FMI Quarterly
2007 ISSUE 1

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BY ASHLEY E. ROBERTSON AND KELLEY CHISHOLM

This Quarter:
Winning the Talent War

Dear Reader:

The War for Talent in the construction industry is ablaze. Companies are starting the long battle for a limited resource, labor. The war is expected to be long — some analysts say this war will be the biggest the industry's seen and predict it will continue raging for the next 20 years. So companies hoping to hunker down will not win this fight; instead, they will likely find they've been raided by their competition. Companies armed with talent-development strategies will be the ones on the right side of the battlefield after this fight through boardroom bunkers and cubicle trenches. Whether you know it or not, you are under attack, and so our issue this quarter is dedicated to helping you win this costly war for talent.

Our feature interview this quarter is with our very own, Hank Harris, CEO of FMI Corporation. Hank shares his insights on the *Surprises of the New Executive*. We've also included eight features surrounding our theme this quarter.

Kelley Chisholm highlights the ACE Mentor Program, an innovative approach to attracting young people to the fields of architecture, construction management, and engineering.

The labor crisis has necessitated an even greater focus within organizations on talent development and training. Ashley Robertson and Kelley Chisholm in their feature, *Developing Talent From Top to Bottom*, describe how companies can effectively address this need through recruiting, training, performance management, career pathing, reinforcement, and evaluation.

Project managers serve on the front lines of the project, and in this war for talent it will be crucial for companies to arm themselves with superior project leaders. Gregg Schoppman shows us how companies can grow project leaders out of project observers through planning, communicating, and business acumen, in his feature, *Evolving Project Observers into Project Leaders*. Then, Schoppman puts the spotlight on one successful program that's developing project leaders.

In *Project Management Excellence*, Schoppman interviews Dr. Ralph Ellis of the University of Florida, revealing how their construction management program is developing young people for work in today's industry.

In our never-ending quest to provide thought leadership for the construction industry, we've included a thought piece on the roots of the industry's labor crisis. Hoyt Lowder and Jay Bowman identify and examine three main roots — the industry's image, current career and education trends, and workforce demographics — in their feature, *Rooting Out the Problem*.

Nick Schubert provides an in-depth look at a growing byproduct of the labor crisis, unauthorized migrant workers in the construction industry. In his feature on the subject, he explains how the industry has become dependent on immigrant labor, making it necessary to understand the changing labor environment, the needs of their current and future workforce, and the laws.

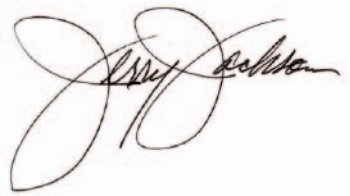
Companies hoping to survive the industry's labor storm will do well to follow Vanessa Winzenburg's outline for developing and executing a strategy to create a sustainable organizational culture characterized by employee growth in her feature, *Shore Up Your Levee System for the Labor Shortage Storm*. Then, Mark Bridgers and Mike Chase provide our annual economic outlook for utility contractors.

Finally, our departmental editors, including a piece penned by Zurich Construction, provide ideas and experiences aimed at equipping your organization with the necessary weapons to win the talent war.

As you take time for reflection in your winter season, use these articles to outline your winning battle plan. We wish you every success in 2006 and, as always, look forward to your comment.

If you would like more information on the topics covered this quarter, or any issue, for that matter, pick up the phone and call FMI in Raleigh, Denver, or Tampa. We aim to build a great future for the construction industry and its leading organizations.

Sincerely,



Jerry Jackson
FMI Quarterly Publisher and Senior Editor

Departments

STRATEGY

Ethics Matter ... Sometimes

"Well, it depends." How often have we heard someone say this when challenged with a difficult question? "Conditional ethics" — what this phrase represents — lead to poor customer satisfaction and poor construction performance. At least, that's what FMI Corporation's 54 years of construction industry experience illustrates.

In a similar vein, ethical lapses have too often dominated business news in recent years. While many individuals are now debating the costs incurred to comply with Sarbanes-Oxley, few doubt the benefits of shareholder trust it has restored in the stock market. Trust is the fundamental concern for business and the economy, and trust is synonymous with integrity, demonstrated through ethical business practices. Yet, in a survey conducted by FMI and the Construction Management Association of America (CMAA), 84% of industry respondents consisting of contractors, construction managers, and owners said that they had personally experienced industry-related acts that they considered unethical. (See Exhibit 1.) *"Well, it depends."* Although this figure is astounding, the solution is simple and fundamental. Trust may be in short supply as demonstrated in Exhibit 2; in this list of the highest ranking topics of concern as rated by construction industry participants, the need to build greater trust is present in four of the five top-ranked responses.

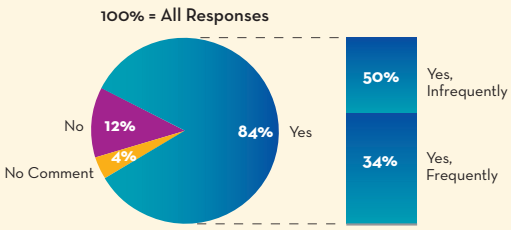
A respondent to FMI's survey of construction industry ethical practices said it best:

"You should not have to regulate or teach ethical behavior. Individuals know right from wrong." — Anonymous respondent to the *FMI/CMAA Survey of Ethics in the Construction Industry.*

Exhibit 1

Observed Unethical Acts

Survey Question: Have you personally experienced industry-related acts that you consider unethical?



Source: FMI/CMAA Survey of Ethics in the Construction Industry

DO ETHICS REALLY MATTER?

Ralph James, long-time consultant to construction-industry firms, in his book, *The Integrity Chain*, on the relationship between integrity, ethics, and successful construction performance, demonstrates the financial and moral link among these three characteristics.

"The integrity of the construction process is as important as the integrity of the construction products." — Ralph James, Ph.D., *The Integrity Chain*

A significant, but not high enough, percentage of the construction industry feels the same way. Thirty-five percent of respondents estimated that unethical practices cost between one-half of one percent and two percent of the total project cost. Additional costs are also incurred for scandalous activity making news headlines such as legal fees, lost reputations, falling share prices, and potential loss of life due to shoddy materials, unprofessional work etc. In FMI's work with owners and contractors, we have learned that unethical behavior is very expensive in both objective and qualitative ways.

Exhibit 2

Top Ethical Concerns

Topic	Percentage of Response
Trust between contractors and subcontractors	76%
Trust between owners and contractors	75%
Public perception of our industry	65%
The cost of getting our projects built	61%
Trust between contractors and design professionals	60%

Source: FMI/CMAA Survey of Ethics in the Construction Industry

STRUCTURAL INTEGRITY

Just as buildings must have structural integrity, we all want to work with individuals and companies with integrity and worthy of our trust. When it comes to the trust issue, 91 percent of survey respondents said they consider the ethics and integrity of the contractors they hire or work with to be important, or of the utmost importance. Yet, only 16 percent of respondents said that they would *never* hire or work with a contractor they *knew* had a reputation for unethical practices. (See Exhibit 3.) *"Well, it depends."* Perhaps this apparent contradiction is not unexpected. In our research, we have found a gap exists between what people want to do and what they actually do. If members of the construction industry want to improve the industry's ethical standing, they will have to work on closing these gaps. The owner community, as the consumers of construction services, can take the lead by both demanding and enforcing higher ethical standards.

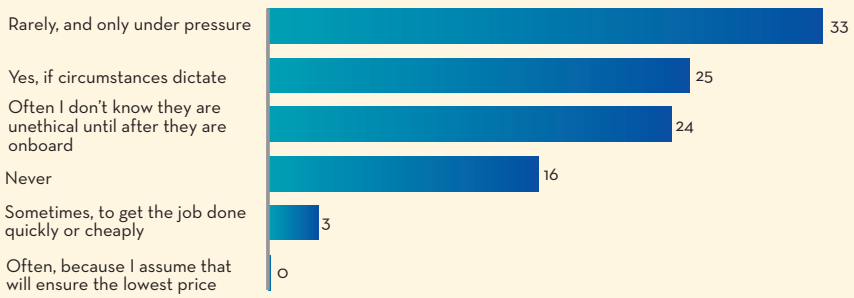
Just as buildings must have structural integrity, we all want to work with individuals and companies with integrity and worthy of our trust.

Exhibit 3

Hiring Unethical Contractors

Survey Question: Do you ever hire or work with a contractor that you know has a reputation for unethical practices?

Percentage



Source: FMI/CMAA Survey of Ethics in the Construction Industry

BLACK AND WHITE

What do we mean when we talk about "ethical" or "unethical" behavior? Merriam Webster defines ethics as:

- The discipline dealing with what is good and bad about moral duty and obligation
- A set of accepted moral principles and values about what ought to be
- A theory or system of moral principles governing the appropriate conduct for an individual or group
- A code of morality.

The term "ethics" can refer to several different things — a discipline or area of study, rules or principles, or a system governing what individuals and groups see as their duty. This term that we use easily in conversation can be loaded with different meanings and questions. What do we mean by "moral principles and values?" Morality is a set of accepted standards or rules about what is right or wrong conduct. Conduct or behavior is the way a person responds to a set of conditions. Therefore, when we speak of an action being "unethical," we mean an action that is inconsistent with agreed-upon moral conduct.

An executive summary of what ethics means is captured in the idea that "Ain't no right way to do the wrong thing." — Rep. Dick Armey.[1] There is general agreement about right and wrong, until we are faced with the choice ourselves. *"Well, it depends."*

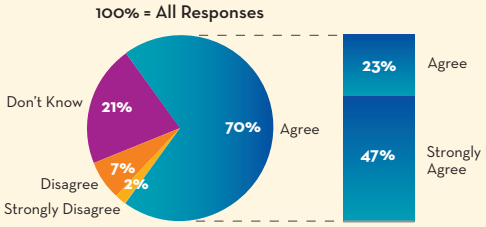
Morality is a set of accepted standards or rules about what is right or wrong conduct.

SHADES OF GRAY

Although many people accept the idea that we intuitively know right from wrong, once we start to talk about moral codes and values, duties and obligations, the subject becomes more complicated. There are differences of opinion and gaps

in what is considered right and wrong in various circumstances. For example, the related practices of bid shopping and reverse auctions have caused a good deal of discussion and disagreement in the industry.

Exhibit 4
Reverse Auction Use
Response to Statement: Use of reverse auctions is unethical



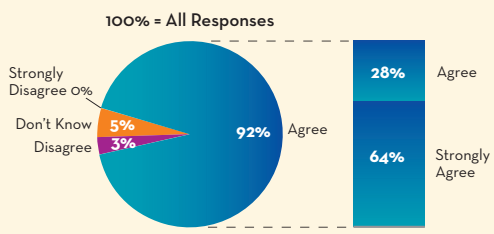
Source: FMI/CMAA Survey of Ethics in the Construction Industry

Surveyed owners, construction managers, architects, engineers, and contractors were clear in their response that reverse auctions are unethical; seventy percent of respondents either agreed or strongly agreed that reverse auctions are unethical. (See Exhibit 4.)

Some might ask: "What is unethical about reverse auctions?" *"Well, it depends."* Applied using strict rules where all players are competing fairly against other firms capable and willing to perform the work, FMI believes there is nothing inherently unethical about reverse auctions. However, many in the industry think reverse auctions look like bid shopping. When we asked respondents if they thought bid shopping was unethical, we got an even stronger, positive response. (See Exhibit 5.) Our conclusion: the two practices are perceived as being different versions of the same thing. The fact is that reverse auctions are simply a different means of purchasing goods or services. Parties to the process are all equally armed with the same information, hardly an unethical advantage to any. What may appear to be situational ethics is, in this case, not two versions of the same thing at all. Simply because one party does not like a particular system or process does not necessarily mean that the process lacks ethics.

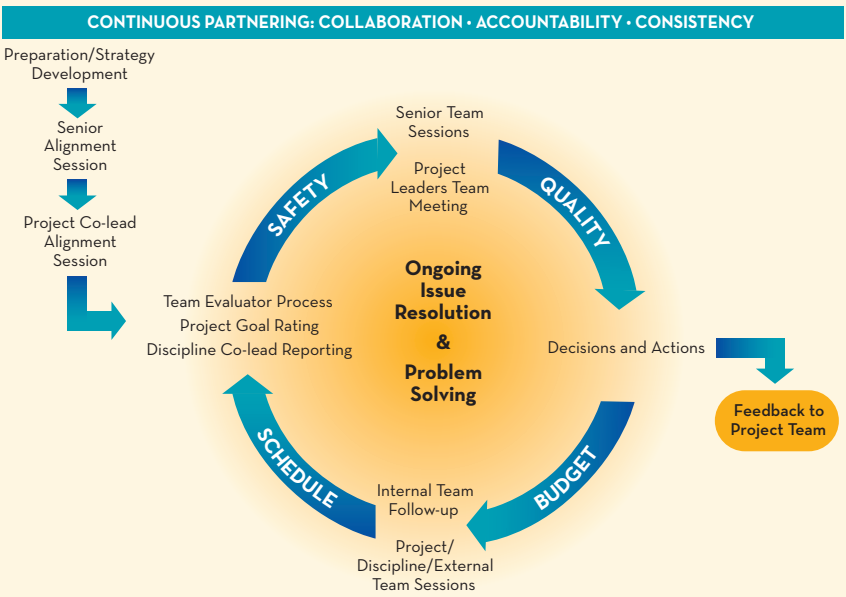
According to the American Subcontractors Association (ASA), bid shopping is "the practice of divulging a contractor's or subcontractor's bid or proposal or requiring a contractor or subcontractor to divulge its bid or proposal to another prospective contractor or subcontractor before the award of a contract or subcontract in order to secure a lower bid or proposal" (ASA news release, Sept. 26, 2003). Bid shopping is a breach of trust. Even though reverse auctions are frequently set up under specific rules, the perception remains that these auctions are a mechanism to cause subcontractors to divulge their bid so contractors or owners can secure a lower bid.

Exhibit 5
Bid Shopping Perspectives
Response to Statement: Bid shopping is unethical



Source: FMI/CMAA Survey of Ethics in the Construction Industry

Exhibit 6
Continuous Partnering Model



OWNERS SET THE TONE

Owners set the tone of the project for the various stakeholders. Early on in the process — when designs are being finalized and construction drawings supplied for bid — service providers develop a sense of how this particular owner will behave. One survey respondent said:

"Ethical issues must be driven from owners. They must first follow their own code of ethics (enforcing the safety requirements for all bidders, [not] shopping prices after the bids [have been] submitted, honoring field orders etc.) If owners dictate ethical behaviors and practices, general contractors and their subs will follow or be pushed out." — Anonymous respondent to the *FMI/CMAA Survey of Construction Industry Ethical Practices*

FMI's research mirrors this sentiment. Without leadership from the owner, specifically at both the senior leadership and owner's representative level, it is much more difficult to set the tone for the construction project. In addition, FMI consistently observes that successful construction owners rely upon the selective use of collaboration and partnering to achieve successful projects. One model of this approach, titled *Continuous Partnering* is illustrated in Exhibit 6. This approach is founded on integrity and demonstrated through ethical behavior. The result is trust, making collaborative relationships work. What can innovative and progressive owners do to ensure ethical behavior?

1. Establish a code of conduct or set of ethical practices.
2. Publish this code to design/construction service providers.
3. Incorporate this code into contracts or general conditions.
4. Review annually to audit compliance.
5. Measure both the cost of compliance and the improvement in performance.

It is FMI's belief and experience that any investment in "ethics" will result in the foundation of a culture built around *"No, it does not depend"* and accrue the financial gains available. ■

FMI plans to update its research on ethics in the construction industry during 2007. If you would like to participate in this research, please contact ***Mark Bridgers****, consultant with FMI Corporation. He may be reached at 919.785.9351 or via e-mail at mbridgers@fminet.com.*

[1] Dick Armey served 18 years in the House of Representatives for Texas beginning in 1984, including eight years as the House majority leader from 1995 to 2003. Armey has written four books, *Price Theory: A Policy-Welfare Approach (1977), The Freedom Revolution (1995), The Flat Tax (1996), and Armey's Axioms (2003).* He is currently chairman of the think-tank, FreedomWorks.

PROJECT DELIVERY

Now is the Best Time for Productivity Improvement

It seems that, with the economy humming along at a good pace, most contractors don't believe they have time to invest in productivity improvement programs despite the fact that many of those same contractors could use the increased capacity in order to meet tight deadlines. So, when exactly is the best time to work on improving productivity? This very moment is a great time. Not because business is booming, or because it might slow down, but because productivity improvement should be a regular program built into any contractor's strategy. Why should productivity improvement be a strategic concern? Profit margins are lower than expected. Contractors are experiencing labor shortages. Competition is tough, and owners keep looking for ways to decrease their capital expenditures. Improving productivity can help contractors make progress with all of these concerns.

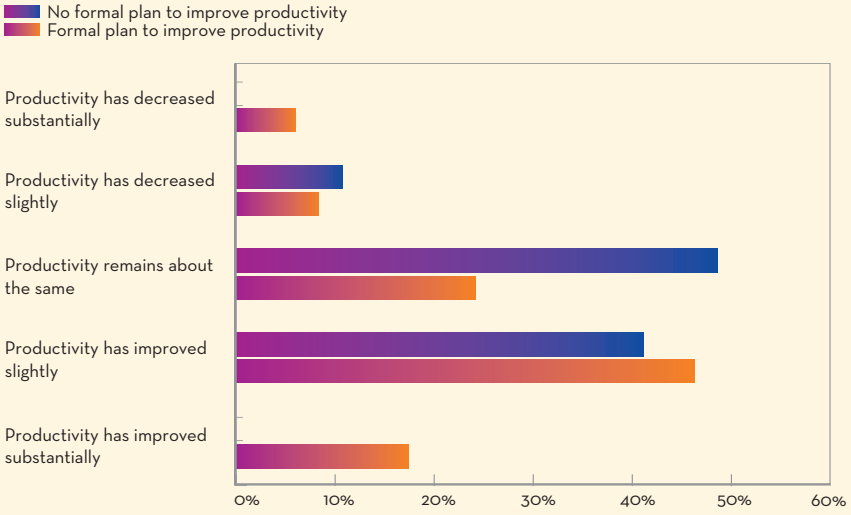
Companies without a formal approach to productivity improvement often try to tackle the task reactively, which usually happens to be the most inefficient time.

Companies without a formal approach to productivity improvement often try to tackle the task reactively, which usually happens to be the most inefficient time. For example, after the project or a major phase of the project is over, or at the end of the fiscal year when reports show lower profit margins, are often when productivity is addressed. However, wouldn't it have been great to affect those negative projects before they disappointed? Because they could have been impacted ... provided there was a formal plan in place to handle the process. Recent research on contractor productivity conducted by FMI found that only 29% of the contractors surveyed had formal strategies or plans to improve productivity. The lack of consideration for productivity in the overall strategic plan is often reflected throughout the organization from the top

Exhibit 1

Productivity Trends

Which of the following best describes the productivity trend in your company over the past several years?



Source: FMI's 2006-2007 Contractors Productivity Survey

executive to the field level. Consider that 80% of FMI's *2006-2007 Contractors Productivity Survey* respondents said they thought that they could save a minimum of 5% of their annual field labor costs through better management — it's hard to see why anyone wouldn't want to start immediately to improve productivity. Not doing so is like burning up one's profits.

PLANNING FOR PRODUCTIVITY

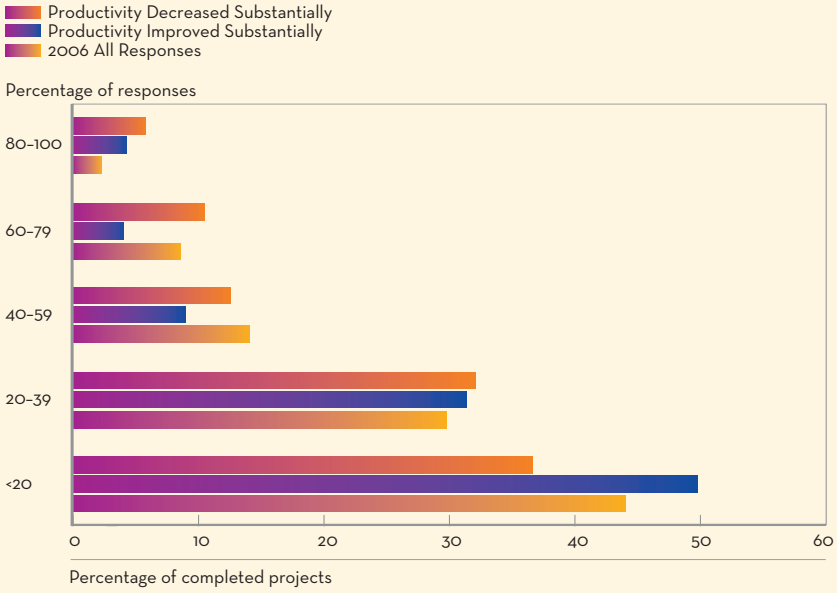
In the labor-intensive construction industry, missing the labor estimate can severely affect a project's profitability. Companies that struggle with productivity reported higher-than-average labor cost overruns, while companies with improving productivity reported a lower percentage of their jobs that overran their budget. (See Exhibits 1 and 2.) Self-performed projects may have labor costs equal to between one-quarter and one-half or higher of the overall project cost. On a million-dollar project, a 10% difference in budgeted labor could mean a difference of $50,000 to the bottom line.

Most contractors agree that they need to improve productivity, but most are unsure where to begin. Since productivity is so closely associated with field labor issues, contractors often blame the field for low productivity — especially in companies that only think to improve productivity after the job has been completed. However, poor productivity levels are more often symptomatic of poor planning throughout the organization. The tools that are lacking are not the latest labor saving machines and gadgets, but the management tools for planning. For instance, if someone forgets to schedule the materials to arrive when they are needed, nothing will be done on time. No gadget is going to magically call a supplier to make sure the job site is fed; that requires humans and planning. Companies without a formal plan for improving productivity are also less likely to have a formal process for pre-job planning, which appears at the field level too. For example, a lack of planning for the resources necessary to perform the

Exhibit 2

Project Profitability

Approximately what percentage of your completed projects run over the labor estimate/budget?



Source: FMI's 2006–2007 Contractors Productivity Survey

job results in non-productive time and confusion on the job site. (See Exhibits 3 and 4.) It is just as important to plan the business of construction as it is to plan the structure that is being built. In this sense, company leadership includes the project architect or engineer.

PRODUCTIVITY IN ACTION

While we stress that productivity improvement should be a key part of a contractor's strategic plan, optimization does not occur if the plan is not communicated and translated into action plans throughout the company. When we asked participants to our construction industry productivity survey to tell us the one thing that they could do to improve productivity, the majority of comments regarded the need for better communication and coordination. For instance, productivity could be improved through:

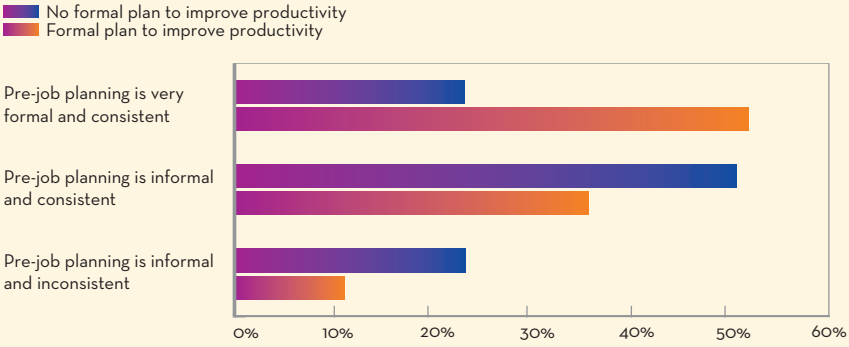
- "Better pre-planning and information flow to the field from the office, and better communication from the field to office (make the field/office relationship seamless from pre-planning forward)"
- "Better communication with customer and general contractor"
- "Complete understanding of targeted production rates by field management and craft-level employees."

In fact, the first step a contractor can and should take to improve productivity is to put together a strategy and action plan for improving productivity continuously. That plan should touch every level of the organization and include measurements to validate the improvements or lack thereof, processes to update actions taken, and methods to communicate progress made. To put the

Exhibit 3

Pre-Job Planning

Describe your company's pre-job planning process.

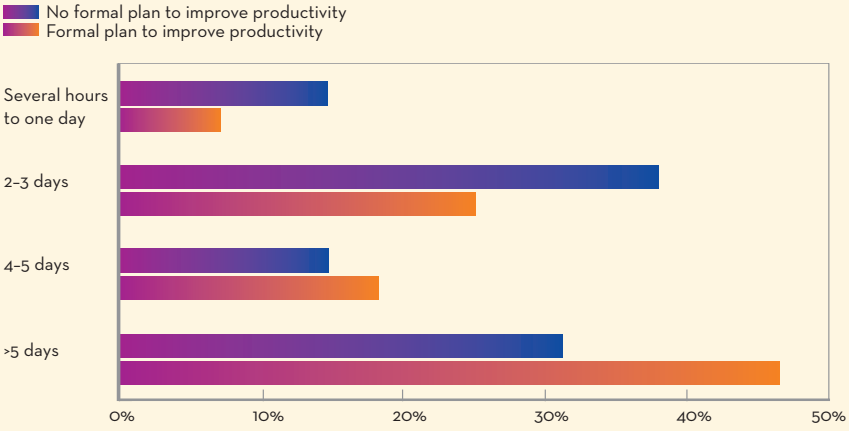


Source: FMI's 2006-2007 Contractors Productivity Survey

Exhibit 4

Resource Planning

On average, how far ahead do your field managers plan and communicate resources such as labor, tools, equipment, materials etc?



Source: FMI's 2006-2007 Contractors Productivity Survey

measurement systems in place, there will likely need to be better documentation, reporting, and communication of information between the office and field. Of the companies reporting improved productivity, 65% noted that they "have a great history of successfully implementing new ideas and sticking with them," while only 27% of companies with decreasing productivity had success implementing new ideas over the long-term. The successful companies are those that both plan and execute plans to improve productivity. Once that culture is in place, there is a better chance that productivity will continue to improve.

ENCOURAGING AND REWARDING PRODUCTIVITY

When companies only do one thing to improve productivity, often that thing is to make changes to the compensation system. The most obvious change is to pay bonuses based upon performance. On a high-level, that often makes sense. However, how will you determine what percentage to dole out? Should

superintendents get X% and project managers get Y%, or should they get the same? Moreover, a percentage of what? A percentage of the amount by which the final project gross profit beats the estimate or a percentage of the company's overall profitability? These questions require considerable thought; however, if they are tied to the company's productivity strategy, they can be powerful tools. From FMI's survey, the companies experiencing the most success with their bonus/incentive programs were those that based them on measurable objectives or performance-based formulas. It is difficult to make that approach work without a plan that addresses productivity measurements, and measurements require good information to and from the field. Companies using that approach pay somewhat higher bonuses, but they also enjoy higher productivity. However, if the incentive plan is not carefully created, communicated, and administered, trying to implement new ideas will become more and more difficult, and may be worse than not having an incentive plan in the first place.

STARTING NOW TO IMPROVE PRODUCTIVITY

Contractors have found that the traditional admonition of "work harder" doesn't work very well with today's workforce. Productivity improvement is a process and not something that can be relegated to being improved after the job is finished. Improving the productivity process takes careful planning and coordination among various departments, and improvement depends on good, regular communication, including meetings, reports, and reward systems. In FMI's research and work with contractors, we find that every contractor wants to improve productivity, but many are confused as to where to begin. There are at least as many reasons that productivity improvement fails as there are excuses for poor productivity, and that causes a good deal of frustration within the organization. This frustration may be one reason that contractors fail to make formal plans to improve productivity. Another reason may be that everyone wants to improve productivity immediately with immediate results, when real, lasting improvement only comes when it is planned and there is the necessary communication, leadership, and training for process improvement that embraces the whole organization. Contractors can start to improve productivity now by planning and acting on those plans, but seeing measurable and sustainable improvement will take more time. ■

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ZURICH CONSTRUCTION
Contractors Stress Safety as a Retention Strategy

Spurred by an increase in commercial building, construction work stands alone in the U.S.'s goods-producing job sector as a strong growth industry. But as the demand for work increases, the industry is struggling with an acute shortage of skilled craftsmen and experienced workers. This trend is requiring contractors across the country to be more selective about the projects they accept, and in many cases, it is forcing postponement or cancellation of jobs.

Although it's unlikely that the industry will face an actual shortage of bodies, the scarcity of adequately trained, skilled, and productive persons in the construction industry is a very real problem.

So what are contractors doing to address the workforce talent drain? For the most part, they are "growing their own" through a combination of recruitment and retention efforts — and making sure that these new employees are adequately trained on job skills and safety skills.

A CONVERGENCE OF TRENDS

The skilled labor shortage is nothing new to construction; the industry has been wrestling with the issue since the residential building boom of the late 1990s, which initially raised concerns about attracting new entrants. But the situation is more acute today. A convergence of trends, including demographics, education, and market demand, has contributed to the situation where construction is facing the loss of 95,000 skilled craft workers through retirement or attrition over the coming decade, with fewer younger workers coming up through the ranks, according to the Bureau of Labor Statistics (BLS).

The aging workforce trend is even more pronounced in construction since job demands include not only physical stamina, but seasoned skills.

DEMOGRAPHICS: AN AGING WORKFORCE

The graying of the American workforce — due to the massive baby boomer generation now edging into retirement — cuts across all industries, but is especially pronounced in construction. Over the next five years, 10- to 24-year-olds will increase by 2.5 million; 25- to 42-year-olds will decrease by 1 million, and 43- to 65-year-olds will increase by 8 million, according to the U.S. Census Bureau. This will affect all businesses with labor shortages.

The aging workforce trend is even more pronounced in construction since job demands include not only physical stamina, but seasoned skills. According to the Construction Labor Research Council, construction has more workers in their prime working years (age 25 through 44) than other industries — and they are getting older. In 1988, the median age of all construction craft workers was 33; it was 37 in 1997 and 38 in 2003. While construction gets its share of new entrants, they are less likely to remain in the industry through what is generally considered their full working life.

EDUCATION: WHATEVER HAPPENED TO SHOP CLASS?

Construction has traditionally relied on high school vocational education programs to help turn out graduates ready to join its workforce. But many of today's high schools have shifted the focus of their vocational education programs to general business and computer training instead of emphasizing hands-on

occupations like carpentry and electrical work. While about 15,000 secondary schools offer vocational education courses, and approximately 20% of all high school coursework is career- and technical-education related, not all of these courses are geared toward craft careers or preparing students for construction work.

The construction industry relies on apprenticeship programs to train and hire new skilled workers. There are an estimated 225,000 people currently enrolled in government-registered apprenticeship programs, according to the Department of Labor's Office of Apprenticeship Training, Employer, and Labor Services.

The construction industry relies on apprenticeship programs to train and hire new skilled workers.

Many construction firms administer their own training programs. The U.S. Department of Labor Employment and Training Administration assists employers in launching and administering these training programs. From 83 offices in all 50 states, technical assistance is provided to current and planned training efforts, including identifying training needs, developing a recordkeeping system, identifying related instruction sources, and coordinating program sponsor services with other federal training programs.

MARKET DEMAND: BEYOND THE RESIDENTIAL BUBBLE

According to the BLS, construction is the only job sector currently showing positive employment growth, adding 792,000 jobs at a 1.1% average annual growth rate. The BLS projects that construction will see an estimated 1.1 million new jobs, 1.4 million retirements/defections, and 2.5 million replacements/new entrants through 2012.

Although the residential building bubble may have shrunk, new construction continues to grow in the commercial and government sectors. Underperforming residential over most of the last decade, total nonresidential construction is expected to grow by 38% during the 2006 to 2010 period. Propelling this growth is the delayed replacement and remodeling of industrial plants; greater demand for aging-population-related nursing, extended care, and high-technology medical facilities; and the need to construct new schools in faster-growing regions of the United States.

Among the major subcategories of total construction spending, the biggest growth was in lodging, up 48.5% year-to-date. The next highest growth categories were: manufacturing, 23.1%; amusement and recreation, 20.2%; and sewage and waste disposal, 19.5%. Highway and street construction rose 15.9% year-to-date, and conservation and development construction are both up at 13.1% and 13.0% respectively.

BUILDING SAFETY INTO THE MIX

Along with a shrinking workforce, the construction industry must also contend with the indirect cost of on-the-job injuries and lost time. Statistics

show that inexperienced workers are more likely to be hurt — or even killed — on the job.

Construction mishaps accounted for 20.3%, or 1,121, of all occupational deaths in 2002. U.S. construction also has one of the highest rates of occupational injuries and illnesses compared with other industries and with construction in other developed countries. From 1980 through 1995, at least 17,000 workers died from injuries sustained on the job. It is physically demanding work with a high burnout and injury rate.

Construction loses more workers to traumatic injury deaths than any other major industrial sector. Falls account for 31% of fatalities and 21% of non-fatal injuries. There are also a myriad of health risks involved with individual construction tasks, including cement dermatitis for brick and stonemasons and exposure to wood dust and plaster dust for drywall installers.

Hispanics made up 13% of the total U.S. population but supplied 51% of new workers to the industry. Hispanic workers held more than 17% of all construction jobs in the U.S., although they comprise only 11% of the total workforce.

CULTURAL CHANGE AND THE HISPANIC SOLUTION

In the U.S. today, construction employs a larger share of Hispanic workers than any other industry except agriculture. This is part of a larger cultural trend since the 23% growth rate of Hispanics in the general population is almost four times that of Caucasians, according to the Construction Labor Research Council. The Hispanic population in the United States is expected to double over the next half century, from 12% in 1999 to 24% in 2050.

The construction industry began turning to Hispanics to fill the labor gap in the 1980s and 1990s. In the mid-1990s, Hispanics represented 10% of all workers in the construction industry; by 2001, the percentage reached 18%, or 1.3 million, an increase of more than 100% over the past 10 years. From 1996 to 2002, Hispanics made up 13% of the total U.S. population but supplied 51% of new workers to the industry. Hispanic workers held more than 17% of all construction jobs in the U.S., although they comprise only 11% of the total workforce.

ILLEGAL IMMIGRATION: THE ELEPHANT IN THE ROOM

Hispanic employees have proven to be an essential part of the construction industry. Contractors who are desperate for laborers have been known to be less than meticulous about determining the legal status of their Hispanic labor force. According to the Pew Hispanic Center, the construction industry may employ as many as 1.4 million illegals, which would make it the single-largest employer of unauthorized workers.

Under increased political scrutiny, contractors must employ only naturalized Hispanics or face the possibility of severe fines. Proposed House and Senate immigration bills would dramatically increase civil and criminal penalties for "knowingly" hiring unauthorized aliens, with fines as high as $50,000 per employee. The construction industry has taken an active role in the federal immigration debate. The Associated General Contractors (AGC) and other industry groups support comprehensive reform that both improves border security and supports the creation of a new guest worker visa program.

The construction industry has taken an active role in the federal immigration debate.

"Though construction jobs vary widely and provide good pay, we continue to struggle to attract a sufficient workforce," the AGC said in its position statement on immigration reform. The AGC supports creation of a new guest worker visa program that would:

- Be valid for a minimum of two years
- Be renewable for a total of six years
- Provide a way to sponsor employees for permanent residency
- Provide a flexible cap based on marketplace needs, if needed
- Require individuals using the visa to stay with the sponsoring employer for a certain amount of time
- Apply all labor and employment laws.

"A guest worker program would begin to address the problem of future illegal immigration," the organization said. "Establishing a way for undocumented workers to get on a legal path toward citizenship would benefit workers, employers, and would prove to be safer for all citizens by having legal aliens in the workforce."

WORKING TOWARD A SOLUTION

It's clear that this combination of trends presents a challenge to the construction industry over the next 10 years. Two companies shared their ideas on how they are recruiting, retaining, and training new employees.

Sundt: Growing Their Own

The Sundt Companies Inc., based in Tempe, Ariz., provides general contracting, construction management, and design-build services for private and public sector clients with budgets ranging from $50,000 to more than $200 million. With much of its work coming from commercial building, military housing, underground, and heavy highway construction, Sundt is slated to undertake almost $800 million in projects in 2006.

The skilled labor shortage has definitely impacted new work for Sundt, said Brian Murphy, Sundt's associate vice president and safety officer. The company is becoming far more selective about the number of jobs they take

and is actually turning down projects because of a lack of workers and qualified supervision, he said.

"Our biggest problem is that our really skilled guys are getting ready to retire, and there's nobody with comparable experience to take their place," Murphy said. "For example, one of the company's top crane operators just retired at age 72, leaving a position that won't be filled until an apprentice or another qualified person fulfills a 20-hour crane safety program to become qualified to operate the particular type of equipment."

Recognizing that another source of talent lies in the Hispanic community, Sundt is also working with Arizona State University and Hispanic organizations to promote bilingual education programs and address immigration issues.

To address this need, Sundt's strategy calls for setting up its own apprentice programs. Although it has been training apprentices since 1986, the dearth of skilled workers has spurred the company to make the program more formal in recent years.

Sundt uses materials provided by the AGC and the Associated Builders and Contractors' Wheels of Learning program, which allows users to choose module materials from a curriculum as needed. Sundt spends about $400,000 a year on craft training alone and a total of about $3 million on all educational programs, including safety instruction.

In 2005, Sundt's two-year apprentice programs for heavy equipment operators and carpenters turned out about 20 graduates, with other individuals coming up through the system. There are now 22 enrollees in the program, including men and women ranging in age from 18 to 40-something.

Recognizing that another source of talent lies in the Hispanic community, Sundt is also working with Arizona State University and Hispanic organizations to promote bilingual education programs and address immigration issues. Like the AGC and other industry associations, Sundt supports the creation of a new guest worker visa program.

"There is a wealth of willing labor across the border," Murphy said. "If we can train them before the guest worker program is enacted, we've got a ready and willing workforce."

Sundt is also committed to a focus on safety as part of its overall training program, as evidenced by the many awards they've won for their efforts. The company focuses on pre-planning all work from a safety and health standpoint. Sundt apprentices are educated in loss control techniques and are held accountable for performing their jobs safely, Murphy said.

Since about 68% of accidents happen during an employee's first 60 days on the job, new workers at Sundt job sites wear yellow hardhats for their first two months on the job so they stand out. This makes it easier for supervisors

to ensure that the workers on a job are a blend of seasoned and new laborers.

Sundt workers get on-the-job mentoring, including a site orientation, introduction to the foreman, and inclusion in all five-minute "safety huddles," where safety, gear, and other daily concerns are discussed.

Safety training is especially critical for immigrant workers, who often come to the United States with a poor understanding of workforce health and safety practices, little or no experience in the building trades, and from regions where the government did little to enforce safety regulations.

These cultural issues make immigrants especially vulnerable to injury and even death on the job. According to the BLS, the fatality rate for Hispanics in all industries — 5.2 deaths per 100,000 workers — is about 20% higher than the rates for Caucasians and African-American workers, which are 4.4 and 4.1 deaths per 100,000 respectively. According to OSHA, 1,126 Hispanic deaths occurred in the construction industry in 2003.

To address this issue, contractors must help non-English-speaking workers on construction sites to understand the importance of safety and the need to follow safety policies. The first critical step is finding and using the skills of a translator who can communicate safety policies — taking into consideration the difference in dialects, which vary by region and even town. Having a full-time safety coordinator on the construction project who is bilingual will likely yield the best result.

Sundt is careful to include its Hispanic workers in training and safety programs. The company has three employees who are qualified to conduct 10-hour OSHA training classes in Spanish, and they also developed Spanish-to-English dictionaries, which they provide to employees. Sundt also teams Hispanic workers with Spanish-speaking foremen and provides tuition reimbursement to workers who take English as a second language class, which is taught in-house. Sundt is also working with a group from Mexico City to create a 10-hour online safety class in Spanish.

It's evident from Sundt's injury statistics that this program focus on safety works: In the 3 million man-hours clocked on jobs in 2005, Sundt had an OSHA injury incident of 2.65 and loss-time rate of .075 — roughly three or four times less than the national average.

Sundt is careful to include its Hispanic workers in training and safety programs.

PCL Family of Companies: Building a Culture of Safety

The PCL family of companies is the largest general contracting company in Canada and the 10th largest in the United States. With three divisions (civil, industrial, and buildings) directed out of 27 major locations, PCL specializes in a wide range of construction projects including bridges, piping, petrochemical, and general commercial building throughout North America, the Hawaiian Islands, and the Bahamas.

While the shrinking labor force is a huge issue for PCL, the company is equally concerned about the retirement of senior staffers. "Many of our

employees, from senior management to job superintendents, have been with the organization for 20 to 30 years," Robert Saiz, PCL's director of health, safety, and environment, said. "We have a number of jobs that are ready to start, but we are struggling to staff the projects with seasoned PCL employees."

PCL recognizes that Hispanics are a large portion of its workforce especially in areas like Florida, where Haitians, Cubans, Mexican nationals, and workers from the Dominican Republic are part of the mix, Saiz said. To address the language issue, PCL initially enrolled its foremen in Spanish lessons but quickly learned that conversational Spanish is far different from the language needed to convey instructions on a construction site. To remedy this, PCL hired more Hispanic foremen and targeted younger workers, training them to become foremen. Translation needs differ by region and site; for instance, PCL's Orlando office produced a step-by-step instruction program on how to erect a scaffold in picture format for its Latino workers, Saiz said.

To protect its employees from being pirated by other contractors, PCL, a 100% employee-owned organization, has implemented stay-on bonuses based on position, availability, and location.

To protect its employees from being pirated by other contractors, PCL, a 100% employee-owned organization, has implemented stay-on bonuses based on position, availability, and location. For instance, a crane operator at a particular job site can earn a bonus if he or she stays on the job until completion, Saiz noted.

PCL is also increasingly turning to recruitment at the high school and college levels. The company employs a full-time college recruiter and is a regular presence at job fairs and career days, targeting young people who want good careers but don't necessarily want to go to college.

Once its new hires are in place, PCL puts them through a strict safety program, which includes a job-site mentoring system where new workers are teamed up with seasoned professionals. This is critically important since sometimes even graduates of apprenticeship programs do not have practical experience.

By applying strict loss control standards, PCL has significantly reduced its injury rate over the past two years, Saiz noted. PCL's most recent total recordable incident rate for North America is 3.66, and its lost-time frequent is .29, based on about 13 million labor-hours.

To enhance its loss control program, PCL is currently developing a weeklong "boot camp" at corporate headquarters in Edmonton, Canada, where all operations employees, no matter their background or experience, go to learn the company's culture and procedures. While safety is a component of the

camp, there are a number of other core elements, including storytelling to convey company vision and values as well as a focus on estimating, scheduling, and preconstruction skills. The program's first test run will be conducted before year-end 2006, and the program will be formally introduced in early 2007.

Proactive methods, such as those employed by companies such as Sundt and PCL, can mitigate industry workforce weaknesses introduced by worker shortages, lack of skills, difficulties of language, and educational shortfalls. ■

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Quarterly Interview

Hank Harris

FMI Corporation

Surprises of the New Executive

"One of the things that really comes home to you is the same thing that starts to come home to you as you get older: most of life's great truths are very simple. All the clichés are true, but that doesn't make any of them easy."

Hank Harris has served as FMI Corporation's CEO for the past three years. Prior to that, he consulted with hundreds of construction-industry leaders serving in the top role. Harris candidly shared with *FMI Quarterly* the surprises of the new executive — **what outside observers can't know and book knowledge doesn't show**. We thank Hank Harris for sharing his insights. We know our readers will find them of interest.

FMI Quarterly: Hank, as an FMI consultant for more than 20 years you've dealt with managers and leaders moving up the organization in hundreds of companies. You've also been in your current role as CEO of FMI for three years. From these experiences, share some stories with us. What are the surprises for which new executives need to be prepared?

Harris: The answer is somewhat different whether you are talking about a seasoned executive with a significant amount of managerial experience who then ends up in the CEO role vs. somebody who hasn't been a manager. The surprises are unique to those two situations. Let's talk about becoming CEO or president under the first scenario.

FMI Quarterly: Are there some things in that top job that were surprising to you — surprisingly better or surprisingly worse or just different from what you expected?

Harris: Yes, there were some surprises. One of the things that really comes home to you is the same thing that starts to come home to you as you get older: most of life's great truths are very simple. All the clichés are true, but that doesn't make any of them easy. A lot of what you see as life's lessons are relatively obvious things, but you gain real insight into how hard they really are. They are

the classic lessons like getting people in an organization to get the big-picture message. For any organization of size, it is a huge challenge. We've all read Jack Welch. He has said that he talked about the message so often and for so long that he became nauseated listening to himself. Honestly, it is that terribly difficult, and it can be discouraging. You are beating your head against the wall, and just about the time you think you have made some progress, you have an interaction with someone, which suggests you haven't progressed at all. This is a non-stop battle, and it is a little surprising that it is so difficult.

FMI Quarterly: You mean that something you thought about for days, weeks, even months, and finally craft into a message … that the telling of that message one time, even with a splendid kick-off session, doesn't make it happen?

Harris: (Laughter) No, it doesn't even get it started, and it is surprising because you think, 'Well, you tell somebody one time, and it doesn't get across; let's tell them five times.' But you still haven't even started to get through at that point. There was an interesting *Wall Street Journal* article about human communication and why organizations have so many difficulties with this. The *Journal* explained that we all process things differently. We hear a message, and we automatically delete words, add more words, etc. It is the old school-kids game of Gossip. After only three people pass it along, the message comes out garbled. You see it play out in real life, and it is a hard task to combat that. Whoever is in that top chair should spend a lot of their energy getting everybody on the same page. That's a challenge in any organization of size.

Whoever is in that top chair should spend a lot of their energy getting everybody on the same page. That's a challenge in any organization of size.

FMI Quarterly: Sometimes horses, when they come out of the gates, they stumble. Sometimes when executives start their tenure, they screw it up. Have you seen people make a bad first impression and then regain their footing and become very successful?

Harris: Absolutely, and it is situational. The ability to recover depends on what kind of pressure the organization is under, and therefore, what degree of forgiveness is present for the CEO as he is getting his arms around the position. There have been plenty of instances, especially in privately held companies without quarterly stock pressure, where people have said, 'it is better the devil we know than the one we don't.' If the new CEO has to spend some time learning, or the company has to spend some time teaching him, there is a certain amount of forgiveness that will be extended by the troops. They may say, 'We are a little frustrated that this is not going as well as we'd like it to, but let's give it a little more time to see if we can get some traction.' If you've never had the job before, there is

going to be some learning involved. No question about it.

FMI Quarterly: Is there more or less forgiveness in the organization if the last name of the new president is the same as the last name of the prior president?

Harris: In most cases, I think there is less forgiveness because companies don't generally handle this transition well. If they handled it well, I think there would be more forgiveness. Twenty years of watching family succession would tell me that the old son of the boss routine is the S.O.B. If you are family, you are going to have to swing harder to prove yourself than if you are not family, unless the family succession was handled well. There are certainly some cases where this transition is handled very well, and by the time that family member takes over, he or she may be revered inside the company.

FMI Quarterly: Do you think most successor sons or daughters, for that matter, understand that they have to work harder and do it better perhaps than dad or mom did simply because they are the son or daughter of the boss?

Harris: This is probably a normal distribution. There are 20% or 30% of the second-generation folks who understand that very well and do a tremendous job. There are companies we know where the son or daughter took a modestly sized organization and turned it into something that their forefathers never even dreamed of. We all know examples like that. I think that's 20% or 30% of the second generation. There is another 20%, the other end of the normal distribution, who would say, 'If you guys would just send the check to me at home it would be that much easier.'

FMI Quarterly: A high sense of entitlement?

Harris: A very high sense of entitlement. Then, you've got that murky middle. For the most part, these folks in the middle of the bell curve don't understand it as well as they should. They may have some sense of it, but because so few companies really put second-generation people through what they should be putting them through, they tend to get a little bit of the

"silver-spoon syndrome," a sense of entitlement, or whatever you want to call it. Some of it may not be a lack of a work ethic; a lot of it is a lack of information.

FMI Quarterly: As you look over the people you have known who have assumed the mantle and for whatever reason didn't last, what accounts for *short* tenures?

Harris: Short tenures occur in companies in crisis or where there is an inordinate amount of pressure for some reason. Again, you could go back to a publicly held situation where capital is not patient and somebody is probably not going to have too much forgiveness from Wall Street. The board may or may not back them, depending on the dynamics there. But since we deal mostly with privately held companies, it is either going to be a gross and obvious miscasting — in other words, you are 60 or 90 days in and everybody is going, 'This was a big mistake,' for whatever reason — or, the company has some sort of crisis, and whoever is in the leadership role is not able to deal with it.

The keys to long tenures are basically fitting the role and gaining the confidence of the people in the organization. I think longevity is more related to the human dynamic side vs. money.

FMI Quarterly: What's the worst mistake you have ever seen a new executive make?

Harris: The most egregious error I've seen is the arrogance of somebody who says, 'I am not going to take the time to really understand this business, and by the way, I really don't like where the business is located so I will live in another state and fly in or have you guys fly over and see me.' That's probably the most dramatic example I know.

FMI Quarterly: Making oneself an absentee landlord, so to speak, is a mistake. Other than lots of stock, what are some keys to *long* tenure?

Harris: The keys to long tenures are basically fitting the role and gaining the confidence of the people in the organization. I think longevity is more related to the human dynamic side vs. money. Obviously, motivations vary, but if you accept the fact that anybody doing the job is going to be reasonably remunerated, then he or she has to enjoy that role, and the people being served have to feel like they are being served effectively.

FMI Quarterly: Does tenure also line up with profitability of the company, or is it somewhat disconnected in the closely held company?

Harris: In the closely held company it is certainly not as connected as it would

be on Wall Street. At the same time, most people are still going to have a business mind toward longevity, and if somebody isn't performing over the long haul, then that is not going to sustain itself.

FMI Quarterly: Which do you think is easier to lead: a self-performing trade contractor or a white-collar team of construction managers, or for that matter even, a bunch of management consultants?

Harris: There's no question in my mind that the higher the education levels are in an organization, the more difficult that organization will be to lead. There is an inverse relationship for all the obvious reasons.

FMI Quarterly: Because everyone thinks they can do it too, or even better?

Harris: Absolutely. My fantasy is to run a self-performing trade contractor. (laughter)

FMI Quarterly: In your personal experience, what has been harder to accomplish in your first few years than you expected during your first term, if you will?

Harris: I'm probably a good example of somebody who did a lot of stumbling early on. There were a lot of things in the first six months that I was not prepared for, and I underestimated and probably misplayed a number of things. I'm tying this to your earlier question about stumbling early on. I think if you are going to stumble, early is good because people will forget those stumbles as you get better. Obviously if you don't, you are not going to last.

I underestimated or probably didn't give credit to the fact that once you are in that top chair, putting on the black hat is not a good idea. Every once in a while whoever is the CEO or president needs to take the black hat out in a specific situation, for example, if the organization has a crisis. This is a real difference between being in the top chair vs. being in the chair one click down. It doesn't pay to put the black hat on often, and this is where I made probably one of my biggest mistakes. You let other people do that as much

I think if you are going to stumble, early is good because people will forget those stumbles as you get better. Obviously if you don't, you are not going to last.

as you can because the guy in the top role needs to be less a disciplinarian and more of a cheerleader/coach. Let's talk about how things are going to get better. Let's talk about where we are going. Let's put the spotlight on all the positives we have. It doesn't mean that you don't discipline people, but — and this is where the cliché of "discipline in private and praise in public" comes in — the CEO needs to get his lieutenants to do the bulk of the disciplining.

FMI Quarterly: Do you think some of the things that look like mistakes early on to the organization will be seen by both the executive and the organization as the right thing to do, a few years later? That, they will both say with the perspective of distance, 'You know at the time that looked bad, felt bad, we-all-smell-mistake was really the right thing to do. It was awkward, but it was still the right thing to undertake'?

Harris: I think so. Our perspective has always modified with the passage of time. There are going to be some things you and everybody else looks back on and says it didn't feel good at the time, but it probably was the right thing to do. I think there will be some of the other too — where you look back and say you know it was a mistake after all! (laughter)

FMI Quarterly: If you had your path to walk again, what would you do to prepare yourself more fully for the role you are in?

Harris: That's a great question. I think in my case, I should have spent more time doing what you are doing right now, which is to talk with some people who had the role and really get some counsel on what are the surprises, what I should expect, and how I can hit the role as aggressively and productively as possible.

FMI Quarterly: Are you saying to find some mentors, create some even, early on in a new role? If they don't necessarily want to be mentors, sort of extract it from them?

Harris: Absolutely. It could be as simple as more conversations with colleagues who had the role. It could be more conversations with people running other consultancies or other professional services companies. Having had a lot of them as clients, I probably assumed that just because I had watched it for so long I knew what I was getting myself into. Academically, I had the answers. But it is one thing to academically or third-party observe something, and it is another thing to live the role.

FMI Quarterly: That's perhaps one of the great roles of trade organizations, too — where you have an opportunity to mix it up with other people in similar positions and similar situations.

Harris: I would encourage others to take advantage of it.

FMI Quarterly: What's been your most rewarding moment to date from the early part of your tenure?

Harris: One of my clients told me — and I have found this to be very true — that one of the intriguing things about earning the CEO role is that you see the very best of what the firm has to offer, and you also see the very worst. So if there is a dramatic service failure or some piece of ugliness that takes place between your staff or whatever it may be, you find yourself having to deal with that in some way ... the hugely disgruntled client or whatever it might be. But you also see the best that the firm has to offer, and so it is a somewhat unique position. One of the most rewarding moments I've had, and maybe it is because it is fresh on my mind, was on Friday afternoon. I got an e-mail from one of our administrative assistants in Denver who said that what I had to say in a company-wide staff meeting was great. She went on to praise how motivational I was to the organization. If I reached an admin in Denver over the video hook-up, I consider that victory. That was a rewarding moment.

FMI Quarterly: If a father asks you, 'How should I prepare junior to take over this business someday,' how would you answer him?

Harris: This is where so many of our clients don't do the job. The worst thing you can do is to let junior wander into the business. Ninety-nine out of 100 kids don't know what they want to do upon exiting college. I sure didn't, and most of the people I know didn't. There is probably one out of 100 kids that has known since he was 12 that he wants to be a transplant surgeon or a trial lawyer or whatever, but 99 out of 100 have to find their way. I think it is a huge mistake to let a kid come into a business because it is convenient or because he doesn't know what else to do. If you really want junior to take over the business, you need to do something like R.H. Donnelly has done with the golden goose philosophy, which says if you are ever going to look after the golden goose you have got to be really qualified. None of my sons would come into the business until they had some sort of advanced degree. It would probably not be engineering; I think engineering is a great undergraduate degree because of the discipline and the math skills and all those things that are very important, but I would want either a law degree or an MBA or maybe both. And I would want them to be successful someplace else for six or seven years. This holds true for most of the businesses we are dealing with. There are some small businesses for which that may be overkill, but you could certainly modify what it represents to fit the situation.

Clearly, going through some hoops and getting yourself qualified and gaining respect in the eyes of the people that you are going to lead is important. I think in today's society — I don't agree with it — graduate business degrees

Remember that truth inside the company is now not going to come your way. You have to aggressively dig it out because you are sure not going to get it. People will spin things.

don't mean much to somebody in the construction industry. For whatever reason, people think a law degree makes you uniquely smart. It is an erroneous view, but it does say something about somebody's ability to go out and walk in a prospect's door with something the other people don't have. There is a certain amount of respect that comes with that. Now, obviously you have to deliver once you are in the workplace or organization, but the point is not to have the kids just stroll in.

FMI Quarterly: If the child were female, would your answers differ?

Harris: Not at all. Obviously because of the nature of this industry, females will have some other challenges, but we have some clients who have second-generation daughters doing very well running their companies. I think developmental needs are the same for both genders for the most part.

FMI Quarterly: If you were to give new executives five rules, what would they be?

Harris: No. 1: Remember that truth inside the company is not going to come your way now. You have to aggressively dig it out because you are sure not going to get it. People will spin things.

No. 2: Remember that your pants go on one leg at a time just like everybody else's, and a lot of the treatment you get, which may be better than other people are getting, is not really you. It is just the fact that you are in that role. Don't let that go to your head. I think this is a good rule.

No. 3: Don't pick too many battles. Be careful; there are a lot of battles that you are tempted to get sucked into, and if you step back you will realize that most of them are going to solve themselves. There's some that you really need to pick, but be careful about the battles you pick.

No. 4: Know your business. I don't think there is any substitute. You need to know the business that you are trying to lead. There is a view in publicly held companies that if you are a great enough CEO, business knowledge is one thing you can

transport. With a big enough company, there is perhaps some viability to that notion, but I think CEOs in those settings do a lot of spade work to get to know the business they are about to lead. Know the nuts of bolts of the business. We've all seen what's happened to public company CEOs who didn't know the numbers and found themselves pilloried accordingly.

No. 5: Don't try to do everything yourself. Leverage yourself. Leveraging yourself is hugely important as an executive. If you get mired in the detail, trying to do everything yourself and not delegating, you will get consumed. You can't do it. That's a big one.

FMI Quarterly: In other words, use delegation effectively? What is key?

Harris: Hire to your weaknesses, and make sure you've got support structures around you. A pretty good degree of self-awareness is important here. If you separate out administrative skills, financial skills, people management skills, and leadership of people skills and put all those things in potential subcontracting categories, leadership skills are probably the toughest thing to subcontract. It's probably the one you *can't* subcontract. It is the toughest one to outsource. You can't. You are in the role. It is expected, and so if you can't pony up to that one, you are going to struggle.

FMI Quarterly: Hank, thanks for sharing those experiences and insights with our readers. ■

Rooting Out the Problem

An examination of the industry's labor shortage reveals three main roots to the problem — the industry's image, current career and education trends, and workforce demographics.

By Hoyt Lowder and Jay Bowman

A plant's root system is often difficult to see and unappreciated, yet it provides the plant's foundation. Much can be learned about a plant by examining its roots, including its overall health, longevity, and history. In this way, we attempt to examine the roots of the current and impending labor crisis within the construction industry.

A proliferation of articles exists on strategies for dealing with the crisis. However, we wanted to start at the origin of the problem and consider the three primary sources, or roots, which exist for this issue: the industry's image, career and educational trends, and demographics. It is our hope that this article will provoke a thoughtful discussion within your company's ranks as to the causes of this overarching and potentially debilitating industry issue with the end goal of rooting out the problem.

INDUSTRY IMAGE AND SELF-IMAGE

For a couple of decades the construction industry has attempted several different initiatives aimed at improving the image of the industry. The premise is that if the image of the industry were upgraded to "more attractive than that of migrant workers" the difficulty in recruiting individuals to choose a career in construction would be reduced, implying there would be more people attempting to get jobs in construction.

Recent research and observations conclude that the image of the industry cannot be "promoted" to a sufficiently improved level for people to be motivated to consider this occupation as a career choice for intelligent, capable, and well-educated professionals. In fact, some describe the industry image as so negatively engrained that only those with a sufficiently low self-image and limited options would even attempt a job in construction, suggesting that this industry offers opportunities at the bottom for those who cannot succeed elsewhere.

The perceptions of the industry leadership could use a makeover. If we really believe that this is an industry that is the epitome of our free enterprise system, and that we have a profession in which we should take pride, then we should start treating our employees, associates, and peers as needed and trusted professionals.

We in America need dedicated people who believe in the American Dream, to join us in "building America." During the depression, hundreds of people joined the Civilian Conservation Corps and the Works Progress Administration (two of Roosevelt's New Deal measures to provide economic relief). The facilities and infrastructure built during this period are some of our nation's most treasured facilities. In addition, the documentaries of these projects clearly show that these individuals had a true sense of accomplishment, self-worth, and a resulting "can do" attitude.

Perhaps this sense of accomplishment and associated self-worth holds the potential for recruiting and retaining the workforce participants that are passing up the construction industry today. By providing a proven vehicle for building physical value that also builds a sense of accomplishment and self-worth, the construction industry can become the place to start for any career one chooses.

When John Kennedy stated, "Ask not what your country can do for you, but what you can do for your country," he solidified a theme that ignited thousands of young Americans. Many of these young people joined the Peace Corps so that they could help those in need around the world. And, with few exceptions the Peace Corps volunteers benefited greatly from the resulting sense of pride for commitments made and kept. And those they aided benefited from their gifts of time, energy, and insights for improved quality of life.

The construction industry is an industry of "doers." Young people today want to make a difference, on their terms. They want challenges and recognition for their accomplishments, not their tenure. The adopted theme for the Gulf Coast Workforce Development Initiative, *I am GREAT*, has some of these attributes. This initiative could serve as a model to demonstrate the basic idea that building something of value is one of life's most rewarding accomplishments.

Another perspective is that of the immigrant. For many immigrant workers today, especially those who have come into the United States from Mexico and Central America, the image of the construction industry is a relatively small concern. Being able to get into the United States and being able to get a job, any job, is a

The shortage of available workers in construction is also the result of the industry's historically low wages, adding to the lack of skilled workers.

bigger issue than the issue of which job is most attractive. Construction is readily seen as more attractive than working in a poultry processing plant. In addition, it is recognized as an even safer industry than the poultry processing industry. The industry's safety record will serve as a key recruiting tool in the near-term and holds the potential to aid in the upgrade of the industry's overall image since those outside the industry often perceive it to be a dangerous one.

The shortage of available workers in construction is also the result of the industry's historically low wages, adding to the lack of skilled workers. In the past, the industry successfully suppressed both real wage growth and available/required training. These two factors together have provided the exclamation point on the relative unattractiveness of the industry. Those who can imagine themselves employed in a more attractive industry do not have a low enough self image to actually seek a job at the bottom of this industry as a laborer, helper, or apprentice. Therefore, the solutions become apparent by identifying the problems.

Better trained, more highly skilled workers will come from individual companies investing in solving the industry's need for labor by requiring their employees and recruits to improve their individual abilities, skills, and productive abilities, which justifies higher compensation, assures career development, and enables longer-term individual and organizational success. More training pays-off the workforce with a greater sense of self worth and the pride of personal accomplishment.

The solution to workforce recruitment and development lies in the work itself. Committing to a career in the construction industry can provide the labor required to rebuild our infrastructure in transportation, water, energy, and low-income housing. The result may well be the building of self-worth, pride in a sense of accomplishment, and a significantly improved industry image in the process.

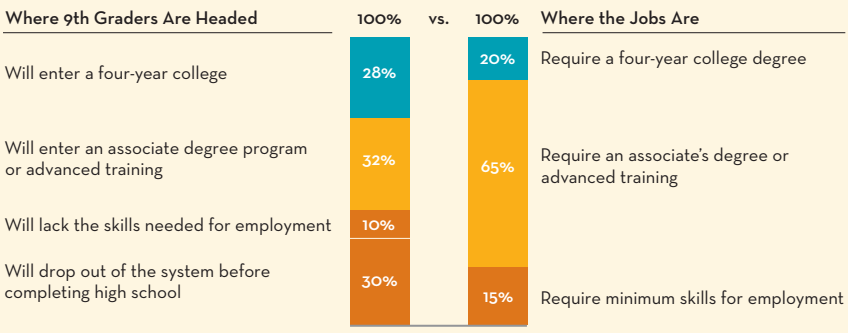
CAREER CHOICES AND EDUCATION TRENDS

Another major root of the construction labor shortage is the decline in the number of students preparing for work in the industry either through vocational education and training or through university coursework in an engineering discipline.

For example, 8% of high school students in 1994 (the latest year for which data are available) took three or more courses in trade and industry programs, which includes courses

Exhibit 1

The Workforce Gap



Source: Workforce 2020: Work and Workers in the 21st Century

in construction, compared to 16% in 1982. These data from the National Center for Education Statistics reflect a general decline in student interest in vocational courses and a shift toward college-prep curricula.

The pipeline is also tightening on the management side. According to the National Science Foundation, the number of students enrolled in an engineering program has declined 1.9% annually since 1983. From its 1983 peak of approximately 441,000 students, undergraduate engineering enrollment declined to about 361,000 students by 1999. Graduate engineering enrollment declined from 129,000 in 1992 to approximately 105,000 by 1999. While these figures have rebounded some recently, they illustrate a general trend among youth today to focus their educational studies more broadly. Exhibit 1 shows how these enrollment figures don't match up with what's needed in the general workforce, creating a gap.

The decline in vocational and technical education and training can be traced back to cultural and value shifts occurring within the current era. In the past, construction represented positive growth, progress, and evolution. Perhaps the best illustration of this is found in old photographs of railroad workers during the Industrial Revolution, standing triumphantly atop their latest built section. This stands in stark contrast to the image of construction growth today. A majority of our current society thinks of urban sprawl, traffic congestion, increased pollution etc. when talking about construction growth. These negative associations, inevitably, get translated to construction. Construction, for many people, represents a past tradition or bygone era.

What's more is that the construction industry doesn't fit with today's Information Age values, which are focused on cutting-edge technology. High school students largely desire a college education and then a professional or management position in a field where they can work with their mind and the latest technology, not their hands. The truth of this shift is proven out simply by asking any eight or 10-year-old, "What do you want to be when you grow up." The oft-heard

response is a doctor or a lawyer. Much of this comes from parents and society who place emphasis and value on obtaining a traditional, four-year degree as the ticket to a better, nicer life. This, of course, leaves those entering the construction trades feeling less successful. Ironically, the average construction job now pays 23% more than private-sector jobs overall, according to the Bureau of Labor Statistics.

So part of the problem is the image of the construction industry. Many programs are in place today to work on improving this image, such as those developed by the Associated General Contractors and the Associated Builders and Contractors. These programs help to educate high school guidance counselors, for example, about the career opportunities available in construction. The long-term goal of this image work is to inform and enlighten: the reality is that construction is one of the few careers where you can potentially own and manage your own company with or without a formal education, within a short time of entering the field, and where the average job pays higher than other industries with a myriad of opportunities for women, minorities, youth, and others.

What this image work can't do is change the reality that construction work is dirty, physical, risky, and unstable in terms of job availability. Moreover, workers are often exposed to the elements and viewed as having a low status. Finally, while the industry has many opportunities, there is not a clearly defined career path to the top. The industry will need to work on changing the nature of its work through steadier, less seasonal work, better leadership and management, and training in non-skill related areas to keep employees challenged and fulfilled.

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Another reality is that an actual shortage of "bodies" is not likely in the future. The "labor shortage" for the construction industry really refers to a dearth of adequately trained, skilled, and productive workers. The real problem stems from the percentage of bodies headed towards a career in construction. The low demand for vocational programs in high schools and community colleges has led to their near extinction. More technical crafts, like electricians, require strong math and science skills, making training for these positions expensive and time-consuming. There is also a declining interest in these technical-based programs. At the college level, students are often intimidated by math and science courses, and after the dot-com bust, hesitant to limit their studies. This is partly why construction management programs have become so popular. These programs are not as technical as an engineering degree, yet they are more focused than a traditional business degree.

A main impediment to training is a lack of necessary resources. High-school and

community college vocational programs often lack basic resources such as books and curriculum, and at the university level, public funds are decreasing. This need has become so clear that the government has authorized appropriations of more than $11 billion through 2012 via the Vocational and Technical Education for the Future Act. Construction-industry firms are also starting to take some of the responsibility for educating and training future employees through private donations and sponsorships.

These programs are what the industry needs to pump up the pipeline, ensuring the industry will be appropriately staffed in the future.

WORKFORCE DEMOGRAPHICS

Since 1970, the United States has witnessed unprecedented economic growth. Although the United States represents less than 5% of the world's population, it accounts for more than 30% of its economic output, by far the largest.[1]

The construction industry has benefited greatly from this economic growth, with strong demand for new buildings (work and home) and infrastructure. This level of demand is expected to continue through the next decade, and with it, the need for more workers. Total employment in the construction industry is projected to increase by more than 1 million from 2002 to 2012. This represents an annual growth rate of 1.5% (16.4% overall). At this rate, by the end of the projection period, the construction industry will rank fifth among the economy's top-10 largest sources of employment growth.[2]

Total employment in the construction industry is projected to increase by more than 1 million from 2002 to 2012.

During this time period, 50 million jobs have been created, and with it, significant changes to the demographic make-up of the nation's workforce, including more women and minority participation than ever before. But perhaps the most discussed change is the aging workforce. With such a great need for workers, contractors will be increasingly challenged by these changes — primarily age, gender, and ethnicity — in the demographic make-up of the workforce. To be more precise, the traditional construction worker is a 43-year-old white male that is getting older but working longer.[3] The young man or woman who will replace him, typically possesses less education and fewer skills, and attracting women to the industry may prove difficult despite women representing almost half of the U.S. workforce. Last, foreign-born workers, primarily of Latino descent, will make up the difference. The reduced education and lowered skills of this demographic will likely result in greater costs to the contractor (e.g., recruiting, training, health care) and a loss of productivity.

Age

Surprisingly, the average age of a person working in construction is not much different than other industries. The Construction Labor Resource Council (CLRC) states that the construction industry in 2005 had more craft workers in their prime

working years (ages 25 through 44) compared to other industries. However, these workers tend to leave construction at an earlier age than do their cohorts in other industries, largely due to the working environment and physical demands of their jobs. Considering the current make-up of the construction workforce, the implications are clear. A large number of skilled and experienced workers will need to be replaced over the next 10 years.

Changing attitudes towards retirement, however, may lessen or delay the immediate need to replace these older workers and fill the skill and experience gaps they will leave. The age at which craft workers typically retire may be increasing as more people, regardless of industry, are extending their working years past retirement age. The reasons for this vary from increased life expectancy to economic need. AARP reports that 69% of employees over age 45 plan to work past 65, and by 2010 more than 51% of the workforce will be 40 years or older, a 33% increase since 1980.[4] Still, there are potential negative consequences associated with an older workforce, especially in one as physically demanding as construction. The National Organization on Disability reports that people aged 45 to 54 have an 11.5% chance of developing a disability, a number that nearly doubles to 21.9% for those aged 55 to 64 (2001). The most common disabilities involve changes in vision, hearing, and manual dexterity. The potential impact on workers' compensation costs are significant. Although research indicates that older workers experience fewer injuries, when they do, they are typically more severe. Another potential cost to contractors will be additional investment in enabling technology to assist and accommodate older workers.

Since not all older workers are expected to delay retirement, they will need to be replaced with younger workers. The chief problem among the young is skill; many may enter construction jobs without any formal classroom training beyond high school, although construction work is becoming more difficult. Given that the industry has become increasingly complex with the proliferation of advanced technology and tools employed on job sites, the need for highly skilled workers is vital. Unfortunately, the young people typically considering craft work lack the necessary math, communication, and technical skills required — leading to increased training costs and decreased productivity.[5]

Gender

Despite representing almost half of the entire U.S. workforce, women continue to be underrepresented in the construction industry. According to the Bureau of Labor Statistics (BLS), women made up 46% of the employed civilian labor force in 2005. Yet in construction, one of the top-10 employment industries, they are only 16%. The construction industry cannot afford to overlook this segment of the population; however, until a critical mass of women on construction jobs can be reached, recruiting them will prove challenging.

The role of women in the workforce will be increasingly prevalent, in numbers, education, and skills. Consider the following statistics from the Bureau of Labor Statistics.[6]

- Women held half of all management, professional, and related occupations in 2004.
- Nearly 33% of women age 25 to 64 years held a college degree in 2004, compared with about 11% in 1970.
- Among 2004 high school graduates, young women were more likely than young men to enroll in college (72% vs. 61%).
- Nearly 60% of women who worked at some time in calendar year 2003 worked full-time and year-round, compared to 41% in 1970.

Ethnicity

Much has been reported recently regarding immigration. Hispanics represent the fastest growing ethnic group in the United States. From 1990 to 2000, the number of Hispanics increased by 58% to 35.3 million compared to 9% for non-Hispanics.[7] From 2000 to 2020, Hispanic residents are expected to double, accounting for 46% of total population growth during this time period.[8] Needless to say, the growth of the Hispanic population has been significant to construction employment, filling much of the needed laborer and craft worker positions.

Hispanics represent the fastest growing ethnic group in the United States. From 1990 to 2000, the number of Hispanics increased by 58% to 35.3 million compared to 9% for non-Hispanics.

According to the BLS, Hispanics accounted for about 20.3% of the workforce in the construction industry in 2003 and 21.4% in 2004. The CLRC's Craft Labor Report (2005) estimates Latinos represented almost a quarter of all construction craft workers in 2003. In other areas of the country, this percentage can be as much as 65% or more.[9] Of the roughly 1 million additional workers in the 2012 construction industry (above that of 2002), FMI projects that more than 33% of these new workers will be Hispanic.

The most obvious challenge this poses is the communication barrier. Seventy percent of Hispanic construction workers were born outside of the U.S., and fully one-third speak only Spanish.[10] But the communication barrier is more than language. A significant portion of Hispanic construction workers are illiterate in their own language. This makes even translated documents and signs useless. The major impact of impaired communication are job-site accidents.

Job-site injuries have been in decline for several years in the construction industry. But among Hispanics, injuries increased 22% from 1999 to 2004.[11] And although

Hispanics represent anywhere between 20% and 25% of the construction workforce, they lead the industry in injuries. In 2003, Hispanics represented 56% of lost-time injuries according to the BLS.

Hispanic culture may also lead to greater injuries. The countries many immigrants come from have little or no governmental enforcement of safety regulations. Moreover, cultural traits such as a hesitancy to disagree with or challenge authority can result in failure to report dangerous conditions or incidents.

Despite the communication challenges faced by Hispanics and their impact on the construction industry, this may be a short-term phenomenon. Births to Hispanic immigrants, rather than immigration itself, will be the key source of population growth among this group. So while most foreign-born immigrants do not speak English, the likelihood for native-born Hispanics is much greater. In fact, the percent of first-generation Mexican children that speak English well or very well is 79%.[12]

The traditional workforce of the construction industry is unlikely to continue in the future. Demographic changes among the United State's civilian labor force include older workers and a large contingency of women and minority workers. In the short-term, as contractors adjust to managing these changes, operating costs are likely to increase, including training and insurance costs. In addition, productivity is likely to suffer. However, the benefits that will emerge at the end of this period will far outweigh the challenges, offering opportunities for dramatic gains.

How will the industry solve the labor crisis? The proposed strategies vary, but the solutions will only become apparent through extensive study and evaluation of the root problems. ■

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The ACE Mentor Program, Coming to a Town Near You

The ACE Mentor Program of America plays a crucial role in attracting young people to the fields of architecture, construction management, and engineering.

By Kelley Chisholm

As the war for talent wages on, the fact that there is a shortage of qualified people in the fields of architecture, construction management, and engineering should be no surprise to anyone in this industry. Universities and colleges, especially engineering schools, are concerned with the declining number of students, particularly among minorities, who are enrolling in their programs.

The National Science Board validates this concern in its 2004 *Science and Engineering Indicators* report, saying that the number of U.S. citizens who are training to become engineers is declining, whereas the number of jobs requiring science and engineering training continues to grow.[1] Recruiting qualified people into construction-related positions has never been more critical, and it is becoming an even-more crucial concern that the industry demonstrate to secondary school-age students just how exciting and rewarding careers can be in architecture, construction management, and engineering. Since its beginnings in 1991, the ACE (Architecture, Construction, and Engineering) Mentor Program of America has been doing just that.

The principals of several leading design and construction firms in New York City founded the ACE Mentor Program as an innovative way to introduce and attract high school students to career opportunities in the industry. Charles H. Thornton, Ph.D,

P.E., founding principal of Thornton-Tomasetti Group, an international design firm, is considered the driving force behind the program. After several years of experimentation with various mentoring models, the independent nonprofit ACE Mentor Program was officially created in 1995 when 17 firms banded together into three teams, each organized like a typical design and construction team, and "adopted" about 90 students from local high schools. Volunteers from each of the firms served as mentors and worked directly with the students to introduce them to the broad range of people and projects within the construction industry. Students gained first-hand insight into the industry by selecting a design project, touring project offices, and visiting active construction sites. Over 20,500 students have participated in the ACE Mentor Program in the past decade, and over 90% have gone on to college. In spring 1995, ACE held its first fund-raising event to establish a scholarship program for ACE graduates. Since that time, scholarships totaling $5.4 million have been awarded.

ACE continues to grow, both vertically and laterally. Affiliates are "under construction" in cities across the United States, and existing affiliates continue to add new mentoring firms and improve the quality of their programs. It takes the dedication and efforts of a number of people to make ACE the winning program it is today. From its board of directors and executive staff, to the firms and national sponsors who participate by providing mentors, financial support, and internships, to the mentors who are the backbone of the program, and finally the students themselves, for whom the program was developed — each group is vital to the continued success of ACE.

Over 20,500 students have participated in the ACE Mentor Program in the past decade, and over 90% have gone on to college.

FMI Quarterly spoke with several people affiliated with ACE in a variety of capacities, including Charlie Thornton, founder and chairman of the program; Pam Mullender, executive director of ACE; and Ricardo Anderson, Adam Snavely, Tom Lynott, and David Gaudreau, who are all with ACE's Baltimore affiliate. *FMI Quarterly* also interviewed Nubia Castano, former ACE student, current ACE mentor, and one of ACE's numerous success stories.

HOW ACE WORKS

Charlie Thornton and Pamela Mullender oversee the executive responsibilities of ACE. Thornton currently spends about 20 hours a week on ACE, making phone calls and developing new concepts. "I talk to Pamela at least 10 times a day," Thornton said. "I wake up with new ideas; she wakes up with new ideas, and we strategize how we're going to get the heavy hitters of the industry. We're focusing on legends of our industry who have attained recognition and success for funding, and strategizing on all fronts. I'm a creative person and like to come up with new ideas. It's fabulous

SAMPLE STUDENT PROJECTS

- A barbeque pit, in which the pit was built into the side of a slightly graded hill using industry secrets and intensive labor to complete the task
- An atrium-domed recreation center, which included tennis courts, a track, pool, fitness center, basketball court, dance studio, and internet café
- A two-story community center with a basketball court, pool, rock wall, tennis court, track, and more
- An outdoor performing arts venue, which included an amphitheater, boat rental spaces, a night club, and retail stores
- Architectural schemes programmed with condos, nonprofit office space, music studios, and a night club — all to serve U2 frontman Bono; the design featured green roofs, green streetscapes, and other sustainable elements to improve the building and blend into the neighborhood
- A destination resort in the form of a medieval castle on the south shores of Whidbey Island with hotel rooms as well as a comprehensive sports facility/arena, 200-seat restaurant, club, and public area

having Pamela there because she knows exactly what to do with those ideas."

ACE consists of affiliates that serve students within a specific city. Each affiliate is made up of a board of directors, executive director, and a number of design, construction, and engineering companies. The companies join teams that are organized similarly to project teams. These teams usually consist of an owner firm, a design firm, an engineering firm, and a construction manager or general contractor, as well as participants from a local college or university with programs in architecture, engineering, or construction management. Each team takes on approximately 20 to 30 students for most of the school year. Students are recruited from public and private high schools, and special efforts are made to reach women and minorities who may not realize the opportunities and rewards of a career in the design and construction industries. ACE Executive Director Pamela Mullender explained: "Our goal is to not only introduce career possibilities but to teach the students about communication, meeting deadlines, and working as team members — the interpersonal skills that are necessary in business today."

Teams meet at least 15 times during the school year. Each team selects a design project and goes through the entire design process, with the tasks they perform for their clients modeled on the real-life activities of their mentoring firms. The school year ends with a major culminating event where the teams present their projects. In addition, the students take field trips to local colleges and construction sites.

SPOTLIGHTING ACE'S BALTIMORE AFFILIATE

David Gaudreau, principal, Gaudreau Architects, is president of ACE's Baltimore Affiliate, and has been involved with it since its inception three years ago.

According to Gaudreau, the Baltimore city schools have been very helpful in promoting ACE to students. The Baltimore affiliate holds

a recruitment night, where they provide interested students an introduction to the industries. In addition, the ACE affiliate markets to parents by showing them that the program is viable since it is endorsed by the city schools; students can obtain a great academic education; and incentives exist for finishing a four- or five-year post-secondary program and having a career at the program's end.

Forty companies participate in the Baltimore affiliate, and just organizing the mentors takes a lot of work. Gaudreau said that in addition to a feeling of great satisfaction that the mentors receive working with the students, they also form valuable business relationships, making it a win-win situation for everyone involved. He estimated the mentors' donated time to be approximately a quarter million dollars. The students learn more about their own worth from the mentors; these relationships are personal and long-lasting. Gaudreau also said the mentors are constantly finding innovative ways to get and keep the students interested in the program.

Presentation night, where the students showcase their team projects, is the best part of the program's season for Gaudreau. "The students become the mentors," he said. "They see the value in being part of something larger than themselves." One of the best aspects of ACE is the fact that it is an evolutionary program; it morphs into something new each year. This is especially valuable for returning students since it offers them new and different experiences each year.

The students learn more about their own worth from the mentors; these relationships are personal and long-lasting.

It's all about the students

Ricardo Anderson is just one of ACE's success stories. Anderson grew up in Baltimore and attended high school at Baltimore Polytechnic Institute. He was one of the first students to participate in Baltimore's ACE program, after learning about ACE from his high-school advisor. "It sounded like a good idea," Anderson said. "As a kid I played with puzzles and Legos® and liked to take things apart and put them back together." He attended the kick-off meeting, was impressed with what he saw there, applied, and was subsequently accepted into the program.

In addition to learning how a design project breaks down into the different areas of architecture, engineering, and project management, Anderson said one of the biggest things he took away from ACE was the importance of teamwork. "If the team didn't come together, things wouldn't get done," he said. The first project Anderson worked on was the re-design for a hospital area with small rooms and a lack of space for patients' families. His team's plan incorporated a common area for the family and visitors so they would be more comfortable. Anderson's initial experience with ACE inspired him to return the second year, where his team designed a high-end retail multiplex building, using the London Eye (the largest observation wheel in the world) as inspiration.

Anderson is currently a sophomore at Drexel University in Philadelphia and is using a scholarship from the ACE program to help fund his education. As part of

the scholarship, he has been an intern for the past two years at Poole and Kent, a mechanical contractor located in Baltimore. Tom Lynott, vice president of pre-construction, heads the company's estimating department where Anderson has been working summers as a project engineer and assisting project management staff. Lynott said he saw "lots of enthusiasm," upon first meeting Anderson. In addition, he felt he was capable educationally as well as being very focused and determined, especially for his age. "I've watched Ricardo grow from being unsure of how Poole and Kent fits into the industry and market to understanding this, as well as all of the daily procedures," Lynott said. "Ricardo has worked very well with the group and fits in well."

Anderson said he is enthusiastic about his work at Poole and Kent. This summer he worked on a multi-use building in Baltimore's Inner Harbor and was involved with many different aspects of the job. He enjoyed the hands-on work, problem-solving, and seeing the building "happen." Anderson said he now feels his resume has more of an edge.

"I would definitely encourage other students to consider the ACE program," Anderson said, "as it allows one to take the childhood fun of taking things apart and putting them back together, and translate that into a career." Another reason Anderson gave for recommending the program is the networking aspect and the ability to call on these industry contacts one day in the future. Anderson said the following knowledge-areas from ACE will stick with him: teamwork and collaboration, industry understanding, and the ability to develop a presentation from ideas on paper. He still isn't completely sure of his near-term career goals and choices, but Anderson said he certainly feels much better equipped to make the right career choice thanks to the ACE program.

Ricardo Anderson is an ACE success story.

Lynott echoed Anderson's sentiments about the ACE program. "Our industry is struggling from the construction aspect, and we need younger people stepping up and filling positions, especially in the Baltimore and Washington markets," he said. "It's a great time to be in construction; there's more of a

team spirit, and a great amount of opportunity and available work." Adam Snavely, president and CEO of Poole and Kent, also agrees. "ACE gives students an early introduction to the industry," he said. "It's a rather unique program in which students get to participate in a case-study and peer environment that normally would not be presented to them until their later years in college. Mentoring is a big part of Poole and Kent. Enthusiasm is contagious, and this is a two-way street."

MENTORS ARE KEY TO ACE'S SUCCESS

ACE relies on mentors who are successful professionals from leading design and construction firms. Mentors devote countless hours and energy, and help the students determine what careers are available and a good, individual fit for them. "Our success is, in large part, a tribute to the dedication of our 1,800 mentors and 800 participating firms," Executive Director Mullender said. "These mentors really demonstrate the spirit of the organization. Whether they give a few hours a year or a few hours a week, these individuals have found a way to change the lives of many youths."

ACE Founder and Chairman Charlie Thornton said that many of the students who have been through ACE eventually become mentors. "They're coming back in droves," he said. "Some of them take a year or two when they graduate to get their positions within their firms established."

SPOTLIGHTING NUBIA CASTANO, FORMER ACE STUDENT AND CURRENT ACE MENTOR

Nubia Castano is an assistant project manager with Mancini Duffy, a leading design firm headquartered in New York City. She will graduate in December 2006 with a construction management degree. A former ACE student, Castano is now a mentor with the New York City ACE affiliate.

FMI Quarterly: How did you learn about the ACE mentoring program?

Castano: I had just arrived from Colombia in 1999, and my high-school advisor suggested the program as a way to help me overcome my shyness. I decided to enroll and see what it was all about.

FMI Quarterly: When you arrived in the United States, were you already bilingual?

Castano: Yes, but I was very shy and didn't like to talk much.

FMI Quarterly: Did you have any experience with or interest in the construction industry before the ACE program?

Castano: I liked construction because I was surrounded by people in the field ever since I was little. When I came to the United States, I decided to pursue my

interests because I really liked design and thought I wanted to go into architecture. Once I got into ACE, I realized that I liked the construction side better, and now I'm pursuing my degree in construction management.

FMI Quarterly: What was your experience like as an ACE student?

Castano: I was very, very shy, but the mentors were very open with me. I was going through cultural shock at the time and didn't know exactly what to expect. For example, in my country you learn the theory and then apply it after you graduate. Here, you gain the experience [through internships] to help you decide on a career field.

FMI Quarterly: What was your group's project?

Castano: We were building two commercial towers: a typical city building, multi-use with retail and residential. We were building models, and the mentors were guiding us and giving us ideas as to what we could do. Students tend to be very wild with their design ideas, and the mentors would bring us back to earth and keep us on track.

FMI Quarterly: What was your biggest success as a student?

Castano: I think being recognized and not forgotten because as a student you often feel insignificant — nobody is going to care about me, etc. But many people know me or recognize me from ACE, even though it's been a long time. That really makes it a good experience.

FMI Quarterly: Did participating in ACE have any impact on your college career/major?

Nubia Castano is an ACE mentor and former ACE student.

Castano: It did, especially because when I decided to go back to school, I had been really isolated and wasn't working in the field, and I was trying to figure out how I was going to get back into it and who I was going to contact to help me. One of my professors who was trying to help me get into the field felt I needed some experience so I mentioned to him my internship and being involved in the ACE program. A couple of weeks later he told me that he had gone to one of the ACE meetings and had run into someone who knew me and told him about me. And that's how I got back into contact with ACE. Later I attended one of the ACE luncheons and met some of the principals of the firm where I'm now working, and they offered me a job. So yes, ACE has had a great impact.

What helped me a lot when I was a student was being involved in the program because if I hadn't had this experience or exposure to the field, I wouldn't have been able to tell for sure if this is what I wanted.

FMI Quarterly: How long have you been an ACE mentor, and what can you tell me about the experience so far?

Castano: This is my first year. I think it's great because I've been there, and I know what students need. Some of them are shy; some have so many ideas and need some guidance on just how far they can go with them. They need motivation, and they need to be certain that this is what they want to do. What helped me a lot when I was a student was being involved in the program because if I hadn't had this experience, or exposure to the field, I wouldn't have been able to tell for sure if this is what I wanted.

FMI Quarterly: How did you get involved in the mentoring side of ACE?

Castano: ACE contacted me and asked me if I wanted to be a mentor, and I said "Sure!" I felt it was the least that I could do.

FMI Quarterly: How much time do you spend being an ACE mentor?

Castano: A couple of hours a week.

FMI Quarterly: What's your favorite part of being a mentor?

Castano: Being able to help and answering questions.

FMI Quarterly: How many students have you mentored, and what was their project?

Castano: Fifteen, and it was a variety of grade levels from sophomores to seniors. They were doing a ticket purchase place in Times Square. They loved the

project and were so enthusiastic. First, they picked a theme, and it took a couple of sessions to agree on it. The next stage was doing sketches of ideas and developing a program. Next, they started designing and figuring out what materials they needed, considering the weather, the field, traffic, etc. Finally, they started doing the model. They split into groups and chose to do whatever they do best, depending on their skills.

FMI Quarterly: How did the final presentation go?

Castano: They were so happy and very proud of their project. They did very well. It was very different from when I was a student because everyone then was very shy, and nobody knew CAD. Now, they all know CAD. They know more than what we knew at that time.

FMI Quarterly: I understand that some of the students drop out of the program before they complete it. What are your thoughts about that?

Castano: The thing that they learn from this experience is if this is what they really want. It saves them time, and maybe money (if they've started college and then learn that's not really what they want to do). It's a great way to test the field and see if they like it. Part of the reason for people dropping out is when you're in high school there are many other activities, and social life plays a very big role.

FMI Quarterly: Do the mentors as a group have any type of planning sessions?

Castano: Each group has an engineer, a contractor, and an architect on board. All the participating firms get together and start talking about ideas for the program and how we are going to plan the session and who's going to attend. The workplace is very hectic and everyone has deadlines so we have to accommodate people's schedules and work around them. In every single session there are at least two mentors available to the students.

FMI Quarterly: What type of support do you receive from your company?

Castano: I receive a lot of support from time to the space — anything that's necessary to accommodate the students as well as my schedule. They're very flexible. There are also a few other people at Mancini who are involved with ACE.

FMI Quarterly: If you were going to a high school to promote ACE, what would you tell the students about the program?

Castano: There's so much to tell. From my experience, I've gotten so many benefits, including a great network of people that I can contact for business or

anything; they provide great knowledge and guidance, and if I have any questions I can always contact them, even on a personal level. It's a great learning experience as well.

FMI Quarterly: What do you see as the major benefit(s) of the ACE program for the industry as a whole?

Castano: The internships for one, and the amount of people you, as a mentor, can recommend because companies in general benefit from the students (labor-wise). Plus, students tend to come back to the industry after they graduate, so that helps with the turnover rates.

FMI Quarterly: What would you change about the program, both from a student's and a mentor's perspective?

Castano: From a student's perspective, perhaps having more trips to the field would be helpful. I wouldn't change anything from the mentor's point of view. The people who become mentors really want to be there to help and to guide. I am really grateful for the program, and I wouldn't be where I am today without ACE.

To build tomorrow's world, the skills and expertise of a new generation of men and women will be needed. According to the Bureau of Labor Statistics, by 2012 there will be approximately one million new jobs for workers in the construction industry. In order to satisfy this demand, the construction industry will need to become very creative in attracting and keeping talent.

To build tomorrow's world, the skills and expertise of a new generation of men and women will be needed.

ACE Founder and Chairman Charlie Thornton said he feels that the ACE program is in the catbird seat right now because everybody is accepting responsibility for the industry's labor challenge. "Our major donors are increasing; we just picked up two more, and our fund raising is going well," he said. "One of the reasons why the fund raising is going so well is because there are 60 more cities that want the [ACE] program … which is making our life a little bit easier. In 2001 when *Engineering News-Record* put us on their cover, we were in three cities. We had asked *ENR* to do a major feature on ACE a couple of years earlier, and [they] said only if we took the program national. So, we did. The following year we were in 16 cities, and the year after that we were in 28 cities, and the rest is history. It's working."

What does the future hold for the ACE Mentor Program? Thornton said he expects the program to have 100,000 kids in the next five years. "There's no doubt in my mind that we'll be in every city in the United States, big, small, etc.," he said. "We really have some fantastic people backing this program." And that's good news for the industry, as ACE continues to play a crucial role in attracting young people to the fields of architecture, construction management, and engineering.

FMI Quarterly *thanks all of the people we spoke with about ACE for their time and their insights. For more information on the ACE Mentor Program, please visit their web site at http://acementor.org* ■

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[1] National Science Board (2004). An Emerging and critical problem of the science and engineering labor force. Retrieved from: http://www.nsf.gov/statistics/nsb0407/ on Oct. 6, 2006.

Evolving Project Observers into Project Leaders

Organizations with superior operating procedures within the spheres of planning, communicating, and business acumen will be able to hire, retain, and cultivate project leaders.

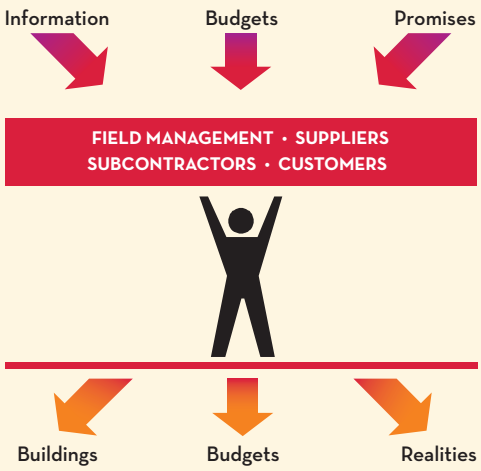
By Gregg Schoppman

If you ask seasoned veterans of the construction industry the origin of project managers, they would all agree project managers came about because superintendents hated doing their paperwork. "Construction is about building things, not shuffling paper," grumbles the stodgy construction curmudgeon.

Enter the project manager. Submittals, shop drawings, change orders, and schedules became the primary duties of a group of individuals trained at universities and building schools across the country. Textbooks, lectures, and labs replaced the real-world lessons amid rebar, concrete, and stale trailer coffee. Within this evolution, project managers became the de facto leaders of the operations component of the business — driving every process and often becoming the customer's main point of contact. Supporting the field and serving the customer remains the most challenging balancing of duties for which any individual could be responsible. Like sand through the throat of an hourglass, information flows up and down through the project manager to the project team. As Exhibit 1 depicts, project managers are the linchpin of every project, controlling every aspect of how the building of projects occurs.

With the massive responsibility of managing the many construction dollars, project managers are criticized for their inability to move the project along and their role as a bottleneck in this pipeline. Plan revisions sitting in the manager's office, unanswered RFIs, and unapproved change orders all flatten the wheels of progress.

Exhibit 1
Project Information Flow



There is also the project manager who operates like an open conduit, allowing information to pass through his or her office without screening or actively participating in the process. In many cases, this type of project observer serves more as a historian of projects rather than actively leading the process. Leading the process requires a proactive mindset and a willingness to make change for better results. These diametrically opposed management styles beg the following questions: What traits should the ideal project manager have, and how can an organization develop a corps of proactive project leaders?

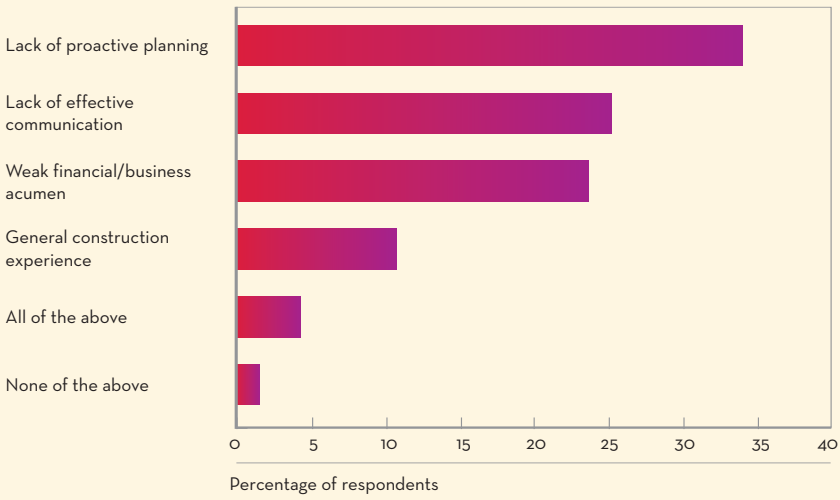
PLANNING, COMMUNICATING, AND BUSINESS ACUMEN

True project management is an amalgam of strong technical acumen and highly developed interpersonal skills. There is usually no shortage of managers that understand their trade. Knowing how buildings and systems are constructed is easy to teach and learn. The challenge lies in finding project managers who either know how to or can be developed to communicate, plan, and financially manage their projects. Project failures rarely are the result of someone not understanding how concrete cures or drywall is hung. Furthermore, training managers in the technical aspect of the business is common and relatively simple to implement. Rather, failure stems from managers' inability to identify project hazards early, adequately plan all resources, comprehend the financial implication of decisions made, and manage expectations through timely and effective communication. For example, understanding how concrete cures is less important from a project management perspective than the questions of: What impact does the curing have on the rest of the project, and how should these impacts be communicated? According to *FMI's 2006 Project Management Survey*, the areas causing the greatest pain to construction organizations are project managers' lack of proactive planning, lack of effective communication, and weak financial/business acumen. (See Exhibit 2.)

What does this glaring absence of specific skill sets indicate about the current state of project management within the industry? For

Exhibit 2

Weak Project Management Areas Causing Greatest Pain to Organizations



Source: FMI's 2006 Project Management Survey

many years the emphasis was always placed on the construction process or cultivating the "builder mentality." Technical skills were heavily stressed, and in many organizations, junior managers or project engineers were exposed only to this side of the business. There are several root causes for this gravitation away from the planning, communicating, and business acumen. First, young managers have often blurred the lines between planning and scheduling. Drafting a Gantt chart in MS Project or Primavera became the minimum level of planning for a project. In many cases, developing this schedule was simply a mandate by the customer so the bare minimum of information was provided to satisfy a mere specification requirement. Second, communication has suffered because of e-mail, faxes, and two-way radios. With a world abundant in communication tools, project management operates as if it were using two tin cans connected by a string. In this paradox of technology, managers at all levels use e-mail, faxes, pages, and chirps as a reaction to activity rather than a proactive measure. In many cases, communication has deteriorated to the point that phone calls and face-to-face meetings are used as last-ditch efforts to solve problems that have escalated to a boiling point rather than preemptive strategies to avoid the problem in the first place. Lastly, the financial component of project management has only begun to take its rightful place in the priorities of managers. Understanding cash flow and the financial implications of all decisions made were once duties relegated to the accounting staff. Incorporating these tasks and responsibilities into operations is slowly becoming a priority even though many organizations are seeing a pushback from their project managers. Many managers believe financial management is not part of the building process and give it lip service during the times of the month when pay applications and projections are due. Collecting the money is viewed as a distraction to actually putting the work in place. In each case, planning, communicating, and financial acumen are talents that can be honed and developed.

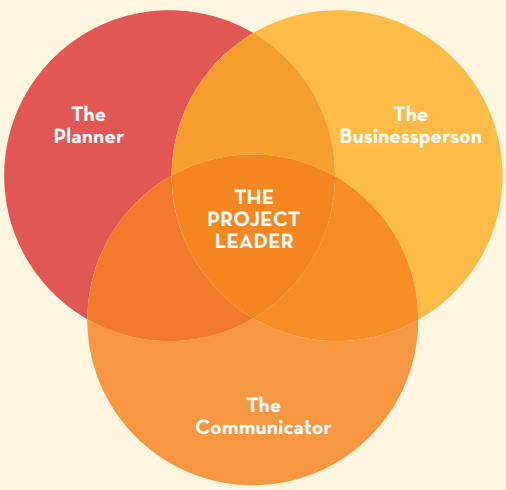
While they may have faults, project managers have an awesome responsibility in an often thankless and grueling environment.

THE PROJECT LEADER MODEL

While they may have faults, project managers have an awesome responsibility in an often thankless and grueling environment. Project management requires a strong individual who can multi-task and lead the frenetic activity of the most complex projects with the sensory perception of a wild-game hunter and the resilience of an offensive lineman. In many cases, project managers will excel in one of the aforementioned areas. Some are exceptional planners, preparing well-scripted plans of attack for every phase of work. Others rival the great accountants of the world and can account for every cent of cost and profit on their projects. However, while some are exceptional in certain areas, they lack the ability to utilize the aspects of the other two areas. And while they may have a plan, they fail to communicate it to the rest of the team, and they fail to consider the financial implications of their plan. The "Project Leader" model is an embodiment of all three traits acting in trinity. The Planner, Communicator, and the Businessperson comprise the spheres of the ideal project manager, as illustrated in Exhibit 3.

Within each sphere, duties and responsibilities exist that are commonly associated with the project aspect. For instance, financial management falls under the auspice of the businessperson. However, it is important to note that none of these duties are done without the influence of the other spheres. Consider project scheduling. Developing the schedule falls under the planner sphere. However, the project leader involves and receives feedback from subcontractors, field managers, and suppliers to properly develop the baseline schedule and to effectively communicate it back to the project team (the communicator). Lastly, the schedule must be developed in concert with a strong understanding of the resources needed to complete the work as well as the expected return on those resources (the businessperson). A schedule without these other components is devoid

Exhibit 3
FMI's Project Leader Model



of substance and is simply a decorative wall covering. The subsequent sections in this article examine the spheres of the project leader model and several of the management processes that comprise each. These sections will also examine the organization's need for consistent management processes to support the project leaders within operations.

The Communicator

Without fail, "communication skills" remains at the top of every list for the most sought after traits when hiring managers. Employers want managers that understand the message and that know how and when to effectively deliver it. The greatest communicators know how to disseminate information and repackage it for their audience. Project management is no different. Audiences can be as diverse as the project designer to the CEO of a Fortune 500 company or the foreman on a sewer crew. In many cases, the message may be the same, but how it is conveyed and the timing of its delivery can profoundly impact the project.

Organizations typically use organizational charts to establish lines of authority and communication. Projects also require this level of detail. Project leaders not only establish roles and communication channels, but they understand who needs the information and when. They understand the customer's needs and actively involve them in decisions. Most importantly, they know the decision maker and institute measures to ensure timely resolutions are made for everything from color selections to change orders. The project managers of old perceived the customer as an impediment to progress. Marketing and business development managed the customer, not the project manager and superintendents. Project leaders today recognize their project delivery affects not only the firm's ability to get more work, but it also affects how they sell on their project. They understand selling change orders, schedules, materials, ideas, and processes can be almost as important as selling the initial project.

Project leaders today recognize their project delivery affects not only the firm's ability to get more work, but it also affects how they sell on their project.

Project leaders are also great listeners. They hear not only what their customers say but also what their team says. They hear the needs of the field manager and accounting. They understand the value of managing these internal customers with the same respect and dignity that the external ones receive. Project leaders actively process what they hear to not only deliver a better product but also to improve the organization. They recognize areas of improvement and focus on implementing new ways of building projects and relationships rather than holding onto tired and stale conventions. Communication comprises more than talking to the project leader. It is a mechanism for receiving and processing information efficiently and a driver of the project's planning and financial management.

The Planner

Many project managers evoke the image of the firefighter. Their desks are ablaze with so many emergencies, and their phone is ringing as if it were a six-alarm emergency. Alas, in many cases, the frenzied activity is the reaction to a problem or challenge. Reactive management is merely a defensive maneuver that occupies time and detracts from high return activities on a project. While no manager can completely plan for every emergency, reactive managers are simply one emergency away from project ruin.

Proactive management is well telegraphed and calculated. Like a chess master, project leaders plan stages of projects well before their start. Project leaders subscribe to Covey's principle of "beginning with the end in mind." Not only have they communicated the end vision with the team and customer, but they meticulously plan the beginning of the project to provide for the highest return. Throughout the project, project leaders have accounted for "rocks in the road" and developed suitable contingencies to protect their assets. Lastly, each project has an exit strategy to avoid the downward spiral of never-ending and margin-eroding punch lists. Project leaders recognize that customers may not remember how the project began, but they are sure to remember its completion.

Planning begins with a comprehensive pre-job planning meeting that involves the project team. It extends to defining the quality of the project and how the budget will be crafted. The project plan identifies and quantifies risk and develops strategies to avoid it. Careful planning of the purchase and award of materials and trade contractors protects against project delays and scope holes. Managers often think that planning is simply a precedence diagram or bar chart that adorns the trailer wall. But planning involves scripting the project with reasonable confidence and communicating the plan to the players responsible for executing it. Championship sports teams spend many hours planning the game at every level and within every position. They continue to plan during the game, reacting to problems and challenges as they arise to mitigate their impact. Project leaders are the coaches of championship projects that may lack a trophy but offer all the return and reward.

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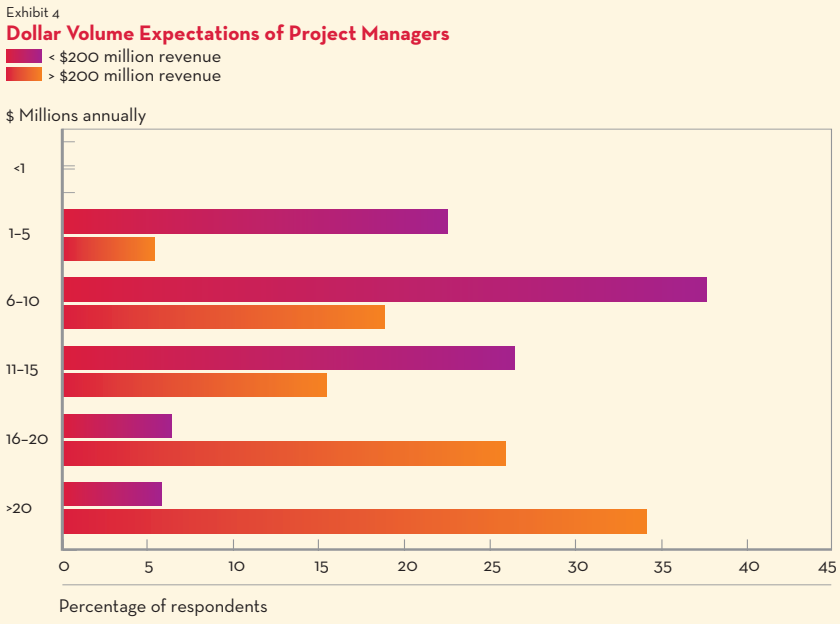
The Businessperson

Construction firms often use the word "entrepreneurial" to describe their organization's project managers. In effect, each project manager is responsible for the execution of not only a project but also the equivalent of an average U.S. business' operations.

Exhibit 4
Dollar Volume Expectations of Project Managers



Source: FMI's 2006 Project Management Survey

Exhibit 4 illustrates the typical volume of a project manager at any given time.

Project leaders understand the difference between the "business of construction" and the "construction business." As businesspeople, project leaders understand the fundamentals of cash flow and the importance of collecting receivables. Project leaders not only manage the finances acutely but also act as if they are personally vested to the profits and losses regardless of their firm's compensation system. Buyout is not simply the exercise of drafting subcontracts and writing purchase orders, but an efficient and ethical way of scrutinizing scopes and budgets to determine the highest value to their organization and the customer.

Key performance indicators provide essential feedback on the project leader's business processes. Days of aging receivables, overruns in labor, recordable incidents, and time of retention collection, benchmark project and firm performance. They serve as guideposts and milestones for a project and help identify areas that require improvement. As a physician examines a patient for symptoms, project leaders use these metrics to prescribe corrective action before a benign problem grows to malignancy.

Project leaders view projects more as a journey for their organization rather than a one-time destination. Project leaders incorporate their vision as part of their project. They view projects as growth engines of an organization as well as enablers of the grander strategic plan. Projects become opportunities to enter new markets or niches and grow the business. It is no wonder that many strong project managers with this entrepreneurial instinct become executives or leaders in their organizations.

DEVELOPING PROJECT LEADERS

Defining the ideal project manager is easy. The ultimate in operations excellence — the planner, communicator, and the businessperson — may appear more like fantasy than reality. The reality is that project leaders do exist, and many managers

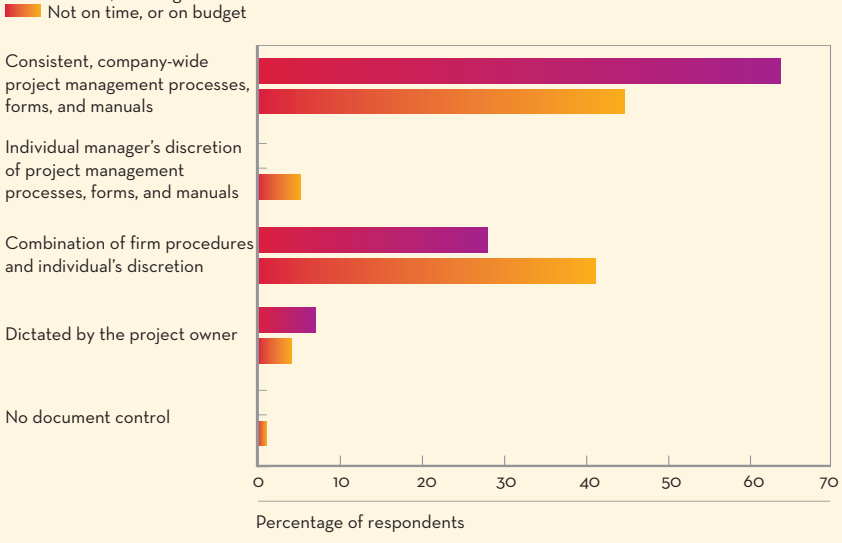
have the potential to become one. A small minority of managers appear genetically wired to perform at this high level, embodying each sphere of the project leader model with every idea, conversation, and meeting. Rather, the vast majority of managers are capable with the right operational structure. Many project managers begin to develop habits, good or bad, at a very early stage in their career. Their exposure to the right systems, processes, and tools will help inculcate them in correct project leader behaviors before they become firefighters. Within the *2006 Project Management Survey*, FMI examined firms that consistently finished their projects on time and on budget. As demonstrated in Exhibit 5, more than 60% of firms that historically finished projects on time and on budget have consistent, company-wide processes and tools to support the construction process. Conversely, firms that relied on individual and inconsistent, ad-hoc management systems stated they typically did not finish their projects on time and on budget.

So many organizations rely heavily on the strength of individuals rather than the strength of their processes. Joe or Jane's project management style defines firm successes or failures rather than that of a unified process or system. Great organizations employ a consistent and well-defined process or tool for every phase of the project management process. The firm then measures individual and team performance to provide constructive feedback and opportunities for development. Great firms also use this system of consistent processes as a platform to train new individuals and teams. Critics argue that this mindset stifles creativity and restricts management's mobility. Arguments like this are uninformed as to how processes are created and the importance of the composition of the team doing the developing. Constructing best practices requires patience and commitment of the processes' practitioners to provide the greatest long-term successes.

Developing consistent and standardized processes within the project leader model

Exhibit 5

Analysis of Consistent Project Management Process and Controls



Source: FMI's 2006 Project Management Survey

Developing the process for every operations activity is challenging and menacing.

is critical for the organization's long-term success. Examine past project failures and shortcomings to isolate the root causes. Ask the questions: Why did this project lose money, why did this project not finish on schedule, and why did this customer relationship fail? Whether it is a customer management plan or financial management process, determine the measurable steps to achieving specific goals or milestones. If the organization historically has aging receivables of 70 days, first identify each step in the accounts receivable/collections process regardless of how minute or inconsequential it might appear. Next, identify the areas that appear to be the impediment in the process, and consider a methodology that will help reduce the collection time. The operations managers and staff that are directly involved in the process must be the authors of the process. They understand the obstacles and complications within each process. Furthermore, project managers' likeliness to use a process they created increases the probability of sustaining it. Their buy-in is essential to ensuring the long-term success of the process. Lastly, do not be tied to typical or traditional conventions when developing processes or tools. Some of the greatest ideas come because leaders are not willing to accept the status quo of project management.

Developing the process for every operations activity is challenging and menacing. It is not often that businesses are able to call a timeout during day-to-day operations to create these processes. Developing them in tandem with current projects and using the projects as pilot studies not only provides real-time feedback, but it also provides a sense of realism in the process' capabilities. Focus on the highest priority and highest return activities early. If the pain in the organization is starting projects, focus on pre-job planning. If it is managing trade contractors, focus on a subcontractor coordination process. Regardless of the process, attack the process with the greatest and quickest opportunity to impact performance.

Developing the processes is only the first step in developing project leaders organically. With processes in place that support the cultivation of project leaders within the organization, the emphasis must be on constant and consistent reinforcement. Having processes in place is not enough. Reinforcement must come in the form of measurement, training, and firm leadership.

Profitability, safety, and productivity are several of the items construction firms should be measuring with consistency and precision. Consider the processes that are important to successful operations. Within each process, some metric should be defined and benchmarks established for individual and project performance measurement. When discussing scheduling, seek to measure days ahead or behind the critical path, duration of project closeout, or the frequency of project updates. Within financial management, measure the average aging of the accounts receivables per project as well as the process used to generate the invoice or pay application. In both cases, examples exist of upstream and downstream metrics. By measuring the upstream process or behavior, firms have a greater control over the downstream result. For

example, measuring labor overruns on a monthly cost report provides a historical snapshot of project performance (downstream metric). On the other hand, measuring a project manager's compliance with the commitment to hold a pre-construction conference will serve to reinforce the need to have such meetings and also positively affect labor performance (upstream metric). While examining labor costs is important, this is simply a reaction to historical data rather than proactive management. Develop metrics that make sense for the organization and help support the project leader processes. Without them, there will be no consistency of process.

The newer generation of employees are demanding training be incorporated within the organization's personnel development plan. Trial by fire does not provide long-term success as the methodology for developing new associates. Firms need to spend time and resources on developing skill sets in all facets of the construction process. Managers not only need training to properly introduce them to the firm's systems and tools, but they also need a forum for sharing their experiences and learning from the firm's collective intelligence. Training also enables scrutiny of the process and refinement. Processes always require revisiting to ensure their capabilities and efficiencies. Great organizations are never satisfied with the status quo. They realize that customers will expect more and the competition will improve. Most importantly, training allows for the perpetuation of project leader processes from generation to generation.

Firms need to spend time and resources on developing skill sets in all facets of the construction process.

It sounds redundant to state that a reinforcement of the project leader model is leadership. Firm leadership provides strategic direction for the organization. Presidents, executives, senior managers, and steering committees need to continually reinforce the practices and stand resolutely behind them. Without strong leadership, processes will wilt and die. They become lip service spewed to a customer as some contrived sales promise but more likely resemble a series of expectations that no one follows. Process and policy become mere suggestions as project managers follow their own lead. Walking the talk starts with senior leadership. Not only do they set the standard, they reinforce the behaviors that drive great project performance. There are no double standards but a single, firm standard that defines how project leaders operate.

Senior leaders understand that the processes' end users should be developing them. Project managers are more apt to buy-in to a process or tool if they have been able to touch it and customize it to suit their needs. All project leader processes are the result of channeling creative energy from the management team. Leadership reinforces through development and use of the process and tools. Consider how many companies purportedly have a policy that states no work shall begin without a signed change order. How many companies actually stand behind this policy? By no means is this policy wrong, but does the leadership of the organization send the wrong message when they make exceptions to maintain the flow of work or sanctity of the

relationship? How many companies preach safety and quickly look the other way when it means higher costs or delayed schedules? Without the integrity to stand behind the processes, there is no substance to the process. Without leadership's endorsement, the process is only a musty and clichéd manual that barely leaves the bookshelf.

Technology continues to play a role in the evolution of the project manager. Document control systems, cost accounting systems, and scheduling systems have flooded the marketplace with a bounty of tools to help project managers control their projects. With the abundance of tools available, why are so many projects failing to meet their schedule or budget? Many managers find these software packages to be complex and challenging. Intimidation by the sheer magnitude of the scheduling package's capabilities becomes the project manager's crutch. Other managers believe the programmers of the technology included some automatic mechanism for schedules to update and documents to process themselves. While the software has streamlined many of the cumbersome and time-consuming tasks, it will never replace the human management of today's construction projects. Software has enabled project leaders the ability to become more efficient and better custodians of project information. Primavera, Project, Prolog, and Expedition are all effective and powerful tools, but without a process to govern their use, they are simply expensive filing cabinets. RFIs are suggestions on a cocktail napkin because the questions lack the substance of viable options and cost effective solutions. Gantt charts become glorified trailer wallpaper because managers do not routinely update a schedule to inform the project team and customer. Project leaders rely on management basics to govern their projects and use technology to improve the quality of their communications, planning, and business perspective. Technology will continue to improve and provide additional platforms on which to operate. Project leaders evolve with the technology and use processes to maximize their effectiveness.

Many great project managers operate within the construction industry today. More exist but fail to grow into project leaders because they lack the necessary processes and tools to be successful. Planning, communicating, and business acumen are not new, revolutionary concepts to operating a profitable and sustaining organization. The construction business has evolved into the business of construction. Managers will continue to evolve into project leaders to survive within this new vision for the construction industry. Organizations that have best of class operating procedures within the spheres of planning, communicating, and business acumen will be able to hire, retain, and cultivate best of class project leaders. ■

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Shore Up Your Levee System for the Labor Shortage Storm

Companies who survive the labor storm will have systematically invested in developing and executing a strategy to create a sustainable organizational culture characterized by employee growth.

By Vanessa Winzenburg

The Saints are back in the Super Dome! At the start of this year's football season, we saw another sign that things are returning to normal in the South following last year's catastrophic hurricane season. Unlike the case in surrounding communities, much of the devastation in New Orleans was not due to Hurricane Katrina's winds and rain but to the failure of the city's levee system to hold back floodwaters, and the subsequent flooding and havoc that ensued.

During the past year, analysts, politicians, engineers, insurers, law enforcement groups, and residents have argued and debated over what leaders could have done differently to prevent the loss of life and property. While there is plenty of finger-pointing and blame to go around, it is undeniable that had the levees held, there would have been a much different outcome to that storm, and the conversation would be much different today.

So why did the levees fail? While some of you likely know a great deal about this, many now know that the system was hardly a system at all. It was developed over decades by the U.S. Army Corps of Engineers with inadequate funding, minimal oversight, and without a comprehensive plan. Despite warnings of the potential

weaknesses in the levee system from scientists and engineers both inside and outside the Corps, the city of New Orleans found itself inadequately protected from the storms that came ashore in 2005. The U.S. Army Corps of Engineers and its levee system failed.

This tragedy highlights the real impact of the quality of our work on people's lives in the communities we serve. However, there are other lessons we can take from this tragedy. Among them is the importance of not only building a city, or a business in this case, but also ensuring that you have developed a comprehensive levee system to hold back floodwaters and protect it from impending storms.

While there are a variety of storms facing companies in our industry, one is looming large on the horizon, threatening to affect all organizations across all industries. It is the imminent global labor shortage. Researchers and experts have been issuing warnings about this storm for over a decade, and while some firms have taken steps to shore up their own levee systems, far too many companies are at risk.

LABOR CRISIS

Consider the current workforce situation. Many of you are already feeling the effects of the leading edge of this storm. For the past two years, results of FMI surveys of more than 600 firms in the construction industry identify a "lack of skilled management" and a "lack of skilled craft labor" as the No. 1 and No. 3 issues respectively facing the construction industry. In addition, according to research by the Construction Users Round Table, 82% of U.S. owners are already experiencing labor shortages. Many contractors are finding that they don't have adequate staffing for their jobs, resulting in overwork, burnout, and costly turnover among their key staff, as well as an increase in scheduling delays, rework, and accidents.

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And it is only going to get worse. The U.S. Department of Labor has identified construction as one of the top industries in terms of projected job growth, with an anticipated growth of 15% between 2002 and 2012. This will create an estimated one million new jobs in our industry alone. At the same time, the average age of field leaders has increased to 43, with more than 40% of field managers over the age of 46, and 12% over the age of 55. The average age of executives is even higher. Nationally, 14% of workers are over the age of 55. In construction, this is closer to 50%.

The U.S. Bureau of Labor Statistics reports that by 2010, nearly 25% of the 2005 U.S. workforce will reach retirement age. Coupled with this, the U.S. Census Bureau reports that on average, Americans are retiring

five years earlier than they did 50 years ago. As a result, nearly half of the country's 400,000 electrical-utility workers and about 40% of the manufacturing workforce will retire in this same period. According to the Construction Research Labor Council, this translates into the need for at least 190,000 new construction employees each year through 2012 in order to keep pace with industry growth and loss of workers from the industry. With the total number of younger workers in America expected to grow by a mere 5% in this same time period, the result will be a shortage of up to 10 million workers across all industries.

These trends are occurring across much of Europe as well, with France, Spain, Germany, and the United Kingdom seeking to reverse the downward trend in birthrates and workforce availability in their countries.

IS THERE ANY HOPE?

So what does this mean for our industry, or more importantly, for your company? There are a variety of answers to the pending labor shortage, just as there are a variety of ways to design a levee system. Ultimately, the companies that survive this storm will be those that are protected by a comprehensive system of well-designed and well-placed levees. They will be organizations encapsulated in a strong organizational culture that supports the needs of today's workforce.

Some of you have set out to implement the latest trends in recruiting, retention, or staff development, while others are hoping to wait out the storm and see who is left standing. Both of these strategies are flawed. To begin with, the storm is likely to last 20 years, much too long to bunker down behind sandbags and shutters. Identifying and jumping into the next big trend is equally dangerous, however. Building and repairing individual levees is not the solution. Organizations need to invest in developing a comprehensive set of levees, which may mean a fundamental change in the way they look at employees and run their businesses, in order to create a sustainable organizational culture that appeals to today's workers.

WHO ARE TODAY'S WORKERS?

What do today's workers want? As with almost any exercise in leadership, the answer is, "it depends." There are some strong similarities, and important differences in what employees are seeking from organizations today. Organizations must understand these similarities and differences if they are to meet the needs of their ever-changing workforce.

Many of the leaders in our industry came to work in the 1960s, 1970s, or early 1980s. This group of Americans — born between 1946 and 1964, and commonly referred to as baby boomers — holds the majority of senior (and almost 50% of field) leadership positions in the construction industry. Baby boomers are the largest group of workers in American history, and the first to attempt real integration of women and ethnic minorities into the corporate landscape. Many baby boomers entered the workforce at a time when company loyalty was reciprocal, pensions were

earned for dedicated service, and a person's seniority was often rewarded with promotions and corporate status symbols. They have a well-refined respect for authority, and the lessons of experience. As a competitive and idealistic group, they grew and expanded the American corporation, and launched many successful businesses of their own. They learned from their parents that work is a privilege or a duty, and went about their duties with little complaint, putting in long hours and years of dedicated service to their organization, looking forward to the sunset days when they could retire and put it all behind them.

Behind the baby boomers came a group of workers known collectively as Generation X (Xers). Unlike their parents and older siblings, this group of Americans, born between 1965 and 1980, grew up in a much less predictable society. While most baby boomers were raised in a household with two parents, more than half of all Xers grew up in a non-traditional family unit, seeing record divorce-rates during their childhood and adolescence. In addition, this generation of "latch-key kids" (so called because many carried a house key around their necks and waited at home for one or both parents to return from work) has witnessed the collapse of corporate pensions and with them a reduction in loyalty to any one organization. They consider themselves free agents in a world of genuine employment at will. In fact, nearly 40% of the current workforce has now worked for six or more employers. Having grown up very independent, Xers, unlike their baby boomer predecessors, want to be evaluated on and respected for their individual contribution, rather than the combined efforts of the team. A true "Army of One," this generation of workers focuses on building a resume of experiences and a portfolio of investments to sustain their mobility and independence. They often refer to the organizational perks that baby boomers value as "golden handcuffs." As the smallest group of adults aged 25 to 40 in the U.S. population in over 100 years, Xers have faced little of the competition baby boomers experienced for positions in organizations. However, they are competing against much more senior and experienced employees for leadership roles.

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Finally, let's consider the youngest members of today's workforce. They are called by many names, most frequently Echo Boomers, Generation Y, and Millennials. We

prefer the term Millennials, as they are the generation born between 1981 and 1999 and influenced by events at the end of the last Millennium. Nearly 74 million strong, this generation is almost as large as the baby boomers. They personify and magnify many of the values of the baby boomers as well. While baby boomers believe in the value of "teamwork," most Millennials have never worked any other way, with collaboration required in the classroom as well as on the soccer field. While baby boomers believed in the ideals of a world without walls, over three-fourths of Millennials (remember they are under the age of 30) have networks of relationships that extend beyond the United States. Baby boomers believe that together we can change the world. Millennials have seen people their own age launch successful businesses, start grass-roots campaigns that have changed laws and conditions in their communities, and introduce new products or services that have changed the way people go about their daily lives. As a result, they believe that one person truly can make a difference.

Millennials differ from baby boomers in several critical ways, however. One difference is technology. The technology explosion began as the Xers were entering the workforce. Computers were replacing word processors. "Car phones" were available for emergencies. And people became easier to reach via telephone-answering machines, pagers, and the widespread use of facsimiles. Millennials have grown up with a whole new generation of technology. From their earliest school years, they have relied on word processing software for book reports, calculators for math tests, and the Internet for research. They expect real-time information, efficiency, and change at the speed of technology.

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Another difference from both baby boomers and Xers is that Millennials have grown up with personal attention from everyone. They are the first of the "no child left behind" students, with actively involved parents and strong social support. They are accustomed to advertisements and recommendations for future purchases customized to their unique interests and habits. Consequently, they expect others to invest time in getting to know them as individuals and helping them achieve their goals. Finally, Millennials are the ultimate multi-taskers. Becoming the "well-rounded" student was a goal for many Xers, but is a way of life for most Millennials. Of those who applied for college admission this year, most are actively involved in more than two extra-curricular groups in their high schools, and more than 70% report community service involvement (while using personal cell phones and web pages to stay in contact with their wide network of friends).

OUR INDUSTRY CULTURE

Many of the companies in our industry are designed by and appeal to the traditional roles and experiences of the baby boomer. They are structured to respect and reward seniority and experience. One must "pay their dues" in order to advance in the organization. Decisions are made at the top and filter down to the field. And the reasons for the rules are that it's "how we've done it for [fill in the blank] years." In addition, respect is earned by demonstrating loyalty to the organization, apparent in the number of years you work for the same company, the time you report to the office (and how late you stay), the professionalism of your attire, and the way you speak to those in positions of authority.

There's a lot of frustration with the disrespect young employees show in the way they dress and the hours they keep. They have the nerve to challenge the decisions made by more senior staff as well as the tried-and-true policies and procedures. And to make matters worse, they think they should be calling their own shots.

For those of you who relate to this description, chances are that you are in a well-defined baby boomer culture. The rules (written and unwritten) were developed by a leader with a vision of how things should operate, and were solidified by decades of demonstrated success. However, this well-defined culture is at odds with what 70% of the workforce is looking for in their organizations today.

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If you are shaking your head and thinking, "No, we're not like that here," my best advice is to put this description in front of your key people under the age of 35 and ask for their response. If you have no one under the age of 35 that you would consider a "key person," then you can definitely count yourself in this category.

For a generation, we have fooled ourselves into believing that these values are what set the construction industry apart from other industries. In truth they are, but not in the ways we have intended. The result has been a highly technical, highly relational, fast-paced, highly challenging industry that is perceived by America's top talent as behind the times, inefficient, rough-edged, and one of the least appealing industries to Americans of all ages (according to the 2002 Jobs Rated Almanac).

SO WHAT?

Employees today can afford to be choosy. Even among the nation's youngest workers, more than 80% of 37,000 college students surveyed by Universum Communications, report high confidence that they will be able to land the position of their choice following graduation. While it is paramount that we change the image of the industry in order to draw more highly talented people into our industry, that process will only occur as the organizations that make up this industry become more desirable places for employees to work. In *Fortune*'s annual evaluation and

announcement of the "Top 100 Companies to Work For," fewer than 5% are construction-related companies. This is a long road, and the front edge of the storm is moving in. The good news is that you are not trapped under the weight of the industry's reputation. Today's workforce has a great deal more job mobility than in the past, with freedom to move not only within an industry, but also across industries. According to *Business Week*, young workers are seeking the right employer, rather than the right industry in which to launch their career. As such, it is paramount that you begin to make necessary changes in your own organization in order to compete for top talent.

KEY COMPONENTS OF STRONG LEVEES

Despite all their differences, there are some themes common to all generations that draw them into organizations and keep them there. The one that will differentiate the companies that survive the storm from those that do not, is the ability to build a succession pipeline and grow talent throughout the organization.

Executive Succession

Not long ago, 25 to 40 was the age of most field-level employees. The average age has now increased to over 40. In executive positions, the average age is over 50. While many companies in this industry are preparing for the exit of their most senior leaders, few replacements are adequately prepared to step into those roles. In fact, according to a recent study by Right Management Consultants, 77% of organizations in the U.S. do not have effective replacements for their current senior management. And it may be worse in the construction industry, where FMI data on more than 2000 construction industry leaders suggest that developing people to fill the succession pipeline is the most neglected area of leadership in our industry. Many construction-industry executives find it difficult to let go of leadership and decision-making responsibility. This is especially true for baby boomers who realize the value of their own experiences. Unfortunately, the industry doesn't have the requisite 25 years required for others to gain the same experiences in the same ways that most of the industry's senior leaders have.

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So what can we do? One option is to rely on hiring someone from outside the organization to take your place, but

few stars are available in this age group, and according to research by the Center for Creative Leadership, more than two-thirds of all executive placements fail within the first 18 months when hired from other companies. The other option, if you are looking to replace yourself in the next decade with someone who has the requisite level of experience, is to find a way to speed up the learning process.

Exhibit 1
Talent Development Cycle

Speed of Development

Regardless of the approaches you use to develop your people, there is no question that the best teacher is experience. People develop through a continuous cycle of preparation, experience, and assessment. For example, consider new engineers. They formally prepared during college and are now having their first real on-the-job experiences. During and following the experience, they will assess it, draw conclusions about how they will maintain or change their performance the next time, and prepare for the next experience (which is unlikely to be exactly like the first). The construction industry maintains a culture of "sink or swim" learning whereby the "cream rises to the top." While it is possible to let milk sit until the cream rises, spinning it is a much faster, more efficient process that yields higher quality results. The Talent Development Cycle is a very slow process, requiring trial-and-error experiences to shape our understanding. (See Exhibit 1.) If we can agree that we do not have 25 years for the cream to rise, we must identify processes by which to spin the wheel faster, causing the cream to rise more quickly.

The key to spinning up development is for leaders to come alongside the employee and insert themselves into the process. Rather than allowing learning to happen haphazardly, leaders can better manage both what employees are learning as well as when and how they are learning it.

Experiences

While experiences are happening every day, the speed of development quickens when leaders thoughtfully assign jobs, roles, or projects that will speed learning. They must masterfully identify the *right*, next experience for emerging leaders at all levels. This requires leaders to be intimately aware of each person's strengths and weaknesses, as well as his or her career ambitions and leadership potential. In the best organizations, senior leaders are developing a few key people, who are in turn developing others, so that responsibility for developing talent becomes a core component of every leader's job and enmeshed in the fabric of the organization's culture.

In considering the next right experience for emerging leaders, the challenge is to think bigger than you usually do. For your mid-level leader, consider giving them the opportunity to explore another part of the business, start a new business line, or open a new office. If you do not have those opportunities, consider asking them to take over one whole area of responsibility you are currently managing. The goal is for them to be able to fill the shoes of the president, and in order to do this, they must be allowed to not only see what you do, but do what you do. Remember, they are looking to grow their resume. They want experience and responsibility. According to a 2005 study by Accenture, 58% of mid-level managers are considering changing jobs, and more than half of these are doing so in order to secure a promotion or a career path not available with their current employers. While, the best way to cause an Xer to leave is to stunt their growth, the best way to keep an Xer is to invest in his or her personal and professional development.

Your youngest workers are also looking for the opportunity to have an impact and make their mark on the world. They are not interested in "paying dues." They came to play. Millennials want exciting, high-pressure work and daily challenges. They do not want to be sidelined because of their age and lack of experience. Let them run work. Put them in front of your top clients. Leaders are beginning to recognize that the face of the world, and ultimately the face of our industry, is changing. Your customers and clients are getting younger, and while they appreciate the wisdom of your most senior staff, most can be quickly won over by an eager, driven, and competent (if youthful) employee.

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Look for employees who are ready and eager to step up. One of the biggest complaints of managers is that young people today think they can run the company after six months on the job. Some companies are giving them the opportunity to do just that. At PepsiCo, following a six-month leadership course, new employees take responsibility for managing a team of people. At Enterprise Rent-A-Car, young people can expect to be running their own profit centers (and are expected to turn a profit) within the first eight to 12 months on the job, and in regional leadership roles within five years. You are probably thinking, "Yeah, but they're not in the construction industry." You are right. However, they are offering these opportunities to students with a variety of degrees (including engineers). So in a sense, they are our competition.

We have seen successful examples of this within the construction industry as well. While there is substantial risk to turning a project over to a young, inexperienced

engineer, it is possible to partner them with a more senior staff member. The key here is partnership. Rather than merely carrying out the wishes of senior staff for several years while they "learn the ropes," consider a structured developmental approach whereby young employees can participate in challenging work and increasing responsibility while mitigating your own corporate risk. In a contractor environment, it could look something like this:

- First six months: Work on one or more projects in the field (depending on size and scope) to get a feel for how the whole process works.
- Next three to six months: Focus on one key area of the project or business to develop proficiency.
- After nine to 12 months: Take full responsibility for this area of the project or business, while learning in-depth about another area.
- Continue the cycle.

This requires a shift in the way we think about our work and the growth of our employees. As a group, Millennials want to master one thing at a time and move on to the next, rather than incremental (and often imperceptible) growth across a wide range of areas. By structuring experiences, we are able to simultaneously speed up the learning process, challenge young people, provide them with the leadership responsibility they seek from organizations, and create the necessary experiences to prepare them to run projects safely and efficiently before giving them full responsibility.

In the midst of the furor to grow and develop emerging leaders, we must be careful not to overlook our baby boomers. According to a 2004 survey by the American Association of Retired Persons (AARP), 80% of workers aged 45 to 70 are looking for opportunities to learn something new in their workplace. Consider pairing them with a young employee whom they can mentor about the business, and from whom they can learn about the latest technology at use in your field. Consider moving them to another area of the business or including them in more strategic or business planning, as examples.

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One of the best things about the current workforce is that, if asked, many workers can articulate where they would like to be in the next two to five years. According to research by Spherion, almost one-half of all workers want to change jobs every three to five years. The leader's role is to challenge his or her own assumptions about whether it is possible for the desired job change to occur within your organization and then partner with the employee to create the process by which they can reach their goals.

Exhibit 2

The Do's and Don'ts of Effective Feedback

Do	Do Not
1. Be honest	1. Use threatening language
2. Be timely and consistent	2. Make accusations or assign blame
3. Describe the specific behavior that is effective or ineffective	3. Be judgmental of the person
4. Describe the impact of the behavior on others	4. Provide feedback publicly
5. Focus on a single message	5. Hedge, lie, or be vague
6. Check to see that feedback was understood	6. Generalize with words like "always" or "never"
7. Be ready to listen to the other person's point of view	7. Label your feedback as positive or negative
8. Be respectful	8. Sandwich your feedback with words like "but"
9. Give your feedback and stop talking	9. Bring in the opinions of third parties

Assessment

Creating new experiences is not enough to speed up the growth process. In fact, done in isolation, it can be a risky and foolish move. To maximize the impact of the learning experience, workers must evaluate their experiences thoroughly and regularly. Leaders aid in this process by asking workers questions to help them draw out the lessons learned and by giving feedback — both the good and the bad.

As an industry, we are not good at giving people the feedback they need to perform their work more effectively. According to FMI data, on average, employees do not feel that their managers are giving them adequate levels of feedback. Baby boomers entered the workforce at a time when "no news is good news." Younger Americans crave feedback, however. They actually want to know what they need to improve. This is what sharpens the saw and helps them to reach their personal and professional goals. Most leaders should give somewhere between two and 10 times as much timely and specific feedback as they currently provide.

When giving feedback, it is equally important to give specific information to employees regarding the aspects of their work that they are doing well. When employees know how their manager feels about their performance, it increases confidence that they are doing some things well. These are the things that keep the saw blade spinning forward.

When giving positive or developmental feedback, there are a few key components to keep in mind. (See Exhibit 2.)

Preparation

In addition to feedback during and after the fact, to maximize learning, leaders must actively prepare employees for new experiences. One thing that often separates a positive learning experience from a negative one is how prepared the person felt going into it. Preparation can mean many things. It may be formal education or training, an opportunity to shadow someone in a similar situation, or at a minimum, a discussion of expectations, potential obstacles, and resources. Have you ever struggled in a job or made a mistake only to hear your manager say, "Yeah, I was afraid that might happen." How did you feel? No one wants to be set up to fail. To the Xers and Millennials on your workforce, this situation will undermine

and erode their trust in you and the organization. Given the opportunity to prepare for the situation, workers are more likely to be successful, benefiting themselves and the organization.

Preparation is an increasingly important part of the equation as we begin to put people into more challenging roles and situations. Some of the skills we have taken for granted may be challenged by this latest group of employees who are more comfortable with text messaging slang than formal business writing. In addition, if we shift our focus from the rising stars in future leadership roles to the masses that reside further down in the organization, it is perilous to overlook the basic lack of skills that many of today's workers possess. With advances in technology and a greater reliance on off-shoring, fewer than 15% of jobs in this industry are characterized as "unskilled labor" according to the Employment Policy Foundation. Added to this, the U.S. Department of Labor predicts that 75% of the current U.S. workforce will require retraining to perform their jobs over the next decade. With the greatest population growth currently among high school dropouts, according to *Time*, we cannot ignore the need to hire unskilled and under-skilled workers and train them in the job skills necessary for success.

OBJECTIONS TO GROWING YOUNG EMPLOYEES

Leaders object to investing in employee development in predictable ways. Over the years, the most common objections fall into one of the four general categories below.

Objection No. 1: If I train them, someone will poach them from me.

Many leaders fear that investing in employees who consider themselves free agents is a great way to train your competition's top talent. While it is true that growing your employees' talent does make them more desirable to other employers, it also makes your company more desirable to these employees. The best way to earn the trust and loyalty of a baby boomer, Xer, or Millennial is to demonstrate respect and trust in them, and to invest in their personal growth and development. None of these generations is motivated primarily by money. According to a recent survey by Accenture, 40% of U.S. workers plan to leave their current employer within the next five years. Additionally, 58% of these will leave because of the lack of opportunities for advancement. While people want to earn a respectable income, money is often a mask for other underlying problems. For example, if you hear grumbling such as, "I don't get paid enough for this," it is more likely related to a feeling that they are not respected, trusted, or growing in their jobs, rather than a statement about salary expectations.

Objection No. 2: It costs too much. It's cheaper to hire experienced people.

Rather than trying to grow talent in-house, some organizations are looking outside to "poach" staff from competitors. Some are seeking to recruit employees

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with five to 15 years of experience who can run jobs effectively and efficiently. These workers are difficult to find and costly to recruit. Furthermore, they will only stay as long as they feel like they are learning and building their resume of experiences. In other words, once you've got them, you've still got to invest in developing them.

Others are recruiting more experienced staff. They are seeking baby boomers who (likely in the interest of learning something new) are willing to move to another organization late in their careers. Given that most do not expect to work more than 10 to 15 more years, it is a short-term solution at best. These are also typically expensive recruits. With the greatest personal debt levels in U.S. history, the inability to rely on pensions or social security to meet financial needs during retirement, and rising financial responsibility for both children and aging parents, these workers seek large financial packages.

Not only do they expect a pay differential for their experience, but studies show that older Americans use more health care (which can drive up employer cost), miss more days of work (often due to personal or dependent health care needs), and have more stress-related injuries.

Objection No. 3: It takes too much time. We are better off to pay people more and recruit the top talent.

If you are in an environment where pricing of your products and services is not competitive, and you have few if any real threats, increasing pay and incentives may be an option for you. For most companies, this is a short-term and often flawed strategy. While the average starting salary for college graduates this year has increased by 3.6%, it is up 5.4% for engineers, and rising. Salaries will continue to rise, and most companies will reach a point where they can no longer grow their companies profitably while continuing to raise salaries and incentive compensation.

Compensation does not guarantee the best employees. While poor compensation will cause an employee to leave an otherwise good job, great compensation will not keep most employees in an otherwise bad one. Employees who come to a company because of pay will leave as soon as a better paying position comes along, or as soon as their financial needs change. Many of today's youngest workers are looking for an opportunity to balance their work and personal life, opportunities to make a difference in the world, or challenging work and personal growth. If your strategy is to pay the highest salaries, you are missing the pool of talent that is focused on other goals. In fact, according to a recent study of more than 37,000 undergraduate students, "building a sound financial base" was a distant third in overall career goals. So how do you compete for talent in this generation? The answer is quite simple — give them something challenging to do!

Objection No. 4: We are transitioning ownership. The new guy can worry about this.

Another solution is to exit the company without a clear plan for weathering the coming storm. The biggest question here is what someone would pay for the company. If the owner is the company, and he leaves, the resultant organization is of little value to investors. While company valuation is a complicated process, there is little doubt that a company whose reputation and decision-making lies solely in the hands of an exiting owner or leadership team, is worth far less than one with an established core group of leaders who can fulfill the company's current commitments and carry it forward.

Most leaders recognize that people are the company's greatest asset.

DESIGN A SUCCESSFUL LEVEE SYSTEM

While we have employed a variety of techniques to patch existing levees or to build new ones, as we have faced the leading edge of this storm, no longer will stepped-up college recruiting and poaching from our competition to staff current jobs be enough to survive. The best approach is to strategically design and develop a comprehensive levee system. The organizations who not only survive the storm but thrive in its presence will systematically evaluate their current staffing situation, identify critical skills and abilities needed for the company to meet its growth goals, and set in motion a chain of events to recruit, train, develop, and retain star talent.

Most leaders recognize that people are the company's greatest asset. As skilled labor is becoming increasingly scarce, staff development is not a process that can be delegated to the human resources department (or an administrative assistant who does the hiring), but must become a key strategic initiative, and part of the conversation and focus of the executive team. While each levee system will be unique to the organization, the most successful ones will be defined by cultures that give people opportunities to pursue challenging work that allows them to grow and develop.

THE STORM IS COMING

Following the devastating hurricane season of 2005 and even more recent threats to our national security, the government has asked residents to be vigilant and prepared. The construction industry, despite its many technological advances is typically characterized by a lack of responsiveness to changing market conditions, until it is forced to change. This is your wake-up and your warning call. Unfortunately, once the full force of the storm is upon us, it may be too late for many companies who find themselves with a backlog that they cannot staff competitively. Salaries and penalties will eat into profits, and many will not survive. We cannot wait to seek answers once the storm has fully come ashore. Those companies who survive the labor storm will have systematically invested in developing and executing a strategy to create a sustainable organizational culture characterized by employee growth. ■

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DEVELOPING YOUR NEXT GENERATION OF LEADERS — UNDERSTANDING GENERATION X

One of the greatest challenges facing your construction company today is how to attract, retain, and develop a new generation of leaders. Consider this demographic: For the next 10 years, a baby boomer will turn 50 every 7.5 seconds. If you don't tap into the strengths of the next generation of leaders, Generation Xers, you will have to rely solely on these aging boomers for your future leadership, and you will not be able to grow and compete with companies that have figured out how to attract, retain, and motivate the next generation.

Of course, any characterization of an entire generation is a generalization. However, reviewing what has influenced and shaped Xers — and the attitudes many Xers share — can help you understand how to relate to them and create a culture that encourages them to excel.

Xers generally have many characteristics that can make them invaluable to your organization. They are the most educated generation in the country. They are the most computer-literate. They generally are more comfortable working with the opposite gender than older workers. They are fiercely independent. They are innovative. They focus on doing things better, faster, and easier. However, to utilize these talents, you need to be aware of what makes Xers tick.

Xers entered into a business world where the old rules were changing. People no longer move up the corporate ladder based solely on hard work and tenure. Now positions are attained due to skill-based competencies. Faced with this new environment, Xers are extremely focused on how they can "get ahead." They understand the importance of developing their personal skills, and they require personal growth opportunities. Like each generation before them, Xers were greatly influenced and shaped by common experiences they had growing up.

The benefits Xers can provide your company as future leaders:

- **Xers are confident and committed to achieving personal success.** When personal goals are aligned with company goals, Xers develop into highly productive and ambitious employees.
- **Xers are very comfortable with information and technology** and feel left behind if they are not incorporating both information and technology into their work. To Xers, information is power. Provide them with the newest technology.
- **Xers are very pragmatic and are used to dealing with uncertainty.** This pragmatism often is seen as cynicism. They expect and want change. If you are a company in pursuit of new ideas, Gen X is certainly a good generation of workers for you.
- **Xers question everything.** Don't see this as a challenge, just view it as information gathering and the way that Xers learn and interact with others. Their questions can lead to answers that improve your company's performance.
- **Xers want to work for innovative company cultures** where they can offer creative solutions to problems. Don't tell them what they can't do. Challenge them to overcome problems.
- **Xers are fast learners.** They change jobs frequently so they adapt quickly. Help them learn as much as they can with the requirement that they teach others, and pass on information and lessons learned.
- **Xers are multi-taskers.** While this multi-tasking may be disturbing for some, you can capitalize on their ability to do several things at once.
- **Xers don't want to be judged against old or "antiquated" standards,** but they do need lots of feedback so they can measure their degree of success and adjust accordingly.

Generation X is the Workforce of Tomorrow

Much can be learned by looking at the experiences, attitudes, and environments that have shaped and marked the Xers. Each generation has unique issues and challenges, and the Xers' path has been and will continue to be dynamic and different from other generations.

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Unauthorized Construction Migrant Workers

The construction industry has become dependent on immigrant labor, making it necessary to understand the changing labor environment, the needs of their current and future workforce, and the laws.

By Nick Schubert

During the last decade, immigrant labor has played a critical role in mitigating the effects of limited labor availability in the construction industry, during relatively strong demand. The current controversy over U.S. immigration policy is fueled by concerns for national security, but the flames are being fanned by politicians and special interest groups of many stripes. If those who want to build a wall around our borders and kick all unauthorized migrants out of the country win, the construction industry might have to replace 14% of its workforce almost overnight.[1]

On the other hand, there are those who caution that the sudden shift of losing 5% of the current U.S. labor force will cause an economic slowdown and potentially higher unemployment among naturalized Americans. Whatever the outcome of the current debate and subsequent legislation, industries that have become dependent on immigrant labor, first as a source of low-cost labor, and now just as a source of available labor, will need to understand the changing labor environment, the needs of their current and future workforce, and the laws. For some contractors, legislative action and strict enforcement standards by administrative agencies could have significant,

troublesome implications resulting in not only the loss of an available labor source, but also stiff penalties for lawbreakers.

In the analysis that follows, we provide some background and facts about the current immigration debates and the potential changes in proposed legislation. However, the unauthorized migrant population will be the primary focus of this discussion since the unauthorized portion of the construction industry workforce is the portion that will be affected most by new legislation and administrative rules.

Increasing labor scarcity at all levels in the construction industry is becoming a familiar reality for many contractors and subcontractors. More recently, owners in some markets have also begun to recognize the growing problem posed by limited labor availability, as strong demand results in scheduling difficulties and insufficient numbers of bidders — problems that are often the result of insufficient available labor.

Mere awareness of limited labor availability and strong demand will not help best-of-class contractors to continue to capitalize on strong demand in challenging market conditions. Trends such as escalating materials prices and increasingly complex project requirements only serve to make labor less manageable for construction firms. Therefore, construction firms must be proactive, rather than reactive, in addressing factors in labor availability. A proper proactive strategy requires planning that reflects a thorough understanding of the fundamental factors contributing to increasing labor scarcity.

Presently, at least two broad phenomenon, in addition to immigration policies and enforcement, contribute to decreasing labor availability — changing demographics and economic evolution. Before examining the current challenges that immigration poses to labor availability, we should first establish a basic context by considering the effects of changing demographics and economic evolution on labor availability in the construction industry.

Changing demographics are beginning to diminish labor availability in the construction industry, and the adversity caused by these changes is likely to grow in the near future.

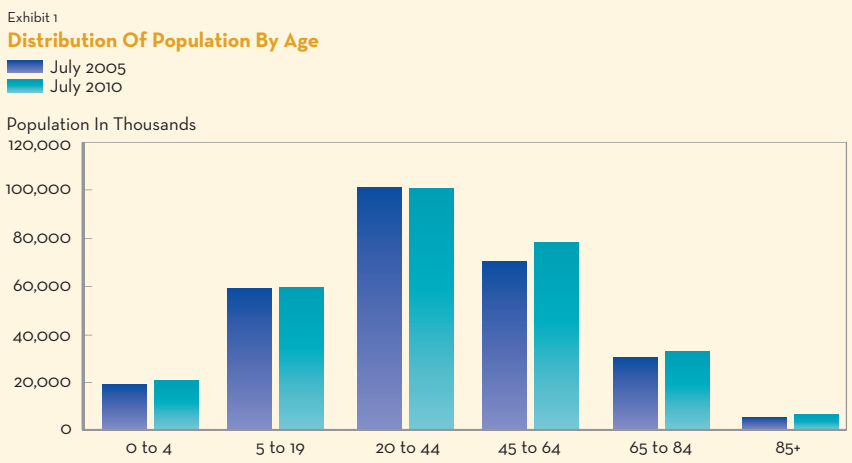
CHANGING DEMOGRAPHICS

Changing demographics are beginning to diminish labor availability in the construction industry, and the adversity caused by these changes is likely to grow in the near future. As the baby boomer generation works toward retirement in the United States, the mean age of the general population and the construction industry labor force will continue to increase. For the construction industry, this demographic shift will result in the retirement of large numbers of workers, and produce a decreasing relative pool of younger workers available to replace those leaving the workforce. (See Exhibit 1.)

Additionally, the aging population will also change the demand for some types of construction. Demand for health care services will likely increase, and as the

Exhibit 1

Distribution Of Population By Age



Source: Census Bureau

health care industry struggles to cope with the evolving needs of an increasingly geriatric society, the construction rate of health care facilities will likely increase.

A second, less obvious, demographic shift is occurring at colleges nationwide. The decreasing proportion of male college students, coupled with decreasing student enrollment in math, science, and engineering programs, likely indicates that fewer qualified graduates will pursue technical and management careers in the construction industry. In universities, male students traditionally pursue technical and scientific degrees, and careers in construction management, at a greater rate than do female students.

The ensuing problem can be summarized as follows: As a greater proportion of the construction industry reaches retirement age, aging in the overall population will drive demand for new types of construction, but a smaller proportion of the population will be available to provide workers ready to take the place of those leaving the construction workforce. In this situation, where will the new construction workforce come from?

ECONOMIC EVOLUTION

While shifting demographics have only recently begun to influence the availability of labor for the construction industry, the evolution of the U.S. market economy, and the domestic workforce, has been progressing away from construction for at least the last decade. Since after World War II, the U.S. economy has been in transition from its early success in primary (activities like farming and extraction) and secondary (activities like manufacturing) economic activities toward its current concentration on tertiary economic activities (activities that provide services through knowledge — financial services, consulting, and legal services are examples).

The rapid transition away from secondary economic activity like construction and manufacturing began in the early days of personal and business computing. As the attractiveness of careers in traditional labor-intensive industries declined, the need for what we now call "knowledge workers" increased and more students were encouraged away from the crafts and technical schools toward business degrees.

Generally, office work meant higher salaries as well as higher social status. The traditional trades are now looked upon by parents and educators only as second-choice careers for individuals not able to successfully enter or complete college. Accordingly, progressively fewer college students in the United States pursue engineering or technical degrees such as math, science, or even construction management. The promise of wealth and easy success in knowledge and service sector jobs, whether accurate or not, increasingly draws potential labor away from the construction industry.

The promise of wealth and easy success in knowledge and service sector jobs, whether accurate or not, increasingly draws potential labor away from the construction industry.

Ironically, the secondary effect of the shifting concentration of the U.S. economy is increased demand for some project types. As a growing proportion of the available jobs in the U.S. require office space, demand for new office construction and the renovation of existing space is strong. However, because the same office jobs driving the demand for office construction also draw workers away from traditional occupations in the construction industry, there is an inherent conflict with this economic transition — strong demand for office construction, but depressed available labor supply.

FACTS ABOUT UNAUTHORIZED IMMIGRATION[2]

While much of the workforce in the construction industry is composed of legal immigrants with proper documentation, many of whom have been in the United States for many years, others are categorized as unauthorized migrants. Unauthorized migrants are individuals who are living in the United States, but do not have citizenship, permanent residence permits, or temporary status that permits residence or employment in the United States.

Much of the recently proposed federal immigration legislation seeks to distinguish between long-term and short-term unauthorized migrants. Long-term unauthorized migrants are those workers that have been in the United States for more than five years, and short-term unauthorized migrants are those that have been in the United States for shorter amounts of time. While both subsets of unauthorized migrants are important to the construction industry, proposed legislation will likely not treat long-term and short-term unauthorized migrants in the same way. Under some proposed legislation, long-term unauthorized migrants may be eligible for benefits such as legalization programs, while short-term unauthorized migrants would likely be required to leave the United States, and then apply for reentry as temporary workers.

Using statistics drawn from the March 2005 Current Population Survey (CPS), which is a significant survey of 50,000 households compiled for joint use by the

Bureau of Labor Statistics and the Census Bureau, the Pew Hispanic Center estimates that there were 11.1 million unauthorized migrants in the United States in mid-2005. The CPS estimate shows a notable net increase of approximately 500,000 unauthorized migrants per year in the United States from the 2000 Census estimate of 8.4 million. During that period, there were roughly 850,000 new unauthorized migrant arrivals in the United States per year, but due to normal rates of death, departure, and conversion to legal status trends, the net yearly unauthorized migrant population gain appears lower.

The Pew Center's projections indicate that this number has probably grown since the mid-2005 CPS to approximately 12 million in mid-2006. The Pew Center reports that this population accounts for roughly 5%, or 7.2 million, of the U.S. labor force of 148 million workers. According to the CPS, approximately 40% of the unauthorized migrant population, or at least 4.4 million individuals, had been in the country in mid-2005 just long enough to qualify as short-term unauthorized migrants, and 66% had been in the country for less than 10 years. The Pew Center estimates that short-term immigrants in the United States are between 80% and 85% unauthorized migrants. CPS calculations indicate that short-term unauthorized migrants represent 2% of the U.S. labor force.

Unauthorized migrants represent roughly 30% of all foreign-born individuals in the United States. Within the unauthorized migrant population, Mexican nationals are the largest group; according to the mid-2005 CPS, there were 6.2 million unauthorized Mexican migrants in the United States, accounting for 56% of the unauthorized migrant population. In the United States, the unauthorized Mexican migrant population increased by 1.5 million between 2000 and 2005 to 6.2 million. The next largest group is unauthorized Latino migrants, composed mostly of individuals of Central American origin. According to the CPS, unauthorized Latino migrants accounted for 22% of the total unauthorized migrant population, or 2.5 million people. In sum, the CPS indicates that unauthorized migrants from Mexico and other, mostly Spanish-speaking countries in Latin America account for 78% of the total unauthorized migrant population in the United States.

THE ROLE OF UNAUTHORIZED MIGRANTS IN THE CONSTRUCTION INDUSTRY[3]

The Pew Center and CPS statistics above suggest a recent increase in the rate of undocumented migrant entry, which is a critical factor enabling the construction industry's increasing dependence on unauthorized migrant workers during the last decade. The construction industry has become the second largest employer of unauthorized migrants in the United States, just behind the service industry. Occupations, which do not require licensing or formal education, including many of those found in construction, offer relative ease of entry for unauthorized

migrant workers. The construction and extractive industries currently employ nearly 20% of unauthorized migrants. In contrast, the construction industry only employs about 6% of the native workforce. Within the construction industry, unauthorized workers represent 14% of the construction workforce. More specifically, within some construction occupations, unauthorized workers represent an even greater share of the workforce — 36% of insulation workers, and 29% of all roofers and drywall installers are unauthorized migrants.

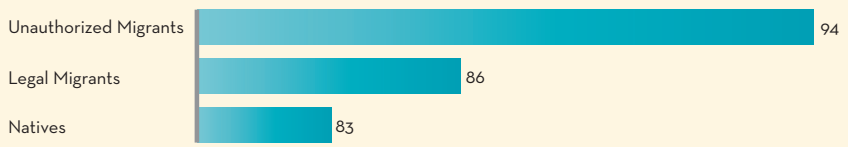
The CPS indicates that overall unemployment is relatively low among unauthorized migrants, approximately 5.8% and 4.1% for short-term and long-term unauthorized migrants, respectively. This is logical, as perceived economic opportunity is an important driver for many unauthorized migrants that relocate to the United States. (See Exhibit 2.) Statistically, unauthorized male migrants are more likely to work than males who are either authorized migrants, or natives. According to the CPS, 94% of working age unauthorized male migrants are in the civilian labor force, while only 86% of legal immigrants and 83% of natives of working age participate in the civilian labor force. (See Exhibit 3.)

Currently, given the evident shortage of native workers or authorized migrants,

Exhibit 2
Unemployment Rate Of Various Categories Of Workforce In 2005
Percentage

Source: CDP/Pew Hispanic Center; Bureau Of Labor Statistics

Exhibit 3
Percent Of Working Age Males In Civilian Labor Force
Percentage



Source: CDP/Pew Hispanic Center

many employers in the construction industry may perceive that they have no choice but to employ unauthorized migrant workers. However, some misperceptions about unauthorized migrants continue to hinder and divide construction managers and unauthorized migrant workers. While unemployment among unauthorized migrants is relatively low, the stereotypical portrayal of unauthorized migrants as young, single, unaccompanied males in search of work is only partially true — a matter of conceptual importance to construction industry management, who must understand the construction workforce and its values to manage successfully. According to the CPS data, of the 11.1 million unauthorized migrants, about 5.4 million were adult males, but only 2.4 million of them were unaccompanied males in the United States without wives or children. CPS data indicates that 3.9 million, or 42%, of the unauthorized adult migrants in the U.S. were women, and only about one-fifth of them were unaccompanied by husbands or children in the United States. Among families with more than one unauthorized migrant member, many have children, but only 36% of the children are unauthorized — the other 64% are primarily U.S. citizens by birth. Accordingly, while children represent only 16% of the unauthorized population, the proportion of unauthorized families that have children is higher than indicated by this statistic, and construction industry management should seek to accommodate family concerns to maintain better working relationships with unauthorized migrant employees.

UNAUTHORIZED MIGRANT WORKERS: THEY'RE HERE ... NOW WHAT?

Political polarization often obscures reasonable policy concerns that lie somewhere between the extremes. Immigration is currently one of the most controversial and polarizing issues in American politics, and the incoherence and ineffectiveness of current immigration policies and enforcement standards have driven it to the forefront of debate. The United States needs new immigration policies, but they are proving difficult to craft. To succeed, new immigration policies will need to balance the seemingly conflicting interests of the United States in providing adequate labor to the national economy and allowing for a continuing tradition of opportunity for immigrants, while also ensuring sufficient national security protection through an effective and organized immigration regulatory system.

The United States needs new immigration policies, but they are proving difficult to craft.

Currently, on one side of the immigration debate, outspoken immigration liberalization advocates call for non-restrictive immigration laws and enforcement standards, including what are commonly known as amnesty provisions, which would allow unauthorized migrants already in the country to remain here permanently. Outspoken liberalization advocates sometimes align immigration with time-honored American values by asserting that the free movement of people is a free market necessity, as well as a basic human right. In contrast, vocal conservatives have positioned campaign strategies around strict policies on national security issues. Among the most notable national security measures that vocal conservatives are calling for are

the deportation of unauthorized migrants already in the United States, punitive measures for employers of unauthorized migrants, far more strict immigration laws and enforcement policies, and a physical barrier on the U.S.-Mexico border. Conservatives tout these measures as critical steps to defending the country against terrorism.[4]

Adding to the uncertainty stemming from the competing political agendas regarding the likely provisions to be included in any new legislation, President Bush along with senators such as John McCain, do not soundly identify with either party's hard-line position. These leaders advocate constructive compromise, favoring both restrictive policies such as a physical barrier on the U.S.-Mexico border and improved enforcement policies, and liberal policies such as some form of guest-worker program.[5]

As the political solution is worked out, compromises will need to be made in order to ensure an adequate supply of labor, while providing for the security of the American public. Immigration is a complex issue for America, and neither of the politically polarized positions for all walls or open doors will satisfy the complex challenges posed by the current immigration situation.

As of this writing, the 109th Congress has been unable to resolve the wide divide between politically driven positions in the Senate and House on immigration policy, and so comprehensive immigration legislation will likely emerge from either the lame-duck session following the November 2006 elections or the 110th Congress, which commences on Jan. 3, 2007.[6] Throughout summer 2006, there was intermittent stalling, posturing, and finger-pointing among federal legislators, with regard to proposed immigration bill provisions.[7] The Senate's immigration bill proposals have favored more liberal provisions, such as a guest worker program that would allow new migrant workers to come into the United States more easily on a temporary basis, and paths to citizenship for those unauthorized migrants already here — particularly long-term unauthorized migrants.[8] However, the House has aligned its immigration bill proposals more closely with conservative priorities that focus on stricter immigration policies and rigorous enforcement of those policies, especially along the U.S.-Mexico

Immigration is a complex issue for America, and neither of the politically polarized positions for all walls or open doors will satisfy the complex challenges posed by the current immigration situation.

border.[9] The Senate immigration bill proposals represent a more moderate approach to new immigration legislation, and a Senate bill would likely be more compatible with the labor requirements of the construction industry.

Although Senate immigration bill proposals could provide comprehensive legislation friendly to construction employers, the construction industry should be wary of both changes to federal immigration law and modifications to enforcement rules. Some legislative proposals and administrative enforcement plans on the table would intensify labor scarcities in the construction industry, and some could penalize employers found hiring unauthorized migrants.[10] Due to the conflicting, and seemingly inflexible priorities of the two legislative bodies, administrative modifications to the enforcement rules for existing immigration laws, with legislative support through financial appropriations to the Department of Homeland Security (DHS), will be needed before the passage of any comprehensive new federal immigration laws.[11]

Revised enforcement rules seem particularly likely now that President Bush has approved The Secure Fence Act, Congress' 700-mile-long-barrier bill for the border with Mexico.[12] Homeland Security funding allocations, along with The Secure Fence Act, will allow the DHS through its Immigration and Customs Enforcement (ICE) agency to better enforce existing immigration laws. The only remaining action necessary to increase restrictive immigration enforcement is the promulgation of new, more aggressive immigration enforcement rules.

As proposed, these rules would allow the DHS and ICE to broaden the scope and increase the frequency of immigration raids on construction sites — particularly those sites that DHS Assistant Secretary for U.S. ICE Julie L. Myers described as, "serious homeland security threats,"— by providing the agencies with more information about construction firms' employment practices through more comprehensive reporting requirements.[13] One raid under the spring 2006 enforcement push led to the arrest of 29 unauthorized drywall workers who had previously been working on a renovation of the Marine Corps Band mess facility at Camp Pendleton, Calif.[14] This raid illustrates the DHS intent to curb the commonplace construction industry practice of employing unauthorized migrant workers through strict enforcement of immigration rules on employers working on projects with even a remote connection to national security.

The Secure Fence Act tasks the DHS with the construction of a fence along large portions of the U.S.-Mexico border, and the Homeland Security spending bill, an operational funding appropriation for the DHS, provides funding to begin the fence project and other enforcement activities.[15] Revised enforcement rules will function as laws created through DHS as an administrative agency. While these administrative rules will not alter the existing federal immigration laws, they will change enforcement to ensure strict enforcement of existing immigration laws.

GOING FORWARD: CHANGING IMMIGRATION POLICIES, ONGOING IMMIGRATION CONCERNS, AND THE CONSTRUCTION INDUSTRY

Construction industry employers face uncertainty about future federal immigration law in addition to new challenges from DHS and ICE administrative enforcement rules, but familiar challenges stemming from immigration will remain constant in the months ahead.

The DHS is now considering a revision proposal titled, Safe-Harbor Procedures for Employers Who Receive a No-Match Letter.[16] This administrative modification to existing rules, if accepted, could result in new DHS and ICE enforcement rules, potentially troublesome to construction employers. New enforcement rules would mean that agents are more likely to show up at the job site of construction employers with unauthorized migrant employees than under current regulatory standards because of additional funding already approved for DHS and ICE enforcement activities. This proposal calls for a few important immigration law enforcement modifications important to construction employers.[17]

- The DHS and ICE will assume that employers have constructive knowledge of an employee's unauthorized status in two additional scenarios that would be added to current enforcement standards, making employers subject to sanctions by the DHS and ICE in more cases. The first scenario in which the DHS and ICE deem that an employer has constructive knowledge involves situations when an employer has received a notice of non-conformity of a name and social security number combination from the Social Security Administration. The second scenario conferring constructive knowledge on employers involves situations where an employer has received notice from the DHS that an employee's indicated I-9 status does not match DHS records.
- Assignment of constructive knowledge to an employer by the DHS would depend on a totality of the relevant circumstances, as determined by the DHS. This modification to existing enforcement standards would give the DHS broad discretion in assigning constructive knowledge to employers, and thus expanded sanctioning capabilities.
- No-match notification situations would require employers to follow a more detailed series of steps to verify an employee's status, possibly requiring the termination of the suspect employee, in order for an employer to avoid loss of safe-harbor protection and exposure to sanctions from the DHS.

The comment period for the revised Safe-Harbor Procedures proposal closed in mid-August, and its ultimate adoption will be decided by the DHS, but construction industry leaders must be proactive in addressing future administrative rule proposals similar to the revised Safe-Harbor Procedures described above.[18] Administrative

agencies, including the DHS and ICE, are permitted to enforce rules having the force and effect of law. At the time of proposal, rules similar to the revised Safe-Harbor Procedures will allow for public comment submission periods, prior to the agency's final consideration and decision regarding the adoption of the rule. Construction leaders should participate in these public comment periods in order to have their voices heard. An unopposed administrative rule, once adopted, could significantly alter the procedures that employers must follow. In the event of a dispute, employers will usually be required to exhaust administrative remedies with the sanctioning agency, before they may seek judicial remedy. Thus, active participation by construction employers in the administrative rule-making process could help to avoid significant restrictions resulting from unopposed administrative rules.

One outcome of growing local enforcement of federal immigration laws may be that there are fewer unauthorized migrant workers available for the construction industry to hire whether intentionally or not. The often confusing federal immigration law enforcement polices and the rising controversy regarding immigrants and perceptions about national security are causing some localities such as Herndon, Va., a town near Washington, D.C., to seek training for their local law enforcement agencies to enforce existing federal immigration laws.[19] Evolving grassroots efforts to curb targeted employers, such as those in the construction industry, could exacerbate labor scarcities by forcing unauthorized migrant workers out of the workforce at an increasing rate.

One outcome of growing local enforcement of federal immigration laws may be that there are fewer unauthorized migrant workers available for the construction industry to hire whether intentionally or not.

While changing immigration policies could create problems for construction employers accustomed to working with or employing unauthorized migrant workers, the inaction on the part of the government may also cause problems related to immigration. With regard to work visas, legislative attempts to rewrite a broad range of immigration-related policies has delayed indefinitely changes to less controversial immigration policies, such as visa availability, due to ongoing controversy about illegal immigration and national security.[20] Thus, the outdated visa allocations remain in place, and these allocations remain insufficient to meet the needs of the construction industry for technically skilled workers with backgrounds in areas such as engineering and construction management.[21] A Senate proposal would have nearly doubled the number of available H-1B visas for skilled workers, from its current number, 65,000, to 115,000 per year.[22] As discussed above, the declining numbers of technical program graduates in major U.S. universities coupled with the woefully insufficient numbers of H-1B and other visas currently available creates insufficient

labor availability for construction employers, and valuable foreign workers face long waiting lists for visas that will permit them to pursue work available for them in the United States.

Constant market factors, such as steady demand, and in many cases rising demand for construction services, and unrelenting competition from other markets internationally, will likely ensure that tracking immigration policies will remain high priorities for the construction industry. Relatively high U.S. employment coupled with a shortage of inexpensive labor indicates that many employers in the construction industry will continue to face staffing problems in the current climate of immigration controversy and uncertain federal immigration policies and enforcement.[23]

According to a recent World Economic Forum survey of more than 11,000 business leaders in 125 countries, relative U.S. competitiveness has fallen from first to sixth place.

Competing external demand for available immigrant labor may further exacerbate internal limitations on immigrant labor availability. For instance, nearby competition from Canada for Mexican and other Latino immigrant construction workers is increasing because of focused efforts by the Canadian Construction Association to attract labor necessary for the 2010 Vancouver Olympics projects.[24] Additionally, international economic competition from more distant regions is equally insensitive to U.S. immigration policy. Countries other than the U.S. are increasingly attractive to foreign workers — this is one factor in declining U.S. competitiveness in the global economy. According to a recent World Economic Forum survey of more than 11,000 business leaders in 125 countries, relative U.S. competitiveness has fallen from first to sixth place.[25] Reasons cited by the international business leaders for the U.S. loss in global competitiveness included incoherent immigration policies — one of the same reasons for competitive problems in the construction industry.[26] ■

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[1] This section draws from reports compiled by the Pew Hispanic Center, a nonpartisan research organization supported by the Pew Charitable Trusts. The Pew Hispanic Center does not advocate or take positions on policy issues. The reports referenced were: Passel, Jeffrey S. "The Size and Characteristics of the Unauthorized Migrant Population in the U.S." 07-MAR-2006; and "Fact Sheet: The Labor Force Status of Short-Term Unauthorized Workers." 13-APR-2006. www.pewhispanic.org

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Developing Project Management Excellence

FMI Quarterly spoke with Dr. Ralph Ellis of the University of Florida to learn how their construction management program is developing young people for work in today's industry.

By Gregg Schoppman

Ralph Ellis, Ph.D., is an associate professor at the University of Florida's nationally ranked Civil and Coastal Engineering Department. Dr. Ellis specializes in the area of construction and engineering management and provides significant faculty support for the University of Florida's EDGE Program (Electronic Delivery of Graduate Education). He holds a bachelor, master of engineering, and doctorate degree from the University of Florida as well as a master of business administration from Nova Southeastern University.

Dr. Ellis worked approximately 15 years in the industry before returning to the world of academia. In addition to working around the world in various capacities, he has authored numerous technical white papers. Dr. Ellis is also currently a member of the U.S. State Department's industry advisory panel for the Bureau of Overseas Building Operations, AASHTO (standing committee on quality, subcommittee on project delivery), and a board member of the American Society of Civil Engineers Construction Institute. *FMI Quarterly* spoke with Dr. Ellis to learn how their program is training young people for work in today's industry.

FMI Quarterly: What is the greatest asset construction management or engineering students bring into the workforce from schools like the University of Florida?

Ellis: For construction, one of the biggest assets is being able to think clearly and quickly. Rapid thinking is required. The construction workplace is much more dynamic than structural design situations so students who get involved in providing construction management and leadership have to be able to think quickly.

FMI Quarterly: Engineering students are required to take courses in many disciplines. This is especially true for civil engineering. What courses or subjects that aren't offered now would better equip students for the workforce?

Ellis: The challenge we have is replicating the project-site dynamics in the classroom. It's very difficult to expose students to the various human relation personnel issues that are involved in managing projects. The challenge is being able to get them into those situations. Most of the time the technical aspect of what we do can be challenging but not as challenging as managing the people side of the business.

FMI Quarterly: This leads into my next question. Soft skills — things like leadership, management, communication, time management — how are they introduced to the students?

Ellis: We cover team dynamics as a course topic in several different subject areas so we do talk about those things. We also conduct personality testing for students, and we improve their skills in these areas through teamwork on student projects. The experience of working together is the best way we can teach students these soft skills.

FMI Quarterly: When you talk to contractors who come to the University of Florida looking to hire graduates, what do they tell you that they're looking for in project engineers and managers?

Ellis: They are looking for a few key items. Most of them tell me that they want a person who is completely ethical. They want someone who is motivated, and they want someone who is flexible in the way they think. They want someone who can deal with the changing situations of the construction workplace. Beyond that, most of the contractors tell me that they want someone who can make something happen. They want somebody who's going to participate rather than watch.

FMI Quarterly: Construction definitely is not a spectator sport. What could construction firms do to help universities better prepare students for the workforce in construction management?

Ellis: We always welcome participation from industry people in our curriculum. There's always a place for a guest speaker to come and talk about what's going on. A funny thing about students is that they are kind of like your kids; you tell them stuff, and they doubt what you tell them, but they'll believe the stranger across the street.

So it's really important to have industry folks come and talk to students about things that are going on and what's important. It reinforces what we do as educators. Every college and school has opportunities in their community for a construction or engineering firm to reach out and help.

FMI Quarterly: What could construction firms and the construction community at large do to increase their retention of these top producers? We hear about people in the industry working for two years and then moving on to the next career opportunity.

Ellis: The challenge is that the people entering the workforce today are not the same as the people who are in senior management positions in the construction industry. The new entrants have different ideas of what they want their life to be, and management needs to compromise on how work life is structured in order to retain these young people. They're willing to work and work hard, but they don't want to work seven days a week. They want to do something else as well as work.

The challenge is that the people entering the workforce today are not the same as the people who are in senior management positions in the construction industry.

FMI Quarterly: University of Florida graduates leave and go on to be project engineers and project managers. The industry is experiencing a talent shortage, which includes these positions and others. What can the industry and the nation's educational system — university, technical schools, secondary schools — do now to address this declining workforce population?

Ellis: Well, it is a national concern, and it seems to remain a chronic problem. You see regional and local efforts to recruit young people or to provide craft training, and some areas are better than others at it. But I think it is a serious enough problem that we need to take a national approach. We need a national program to provide education and training to young people who see a technical or craft course as a better path than a four-year college program. It takes structure to set up a program to do this; it takes government support, and it certainly takes education of high-school career counselors.

FMI Quarterly: Technology is constantly evolving and offering project managers new tools to make their projects more efficient. Whether it is a document control system or a scheduling program, there is no shortage of programs out there. What do schools like the University of Florida do to introduce these technologies to students?

Ellis: We keep our project control technology and our scheduling software current so our students get an opportunity to work on class projects with the latest tools. We certainly cannot introduce them to everything since we do not have time to use every tool on the market. We think we have selected the ones representing the

best of class, and students who learn the basics of how to use a particular application can adapt rapidly to a different vendor's application.

FMI Quarterly: It's no secret that there have always been heated relations between designers (architects/engineers) and the construction community at-large. How do programs like the one at the University of Florida bridge this gap as construction projects increase in complexity and communication, making a partnered approach even more important?

Ellis: We do a fair amount of classroom project work as design/build. I like design/build as a teaching model because it takes students and puts them in situations where they need to contribute to the group and develop a design. They also have to think through the construction process and develop a construction plan, including budgeting and scheduling. When you put both of these activities together, the design and the construction, and make it a single activity, it does a lot to illustrate to the students how these two processes are basically similar and rely on one another to construct a quality finished product.

FMI Quarterly: There still remains a perception that design documents are worsening, with no relief on the horizon. Why do you think that is?

Ellis: I believe it's largely due to the experience level of the people actually doing the design. It is not the firms, but the people doing the designs. In most cases, there is a shortage of experienced design professionals because of resources and the demand for products.

FMI Quarterly: It's not too dissimilar from the construction labor that we were just talking about a moment ago?

Ellis: It is the same situation.

FMI Quarterly: Rising costs always make the news. Do engineering and construction students adequately understand the impact of financial decisions before and during a construction project?

Ellis: My students do. We teach financial management as well as traditional project management cost control, but we also take it to another level and talk about how the project economy affects the business economy.

FMI Quarterly: This is a very simple question but probably requires a complicated answer. Why do projects fail?

Ellis: There is not a single answer. They fail for many different reasons, but one of the most common reasons is not having a clearly defined objective, i.e., what is supposed to happen with the project and having that objective understood by all project participants. Beyond that, successfully completed projects require technical competency, which requires having people involved on all sides and all

the participants knowing how to build a technically competent project. Technical competence is a mandatory requirement; teamwork and partnering will not produce a successful project if you don't have people that are technically competent.

FMI Quarterly: What role does the customer play in the curriculum that you teach? How do you portray the customer, whether they are trade contractors or general contractors? That the customer is king?

Ellis: We teach some rules of marketing as part of our program. Within the general subject of marketing construction and engineering services, we talk about the importance of knowing your customer and your customer's business. We communicate the importance of knowing your own business and positioning your services so you can satisfy your customers' needs. We do a good job of that, but the customer isn't always right. They are wrong sometimes, and we want to satisfy them. So we have to learn how to strategically tell them they are wrong.

FMI Quarterly: What about project controls and documentation? What are firms currently doing to address documentation shortcomings and to protect themselves?

Ellis: Documentation remains a challenge. At the project level, it is a nuisance. People are busy trying to build the project. Maintaining documentation is a diversion of their time so it's going to require a structured process that makes the documentation mandatory. If you leave it to when managers and superintendents have time, they will never have time. So documentation remains a challenge, and one of the best ways to deal with that is to make it a mandatory part of the process.

Technical competence is a mandatory requirement; teamwork and partnering will not produce a successful project if you don't have people that are technically competent.

The biggest challenge with project controls is in the timing of the control. Most companies have a thoroughly adequate job cost accounting process. The challenge at the project level is to get that information quickly enough to be able to do something about it. Many times, if we talk about a 30-day accounting cycle, that is not quick enough to be able to change something on the project. Timing is extremely important. The other thing that is important is to put some thought into how you want to provide project control information to your project team. It is real easy to overload them with information today since we have the ability to provide a heckuva lot more information than we can absorb. You have to really think about what are the key things that need to be controlled and what do you want your project staff to be looking at on a daily or weekly basis while not overloading them with too much information.

FMI Quarterly: How does a company, a general contractor, or trade contractor create a culture of proactive managers rather than reactive managers?

Ellis: One of the most important skills a project manager needs is the ability to look ahead. The difference between a successful project and a non-successful project is a manager who can see what is going to be happening two weeks ahead, identify the issues and challenges, and solve them before they become a problem. On the other hand, a recipe for disaster in the construction industry is having somebody who just takes things as they come. We have to pair an entry-level assistant project manager or project engineer with a senior manager who has the skill and habit of a look-ahead approach to managing projects. Then, you have to allow that assistant project manager the opportunity to exercise that activity. Give them the opportunity to take a particular part of the project, look at the work, and say what kinds of issues need to be addressed at one, two, and three weeks out. Then, you can critique it.

Without exception, students today are looking more long-term. They want to know where they are going to be in five years with their organization.

FMI Quarterly: We often hear about the "trial by fire" approach for entry-level managers. What is the best way for organizations to bring new people in and indoctrinate them?

Ellis: First, each organization should develop an inventory of the experience and the skills that they want their project managers to have. This takes a little time because you have to think about all the different project managers, areas, and processes that are involved. Then, organizations should manage the growth of these assistant project managers or entry-level managers. Firms should ensure they get the experience necessary and take time for periodic reviews of their performance. A review on a six-month interval probably works for most situations. Both the project manager and the assistant project manager should know exactly what the company wants that assistant project manager to be able to do when he or she moves to the next level. It becomes a shared responsibility. Organizations need to give that new person the opportunity and the guidance to get those skills. It is not something you can let happen by accident; you have to manage the process.

FMI Quarterly: How important is career-pathing to your students? What are their expectations of the employer when they enter the workforce?

Ellis: Without exception, students today are looking more long-term. They want to know where they are going to be in five years with their organization. It's almost mandatory that there be a career path. If you do not have career paths for your people, then you cannot share with these new associates their roadmap, and as a result, these people are not going to want to work for you. They want to see the career path and some structure. This lets them know if they want to be a project

manager, what they need to do or know before they can become one. And you need to be able to tell them that.

FMI Quarterly: What are students' hot buttons when choosing one firm over another? Is it compensation, retirement plans, getting a truck, etc.? What are the big things that are important to the students now?

Ellis: Firms with a recognizable image, at least initially, attract people. Therefore, companies need to work on their image. This may mean visiting the university or simply talking with the students. But you need to be visible. Students are interested in what you do and what kind of projects you build. You need to be able to talk about the kinds of work that you do. They also want to see a career path. Compensation isn't the issue people make it out to be. Interest in a firm is based more on what students are going to be doing and what their path will be in the organization.

FMI Quarterly: Is a bachelor's degree enough to be successful in construction?

Ellis: The American Society of Engineers is about to release information that strongly emphasizes that the bachelor's degree should not be an entry-level degree. The belief exists that one more year is needed, and this would be the equivalent of a master's degree. In the case of our civil engineers, we have to teach these students how to be civil engineers first, and we would really value the opportunity to have another year where we can concentrate more on construction engineering and project management. It helps our students a great deal. My feeling is that the extra year is a good investment of their time.

FMI Quarterly: One last question. Are great managers born, or are they made?

Ellis: Being a construction project manager requires a unique sense of balance — an ability to understand the dynamics of different situations and different personalities. A job site meeting is a good example. You typically have a prime contractor, an owner's representative, and numerous subcontractors, and each participant has a different perspective and a different agenda on what they want from that particular meeting. I have students that I could put into that meeting and in five minutes, they would understand what everybody wants and more importantly, know what they need to get for their particular employer from the meeting. So there is some natural talent required to be a great project manager, but I still think we can do a great deal to improve the skills of the people that are going to be managers.

FMI Quarterly: Dr. Ellis, thank you for taking the time to share your thoughts with our readers. ■

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2007 Economic Outlook for Utility Contractors

Overall, demand for construction services in the utilities markets is unparalleled, yet funding and regulatory challenges still restrict the amount of capital spending put in place.

By Mark Bridgers and Mike Chase

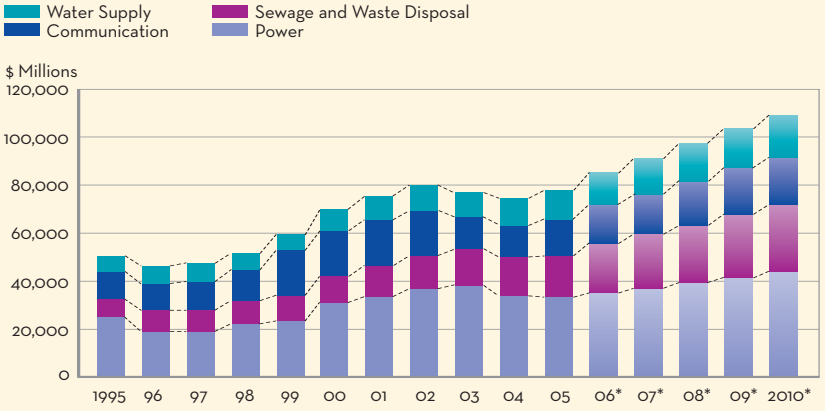
The economic outlook for utility contractors is positive with growth rates in every segment exceeding both gross domestic product (GDP) and inflation. The demand for this type of construction, however, is largely unmet due to financing constraints and structural barriers in the various markets indicating further acceleration potential.

In FMI's 2005 forecast, the overall power market, consisting of power generation, transmission, and distribution, was forecasted to generate the highest growth rates through 2009. FMI has since tempered its optimism in this segment in part due to the housing slowdown and permitting and regulatory barriers impeding the construction of these assets. The highest growth rates through 2010 are generated in water supply, communication, and sewage/waste disposal. Beyond 2010, FMI expects the overall power market to accelerate as planned new generation facilities are installed at a faster pace. (See Exhibit 1.)

Demand for capital spending in all segments is strong due to utility service needs created by the strong economy, aging infrastructure, shifting population demographics, and reliability/environmental compliance regulation. However, FMI expects capital spending for infrastructure work to continue to fall short of identified needs despite the strains placed on existing systems. Water/wastewater and sewer infrastructure are among the systems that are the oldest, most neglected, and at

Exhibit 1

Utility Construction Put in Place
Historical Figures and Forecasts



** FMI prepared forecasts for 2006-2010*
Source: Building permits, construction put in place, and trade sources

highest risk of failure. Of the 16,000 sewer and waste systems across the nation providing wastewater services, many were predominately built between 1950 and 1970 and are operating beyond their useful life expectancy. They are especially hard hit by the lack of historic investment and structural barriers that make it difficult to finance improvement. In many areas of the country, growth has outstripped the water supply, forcing states to enact both periodic and consistent water restrictions and conservation efforts. A series of federal mandates is compelling system owners to upgrade; however, most of these mandates do not have any federal funding attached. As a result, system operators rely on rate payers and rate relief to fund 90% of system upgrades. Construction spending in the telecommunication sector will likely remain stable through 2010, driven by increasing usage and capacity, technological improvements, and infrastructure upgrade demands. In the electric/gas transmission and distribution segment a period of scant investment in upgrading infrastructure is now showing signs of a turnaround. This turnover will be moderated, however, by state commissions' downward pressure on regulated utilities; this pressure is aimed at controlling recovery of these expenditures through rate increases. The power generation and environmental compliance construction expenditures are expected to continue accelerating between 2007 and 2010; while not forecasted currently, 2010 and beyond should see even higher growth as power

In many areas of the country, growth has outstripped the water supply, forcing states to enact both periodic and consistent water restrictions and conservation efforts.

generation facilities are actually constructed.

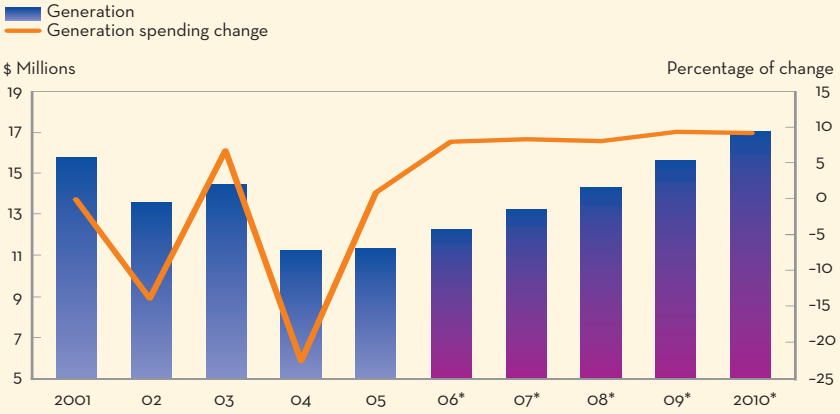
Competitive pressures faced by nearly all utilities are causing significant management, strategy, and philosophy changes. Additionally, utilities are facing the same shortage of future talent as many others in the construction industry. This is exacerbated by dramatic cost cutting, the aging workforce, and low attraction to utilities among entry-level staff. Insightful contractors will look upon these challenges as opportunities to fill a void, offering high-value services to support the utility's implementation of business strategies. FMI expects an increasing number of utilities to use outside service providers to fill talent holes as well as to support increasing demand for capital construction spending.

POWER GENERATION AND ENVIRONMENTAL COMPLIANCE

In 2005, FMI's forecasts did not segregate between generation, transmission, and distribution spending. FMI's 2006 forecast segregates these categories, and in the following material, we focus solely on generation-related spending from 2001 to 2010. (See Exhibit 2.) The passage of the U.S. Energy Policy Act of 2005, and the potential removal of barriers preventing significant capital expenditures, caused FMI to prepare an optimistic forecast for spending in this segment a year ago. The passage of time has tempered this optimism, and FMI is now projecting that the more dramatic rise in spending originally forecasted for 2008 to 2010 will occur after 2010. Environmental compliance construction — predominately the installation of selective catalytic reduction (SCR)[1] and Flue Gas Desulfurization Units commonly known as scrubber[2] technologies to reduce coal burning emissions — continues to occur and will dominate spending between 2007 and 2010. Overall, power generation

Exhibit 2

Power Generation Construction Put in Place
Historical Figures and Forecasts



** FMI prepared forecasts for 2006-2010*
Source: Building permits, construction put in place, and trade sources

and environmental compliance construction expenditures are forecasted to reach $13 billion in 2007, representing an 8% increase over 2006 forecasts. Between 2007 and 2010, the average annual growth rate is just over 8%, outpacing economic growth rates.

Nearly all of the power plants built in the last 15 years have been natural gas-fired. When the majority of these power plants were planned and permitted, natural gas prices were at all-time low prices and below $3 per million Btu[3] (See Exhibit 3). Gas plants were attractive due to low capital cost, relatively small size, high efficiency, low emissions, and short construction time. Over the last five years, the need for base load power generation facilities, dramatically rising natural gas costs, and the economics of new plant construction have raised the interest in both coal and nuclear generation facilities. TXU recently announced it had secured $11 billion to invest in 20 pulverized-coal (PC) power plants overcoming two major obstacles, fuel prices and environmental regulations. Start-up of the first of these facilities is preliminarily scheduled for 2010.[4]

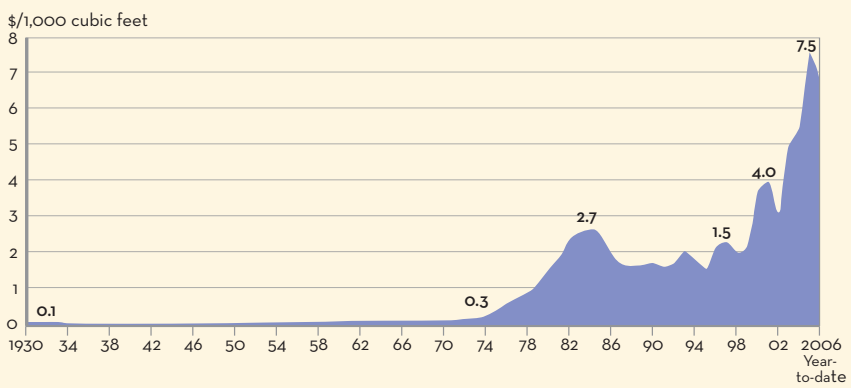
The U.S. Department of Energy is currently tracking approximately 135 planned or proposed coal generation facilities of various sizes. These proposals include plants using supercritical steam, circulating fluidized bed, and integrated gasification combined cycle technologies etc. While not all of the proposed plants will be built, these new coal plants will provide long-term base load power generation and are designed to cost effectively meet current emission requirements.

The barriers to ultimate construction include uncertainty over the future regulation of emissions, permitting of facilities, and pressure by some environmental groups. These barriers will continue to slow the design/construction process. FMI's tempered optimism in this segment from its 2005 forecast is directly due to these barriers. An increasing number of power companies are making it clear that they cannot commit to large investments in new coal plants with a lifetime of 40 or 50 years without reasonable certainty as to their future regulatory environment. The four main regulated emissions include sulfur dioxide (SO_2), nitrogen oxide (NO), mercury (Hg), and carbon dioxide (CO_2). Some companies are calling for greater

Exhibit 3

Natural Gas Historical Pricing — 1930–2006

Current Dollars



Source: UNCTAD based on data from Thomson Datastream

regulation to provide clarity. Examples include North Carolina's negotiated emission standards later documented through legislation with Duke Energy and Progress Energy, which currently exceed current federal requirements.

ELECTRIC/GAS TRANSMISSION AND DISTRIBUTION FORECAST

In 2005, FMI's forecasts did not segregate between generation, transmission, and distribution spending. Our 2006 forecast segregates these categories, and in the following material, we focus solely on the transmission and distribution spending from the period of 2001 to 2010. FMI expects slow growth over the long-term with some potential short-term disruption. This segment is fueled by demand for power, new home construction, aging infrastructure, and reliability requirements. FMI's current estimates in Exhibit 4 show healthy spending growth. The recent slowdown in the housing market will impact new construction growth in the short-term, and FMI projects a slowing of the growth rate in 2007. We do not anticipate a significant negative effect on this market beyond 2008 or 2009 and expect growth to accelerate after this point. Transmission construction for both gas and electric is expected to grow more rapidly and is accounting for much of this growth. The recent passage of the U.S. energy bill with its components to accelerate the permitting process may create a relief valve to push this capital spending forward.

"Jendal Texas Works has filled its pipe order book for the next 12 months and there's still a lot of business out there. Our challenge is to ramp up production so that we can take advantage of recent market upturn and take on more orders."

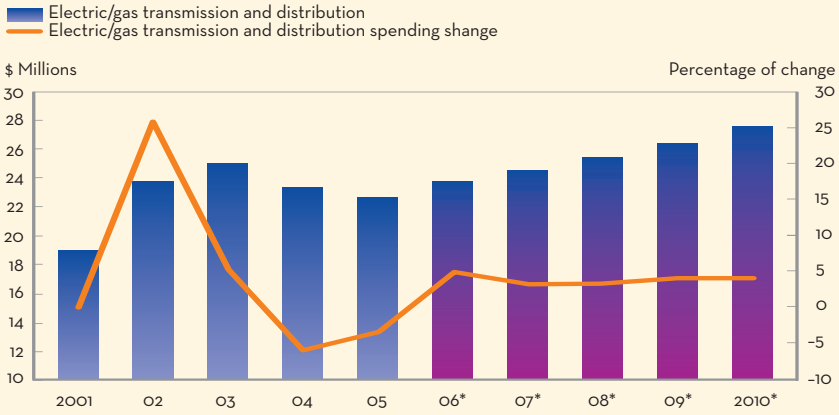
— Kevin Bartol, CFO Jindal Texas Works

Source: Pipeline & Gas Journal interview by Rita Tubb, Managing Editor, July 2006, pg 42.

Natural gas pipeline capacity added during 2005 was 7% above the 2004 level, representing the smallest annual increase since 2000. The current stock of project proposals indicates that a return to more rapid growth is anticipated. According

Exhibit 4

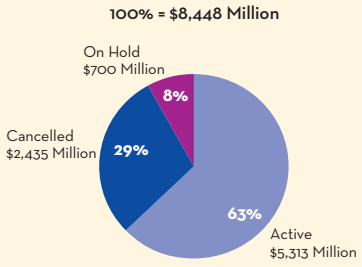
Electric/Gas Transmission and Distribution Construction Put in Place Historical Figures and Forecasts



** FMI prepared forecasts for 2006-2010*
Source: Building permits, construction put in place, and trade sources

Exhibit 5

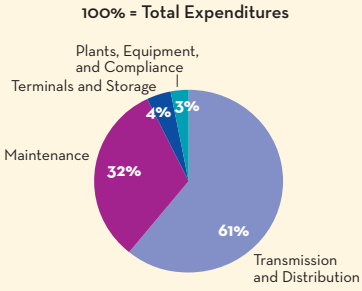
Oil/Gas Transmission Construction — 2006



Source: Industrial Info Resources, 2006

Exhibit 6

Electric/Gas Construction — 2005



Source: FMI Research and Estimates

to Industrial Info Resources, there are 87 oil and gas transmission projects with an estimated cost of almost $6 billion. This total accounts for the $2.4 billion in cancelled projects shown in Exhibit 5.

The Energy Information Administration announced there are 157 natural gas pipeline projects, accounting for more than 9,500 miles of potential new pipeline, proposed for development between 2006 and 2008. Of this total, 71 projects have already been approved by regulating authorities and have begun, or are permitted to begin, construction. Approximately 28 projects are still in the planning stage, and 58 have been submitted to various regulatory authorities for review. Nineteen of this latter group have been submitted to the Federal Energy Regulatory Commission (FERC) under the National Environmental Policy Act's (NEPA) pre-filing process. If all current proposals are completed as designed and scheduled, as much as 77 Bcf/d[5] of natural gas pipeline capacity will be added to the national network between 2006 and 2008. Transmission and distribution construction will dominate the short-term bulk of future capital expenditures through the forecasted years shown in Exhibit 1. One potential project example: CenterPoint Energy Gas Transmission (CEGT), in partnership with Duke Energy Gas Transmission (DEGT), announced plans to build a 1,600-mile natural gas pipeline slated to enter service by 4Q 2008.[6]

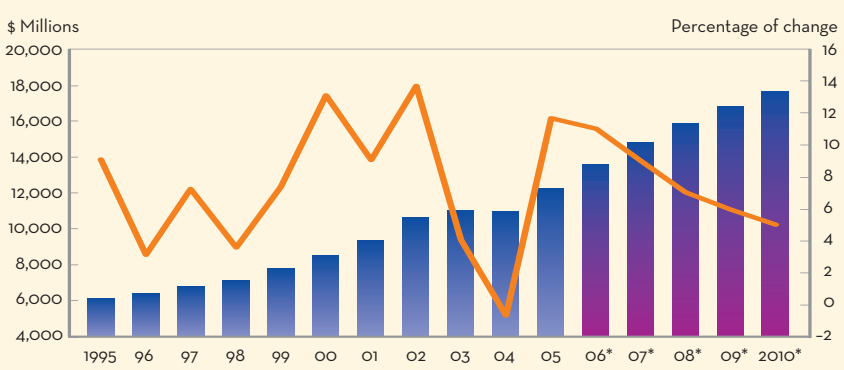
Exhibit 6 shows the estimated percentage splits between maintenance; terminals and storage; plants; and transmission and distribution spending in 2005. (This does not include generation spending.) The maintenance expenditures depicted in this exhibit are estimates and are not included in FMI's forecasts from Exhibit 1, 2, or 4. Transmission and distribution construction clearly dominates current spending allocations, and FMI believes this trend will continue.

WATER SUPPLY FORECAST

"Water, water everywhere, nor any drop to drink" goes the familiar refrain from *The Rime of the Ancient Mariner* by Samuel Taylor Coleridge and describes the feeling of being surrounded by something, yet being unable to access it. For the water segment, the refrain is: "water, water infrastructure needed everywhere, no funding to be had." FMI forecasts growth of 11% in 2006 and 9% in 2007 for

Exhibit 7

Water Supply Construction Put in Place
Historical Figures and Forecasts



** FMI prepared forecasts for 2006-2010*
Source: Building permits, construction put in place, and trade sources

this market, (see Exhibit 7) reflecting a more bullish perspective from the previous year. Beyond this point, growth rates in capital spending between 5% and 7% continue to push up spending in this segment through 2010. This amount of capital spending is grossly inadequate for nationwide infrastructure largely built in the 25 to 30 years post World War II.

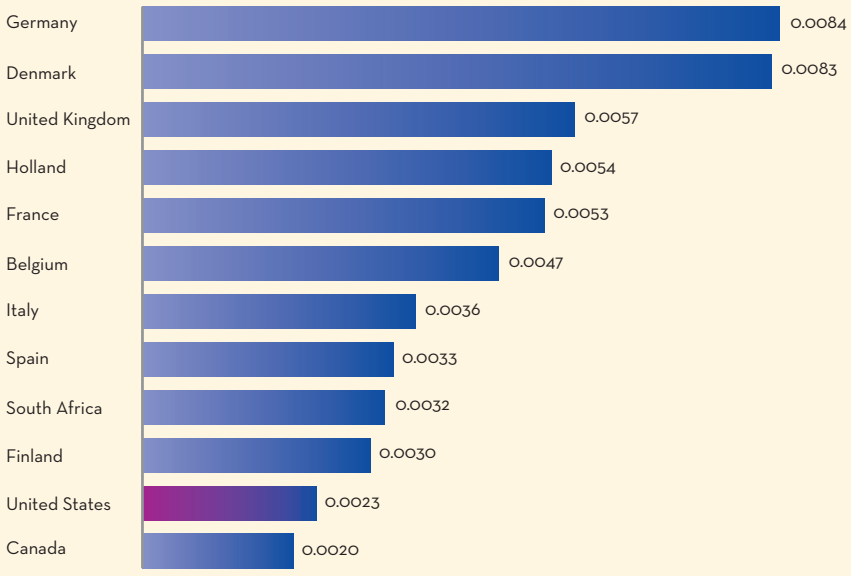
Many sources describe this inadequate funding situation.

- The Environmental Protection Agency (EPA) predicts $277 billion is necessary over the next 20 years to repair or replace aging pipes and related equipment.
- The Clean Water and Drinking Water Infrastructure Gap Analysis describes a potential 20-year funding gap for drinking water capital; operations and maintenance costs ranging from $45 billion to $263 billion; and capital needs of $161 billion.
- The Congressional Budget Office (CBO) has concluded that current government funding and taxpayer revenues will not reach the projected $10 to $20 billion needed to meet minimal demand for maintenance and necessary upgrade to the nation's aging infrastructure over the next 20 years. Current FY 2007 appropriations stand at only 9% of the total national requirement.
- The Water Infrastructure Financing Act of 2002 provided funding for drinking water through a State Revolving Fund (SRF) of approximately $15 billion. Unfortunately, only 8% to 10% of the funding has been distributed to large metropolitan systems with the oldest assets in the greatest need of upgrade.
- The current administration proposed water infrastructure appropriations of $3 billion for 2007. Included in this spending is the $841 million for drinking water SRFs, an increase of 1% from 2006, and $688 million for clean water SRFs. The latter represents a 22% decrease in spending from 2006.

Exhibit 8

Average Price Per Gallon of Drinking Water

$U.S./Gallon



Source: Maxwell, Steve, "The State of the Water Industry-2006," The Environmental Benchmarker and Strategist Annual Water Issue, 2006, pg 14.

Construction spending for the water segment will not reach its potential until the market is restructured through consolidation and the use of alternative financing techniques such as public-private partnerships (P^3) becomes more prevalent. This segment also demands the political will to address funding issues by raising the cost of water to a level reflective of its value and funding infrastructure upgrades through additional taxes.

The relative low cost of a gallon of treated drinking water in the United States is best represented when compared to other countries' water costs, as well as other liquid commodities of similar volume. Exhibit 8 shows the price per gallon of water for 12 countries. The U.S. has the second lowest cost per gallon, lagging only Canada. Further illustrating the cheapness of U.S. water, Exhibit 9 shows the cost of 11 liquid-consumer goods that Americans frequently use and often consider "necessities."

Surveys conducted by The Luntz Research Companies and Penn, Schoen, and Berland Associates Inc. indicate overwhelming support for federal trust funding for clean and safe water resources. (See Exhibit 10.) In a separate study, data collected in 2005 showed 86% of polled citizens would support legislation by the U.S. Congress that would create a long-term and sustainable trust fund for water infrastructure. Additionally, the majority of survey respondents ranked the

Exhibit 9

Cost of Water vs. Liquid Consumer Goods

$ U.S./Gallon

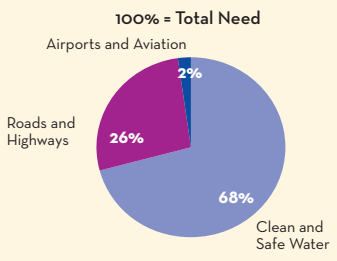
Source: Maxwell, Steve, "The State of the Water Industry-2006," The Environmental Benchmarker and Strategist Annual Water Issue, 2006, pg 14.

need for a dedicated trust fund for clean and safe water higher than a similar trust for roads and highways and aviation.

Relatively cheap water, combined with support from citizens for additional infrastructure spending, could create a perfect-storm scenario, alleviating deficiencies in water infrastructure, if politicians can decide whether higher local rates, local taxation, or a federal trust is the best way to provide infrastructure funding.

Exhibit 10

Greatest Need for a Federal Trust Fund



Source: Luntz Research & Strategic Services

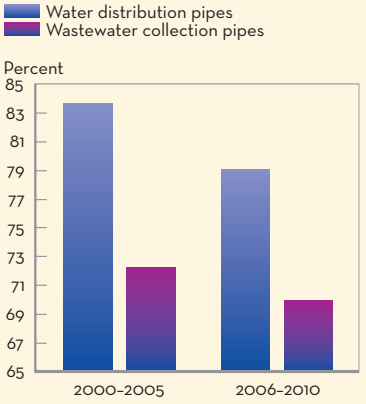
Despite a plethora of sources identifying infrastructure-funding gaps, many municipalities have been and will continue to concentrate on water infrastructure construction as a top priority for their constituents. According to The United States Conference of Mayors' Urban Water Council (UWC), water infrastructure construction has been robust for the past five years and will continue to be for the remainder of the decade. The UWC found in a survey distributed to more than 1,200 municipalities with populations over 30,000, that 84% had constructed water distribution projects in the past five years and 79% have planned construction projects sometime in the next five years. (See Exhibit 11.)

Contractors or engineers operating in this market can expect slight upward pressure on margins due to higher demand for services driven by the growth rates. In the short term, the performance of construction will remain competitive and highly

Exhibit 11

Infrastructure Construction

Municipalities with planned infrastructure construction



Source: U.S. Conference of Mayors' Urban Water Council

fragmented since many relatively small firms and some large firms will do the work. Most importantly, local political and citizen influence will continue to drive project delivery systems for municipalities purchasing construction services. Over the long-term, a trend toward consolidation of water systems and use of P³ will create high-profile project opportunities — stretching the internal capacity of utilities to manage, finance, or supply the necessary construction labor or expertise. Small- to medium-sized contractors will remain the most competitive sources for this work so long as projects remain relatively small and fragmented.

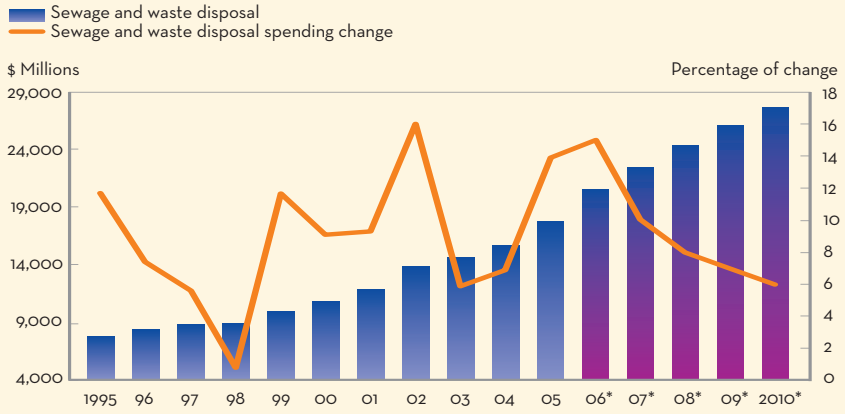
SEWAGE AND WASTE DISPOSAL FORECAST

The sewage and waste disposal market faces much the same situation as the water market — tremendous demand and limited funding. FMI also increased its forecasted growth rates and construction spending over the 2006 to 2010 time period for this market. (See Exhibit 12.)

The EPA estimates a national investment need of more than $390 billion over the next 20 years to meet growing demand by replacing existing systems and building new systems. Federal funding from 1995 to 2004 was steady, between $1.20 and $1.35 billion annually; yet wastewater funding cuts, as enacted and proposed, by the current administration will characterize 2006 and 2007. A structural change is needed for this

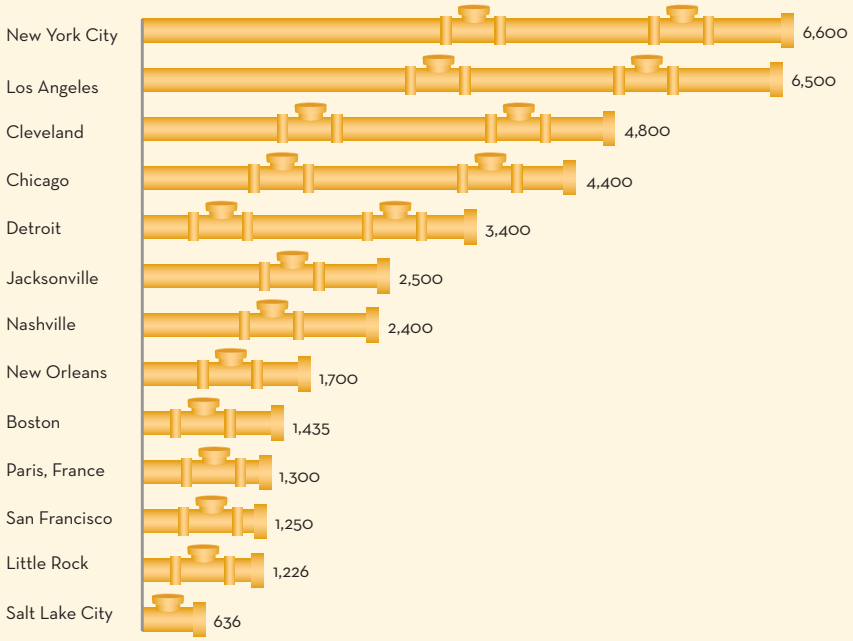
Exhibit 12

Sewage and Waste Disposal Construction Put in Place Historical Figures and Forecasts



** FMI prepared forecasts for 2006-2010*
Source: Building permits, construction put in place, and trade sources

Exhibit 13
Miles of Sanitary Sewer Pipeline



Source: FMI conducted research from publicly-available resources

market segment to create opportunities for economies of scale and additional local-level funding. General agreement exists that something must be done, and EPA Administrator Stephen L. Johnson predicts that protecting the country's water supply from natural or other pollutants will be one of the pressing environmental concerns of the 21st century.

"The SRF [State Revolving Fund] loan program and the historical and ongoing commitment of major municipal funds to rehabilitate an aging water and waste-water infrastructure may only help cities 'run in place' rather than satisfy growing investment needs."

— Richard F. Anderson, Ph.D.
Senior Advisor to the Mayors Water Council

Contractors operating in this segment will experience the same characteristics of multi-faceted competition: local firms competing based on lowest price and higher profile projects and construction programs that attract national players with specialized skills or financial capability.

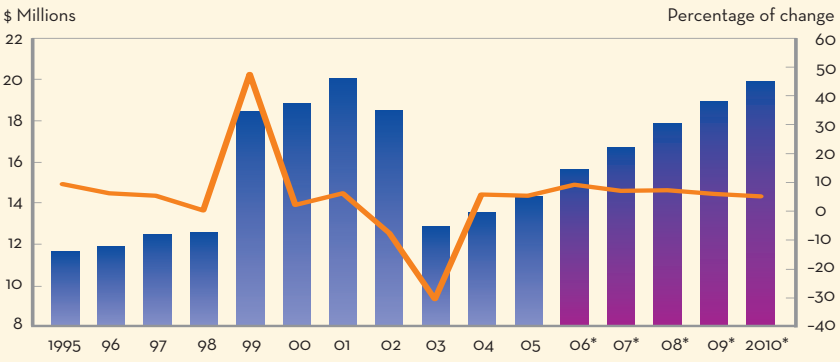
Sanitary sewer systems are relatively small and except for a handful of major cities, total pipe miles range between 200 and 400 miles. Exhibit 13 demonstrates comparative sewer pipeline mileage for 12 well-known U.S. cities and Paris, France. While these cities are not the 12 largest sewer systems, they give a flavor of the magnitude of work necessary with in-place systems.

TELECOMMUNICATIONS

The telecommunications market has experienced wider swings in construction spending than nearly any market, and many contractors were hurt severely during the downturn between 2000 and 2003. Today, these disruptions are still playing out,

Exhibit 14

Communication Construction Put in Place Historical Figures and Forecasts



** FMI prepared forecasts for 2006-2010*
Source: Building permits, construction put in place, and trade sources

making it difficult to know where to position a construction service provider. FMI is bullish on total spending in this segment.

Key spending drivers in this market include network infrastructure upgrades and expansion, wireless technology introduction, continued provider consolidation, and telecommunications security. Infrastructure upgrade is tied to urban and suburban residential broadband use that is up 40% in 2006, doubling the 20% market adoption rate reported from 2004. This totals nearly 84 million subscribers, according to a survey by the Pew Internet and American Life Project. This dramatic increase is a result of new or upgraded service for high-speed internet connections. Wireless infrastructure is shifting the nature of telecommunications construction, in part, due to the adoption speed; wireless subscribers are projected to exceed 215 million in 2006, growing to more than 270 million by 2009.[7] (See Exhibit 14.) Telecommunication-firm consolidation is driven by a repositioning of the mix of wire line and wireless assets. In North America alone, revenues from residential Voice Over Internet Protocol (VoIP) are expected to grow to $23.4 billion by 2009, up from $1.25 billion in 2004, according to Infonetics. As of 2005, consolidated residential cable operators supplied almost half of all North American VoIP service. IDC, a telecommunication industry research company, estimates that businesses worldwide spent $70 billion on communication, security, and business continuity technology systems in 2003, and this figure is expected to rise to $116 billion by 2007. Each of these trends will play out locally, and contractors providing services to these markets should look to their market's behavior.

IMPLICATIONS

Overall, demand for construction services in the utilities markets is unparalleled, yet funding and regulatory challenges still restrict the

amount of capital spending put in place. Overall, this entire market is expected to exhibit reasonable growth with geographic pockets of activity demonstrating high growth. Population growth and aging infrastructure are the two biggest drivers, creating opportunities for utilities contractors operating in the segments of electric/gas transmission and distribution, water/wastewater and sewer, and telecommunications. These drivers of demand and the financing constraints are pressuring owners to look at alternative delivery and financing systems. This movement will create more opportunities for construction service providers to offer value-added services and escape the highly competitive bid markets, which are all too common for this type of construction. Another underlying challenge is the perpetual shortage of labor created by the aging workforce and the difficulty of both owners and contractors to attract younger workers into the engineering and construction industry. Like all challenges, the critical shortage of labor has the potential to create a competitive advantage for firms that demonstrate control of a scare resource: highly skilled field labor, construction/project management staff, and design professionals. ■

Overall, this entire market is expected to exhibit reasonable growth with geographic pockets of activity demonstrating high growth.

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[1] SCR is the most widely used post-combustion technology for minimizing Nitrogen Oxide (NOx) emissions, a pollutant regulated by the EPA and current Clean Air Legislation.

[2] Equipment used to remove sulfur oxides from a power plant's combustion gases before they are discharged into the atmosphere.

[3] Short for *British thermal unit*, a standard unit of energy. One Btu is equal to the amount of heat required to raise the temperature of one pound of liquid water by 1 degree Fahrenheit at its maximum density, which occurs at a temperature of 39.1 degrees Fahrenheit. One Btu is equal to approximately 251.9 calories or 1055 joules.

[4] "TXU's Coal Bet," Public Utilities Fortnightly, August 2006, pg 55.

[5] Billion cubic feet per day.

[6] *Pipeline & Gas Journal* interview by Rita Tubb, Managing Editor, July 2006, pg 45.

[7] Telecommunications Industry Association, www.tiaonline.com.

Developing Talent From Top to Bottom

Organizations effectively addressing the need to develop talent through recruiting, training, performance management, career pathing, reinforcement, and evaluation will gain a competitive advantage.

By Ashley E. Robertson and Kelley Chisholm

Businesses worldwide are facing the challenges associated with the war for talent. This is especially true for the construction industry, which must confront a critical and growing labor shortage. According to the Construction Users Round Table's Workforce Development Survey, "The most critical issue facing the construction industry today is the growing gap between the supply of and demand for skilled construction laborers."

The construction industry's image is one of the primary reasons it is facing a workforce shortage. Many job seekers, including young people and women, believe that the industry's record on health and safety, diversity, and training is poor. Add to that long hours and arduous work environments, along with perceived adversarial attitudes, and it is no wonder the image of a career in the construction industry does not appeal to many. In addition, the construction industry tends to be its own worst enemy in terms of attracting people to the field. When current superintendents and project managers are asked if they would encourage their children to join the industry, typically, they say they are telling their children to join "more professional" industries. The industry must make a concerted effort to positively change its image if it wants to attract new workers. It must also make these target groups aware of the numerous employment opportunities and the potential

earnings and rewards available through a career in construction.

In the face of this labor shortage, the U.S. Department of Labor has identified construction as one of the top industries in terms of projected job growth. According to the Bureau of Labor Statistics, employment in the construction industry will grow at an average 11.4% between 2004 and 2014, and workers will be needed to fill almost a million new jobs created within that period. Despite the predicted need for more workers, the primary working age group (those between the ages of 25 and 54 years old) is projected to shrink, resulting in approximately three million fewer workers in this age range alone. With the reduction in available workers and the improving job market, many organizations may lose their star employees to their competitors.

Exhibit 1
Strategies for Success

Many strategies exist to win the war for talent, and no single strategy is clearly superior. Organizations need to decide what works best for them and be willing to change their approaches when necessary. A talent development process begins at the strategic level. Strategies should focus on an organization's ability to link business results to its talent. A company's largest expense, exposure, and risk are found in its people. Yet, while many organizations recognize that their greatest asset is their people, they have a hard time making additional investment in this resource. Organizations must align their business to their marketplace by identifying core values and developing a strategic mission and vision. Companies striving for long-term development while maintaining a focus on short-term goals will want to measure each employee's contribution to the overall success of the business.

As Exhibit 1 indicates, companies can select from many areas as they outline ways to win the talent wars. Effective recruiting and hiring, training development and delivery, performance management, and providing career pathing and other resources to employees is an ongoing, continuous process that needs sustained assessment and reinforcement for optimal success.

RECRUITING AND HIRING

Effective recruitment is essential to a company's talent development strategy. This may require aggressive tactics; organizations must first be able to prove their claim that they are an employer of choice. Companies can do this by branding and marketing their image. Simply put, a brand is a promise that internal and external

To effectively hire the best talent and avoid "bad" hires, begin by understanding which positions are needed within the organization.

customers will receive a specific level of value, quality, and service. When a brand promise is not kept, customers flee and go elsewhere. Not only do they go elsewhere, but they will share their bad experience with everyone they know. In the war for talent, companies cannot afford to have a negative image in the marketplace. Companies should invest in learning what their current talent thinks about the company in addition to the reasons they stay. Companies can then publicize these reasons in targeted media outlets, web sites, etc. to attract people to their doors rather than having to make all of the recruiting effort. Gaining placement on "best employer" lists is one way to provide third-party proof of performance as an employer of choice.

Furthermore, companies should ensure training and development programs, performance management systems, and rewards programs are designed to reinforce and promote the image they have created for themselves. Inevitably, when internal customers believe in the company message, they will convey that to external customers, and even more importantly in this case, convey that to potential hires.

In this market, top performers will have many companies "fighting" over them. Companies will need to be prepared to make offers efficiently, even if it means losing the red-tape and expediting the hiring process. After employees are hired, they should be brought up to speed as quickly as possible so that they will be a productive part of the workforce. New employee orientation (often referred to as integration or on-boarding) solidifies the new employee's relationship with the organization, fuels their enthusiasm, and guides their steps into a long-term positive relationship with the organization. Done poorly, it will leave new employees wondering why on earth they ever walked through the door.

Hiring decisions that result in "bad" hires drain a company's time, training resources, money, and energy. To effectively hire the best talent and avoid "bad" hires, begin by understanding which positions are needed within the organization. Define and build these positions before recruiting and hiring begin. Once these positions are identified and understood, the organization must have an effective strategy for recruiting top performers. This may involve improving the organization's image, recruiting

in the most effective arenas, and/or understanding the factors that will attract top performers. However, a company's efforts cannot stop with successful recruiting.

TRAINING DEVELOPMENT AND DELIVERY

Opportunities for training and development are one of the most important predictors of employee retention. Not only does training show employees their value to the organization, but it also increases skill levels, enabling better on-the-job performance. According to the Bureau of National Affairs, the average annual turnover rate for all U.S. industries is approximately 12%. However, some contractors have turnover rates reaching as high as 80%. The loss of available workers costs time and money, making the retention of existing workers even more important.

Many organizations have found that providing training opportunities gives them a competitive edge when recruiting top employees. According to the American Management Association, more than half of all U.S. companies currently use their leadership development program as a recruiting tool. One of the best ways to attract and retain top employees is to show them the organization's willingness to help them achieve their desired career path by offering them opportunities for career development through training.

Management training in the construction and engineering industry should be focused on the profile of the people in this industry. To be effective, training must be responsive to the needs of these participants. Although they are generally well educated, many industry recruits are not used to sitting in a classroom. In general, adults have short attention spans, a condition that is compounded by the pressures of the construction industry. Training must be designed with components to support a stimulating adult learning environment.

PERFORMANCE MANAGEMENT AND REWARD SYSTEMS

In the traditional performance appraisal or review process, supervisors annually assess and document the performance of their reporting staff members. In some organizations, employees are asked to fill out a self-review to share with their supervisors. In many instances, the appraisal reflects what the supervisor can remember, and often these are based strictly on the supervisor's opinion of the employee's behavior during those recent, remembered events.

Many supervisors are so uncomfortable in the role of judge that performance appraisals are often months overdue. Despite the fact that annual raises are often tied to the performance evaluation, supervisors avoid appraisals as long as possible. This results in unmotivated employees who feel their supervisor doesn't care about them enough to facilitate their annual raise.

Performance management is more than a form and an annual sit-down with

the boss. Performance management starts when a new employee comes onboard and ends with a departing employee's exit interview. Between these points, the following must occur to make performance management work:

- Develop clear job descriptions.
- Select appropriate people with an appropriate selection process.
- Negotiate requirements and achievement-based performance standards, outcomes, and measures.
- Provide effective orientation, education, and training.
- Provide ongoing coaching and feedback.
- Conduct quarterly performance development discussions.
- Design effective compensation and recognition systems that reward people for their contributions.
- Provide promotional/career development opportunities for staff.
- Reinforce excellent performance.
- Assist with exit interviews to understand why valued employees leave the organization.

Once a company has found star-potential talent, it must work to keep this talent by successfully managing their performance and career progression. Managing the performance of stars is a continuous and evolving process aimed at ensuring employees' goals are consistently being met in an effective and efficient manner. Performance management enables companies to help employees develop and reach clearly articulated goals. Furthermore, it helps people develop both personally and professionally. When an organization's employees are successful, success for the organization follows.

Once a company has found star-potential talent, it must work to keep this talent by successfully managing their performance and career progression.

CAREER PATHING

Career pathing is a process for identifying specific advancement opportunities within an organization and includes the necessary steps to attain particular career goals through education, skills training, and experience building. Employees and their managers or human resource personnel work together to develop career plans that focus on the employees' strengths and interests while addressing relevant growth and advancement opportunities within the company.

Successful career pathing is key to ensuring personal growth and the retention of the right staff for an organization. Helping employees achieve their career goals encourages them to remain with their company. This show of support increases commitment and productivity, and thereby reduces voluntary turnover. Career pathing is often linked to succession planning and is used to fill key positions in most organizations.

ASSESSMENT/EVALUATION

Finally, companies need to recognize the importance of continuously assessing and evaluating their strategies in the ongoing war for talent. Metrics must be established and tracked to quantify the impact of all new actions and reinforce their continued use when successful. Examples of metrics include:

- Reductions in turnover and absenteeism
- Increased productivity
- Improved efficiency
- Decreased costs

Employee turnover, for example, is inevitable. The costs of turnover are easy to overlook or ignore, but beware. Excessive employee turnover has obvious costs that can be tracked, but the real costs often take a far greater toll. Many new employees do not become fully productive until they have been trained and gain experience, a process that usually takes months, at a minimum. The time, effort, and money invested in those employees also walks out the door when the employees leave. Tracking reductions in turnover and absenteeism is just one method of evaluating a talent development strategy.

The war for talent is real, and we can either do something about it or attempt to ignore it. In order to remain sustainable and successful in the knowledge-based, changing economy of our present world, construction companies must continuously invest in their human capital. Organizations that effectively address the need to develop talent through recruiting and hiring, training development and delivery, performance management, career pathing, and reinforcement and evaluation will gain a competitive advantage. ■

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