Membership positions, respectively.

Since June of last year, the officer team has been focusing on improving the organization. We have improved our documentation by writing descriptions of officer positions and developing Spring Seminar planning tools for the first time. These documents will ensure continuity in future years. We recognize that the Geotechnical Group is your organization. Therefore, we started out this year polling many of you at the September Dinner Meeting to get your input on the short- and long-term goals for the organization. You gave us great ideas for our

goals and provided feedback on existing programs. With that information, we are focusing on implementing more programs for you in the coming year and developing multi-year programs.

Fortunately, the Geotechnical Group is in good financial standing, but without a multi-year plan, it has been difficult to develop long-range programs. To help develop this plan, we are tapping into the institutional knowledge and passion of the **Past-Chairs**. Last month, 13 of the 23 Past-Chairs from as far back as 1975 met for an evening of intense discussions to help formulate mission and vision statements for the organization. It was an interesting and thought provoking evening, and I want to thank everyone who participated. We're in the process of writing these statements and look forward to rolling them out to you this spring.

Besides all these "serious" things, the officers have been able to design and order gifts for our dinner meeting and spring seminar speakers. **Mike Harney** has also led the effort to get our very own Geotechnical Group logo (see above).

In addition to our usual excellent dinner meetings this past fall, we were excited to be co-sponsors of a USGS Workshop on Current Earthquake Hazard Studies in Puget Sound in October. As part of the workshop, USGS invited the group to make a presentation on issues where USGS capabilities may be useful in solving local problems. Over 100 people attended the half-day workshop.

With almost 400 members and many strong programs in place and in development, I believe that the Geotechnical Group has much to offer all of us. I encourage you to get involved whether it's by attending current programs or by planning the future of your organization.

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## NEWS AND COMMENT

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### New Groundhog Sections

In response to comments made by many of you during the polling conducted during the September 2003 dinner meeting, two new sections have been added to the **Groundhog**. For information regarding upcoming dinner meetings, please refer to the “**Upcoming Events**” section; and for information on currently proposed code revisions, new landslide mapping resources, and information on other professional organizations please refer to the “**Geotechnical Updates**” section.

### Planning Committee Meetings

Geotechnical Group planning meetings are typically scheduled the third Wednesday of each month (September through June). These meetings are used to improve existing programs, develop new programs, coordinate community outreach, and to propose topics for consideration by the board. Some of the topics addressed at this year’s planning committee meetings include: King County DDES Preferred Consultant Program, Geotechnical Specialty for the Washington P.E., and a potential research project involving geotechnical aspects of LRFD design.

We encourage all Seattle area geotechnical firms/agencies to have a representative at each monthly planning meeting. The planning committee is looking for your help in selecting topics of interest and identifying potential speakers for the upcoming 2004-2005 year.

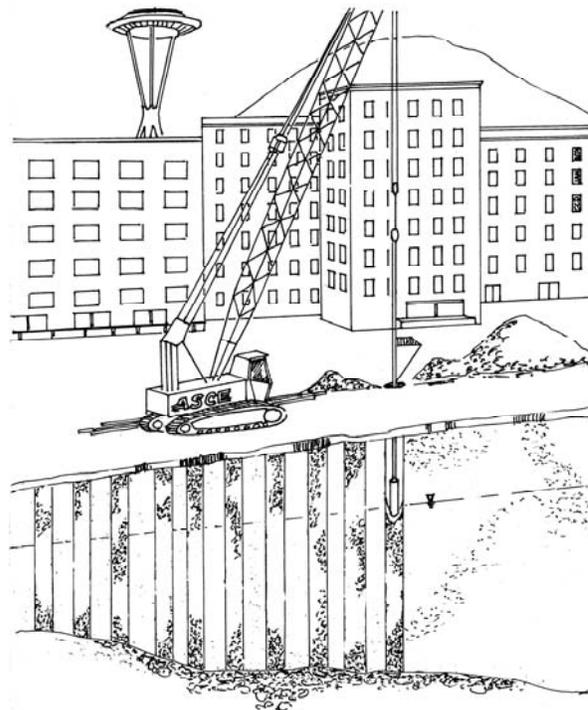
Please contact Mark Rohrbach or one of the other officers if you have any suggestions, would like to participate, or if you would like to attend a planning committee meeting. Lunch is provided at planning committee meetings.

### ASCE Membership Information

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 will receive a free Geo-Spectra publication. The Geo-Institute is a full-service, discipline-oriented, and semi-autonomous institute within ASCE, it

strives to be the premier organization for a wide range of geo-professionals. For more information on how to become an ASCE member, please refer to our website at: [www.asce.org/membership](http://www.asce.org/membership).

### Seattle’s 21<sup>st</sup> Annual Spring Seminar



#### “ADVANCES IN GROUND IMPROVEMENT”

April 3, 2004

The ASCE Seattle Section Geotechnical Group will hold its 21<sup>st</sup> Annual Spring Seminar on the topic of “**Advances in Ground Improvement**” on **Saturday, April 3, 2004** at the University of Washington in the HUB Auditorium. The seminar will bring together some of the top professionals in the field of ground improvement with general and project specific presentations.

The morning session will begin with presentations by **George Burke** of Hayward Baker and **Donald Bruce** of Geosystems, L.P., who will provide an introduction to the various techniques within the field of ground improvement. After a morning break, **Steve Bartlett** of the University of Utah and **Jim Lambrechts** of Haley Aldridge will speak on

ground improvement on the Utah I-15 project and the Boston "Big Dig," respectively. **Red Robinson** of Shannon & Wilson will follow with a presentation on ground improvement in the Pacific Northwest. Afternoon speakers include **Jim Mitchell** of Virginia Tech and **Nick Sitar** of the University of California at Berkeley presenting on post-liquefaction remediation of earthquake damaged sites and the seismic response of mechanically stabilized slopes and embankments, respectively. The final session will include local presentations by **Dan Mageau** of GeoEngineers and **Erik Andersen** and **Ralph Boirum** of HWA GeoSciences followed by a panel discussion moderated by **Tom Armour** of DBM.

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 the seminar chair, Doug Lindquist of Hart Crowser, by email [doug.lindquist@hartcrowser.com](mailto:doug.lindquist@hartcrowser.com) or phone 206.324.9530 for details on how you can participate in this year's spring seminar. Registration information is available at <http://geotech.seattleasce.org> by clicking on the "Geotechnical Group" link.

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### Applications Are Sought For ASCE 2004 Outstanding Project Awards

It is time to start thinking about what projects you might want to submit for Seattle Section's Outstanding Project Awards. Applications and rules for the "**2004 Outstanding Project Awards**" program will be available soon on the Section's webpage, which is located at: <http://www.seattleasce.org/>. Awards will be given in the following categories: Geotechnical, Transportation, Water Resources, Ports & Waterways, Structures, Site Development, and Small Project.

Volunteers are also needed to help judge the submittals in these different categories.

The application process is simple and straightforward. The submittal **deadline** is **February 28h**, 2004. Project awards and recognition will be at the June 2004 meeting. The small project category is for any project with a construction cost under \$1,500,000. Projects constructed in 2003, and projects that are almost complete are eligible. Project submittals are welcome from governments, clients and consultants. For more information contact Ray Walton, phone: 425.646.-8806, email: [RWalton@WESTConsultants.com](mailto:RWalton@WESTConsultants.com).

### Update on LRDF Research Project

The Geotechnical Group has pledged \$2,500 to assist in the funding of a graduate research project focusing on the geotechnical aspects of LRDF design. At the time the Geotechnical Group made this pledge, it was assumed that other professional organizations and private groups would assist in the funding of the research project. The University of Washington has indicated that the current pledge amount is not sufficient to properly fund a project as complex as this project is likely to become. Bob Holtz, professor at the University of Washington, and the ASCE Geotechnical Group officers have elected to delay the project until sufficient funding can be established. If you would like to help move this research forward or desire more information about this project, please contact one of the Geotechnical Group officers.

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### ASCE Seattle Section and Geotechnical Group Website

The Geotechnical Group continues to improve the website it shares with ASCE Seattle Section. The Seattle Section website is located at [www.seattleasce.org](http://www.seattleasce.org) and the Geotechnical Group web site can be found by clicking the "Geotechnical Group" link located under the "Committee" heading on the left side of the page.

Our goal is to keep the website updated with a current list of activities, current and past issues of the **Groundhog**, and the planning committee meeting minutes. 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 Mark Rohrbach at [mrohrbach@geoengineers.com](mailto:mrohrbach@geoengineers.com).

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### The Groundhog

The **Groundhog** is the Geotechnical Group's official newsletter. The 2004 **Groundhog** is used to inform the membership of past and planned activities, to provide information about other organizations that geotechnical engineers may find useful, and to provide member organizations the opportunity to inform others in the geotechnical community of new developments within the membership organizations. For more information about the

**Groundhog** please visit our web site at <http://geotech.seattleasce.org>, then click "Geotechnical Group." Past editions of the **Groundhog** are at the bottom of the Geotechnical Group page.

If you are interesting in announcing news in future issues of the **Groundhog** please contact Mark Rohrbach (contact information is on pg. 1).

### Past-Chairs of Geotechnical Group Meet

On December 10, 2003, twelve Past-Chairs of the Geotechnical Group plus the current Chair and Vice-Chair met at CDM's Bellevue office to discuss the future of the Group (see photo below). The first Chair of the Group, Frank Pita (1976-1978) was in attendance, resulting in over 27 years of Group participation being represented. Keith Ward, the current Chair, called the meeting to tap the knowledge, historical perspective, and enthusiasm of the

Past-Chairs to solicit their assistance in establishing Mission and Vision Statements for the Group. Keith prepared thoughtful worksheets and moderated the program to keep discussions on track (there was a tendency for discussions to wander). Other items discussed included the type and number of dinner meetings; use of Group funds; increasing the diversity of Group activities; donations and scholarships; and increasing public awareness of Geotechnical and Civil Engineers. Mission and Vision Statements may be presented to the Group for approval in the spring or fall of 2004.

All of the participants expressed their general amazement at how the Group has progressed from its humble and shoestring budget beginnings in 1976 to the large, active, and financially sound organization that it is today. Future meetings of the Past-Chairs are planned, but dates have not been set.



#### Past-Chairs of ASCE Seattle Section Geotechnical Group

From left to right: (front row) Pete Douglass ('78), Stan Boyle ('98), Keith Cross ('86), Bob Holtz ('90), John Newby ('83); (back row) Jim Thompson ('89), Bob Metcalfe ('01), Don Anderson ('91), Bo McFadden ('97), Dean White ('93), Keith Ward ('03), Doug Lindquist ('04). Also in attendance, but not shown: Frank Pita ('76 and '77) and Matt Smith ('99). Dates are year during which 1-year term started.

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## UP COMING EVENTS

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### ASCE Seattle Section Geotechnical Group

- January 22, 2004:** Prof. Rich Finno – Northwestern University “Lessons Learned from Performance of Excavation Support Systems in Soft Clays” at the Rock Salt Steakhouse in Seattle.
- February 26, 2004:** Mr. Raymond Sandiford – Port Authority New York/New Jersey “World Trade Center Basement Stabilization, Restoration of PATH Subway Service, and Future Plans for Downtown Restoration” at the Bellevue Hilton.
- March 25, 2004:** Prof. Tim Stark – University of Illinois “Design Guidelines for Geofoam in Roadway Embankments” at the Bellevue Hilton.
- April 22, 2004:** *TENTATIVE* - Mr. Gerald Buechel – Shannon & Wilson “Tacoma Narrows Project” at the Rock Salt Steakhouse in Seattle.
- May 27, 2004:** Dr. John Christian – Consulting Engineer “39<sup>th</sup> (2003) Terzaghi Lecture: Geotechnical Engineering Reliability: How Well Do We Know What We Are Doing?” at the Bellevue Hilton.
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### Structural Engineers Association of Washington (SEAW)

- January 27, 2004:** “Fifth and Jackson Design (Including Geotech Issues)” at the College Club (505 Madison Street, Downtown Seattle), meeting runs from 5:30 p.m. to 9:00 p.m. This meeting also includes a Free IBC Mini-Seminar: “QA/QC Procedures” by John V. Loscheider from 5:15 p.m. to 5:45 p.m.
- February 24, 2004:** “Monorail Design” (a joint meeting with ACI) at the College Club, meeting runs from 5:30 p.m. to 9:00 p.m.
- March 23, 2004:** USGS presentation on “Seattle Fault” at the College Club, meeting runs from 5:30 p.m. to 9:00 p.m.
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### UW Geo-Institute Graduate Student Society (UW-GIGSS)

- February 15, 2004:** Gerard Buechel - Shannon & Wilson, “Tacoma Narrows Bridge Foundation”, at the University of Washington Seattle Campus.
- February 26, 2004:** Chris Robertson - Shannon & Wilson, “Rockfall Site at Boundary Dam”, at the University of Washington Seattle Campus
- March 4, 2004:** David Pischer - Landau Associates, “The Home Depot Development on the Rossman’s Landfill in Oregon City, Oregon”, at the University of Washington Seattle Campus.
- TBD** David Phelps – GeoEngineers, “Marshal Avenue Bridge Project (Fife, Washington)” at the University of Washington Seattle Campus.
- For more information about the UW-GIGSS meeting time and locations contact University of Washington Graduate Student Kathryn Petek by email at ([kpetek@u.washington.edu](mailto:kpetek@u.washington.edu)).
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### ASCE Seattle Section

- February 11, 2004:** Drew Gangnes - Magnusson Klemencic & Associates, “Sustainable Design”, at the Ballard Yankee Grill (joint meeting with the Kitsap Branch).
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### Association of Engineering Geologists (AEG)

- February 19, 2004:** Dr. Jeff Keaton - AMEC (Santa Ana, CA) “AEG/GSA Jahns Distinguished Lecture: *Engineering Geology Mapping in the Information Technology Age*”. Dr. Keaton will also be giving Jahns lectures on other topics at UW (February 19th afternoon) and Western Washington University (February 20th a.m.). These presentations were coordinated by the WA AEG section.
- March 20, 2004:** Unspecified URS personnel will present a talk on the large SR-20 Rock Avalanche near Newhalem, Whatcom County.
- April or May 2004:** Dave Simon, AEG president.
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### Consulting Engineers Council of Washington (CECW)

- February 4, 2004:** Karen Johnston - Johnston Training Group, “Business Practice Breakfast” at the Bellevue Hilton from 7 a.m. to 9 a.m.
- March 10, 2004** Michael Injardia - SMCP.E Seminar, “Selecting & Managing Effective Accounting System” from 8 a.m. to noon.

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## GEOTECHNICAL UPDATES

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In response to comments made during the polling, which occurred at the September 2003 dinner meeting, requests for organizational updates or “technical articles” were submitted to local professional organizations, local research institutions, and public agencies (including cities, counties, Washington State, and several federal organizations). The Geotechnical Group would like to thank those professionals who were able to take time from their schedules to submit the following articles.

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### Association of Engineering Geologists (AEG) Washington Section

The AEG Section got a slow start to 2003-04 due to a late summer transition of board members but is on track for 2004. The new board members are **Fred Becker** (Secretary), **Steve Palmer** of WA DNR Geology (Treasurer), **Darrell Sofield** of GeoEngineers (Vice Chair), and **Mark Molinari** of URS (Chair). In addition, **Bill Haneberg** is serving a one-year term as chair of the Geological Society of America (GSA) Engineering Geology Division. Anyone interested in joining or in more info on AEG or the WA section can contact Mark Molinari at [mark\\_molinari@urscorp.com](mailto:mark_molinari@urscorp.com), visit the section web site <http://www.aeg-wa.org>, or the National AEG web site [www.aeg.org](http://www.aeg.org).

The WA section was well represented at the AEG National Meeting in Vail, Colorado in September 2003 including members: **Julia Turney**, **Ken Neal**, **Dick Galster**, **Steve Evans**, and **Doug Anderson**. Talks were given by **Jeff Laird** of Shannon & Wilson on “*The Current State of Engineering Geology, Slope Stability and Harvest Unit Plans*” and **Mark Molinari** on “*The Future of Engineering Geology in the Pacific Northwest and Fundamental Skills Needed by Future Applied Geoscientists*”. Mark’s presentation was part of a symposium exploring the process of accrediting engineering geology and geological engineering Bachelor degree programs. **Dick Gates** and **Brendan Fisher** of Kleinfelder were instructors for a one-day short course titled “Applied Rock Slope Engineering” at the meeting.

More than 7,000 geologists attended the GSA National Meeting in Seattle in November 2003. Numerous section members attended and the following presented or were co-authors on oral talks or posters including: **Tom Badger**, **Chip Barnett**, **Robert Bogar**, **Bob Burk**, **John deLaChapelle**, **Steve Evans**, **Bill Haneberg**, **Jon Koloski**, **Bill Laprade**, **Richard McCain**, **Dave McCormack**, **Mark Molinari**, **Pat Pringle**, **Patricia Reed**, **Darrell Sofield**, **Don Tubbs**, **Kathy Troost**, **Tim Walsh**, and **Don West** (apologies to anyone missed). The abstracts for these presentations can be reviewed by searching by author at: <http://gsa.confex.com/gsa/2003AM/finalprogram/>.

Joint section meetings were held in 2003 with the Northwest Geological Society in November (Dr. David Montgomery, University of Washington (UW) titled “*Of Geology, Rivers and Salmon*”) and ASCE Geotechnical Group in December. The January 2004 section talk was by **Darrell Sofield** of GeoEngineers on “*Channel Migration History of the Puyallup, White and Carbon Rivers: A Story of River Destruction, Mitigation, and Modifications*”.

We are in the planning stages for a field trip in May or early June that will most likely focus on various areas of geologic hazards and engineering geology in Skagit and Whatcom counties. Let us know if you have a good candidate site, especially if you want to be the presenter at the stop!!!

**By Mark Molinari**

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### City of Seattle

Geotechnical engineers within the City’s various departments have been busy and continue to tackle challenging projects.

Seattle Department of Transportation (SDOT) has hired a geotechnical engineer, **Steve Hou**, to work on landslide mitigation programs for SDOT. With a risk assessment process, high-risk street segments were identified within landslide prone areas. Four geotechnical studies were performed this year on some of the high priority sites where streets are adversely impacted. SDOT is continuing working with other City departments to prioritize and find funding for potential landslide mitigation projects.

Most of SDOT’s landslide projects include retaining wall construction. SDOT has continued to invest in replacement of failing retaining walls. This year SDOT constructed four walls - three soldier pile walls and a

cylinder pile wall. The Alaskan Way Seawall (AWS) continues to be a concern to the City. Recent work completed as part of the Alaskan Way Viaduct/Alaskan Way Seawall EIS concluded that the AWS has many areas of severe deterioration. The City is working to repair settlement damage along the AWS following the Nisqually earthquake. Due to voids in the subgrade below the sidewalk behind the AWS, compaction grouting was selected for ground improvement to restore strength of in-situ soil behind the AWS.

Within the past year, the Seattle Public Utilities (SPU) Materials Lab Geotechnical Group has added **Nils Lindwall** to its roster. **Jeff Fowler** passed his Professional Engineering exam, and is now licensed as a P.E. in the State of Washington. The group's geologist and laboratory manager, **Taryn Sass**, was promoted to Civil Engineering Specialist Assistant III.

The Materials Lab Geotech Group continues to provide geotechnical services to several City departments including SDOT, Seattle Parks and Recreation, Seattle City Light and SPU. These services include geotechnical studies, design, and construction monitoring for various projects such as landslide remediation, utility improvements, bridges, and park improvements. The group has been very busy this past year and is looking forward to an even busier spring.

**By Nils Lindwall**

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## City of Tacoma

The City of Tacoma is currently updating their critical areas ordinance, which includes rules and regulations governing steep slopes, landslide hazard areas, erosion hazard areas, seismic hazard areas, mine hazard areas and aquifer recharge areas. Development of the new regulations requires a research of Best Available Science (BAS) for each type of critical area. The City's outdated code will be rewritten based on the outcome of the BAS research. New regulations will help property owners identify buildable areas and design the construction to take into account potential hazards. Geotechnical designers will also benefit from being able to work with regulations that are more consistent with current technologies.

This year City of Tacoma is also starting to scan historical geotechnical reports. It is expected that these reports should be available on the City's *govme.org* website late 2004. The

City will also continue to scan geotechnical reports as they are approved with new permits issued.

In 2003, the City of Tacoma rolled out its new Stormwater Management Manual. The erosion control provisions in the new manual are more stringent than in the former stormwater manual. With the new manual, an erosion control plan is required for projects adding more than 2,000 square feet of new impervious, or clearing/grading more than 7,000 square feet of land. The City developed a "Short Form" that can be used for sites with less than 5,000 square feet of new impervious and/or less than 1 acre of land-disturbing activity. Both the "Short Form" and "Long Form" are available on the City's *govme.org* website.

**By Susan Coffman**

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## Geologic Society of America (GSA)

### Mitigation Of Landslide Hazards Along Puget Sound Shorelines

Thousands of single-family, multi-family and/or vacation residences are located along the shorelines of Puget Sound in western Washington. Many of these residences are situated at the base of bluffs that are prone to landsliding as a result of the geologic history and geomorphic evolution of the Puget Lowland. Numerous such houses have been destroyed and in some cases occupants killed or injured. The risks of damage, injury and death are likely to increase as houses, which were originally built as summer cabins are increasingly occupied year-round. The risks also increase as the density of land use increases, and can further increase due to upland land use changes. Economic impact increases as the value of the properties at risk increases due to escalating real estate prices.

Simple avoidance of the landslide-prone shoreline areas is not practicable as the sole mitigation, particularly for existing developed sites. In most locations, one or more of four general approaches can be used to mitigate the landslide hazards: (1) The steep bluff source area can be modified to reduce the potential of landslide occurrence or the potential for damage from landslides. (2) Appropriate structures or other provisions can be made to detain or deflect landslide debris. (3) The at-risk buildings can be replaced, re-constructed, or retrofitted, with specific design measures employed to minimize damage to the structures and/or risks

to the occupants. (4) Use of the houses or other buildings can be restricted. All of these mitigation approaches have been used in the Puget Sound area, for more information please contact one of the authors.

By **Donald W. Tubbs, Jack K. Tuttle, and Jon W. Koloski**

## U.S. Geological Survey

A web-based, prototype system for forecasting precipitation-induced landslides that occur in the Seattle area has been developed by landslide specialists with the USGS Geologic Hazards Team in Golden, Colorado. Presently, the system provides near-real-time updates of current conditions in Seattle relative to a recently developed precipitation threshold for anticipating the occurrence of landslides ([http://landslides.usgs.gov/html\\_files/ofr-00-0469/seattlenet.html](http://landslides.usgs.gov/html_files/ofr-00-0469/seattlenet.html)). Updates are based on hourly precipitation data from the City of Seattle rain gauge network. The purpose of the system is to provide information for emergency response preparedness to the City of Seattle. The information is also available to the public as an indicator of current conditions in the Seattle area relative to those that commonly produce landslides.

Plans are underway to couple numerical precipitation forecasts provided by the University of Washington's Department of Atmospheric Sciences with precipitation measurements in order to forecast conditions relative to the threshold. Preliminary tests using UW's MM5 numerical forecasts (<http://www.atmos.washington.edu/mm5rt/>) have demonstrated the potential of the method. In the tests, conditions relative to the threshold were successfully forecasted for storms of October 20 and November 17-19, 2003.

A preliminary evaluation of the precipitation threshold based on compilation and analysis of three wet seasons of precipitation and landslide data was recently completed (USGS Open-file report 03-0463). Results of the evaluation were consistent with previous findings used to define the threshold. A rainfall history graph developed in the study proved useful for examining relationships between landslide occurrence, antecedent rainfall, rainfall intensity, and the precipitation threshold.

Compilation and analysis of landslide and precipitation data for the current (2003-2004) wet season is in progress as part of an ongoing evaluation of the threshold. Future plans include analyses to further estimate the probability of

landslide occurrence relative to the precipitation threshold, evaluation of recently developed thresholds based on rainfall intensity, and the development of a protocol for issuing landslide advisories.

Landslide specialists with the City of Seattle, consultants, and local residents have generously provided information on landslide occurrence that has been vital to the success of the study.

By **Alan Chleborad** (303.273.8563, [chleb@usgs.gov](mailto:chleb@usgs.gov)) and **Rex Baum** (303.273.8610, [baum@usgs.gov](mailto:baum@usgs.gov))

## King County

### Proposed Changes to Road Standards Regarding Flexible Pavement Design Principles and Procedures

King County Department of Transportation is currently in the process of updating the King County Roads Standards. The Standards were last updated in 1993.

To provide greater consistency when designing flexible pavement sections, the County is proposing changes that would modify the flexible pavement design requirements for Arterials and Commercial Access Streets. Currently, the Standards require that CBR or R-value tests be performed to determine the subgrade strength of the roadway for design purposes. The Standards also allow a variety of design methods to estimate the required pavement section.

The Standards would be revised to specify that flexible pavement sections be designed using a layered design analysis in accordance with the 1993 AASHTO Guide for Design of Pavement Structures. Design inputs, including pavement design life, design serviceability loss, and layer coefficients will be provided in the update.

In order to simplify the design process while reducing the cost of analysis, subgrade resilient modulus ( $M_r$ ) values would be able to be determined using default values based on soils classification. The County is proposing that R-Value and CBR test results no longer be accepted for estimating the subgrade  $M_r$ . In most cases, only grain-size analysis and Atterberg limits testing will be required to use the default value table provided in the revised Standards. Alternatively,  $M_r$  values for subgrade soils can be determined by performing Laboratory  $M_r$  tests or falling weight deflectometer tests performed in the field.

Language is included that requires the subgrade to be proof rolled prior to paving. It is estimated that the newly revised Standards will be implemented in the Fall of 2004. For additional information, contact **Kevin Kelsey** at kevin.kelsey@metrokc.gov.

By **Kevin Kelsey**

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## Washington State Department of Transportation (WSDOT) Geotechnical Division

The Geotechnical Division of the Washington State Department of Transportation (WSDOT) continues its work on many exciting and challenging projects of local and national interest.

Topics of local interest include our plans in 2004 to revise Division 6 of the *WSDOT Standard Specifications* to specifically address construction of retaining walls. Also, new guidelines on infiltration design will be published in WSDOT's Highway Runoff Manual, the first updates on infiltration design methodology to this manual since 1995. And finally, our office is assisting WSDOT's Urban Corridors Office and consultant team to produce a GIS database that will catalogue WSDOT borings along state corridors, starting with SR-405.

Several staff are currently involved in research projects of national interest. **David Sowers** is a panel member for National Cooperative Highway Research Program (NCHRP) 12-66, which will oversee the calibration of LRFD resistance factors for serviceability design of bridge foundation. **Dave Jenkins** and **Todd Mooney** recently completed a review of state DOT scrap tire usage in road building applications, at the request of the WA State Legislature. **Dave Jenkins** is also active on NCHRP 24-22, which is evaluating usage of low quality backfill for MSE walls and reinforced slopes. Bryan Dias, who will be on military leave for the first part of 2004, continues his activity with NCHRP 24-21, LRFD Soil Nailing Design and Construction Specifications. And Tony Allen continues his work on NCHRP 12-55, which will provide LRFD load and resistance factors for earth pressures on retaining walls, as well as rewriting Section 10 of the AASHTO LRFD Bridge Design Specifications.

Filling a recent vacancy, **Pete Palmerson** was added to the WSDOT family. Pete comes to us from CALTRANS, where he worked as a geotechnical engineer in their Roadway Group for two years. Pete recently received his

Masters Degree in Geotechnical Engineering from Sacramento State University.

And finally, of course, the Geotechnical Division continues to provide support on many exciting projects, a list that includes the new Hood Canal Bridge, the SR-18 widening project from Maple Valley to Issaquah-Hobart Road, the large rockfall project in near Newhalem on SR-20, and new ferry terminals on Shaw Island and San Juan Island.

By **Dave Sowers**

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## UNIVERSITY OF WASHINGTON GRADUATE STUDENT RESEARCH

**Tim Bailey** is near completion of his Master's thesis with Bob Holtz, researching the filtration compatibility of several geosynthetics and soils. He is now working with GeoEngineers in Redmond.

**Changho Choi**, a PhD student, has been working to characterize three-dimensional behavior of gravelly soils using true triaxial device for monotonic and dynamic loading conditions and to calibrate an advanced constitutive model capable of reproducing the behavior of gravelly soils under general loading conditions. He just defended his final PhD exam in December 2003 and is actively looking for a consulting job.

**Brian Collins**, a Master's student working with Professor Holtz, is investigating the influence of different geotextile separators on the long-term performance of pavement systems. In addition, back calculations are being performed in an attempt to correlate pavement and geotextile performance with FWD results.

**Michael Harney**, a Doctoral student working with Bob Holtz, is studying the plane strain deformation behavior of dense drained sands. Predictions of the plane strain deformations of a soil using a numerical model will be compared to multiaxial/plane strain laboratory tests. The calibrated model will then be used to make Class B and C predictions of instrumented engineering structures exhibiting plane strain behavior.

**Fu Jen Ho** is a Doctoral student and has been working at National Chiao-Tung University in Hsinchu, Taiwan for the past year and has just returned to the UW to complete his research. The work, supervised by Professors 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 that 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** completed his PhD under the direction of Steve Kramer. Allen looked at the problem of liquefaction and sand boil development from a probabilistic viewpoint. Mr. Jones is now an Assistant Professor at South Dakota State University.

**Roy Mayfield** will finish his Master's degree in January and start work on a PhD; both projects are with Steve Kramer. For his PhD, Roy will develop a performance-based approach to liquefaction hazard evaluation. The new approach will (a) integrate hazard over all return periods, rather than limiting consideration to one or two return periods as is commonly done now, and (b) implement an improved approach to ground motion characterization that will reduce the uncertainty and overconservatism that is often embedded in the commonly-used "simplified" method.

**Kathryn Petek**, a Doctoral student working with Bob Holtz and Pedro Arduino, is considering the effect of construction defects on drilled shaft capacity 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.

**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.

**Ben Upsall** is completing his study with Bob Holtz on the pullout capacity of Spiralnails, a new groutless soil nailing system. The study involves both field and laboratory investigations accompanied by a finite element analysis.

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## AREA FIRMS

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### CH2M HILL

The geotechnical staff at CH2M HILL wishes everyone a Happy New Year.

**Mike Reimbold** continues to serve as the staff's group leader in addition to his role as

design manager for several projects for our business groups, including King County's Hidden Lake Pump Station. He is also the geotechnical lead for Hanford Integrated Disposal Facility. **Kevan Sharp** continues as the staffing manager for Northwest Transportation Business Group. **Joan Stoupa** is managing work on King County's Brightwater Wastewater Treatment Plant and a Port of Tacoma project evaluating redevelopment options for the old Kaiser Smelter site, as well as developing new opportunities for existing and new clients for the energy and environmental sciences business group. Efforts for the Brightwater project included completion of the final EIS, which in cooperation from CDM and Shannon & Wilson, includes the results of dozens of borings up to 500 feet deep and is a major treatise on hydrogeology for southern Snohomish County.

Our geotechnical work focused on supporting our business groups for transportation, water, and environmental and energy sciences. **Karen Dawson**, **Joel Theodore**, and **Jen Schaeffer** provided engineering and design support for several challenging projects, including the Tacoma pipeline, the Hidden Lake Pumping Station, and the Hanford Integrated Disposal Facility. Karen also provided construction support for the SW Snohomish County Transfer Station and Cedar Water Treatment DBO projects. **King Sampaco** returned in January after an extended time in the Philippines, and has been providing technical support in Bellevue and in several of our national offices, including work on the Marquette Interchange Reconstruction project, a \$1 billion project to redesign 12 miles of urban freeways near downtown Milwaukee. We welcome **Sandra McGinnis**, who comes to us from our environmental sciences group; she is a registered engineering geologist and has been providing support for many of our projects. **Ken Green** has been busy with several projects including the City of Newcastle's Coal Creek Parkway widening and work for the City of Des Moines. **Mike Gibb** continued to serve as a resident engineer on large projects last year, including final work on the Rocky Reach Juvenile Fish Bypass project in Wenatchee. Over the last few years, our group provided the geotechnical engineering and construction support for the Rocky Reach project, which was just awarded ACEC's Platinum Award for Washington. **Don Anderson** and **Dick Coon** continue to serve as senior advisors and consultants on projects nationwide and mentors

to the local staff. During the last year, Dick was involved with tunnel projects in California, Utah, Minnesota, Ohio and Egypt .

In professional activities, **Don Anderson** is a member of one of the committees involved in the next update to the NEHRP seismic regulations, and he still serves on the Scientific Advisory Committee for the Pacific Earthquake Engineering Research (PEER) Center. **Kevan Sharp** served on the steering committee for the upcoming spring seminar. **Joel Theodore** passed his PE exam.

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## Condon-Johnson & Associates

Condon-Johnson & Associates (CJA) had a very productive 2003 and are looking forward to an even busier 2004. Major earth retention projects in 2003 included Oregon Health Sciences – Portland, OR; Microsoft – Redmond, WA; Immel Road – Colville, WA; 228<sup>th</sup> Ave – Sammamish, WA; and East Bound Passing Lane – Lewiston, ID. Slide repair projects were performed at Depot Bay, ID and Kelso, WA. Drilled shafts were installed at Galer Street – Seattle, WA, Forks, WA, and Grants Pass, OR. In addition, we completed Missile Silos – Phase I – Ft, Greeley, AK.

During 2003, we welcomed **Dominic Parmantier** to Condon-Johnson in the position of Geotechnical Manager. While Dominic's responsibilities are for the four CJA districts of Seattle, Bay Area, Los Angeles and San Diego, his office is in Seattle. **Andy Gano** became General Superintendent for the Seattle Office of CJA.

In addition to its product line of Drilled Shafts, Anchored Earth Retention, Soil Nailing, Deep Mixing, and General Civil Engineering, CJA introduced two new lines in 2003. These were Stone Columns and Jet Grouting.

In 2004, our backlog includes large shaft projects at Maple Valley, WA and Contract C700 Sound Transit as well as Earth Retention at Zig Zag, OR. We will also be performing Phases II and III Missile Silo Installation in Ft. Greeley, AK.

The Seattle office is managed by **Eric Dybevik** while **Ray McCorkle** and **Leo Stapleton** perform estimating and project management. **Alan Macnab** has responsibilities for business development in the four CJA offices but maintains his office in Seattle. For more information about us please feel free to contact us at: Condon-Johnson & Associates Inc, 651 Strander Blvd., Tukwila, WA 98188; 206.575.8248; [www.condon-johnson.com](http://www.condon-johnson.com)

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## DBM Contractors, Inc.

Well another year is in the books...my how time flies. As we look back on 2003, DBM has enjoyed another year full of challenging projects. DBM has continued to spread its wings throughout the western United States and even up to Alaska. Some of our more notable projects included:

**SH-34 Soda Springs Railroad Bridge Overpass, Idaho**-DBM assumed the role of general contractor as well as specialty contractor in this interesting project for Idaho Transportation Department. The project consisted of the repair of failing MSE approach walls and bridge abutments for the UPRR railroad overpass. Specifically, corrosion of the metallic soil reinforcements caused localized wall panel failures. Horizontal crosstie anchors were used to stabilize the MSE wall abutments, and 38,000 square feet of permanent earth retention was constructed.

**Snohomish County CRI, Everett, Washington**-DBM completed one of the largest soil nail earth retention projects our region has seen. The excavation support covered just over 60,000 square feet and reached a depth of nearly 90 feet. DBM worked closely with Shannon & Wilson to construct the soil nail system in both wet weather and wet ground conditions.

**Glenn Highway MP 100-109, Caribou Creek, Alaska**-DBM contracted with Quality Asphalt Paving of Fairbanks, AK to design and build a permanent earth retention wall for widening of the existing highway and to construct drilled shaft foundations for the new bridge. The permanent anchored-pile wall spanned nearly 40,000 square feet along a 1,800 linear foot alignment, and 10-foot- 4 inch-diameter drilled shafts reached depths up to 130 feet.

**BNSF/Sound Transit Commuter Rail, Tacoma, Washington**-DBM completed construction of a permanent anchored-pile retaining wall below Stadium Way in Tacoma for a track siding for the new Sound Transit commuter rail. DBM provided a design/build alternative to the original design, reducing earth retention costs by over \$390,000.

DBM continues to heavily market our Southwest Regional Office (currently located in Sacramento, California), achieving increasing momentum. With recent projects in northern and southern California, and upcoming projects in UC Berkeley, Las Vegas, and Hawaii, DBM continues to expand our presence as a leading

geotechnical contractor in the western United States. So, when that next foundation, earth retention, or ground improvement project comes along, call us; we'll be glad to help!

Safe and prosperous 2004 to all!

## Earth Consultants, Inc.

2003 was another very busy year for Earth Consultants, Inc. (ECI).

**Kyle Campbell**, Principal and CEO continues to function as Principal in Charge he is responsible for business oversight and the general management of Earth Consultants, Inc.

**Scott Dinkelman**, Associate Principal, oversaw the successful completion of the White River Amphitheatre project. Mr. Dinkelman has also been working on a 4 million gallon water reservoir and 138-foot-high water standpipe in Maple Valley as well as several vibration monitoring projects and large single-family residence and townhouse developments. These development projects also include many low-income housing projects such as the Judkins Street Apartments and Seattle Housing Authority's Holly Park project.

**Ray Coglas**, Associate Principal, was appointed Manager of Earth Consultant's geotechnical engineering division. Although his new position keeps him extremely busy, Mr. Coglas continues to provide project oversight. His recent projects include the Puyallup Street Extension project located in Sumner and the New Immigration and Naturalization Services (INS) building for the Department of Homeland Security in Tukwila.

**Kris Weller**, Project Manager, has been working on a multitude of projects, including the Seattle Housing Authority's Rainier Vista project, Cedar River Water District's 1 million gallon water reservoir, and continues working on several new single-family residential developments.

**Lewis Conklin**, Construction Monitoring Field Manager, continues to manage Earth Consultant's construction monitoring services division.

**Mitch McGinnis**, Project Geologist and **Scott Riegle**, Staff Geologist continue to provide excellent field and technical support on all of our projects.

**Frank Adams**, Laboratory Manager and **Sam Hyatt**, Project Manager are continuing to expand our materials testing and special inspection capabilities and recently opened a

satellite office in Fife to handle materials testing for our south end projects.

**Dianne Hurt**, Director of Business Development, was hired in July of 2003. She comes to ECI with 7 years marketing experience in the A&E industry. Within the past few months Ms. Hurt has successfully updated our marketing materials, developed a materials testing services flyer, and persuaded the ECI staff to help her brew, label, and deliver approximately 1,200 bottles of soda, "EARTHY BREW" which was used for our client holiday gifts. She is actively involved in several local associations and focuses on further developing our materials testing and inspection division and our business relations within the public sector.

## GeoEngineers

GeoEngineers continues to grow and expand its services as a result of their merger with Applied Environmental Services in March 2003. GeoEngineers now offers biological and ecological services, including: wetlands, shorelines, streams, biological assessments, diving, and fish and wildlife. In addition, we now have an office in Port Orchard, Washington. We are experiencing continued success and recently hired several new geotechnical employees. They include: **David Winter**, Seattle, Principal, Business Development; **Donald Chadbourne**, Spokane, Senior 1 Geotechnical Engineer; **Eric Heller**, Tacoma, Staff 1 Geotechnical Engineer; **Tim Bailey**, Redmond, Staff 1 Geotechnical Engineer; and **Greg Rollins**, Portland, Senior 2 Geotechnical Engineer.

GeoEngineers congratulates its staff for their efforts on several projects that received American Consulting Engineers Council (ACEC) awards on January 7, 2004. Specifically, ACEC awards include the former Standard Chemical Company site remediation (Silver Award), Alaskan Way Seawall (Silver Award), and Southfork Nooksack River logjam (Bronze Award).

GeoEngineers also is pleased to announce the following promotions: **Matt Smith**, Redmond, promoted to Senior 2 Geotechnical Engineer; **Dan Campbell**, Redmond, promoted to Principal; **Erica Mangan**, Portland, promoted to Staff 1 Geotechnical Engineer; **Mark Rohrbach**, Tacoma, promoted to Staff 3 Geotechnical Engineer; **Larry Sant**, Spokane, promoted to Staff 3 Geotechnical Engineer; and **Aaron McCain**, Bellingham, promoted to Project

1 Geotechnical Engineer. Congratulations to our new registered engineers: **Ken Gill**, Tacoma; **King Chin**, Redmond; and **Aaron McCain**, Bellingham.

We are proud to provide geotechnical engineering services for several significant projects in our Puget Sound communities, including: Greater Tacoma Convention and Trade Center (Tacoma), Port of Tacoma Pierce County Terminal Expansion (Tacoma), Bellevue City Hall (Bellevue), Alaskan Way Seawall (Seattle), and Meydenbauer Convention Center (Bellevue).

GeoEngineers wishes you a joyous and prosperous new year.

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## Geopier Foundation Company Northwest

Geopier Foundation Company Northwest worked closely with local geotechnical and structural engineers this past year on numerous projects in Washington. The Geopier soil reinforcement approach was used in applications to support building foundations, floor slabs, tanks, and MSE walls.

Geopier soil reinforcement was used for support of foundations and floor slabs on two large retail projects this past year. About 2,000 Geopier elements were installed at a spacing of about 9-feet on-centers for a Home Depot project (Kleinfelder) in College Place (Walla Walla). The Geopier reinforced silt layer support structural fill up to about 12 feet in thickness and a design floor load of 650 psf. About 2,200 Geopier elements were installed on a Costco project (Associated Earth Sciences) in Vancouver. The Geopiers reinforced weak organic silts and peat for support of heavy floor slab loads.

Two major projects were completed in the "Palouse" silts in eastern Washington, where deep pile foundations have historically been used. A second phase of a nine building housing project was completed on the University of Idaho campus (Strata). The Geopier approach was also used on the Johnson Hall project at Washington State University (Strata). Geopier supported footings were designed based on an allowable bearing pressure of 7,000 psf to support column loads of about 650 kips.

Geopier Foundation Company recently completed installation of Geopier soil reinforcement for support of an MSE wall on the King County 140<sup>th</sup> Avenue project (Shannon &

Wilson). The Geopier system was designed to mitigate liquefaction and to provide increased shear reinforcement. Geopier Foundation Company is a subsidiary of Tensar Earth Technologies and has teamed with Tensar on numerous wall applications.

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## Geotech Consultants, Inc.

This is the first time that we have provided an entry to the **Groundhog**. Our 17<sup>th</sup> year in business was a good one, even with the sputtering local economy. We are blessed with many clients that continue to refer us to new customers. While the number of larger projects was certainly lower than in past years, we were still involved with many challenging developments and sites. Often, the more interesting projects were the smaller ones that are more commonly sandwiched into tight sites with restrictions from slopes and adjoining structures.

**Kristopher Hauck** has been promoted to senior geotechnical engineer for his dedication and rapport with our clients, general contractors, and governing agencies. We were able to maintain our same staff level through the year (13 employees). **Ben Sommers** joined our firm as a staff geotechnical engineer to replace one of our engineers who went back to school. We also hired a new bookkeeper to replace one that retired.

We wish all of you a successful 2004.

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## Golder Associates

Golder Associates saw an action-packed 2003 from designing mountains in Las Vegas to celebrating 30 years of serving clients in the Pacific Northwest.

We completed the design of *Le Reve Mountain*, a 100-foot-tall by 500-foot-long landscaping feature for the new Wynn Resorts Hotel and Casino in Las Vegas. Now under construction, this one-of-a-kind MSE structure consists of over 100,000 ft<sup>2</sup> of architecturally sculpted shotcrete wall face. Guests can look forward to full landscaping with 40-foot trees and five waterfalls. The structure includes an 85-foot-high vertical wall face, making it the highest MSE wall constructed out of HDPE geogrid.

We completed an aquifer storage and recovery (ASR) project for the City of Walla Walla. This included a hydrogeologic study, permitting, and system engineering required to

modify an existing city well for use as an aquifer storage and recovery well.

Golder is now providing construction support for Sound Transit, relating to two of the five design geotechnical sections we created several years ago. These sections involve a large Maintenance Facility and about 1-1/2 miles of at grade and elevated track with several stations. They are particularly challenging since they are underlain by over 100 feet of loose, liquefiable soils, and will involve installing drilled piers, piles, and stone columns.

Golder was honored with awards for projects ranging from downtown Seattle to the canyons of Utah. These include: NCSEA 2003 Outstanding Project Award for Seattle's 5<sup>th</sup> & Jackson Building; ACEC Arizona Grand Award for Design Build Project of the Year for US 60; UDOT Contractor of the Year Award for sculpting shotcrete walls along SR-189 at Provo Canyon; ACEC Washington Silver Award for innovative groundwater remediation and collection treatment design at Success Mine near Wallace, Idaho; and the Environmental Business Journal's Merit Award for Golder's novel application of risk analysis to large transportation projects.

Congratulations to the following individuals who received their Professional Engineers Licenses: **Joe Schrank, Colby Caywood, Andrew Walker.**

And congratulations to **Matt Malgesini** and **Mike Mengelt** on their promotions to Project Engineer.

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## Hart Crowser

Hart Crowser's geotechnical group enjoyed a busy and successful year in 2003. We continue to be involved with a number of high profile projects throughout the Puget Sound area. Two high-rise developments with deep excavations in downtown Seattle, 2200 Westlake and the Washington Mutual Tower, are slated to begin construction in early 2004. Senior Principal **Garry Horvitz** led these design efforts, with heavy involvement by **Doug Lindquist** who was promoted to the level of Senior Project Engineer in mid 2003.

Garry has also managed a number of high profile waterfront projects, including the Ketchikan Cruise Ship Terminal, the Seattle Marriott Waterfront Hotel, the Terminal 18 Berth Deepening, additions to the service pier for Naval Sub-base Bangor (NSB), and the Thea Foss and Lockheed Yard 1 sediment

remediation projects. **Matt Woltman**, recently promoted project engineer, has been a key element in many of these efforts.

Senior Principal **Mike Bailey** continued his tireless commitment to the Sea-Tac Third Runway project as he has since Hart Crowser's initial involvement in 1998. Mike and the rest of the Hart Crowser team, including Principal **Barry Chen**, our newest Associate **Reda Mikhail**, and Senior Staff Engineers **Carsten Becker** and **Alison Stanley** are currently wrapping up design documents and looking forward to the start of construction in April 2004.

In addition to his focus on seismic design issues, **Barry Chen** has been instrumental in developing Hart Crowser presence in the transportation market. Barry is leading Hart Crowser's review of the Sound Transit Project for the Seattle Department of Transportation (SDOT). He is also managing our effort for the I-5/SR-18 Triangle project, the I-5/Roanoke Noise Wall project and the Sea-Tac Security Screening Facility.

Principal **Jeff Wagner** continues Hart Crowser's involvement with Bellevue Square as even more additions are scheduled for construction in 2004. This will compliment the continuation of the Lincoln Square construction, just across the street. We also look forward to our involvement with the Performing Arts Center Eastside (PACE), adjacent to the existing Hyatt Hotel in downtown Bellevue.

Hart Crowser recently added **Matt Gibson** as a senior staff geotechnical engineer in December 2003. Matt is a University of California - Berkeley graduate and comes to us with a year of experience in the Bay Area. We're excited to have Matt aboard and we're looking forward to getting him involved with our work here in the Puget Sound area.

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## HWA GEOSCIENCES INC.

HWA GeoSciences Inc. begins its 26<sup>th</sup> year with two ACEC Engineering Excellence awards. A Silver Award for "Technical Value to the Engineering Profession" was given to **Les Banas** for the Seattle Public Utilities' Lincoln Reservoir Falling Weight Deflectometer Testing (FWD) project with Tetra Tech/KCM, Inc. The project involved the innovative use of HWA's in-house FWD to evaluate the suitability of the existing concrete floor for footings to support new reservoir cover columns. A Bronze Award was received by **Michelle Ramos** for the King County Cecil Moses Memorial Park Estuary

project with MacLeod-Reckord Landscape Architects. Construction of the new estuary required excavation adjacent to an existing water main that was at risk of rupturing due to lateral spreading from an earthquake. In order to protect the main, HWA designed and monitored installation of a stone column buttress that extended onto the side slopes of the estuary.

HWA's geotechnical engineering staff continues to strengthen with the addition of **George Minassian**. George is finishing up his PhD in Transportation Engineering with emphasis on the new HMA pavement design system (Superpave) at the University of Alaska and will join HWA in January. In addition, **Les Banas** and **Bryan Hawkins** recently obtained their professional engineering licenses. Our geo-environmental group and laboratory/inspection group continues to support the geotechnical group allowing us to provide comprehensive engineering services.

Some unique projects HWA has recently worked on include design-build projects for United States embassies in Conakry, Guinea and Bamako, Mali. Both projects involve construction of heavy structures over highly laterized soils and badly weathered bedrock. We just completed a residential foundation designed to "ride out" a landslide should it reactivate. We are also working on a parking lot cut into the hillside on the south side of Mukilteo Lane as part of the Sounder Rail Station, which will eventually tie rail, bus and ferry traffic together at that point.

In addition to project work, our staff has been involved in research. **Tom Kinney** has been working closely with the Hendrikus Group on the development of new erosion control soils with outstanding structural and growth properties. Part of the research is to create a new classification system for erosion control soils. Lastly, **Ralph Boirum** and **Tom Kinney** continue to teach engineering classes at the University of Washington.

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## Landau Associates

At Landau Associates, we experienced growth and enjoyed working on some challenging and exciting projects in 2003. We also welcomed staff additions in three of our offices. Project geotechnical engineer, **Scott McDevitt**, and **Michael Vedder**, geologist, joined our Portland office along with **David Moser**, environmental technician. In Spokane,

we welcomed **Ryan Molsee**, staff hydrogeologist and **Bill Towey**, senior biologist. In Edmonds, we added **Brian Bennetts**, staff geotechnical engineer; **Mike Buckley**, staff geologist; **Todd McKenney**, technician; **David Nelson** staff geologist; and **Mario Lopez**, technician. **Dave Pischer** completed his role as chair of the ASCE Seattle Section Geotechnical Group for the 2002-2003 season.

Work on the King County Brightwater Conveyance System geotechnical engineering services contract has kept many of our geotechnical engineering personnel busy, including **Ed Heavey**, **Steven Wright**, **Brian Christianson**, **Dennis Stettler**, and **James Wilson**. Looking ahead at our clients' upcoming projects in 2004, the year promises to be a busy one again for Landau Associates. Work will continue on Seattle Public Utilities' Cedar Moraine watershed for **Paul Ford**, **Deb Ladd**, and **Sean Cool**. In Portland, the next phase of the Peterkort complex in the West Hills, in addition to several projects for PacifiCorp keeps **Dave Thielen**, busy; and **Julio Vela** stays in high gear with a continuous flow of work for Home Depot. We were excited to be selected as Snohomish County's on-call geotechnical engineering and environmental consulting firm for the next three years, which kicked off late in 2003 with assignments at the airport and in transportation system design. We also began another on-call geotechnical services agreement with WSDOT and added an on-call geotechnical services agreement with Tacoma Public Utilities.

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## PanGEO

PanGEO enters its fifth year following a very successful and productive 2003. The company continued the trend of steady and consistent growth and the year 2004 promises more of the same. The firm continues to operate with a staff of seven, including four registered professional engineers, one licensed engineering geologist and one staff-level engineer.

PanGEO provides geotechnical and earthquake engineering solutions to a wide variety of technically challenging projects. This year, we provided geotechnical support on numerous high-profile projects, including the Sound Transit DS 755 Light Rail project and the King County Brightwater Conveyance system project. PanGEO provided support on a number of transportation projects that are currently under construction or in the design phase, including the ODOT Upper and Lower Quarry

Interstate 84 bridges in La Grande, Oregon, and the Lexington Bridge spanning the Cowlitz River. Work is also just getting underway on the City of Port Angeles 8<sup>th</sup> Street bridges replacement project.

Seismic engineering continues to be a staple in our project portfolio. In 2003, we performed seismic analysis for Caltrains Tunnels 1-4 in the San Francisco Bay area. This project utilized FLAC modeling of the seismic response of the tunnels for the occurrence of a magnitude 8.0 earthquake on the San Andreas Fault. We provided seismic evaluations for the Evergreen State College Library and several elevated water-storage tanks for various water districts. In 2003, PanGEO was asked to provide construction monitoring of soil nail walls for the first implementation of soil nail technology used by the Michigan Department of Transportation (MDOT). PanGEO is also under contract to provide support for the FHWA development of new course materials and revised AASHTO specifications for LRFD design of substructures.

PanGEO received recognition for the unique design utilized in the rehabilitation of the SE 8<sup>th</sup> Street project in Bellevue. Geofoam blocks were placed beneath a thin layer of roadway fill to limit settlement in 50 feet of organic soils. The project received the ASCE Seattle Section Outstanding Project Award for both the Transportation and Geotechnical sectors. It also received the ACEC Gold Award for Innovative Application of New or Existing Techniques in the local track category in the engineering excellence awards program.

PanGEO is pleased to have **Tiffany Adams** serving as the ASCE Seattle Section YMF President this year. This YMF group is extremely active in the community and we are proud of her accomplishments.

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## PSI

Despite the slow economy, PSI continues to see significant demand for our geotechnical, environmental, and special inspection services. Our Northwest offices, serving Alaska, Washington, Oregon, and Idaho have been quite busy during the past year.

PSI made two additions to their geotechnical services staff during 2003. **Tim Huntting** recently joined the Seattle office as department manager for Geotechnical and Construction Services. Tim has over 20 years of engineering and construction management experience. He is a registered professional

engineer and a member of ASCE. **Scott Johnson** joined us earlier in the year as a field geologist and special inspector. Scott has a BS in Earth Sciences from Northeastern Illinois University.

Recently completed geotechnical site evaluations include several school sites for the Seattle School District, community water system improvements in Ashford, and numerous new residential developments throughout Pierce and King counties. PSI is also providing special inspection services on the new Seattle Library, the Fred Hutchinson Cancer Research Institute, and the Tacoma Narrows Bridge. Our services at the Tacoma Narrows Bridge include monitoring the anchorage excavations with inclinometers.

In addition to our geotechnical evaluation services, PSI also provides comprehensive laboratory testing capabilities. Our geotechnical capabilities include triaxial compression, hydraulic conductivity by flexible wall permeameter, Los Angeles degradation, direct shear, and consolidation.

PSI has been providing business and industry with objective, accurate, and useful information in building plans for their facilities and operations for more than 100 years. PSI is a nationally recognized leader in environmental consulting, geotechnical engineering, and construction testing services, ranking as one of North America's largest consulting engineering firms according to ENR.

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## Shannon & Wilson, Inc.

For 49-year-old Shannon & Wilson, Inc., the year 2003 was one of surprising busy-ness in a sluggish regional economy.

Staff numbers in the Seattle office hovered around 100 for most of the year. Key technical staff additions included **Travis Deane** (Principal Geotechnical Engineer), **Scott Pawling** (Geotechnical Engineer II) working with our underground services and railroad groups; and **Claire Roggero** (Geotechnical Engineer III) specializing in seismic issues. Retired Executive Director of Coast Guard FD&CC Pacific, **Martin Boivin**, joined the firm as a vice president focusing on marketing and business development of the firm's environmental services. Seattle Office Manager **Gerard Buechel** was named chairman of the Board of Directors; Vice Presidents **Tom Gurtowski** and **Red Robinson** were elected board members.

Geotechnical engineer **Hisham Sarriddine** was promoted to associate.

Shannon & Wilson geotechnical and environmental contributions are in evidence on projects completed this year, including the UWMC Surgery Pavilion (with NBBJ), Everett Events Center (LMN), and Tukwila's S. 180<sup>th</sup> Grade Separation (BERGER/ABAM). 2003 also saw the completion of our work on the Boston Central Artery project. The firm was included on winning teams for WSF Anacortes and Mukilteo Intermodal facilities (with PB and Moffatt & Nichol), SMP Green Line (Bechtel/Jacobs team), WSDOT SR 18 (HDR) and SR 522 (Parametrix). Work continues with PB on the Alaskan Way Viaduct and Seattle Seawall; with Tetra Tech/KCM at the Marysville Wastewater Treatment Plant; on the Snohomish County campus with NBBJ; at Port of Seattle's Terminal 46 with Moffatt & Nichol; and on the DB team for the new Tacoma Narrows Bridge. We continue to provide on-call and emergency services for the Seattle Corps of Engineers, Sound Transit, BNSF, and UPRR. Our geofoam embankment design on the Fibre Way Overcrossing for the Port of Longview was honored with an ACEC-WA Silver Award.

Co-sponsored by the UW's Civil Engineering Department, this year's Stanley D. Wilson Memorial lecturer, Dr. J. Michael Duncan, University Distinguished Professor at Virginia Tech, spoke on "Progressive Failure of Lined Landfills" at the Center for Urban Horticulture in November.

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## URS Corporation

URS saw some interesting new work and a few new faces during 2003. **Bob Burk** is managing our response to the massive SR-20 landslide near Newhalem, Washington, with assistance from **Mark Molinari** and **Balin Strickler**, as part of our on-call contract with WSDOT. Survey prisms have been set by helicopter and geophones are being used to monitor continuing rockfall activity that initially closed the highway for several weeks. Blocks up to 60 feet in dimension were deposited in the debris field that could threaten the roadway below. Burk, Molinari and Strickler also co-authored a paper at the recent Geological Society of America National Meeting in Seattle, describing their discovery of a new late Quaternary fault near Everett. **Todd Parkington**, **Dick Clark** and recently hired engineer **Erich Lenz** have been serving

Transalta Mining Company by performing field investigations and analysis for tailings management systems and expansion of the South Field pit at the open pit coal mine in Centralia, Washington.

**Charles Masala** has joined the Seattle group from the Phoenix office and has been working on a tailings dam raise at the Red Dog Mine in Alaska, with construction monitoring assistance from **Ian Sutton**. **Marty McCabe** and **David Raubvogel** worked on a University of Washington Tacoma Campus expansion project that will eventually provide new housing and parking. **Cecil Urlich** has been assisting the Greater Vancouver Water District with studies of the operations of their dams in British Columbia and the associated risks. **Dr. Sri Rajah** was our prime consultant to Kimberly Clark and the City of Everett during design and construction of a new outfall pipe in Everett. **Dan Hawk** provided geotechnical support for remedial action activities at the Tongue Point Landfill in Astoria, Oregon. **Charles Vita** continues to provide assistance to the EPA associated with the superfund cleanup activities in the Coeur d'Alene River Basin, Idaho. **CB Crouse** and **Juan Carlos Ramirez** devoted a large block of time to assessing seismic hazards for a new LNG facility at the Port of Long Beach and for the existing Portuguese Dam in Puerto Rico. **Bob Wallace** and **Arturo Ortiz** are providing services to King County during closure of the Cedar Hills Landfill Area 5.

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## Zipper Zeman Associates, Inc. (ZZA)

Five years and counting - that is how long ZZA has been turning out quality geotechnical and environmental consulting services. During three of those years, several professionals were working on the Port of Seattle's 71-million-gallon industrial waste lagoon at SeaTac Airport. Other high profile projects on our resume include the high-rise at 1700 Seventh Avenue in Seattle and the Alderwood Mall Expansion in Lynnwood. The Alderwood Mall project will keep **Ed Garcia** and **Max Enders** busy for more than a year. **Jim Thompson** (past chair of the ASCE Geotechnical Group) continues to attract challenging pipeline projects. The City of Everett's replacement of water pipelines 2 and 3 across Ebey Island is just the latest example. **James Georgis** is currently managing the City of Everett project after completing a seismic hazard mapping project for Seattle Public

Utilities. Meanwhile, **Rob Ross** is now designing a handful of replacement retaining walls after evaluating the City of Bellevue's 66 rockeries. The Sam's Club project in Renton has been a focal point for **Tom Jones** and **Sean Donnan** in recent months. Thick deposits of coal mine waste at the site have resulted in driven grout piles to once again be selected as the deep foundation option of choice for the south Lake Washington area. **John Zipper** continues to provide excellent leadership for the company and attract challenging work from the insurance industry. Geologists **Curt Thompson** and **Greg Simons** have assisted John in characterizing subsurface conditions for many of these forensic projects, including the failure of a large earth dam.

**Jason Washburn** has joined **Tim Roberts** in our Tacoma office. Tim is establishing a solid presence for ZZA in the south Puget Sound region. **Eric Lim** of our Seattle office and **Michael Bullock** of our Lynnwood office earned their Professional Engineer licenses in the past year. **Dave Baska** and Eric will be busy this coming year managing several Seattle-area construction projects including two deep excavations for the private sector. **Dave Williams** recently added the City of Mukilteo to his list of public sector on-call service contracts. New hires, **Yen-Vy Van** (senior project environmental specialist) and **Kevin Howell** (technician) have been instrumental in managing our backlog of work and UW student **Rob Sargent** was a valued summer intern. Finally, **Al Zeman** is anticipating an increased peer review workload from Nordstroms in 2004.

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## Positions Available

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### Geotechnical Engineer

Landau Associates, Inc., a leading regional environmental, geotechnical engineering, and natural resource consulting company, has IMMEDIATE openings for qualified geotechnical engineers in our regional offices:

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at both entry and more senior levels for both the Tacoma and Edmonds Offices. For more information concerning education and experience qualifications and position responsibilities, please check our website at [www.landauinc.com](http://www.landauinc.com). Environmental engineering experience is a plus.

We offer a competitive compensation and benefits package and a casual workplace. Qualified applicants may forward a cover letter and resume to: Brian Bosse, Landau Associates, 130 – 2<sup>nd</sup> Avenue South, Edmonds, WA 98020; email to [HR@landauinc.com](mailto:HR@landauinc.com); or Fax: 425.778.6409. EEO/M-F N/S Environment

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### Geotechnical Engineer

Golder Associates is interviewing Staff and Project Engineers for their Reno, Nevada office to support the civil and geotechnical needs of the mining, pipeline, and infrastructure markets domestically and internationally. This is exciting work! MS in Civil, Geotechnical, or Geological; 0-10 years experience; AutoCAD, good communications skills, high motivation are required. Fax resume to 775.828.9645 or email to [cluter@golder.com](mailto:cluter@golder.com).

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