January 25, 2011

Dear Members and Friends of the Civil Engineering Institute,

As we begin 2011, I cannot help but reflect on our accomplishments in 2010. Our team, the Institute and the Civil, Environmental and Infrastructure Department (CEIE) at George Mason University, has achieved a new level of success.

More importantly, however, is the fact that having reached this new level, we have greater momentum and awareness to reach even higher levels. Provided in this 2010 Annual Report you will learn how our Department has broadened its mission and how the Institute can leverage new opportunities to partner with the Department which will ensure continued success and to provide its members greater returns!

Consider the facts that the CEIE achieved in 2010:

- Enrolled 300 undergraduate students;
- Increased graduate students to 60;
- Grew to be the 2nd largest Civil Engineering program in the DC metro area;
- Continued to be George Mason University’s fastest growing department in past 5 years;
- Approved a PhD program and had its first graduate;
- Provided students at all levels with new educational opportunities and recognition for their successes.

You will see that these achievements represent the efforts of an expanded and talented faculty with excellent leadership as well as an increasingly gifted and motivated student body.

Similarly, the Institute in 2010 had notable achievements. The Institute:

- Provided critical input into the design of the new curriculum for the Department;
- Re-vitalized its committee organization to better utilize the desires, skills and efforts of its members;
- Developed a plan to increase the membership of the Institute by offering to members greater roles and returns for their participation;
- Continued its role as a provider of scholarships, internships, and student activities which greatly enhanced the educational experience for the students.

The active Institute members are proud of the Institute’s achievements and feel immensely rewarded for their efforts.

The CEIE, under the influential leadership of Dr. Goodings, is considering the successes recognized in 2010 as a platform to achieve higher goals. Immediate plans include adding faculty at an unprecedented rate, creating a state of the art physical lab, increasing scholarship opportunities, and offering new student activities to vastly enhance the students’ education and experience at George Mason University. All of these require the support of the Institute and the region’s engineering industry as a whole.

It is with great pleasure that the Board of Directors proudly presents to you this 2010 Annual Report of the Civil Engineering Institute. The Institute is soundly operated and has achieved its financial and operational goals for the year. Please note that this Report also comes with a call to action. All Washington metropolitan region industry’s and organizations should seek to offer their support, both financially and with other resources, to help the George Mason University, Volgenau School of Engineering, Department of Civil, Environmental and Infrastructure Engineering continue its incredible success. After reading this report, contact a member of the Board or the CEIE Department and learn more about the benefits of your support!

Sincerely, and with best wishes for a successful 2011,

William G. Fry, PE
Chairman
Few engineering departments in the United States can boast as close a relationship to engineering practice as our Department of Civil, Environmental, and Infrastructure Engineering (CEIE) at George Mason. First and foremost in our link to practice is the Civil Engineering Institute.

As you leaf through this report on department activities, you will see the many ways in which the Civil Engineering Institute has supported our students. This includes allocation of funds for scholarships; for special events for our undergraduates; for prizes for high school students in our hugely successful popsicle stick bridge competition; and for very substantial support for the student chapters of Chi Epsilon, Design-Build Institute of America, the American Society of Civil Engineers, and Engineers Without Borders. Their influence extends to curriculum advising; assistance in placing students in internships; willingness to bring practice experience into our classrooms; networks to locate outstanding adjunct instructors; and advocacy for the department. The Civil, Environmental, and Infrastructure Engineering Department is grateful for the Civil Engineering Institute’s generosity in terms of their time, their advice, and their financial support.

The Civil Engineering Institute continues to be our partner as we plot our future course. As William Fry points out in his welcome as the Civil Engineering Institute Chairman, what was once a small department educating engineers with an emphasis in land development engineering, has become a much larger program, preparing students to practice across the spectrum of civil engineering, both within the United States, and, increasingly, internationally. In this report you will sense the vitality of our program.

Even with our impressive growth, our efforts are focused on where we’re headed. In the next five years we mean to elevate our status in civil engineering higher education both locally in the mid-Atlantic states, and nationally; and in so doing, to enhance our contribution to the economic prosperity of the Washington DC metropolitan region. In terms of our student body, we aim to plateau our undergraduate population while raising the academic bar for admission and retention in CEIE. We are introducing a Civil Engineering Honors Program that is the most ambitious honors program at George Mason. International opportunities for undergraduates are expanding, including an Engineers Without Borders chapter already at work on a water project in Peru; and efforts are underway to create a civil engineering semester study abroad program. Our graduate program will follow suit: our target is to increase our enrollment by 50%, engaging graduate students in study that offers education for high level engineering practice, and increased opportunity for study that culminates in engineering research. As part of that we anticipate final approval shortly for a new Master of Engineering that offers integrated study of structural, geotechnical, and construction engineering, a degree unprecedented in the United States.

We have our work cut out for us. In order to reach these goals, we propose in the next five years:

- To add four full-time faculty members, and one endowed professorship.
- To create a materials testing laboratory that enhances textbook learning and satisfies ABET re-accreditation.
- To expand CEIE scholarship resources to fund full-ride undergraduate scholars.
- To offer support for graduate students competitive with our aspirational peers.
- To cultivate an endowment that will provide funds for undergraduate projects; for partial support of distinguished visiting faculty; and for our own faculty on sabbatical; and for enhancement of research initiatives.

Our successes have been the result of a shared vision, supported by an enviable partnership between our department, engineering practice, and civically-minded individuals. Our shared future depends on rededicated collaboration of these partners. Join us.

Deborah J. Goodings, Ph.D., P.Eng, FASCE, D.GE
Dewberry Professor
and Department Chairman
Mission and Membership

The Civil Engineering Institute is a nonprofit corporation registered in the State of Virginia since 1989, with the purpose of assisting the Civil and Infrastructure Engineering program of George Mason University. The objectives of the Civil Engineering Institute include:

- advising on curricula changes to keep the program on the leading edge of the professional practice;
- providing liaison with the business community for teaching and advising;
- assisting in internship placement for students;
- assisting in securing nationally-recognized faculty by raising private Eminent Scholars endowments; and
- fundraising for scholarships, student activity support, and academic program assistance to supplement that provided by the university.

Membership in the Civil Engineering Institute is open to private companies, public agencies, and individuals, who are committed to the importance of investing in engineering education. Members join because they are committed to:

- building the CEIE Department;
- developing relationships with CEIE faculty, students and industry;
- expanding and sustaining student scholarships and education; and
- partnering with GMU and industry leaders in providing employment opportunities.

In return, Civil Engineering Institute members receive the following benefits:

- special invitations to attend student and visiting lectures;
- special access to CEIE students and alumni and recruiting events, and a "Member-only" exclusive access to the CEIE "student résumé book";
- recognition of members as CEIE Department supporters on the CEIE website;
- invitations to social events organized annually by CEI Board Members and Committees; and
- opportunity to earn a seat on the CEI Board of Directors.

By participating in a variety of CEI and Volgenau School of Engineering activities — academic, leadership, educational and social — companies become integrated into the fastest growing and most quickly advancing civil engineering program in the Washington DC metropolitan region. Join, for your sake and the students’.

Membership Category | Annual Dues
--- | ---
Individuals: | $ 150
Under $5 million in annual revenues | $ 500
Over $5 million in annual revenues | $1,250
Public Services: | 
Those serving population under 25,000 | $ 500
Those serving population over 25,000 | $1,250

2009 – 2010

**Member Organizations**

ATCS, P.L.C.
Balfour Beatty Construction
Bohler Engineering, P.C.
Christopher consultants, ltd.
Dewberry
ECS Mid-Atlantic, LLC
Engineers & Surveyors Institute, Inc.
Fairfax Water
Lance Construction
Parsons Brinckerhoff
Patton Harris Rust & Associates, P.C.
PBSK
R.E. Daffan, Inc.
Shirley Contracting Co., LLC
The Engineering Group, Inc.
Tri-Tek Engineering, Inc.
Vanasse Hangen Brustlin, Inc.
Washington Gas
Wetland Studies and Solutions, Inc.
William A. Hazel, Inc.

**Representatives**

Mr. Bill Caruthers
Mr. David Laib
Mr. Adam J. Volanth
Mr. Lou Canonico
Mr. Kurt Thompson
Ms. Tricia Shilton
Dr. Terrance C. Ryan
Ms. Jaime Bain Hedges
Mr. Farid Hamad
Mr. Eric Ulsh
Mr. Edward G. Venditti
Ms. Terry Suehr
Mr. Larry Dickenson
Mr. Michael E. Post
Mr. John S. Groupe, V
Mr. Kevin Murray
Warren Hughes
Mr. Hardeep S. Rana
Mr. Brian Chromey
Mr. David M. Speed

**Individuals**

Mr. Richard Benton
Mr. Michael Bronzini, Emeritus
Mr. Charlie Crowder, Jr., Emeritus
Mr. Sidney O. Dewberry, Emeritus
Mr. David Donahue
Mr. William Fry
Mr. John Gaston
Mr. H.S. Hulme, Jr., Emeritus
Mr. Richard S. Kem
Mr. James Kirk
Mr. Carl H. McNair, Jr.
Mr. Peter Rigby
Mr. Harold L. Rodriguez
Mr. Howell B. Simmons
Mr. Joseph Vilseck III
The Civil Engineering Institute Board of Directors meets regularly to conduct its business, to interact with CEIE, and to report on committee activity. Directors are elected by the Civil Engineering Institute membership, and serve three-year staggered terms. The Board elects its officers from among its ranks. Mr. William G. Fry, P.E., Chairman; Mr. Hardeep S. Rana, P.E., Vice-Chairman; and Dr. Deborah J. Goodings, P.Eng., F.ASCE, Executive Director, were elected in 2010, and will continue through 2011.

Directors serve on committees with the following foci:

- Internships, Scholarships and Fellowships
- Curriculum and Programs
- Annual Meeting Planning
- Civil Engineering Institute Membership
- Financial, Fund-raising and Grants
- Bylaws, Nominating, and Awards

The Civil Engineering Institute is grateful for the service of the following people who are departing the Board in 2011:

MG (Ret.) Russell L. Fuhrman, P.E.
Mr. Thomas W. Julian, P.E., LEED GA
MG (Ret.) Richard S. “Sam” Kem, P.E.
Mr. Joseph W. McClellan, P.E.
MG (Ret.) Carl H. McNair
Mr. George Morschauser, P.E.
Mr. Michael J. O’Hara, P.E., LEED AP
Dr. James E. Woods, P.E.

ASCE’s 4th Annual Popsicle Bridge Competition

2010 Board of Directors

Mr. S. Richard Benton, P.E., FASCE, DBIA
SR Benton & Associates, LLC
Mr. Brian Chromey, P.E.
Wetland Studies and Solutions, Inc.
Mr. Lawrence B. Dickenson
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MG (Ret.) Russell L. Fuhrman, P.E.
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Mr. John S. Groupe V, P.E.
The Engineering Groupe, Inc.
Mr. Farid K. Hamad, P.E.
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Ms. Terry Suehr, P.E.
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Patton, Harris, Rust & Associates, P.C.
Mr. Joseph R. Viseck, III, P.E.
Timmons Group
Mr. Adam J. Volanth, P.E.
Bohler Engineering, P.C.
Dr. James E. Woods, P.E.
The Building Diagnostics Research Institute, Inc.
Emeritus Members
Dr. Michael S. Bronzini, P.E.
Mr. Charlie C. Crowder, Jr.
Mr. Sidney O. Dewberry, P.E., L.S.
Mr. H. S. Hulme, Jr.
CEIE Faculty Ex Officio
Dr. Tomasz Arciszewski
Dr. Michael Casey, P.E.
Dr. Sharon deMonsabert, P.E.
Dr. Liza Wilson Durant
Dr. Aimée Flannery, P.E.
Mr. Edward G. Venditti, P.E.
Patton, Harris, Rust & Associates, P.C.
Mr. Joseph R. Viseck, III, P.E.
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Mr. Sidney O. Dewberry, P.E., L.S.
Mr. H. S. Hulme, Jr.
Close to 200 people attended the fifth Civil Engineering Institute Awards Luncheon and Annual Meeting on January 26, 2010, with eighteen firms sponsoring tables. Guests were welcomed by Mr. Ron Ewing, the outgoing Civil Engineering Institute Chairman, and Dr. Lloyd Griffiths, Dean of the Volgenau School of Engineering. New Civil Engineering Institute Board members were elected; outgoing and continuing Board members were recognized for their service; and Mr. Bill Fry assumed the leadership of the Civil Engineering Institute, succeeding Ron Ewing. Dewberry Professor and CEIE Department Chairman, Dr. Deborah Goodings, provided an overview of the department’s impressive current status and sketched out ambitions for the next year. Bill Fry introduced the distinguished 2010 Engineering Excellence and Leadership Awardee, General Henry Hatch, P.E., N.A.E., D.M. ASCE. General Hatch took a few moments to describe his convincing vision of civil engineers as leaders in engineering a sustainable environment and infrastructure, both domestically and internationally. The West Point Glee Club provided the surprise musical entertainment, inviting General Hatch to join them.
CEIE Student Enrollment

Undergraduate Studies:

The Civil Infrastructure Engineering undergraduate population has increased four-fold since 2000, stabilizing at 300 students this year, of which roughly 90% are Virginia residents. In 2009-2010, the department graduated 52 students, bringing the department's alumni — both Civil Infrastructure Engineering and Urban Systems Engineering — to just over 350 students. This growth has posed challenges and created opportunities, and while an academic department is always a work in progress, both students and faculty are enthusiastic about the directions the program is taking.

In spring 2011, the department is introducing an Honors Program in Civil and Infrastructure Engineering to create a community of outstanding scholars in civil engineering who share a commitment to learning, service, and leadership. Entry to the Honors Program is by invitation, extended to students with a high school GPA of at least 3.8. The Program is distinct from the University Honors Curriculum, requiring a demanding curriculum of civil engineering and supporting courses. While it requires the same number of credits as a regular BS-CIE, Honors students must complete an advanced communications course and a minimum of 18 credits of honors courses.

Graduate Studies:

CEIE graduate students may pursue a Ph.D., an M.S., or non-degree certificate programs in the department. Our graduate student enrollment has reached 90, doubling over the past 5 years. Between our strategic position in northern Virginia, and the expectation that P.E. registration will soon require either an M.S. or 30 credits beyond the B.S., we expect continued steady growth in our graduate program.

The department is also in the final stages for approval for a new Master of Engineering (M.Eng.) degree in structural, geotechnical, and construction engineering. The curriculum for the M.Eng. was designed in collaboration with leading practicing engineers to develop a course of study that recognizes that structural, geotechnical, and construction engineering are practiced together, and should be taught together in an integrated manner. The purpose of the degree curriculum is to educate engineers for practice, for excellence in design and execution now, laying the groundwork for practice demands 25 years from now. It is a program that balances theory and practice, building on the foundation of an undergraduate degree in civil engineering. New courses in bridge engineering, advanced steel design, engineering geology, and construction law will be offered in 2011 in support of the new degree.

While the department has graduated Ph.D.'s in the past through a Volgenau School-wide Ph.D. track, the Civil, Environmental, and Infrastructure Engineering dedicated Ph.D. program was made official in 2009. Twelve students are currently registered in the program, and Dr. Cerasela Cristei, a transportation engineer with Dewberry, graduated in 2010 as our first official PhD, under the supervision of transportation engineering Professor Aimee Flannery.
The Civil Engineering Institute supports distinguished CEIE students with scholarships. In 2010-2011, three undergraduates received CEI tuition support.

James Milliken has taken great advantage of his four years at George Mason. Not only is he an outstanding scholar, and an officer in the GMU student chapter of the Society of American Military Engineers, but he has led the student formation of the International Engineering Group that has since become the GMU chapter of Engineers Without Borders-USA. His civil engineering interest in sustainable development in low-income regions of the world led him to accompany Professor Arciweski to Nigeria in fall 2010 to attend a National Science Foundation conference. Jim will graduate in spring 2011, and will continue on for an MS in civil engineering.

Matin Kheyani transferred to George Mason University from Boise State University in January 2009. Matin is an outstanding student with particular interest in construction management, carrying on his family tradition in construction engineering. He was active in the GMU student chapters of the American Society of Civil Engineers, the Design-Build Institute of America, and a member of the civil engineering honor society, Chi Epsilon. Matin graduated in December 2010, and he plans on attending graduate school part-time while working in construction.

Trevor Hughes arrived at George Mason from Frederick Community College in Maryland in fall 2008. Another excellent student, Trevor is interested in environmental and infrastructure engineering as it relates to the developing world. He has been heavily involved in CEIE student organizations including Chi Epsilon as its secretary, and Engineers Without Borders-USA as its vice-president. He will graduate in spring 2011, and plans to continue on for his MS in civil engineering.

Undergraduate John Guenther distinguished himself, and our department, in fall 2010 by winning a nationally competitive SMART scholarship (Science, Mathematics, And Research for Transformation) administered by the American Society for Engineering Education for the U.S. Department of Defense. This generous scholarship covers John’s tuition and living expenses for his final year at GMU. In return, John will spend one year after graduation working with the US Air Force’s Space and Missile Center in Los Angeles.

Freshman Zachary High, an outstanding student from Chesapeake, VA, joined CEIE in fall 2010 as the first A. James Clark Distinguished Scholar in the Volgenau School. Zachary, a straight A student and Student of the Year in several of his high school classes, is also a saxophonist. The A. James Clark Distinguished Scholarship provides Zachary with a full scholarship — tuition, books, and a stipend for room and board — for four years of civil engineering undergraduate study.

In spring 2010, the Construction Management Association of America at their annual banquet recognized CEIE graduate student Farzad Amir Faryar, and CEIE undergraduate Kristen Stevens, with scholarships for their scholastic achievement and interest in the construction field.

Benyamin Marks was awarded the Virginia American Water Works Association Graduate Scholarship, from a competitive field of students from Virginia Tech, University of Virginia, and Old Dominion. Ben is using his scholarship to support his graduate studies in water resources engineering.

Kristen Stevens and Shweta Dixit were recognized by a special scholarship from the Washington Area Railway Engineering Society. Kristen will apply her award to her final undergraduate semester. Shweta will use hers in support of her Ph.D. studies in transportation engineering under the guidance of Professor Mohan Venigalla.
All full-time faculty engage in research, both to advance engineering science as well as to educate graduate students in critical thinking. Increasingly undergraduates are also asking to be part of these initiatives.

M.S. students are required to complete either a research thesis or an independent study project. In 2010, the following independent study projects were presented, projects that provide insight into the interests of our students and of the faculty.

- Nicky Le – The Application of Building Information Modeling in Sustainability Design for New Buildings
- Jesse Coleman – Building Information Modeling Mobile: IFC File Viewer for iPhone OS Devices
- Hieu Tran – Laser Scanning for Building Information Modeling Creation
- Chris Williams – Forensic Scheduling Analysis
- Chi Chuk – Numerical Analysis of Stresses for Cured In-place Pipe Linings
- Paul Jenkins – Munition Fragmentation Model
- Shweta Dixit – Dis-aggregation of Hazardous Material Freight Data to County Level for a Metropolitan Region using Freight Analysis Framework Database
- Aaron Montgomery – Maintaining Operations at a Wastewater Treatment Plant during Construction
- Alex Iszard – Sustainability: An Alternative Point of View
- Sean McBride – Estimating the Carbon Imprint for the Cable Industry

Of particular note this year, CEIE Dewberry Professor Emeritus Dr. Michael Bronzini; newly-appointed research professor, Dr. K.T. Thirumalai; and CEIE associate professor, Dr. Mohan Venigalla were awarded a two-year $1.3 million research contract by the U.S. Department of Transportation on Multimodal Short Sea Freight Shipping. Multimodal Short Sea Freight Shipping has the potential to divert movement of freight from the heavily travelled I-95 corridor on the east coast, to inland and coastal waterways, reducing highway congestion and stress on our highway infrastructure, as well as reducing fuel use and associated carbon emissions. The research will produce guidelines and evaluation tools for shipping operators, port authorities, metropolitan planning organizations, and state and local transportation engineers to deliver a first-ever systematic and scalable methodology for evaluating Multimodal Short Sea Freight Shipping routes.

Will Kelsey, José Castillo, and Riyam Alobaidi presenting their work

Shweta Dixit disaggregates
International Initiatives

The Civil, Environmental and Infrastructure Engineering Department is undergoing significant change driven by the progress in Information Technology and by the related globalization of engineering. Civil engineering no longer operates on the local level and outsourcing is becoming an ever more critical issue in the future of our profession. In recognition, our research, professional activities, and teaching reflect the need to graduate civil engineers who are globally aware and prepared for the global competition.

International activities initiated by students, including the American Society of Civil Engineers student chapter trip to Paris in January, 2010, and the Engineers Without Borders-USA projects underway now, (both of which are described under Student Group Activities), indicate clear student interest in international engineering. So also do their choices in course selection.

Twenty-six undergraduate and graduate students enrolled in spring, 2010, in CEIE’s first offering of Sustainable Water Resources Infrastructure in Developing Countries, taught by Dr. Barry Liner. The course dealt with the principles of infrastructure engineering and planning in developing countries, with a particular focus on sustainable technologies for rural and small-scale water and wastewater. It also incorporated technical, socio-cultural, public health, and economic factors into the planning and design of water and sanitation systems. The course is being offered again in 2011. Student enrollment also continues to be high in CEIE’s Professor Mark Houck’s freshman course, Environmental Engineering around the World.

While GMU’s Center for Global Education offers study abroad opportunities for undergraduates in many majors, none currently exist to expose students to international engineering curricula. As our Director of International Engineering Programs, Dr. Barry Liner is working on correcting that, examining opportunities for our CEIE students to spend a semester studying civil engineering abroad with minimal delay in their GMU graduation. At present he is exploring partnerships with universities in Spain, in Ireland, and in Britain.

Dr. Sebastian Koziolek, a junior faculty member in the School of Mechanical Engineering at the Wroclaw University of Technology in Poland, joined the department as a visiting scholar in fall 2010. He worked primarily with CEIE Professor Tomasz Arciszewski in the area of inventive engineering.

The interest of foreign universities in engaging with our department through formal agreements is also increasing, and is an initiative supported by GMU’s Provost. Last year, Professor Tomasz Arciszewski was the architect of a memorandum of understanding signed between our department, and civil engineering departments at several Nigerian universities. Professor Arciszewski reinforced our interest in developing that MOU in a trip to Nigeria in November, 2010, taking with him undergraduate, Jim Milliken, and MS graduate student, Scott Remer, both of whom are interested in international engineering. Efforts are also underway to develop civil engineering education programs to assist universities in southeast Asia, developing opportunities offered by the U.S. State Department Agency for International Development.
The CEIE undergraduate experience is enriched by activities and opportunities outside the classroom experience. The extent and breadth of student-driven activities demonstrate the vitality of our students and their enthusiasm for professional development. CEIE student chapters of professional associations provide the platform for many of these activities.

For the past four years, an annual Design-Build Student Night has been held at George Mason in association with the Mid-Atlantic Chapter of the Design Build Institute of America. In January 2010, CEIE students formalized their interest in design-build by forming a GMU chapter of the Design Build Institute of America, the only student chapter in the National Capital Region. The founding student members drafted a constitution and elected a board led by President and CEIE Senior, Kristen Stevens. In May, the chapter toured the Maryland Inter-County Connector (ICC) Contract C site currently being built by a joint-venture of Clark Construction, Shirley Contracting, and Dewberry, among others. In October, five students attended the National Conference of the Design Build Institute of America in Las Vegas made possible by travel support from Design Build Institute of America Mid-Atlantic and the Civil Engineering Institute.

The Institute of Transportation Engineers student chapter held its second annual Washington DC Section of the Institute of Transportation Engineers on September 18, 2010, in the atrium of the Nyugen Engineering Building. The event is an opportunity for members of the Institute of Transportation Engineers Chapter Washington DC chapter to interact with CEIE students eager to learn about career opportunities in transportation engineering. This year, students heard presentations from Cambridge Systematics, Inc., and Kittelson & Associates; and were given an overview of the Transportation Research Board’s Strategic Highway Research Program.

In fall 2010, eight CEIE undergraduates, one CEIE alumna, and Professor Deborah Goodings took the oath of the Order of the Engineer, organized by Harold Rodriguez (a CEIE alumnus and a Civil Engineering Institute member). The oath is similar to the Hippocratic oath in the medical profession. It sets forth an ethical code of professional integrity and requires members to shoulder their responsibility to serve and to protect the public in their engineering practice. Engineers receive a stainless steel ring to wear on their working hand. This was the first ceremony at GMU, and it will be repeated annually.

Civil Engineering adjunct faculty member, Ronaldo Nicholson, takes students on a field visit to the HOT Lanes project in Tysons Corner, VA.
In spring, 2010, CEIE students formed the International Engineering Group of George Mason University. The Group worked with the University of Maryland’s Engineers Without Borders-USA chapter to collaborate on a simple infrastructure project in Compone, Peru, near Machu Picchu, a small community in the Andes experiencing water shortage arising from global climate change. Ms. Mariana Cruz, a CEIE rising senior, and Dr. Barry Liner travelled to Compone for two weeks in August with University of Maryland EWB-USA chapter members, using travel funds provided by the GMU’s Provost’s Office. The team evaluated irrigation and drinking water strategies to stretch water resources in the Andean village, working with the local community and local non-governmental organizations. Upon completion of a formal assessment report, Mason accepted the task of designing a solution — either a repair or a replacement — for an existing, but unusable, water storage tank.

In fall, 2010, a student project manager, design team members, and professional engineering mentors were identified and they have been working together on project design. Although CEIE students dominate the project, students from other departments, both within the Volgenau School, and outside, have joined the project team. In November, 2010, the GMU International Engineering Group’s application to become the George Mason University chapter of Engineers Without Borders-USA was approved. The new GMU chapter continues to coordinate with the Maryland chapter, and is working toward an implementation trip to Peru in May, 2011, to construct the tank. This trip will be supported by a combination of funds, included a generous grant from the Civil Engineering Institute; funding from the GMU Provost’s Office; funds the students are raising independently; and funds students will put up from their individual resources.

Under the leadership of the Chapter President Jacobo Flores, Vice President Karim Shalaby, Treasurer Mostafa Ibrahim, Secretary Casey Hudson, and Chairman Megan Salame and with significant support from the Civil Engineering Institute, the American Society of Civil Engineers GMU student chapter, hosted an impressive roster of activities and events in 2009-2010. The ASCE student chapter attracts the largest membership from among CEIE undergraduates.

In November, 2009, the student chapter organized the fourth annual ASCE Civil Engineering Career Fair generating revenue for the organization to support events and travel for student members. Nine companies, including several Civil Engineering Institute member companies, attended the fair and recruited CEIE students for summer internships and entry-level positions.
In January, 2010, nine ASCE student members traveled to Paris, to learn about civil engineering practices and research methods in Europe. This trip, as in past years, was made possible with the substantial assistance of the Civil Engineering Institute. The group was accompanied by Dr. Barry Liner, and hosted by Dr. Jean-Francois Semblat of the Central Laboratory of Highways and Bridges. Students spent considerable time in the Central Laboratory of Highways, Soils and Structural Testing Laboratory, and attended a Construction with Earth and Sustainable Development exhibition at the Cité des Sciences & de L’industrie, the largest science museum in Europe. Students completed their travels with a visit to Omaha Beach in Normandy and used the second busiest public transit Metro System in the world to tour the Eiffel Tower, the Louvre, Notre Dame, Versailles, and Napoleon’s resting place at Les Invalides.

ASCE students were heavily involved in assisting in a highlight of GMU’s Engineering Week in February, 2010: the Fourth Annual Popsicle Stick Bridge Contest. This competition has been organized by CEIE since 2007, with prize money contributed by the Civil Engineering Institute. Twenty-nine high school teams designed, constructed, and load-tested truss bridges made from balsa wood popsicle sticks and glue. Bridges were judged primarily on the ratio of ultimate load to bridge weight. The winning team came from McLean High School with a bridge weighing less than a pound, yet failing with a load of 248 pounds.

In March, 2010, three students from the GMU ASCE student chapter were invited by ASCE National to attend the ASCE’s 2010 Outstanding Projects and Leaders (OPAL) Awards. The event, held in Washington, DC, celebrates the civil engineering profession by recognizing outstanding individuals and projects that have enhanced civil engineering methods, projects and achievements which inspire future generations of engineers. During the OPAL Awards event, students met ASCE National President Blaine Leonard and invited him to George Mason where he delivered ASCE’s vision on “The Future Engineer: Civil Engineering in 2025.”

In April 2010, the ASCE Student Chapter fielded its second steel bridge team for the Virginia Regional ASCE Student Conference held at Catholic University. The GMU team competed against other engineering schools in the Virginia, West Virginia, and the Washington, DC area participated in the AutoCAD, Technical Paper, Surveying, Mystery Design and Steel Bridge Competitions. The team was supported by Cives Steel of Winchester (VA) who provided the supply and fabrication of the steel; and by Kurt Fischer of Shirley Contracting Company, LLC, and Patton, Harris, Rust & Associates (both Civil Engineering Institute members) who provided surveying equipment. GMU ASCE student members are already at work on their design for the steel bridge competition scheduled in April, 2011, in West Virginia.
While CEIE bid farewell in 2010 to Ms. Jean Jefferies, our wonderful office manager who expertly managed faculty and student needs, as well as those of our Civil Engineering Institute, the department has undergone a net increase in personnel.

**Dr. Liza Wilson Durant** joined the CEIE Department in August, 2010. Dr. Durant is an environmental engineer whose PhD research at The Johns Hopkins University focused on bioremediation of petroleum hydrocarbons in aquifers. She brings to the classroom the insights of her consulting experience evaluating the feasibility and economics of hazardous waste management and remediation, integrated with risk assessment, and her experience as an American Association for the Advancement of Science Environmental Science and Engineering Fellow. In her first year with us, Dr. Durant is teaching in environmental and water resources engineering, as well as in civil engineering information technology at the undergraduate level. She is also expanding our graduate program offerings with a new course in environmental engineering microbiology offered in spring, 2011.

**Dr. Barry Liner**, a home-grown GMU PhD, was appointed in fall, 2010, to the new position of Director of International Engineering Programs, a part-time position funded through seed money from the GMU Provost’s Office. Dr. Liner brings important strengths to this position, as an environmental engineer with practice experience, including in the international arena; as the Water Environment Federation’s Director of its new Water Science and Engineering Center; as a visiting assistant professor in CEIE last year; and as the faculty advisor to our ASCE students on their trip to Paris in January, 2010. His responsibilities as Director of International Engineering Programs, focus on developing our GMU chapter of Engineers Without Borders-USA, and their project work in Peru; and on developing our civil engineering study abroad, both of which are described in other sections of this report.

This fall the Civil, Environmental, and Infrastructure Engineering Department welcomed **Nicole Jerome** as our new administrative assistant and office manager. Nikki is a 2010 Mason honors graduate in Government and International Politics, who is studying now for a graduate degree in Public Administration at GMU. Nikki’s familiarity with the university through her career as an undergraduate at George Mason, as well as her current experience as a graduate student, has been a real asset to the department, as well as her energy and resourcefulness.
Educating on the order of 400 students a year requires dedicated faculty. Even with recent increases in faculty size, the excellent and creative efforts of CEIE’s faculty is impressive, not only to maintain the status quo but to introduce new programs. These outstanding faculty include:

**Fulltime Faculty:**

- Tomasz Arciszewski, Professor. Ph.D., Warsaw University of Technology. **Expertise:** structural and inventive engineering; education; international engineering.

- Michael J. Casey, P.E., Assistant Professor. Ph.D., University of Maryland. **Expertise:** construction and project management; building information modeling; geographic information systems.

- Sharon deMonsabert, P.E., Associate Professor. Ph.D., Purdue University. **Expertise:** environmental engineering; sustainability; energy.

- Liza Wilson Durant, Assistant Professor. Ph.D., The Johns Hopkins University. **Expertise:** transportation engineering; highway operations; highway safety; performance measurement.

- Deborah Goodings, P.Eng., FASCE, D. GE., Dewberry Professor of Civil Engineering and Department Chairman. PhD, Cambridge University. **Expertise:** geotechnical engineering; extreme geotechnics; international engineering.

- Mark Houck, P.E., FASCE. Professor. Ph.D., The Johns Hopkins University. **Expertise:** water resources; infrastructure security; water management.

- Girum Urgessa, Assistant Professor. PhD, University of New Mexico. **Expertise:** structural engineering; computational mechanics; composite materials.

- Mohan Venigalla, P.E., Associate Professor and Associate Department Chairman. Ph.D., University of Tennessee. **Expertise:** transportation engineering; transportation planning; transportation air quality.

**Director of International Engineering Programs**

- Barry Liner, P.E., LEED GA. PhD, George Mason University. **Expertise:** sustainability, water resources, international development, engineering management.

**Research Faculty:**

- Michael Bronzini, P.E., FASCE, Emeritus Dewberry Professor. Ph.D., Pennsylvania State University. **Expertise:** national transportation networks; transportation security; remote sensing.

- K.T. Thirumalai, Dr.Ing., Freiberg Technical University (Freiberg Academy), Germany. **Expertise:** Multimodal transportation; innovation policy; infrastructure systems; engineering mechanics.
Adjunct Faculty 2010:

A signature of the Department of Civil, Environmental, and Infrastructure Engineering is the incorporation of leading engineers in practice into our curriculum as adjunct faculty. We are grateful to engineers who enrich our curriculum by a lecture or service on a panel, however adjunct faculty take full charge of a course, beginning to end, while maintaining their positions in their engineering practices. This demanding and underpaid gift to our students, and ultimately to civil engineering practice, is outstanding, and as such we recognize the following engineers who joined us as adjunct faculty in 2010:

- Mr. Stephen Benton, SR Benton & Associates, LLC
- Mr. Jagannath Bhargava, General Services Administration
- Mr. David Binning, Applied Engineering Management Corporation
- Dr. Michael Chipley, independent consultant
- Mr. David Donahue, Arlington County Department of Environmental Services
- Mr. Matthew Doyle, Fairfax County Government Department of Public Works and Environmental Services
- Dr. Gary Greene, Professional Service Industries (for Federal Highway Administration)
- Dr. Joseph Hartmann, Federal Highway Administration
- Mr. William Johnson, Wells + Associates, Inc.
- Dr. Michael Krimmer, Northern Virginia Community College
- Mr. John Matusik, The Engineering Groupe, Inc.
- Ms. Laura Miller, Global Engineering Solutions (for US Army Corps of Engineers)
- Mr. Ronaldo Nicholson, Washington D.C Department of Transportation
- Mr. Dean Randall, HydroLogics, Inc.
- Mr. Duane Reger, Trademasters Service Corp
- Mr. Harold Rodriguez, Jacobs Engineering
- Mr. Phillip Shapiro, Shapiro Transportation Consulting
- Mr. Paul Swanson, Facilities Engineering Associates
- Mr. Richard Thoesen, City of Fairfax Government
- Mr. Harry Ward, Harken-Reidar, Inc.
- Dr. Robert Zobel, Professional Service Industries (for Federal Highway Administration)
Year in Review

CEIE 2010 Fall Graduates

Civil engineering career fair

CEIE students in class

CEIE students in the field

Attendees at the CEIE 2010 Annual Meeting
The consolidated Treasurer’s Report for FY2009 appears opposite, covering the period from July 1, 2009 to June 30, 2010. The upper portion of the report shows the Civil Engineering Institute operating account. Institute Foundation income is derived principally from Civil Engineering Institute membership dues, and the January Annual Meeting Luncheon. Foundation expenses are shown below that. Just over $13,000 was spent on student activities — a graduation lunch and gifts; and support for ASCE students to visit France — and over $3,000 was spent on CEIE student Scholarships.

The middle section of the report shows that $23,500 was awarded as scholarships from endowed accounts; this was distributed among nine students, three of whom received continued support in 2010-2011.

The bottom section reports on the three endowed Civil Engineering Institute scholarship funds. In the case of the Civil Engineering Institute Scholarship and the PHRA (Patton, Harris, Rust & Associates) Scholarship, funds that are invested by the George Mason University Foundation, the endowment values at the end of FY2010 fell below the original gift values, precluding spending from the endowment this year.

The Bronzini Scholarship Fund remains below the endowment threshold $25,000; the Civil Engineering Institute will begin to top up that account in this fiscal year.

Once again the Civil Engineering Institute has handled its funds conservatively, allowing it to address three priorities in FY2011. These include scholarship awards; support for expanding student group activities; and renovation and outfitting of an essential materials testing undergraduate laboratory. The department is grateful for the ongoing support of the Civil Engineering Institute.
# George Mason University Civil Engineering Institute
## Consolidated Treasurer's Report  FY 2010

### CEI Account

<table>
<thead>
<tr>
<th>Opening Balance</th>
<th>$ 32,177.15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
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</tr>
<tr>
<td>Member Dues</td>
<td>$27,900.00</td>
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<tr>
<td>Contributions</td>
<td>$ 960.00</td>
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<tr>
<td>CEI Annual Meeting</td>
<td>$16,580.00</td>
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<td>CEI Events</td>
<td>$ 83.33</td>
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<tr>
<td>Total</td>
<td>$45,523.33</td>
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<tr>
<td>Total Funds Available</td>
<td>$77,700.48</td>
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<table>
<thead>
<tr>
<th>Expenditures</th>
<th></th>
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<tbody>
<tr>
<td>GMUF Administrative Fees (3% of income)</td>
<td>$ 1,363.20</td>
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<tr>
<td>Meeting Expense</td>
<td>$ 606.68</td>
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<tr>
<td>Graduation Luncheon</td>
<td>$ 2,131.30</td>
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<td>CEI Annual Meeting</td>
<td>$ 8,988.82</td>
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<td>CEI Events</td>
<td>$ 53.69</td>
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<tr>
<td>Student Travel</td>
<td>$ 9,965.44</td>
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<tr>
<td>Scholarships</td>
<td>$ 3,356.02</td>
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<td>Gifts</td>
<td>$ 1,219.22</td>
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<td>Total</td>
<td>$27,684.37</td>
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### Scholarship Accounts

#### CEI Endowed Scholarship

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<th>Opening Balance</th>
<th>$ 16,178.60</th>
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<tr>
<td>Income</td>
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<tr>
<td>Contributions</td>
<td>$ 2,000.00</td>
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<tr>
<td>Endowment Payout</td>
<td>$ 4,000.00</td>
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<tr>
<td>Expenditures</td>
<td></td>
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<tr>
<td>Scholarship Awards</td>
<td>$(20,000.00)</td>
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<tr>
<td>GMUF Fees</td>
<td>$(60.00)</td>
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<td>Closing Balance</td>
<td>$ 2,118.60</td>
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#### PHRA Endowed Scholarship

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<thead>
<tr>
<th>Opening Balance</th>
<th>$ 2,765.38</th>
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<tbody>
<tr>
<td>Income</td>
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<tr>
<td>Endowment Payout</td>
<td>$ 1,600.00</td>
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<tr>
<td>Expenditures</td>
<td></td>
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<tr>
<td>Scholarship Awards</td>
<td>$(3,500.00)</td>
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<tr>
<td>Closing Balance</td>
<td>$ 865.38</td>
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</tbody>
</table>

### Total Scholarship Funds Available

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Total Scholarships</td>
<td>$2,983.98</td>
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### Endowment Funds

<table>
<thead>
<tr>
<th>Gift Value</th>
<th>CEI Scholarship</th>
<th>PHRA Scholarship</th>
<th>Bronzini Scholarship</th>
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<tbody>
<tr>
<td>Market Value June 30, 2009</td>
<td>$ 80,117</td>
<td>$ 31,346</td>
<td>$ -</td>
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<tr>
<td>Net Earnings, FY09-10</td>
<td>$ 3,704</td>
<td>$ 1,449</td>
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<td>Distribution for current use*</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Market Value June 30, 2010</td>
<td>$ 83,821</td>
<td>$ 32,795</td>
<td>$ 18,250</td>
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