This past year, two of the true giants of our profession, Gene Grant and Rolf Eliassen passed away. Their contributions to our department and to Stanford University are legendary. While I would love to talk about both men in this letter forgive me if I focus this time on Rolf. As many of you know, Stanford University invited Rolf to join the Department of Civil Engineering in 1961 to form a new program in environmental engineering. His early research with solid wastes, air pollution control, and radioactive waste disposal suggested to him that environmental problems were rapidly expanding beyond the traditional framework of water supply environmental engineering and wastewater disposal. A much broader approach to solving these problems was needed that involved interdisciplinary collaboration between engineering and the social and natural sciences, and he felt that Stanford provided a unique climate for such cooperative activities. He founded a new and flexible environmental engineering program that permitted students from a wide range of backgrounds and career goals to obtain a graduate education that met their individual needs. Many of you were the beneficiaries of his great vision!

I am telling you all this to set the context for a very important decision that was recently made by the faculty of our department - as of September 1, 1997 our department is known as the Department of Civil and Environmental Engineering (CEE). We have chosen to do this because environmental engineering has grown as a field to the point where it has a very clear identity. Moreover, at many institutions environmental engineering is not part of civil engineering. However, at Stanford it is an integral part of what we do, and it is something of which we are very proud. Since its establishment by Rolf Eliassen and Perry McCarty our environmental engineering program has grown in stature to the point where it enjoys a national and international reputation second to none. By including the valuable environmental engineering descriptor in our name, our goal is to enhance the long and rich civil engineering tradition that exists at Stanford.

Our newsletter has a very “subsurface” flavor to it featuring research articles by Perry McCarty on groundwater cleanup and by Ronnie Borja on foundation restoration for the Tower of Pisa. In addition, we are delighted to bring you news about our faculty, staff, students, and our alumni. As always, I encourage you to write to us using the attached update page and let us know what you are doing.

In closing, I join the current CEE students, faculty, and administrative staff in wishing you the very best for a wonderful holiday season and a healthy and happy 1998. 

Chair Jeff Koseff
**AWARDS**

**Mark Jacobson** was selected as a Terman Fellow for 1997-98. His appointment is for three years, with an unrestricted award of $40,000 per year to be used to develop his teaching and research.

**Perry McCarty** was awarded the 1997 Athalie Richardson Irvine Clarke Prize for outstanding achievement in water science and technology. The $50,000 prize, which is awarded annually by the National Water Research Institute is the largest monetary award in the field. **Jim Anderson**, Perry’s advisee and a recent graduate, has won the 1997 Outstanding Doctoral Thesis Award co-sponsored by CH2M Hill and the Association of Environmental Engineering Professors. The title of his dissertation is, “Effect of Chlorinated Ethene Biodegradation on Growth Rates of Methanotrophic Bacteria in Biofilms and Mixed Cultures.” The award ($1,000 and a plaque) was presented on October 20 at the Water Environmental Federation Annual Conference in Chicago.

**Robert Street** was appointed as the first William Alden and Martha Campbell Professor in the School of Engineering. This endowed chair appointment was reported by the Board of Trustees on June 12.

**Martin Fischer** was honored as one of the “Top 25 Newsmakers in the Construction Industry” by *Engineering News-Record*. Martin was honored for his groundbreaking effort that sequenced hundreds of three-dimensional computer-aided design models with a project schedule, in order to increase the buildability and affordability of a major hospital reconstruction project. The process, known as 4-D CAD, put architects, engineers, and project managers on one system, vastly improving project communication.

The Outstanding 1996 Journal Paper awarded by the Los Angeles Tall Buildings Structural Design Council was given to **Helmut Krawinkler**. This paper, titled *Seismic Demand Evaluation for a 4-story Steel Frame Structure Damaged in the Northridge Earthquake*, was co-authored by Helmut and his student **Ali Al-Ali** and published in *The Structural Design of Tall Buildings*.

The **Eugene L. Grant Award for Excellence in Teaching** was awarded to **Lynn Hildemann** at commencement on June 15. The award was established by alumni, individuals, and corporations to honor the many contributions of Gene Grant. Winners of the award are selected by the current and most recent senior classes in the department.

**SHAH FAMILY FUND STAFF AWARD**

Two years ago Professor Haresh Shah and his family established an endowment to help fund and support scholarship in the general area of catastrophic risk management. In addition, part of this endowment was to honor the contributions of staff members in the Department of Civil and Environmental Engineering for their “outstanding competence, dedication, and accomplishments”. This year the award went to Leyla Unerdem, administrative manager of the Center for Integrated Facility Engineering.

In nominating Leyla for this award, Professor Paul Teicholz wrote:

“Leyla is a person who really cares for the people at our center and helps students and visiting scholars with their professional and personal problems. Even more important is her contribution to the success of our center. She organizes all of our technical meetings, does our accounting and budgeting and is now creating material for the CIFE web page that is attractive and useful. She is a remarkable CEE staff person who deserves recognition for her competence, dedication to all aspects of CIFE, her intelligent and caring approach to problems and people issues, and willingness to give what it takes to get the job done right. CIFE would not be where it is today without her. She is the “heart” of CIFE!”
Chlorinated solvents, such as trichloroethylene (TCE), are the most widespread and difficult to treat hazardous organic contaminants in groundwater. About 150 million tons of these solvents have been used each year for dry cleaning of clothes, and degreasing of engines and electronic parts. The spent solvents were often disposed improperly by dumping onto soils or discharging to dumps or waste lagoons, a practice that has since been prohibited. The traditional method for treating TCE contaminated groundwater has been to pump the water to the surface, and there to treat it to remove the TCE by air stripping. The air stripped TCE is then adsorbed onto activated carbon so that it will not contaminate the air. The treated groundwater is generally thrown away by discharge to a sewer or surface water body and the TCE-contaminated activated carbon is sent to a processing facility to remove the TCE so the carbon can be reused. Now, however, students, staff, and faculty with the Western Region Hazardous Substance Research Center (WRHSRC) have pioneered the development of a new biological treatment procedure that destroys TCE in place (in situ) so that groundwater need not be pumped to the surface and wasted, and no activated carbon is needed. A successful full-scale year-long demonstration of the process was completed at Edwards Air Force Base in southern California in March 1997.

Research on this biological process was begun at Stanford in 1985, the year after it was discovered by Dr. John Wilson, a scientist with the U.S. Environmental Protection Agency’s research laboratory in Ada, Oklahoma. Wilson found that by adding a small amount of methane gas and oxygen to a small laboratory column containing TCE contaminated soil, some species of bacteria would grow by oxidizing the methane for food, and in the process, they produced an enzyme called methane monoxygenase which fortuitously degraded the TCE. The bacteria obtained no benefit from the TCE transformation. The process has been given the name “cometabolism.” The question arose as to whether an engineered process could be developed that could carry out TCE destruction in groundwater through cometabolism by use of native microorganisms.

Prof. Paul Roberts began the Stanford studies with a team of faculty, staff, and students, who conducted basic research on the cometabolic process in the laboratory and evaluated its potential through field research at the Moffett Federal Air Field in Mountain View, California. WRHSRC research leading up to the successful demonstration at Edwards AFB has involved 23 different faculty and staff from Stanford and Oregon State, in collaboration with Michigan State University, the University of Western Florida, and the University of Minnesota, together with about 30 graduate students. The studies at Moffett indicated that methane addition to groundwater was not very successful for bringing about destruction of TCE, although it worked quite well with some other chlorinated organic contaminants of concern in groundwater such as vinyl chloride and 1,2-dichloroethylene. Studies with other possible organic compounds led to the finding that very active cometabolism of TCE could be obtained by adding toluene, a natural organic compound that is contained in gasoline.

A research team led by Prof. Perry McCarty, as project director, Dr. Mark Goltz, as project manager, and Gary Hopkins, as system designer and implementor, began the search for a site to carry out a full scale evaluation. There were many technical issues that needed to be studied before the process would be appropriate for commercial use, such as how to mix the toluene with the TCE contaminated water, how to deliver this mixture to the TCE degrading bacteria, and how to prevent potential clogging of the aquifer with excessive bacterial growth.

The site selected for implementation was the Edwards Air Force Base, located on the western portion of the Mojave Desert, about 60 miles north of Los Angeles. From 1958 through 1967, the X-15 experimental rocket plane was operated here, and TCE was used to clean the engines. About one 55-gallon drum of waste TCE from this operation found its way to the groundwater nearby, and from this a groundwater plume contaminated with over 1000 parts per billion (ppb) TCE extended several hundred meters from the source of contamination. Two aquifers were contaminated, one, an 8-meter thick upper aquifer, was located about 9 meters below ground surface. Below a 2 meter thick layer of clay was the second, a 5-meter thick aquifer.

The treatment scheme conceived by the graduate students involved two wells 10 meters apart, each containing two screens, one located in each aquifer, and a pump. In one well, 6.7 to 10 gallons of water per minute was pumped downward, bringing water from the upper aquifer to the lower aquifer. In the other well, the water was pumped upward, bringing water from the lower aquifer to the upper one. This caused a circulation of water between the two wells. Into the circulating water at each well was added toluene, oxygen, and hydrogen peroxide. When this mixture was injected back into the aquifer, native bacteria oxidized the toluene with the oxygen, providing energy for their growth and forming a bioactive zone near each well. They

continued on page 7
1940s

Jack J. Coe (MS 1948) was recently reappointed by Governor Pete Wilson to the California Regional Water Quality Control Board, Los Angeles Region. He is currently chairman of the board and begins his second four-year term. Jack is a principal consultant with Boyle Engineering Corporation. He remains active in the ASCE on engineering education and professional conduct issues.

1950s

Michael S. Bickers (BS 1950) retired from his position as president/CEO of Davy McKee Corporation. He is now active in consulting, mostly with former mining clients working as a principal of mineral advisory group based in Tucson, AZ. George E. Gray (BS 1951) retired from Caltrans where he was a transportation engineer. He is currently consulting on NAFTA transportation issues and is coeditor of a textbook, Public Transportation. Raymond J. Dodson (BS 1952, MS 1952) retired after 35 years with Guy F. Atkinson Co. He is now working part time as a arbitration panel member on construction disputes. He is also an American Arbitration Association Panel member. Richard C. Harlan (BS 1952) remains a part-time principal in the firm Harlan Tait Associates, which he founded in 1974. His consulting work specializes in the planning, investigation, design and construction of dams and the investigation of safety, enlargement, safety improvement, and repair of existing dams. Daniel D. Clinton Jr. (MS 1953) served as president of the Texas Society of Professional Engineers in 1993-94. He is currently Southwest regional vice president of the National Society of Professional Engineers. Roy W. Fowler (BS 1956, MS 1957) has been appointed chairman of the Sacramento Environmental Commission, a joint commission of the County and City of Sacramento and other local cities within the county. Stan Kangas (BS 1959) retired after 37 years with Brian Kangas Foulk, the last 22 years as chairman and CEO. He is a director of the Bay Area Bank and serving as a director of the Boys & Girls Club on the Peninsula, the Sequoia Hospital Foundation, and co-chair of the San Carlos Youth Foundation.

1960s

Leon D. Luck (Engineer 1960) was formerly chair of the Civil and Environmental Engineering Department at Washington State University. He retired in 1983 and spent a year in the Republic of Korea on a Fulbright Lectureship. Satish P. Shah (MS 1960) worked for the US Agency for International Development for 27 years in several senior positions such as chief engineer for USAID/Kenya and director of Office of Development Resources. He is now working as an international development consultant. Gregory A. Howell (BS 1965, MS 1972) is a self-employed consultant to the construction industry and an adjunct professor of building construction at VPI. Darryl W. Davis (MS 1966) worked short stints with the State of California Department of Water Resources, and as a private consultant doing international work, and has since been employed by the US Army Corps of Engineers for the past 27 years, the last 8 years as director of the Hydrologic Engineering Center. Michael D. Tom (MS 1968) formed a law firm 2-1/2 years ago with a focus upon all aspects of the construction and engineering industry.

1970s

Robert L. Moeller (MS 1971) is a rear admiral and will retire next year after 30 years with the US Navy - Civil Engineer Corps. Richard Mesley (MS 1974) is a principal at Connell Wagner Pty Ltd working on consulting engineering projects throughout Australia and Asia. Ikuo Naramura (MS 1976) is currently working for Obayashi Corporation as a manager for projects in southeast Asia. Chi-Hsin Shao (MS 1978) is a vice president for Korve Engineering, Inc. in California. Ronald Steinworth (MS 1979) is the president of Grupo IECA S.A., a consulting firm in structural and earthquake engineering in Costa Rica.

1980s

Jean-Michel Desloges (MS 1980) worked in Argentina for a water utility company before returning home to Paris as the general manager of the water distribution division of Lyonnaise Des Eaux. Bill Edwards (MS 1980) is president of Earthsafe Systems, Inc., a company that designs and builds fuel systems for commercial and industrial facilities and automotive research. David Harrison (MS 1980) is responsible for business development in southern California, southern Nevada, Arizona and New Mexico for Montgomery Watson. Brian Stephenson (MS 1980) has changed his focus after working 15 years in the design of buildings. He is now working in forensic and failure investigations in the Baltimore-Washington corridor. Isaac Zingerevitz (MS 1981) is still a professor at Escola de Engenharia Maua as well as being self employed as a specialist in pipeline cleaning and rehabilitation in-place, water and wastewater measurement using state-of-the-art electromagnetic flowmeters, and analysis of the network. Patrick H. Peopsel (MS 1982, Engineer 1984) is a geotechnical consultant with HDR Engineering, Inc. James Berg (PhD 1983) is living in Norway and working for Colfast Systems ASA as technology director after ten years with Consultancy Aquateam. Pam Lettrich (MS 1983) stays at home these days taking care of Chloe and Troy. John Caulfield (MS 1984) recently accepted a position with the Electricity Corporation of New Zealand as the project engineer for the second Manapouri Tailrace Tunnel. The project is located within the Fiordlands National Park at the largest hydroelectric power plant in New Zealand. Joseph F. DiGangi (MS 1986) spent 3-1/2 years teaching at West Point after graduating from Stanford. He is currently
serving with the Defense Logistics Agency as a senior engineer planner. David McKenzie (MS 1986) retired from the Air Force in 1996 after 20 years. He is now a systems engineer with Lockheed Martin Command and Control Systems. Anne Braghetta (MS 1987) finished her PhD at UNC and is now working for Montgomery Watson in DC. Hiroyuki Fuyama (MS 1987, Engineer 1989, PhD 1993) is a senior research engineer for Mitsubishi Heavy Industries, Ltd. involved in a Japanese national project on prestressed concrete container vessel for nuclear power plants. Jun Matsumoto (MS 1987) works for Nippon Koei in the Philippines as a river structural engineer for Mt. Pinatubo Urgent Hazard Mitigation Project. Richard Myrah (MS 1987) procured and administered over twenty separate design, construction, and specialty contracts related to the expansion of Washington, DC’s National Airport Terminal. Kym (DiLorio) Sterner (MS 1988) is working part time at Dowling Associates as a senior transportation planner and spending time with her son Andrew and husband Dave. Rick Zabel (MS 1989) is working for Bechtel International in Irian Jaya, Indonesia. He is involved in the expansion of a copper, gold, and silver concentrator. Despite being in one of the most rugged, primitive, and remote areas of the world, Rick can be contacted at rzabel@bechtel.com and would love to hear from anyone.

1990s
James E. Alty (MS 1990) is stationed in Heidelberg, Germany as chief of NATO construction for the U.S. Army. Paul Dahlberg (MS 1990) is a senior software engineer for Det Norske Veritas working on a suite of programs for structural analysis for the maritime and offshore industry. Jennifer Grey Fox (BS 1990, MS 1992) has been working for the past two years (since returning from doing Fulbright research on hydroelectric development in New Zealand) at the EPA as an instructor at the Headlands Institute in the Marin Headlands. Carlos Hernandez Perez (MS 1990) was awarded a consortium for graduate study in management fellowship for the 1997-98 and 1998-99 academic years at the University of Michigan Business School. Scott Tankel (MS 1991) is a registered professional engineer in the state of New Jersey currently overseeing a $20 million concrete paving and rehabilitation project at Newark International Airport. Cameron Winey (MS 1991) is a senior engineer at Montgomery Watson. Peter Kukielski (MS 1992) is managing the detailed engineering in Manila, Philippines of a $1.9 billion copper and gold mining project as a production engineer and pre-operational testing manager for Fluor Daniel. Scott C. Wright (MS 1992) commands a preventive medicine detachment that provides medical oversight of safe drinking water requirements and food service sanitation for 20,000 soldiers and civilians for the US Army. Marc DeMenibus (MS 1993, Engineer 1994) is a project manager for international projects at OTV, a large water treatment company, and a Parisian explorer in his free time. Wataru Kurosawa (MS 1993) is a senior engineer for Taisei Corporation on a power plant project in Kyoto. Keith Marrack (BS 1993), along with his wife Sally, works for Nike, Inc. as a project manager in the Advanced Technology Exploration Group. He manages footwear projects that are expected to be on the market 4-5 years down the road. Stephanie Tan (BS 1993, MS 1994) worked as an environmental consultant for Environ Corporation in Princeton, NJ before returning to school at the MIT Sloan School of Management. James Bodnar (MS 1994) was recently hired by the Metropolitan Water District of Southern California to conduct groundwater modeling and water resource management. David Knudsen (BS 1994) works in a strategic environmental group developing information systems for environmental models for Intel. Caroline C. Lin (MS 1994) worked in the Los Angeles area before starting work at Vienna Consulting Engineers Taiwan Branch on bridge design. Michelle Makley (BS 1994) received an MS from UC Berkeley in 1995 then spent three months in Central and South America. She has been working at CH2M Hill for a year on a variety of water and wastewater projects. Hank Seeman (BS 1994) is a project engineer with ERM-North Central, Inc. Paula Sanjinés (MS 1996) worked in Washington, DC on a World Bank initiative on sustainable development in agriculture before starting a job with CH2M Hill. She now works on the hydraulic expansion of a 200MGD wastewater treatment plant.

This photo of Lori Adams Simpson (BS 1987) and Kristen Meter (BS 1987) was taken at the 1986 ASCE student meeting in Reno, NV. Lori and Kristen won the “beam-busting” competition. Roger Newman (MS 1987), Bob Janssen (MS 1987), James Hoffman (MS 1987), and Torsten Duffy (BS 1986) sank the concrete canoe and were disqualified.
Few monuments have been studied as much by engineers as the Leaning Tower of Pisa. Constructed over a period of roughly two hundred years (1173-1370), the tower was already perilously tilting even before it was fully built. In 1990, with a total southward tilt already in the order of about 5.5 degrees (or a deviation close to 5.5 meters at the top), the tower was declared dangerous and closed to the public. No fewer than 17 committees have been formed since the construction of the tower, and the latest one is still at work trying to find the best way to correct this dangerous tilt.

This project involving four geotechnical investigators has produced the first three-dimensional finite element model ever constructed for the tower of Pisa. Previous numerical models have utilized either plane strain or axisymmetric assumptions, which unavoidably introduced unknown geometrical errors into the analyses. The goal of this project is to use the three-dimensional model to study the time-dependent behavior of the foundation subsoil. Among the factors included in the investigation are hydrodynamic lag due to fluid flow (or consolidation), and creep effects arising from the viscous behavior of an underlying soft clay deposit known locally as Pancone clay.

The modeling procedure involves a process of sequential construction using the finite element method. With this procedure, the finite elements representing the tower body are placed sequentially using the element birth option of a nonlinear finite element code called SPIN. The accompanying figure shows the finite element mesh for the tower of Pisa as the elements are being put in place. The tilting of the tower is triggered by a soft silty layer located directly below the tower foundation block, which increases in thickness in the southward direction. This geological feature has been well documented from extensive geotechnical investigations, and serves as the “imperfection” required by the numerical model to make the tower tilt.

The numerical modeling requires consideration of both material and geometric nonlinearities. The foundation subsoils are modeled using critical state soil mechanics and theory of plasticity, in which the yield surface is represented by the ellipsoid of modified Cam-Clay theory. The parameters for this model were obtained from high-quality laboratory tests conducted in Rome. The geometric nonlinearity is included in the analysis using a methodology known in continuum mechanics literature as the multiplicative decomposition of the deformation gradient. More recently, a strain localization option has been added to the finite element code to investigate bearing capacity and other related stability problems as a possible cause of continued tilting.

In July 1993, about 600 tons of lead ingots were laid on the base of the tower as a temporary stabilization measure. In June 1995 engineers began installing a concrete ring around the monument. This ring will be anchored to a layer of sand 50 meters below the ground by means of steel cables, eventually replacing the lead ingots. The present committee is now studying other remedial measures that have longer-term impact, such as electro-osmosis to alter the compactness of the soil, and subsoil earth removal which has been used on a tilting cathedral in Mexico City. The goal is not to straighten the tower completely, but just bring it to a stable tilt. Once properly calibrated, the numerical model developed in this research may be used as a tool to study the consequences of such proposed remedial measures.

*Deceased
also produced an enzyme (toluene orthomonooxygenase) that destroyed the TCE. Hydrogen peroxide was found to be effective for preventing excessive bacterial growth near the well screens, which otherwise might clog the screens. Hydrogen peroxide is ideal for this purpose as it hydrolyzes as it moves out into the aquifer, producing water and oxygen, the latter also being used by the bacteria to oxidize toluene. Another strategy used to reduce growth near the wells was to add oxygen and hydrogen peroxide continuously, but the toluene was added in pulses over a two hour period once each day. This pulsing helped move the toluene out into the aquifer further before it was oxidized, which help spread out the bacterial growth. Pulsing provided other benefits, such as providing a long period of time between pulses when toluene did not compete with TCE for the oxygenase enzyme, which further enhanced TCE degradation.

Laboratory studies by Dr. Ursula Jenal-Wanner, a postdoctoral scholar, helped establish that the native bacteria would be effective at TCE degradation, and provided rate data for simulation modeling. M.S. student T. J. Carrothers evaluated the kinetics of sorption and desorption of TCE to Edwards soils, a further requirement for simulation modeling. Graduate student Brett T. Kawakami conducted the simulation modeling for the proposed system, which was crucial in the determination of well spacing and pumping rate for design, and in estimating treatment effectiveness. Prof. Peter Kitanidis advised on this aspect of the study and on the field testing required.

Gary Hopkins, the EES Science and Engineering Associate, designed the field system, including the automatic sampling and analysis platform that permitted continuous sampling and analysis for all constituents of interest from the 41 sampling locations at a rate of one sample per hour. The treatment system was operated for one year by graduate student Jason P. Allan and postdoctoral scholar Mark E. Dolan, under Gary Hopkins’ supervision. During the last three months of the study, after chemical doses were optimized, 83 to 86 percent of the TCE was destroyed with each pass through a treatment well. Because of the recirculation in effect, several passes through the wells were obtained as regional groundwater moved through the treatment zone. This effected 97 to 98 percent removal of the 1,000 ppb TCE in the 50 to 60 meter wide plume that was drawn into the treatment zone. No water was drawn to the surface except for analysis.

A concern by regulatory authorities was over the fate of the added toluene, as it is a federally regulated chemical, that cannot exceed 1,000 ppb in drinking water (the added concentration was 9,000 to 13,000 ppb). However, the native bacteria were very efficient in destroying toluene, bringing its concentration down by 99.99 percent to an average of 1 ppb at the 22 meter square boundaries of the treatment zone. This is far below the drinking water standards, and even well below the odor threshold of 24 ppb and taste threshold of 120 to 160 ppb.

The WRHSRC now believes that this new technology is ready for commercial application. This technology will be applicable only where site conditions are appropriate and where cost comparisons with competing technologies are favorable. The Edwards aquifer is a relatively tight one with a somewhat high potential for clogging. For aquifers with higher hydraulic conductivity, this should be less of a problem. The WRHSRC is continuing studies on the fundamentals of this process, but is also investigating other significant groundwater contaminants, such as gasoline hydrocarbons, pesticides such as pentachlorophenol, and heavy metals. Groundwater contamination problems are significant and not likely to disappear for many years into the future. There is a continued need for innovative processes to address these relatively new, difficult, and costly problems.

Rahul Young was chosen as a recipient of the Hoefer Prize for Excellence in Undergraduate Writing. A faculty selection committee judged his paper, “Habitat Productivity” an outstanding writing achievement in engineering. The prize recognizes students and their faculty (Professor Martin Fischer) for outstanding work in courses that meet the University writing requirement for writing in the major. Each winner of the Hoefer Prize is presented with a certificate, an inscribed book, and a check for $250.

Students graduating with distinction are among the top 20% within their majors and among the top 20% within the graduating class as a whole, and have therefore met the criteria for graduation “with distinction”. The following students were honored with distinction:

Laura Elizabeth Chummers, Elizabeth Kay Nelson, Andrew Robert Price
The Alumni News Update is an important part of all our newsletters. Please help us by filling out and sending us the questionnaire below, and include a photo if you have one! We are anxious to stay in touch. Return your comments by fax (1-650-725-8662), or mail to: CEE Newsletter, Department of Civil and Environmental Engineering, Stanford University, Stanford, CA 94305-4020

Name: ___________________________________________________________

Graduating Class: __________ Degree: _______________________________

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