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NOVEMBER/DECEMBER 2008

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12



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### COVER STORY

#### ENGINEERING GOES BACK TO SCHOOL

12

New approach to recruitment shows students the “cool” side of engineering.

### FEATURES

#### WINNING THE TALENT WAR

16

How to retain top-notch employees amid a shrinking talent pool.

#### MASTERING A HARD-LUCK ECONOMY

20

Firms use creative strategies to survive—even thrive—in tough economic times.

#### EDUCATION MAKES THE GRADE IN GREEN CONSTRUCTION

24

A look at innovative and sustainable designs for schools and universities.

#### 2008 YOUNG PROFESSIONALS OF THE YEAR

29

The Council honors five up-and-coming engineers for their contributions to the industry.

#### 2008 FALL CONFERENCE HIGHLIGHTS

30

Legendary explorer and record fundraising highlight annual event in Montréal.



### DEPARTMENTS



COVER: SWELL MEDIA/GETTY IMAGES

#### FROM ACEC TO YOU

2

Challenging economic times.

#### NEWS & NOTES

4

CH2M HILL donates engineering artifacts to the Smithsonian; science/technology execs fear America's potential global leadership loss; engineers set pace for NASCAR.

#### MARKET WATCH

8

Education facility construction keeps pace with surging demand.

#### LEGISLATIVE ACTION

10

Congress clears Highway Trust Fund fix; ACEC urges Congress to address infrastructure crisis in the financial bailout package.

#### TECHNOLOGY

34

Popularity of servers raises concerns about data protection.

#### MEMBERS IN THE NEWS

36

Gregs Thomopoulos named president-elect of FIDIC; RBF Consulting promotes co-presidents S. Robert Kallenbaugh and James E. McDonald to co-CEOs.

#### ONE ON ONE

40

AECOM President and CEO John M. Dionisio discusses his firm's global perspective and “balanced approach to growth.”

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*Engineering Inc.*, Volume 19, Number 6 (ISSN 1539-2694), is published bi-monthly by the American Council of Engineering Companies (ACEC), 1015 15th Street, NW, 8th Floor, Washington, D.C. 20005-2605. Periodicals postage paid at Washington, D.C., and at additional mailing offices. Annual subscriptions are \$24 for members (included in dues as a non-deductible amount); \$45 for U.S. non-members; \$65 for institutional subscriptions. Back issues are \$15.

POSTMASTER: Send address changes to *Engineering Inc.*, c/o ACEC, 1015 15th Street NW, 8th Floor, Washington, D.C. 20005-2605.

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## Rising to the Occasion

These are challenging times for our industry, but also times of opportunity.

Most of the nation's economic indicators point downward, and prospects for an imminent turnaround are unclear. The crises in the real estate and credit markets have hit the engineering industry hard.

Individual firms not only are struggling with the vagaries of the market, but must do so in the face of a long-standing shortage of qualified engineers.



In this issue of *Engineering Inc.*, we look at how the industry is facing up to these challenges and creating opportunities. Our examination of the current economic situation also highlights the varied and novel steps Member Firms have undertaken to weather the economic storm. (See page 20.)

As the industry continues to struggle to recruit qualified engineers, we take a look at the impact of the engineer shortage and how the industry, includ-

ing many of our Member Organizations and Member Firms, are more aggressively promoting the profession to the source of our industry's future—grade and middle school students. (See page 12.)

This issue also features successful examples of "green design" increasingly embraced in the construction of education facilities.

As we near year's end, our focus will turn to another major challenge looming on the horizon—reauthorization of SAFETEA-LU, due for consideration next year, along with the overall future and funding of the nation's transportation infrastructure.

Rest assured, the Council will be a vocal and powerful force in these discussions to protect and promote the interests of our industry.

John F. Hennessy III  
ACEC Chairman

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## CH2M HILL Donates Historic Engineering Artifacts to Smithsonian

**C**H2M HILL has donated more than 36,000 “ink on linen” architectural and engineering drawings to the Smithsonian’s National Museum of American History in Washington, D.C.

The effort was important to preserve and catalogue American engineering heritage, said CH2M HILL Chairman and CEO Ralph Peterson.

“This is very exciting for us,” said Peterson. “These drawings provide a glimpse into the evolution of engineering and immortalize the industrial revolution by showcasing some of the first textile mills and manufacturing facilities.

“Helping to archive and preserve these drawings for future generations is a privilege and helps to honor the legacy of Lockwood Greene, the oldest American engineering and construction firm in continuous operation.”

Discovered in 1996 at an abandoned Civil War weapons warehouse in Boston, the documents provide a pictorial account of America during the industrial revolu-

tion. The drawings, hand-crafted on linen parchment, represent some of the most prominent textile mills, manufacturing facilities, mechanical processes and buildings of the 19th century.

Drawings catalogue the first electric-driven manufacturing facility, the Columbia Mills textile mill in Columbia, S.C. Lockwood Greene, acquired by CH2M HILL in 2003, is credited as the first company to successfully engineer and apply an electric drive to a manufacturing operation. The 1893 project was undertaken with a new startup company, General Electric, which was incorporated just one year before.

Other early drawings and photographs from this period include office buildings and manufacturing plants for the Baldwin Piano Company, *The Christian Science Monitor*, Palmolive, the International



**CH2M HILL Chairman and CEO Ralph Peterson (center) and Michael McKelvy (right), president and group chief executive of CH2M HILL’s Industrial Group, present a “gift” to Dr. Brent D. Glass (left), director of the Smithsonian’s National Museum of American History.**

House at Cité Universitaire in Paris, Lewiston Bleachery & Dye Works, Piedmont Manufacturing Company, Pelzer Manufacturing, American Cigar Company, Pierce-Arrow Motor Car Company, Gillette, Hewitt Rubber and numerous cotton and textile mills across the eastern seaboard.

Denver-based CH2M HILL has more than 25,000 employees worldwide.

## Science/Technology Execs Fear America’s Potential Global Leadership Loss

**S**enior executives at some of the nation’s largest chemical, pharmaceutical, aerospace, semiconductor and other technology companies say the United States is set to lose its position as the global technology leader if recruitment of students into science, technology, engineering and mathematics (STEM) does not increase.

These are among the findings of a new survey commissioned by Bayer Corporation as part of its *Making Science Make Sense* initiative. The survey asked 100 executives from prominent tech-

nology firms to address three STEM work force aspects: current U.S. STEM work force needs in the face of rising international competition; the need for a more diverse U.S. STEM pipeline to address these needs; and recruitment and workplace realities in achieving a diverse STEM workplace.

Survey results show that 95 percent of executives surveyed are concerned that the United States is in danger of losing its global leadership position in science and technology due to a shortage of STEM talent.

Results show that 55 percent are already experiencing shortages at their own companies.

Results also show that 68 percent are concerned that other countries’ increasing access to STEM talent is giving rival companies in these countries a competitive advantage, with 20 percent listed as “very concerned.”

Diversifying the STEM talent pool is seen as part of the solution. Ninety percent of respondents say bringing more women and minorities into STEM fields is a step in the right direction.

“Almost without exception, executives overwhelmingly recognize this country’s great need to tap the potential of the entire STEM talent pool, and the importance of doing so at every point on the development continuum beginning in elementary school with high-quality, hands-on, inquiry-based science education,” said Dr. Attila Molnar, former president and CEO of Bayer Corporation.

Not one of the executives surveyed graded the United States an A when asked how well the U.S. precollege system is engaging and nurturing girls and minorities to pursue STEM careers. In fact, approximately 60 percent assigned it a grade of D or F.



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## No Longer Automotive 'Court Jesters,' Engineers Now Set Pace for NASCAR

**E**ngineers, start your computers!" Gone are the days when the NASCAR driver, or even a crew chief, could diagnose a car problem by the seat of his pants and be successful. NASCAR has now become the U.S. version of Formula One, ruled by the very people—engineers—who were the object of derision not long ago.

Long before NASCAR's drivers pull their sponsor-sticker-sparkled cars to the starting line, engineers at test tracks have a lot to say about who will win the race.

Brian Whitesell, team manager for Hendrick Motorsports, which features Jeff Gordon and Dale Earnhardt Jr., holds a mechanical engineering degree from Virginia Tech. Eric Warren, technical director for Michael Waltrip Racing, has a Ph.D. in

aerospace engineering from North Carolina State University.

"Without the computer strength that flows from Detroit with all of the algorithms and the predictive and analysis models that we've got, there's no way to have a competitive race team or a competitive car," said Jack Roush, co-owner of Roush Fenway Racing.

Basking in the limelight after one of his cars won the opening race of a 10-race championship season, Roush was effusive about engineering's role in NASCAR.

"Twenty years ago when I started stock car racing, there was contemporary wisdom among the crew chiefs and the owners and the drivers...that really led the sport from a technology point of view, and they used engineers pretty much as court jesters," said Roush.



"They were fun to have around. Occasionally, they would come up with something that was interesting to talk about, but when the teams stopped being amused by them, they'd run them off and the teams did just fine that didn't have engineers."

No longer, said Roush. Each team sports a lineup of engineers who analyze every aspect of the car and the track before each race.

"A driver cannot make the decisions for what spring he could use, what shock he could use, what the wedge needs to be, what the toe curve needs to be—what all those variables are that affect the performance of the car," said Roush.

Said Greg Biffle, who drove Roush's winning car, "The white coats did a good job getting the car ready for today."



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## Education Facility Construction Keeps Pace With Surging Demand

By Joe Salimando

A wise man once said that demographics is destiny. With that reasoning, it should not come as a surprise that construction of education facilities has gained mightily in the past few years—more kids equals a need for more schools on all levels.

Economy.com predicts that education construction will trend up one percentage point, compared to a 2.9-percent decrease in total nonresidential construction. Reed Construction data forecasts a 2009 uptick in education construction of 4.4 percent, compared to 4.3 percent in total nonresidential construction.

These June estimates are subject to revision, of course, as the economy has stumbled seriously in recent months.

There are several points to keep in mind regarding school construction:

- Local markets need new schools as houses are built and families grow. A “younger” area typically needs more schools than one with older residents.
- Schools are concentrated. According to *American School & University*, there are 14,000 school districts in the United States, but the top 100 accounted for more than 20 percent of the nation’s public school enrollment in 2004–2005. These 100 districts together equaled the enrollment of nearly 13,000 smaller school systems.
- College and university construction projects are undertaken as alumni

provide funding and foundation investments grow. Assuming a stagnant-to-worse economy in 2009, it’s likely that construction planning by private institutions in higher education will slow down.

- Green issues are “hot” everywhere, but perhaps nowhere to the extent they are in education construction. (See Multi-Project Feature, page 24.)

At midyear, when McGraw-Hill Construction revised its construction market estimates, it lowered its estimate for the 2008 gain in new contracts for education construction from 7

percent to 2 percent. But the glass is still half full: That’s a 2 percent gain!

### A Growth Market

Table 1 shows that our nation is enamored with new construction and renovations of buildings where children learn. Some interesting facts you might not immediately notice:

- Despite declines in total nonresidential construction—with 2003 significantly below 2000, and with 2010 projected to be about where we were in 2007—education construction seems never to decline.
- Education increased as a

percentage of the overall nonresidential construction market from 15.7 percent in 1998 to 17.2 percent in 2000; FMI estimates it will reach 22 percent in 2008 and more than 24 percent in 2012.

- From 2007 to 2012, total nonresidential construction will grow by 17.3 percent in unadjusted-for-inflation dollars. In that period, education construction will grow by 32.3 percent.

Much of the school construction dollar is going to additions and modifications to existing school buildings, according to *American School & University*. In its mid-May 2008 Construction Report, the magazine estimated (using reader survey responses) that one-third of 2007’s school construction dollars, including colleges and local school districts, went to additions and modifications to existing structures.

Thirty-six percent of the K–12 school districts that responded said they completed some form of school construction project in 2007, and 52 percent of respondents said they planned to complete a construction project by 2010.

On the college/university front, 61 percent of respondents completed a project in 2007 and 73 percent planned to finish at least one project by 2010.


*Joe Salimando writes frequently on the construction industry at [www.eleblog.com](http://www.eleblog.com). He can be reached at [ecd@comcast.com](mailto:ecd@comcast.com).*

**Table 1**  
**Education and Nonresidential Construction**

	(in millions of dollars)	
YEAR	TOTAL EDUCATION CONSTRUCTION	TOTAL NONRESIDENTIAL BUILDING
1998	\$46,421	\$296,427
1999	\$52,456	\$315,041
2000	\$58,848	\$341,503
2001	\$64,960	\$346,739
2002	\$73,862	\$319,325
2003	\$74,316	\$308,649
2004	\$74,250	\$324,544
2005	\$79,687	\$347,245
2006	\$85,992	\$390,632
2007	\$98,441	\$457,267
2008 Est.	\$102,379	\$465,659
2009 Forecast	\$442,441	\$104,427
2010 Forecast	\$109,648	\$465,097
2011 Forecast	\$119,516	\$499,287
2012 Forecast	\$130,273	\$536,109

Source: FMI Corp. Q2 2008 Construction Outlook

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## CONGRESS CLEARS HIGHWAY TRUST FUND FIX; ACEC URGES CONGRESS TO ADDRESS INFRASTRUCTURE CRISIS IN BAILOUT PACKAGE

### Congress Clears Highway Trust Fund Fix

Responding to pressure from ACEC, other industry groups and state departments of transportation, Congress passed and President Bush signed legislation in early September—H.R. 6532—that restores solvency to the Highway Trust Fund. The bill transferred \$8 billion from the General Fund into the Highway Trust Fund, averting a potentially devastating funding

cut to the states and enabling the funding guarantees of SAFETEA-LU to be met.

Passage of the bill became urgent when U.S. Secretary of Transportation Mary Peters informed states that the Trust Fund balance was nearly depleted and reimbursement payments would be reduced.

“It was imperative that Congress act to prevent what could have become a major crisis facing the nation’s economy,” said ACEC President Dave Raymond.

State highway officials are canceling or postponing important projects, creating a “disastrous outcome during a time when the economy is slow and the country faces substantial highway maintenance and improvement needs.”

Following the action by Congress, the Federal Highway Administration informed ACEC and other industry groups that the Trust Fund is projected to have an adequate balance through the end of the current fiscal year. However, projections for F.Y. 2010 show that gas taxes and other revenues will be insufficient to maintain current funding levels.

### ACEC Weighs In on Student Loan Forgiveness Regulations

Now that the ACEC-backed provision offering student loan forgiveness to engineers is law, the U.S. Department of Education (DOE) is writing regulations to implement the program.

The Higher Education Opportunity Act of 2008 created a program that will provide up to \$10,000 in student loan forgiveness to individuals who are employed full-time in areas of national need, including engineering. DOE asked interested parties to submit comments on the new law.

As part of its comments, ACEC said the law should provide a clear definition of who qualifies as an engineer and the role of engineering companies in certifying that an individual has worked as an engineer in a given year.

DOE next will establish a negotiated rulemaking committee charged with drafting regulations to implement the program.

### Senate Committee Clears ACEC-Backed \$38.5B Water Bill, Expands QBS

The U.S. Senate Committee on Environment and Public Works approved major water infrastructure legislation prior to adjournment that significantly boosts investment in drinking water and wastewater projects.

At the Council’s urging, the package also includes a new mandate to require certain municipalities to use Qualifications-Based Selection (QBS) on federally funded water projects.

The Water Infrastructure Financing Act (S. 3500) authorizes \$38.5 billion over five years for projects funded through the Clean Water Act and Safe Drinking Water Act State Revolving Fund (SRF) programs. The measure would allocate \$19.6 billion for wastewater projects and \$15.7 billion for drinking water projects over a five-year period.

The bill also authorizes nearly \$2 billion for municipal sewer overflow control grants, and a new \$294 million grant program for “critical drinking water infrastructure projects” to help water systems meet Safe Drinking Water Act requirements.

A number of reforms to the SRF programs are included, such as extending loans to 30 years and broadening the list of eligible projects to better assist local communities. The bill also gives greater weight to applications from communities developing asset management and long-term financial plans.

The Senate bill requires communities with populations of 10,000 or more to use QBS on projects funded through the SRF programs. The House-passed bill includes a QBS mandate that would cover all federally funded projects. The Council will advocate for the broadest possible application of QBS when the Senate takes this legislation up again in 2009.



AP PHOTO/MANUEL BALCE CENETRA

Mary Peters

ISSUES ON THE MOVE	WHAT'S NEXT
Infrastructure Stimulus Package	Possible action after Election Day
Highway Trust Fund	Congress to begin reauthorization of SAFETEA-LU early in 2009
Water Infrastructure Package	Further action early in 2009
Engineering Loan Forgiveness Program	Regulatory implementation in early 2009

### **ACEC Urges Congress to Address Infrastructure Crisis in Bailout Package**

Congress needs to tackle the crisis facing the nation's infrastructure with the same urgency as the crisis facing the nation's financial markets, ACEC President Dave Raymond told congressional leaders during consideration of the financial rescue package cleared by Congress.

Prior to congressional approval of the financial rescue package, Raymond emphasized in a letter to House and Senate leaders the importance of including infrastructure investment in the financial bailout legislation under debate.

The House and Senate reportedly might take up an economic stimulus bill that will include additional funds for transportation, environmental and other infrastructure projects during a "lame duck" session following Election Day.

"Infrastructure is literally the foundation of the nation's economy, and that foundation is falling apart," said Raymond. "If Congress and the administration wish to commit hundreds of billions of dollars to remedy the nation's financial markets, they should also look seriously at a positive investment in the nation's infrastructure, which will improve our economy in both the near- and long-term."

Raymond added that "in the transportation area, the nation's economy is suffering a \$135 billion shortfall necessary to sustain economic growth.

"America's water infrastructure needs are equally severe," said Raymond, "with a funding gap of \$300 billion to \$500 billion between current annual investments and what is needed to repair deteriorating drinking water and wastewater systems over the next 20 years.

"We agree that Congress needs to act quickly to stabilize the U.S. economy, but if lawmakers want to take serious action to reverse the tide and spur economic growth, both near- as well as long-term, an infrastructure-based stimulus package offers a positive and safe investment of taxpayer dollars."

### **Industry-Backed Business Tax Provisions Included in Financial Rescue Package**

The financial rescue bill approved by Congress included legislation to extend a large package of business and energy tax provisions that had expired at the end of 2007.

Included was an extension of the R&D tax credit, which many engineering firms use to perform research, develop new designs, use new technologies in new applications and perform other types of qualifying activities.

The package also contained numerous energy tax incentives, such as renewable energy tax credits, new tax credits for clean coal projects and an extension of the energy-efficient building credit.

### **ACEC-Supported Bridge Legislation Receives Senate Committee Approval**

The U.S. Senate Committee on Environment and Public Works approved ACEC-backed legislation to improve the nation's bridge inspection, rehabilitation and repair programs.

The National Highway Bridge Reconstruction and Inspection Act (H.R. 3999) authorizes an additional \$1 billion for F.Y. 2009 for the Federal Highway Administration's Highway Bridge Program. The U.S. House of Representatives passed the bill in July.

The legislation includes a key Council recommendation that requires the U.S. Department of Transportation to develop a new risk-based process for bridge inspections and repairs. The bill also includes an ACEC-backed provision requiring bridge program managers and team leaders to be state-licensed engineers.

It is uncertain whether the full Senate will take up the bill prior to adjournment. If not, it is expected that this legislation will be included in the broader SAFETEA-LU reauthorization bill due for consideration next year.

### **ACEC Nominees Selected for National Committee on Levee Safety**

Two ACEC nominees—Don Basham of Stantec, Inc., and Les Harder of HDR, Inc.—were selected recently to serve as private-sector members of a national panel charged with developing safety policies for the nation's levees.

Basham is Stantec's senior consultant and adviser on water resources specializing in levees and dams. He previously served as chief of engineering and construction with the U.S. Army Corps of Engineers.

Harder is HDR's senior water policy technical adviser. He previously held leadership positions with the California Department of Water Resources.

A provision in the Water Resources Development Act of 2007 required the Corps to develop a national levee safety and inspection program and create the National Committee on Levee Safety.

A key ACEC objective is to prevent unreasonable liability for those performing levee safety assessments.

"We were very pleased to have the opportunity to select two such highly qualified and well-respected professionals from the private sector as Don Basham and Les Harder for the National Committee on Levee Safety," said Eric Halpin, committee vice chairman and special assistant for dam and levee safety at the Corps.



**Don Basham**



**Les Harder**

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# ENGINEERING Goes Back

New approach to  
recruitment shows  
students **cool** side of  
engineering



# to School

By Jim Parsons

**O**f the approximately 56 million children enrolled in the nation's K–12 schools this year, how many will eventually become engineers? **As far as the nation's industry is concerned, not nearly enough.**

Opinions vary as to the depth and urgency of the engineer shortage, but most agree that demand for new faces with technical expertise will continue to outpace supply for the foreseeable future. Though the traditional allure of stimulating work, good pay and near-infinite advancement opportunities remain a strong draw for students, many firms still find their offices growing older, grayer and emptier.

Getting young people interested in engineering means exposing them to the profession—what a career entails, what sort of work is done. Though the industry has a tradition of educational outreach, CH2M HILL's Jane Rozga, who also is national director for ACEC/California, wonders if students are getting the complete message.

"I find that students too often have no idea as to what an engineer does," says Rozga, who also chairs ACEC/California's Student Outreach Committee. "Once, after we showed our outreach video to a high school class, a student commented, 'We hear a lot from our teachers about what we have to do to get into college, but they never talk about what we might do when we get out.'"

Adding to the confusion is the fragmented nature of the engineering profession, says Pamela Mullender, president of the ACE Mentor Program of America.

ACE is a partnership among industry professionals—architects, interior designers, engineers, construction managers, college and university representatives and other professionals from related corporations and professional organizations—who work together to attract young people to their professions.

"The U.S. Department of Labor lists more than 70 industries that are part of the construction industry," Mullender says. "Because there's not a united approach to market the industry, students and teachers don't know all the benefits or opportunities available."

Traditional tactics for attracting students are proving less effective. According to *Changing the Conversation: Messages for Increasing Public Understanding of Engineering*, a recent report by the National Academy of Engineering, the engineering community would do well to take the emphasis off of math and science and demonstrate instead how engineers can make a difference in the world through creative problem-solving.

The report also found that fewer than 15 percent of adults or teens characterized engineers with negative stereotypes (e.g. "boring" or "nerdy"); many students simply don't enjoy math and science enough to pursue engineering as a profession.

## In Search of the "Cool" Factor

The challenge, then, is not to get K–12 students to think about engineering, but to change the way they think about it.

"Engineers often focus first on the process of entering the profession, which means taking all those 'hard' math and science subjects," explains Leslie Collins, executive director of the National Engineers Week (E-Week) Foundation. "Instead, we need to show how engineers help people and how their work relates to their world—in other words, the things that make engineering cool to kids."

As an example, Collins cites the E-Week Foundation's "Discovering Engineering" website that zeroes in on middle school students' strong interest in the environment and technology. Because young people relate better to their own age group, the site's interactive videos follow three middle

**I am an engineer today because an engineer/surveyor took the time to talk to me when I was starting college about the opportunities available.**

JANE ROZGA  
ACEC/CALIFORNIA



**E**ven if a student doesn't go to a four-year college, he or she can still be involved in our industry.

RON BRENKE  
ACEC/MICHIGAN



school students on a voyage of discovery about water purification, solar energy and computer simulations, and how engineers use them to make the world a better place.

"We get a lot of genuine 'I didn't know engineers did that' reactions from the kids," Collins says.

The foundation also has added other educational and entertaining websites, "reality" programs for public television such as *Design Squad* and *CyberChase*, the Future City Competition, and efforts focused on girls and young women, including *Introduce a Girl to Engineering Day* and the *Global Marathon For, By and About Women in Engineering*.

Launched in New York City in 1994 by former Thorton Tomasetti Co-Chairman Charles H. Thornton, ACE now has more than 100 locations nationwide where architect, engineer and contractor mentors work with teams of 15 to 25 high school students to take mock projects from concept to completion throughout the school year.

To date, approximately 37,000 students have participated in ACE, many of them from economically disadvantaged backgrounds. More than 90 percent go on to higher education or apprenticeships. ACE also has awarded more than \$7 million in merit-based scholarships, proving there's no end to students' creativity.

### A Proactive Message

Many ACEC Member Organizations and Member Firms also have incorporated the concept of discovery and fun into student outreach efforts. ACEC/Michigan teams

with other members of the Michigan Design and Construction Coalition to present an infrastructure-oriented display each year at the annual Michigan Youth Engineering and Science (YES) Exposition at Ford Field in Detroit.

Collaborating with the other professional associations and unions that make up the coalition does more than simply eat up a larger chunk of the exhibit floor. "It shows kids the different ways in which design and construction interact," says ACEC/Michigan Executive Director Ron Brenke. "That's the way we work together in real life, so why not present it that way too? Even if the student doesn't go to a four-year college, he or she can still be involved in our industry."

To commemorate the 100th anniversary of the Mackinaw Bridge at last year's YES event, the Coalition used its scaffolding-framed booth to provide visiting students with an inside look at the bridge's history, design and construction. Using a simulation program, students tested various components for deflection under different loads.

"You had kids talking engineering with other kids, which made for a really neat connection," Brenke says.

ACEC/New York used student-to-student communication as the theme of its new informational video, *Consulting Engineering—A Career that Matters*. Targeted to college freshmen and sophomores, the eight-minute film features young engineers describing their work across various engineering disciplines and incorporates real project photos.

"The young engineers' responses are spontaneous and unscripted, which helps the film resonate with other young people," says ACEC/New York Deputy Executive Director Hannah O'Grady. Having the video available on the ACEC/New York website enhances its accessibility to Member Firms, colleges, other Member Organizations and—perhaps most important—the students themselves.

"This is the way today's young people operate and get information," O'Grady says. "If something clicks and students see an aspect of infrastructure engineering that appeals to them, they may pursue an internship with one of our firms."

**I**f something clicks and students see an aspect of infrastructure engineering that appeals to them, they may pursue an internship with one of our firms.

HANNAH O'GRADY  
ACEC/NEW YORK



Additionally, an ACEC/Maine-sponsored program brought engineers from Member Firms into local public school rooms to emphasize the "cool" aspects of engineering. ACEC/Oregon members worked with engineering school officials from the University of Portland, Portland State University and the University of Oregon on an initiative to create greater interest in the field among Oregon middle and high school students.

Though many students often display interest in engineering, they often don't have the resources to follow through on their ambitions. To help, several Member Firms are now making scholarship programs a key part of their outreach efforts.

One example is ACEC/Tennessee, which joined with the Tennessee Society of Professional Engineers to create the Tennessee Engineering Foundation, which funds and awards scholarships to students in state engineering schools.

Candy Toler, executive director of ACEC/Tennessee, says project funds are derived from a golf tournament and donations from individuals and other Member Firms. "The screening process is performed by a group of young engineers appointed by the ACEC/Tennessee president," Toler explains. "This is an interesting way to get young people at Member Firms involved in the association."

ACEC/Wyoming has added unique elements to its scholarship program with the University of Wyoming's engineering school. "Each year, we award a scholarship



**Students from Pennsylvania's affiliate ACE Mentor Program try their hands at site plotting.**

to a rising senior and rising junior, with a third going to an incoming freshman selected by the faculty," explains Executive Director Joe Lord.

Unlike many scholarships, Lord says, grade point average (GPA) is not part of the selection criteria. "We found that many students didn't apply because they assumed the scholarships were going to the 4.0 students," he says. "Taking GPA out of it has helped increase the number of applicants." But it's up to teachers to let students know those funds are available.

### Partners in Promotion

Cultivating the next generation of engineers also requires reaching out to the educators who shape what and how students learn.

One example is ACEC/California's multifaceted program for junior and senior high schools. Volunteer outreach liaisons from various chapters work with guidance counselors and teachers on projects ranging

**Nate Bell, an MIT engineering graduate and host of the PBS reality competition *Design Squad*, demonstrates his invention, the Power Ascender, to visitors at the 15th annual Discover Engineering Family Day at the National Building Museum in Washington, D.C., in February.**



from science fairs to special events to promote careers in engineering and surveying.

Rozga says these efforts reach thousands of students each year. "We also are encouraging chapters to consider holding a local event with high school teachers and counselors so that we can establish relationships with them, in hopes of making more direct connections between the working professionals and the students," she adds.

Other Member Organizations are developing programs to help raise teachers' awareness of engineering careers. Last year, ACEC/Virginia launched a two-year 21st Century Fellows pilot program in cooperation with the MathScience Innovation Center, a Richmond-based organization dedicated to math and science education for K-12 teachers and students. Seventeen central Virginia teachers attended a two-week summer institute where they learned about built environment engineering from ACEC/Virginia Member Firms via presentations, panel discussions and project field trips.

"The teachers then used that experience to incorporate engineering into various classroom and school activities," says ACEC/Virginia Executive Director Nancy Israel. Educators praised the program and its relevance. A three-day minisession attracted more than 50 additional teachers. And plans are under way to repeat the program in 2009, expanding it to include teachers from other parts of the state.

In Massachusetts, a not-for-profit association management company co-sponsored by ACEC/Massachusetts—The Engineering Center—is involved in a similar collaboration with the South/West Regional Employment Board to promote the Massachusetts Department of Education-sponsored Leadership Initiatives for Teaching and Technology (LIFT<sup>2</sup>) program.

"Through LIFT<sup>2</sup>, our Member Firms sponsor five- to eight-week externships for secondary school science, technology and math teachers," says Susan D'Olimpio, The Engineering Center's association manager. "Through direct engagement with teachers, companies can offer significant insight into careers that have high relevance for students, which in turn motivates them to

pursue science and technology majors and, ultimately, careers in engineering fields."

Participating teachers spent their externships engaged in a variety of activities for a comprehensive look at engineering. In sharing the experience of her "summer vacation" in ACEC/Massachusetts' *Insights* newsletter, Judi Robinson, a teacher at William Diamond Middle School in Lexington, wrote that her experience "was not only valuable for me to get reacquainted with the 21st century science work world, but it continues to be a true asset in my teaching."

It might be some time before these and other educational outreach efforts translate into an uptick of new engineers. But there should be no doubt that the right approach, complemented by an engineer's passion and enthusiasm for his or her profession, can make a difference.

"I am an engineer today because an engineer/surveyor took the time to talk to me when I was starting college about the opportunities available to someone who could 'do the math' and also communicate about the results," says ACEC/California's Rozga. "Many of the folks involved in our student outreach see it as an opportunity to influence students as they were influenced when they were making career choices. It's a way to give back to the profession and, to a degree, to our communities that will depend on engineers and surveyors to build the infrastructure we need to thrive as a society." ■

*Jim Parsons is a business writer living in Bristow, Va.*

**Choose Engineering as Your College Major**, ACEC's colorful new informational brochure on engineering careers geared toward middle and high school students, will be available soon. The brochure features a state-by-state listing of all colleges and universities (including their URLs) offering Bachelor of Science programs in traditional engineering disciplines.

By Alan Joch

# Winning the TALENT WAR

## Retaining top-notch employees a priority amid today's shrinking talent pool

For many years, the easiest way to bring top-tier talent into a firm was to entice it away from another firm. In today's tight economic times, that option has become more difficult. Experienced engineers are choosing to stay with their current employers, preferring the security of a known entity to the unknown but potentially higher rewards of starting anew. At the same time, the flow of new engineers coming into the industry has slowed to a trickle.

Engineering firms today find themselves stuck in the middle. Firms need to boost their staff talent but they have few directions to turn. Except inward. Increasingly, firms are putting their focus on improving and upgrading current staffs, adding experienced and new engineers only when those opportunities arise.

"When people get to be experienced engineers, project managers, or start managing teams," says Ed Barrett, director of human resources at Howard R. Green Co., an engineering firm in Cedar Rapids, Iowa,

"companies are doing whatever they can to try to lock them up."

Locking up the talent for the long term has become the prime objective, because while these tough economic times won't last, all indications suggest that the shortage of qualified engineers in the immediate future could drag on for years.

### Between a Rock and a Hard Place

Engineering industry employment is being pulled from both ends of the demographic spectrum. On the one hand, with a wave

of baby boomers expected to leave the work force soon, the pool of experienced engineers in all sectors—from bridge design to highways to water infrastructure—is running dry. One in four of all current science and engineering (S&E) degree holders in the labor force are 50 or older, according to the National Science Foundation (NSF). Among S&E doctorate holders in the labor force, 40 percent are age 50 or over. Statistics also show that by age 62, more than half of all S&E bachelor's degree holders in the work force leave full-time employment.

"The situation is likely to get worse, and that's simply the effect of demographic changes," says Barrett. "Older engineers are retiring, and they're not being replaced fast enough because we're not graduating enough engineers to replace them."

That's the other hand. NSF data also shows that between 1980 and 2000, the total number of S&E degrees earned grew at an average annual rate of 1.5 percent, which was faster than labor force growth, but less than the 4.2 percent growth of S&E occupations, or the need for current engineers.

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## New Law Addresses Talent Gap

As the engineering industry grapples with a long-term talent shortage, new federal legislation signed into law in August could encourage more students to seek technical degrees in college.

The Higher Education Opportunity Act forgives up to \$10,000 in student loans given to engineering students and others whose professions are considered of particular importance to the nation.

As the act was being written, ACEC lobbied congressional leaders to include engineering among the targeted professions. Engineers will receive credits of up to \$2,000 a year, or a total of \$10,000, for outstanding student loans after they graduate and enter the engineering work force.

ACEC President Dave Raymond called the forgiveness plan "a great first step" for addressing a critical shortage of engineers in the United States. "The ideal solution is to find ways to encourage more young people to pursue engineering careers," Raymond said. "This is an investment that will benefit our country for decades."

"Civil engineering, versus chemical or petro engineering, is losing more than its fair share of new students going into the field," says Tim McKindles, people services manager at Wade Trim Associates in Detroit.

Engineering executives have several theories as to why the talent pool is shrinking, but many are hard pressed to come up with a definitive answer—much less a solution. "It's an interesting question that we often scratch our heads over," says Jeff Peacock, president of Parametrix in Auburn, Wash.

Some point to changing cultural values that discourage people from pursuing careers that offer delayed gratification when it comes to riches, responsibilities and professional recognition. "Our culture just has not stressed the importance or the excitement of an engineer's or scientist's role in shaping society and the world around us," Peacock says.

Another demographic factor that dramatically impacts the potential talent pool in engineering is the profession's ongoing gender gap. Though women earned nearly 829,000 bachelor's degrees in 2005—about 57 percent of all those awarded—

only 13,197 were engineering degrees. "That's 50 percent of the work force that doesn't look at engineering as a possible career," says Barrett.

Parametrix and others are working, often in partnership with ACEC/Washington, to spark interest in junior high and high school students. "Experienced engineers who can present themselves well are going into the schools and sharing with the kids the work that we do," Peacock says. "That can be pretty infectious."

### Retain and Cultivate

This demographic trauma shines the spotlight on the experienced, skilled engineers already toiling away in the industry. These professionals suddenly find themselves in high demand by their own firms—as well as by other firms in the marketplace.

Right now, most of these professionals are staying put, even if their employment situations are less than perfect. "It's a matter of the devil that you know may be better than the devil that you don't know," says McKindles. "A person might be willing to stay in a current job and suffer that agony as opposed to leaving and taking a chance with new seniority, new tenure, a new operating structure, a new everything."

Proactive firms in the industry are taking advantage of this recruitment respite to refine and implement programs and incentives for retaining and cultivating their current employees.

Firms also are using in-house training to ward off recruiters and a steady stream of new offers. Howard R. Green's training begins by sending new hires to a two-day "boot camp" to introduce them to the company's culture and key staff members. Its "university" offers 50 courses throughout the year to develop skills in project management and business development aimed at those interested in executive responsibilities.

The mantra "look within" guides Wade Trim Associates, which also runs a university-style educational program to groom current employees for senior-level positions. "Many times you're better off to just simply home-grow your talent," says McKindles.

The company runs its own collection of "colleges," which offer advanced instruction for transportation, water resources, land development and other disciplines; within each college, specialized schools cover such topics as traffic engineering, roadway design and bridges and structures. Students also are encouraged to attend continuing education classes or seek master's degrees.

As Wade Trim employees progress in their training, they're expected to participate in various professional committees organized by ACEC and state and federal agencies.

The company also taps top performers with two years of experience and helps them chart a career path based on the firm's and the employee's common goals for the future. "We give them exposure to new projects and put them under the wing of someone who we have identified as a successful mentor," McKindles explains. "You basically groom them for that future position."

Stock ownership can also be a very effective way to tie an engineer to a firm. Of Howard R. Green's 240 employees, more than 70 own stock in the company.

Engineering firms also are working to reduce the negative impact of today's labor shortages on their employees. Because his

**C**ivil engineering...is losing more than its fair share of new students going into the field.

TIM MCKINDLES  
WADE TRIM ASSOCIATES



clients face projects driven by firm schedules, Peacock says that when a talent gap occurs, Parametrix might enter a subcontracting arrangement with a peer firm to address the immediate need.

Firms also are careful not to overburden staff. "We have great people on our team, and they are more than willing to step up in the short and intermediate term," says Barrett. But, he adds, this additional work can diminish job satisfaction.

"It makes it very difficult to maintain what, for us, is very important: the best work environment we can provide for our existing staff," he explains. "The last thing you want to do is put so much stress on the other people that they get frustrated and leave. We don't have big mills that we invest millions of dollars in, so the scary thing is that on any given day our capital—the human capital—can make a choice to walk out the door."

**O**ur culture just has not stressed the importance or excitement of an engineer's or a scientist's role in shaping society and the world around us.

JEFF PEACOCK  
PARAMETRIX



#### "Greening" the Future

Many firms are turning to another, somewhat more amorphous inducement for attracting and retaining employees—a

sense of purpose greater than just individual accomplishment. Indeed, the burgeoning "green" movement might be one of the biggest recruiting tools to come along in years. Environmentally conscious firms are emphasizing to the next generation how engineers and scientists will be needed to solve environmental threats and improve the quality of life in communities grappling with pollution and other industrial hazards.

"It's rare for engineers to come into the industry expecting to become wealthy," notes Peacock. "Especially for the younger professionals, we are communicating to them a strong sense of purpose as to why we are engineers and scientists, and that seems to be a pretty attractive message for that generation of people." ■

*Alan Joch is a business writer based in Franconia, N.H.*



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By Samuel Greengard

# Mastering a Hard-Luck Economy

## Firms use creative strategies to survive—even thrive—in tough economic times

**R**ob Barrick has seen the boom times and the down times. He's survived recessions and dealt with inflation. After 35 years, the president and CEO of Smith Seckman Reid, Inc. (SSR), a Nashville-based construction and engineering firm, has learned to roll with the economy—in good times and bad. "There's no question that the engineering industry is heading into challenging times," he says. "It is essential to have a fundamental strategy and plan in place."

That's easier said than done. At a time when economic activity is declining and projects are disappearing within many sectors, following a plan can prove daunting. Strategic decisions become more difficult: Should a firm outsource services? What

about diversifying through internal expansion or acquisition? On a tactical level, it's easy to put labor and material costs or information technology (IT) efficiency under a microscope; doing something constructive about these issues is a different matter altogether.

One thing that is clear, at least over the short term, is that the nation's economic picture is cloudy, with little or no relief in sight. During the first half of 2008, total U.S. construction fell 16 percent compared to last year. Numerous factors, such as the liquidity crisis on

Wall Street, rising oil prices, the growing international credit crunch, the subprime lending debacle and resulting weak housing market, have put serious pressure on an already overburdened economy. So far, the economic dip hasn't officially been labeled a recession (usually defined as two successive quarters of negative GDP growth). But this yardstick often overlooks significant downturns. What's worse, economic prognosticators say they don't anticipate a spike in economic activity until well into 2009.

"The problem right now is that there's no consensus on how the current situation is going to play out," says Michael Mandel, chief economist for *BusinessWeek* magazine. "A lot of unresolved questions exist."

Mandel, like many economists, is surprised by how well consumer spending has held up in the face of growing foreclosures, high energy and food prices, and growing debt. He believes the economic weakness could persist and might lead to further declines. Some sectors, such as residential and commercial development, will almost certainly lag. "Retail and office buildings are overbuilt," says Mandel. "We're probably not going to see any real recovery in these areas for quite a while." On the flip side, health care and education are holding up relatively well.

**T**he problem right now is that there's no consensus on how the current situation is going to play out.

MICHAEL MANDEL  
BUSINESSWEEK



**It's all about possessing the agility required to deal with fluctuations in business since the economy is a constantly moving target.**

CHUCK LEICHTNER  
ARCADIS



Mandel and others point to the nation's infrastructure as the "big question mark." With the current "trust fund" financing model faltering because higher oil prices have forced Americans to cut back on their gas consumption, Congress and the new administration must find a way to fund sorely needed infrastructure projects across the country.

"Infrastructure is, at this point, a political question more than an economic question," Mandel says. It's an issue that could determine whether bridges, tunnels, roadways and other improvement projects get off the ground. "It's one thing to pave potholes, but it's entirely another to build new bridges," notes Mandel.

### Strategic and Proactive

Trying to predict which direction the economy will turn is at best an educated guess. What executives at engineering firms can control is how they approach economic swings and how they run their business—during a downturn, but also over the long haul. "It's best to build a business plan that deals with various scenarios and problems before they arise," says Ray Kogan, president of Kogan & Company, a McLean, Va.-based consulting firm.

Engineering firms are no strangers to boom and bust cycles. Depending on the sector, public and private spending fluctuates dramatically based on an array of factors, including consumer confidence, tax revenues and actual contracts. Although there's no single way to best deal with this reality, the common denominator for engineering and design firms is that a strategic and proactive approach is essential. Organizations that use the downturn as an opportunity to adapt and adjust are far more likely to emerge healthier and stronger.

This is an approach that SSR's Barrick knows well. Over the years, he has built a diversified, multidisciplinary firm that touches several engineering sectors, including health care, transportation, water and sewer and sports stadiums. In 2008, Barrick says, his company's revenues grew by a hefty 18 percent, despite a softening economy. In fact, the

530-person firm has maintained a steady 15-month backlog of projects. "We haven't seen any slide yet, though we are concerned about the state of the industry and how that affects business in 2009," he says.

Anthony Zuena, president and CEO of SEA Consultants, a six-office, 180-employee Cambridge, Mass.-based firm that specializes in environmental engineering and architecture, has taken a more conservative approach. "We specifically set out to become as recession-resistant as possible by creating a balanced client base and a balanced portfolio," he says. The company embraces a lean mentality and works to manage staffing and offices as efficiently as possible.

### Labor Pains

In economic downturns, labor issues always come to the fore. ARCADIS, a design and engineering firm with \$2 billion in annual sales and 13,500 employees worldwide, has focused on creating a highly flexible work force.

"As one sector of the business shrinks, we move people over from another; in many cases, the talents are transferable," explains Chuck Leichter, executive vice president of strategic development at ARCADIS, which is headquartered in the Netherlands with U.S. operations based in Denver. For example, engineers with expertise in water resources often are equipped to handle similar challenges in transportation or other infrastructure projects. Although some training or cross-functional experience is

required, the transition is fairly seamless. "It's all about possessing the agility required to deal with fluctuations in business since the economy is a constantly moving target," says Leichter.

The company also reassigns engineers and other professionals based on need. For example, ARCADIS has a large contingent of Dutch engineers assigned to a levee project in New Orleans. That makes sense—and maximizes dollars—because the largest levees in the world are in the Netherlands. Leichter says the approach also helps ARCADIS balance the effects of stronger and weaker economies in different regions.

SEA has created a flexible work force by placing a heavy emphasis on training. The firm provides more than 40 hours of training per employee per year. It also taps recruiters to locate talent, and it has established an associate recruiting program. The combination has been extremely effective, Zuena says. "We've been able to build a diverse staff of architects, engineers, scientists and specialized experts. We're able to provide a wide range of services to our clients and that has helped us deal with economic fluctuations." Although SEA so far has experienced flat growth in 2008, it has maintained an 18-month backlog. "We've managed to avoid a decline, and we're healthy," explains Zuena.

One benefit of the downturn, says SSR's Barrick, is the growing pool of talent in the marketplace. "Either because other firms are laying off or because they're hiring less, we're able to take advantage in selective situations," says Barrick.

The key word is "selective," says Kogan. "Many firms have gone from a mind-set of recruiting like gangbusters and trying to poach talent from across the street to shedding workers at all costs," he explains. Such reactionary thinking can lead to problems. In some cases, organizations trim talent and costs from the lower rungs of the organization, while neglecting to examine the value and contributions of far more expensive senior-level employees. A single high-level executive might represent the cost of 15 or 20 engineers.

# Strategies in a Downturn

Here's how to stay competitive in tough times:

## Track your backlog.

Your backlog is a key indicator of your firm's current and future financial health. If it begins to drop, take action early and make adjustments before there's a crisis. Check the backlog on a monthly basis.

## Conduct due diligence.

Know who you're working with; know their financial status and the likelihood that they will complete a project. Upfront research eliminates trouble down the line.

## Cross-train staff.

During a downturn, companies that have invested in training can shift workers between domains and sectors. Engineering skills often are transferable, though a basic understanding of the field is necessary.

## Don't play economist.

It's fine to look at leading economic indicators and internal numbers. But nobody knows for sure how the economy will behave. Instead, focus on internal benchmarks and strategies. Look to become the most efficient firm possible.

## Consider mergers and acquisitions.

In some cases, consolidation results in a sum that's greater than the individual parts. A weak firm might benefit by gaining cash and marketing muscle; strong firms can fill niches while securing resources at a discount.

## Forge alliances.

Look for opportunities to work with other firms where there's a complementary fit. This approach helps organizations land larger projects and enter fields that otherwise might be off limits.

**Outsource.** One way to reduce staffing demands is to tap outside engineers, architects, designers and project managers. Organizations must cultivate talent pools and understand that, if used too heavily, outsourcing can result in an inadequate core of internal expertise.

**Recruit and reshuffle.** It may seem counterintuitive, but an economic downturn requires new thinking and more defined strategic knowledge. Consider recruiting new talent for key strategic positions.



## Embrace information technology.

A well-designed IT infrastructure can trim costs and boost efficiency. During a recession, it can help a company gain a clear competitive advantage. With the emergence of Software as a Service (SaaS), organizations can put top-tier systems in place while minimizing upfront investments.

**Diversify.** Gaining exposure to different sectors, such as transportation, energy, infrastructure, health care and commercial development, can buffer the effects of economic malaise. It's also wise to diversify projects between public- and private-sector clients.

At the same time, Kogan says, it's wise to examine a top employee's value and to take into account the relationships they've forged as they've established their career. The loss of a senior executive with years of experience and key industry connections could result in a downturn in bookings, billings and bottom-line results. "It's important to make the right cuts rather than the easiest cuts," he says.

## On the Money

Equally important as managing people is managing finances. The ability to oversee expenses, billings and cost overruns is vital. At TSP Inc., a 150-person Rapid City, S.D., firm that specializes in education, health care and infrastructure projects, the emphasis is squarely on fiscal performance. "Revenues have dropped over the last few years, though the company is healthy," says Robert Morcom, the firm's managing principal.

Still, Morcom says, the downturn has forced TSP to examine its balance sheet more closely. "We're now far more selective about clients and the business we go after. We don't want to wind up with projects being put on hold," Morcom explains. As a result, the firm examines prospective customers' financial resources more closely, including credit ratings and past payment histories. The firm also works to establish solid relationships with clients before it

gets to the RFP stage. "We try to examine the social and economic implications of projects—and know the decision makers behind them," he says.

TSP also uses strategic alliances and outsourcing to leverage the strengths of other firms and improve its agility. "We are always looking for individuals or firms that have specific expertise we can use to mutual advantage," Morcom says. "We feel it is a way to bypass hiring more staff and expertise. We can adjust dynamically

**We're now far more selective about clients and the business we go after. We don't want to wind up with projects being put on hold.**

ROBERT MORCOM  
TSP INC.



to business and economic conditions." This approach also allows the company to manage its payroll more effectively and maintain more predictable labor costs.

Economic downturns call for tighter management, agrees SSR's Barrick, but firms don't necessarily have to batten down the hatches in the face of an economic storm. He says his firm continues to look for opportunities to improve its business. "If we can make a selective and strategic acquisition at an attractive price—perhaps a discount—it certainly makes sense to explore the option. One way an engineering firm can buffer the effects of a weak economy is to diversify and have a presence in different sectors."

Still, these executives say they are jittery about 2009 and 2010. Explains Mandel: "It is going to take some time for the economy to sort itself out." In the meantime, some firms are likely to shutter their doors or find themselves the target of an acquisition; others are likely to lay off staff and close offices. Savvy firms, Kogan says, will continue to invest strategically in staff, offices and IT. "Every company must deal with the situation differently. The common thread is that organizations must engage in strategic planning. It is a make-or-break issue." ■

*Samuel Greengard is a business writer living in West Linn, Ore.*

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# Education Makes the Grade in



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## Construction

By Darlene Bremer

# High School Is Environmental Gem



LBYD Civil and Structural Engineers worked to minimize Alabama's Hewitt-Trussville High School's environmental impact through the use of natural plant life and by matching existing grading as closely as possible.

**PROJECT:**  
Hewitt-Trussville  
High School,  
Trussville, Ala.

**FIRM:**  
LBYD Civil  
and Structural  
Engineers,  
Birmingham, Ala.

**W**ith its close proximity to the protected Cahaba River watershed, designing the new 361,000-square-foot, \$72 million Hewitt-Trussville High School in Trussville, Ala., meant overcoming a number of environmental challenges.



Birmingham-based LBYD Civil and Structural Engineers was selected to design the state-of-the-art educational facility, intended for 1,600 students with an expansion capability of 2,400 students and featuring an outdoor art patio, practice and playing fields for football and soccer and parking lots across its 65 acres.

"The school district wanted a new facility that would not negatively impact the Cahaba River and that would be environmentally integrated within the watershed and easily adapted for future student population growth," says LBYD Principal Rick Nail. "Building placement and parking lot layouts were restricted by the site's proximity to the protected Cahaba River, the existing tree canopy and the

ruggedness of the existing topography."

To minimize the building's environmental impact, LBYD matched the existing grading as closely as possible. Engineers studied the natural topography and modeled the impact on tree preservation of various grading options, ultimately choosing the one with the least impact.

To meet the school district's goal of environmental responsibility, LBYD designed an aboveground storm-water detention/retention pond to supply irrigation water for campus landscaping. "Bio-swales were used in the denser parking lot to enable pretreatment of storm water and an opportunity for groundwater recharge," Nail says.

LBYD's civil engineering

division was responsible for mass grading the site, as well as for detailed grading for the building and parking lots. The firm also designed all storm-water drainage and collection, erosion control and the site's utility infrastructure. "We worked closely with the architect, landscape architect and the Cahaba River Society on orienting the building to avoid any negative impact on the river's flow and water quality," says Nail.

The company's structural engineering division developed designs for the floors, columns, ceilings and roof systems to ensure the new building's structural integrity. LBYD also designed a pedestrian bridge across the river to connect the main building to the athletic fields.



Rick Nail

Close collaboration among LBYD, Trussville City Schools, local officials, Davis Architects, Inc., Robert Marvin/Howell Beach & Associates, and the Cahaba River Society (CRA) paid off when the project received CRA's 2008 Blue-Green Design Innovation Award.

# Elementary School Saves With New Cooling System

**PROJECT:**  
Bethke Elementary School, Timnath, Colo.

**FIRM:**  
Shaffer Baucom Engineering & Consulting, Lakewood, Colo.

**B**ethke Elementary School in Timnath, Colo., part of the Poudre School District (PSD) in suburban Ft. Collins, uses 40 percent to 50 percent less energy than its older counterparts.

Additionally, because PSD uses a prototype design for its new elementary school

projects, officials say the buildings cost 10 percent less to construct compared with other schools in the Colorado Front Range region.

PSD hired Lakewood-based Shaffer Baucom Engineering & Consulting (SBEC) to design the mechanical, electrical, plumbing and fire protection systems for the 63,000-square-foot, \$9.6 million school, which includes classrooms, computer labs, offices and special program rooms. SBEC's design placed an emphasis on sustainability, system performance and the use of daylight harvesting.

"The project is on target to be the first school in the country to earn Leadership in Energy and Environmental Design (LEED) for Schools Gold certification," says Barry Stamp, SBEC principal.

SBEC included an indirect evaporative-cooled chilled water system for environmental control, an exhaust air heat

recovery system, a LONWorks building automation communications infrastructure that enables remote monitoring and control of building systems, security and access control systems and a daylight harvesting lighting control system. "Prior versions of the building prototype had air-cooled chillers and ice storage tanks. The chiller is run at night and during the day melting ice cools the building," explains Stamp. In designing Bethke, SBEC replaced the chiller with the indirect evaporative chilled water system. The firm added an exhaust air heat recovery system to preheat incoming ventilation air, reduce the heating load and improve efficiency.

"Cooling the school efficiently without a chiller was a major mechanical system challenge," says Stamp. The semiarid conditions of the area made evaporative cooling the superior option.

"During the school year, there is very low humidity, which is the most effective environment for evaporative cooling and an efficient way to cool a building," Stamp added. "In addition, the exhaust air heat recovery system provides a measure of pre-cooled air being circulated in the building, enabling the school district to better meet its environmental, sustainable and LEED certification goals."



Barry Stamp



**BETHKE ELEMENTARY SCHOOL**

A green design spearheaded by Lakewood, Colo.-based Shaffer Baucom Engineering & Consulting enables the new Bethke Elementary School in Timnath to use 40 percent to 50 percent less energy than its older district counterparts.

# College Goes for LEED Gold

Beaudin Ganze Consulting Engineers designed this administrative and classroom building, part of Sierra College in Truckee, Calif. The building boasts several green features, including an evaporative cooling system and smart controls for moderating temperature and light.

**PROJECT:**  
Sierra College,  
Truckee Campus,  
Truckee, Calif.

**FIRM:**  
Beaudin Ganze  
Consulting  
Engineers, Inc.,  
Lake Tahoe, Calif.

Officials at Sierra College in Truckee, Calif., established LEED certification as one of their main goals in the design of a new 30,000-square-foot administrative and classroom building.

California is a national leader in green building mandates and incentives, and LEED programs play a large part in helping building owners authenticate sustainability efforts in the design of their facilities.

Beaudin Ganze Consulting Engineers, Inc. (BGCE) was tabbed to design the mechanical, electrical, plumbing, lighting, fire alarm, telecommunications and energy management systems, as well as to

oversee the LEED process for the new building. The firm also worked on a longer-term site infrastructure plan for future building phases.

"To enhance the building's energy performance, BGCE worked closely with the architect to develop an efficient building envelope using energy modeling software," says Mark Schlosser, a BGCE senior associate.

BGCE also worked closely with the building commissioning agent to ensure that building systems would efficiently operate within the designed parameters. "BGCE designed a building that would fulfill the college's goals of serving students' educational needs, reducing energy use and attaining LEED certification," Schlosser says.

Key sustainable features of the project include efficient plumbing fixtures, allowing the building to use 40 percent less water; a combination of evaporative cooling and outside air to reduce air conditioning energy use by up to 80 percent; smart controls to

regulate temperature and lighting according to the amount of sunlight and occupancy; 50 percent to 100 percent thicker insulation than the national average in piping and ductwork for more efficient heating and cooling; variable frequency drives for reduced energy consumption by large fans and pumps; and ultra-high-efficiency heating boilers.

A major challenge of the project was fitting the large,



Mark Schlosser

efficient equipment into the small mechanical spaces designed by the architect to reduce construction costs. BGCE specified customized equipment to fit into the spaces and ensured the project's success through extensive design, construction and installation coordination with other design team members and with the construction contractors.

The new building includes offices, art rooms, computer and science labs, student gathering areas, EMT training rooms and a library.

"Sustainability features have allowed us to submit seven out of 10 Optimize Energy Performance points, which could result in LEED Gold certification," Schlosser says.

# Energy Savings Fuel Historic School District's Green Dream



Eric Young

EMC Engineers designed this energy-efficient school building, part of Manitou Springs School District 14 in Colorado.



**PROJECT:**  
Manitou Springs School District 14, Manitou Springs, Colo.

**FIRM:**  
EMC Engineers, Inc., Lakewood, Colo.

**A**mid concerns over energy consumption and rising costs, but without the funds to make substantial improvements, the Manitou Springs School District 14 entered into an Energy Savings Performance Contract (ESPC), with EMC Engineers, Inc. (EMC), to update and improve the performance of its facilities.

The district, comprising of nine buildings totaling 246,000 square feet across three campuses with the old-

est building constructed in the early 1900s, serves the Colorado mountain communities of Manitou Springs and Cascade.

An ESPC is a contract through which the building owner finances energy-efficient upgrades with the projected savings from those upgrades.

"EMC guaranteed the projected energy savings that would result by implementing the improvements, allowing the school district to acquire the construction financing package necessary to make them," says Eric Young, president of EMC.

As the project's lead engineer and construction manager, EMC conducted an initial technical energy audit to determine the energy performance of the existing sys-

tems. The firm also performed energy analysis and modeling to simulate baseline energy performance and to determine the possible improvements and the mechanical and electrical designs for sustainable upgrades to improve energy performance. Finally, EMC was responsible for hiring the appropriate contractors to complete the construction.

The district's goal was to make its buildings more energy-efficient, reduce energy consumption and, in turn, reduce its utility bills—all part of the community's goal of becoming a sustainable city.

EMC's innovations included a districtwide BACnet system to monitor alarms, trends, schedules and individual equipment operation; occupancy sensors to control lighting and HVAC equipment in

each room; variable frequency drives for fan-powered equipment and pumps; new very-high-efficiency condensing boilers; and a water-heating system that uses a recirculation loop controlled by occupancy schedules.

Because the existing buildings have different types of mechanical systems and controls, EMC had to create a uniform control system simple enough to be effective, but complex enough to operate the different equipment and systems.

In another challenge EMC had to change "from the original summer installation schedule, due to the discovery of an incomplete asbestos mitigation project and a previously improperly installed boiler plant," says Young. EMC rewrote schedules and contracts to accommodate these project delays, requiring contractors to work when they could—including weekends, holidays and at night—to avoid classroom disruptions.

"By enabling the school district to accomplish its goals, EMC has demonstrated that consulting engineering firms can provide more than just design and construction services, but can enable creative financing and implement innovative, energy-saving strategies that offer improved efficiency, comfort, health and safety for building occupants," adds Young. ■

# 2008 Young Professionals of the Year HONORED

ACEC presented five Member Firm engineers with 2008 “Young Professional of the Year” Awards at its Fall Conference in Montréal. Selected by the ACEC Fellows, these engineers were recognized for making significant contributions to the profession at early stages in their careers.



**Benjamin L. Phillips**  
Civil Engineer  
Stantec Consulting  
Services  
Lexington, Ky.

Phillips is helping to head an extraordinarily large and diverse geotechnical program. After being one of the first geotechnical engineers on the ground in New Orleans following Hurricane Katrina, Phillips established an 8,000-square-foot, state-of-the-art soils testing laboratory and a 10,000-square-foot warehouse near the Crescent City to process the 630 tons of samples needed to define the underlying soil properties of the levees surrounding the city.



**Joshua Boltz**  
Process Engineer  
CH2M HILL  
Tampa, Fla.

As a project wastewater process engineer at CH2M HILL, Boltz already has made his mark in the wastewater industry by co-developing a novel hybrid bioreactor that CH2M HILL engineers now use as a global design standard for the construction of advanced nutrient control systems. Boltz also has published 31 articles, authored two chapters in *Biofilm Reactors* and is active in the Water Environment Federation.



**Christine Brazill**  
Electrical Engineer  
HSMM  
Washington, D.C.

Brazill is leading the sustainable design for the U.S. Capitol's first green project—the Science and Technology Committee suite. Brazill also is the sustainable design coordinator for the modernization of the historic Eisenhower Executive Office Building. She devotes her spare time to teaching and promoting engineering, having created and instructed a course on lighting at the Art Institute of Washington.



**Stephanie Hoffman**  
Project Engineer  
DMJM Harris  
Solana Beach, Calif.

As a project engineer for the Energy and Power Division of DMJM Harris, part of AECOM, Hoffman developed sustainable solutions for two campuses of the California State University system that will deliver annual savings of more than \$600,000. As the design lead on a project to develop air-conditioning standards for the San Diego Unified School District, Hoffman has targeted offsetting the increased energy use from air-conditioning school buildings with a variety of energy-efficient measures.



**Zachary Kostura**  
Structural Engineer  
Arup  
New York City

Kostura has worked on several complex projects, most notably the Fulton Street Transit Center, where he performed structural analysis of the existing cast-iron-lined subway tunnels and helped design the transit center's innovative circular, glazed, light-steel “Oculus” structure. Kostura also has been involved in WaterAid Nigeria, a humanitarian effort to improve the clean water delivery infrastructure for local communities in Nigeria.

ACEC President Dave Raymond reports to the Board on "the state of the Council."

## Fall Conference in

# Montréal

More than 800 participants in ACEC's Fall Conference in Montréal enjoyed captivating speakers, insightful business sessions and valuable networking.

Against the backdrop of a slowing economy and a hard-fought national political campaign, the meeting addressed critical business and public policy issues.

Legendary explorer Robert Ballard was a Conference highlight as he described stirring tales of undersea discovery. "Wasn't Ballard something? That was a home run," said Charles Geer of Kimley-Horn and Associates, Inc. in West Palm Beach, Fla.

Eric Franson of Franson Engineers in American Fork, Utah, said "This was my first ACEC Conference and it exceeded my highest expectations. The best part was meeting industry people and being able to discuss relevant issues."



ACEC Chairman John Hennessy (left) shares a laugh with Morton Kondracke after the FOX News commentator provided election insights for Conference attendees.

## Strategic Goal #1 – Advocacy

### Achievements

- Restored \$8 billion FY'09 highway shortfall.
- Enacted engineering student loan forgiveness program (\$10,000/five years).
- Killed over-reaching wetlands bill.
- Advanced \$1 billion bridge repair bill; PE required for inspectors.
- Advanced QBS in water and aviation legislation.
- Secured House majority and new Senate support to kill 3% withholding.



Fall Conference guests are treated to an acrobatic cirque performance at the historic Le Windsor Ballroom.

## Conference Highlights:

- Princeton University Professor **David P. Billington** received the 2008 Distinguished Award of Merit—the Council's highest award bestowed upon an individual.
- Explorer **Robert Ballard**, discoverer of the Titanic, gave a tour de force on ocean exploration.
- FOX News analyst **Morton Kondracke** previewed the hotly contested presidential election.
- Fall Conference fundraising propelled ACEC/PAC over the \$1 million mark for the first time.
- PBSJ Chairman **John Zumwalt** provided a haunting recount of how his firm successfully navigated through a major internal embezzlement crisis.
- ACEC's new Land Development Coalition and new Education Forum held successful inaugural meetings.
- 2008 College of Fellows inductees were: **Everett Cowan** of Gresham Smith and Partners, Nashville, Tenn.; **Ara Arman** of G.E.C., Inc., Baton Rouge, La.; **Woody Germany** of WGM Group, Inc., Missoula, Mont.; **Rajan Sheth** of Mead & Hunt, Madison, Wis.; **Paul Tarvin** of STS Consultants, Milwaukee, Wis.; **Franklin Wilson** of McKinney & Company, Ashland, Va.; **Michael Hanlon** of Weston & Sampson Engineers, Peabody, Mass.; and **Gilbert Gerdman** of MSA Professional Services, Inc. Baraboo, Wis.
- Community Service Awards were presented to **John Coombe** of Hanson Professional Services, Inc. in Springfield, Ill., and **Rick Baldocchi** of AVCON, Inc. in Orlando, Fla.
- The ACEC Past Chairmen's Award went to **David Oates**, president and CEO of Oates Associates in Collinsville, Ill., for his special contributions to the Council.
- CASE presented its 2008 CASE Past Chairman's Award to longtime CASE Staff Director **Edward Bajer**.

## Fall Conference Propels ACEC/PAC to \$1 Million

ACEC/PAC fundraising crossed the \$1 million mark for the 2007–2008 election cycle for the first time in Council history.

Winners of the ACEC/PAC Sweepstakes: Larry Fairchild of Clough Harbour & Associates in Albany, N.Y., won the \$10,000 Grand Prize; Elliot Sulsky of Felsburg Holt & Ullevig, Inc., in Centennial, Colo., claimed the \$5,000 second prize; and Tim Anderson of Karins and Associates in Delaware and Brian Lawlor of Symmes Maini

& McKee Associates, Inc., in Massachusetts, won the \$2,000 third and \$1,000 fourth prizes, respectively.

The ACEC/PAC Golf Tournament was held at the historic Ilsemer Country Club.

The winning team included Michael Smith of Nussbaumer & Clarke in Buffalo, N.Y., Tom Ahneman of Ahneman Kirby in Port Chester, N.Y., and Greg Knopp of ACEC in Washington, D.C. Smith also was victorious in the closest-to-the-pin and long-drive competitions.

## Ballard Thrills and Inspires

The famous underwater explorer revealed that his history-making discovery of the Titanic was actually a cover for a top-secret military mission.

He also described his journey to the bottom of the deepest recesses of the ocean: "We found 40-foot-tall steam-emitting chimneys rich with all types of key minerals. And, moreover, we found life that should not have been down there."

"Fifty percent of the United States lies under the sea," he said. "Yet, we have better maps of Mars than we do of our own ocean floor."

**Famed explorer Robert Ballard poses with one of his biggest fans, nine-year-old Tyler Rouis, son of Paul Rouis of Ryan-Biggs Associates in Troy, N.Y. Paul brought his son to the Fall Conference so he could meet his idol in person.**

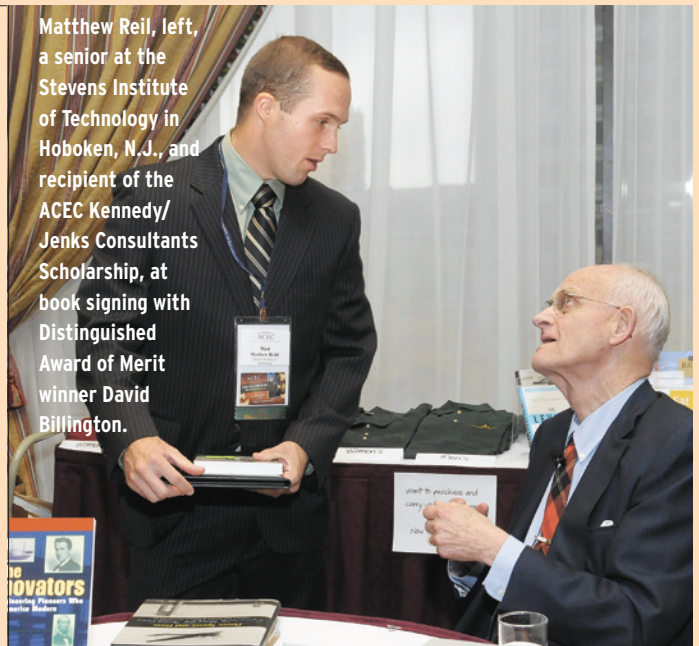


In addition to exploration, he emphasized his other passion—exposing youth to the excitement of engineering and science.

Through his Jason Project, which uses advanced communication technologies to allow school children to participate remotely in undersea exploration, Ballard has helped inspire more than 500,000 young people.

"The battle for the engineer is over by the eighth grade," he said. "If, through this program, I can get their jaw to drop, I have won a new engineer."

Matthew Reil, left, a senior at the Stevens Institute of Technology in Hoboken, N.J., and recipient of the ACEC Kennedy/Jenks Consultants Scholarship, at book signing with Distinguished Award of Merit winner David Billington.



## Billington Receives Distinguished Award of Merit

ACEC presented its highest honor, the Distinguished Award of Merit, to Professor David P. Billington, one of the world's foremost engineering educators.

A professor at Princeton University's School of Engineering and Applied Science since 1961, Billington was named by *Engineering News Record* as "one of the top five educators in the construction industry over the past 125 years."

In his many books, Billington evokes "the grand tradition of modern engineering, the transformation of American society by engineering and the role of engineering in the history of America."

In accepting the award, the professor spoke passionately about the engineering field and the need to pass on its excitement to a new generation of students and practitioners.



**Courtney Brown, left, president of ACEC/Metro Washington, talks with ACEC/Virginia leadership—Steve Roberts, president; Cindy Allen, president-elect and John Mann, national director—during a break at the Board of Directors meeting.**



Enjoying the Fall Conference are from the left: Angie and J. Wayne Morrison of Williams, Clark & Morrison, Inc. in Yazoo City, Miss.; ACEC/Mississippi Executive Director Judy Adams; and Marilyn and Ed Dedeaux of Allen & Hoshall in Ridgeland, Miss.

## PBSJ Chairman Recounts Embezzlement Crisis at His Firm

**J**ohn Zumwalt, Chairman and CEO of The PBSJ Corporation, closed the 2008 ACEC Fall Conference with a cautionary tale of embezzlement and misplaced trust.

Miami-based PBSJ, the parent company of PBS&J, experienced rapid growth from the early 1990s through 2005, quadrupling in size to become a \$3.7 billion firm operating across the country.

In 2005, a question about a discrepancy in a single account revealed a massive internal fraud perpetrated by the firm's CFO and two accomplices in the accounting department.

Ultimately totaling \$37 million, the fraud was discovered by the firm's own internal procedures and Zumwalt guided the firm through a tortuous process but successful outcome.

Despite the crisis, the firm did not lose a single client and regained its financial health and reputation.

The CFO is serving nine



John Zumwalt, chairman and CEO of The PBSJ Corporation, urged firm leaders to "trust but verify."

years in prison, and his two accomplices were sentenced to six years each.

"This can happen to anyone," Zumwalt warned. "It happens to a lot of companies and they don't even know it." He offered some simple advice to firms: "Trust but verify."

"John has provided a unique service for our industry by sharing his experiences," said ACEC President Dave Raymond. ■



Richard Stees (second from right), of Erdman Anthony in Mechanicsburg, Pa., didn't need a cirque mask to enjoy Local Color Night, while Wendy Biggar (left), of St. Paul, Minn.; Stees' wife, Kathy Stees; and Sandy Giefer, also of St. Paul, donned the event's appropriate attire.



Acrobatic cirque performers entertained Conference attendees with their artistry.

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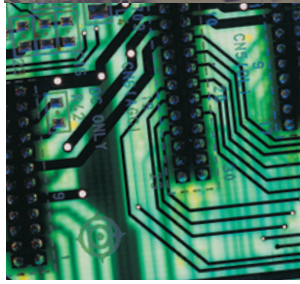
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## PROTECT AND SERVE

### Poor server management means increased costs, greater security risks

By Bob Violino

Businesses have seen a proliferation of servers; failure to manage these information technology (IT) resources effectively can result in rising costs, increased energy consumption, information security risks and other problems.

Engineering firms have to deal with server management challenges just like any other business. Among the key issues: server virtualization, energy usage, availability, storage and security.

Philadelphia-based engineering firm Pennoni Associates, Inc. supports an increasingly complex array of applications and services for its 850 employees. The firm runs 70 servers to support communications, e-mail and web applications, as well as core functions, including enterprise resource planning applications and file and printer sharing.

"Growing our server population resulted in us outgrowing our headquarters data center and moving to an off-site collocation strategy, where we now position high-value assets and critical systems in a 24/7 protected facility," says Markus Weidner, director of IT at Pennoni Associates.

In the process of that conversion, the firm identified many servers that could be virtualized without an impact on performance or functionality. Virtualization is a concept by which single servers are divided into multiple virtual machines that can run multiple operating systems and applications as if they were running on physically separate machines.

Already virtualization has resolved some of the firm's server management challenges, such as power, cooling and disaster recovery, Weidner says. "We would have a very difficult time finding cooling and power if we turned our 25 virtual machines into physical boxes today," he explains.

Storage is another of Pennoni's concerns, particularly with the growth it has seen recently at its branch offices. The firm's IT staff is developing an archival policy to control that growth "so that we are only storing and backing up current projects," Weidner says. "This will prevent us from the constant cycle of adding more drive space."

#### Accessibility

Another challenge is how to make the information stored on servers easily accessible to engineers, says Colleen Mulrooney, IT manager for Delta Engineers & Architects in Binghamton, N.Y.

"Every day, our engineers manage information that comes in various formats," including e-mails, transmittals, specifications, drawing files and customer data, Mulrooney says. "The delivery and storage systems for that data could be a database server, e-mail server or file server, which requires providing a separate interface for each."

That type of environment often requires engineers to sift through

multiple applications to locate information. "There are hundreds of documents in various formats that engineers have to manage for every project they're working on, and all are working on multiple projects," Mulrooney says. "The time needed to navigate all those applications to locate the files they need adds up quickly."

To solve this challenge, the firm deployed a central repository for data collected from multiple servers. Combining the information stored on multiple servers and making it available to engineers from a single interface ensures quick, easy access to everything, no matter where it's stored, says Mulrooney.

Yet another concern for Delta is server sprawl—and the costs associated with it. The firm has rapidly increased its number of servers, in part to support the hundreds of applications it provides to its engineers, many of which require high bandwidth and memory.



The firms soon will launch a server virtualization project to cut down on the number of physical servers in use. "We should be able to cut the number of physical servers down by about 60 percent," Mulrooney says. "That will significantly decrease our software and hardware expenditures."

Protecting servers against viruses and other security threats is another concern. "A user could access a seemingly legitimate website and download a Trojan horse virus that's designed to provide remote access to someone with malicious intent," Mulrooney says.

A new breed of Trojan horse virus that security companies are warning about requires no user interaction. "This type of threat could open up every employee in the company to identity theft," explains Mulrooney. "Most firms store the sensitive personal information of all their employees on at least one server—so without adequate security, this could pose a significant threat."

To protect against unwanted network intrusions, Delta employs filters and antispyware technology that blocks and, in some cases, quarantines compromised websites and e-mails before they reach users' desks. ■

*Bob Violino is a business writer living in Massapequa Park, N.Y.*



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### On The Move



**ACEC Senior Vice Chairman Gregs Thomopulos**

## Thomopulos Named President-Elect of FIDIC

**A**CEC Senior Vice Chairman Gregs Thomopulos has been elected president-elect of the International Federation of Consulting Engineers (FIDIC), the worldwide organization representing the consulting engineering industry.

Thomopulos, who is chairman and CEO of Stanley Consultants, Inc. in Muscatine, Iowa, will assume the FIDIC presidency in September 2009. FIDIC's membership includes associations from 75 countries, including ACEC, the largest member.

Thomopulos has been on the FIDIC executive committee since 2004 and has served as the organization's vice president. He will be the fourth American to be FIDIC president following Bill Moore (Dames & Moore), 1970–1972; Wilson Binger (TAMS), 1981–1983; and Bill Lewis (ASL Consulting Engineers), 1995–1997. All three served as ACEC chairmen.

“As the global voice of the engineering industry, FIDIC has taken the lead in advocating the use of Qualifications-Based Selection (QBS) by foreign governments and the

multilateral development banks,” said Thomopulos. “In my leadership role in FIDIC, I plan to continue working on acceptance of QBS and to make advocacy a top issue in the same manner that ACEC has been so effective in the United States.”

“Since ACEC joined FIDIC almost 50 years ago, we have used the organization to establish best practices in the international market,” said ACEC President Dave Raymond. “Gregs Thomopulos’ ascension to the FIDIC presidency will give us new opportunities in this important organization.”

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S. Robert Kallenbaugh



James E. McDonald

The board of directors of **RBF Consulting** recently promoted co-presidents **S. Robert Kallenbaugh** and **James E. McDonald** to co-CEOs of the firm. This is only the second appointment of the CEO position in the firm's 65-year history. McDonald and Kallenbaugh, who succeed RBF's retired CEO Robert W. Bein, have been co-presidents since 1991.



Richard Kuzmar



James W. Blake

**Greeley and Hansen** named **Richard Kuzmar** CFO. Kuzmar most recently served as CFO and principal with CCA Strategies, a national benefits consulting and pension plan administration business.

**Greenman-Pedersen, Inc.** named **James W. Blake** vice president and director of engineering for the firm's Annapolis Junction, Md., office. Blake's expertise includes civil engineering, environmental planning and land surveying.



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# MEMBERS IN THE NEWS

## Welcome New Member Firms

### ACEC/California

Costello Consulting, Upland  
Palmetto Engineering and Land  
Surveying, Inc., Bakersfield  
Remington Engineering,  
Fairfield  
R.E.Y. Engineers, Inc., Folsom

### ACEC/Colorado

Frachetti Engineering Inc.,  
Denver

### ACEC/Connecticut

Milone & MacBroom, Inc.,  
Cheshire

### ACEC/Florida

Base Consultants, P.A.,  
Winter Park  
E. L. Robinson Engineering of  
Florida, Inverness  
Fullone Structural Group,  
St. Petersburg  
GCME, Inc., West Palm Beach  
Hillers Electrical Engineering,  
Inc., Boca Raton  
New Millennium Design  
Consultants, Miami  
Palm Engineering, Inc.,  
St. Petersburg

Thompson & Associates, Inc.,  
Fort Lauderdale

### ACEC/Georgia

Infratec Consultants, Inc.,  
Atlanta

### ACEC/Idaho

Erickson Civil, Inc., Meridian  
Holladay Engineering Company,  
Inc., Payette

### ACEC/Illinois

Avila Consulting Services, Inc.,  
Chicago

### ACEC/Massachusetts

The Bhatti Group, LLC, Boston

### ACEC/Michigan

BB&E, Farmington Hills

### ACEC/New Hampshire

JGI Eastern, Inc., Manchester

### ACEC/South Carolina

Rowe Professional Services  
Company, Myrtle Beach

### ACEC/Washington

BrN Engineering, Inc., Seattle  
E3 Energy Partners, LLC,  
Seattle  
UrbanTech Systems, Seattle

## Anniversary

**H**olzmacher, McLendon & Murrell, P.C. (H2M Group), a multidisciplinary engineering and architectural firm, recently celebrated its 75th anniversary.

Henry G. (Gus) Holzmacher started the company in 1933 working out of his home designing and implementing projects throughout Long Island, N.Y., including sewage and water treatment facilities, schools, road reconstruction and traffic surveys, and safety and environmental site assessments and remediation.

Today, H2M, with a staff of more than 260 professionals, provides multidisciplinary engineering; architecture and environmental services; civil/site, structural and transportation engineering; mechanical/electrical/plumbing engineering; water supply/water resources; digital infrastructure management; and a host of other services.



H2M's president and CEO, John Molloy (left), and Robert G. Holzmacher (son of founder Henry G. Holzmacher) unveil an anniversary banner outside the company's Melville, N.Y., headquarters.

UNITED STATES POSTAL SERVICE® (All Periodicals Publications Except Requester Publications)		
1. Publication Title <b>Engineering Inc.</b>	2. Publication Number 0 0 0 7 - 3 9 5	3. Filing Date October 1, 2008
4. Issue Frequency <b>Bi-monthly</b>	5. Number of Issues Published Annually <b>6</b>	6. Annual Subscription Price <b>\$24, \$45 and \$65</b>
7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4®) <b>1015 15th Street, NW, 8th Floor, Washington, DC 20005-2605</b>		
8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer) <b>1707 L Street, NW, 3rd Floor, Washington, DC 20036</b>		
9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank)		
Publisher (Name and complete mailing address) <b>The Magazine Group, 1707 L Street, NW, 3rd Floor, Washington, DC 20036</b>		
Editor (Name and complete mailing address) <b>Andrea Keeney, American Council of Engineering Companies 1015 15th Street, NW, 8th Floor, Washington, DC 20005-2605</b>		
Managing Editor (Name and complete mailing address) <b>Corey Murray, The Magazine Group 1707 L Street, NW, 3rd Floor, Washington, DC 20036</b>		
10. Owner (Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, give the names and addresses of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address.)		
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13. Publication Title <b>Engineering Inc.</b>		14. Issue Date for Circulation Data Below <b>September/October 2008</b>	
15. Extent and Nature of Circulation		Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies (Net press run)		21,153	20,916
b. Paid Circulation (By Mail and Outside the Mail)	(1) Mailed Outside-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	19,660	19,365
	(2) Mailed In-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	0	0
	(3) Paid Distribution Outside the Mails Including Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Paid Distribution Outside USPS®	0	0
	(4) Paid Distribution by Other Classes of Mail Through the USPS (e.g. First-Class Mail®)	0	0
c. Total Paid Distribution (Sum of 15b (1), (2), (3), and (4))		19,660	19,365
d. Free or Nominal Rate Distribution (By Mail and Outside the Mail)	(1) Free or Nominal Rate Outside-County Copies Included on PS Form 3541	0	0
	(2) Free or Nominal Rate In-County Copies Included on PS Form 3541	0	0
	(3) Free or Nominal Rate Copies Mailed at Other Classes Through the USPS (e.g. First-Class Mail)	338	375
	(4) Free or Nominal Rate Distribution Outside the Mail (Carriers or other means)	517	476
e. Total Free or Nominal Rate Distribution (Sum of 15d (1), (2), (3) and (4))		855	851
f. Total Distribution (Sum of 15c and 15e)		20,515	20,216
g. Copies not Distributed (See Instructions to Publishers #4 (page #3))		639	700
h. Total (Sum of 15f and g)		21,153	20,916
i. Percent Paid (15c divided by 15f times 100)		96%	96%
16. Publication of Statement of Ownership <input checked="" type="checkbox"/> If the publication is a general publication, publication of this statement is required. Will be printed in the <b>Nov/Dec 2008</b> issue of this publication. <input type="checkbox"/> Publication not required.			
17. Signature and Title of Editor, Publisher, Business Manager, or Owner <i>Andrea S. Keeney</i>		Date <b>October 1, 2008</b>	
I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).			

## Awards

**T**he National Building Museum in Washington, D.C., presented the 2008 Henry C. Turner Prize for Innovation in Construction Technology to **Charles H. Thornton**, co-founder of Thornton Tomasetti, Inc., and founder of the Architecture, Construction and Engineering (ACE) Mentor Program of America.

The Henry C. Turner Prize recognizes an invention, an innovative methodology, and/or exceptional leadership by an individual or team of individuals in construction technology.

Through the ACE Mentor Program of America, high school students are introduced to career opportunities in architecture, construction and engineering.



**L**isa A. Brothers, vice president and COO of Nitsch Engineering in Boston, was named 2008 Woman of the Year by the Boston Chapter of the Women's Transportation Seminar (WTS-Boston).

The award recognizes a member of WTS-Boston who is a leader in the transportation industry and has advanced the reputation and credibility of women and minorities within the industry through her career achievements.

Brothers is a 2004 graduate of ACEC's Senior Executives Institute. She is senior vice president of ACEC/Massachusetts and also serves on its membership and government affairs committees.



## Calendar of Events

2008

### NOVEMBER

- 18** Now That I Have Them, How Do I Keep Them? (online seminar)
- 19** Limiting Liability and Managing Risks Through Contract Provisions: Ceilings, Floors and Trap Doors (online seminar)
- 20** Professional Ethics: A Preventive Maintenance Approach (online seminar)

### DECEMBER

- 2** Effective Project Planning to Improve Profits (online seminar)

2-5

**Sustainable Project Management for Facilities and Infrastructure Systems, Falls Church, Va.**

3

**Showcasing Your Expertise: How to Attract Clients Using Stories and Examples (online seminar)**

4-5

**Building Information Modeling (BIM): The Promise and the Reality for A/E/C Firms, New Orleans**

10

**Future Leaders Focus: A Study of the Needs and Priorities of Young Design Professionals (online seminar)**

11

**Are You Fighting Fires Instead of Managing Your Employees? (online seminar)**

Additional information on ACEC's events is available at [www.acec.org](http://www.acec.org).

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John M. Dionisio is president and CEO of AECOM.

## AECOM's Global Perspective And 'Balanced Approach to Growth'

### Q. How has the upheaval in the financial markets affected your business?

A. While the state of global financial markets is top-of-mind for many in our industry, AECOM's business has not experienced significant change. Though the United States is a large and important market for us, we are diversified and derive approximately half of our revenue from outside of the United States, where emerging markets continue to invest in new infrastructure. Furthermore, our work is funded by a variety of sources, including federal, state and local governments; private multinational clients; long-term bonds; user fees; and public-private partnerships. This diversification allows us to weather market ups and downs.

### Q. As master planner for the 2012 Summer Olympic Games in London, what are AECOM's main challenges?

A. Our biggest challenge has been to ensure that the facilities and infrastructure built for the games benefit London and the U.K. long after the event is concluded. This is something that was not done very well with some previous Olympiads. In Athens, for example, little attention was paid to future uses of Olympic venues.

In London, the main Olympic park is in the Lower Lea Valley, one of the U.K.'s most economically challenged areas. Following the games, the entire area will benefit from a dramatically improved physical and socioeconomic environment. This focus on the impact on the broader community has been paramount throughout the planning process and has the potential to effect a profound change on this part of London.

### Q. Considering your firm's expertise on water issues, what is your view of the current state of the U.S. water/wastewater infrastructure?

A. As with much of the U.S. infrastructure, our water and wastewater systems have not received the necessary attention or funding in recent decades, which has led to an aging and under-maintained system. Findings by organizations such as the EPA, the Water Environment Federation and others have

identified a necessary investment of approximately \$650 billion in U.S. water and wastewater systems over the next 20 years. There are also many new, large opportunities around the world in this market that are already fully funded.

### Q. Is the engineer shortage as severe as some say? What, in your view, is the solution?

A. Although the "battle for talent" in our industry is an issue that we are aware of—and focused on—AECOM has not seen any negative effects from it thus far. That being said, there is clearly a shortage of engineers in our industry, and the pipeline of new engineers entering the field has declined in recent years.

However, we have been able to consistently pursue and win some of the most iconic and professionally fulfilling projects in the world. This translates to enhanced professional and career development opportunities for AECOM employees.

In addition, we are very active in encouraging young people to enter the profession through programs such as the ACE Mentoring Program, of which we are a national sponsor; our popular water/wastewater Collegiate Design Competition; and numerous research collaborations with colleges and universities across the United States.

### Q. What has stimulated AECOM's acquisition policy over the years?

A. Throughout AECOM's history, we have been very successful at growing our business organically, and we have also expanded our market positions and global footprint via acquisition. This balanced approach to growth has helped AECOM evolve from a primarily U.S.-focused business to a true global firm with expanded presence in Australia, Asia, Europe, Canada and the Middle East. Acquisitions have also played a key role in helping grow our leadership position in the environmental, water and energy and power end markets. ■

### About AECOM

**Services:** Technical and management services for broad range of markets including transportation, facilities, environmental and energy

**Founded:** 1990

**Headquarters:** Los Angeles, Calif.

**Employees:** 41,000

**Operations:** More than 100 countries

#### Mergers/Acquisitions

**Include:** Hayes, Seay, Mattern & Mattern; RETEC; Boyle Engineering; Earth Tech



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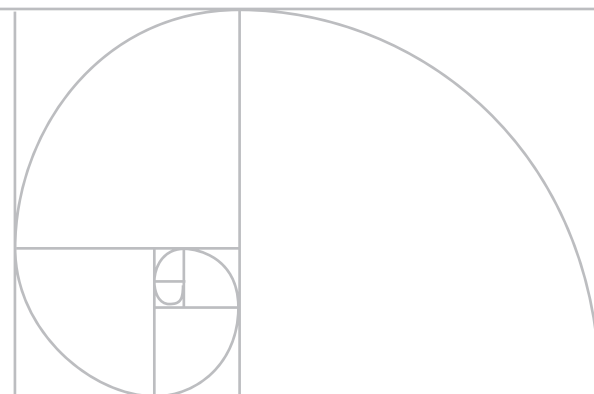
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