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BY DAVID N. ALLISON AND TIMOTHY R. SZNEWAJS

This Quarter: Weighty Matters

Dear Reader:

Like many of us who ate too much during the holiday season, the *FMI Quarterly* has gained a bit of weight for this issue. I think that you will find the reading not only greater in quantity, but you'll also find more provocative and useful ideas.

Hugh Rice and Art Heimbach weigh in with both the longest piece and one of the more thought provoking pieces in *FMI Quarterly's* history. They and FMI's Research Services Group have undertaken the dissection of many of the large, failed contractors of recent decades in our effort to understand primary causes of failures. While some of the apparent causes are obvious, the underlying factors are less obvious. Stick with the narrative ... and ask yourself if any of the characteristics are becoming true in your organization.

Bill Spragins brings us an in-depth description of the award-winning T-REX project and the partnering that helped T-REX win AGC's Marvin Black Award for Excellence in Partnering. What a testimony to the power of the partnered project. If you thought partnering was passé, give Bill's article a careful read.

Our partner in producing the *Quarterly*, Zurich North America Construction, gives us some tips on connecting the dots between safety, quality, productivity, and profitability. We continue to appreciate the support that Zurich provides to this publication.

Mark Bridgers bring us our interview this issue with Contax, a growth advisor to companies wanting to enter the Middle East construction market. Mark talks with Chairman and Founder, Tony Bury; CEO Paul Eccleston; and Director Shaheen Chohan to gain insight into the challenges and opportunities in this region.

Regular contributor Kelly Chisholm brings us a discussion of online degrees in construction management and joins with Randy Nemchin to frame a thoughtful piece on how to leverage the trained worker.

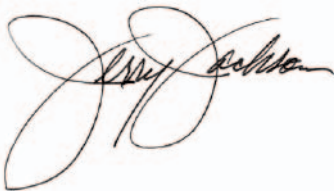
Greg Schoppman isn't a regular contributor, but when he does, it is always worth reading. Greg's work this issue deals with change orders and how to better manage them. Follow his suggestions, and you should plug profit leaks and even turn aggravation into opportunity.

Heather Jones, chief construction economist from our Research Services Group, provides the good news and the bad news in her regional forecasts. Heather is a large portion of the brains behind FMI's *U.S. Markets Construction Overview*. Her ability to produce for the *Quarterly* and get her major publication completed is impressive.

We have a number of other articles from regulars like Ralph James, Vanessa Winzenburg, and Ashley Robertson in addition ones from newer writers like Jeff Schulz, Tim Tokarczyk, and Willie Hepworth.

Next quarter we may shed a few pages from the *Quarterly*, just as some of us hope to shed a little weight ourselves. Someone posed the notion that "Hope is not a strategy." Losing pages is much easier than losing pounds. In neither case, though, do we aim to lessen the quality of our product. Enjoy your reading.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jerry Jackson", with a large, stylized loop at the beginning.

Jerry Jackson
FMI Quarterly Publisher and Senior Editor

Departments

GENERAL CONTRACTORS

Understanding More With the Personal Profile System

The Personal Profile System (DiSC) has been an easy-to-use tool for understanding human behavioral tendencies for many years. The DiSC is a fast way to discover our own tendencies and the tendencies of others without going through the much more costly and time-consuming route of trial and error.

Respondents provide opinions to most and least choices of 28 groups of four words. This is not a test; no right or wrong choice exists. Choices are then sorted into four meaningful patterns: Dominance, influence, Steady, and Conscientious (DiSC). Patterns reflecting choice preferences are then displayed in panels (see Exhibit 1). Stronger tendencies are depicted closer to the top of each panel while less-intense tendencies inhabit lower positions.

Stronger tendencies are those clusters of behavior that individuals choose to use most of the time when dealing with others. Under certain conditions, an individual may choose non-typical behaviors. Some of these conditions will be illustrated later in this article.

THE STANDARD INTERPRETATION

In the standard interpretation, emphasis is given to the key characteristics of each behavioral pattern (D's, i's, S's, and C's).

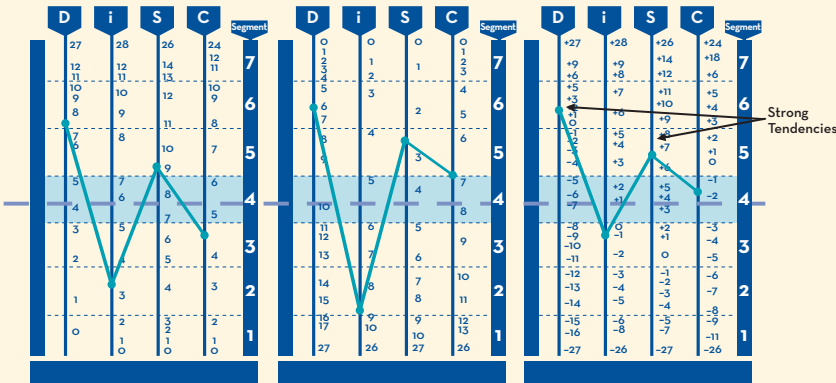
D — Dominance	i — Influences	S — Steadiness	C — Conscientiousness
Results-oriented	Friendly	Easy-going	Correctness
Decisive	Trusting	Team-worker	Accuracy
Adventurous	Open	Consistent	Analytical
Bold	Enthusiastic	Listener	Thorough
Competitive	Talkative	Sincere	Standards-oriented
Enjoy challenge	Interactive	Low-key	Critical

Each panel also plays a role in the standard model. The first panel reflects perceived expectations and provides insight into how the respondent feels about the job or role demands. This can then be contrasted with the individual's actual job description.

The second, or middle, panel describes the individual's instinctive response to pressure. This is the underlying self-programmed behavior from childhood.

Exhibit 1

Preference Panels



Because behavior under pressure usually occurs without conscious thought and selection, this behavior can be referred to as the “true self.”

The third panel summarizes the first two panels into a consensus self-perception. This is who the individual believes himself or herself to be. Notice that the evaluations of data points in the third panel fall halfway between elevations in the first two panels. In this sense, the self-perception of panel three is an average of perceived expectations and true self.

Behavior patterns are further interpreted in 15 classical models. These models describe typical characteristics of profiles of a given shape. For example, the results-oriented classical pattern (see Exhibit 2) describes the results-oriented individual as forceful and competitive. The system provides specific goals and fears with effectiveness growth strategies.

THE PANEL RELATIONSHIP INTERPRETATIVE

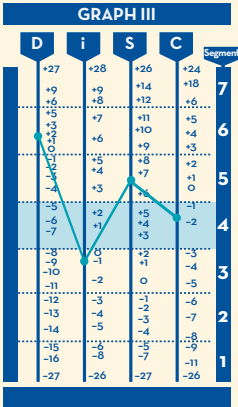
Over the last 20 years thousands of DiSC seminar participants have been asked by FMI to confirm or refute additional inter-panel information not presented in the DiSC Profile. They overwhelmingly confirmed the correctness of certain inter-panel interpretations. This is presented here as customer feedback, not scientific research.

Customers agree with the following additional points (refer to Exhibit 1):

- If the D data point is higher in the middle panel than the first panel, the individual tends to feel anger under pressure.
- If the D data point is lower in the middle panel than the first panel, the individual tends to become more team-oriented under pressure.
- If the i data point is higher in the middle panel than the first panel, the individual tends to thrive under pressure and communicate more.

Exhibit 2

Results-oriented DiSC



- If the i data point is lower in the middle panel than the first panel, the individual tends to dislike pressure.
- If the S data point is higher in the middle panel than the first panel, the individual may require pressure to perform tedious tasks such as paperwork.
- If the S data point is lower in the middle panel than the first panel, the individual becomes more active under pressure.
- If the C data point is lower in the middle panel than the first panel, the individual becomes less compliant under pressure.
- If the C data point is higher in the middle panel than the first panel, the individual tends to be motivated by deadlines.

Customers also agree that the closer the shape of the profile in the third panel is to the shape in the first panel, the higher job satisfaction tends to be.

Finally, customers agree that the closer the shape of the profile in the third panel to the middle panel, the better the individual knows himself or herself.

Customers may not be scientists, but they are central to how any instrument is received and understood. As a general rule, they appreciate the insights of the Personal Profile and enjoy discussing its in-depth implications. ■

Ralph James, Ph.D. is a director with FMI Corporation. He may be reached at 919.785.9227 or via e-mail at rjames@fminet.com.

ZURICH CONSTRUCTION

Making the Connection: Safety, Quality, Production, and Profit

Recent Construction Industry Institute studies point to both good and bad news in the construction industry. The good news is that overall worker injuries are down. The bad news is that losses connected to quality continue to have a negative effect on production and profit.

Such mixed results aren't surprising since the safety, quality, and production programs in many companies are so compartmentalized that the responsible parties don't communicate with each other. Because the success of these programs is so intertwined, this lack of communication hinders each program — and collectively affects the contractor's profitability.

Construction defect claims cost an estimated \$3.2 billion a year in the United States.

Construction defect claims cost an estimated \$3.2 billion a year in the United States. One of the most common reasons for filing a claim is to "just-get-it-done." Shortcuts undermine not only safety, but quality and productivity.

This article examines each type of program and demonstrates how weaving them together improves outcomes and profitability.

Just imagine how a single headline-grabbing incident could stifle your company's profitability for years to come.

years to come. For starters, the accident could result in both short- and long-term costs to secure a replacement for an injured employee and create an immediate project delay while medical workers attend to the injured employee(s). In the days and weeks to come, accident investigators would cause further slowdowns when they interview witnesses and examine the site and any machinery involved. Then, of course, the legal teams for the defense and prosecution will spend time and money building a case on their clients' behalf.

In addition to the direct costs associated with compensating the injured and bereaved, the contractor may need to provide counseling for employees who witnessed the accident. Some employees may quit because they no longer have confidence in their employer. The company may need to upgrade site facilities and belatedly enhance its safety training program.

The most valuable asset a company has is its reputation — which can wither in the aftermath of a serious incident. Public relations expenditures will rise as the company finds it more difficult to keep its current customer base and attract new customers and employees. Even in the best-case scenario, it may be decades before the company's public image is fully restored. It's hard to put a figure on such indirect expenses — none of which are covered by insurance.

A proven safety track record is critical for acquiring new customers, especially in high-risk industries such as pharmaceutical, petrochemical, and energy — where contractors that don't have a good record can't get on the bid list for major projects.

A poor record will also lead to a high Experience Modification Rate (EMR), which insurance companies rely on to determine premiums. While a rate of 1.0 is considered average, the ratings for the most safety-conscious contractors are much lower.

An effective safety program also:

- Lowers medical costs by reducing the frequency and severity of injuries

SAFETY COMES FIRST — OR IS IT QUALITY, PRODUCTION, OR PROFIT?

In some construction organizations, efforts to maintain an effective safety program continue to be undermined by an "accidents-will-happen" mentality. This lack of commitment has an enormous effect on the bottom line and on a loss of expertise in some construction organizations.

Just imagine how a single headline-grabbing incident could stifle your company's profitability for

The most valuable asset a company has is its reputation — which can wither in the aftermath of a serious incident.

- Eliminates the need for recruiting and training someone to replace an injured employee
- Leads to higher-quality workmanship
- Improves employee morale, which leads to increased productivity
- Reduces the likelihood that expensive, time-consuming rework — which triples the odds of having an accident — will be required.

Fortunately, many forward-thinking contractors closely associate safety and quality and have implemented rigorous programs to protect both. They know that a strong safety culture enhances compliance and results in improved utilization of resources — time, money, and energy.

INDUSTRY CHALLENGES

As processes, materials, equipment, and the workforce continue to evolve, the construction industry is facing more challenges today than at any time in its history.

Bureau of Labor (BLS) statistics indicate more than half of the construction workforce is over 45 years old. In some crafts, the median age is even higher. While experienced workers are less likely to take foolish risks, they can be more prone to stress and overuse injuries.

As processes, materials, equipment, and the workforce continue to evolve, the construction industry is facing more challenges today than at any time in its history.

Language barriers represent another significant workforce issue. OSHA statistics indicate non-English-speaking workers are 45% more likely to die in construction accidents. The reason is readily apparent: How can a worker who doesn't understand the language follow directions?

Cultural differences create additional communication barriers. In some cultures, workers are trained never to question authority, never to say "no" to a supervisor's request. This lack of bottom-up communication can be hazardous.

The latest tower crane monitors an EKG and the pulse of its operator.

The latest power nailers use butane

gas, reducing noise and clean-up time. While it is exciting to think of the potential these enhancements offer, it is also necessary to consider whether they require changes to worker training programs and safety procedures.

The way in which construction project liabilities are structured is also changing. In the past, most project owners hired a general contractor who, in turn, hired subcontractors. Today, the owner of the project may also be the general contractor. In terms of insurance, project policies now come in a variety of forms — owner-controlled (OCIP), contractor-controlled (CCIPS), and self-insured contractors who provide coverage for their subcontractors.

Each of these insurance arrangements entails specific legal responsibilities and worker relationships. A key aspect of these arrangements is an assignment

of responsibilities and authority from the top that extends to the newest worker. Who is responsible for safety? For quality? For production?

Every new construction material introduced in the marketplace also creates challenges. For example, a new paint may have a different chemical composition

that requires spray-gun application instead of a roller. How will this affect quality and safety? What about productivity? Profitability? If you incorrectly apply the paint and it peels off a month later, you will have problems with all of these programs.

A safety culture that permeates all levels of a company takes years to achieve and must start in the CEO's office.

ORGANIZATIONAL DYNAMICS

A safety culture that permeates all levels of a company takes years to achieve and must start in the CEO's office. Safety must be a common theme in all CEO communications with employees. Companies with an unwavering commitment to safety

require the highest-ranking safety professional to report directly to the CEO.

To ensure the safety message is not diluted as communication moves down the corporate hierarchy, project managers, superintendents, and foremen must consistently demonstrate a safety mindset. Even though they are not in the chain-of-command at the job site, safety professionals assist the management process and serve as an important link between the corporate office and job site.

Many companies have a culture that is not aligned with corporate policy. In these organizations, workers and managers may circumvent sound policy for the sake of expediency. Sometimes an old-school, macho-mentality persists. To bring these nonconformists in line, the management message must be clear: We will not sacrifice safety for short-term productivity because our primary goal is to have zero incidents.

All accidents are caused by people, machines, or materials. In addition to ensuring machines and materials are task-appropriate and in working order, supervisors must focus on their workers.

Many loss-control experts agree that different perceptions of the contractor's corporate culture or environment can lead to communication breakdowns and gaps among what management, supervisors, and field employees think — which can hamper safety efforts.

To help contractors identify potential culture problems, Zurich offers the Cultural Gap Analysis™, an objective tool specifically designed to evaluate construction businesses. The analysis is a perception survey that helps companies understand

All accidents are caused by people, machines, or materials.

the areas where they are doing well in loss prevention and also the areas for improvement. Unlike traditional safety measures that identify where safety performance should be, the Cultural Gap Analysis reveals what is actually happening on the job site.

A proactive safety culture should permeate all levels of the organization. When management actively supports the safety program, when field supervisors implement it, and when employees embrace it, the program will be successful. The Cultural Gap Analysis verifies where any shortfalls are occurring.

LINKING IT ALL TOGETHER

So what can you do to limit worker injuries, while improving quality, production, and profit?

Here are tips from some of the most successful construction organizations:

Grow your bench strength — If you only have one worker with a specific skill set, what will you do if that worker leaves?

One contractor has solved this problem by implementing a program called, “Everyone teaches one.” This program is designed to create an institutional memory of every job and promote the development of job skills.

Establish accountability — Clearly define your goals and compensate the people who help you achieve them. Do you have accountabilities for production at each step and with each subcontractor? Who is accountable for safety and quality? What gets measured gets done. Reward people based on the measures you establish.

But also discipline workers who don’t comply with your programs. Some companies will ask an offending worker to bring their spouse or significant other to a meeting where management discusses the possible consequences of safety mishaps. Bringing the problem home is an effective way to change behaviors.

Get it on paper — Documentation is a critical component of any construction project. Expectations for safety, quality, and production need to be clearly

stated. More and more, contractors are doing this electronically — via CD-ROM or an intranet.

Clearly define your goals and compensate the people who help you achieve them.

Follow schedules and make plans — A clearly defined schedule prevents a host of problems. Materials delivered on time are less likely to be stolen, damaged, or block the progress of other work. All craft schedules need to be orchestrated.

Pre-project planning improves safety, quality, and productivity — while also saving money on the

back-end. For example, a temporary stairwell takes a little longer to erect, but is safer and more efficient than a job-built ladder. Also, consider the traffic flow through the job site to reduce the chance of accidents.

Establish a training regime — Industry statistics indicate nearly half of construction accidents happen with workers new to a job site. That's why new workers must start by attending an employee orientation program. An additional measure of precaution is to identify new workers on the job site with a special piece of apparel — such as a different color hard hat — so other workers can easily identify them.

Progressive contractors take their new-hire training a step further by providing an orientation each time an employee transfers from one job site to another.

To prevent complacency, management must explain the rationale behind new and existing safety policies. The companies with the lowest EMRs empower employees by giving them the final say in safety matters.

S&B Engineers and Constructors, a leading contractor in Houston, Texas, believes in establishing a safety mindset on every construction project. S&B has implemented a “no-fault” safety policy. Under this tenet, any worker who decides to stop a project because something is unsafe is not held responsible for project delays.

“Our safety department is involved right at the start of every project,” said Ralph Riley, corporate workforce programs manager at S&B. “We’re always looking for ways to make and keep a project safe — whether the topic is project planning or hazard analysis.”

S&B has established a rigorous new-hire training program.

“We make no assumptions as to the level of safety training new employees may have,” Riley said. “Our approach is to assume they are either untrained or poorly trained in safety, and so we train, train, and train them in S&B’s safety culture. We take the same attitude toward our subcontractors. We consider it not only a matter of survival, but also a moral obligation to our workforce and our clients.”

Communicate, communicate, communicate — The most successful contractors continually renew their commitment to safety and quality at the job site. Each day begins with a meeting, during which assignments are reviewed and analyzed. This meeting serves a dual purpose: It ensures everyone has the equipment required to start work immediately and facilitates a smoother workflow as the day progresses.

“Our morning meetings provide a roadmap for the day,” said Riley. “Supervisors can use this time to verify the right tools and the proper numbers of employees are on-hand for each task. Some workers may be working on an excavation in the morning, but in the afternoon will be working at heights that require all of their fall-protection gear.”

Progressive contractors take their new-hire training a step further by providing an orientation each time an employee transfers from one job site to another.

Identifying these changes before the task begins helps avoid a situation in which employees are standing around, waiting for the proper equipment to arrive at the job site. The workflow is more efficient and productivity is enhanced when everyone has the right tools and is prepared for work.

Morning meetings also provide supervisors an opportunity to restate the company's safety policy and notice whether workers are primed for the day ahead. Do they look healthy? Are there any signs of a hangover? Are they experiencing any other stressors that could influence their concentration or work quality?

As the day progresses, supervisors may find that additional meetings are necessary. Whenever workers are tackling non-routine tasks or something for the first time, it is prudent to spend a few minutes discussing task-specific safety issues.

Linking production, safety, and productivity programs together can dramatically improve outcomes and profits.

Effective safety programs also include post-task reviews. What went right? What can we do to improve the process? What have we learned for the next job? These reviews help refine existing processes and future activities.

There is no quick-fix method of making the connection between safety, quality, and production programs. Each program involves methodology, workers, site issues,

environmental conditions, and other variables. When people say "safety, quality, and production are everyone's job," that may mean it's no one's job. That is why it is important to establish accountability for each individual program and to establish linkages among programs. Linking production, safety, and productivity programs together can dramatically improve outcomes and profits. ■

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CASE STUDY: PCL CONSTRUCTORS REACHES FOR ZERO INCIDENTS

At the PCL family of companies, an employee-owned firm headquartered in Edmonton, Alberta, Canada, safety has always been an instilled value.

"The care and concern PCL employees have for each other is unparalleled," said Jim Barry, director of environment and safety at PCL. "Added to this genuine care and concern is the fact that most PCL salaried employees are shareholders in the group of companies so injuries affect us in many ways."

PCL, which began as a small prairie construction firm in the early 1900s, has grown into the largest general contracting organization in Canada and the 10th largest in the United States. The company employs more than 2,500 full-time professional and administrative salaried staff and more than 5,000 hourly tradespeople who work in locations across Canada, the continental U.S., Hawaii, and the Bahamas. At any one time, PCL's network of companies is working on more than 500 projects, ranging in value from \$20,000 to more than \$2 billion.

"Our enhanced safety efforts started right from the top," Barry said. "Our president and CEO, Ross Grieve, stood up at our annual operations conference a few years ago and challenged us to achieve a zero incident rate. We were very motivated by Ross' challenge and left the conference determined to achieve the goal he outlined."

Enhancing PCL's safety program required input from many sources and a review of the roles that PCL's safety professionals play.

"It wasn't an easy process," Barry said. "We had to focus on many issues and the core program elements. Our equitable management program, business plans, and site-specific safety plans all came under review. Before we analyzed our program, our safety professionals used to sit on the sidelines and criticize operations after-the-fact. Now they're intertwined, in the trenches, at each job site. They function as an on-site resource instead of acting as safety police."

Even though safety is an instilled value for everyone at PCL, the company has clearly defined who is responsible for each aspect of the program.

"Our safety program has definite accountabilities," Barry said. "The three chief operating officers who run our divisions hold district managers responsible, and this accountability flows down the chain of command. And safety performance is considered when determining employee compensation."

PCL supervisors also play a key role.

"At each job site, supervisors conduct regular morning meetings," Barry said. "During this time, trends and issues are discussed and workers are given a chance to stretch out, which helps prevent soft-tissue injuries. We also use this time to conduct pre-job safety sessions, which include personal protective equipment discussions and identification of hazards such as ergonomics and weather-related issues. We find that when we give workers clear and concise instructions, safety rides along with production."

Keeping a detailed record of safety performance also helps PCL stay on track.

"We've made a tremendous investment in a safety management database that is available to all employees and sites throughout the company," Barry said. "We put inspection, first-aid, incidents, and a variety of other data into the system to help us identify trends and prevent the likelihood of future occurrences."

PCL is reaping the results of its comprehensive safety program. In 2006, PCL's lost time frequency rate was .26 and its total recordable incident rate (TRIR) was 3.5, based on 15.3 million man hours.

"Our executives read our safety reports and use the information at bi-annual employee fireside chats to encourage continuous improvement," Barry said. "Safety is always the first item on their agenda, and they continue to challenge us to raise the bar."

Quarterly Profile

**Middle East
Market Challenges:
*Contax***

**“The contracting
industry is no stranger
to change ... but is
it ready to address
tomorrow’s challenges?
We believe that it is.”**

— Paul Eccleston

In the following interview, FMI's Mark Bridgers talks with Tony Bury, Contax chairman and founder, Paul Eccleston, CEO, and Shaheen Chohan, director of market insights. Together, they describe their **perspectives on challenges and opportunities in the Middle East** that are impacting many of the U.S. firms operating there.



Tony Bury

They also shed light on how the fastest growing construction market in the world is influencing design/construction activity in the United States.

FMI Quarterly: Describe Contax's background and what brought the firm to its dominant position today?

Bury: My experience in the Middle East goes back to 1966 when my parents lived in Bahrain. I later worked in Saudi Arabia between 1974 to 1976, and ultimately ended up in Qatar where I served as a general manager of AKC Contracting. This firm had four core operations: 1) AKC, a building company with over 1,400 staff, 2) AK Group, a trading company, 3) Nefco Industrial Services Company, and 4) AK Trading, a petroleum trading company. Through this exposure, I built extensive relationships with both native and foreign firms operating in the Middle East. When I left this organization and founded Contax in 1985 in Qatar, our mission of providing market insights on the Middle East was built upon my accumulated experience. Our first four customers



Paul Eccleston



Shaheen Chohan

included managing a relationship with British Petroleum, General Electric, and two Japanese trading firms, all of whom were looking for a competitive advantage in securing work in this region. (See map on page 18.)

FMI Quarterly: Why would companies as large and sophisticated as British Petroleum and General Electric need help? What was the challenge they were facing?



Bury: Securing business in the Middle East during this time period was based on existing relationships and trust. This focus goes back to the family-oriented ownership of the native businesses in this region. Almost without exception, foreign nationals and foreign corporations could not own equity stakes in operations at that time. The family relationship is the dominant one in that native firms want to deal with family or organizations run by

neighboring families they know and trust. In the absence of a native firm with the capability, they will turn to outside organizations, but only ones they know and trust. The relationships I built allowed me to support introductions and assist organizations with the development of compelling proposals and business cases to serve these native firms.

FMI Quarterly: Is the market the same today?

Bury: It is changing dramatically; it has become more arms-length and less based on historical family relationships. Firms like Exxon/Mobile have introduced their standard procurement methods on their projects, and the selection of a design/construction service provider is more objective — based upon both qualification and price. Relationships can still help get someone to the table, but it will not secure the project.

Eccleston: This shift is helping to drive the growth of our business. Today, we have four main services that we offer owners, contractors, and designers in the Middle East market.

- **Business advisory services** — built around helping design/construction service providers implement an appropriate strategy to secure high-value projects.
- **Business investment services** — provides sales representation to customers by established companies owned by local persons through a joint venture to build local operations in the region.
- **Market insights services** — provides the use and sale of our extensive accumulated knowledge on what is happening in the Middle East.
- **Growth advisory services** — designed to help organizations successfully grow their Middle East operations.

FMI Quarterly: Tell me more about each of these areas.

Bury: Business advisory in the form of project acquisition efforts was our original, core service. Today, we work with our client's project team to advise

and provide assistance through opportunity selection and positioning along with advice on the structuring of their technical and commercial proposals. Our accumulated knowledge and experience of how the owners tend to make decisions generates a competitive advantage for our customers. We have demonstrated an ability to dramatically improve the likelihood our clients will be selected, and we align ourselves to our customers in that we are only paid when our clients are successful. This fee structure is central to our approach; we share the risk and the reward with these clients. The business investment portion of our business is built around helping connect the right people. A contractor or owner that wants to conduct business in the Middle East, almost without exception, uses a local business person that owns either 100% or at least the majority of corporation's stock. The financial rewards of this arrangement are normally distributed in a variety of structures, including management agreements to contracts. As you can imagine, connecting with the wrong local person can be disastrous. Our role is to bring together the right people.

Chohan: Contax is unique in that we are tracking 99% of the project activity occurring in the broader Middle East. This ability to access project-by-project level information and specifically identify the owner or buyer is invaluable to our clients and particularly new market entrants who want to better understand the volume of work in a market and the players in that market. To outside participants, this Middle Eastern market is still opaque and gaining visibility is not practical or possible without connecting with someone like Contax. Ultimately, we use this information to help firms make both market entry strategy into the Middle East and appropriate opportunity identification to achieve growth.

Eccleston: Our growth consulting business is our newest service offering. In July 2004, Contax was highly successful but not sustainable since Tony (Bury) was one of the main drivers of business activity. The management team met and agreed upon a set of strategies specifically designed to build a sustainable business. These strategies dictated the start-up of a new service offering, which grew from our existing base of knowledge but did not totally rely on Tony (Bury). Our hiring has ramped up, and today, we have 40 individuals

Founded in 1985 by Tony Bury, **Contax** is specifically focused on the Middle East oil, gas, and petrochemical industries and the construction necessary to support them. A specific area of the firm's knowledge is the application and use of Engineer/Procure/Construct (EPC) project delivery systems. The firm's historic focus has been completing numerous market entry studies, predominately for contractors attempting to enter this market. Going forward, the firm is re-branding itself as "a strategic growth advisor for the Middle East" and will focus on the delivery of consulting solutions to owners, engineers, and contractors. A headquarters is maintained in Dubai along with additional offices or representation in Bahrain, Qatar, Saudi Arabia, United Arab Emirates, Cyprus, and India, which results in an intimate familiarity with both local culture and the specifics of design/construction markets in the Middle East. A research group with primary and secondary research capabilities is central to the firm's success; it focuses on developing insights through fact-based market intelligence. As a result, Contax has considerable insight on the challenges and opportunities in the Middle Eastern design/construction markets.

on staff providing or supporting our growth consulting business that were not employees of Contax 12 to 15 months ago. We see great opportunity in the market and intend to capture it.

We have positioned the firm for growth through these service offerings, which ironically are focused on helping our clients grow successfully. This growth consulting is based upon answering three core questions:

1. How do we create value?
2. How do we accelerate value creation?
3. How do we minimize risk?

FMI Quarterly: Paul (Eccleston) and Shaheen (Chohan), what is your area of expertise with Contax?

Eccleston: My expertise is in the energy, utilities, and construction industries focused on delivering market strategies, strategy and implementation, mergers and acquisitions, strategic outsourcing, business transformation, and strategic asset management.

Chohan: My current role is managing the Contax energy project data service, which is the region's leading CAPEX project-tracking and monitoring database and provides detailed information on around 4,000 energy and energy-related projects within the Middle East and Africa.

FMI Quarterly: Regarding change, what are the drivers of change in the Middle East market today?

Chohan: We see nine “game changing” forces playing out over the next decade and impacting both domestic and foreign design/construction firms and owners. These are:

- **Construction demand** — unparalleled for CAPEX projects in the region
- **Parallel demand** — a workload peak for labor during 2008
- **“Rules of play” shift** — a much greater need to deal directly with customers/clients to understand their needs
- **Boom followed by boom** — Saudi Arabia is the next boom market followed by Qatar once they lift the gas moratorium.
- **Soaring costs** — yesterday, materials; today, labor; tomorrow, facility cost
- **Resource pull** — as the next boom market, Saudi Arabia has the cash and will pull the resources from other markets.
- **Workforce quality** — demand currently exceeds supply of qualified labor, and the pending retirements are further draining available staff, creating a crunch.
- **Cost to conduct business** — readily available cash is creating inflation pressure resulting in a paradox: high growth whilst firms are losing market share to competitors.
- **Competitive advantage shift** — differentiating competencies are emerging, resulting in a shift to new sources of these advantages.

Our four key services are designed to help organizations recognize which of these forces are specifically impacting their strategies. We find in many instances that the impact of a particular factor is directly related to the internal strengths or weaknesses of the firm in question.

FMI Quarterly: If there are differences in impact, do these challenges play out differently for owners vs. contractors?

Eccleston: The shift in competitive advantages we observed resulted in our identifying a set of nine questions, which we pose to our contractor clients. We have a separate set of six questions for owners when they pursue growth. The answers to these questions impact the development of strategy and tactics for these firms.

Questions for Contractors

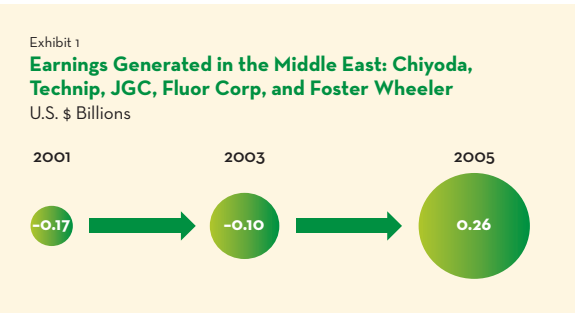
1. How are you going to build respectful, meaningful relationships with your suppliers?
2. How are you going to measure your competence to take on appropriate contracting strategy?
3. How are you going to benchmark your capabilities against competitors and owner aspirations?
4. How are you going to enhance your capabilities as a result of benchmarking?
5. How are you going to develop strategic orientation before the downturn arrives?
6. How are you going to capture knowledge before it walks out the door?
7. How is “people development” going to be placed at the heart of your competency framework?
8. How are you going to develop community orientation as a core competency?
9. How are you going to build trusting relationships with your subcontractors?

Questions for Owners

1. How are you going to capture “knowledge” for the benefit of new recruits?
2. How are you going to develop performance metrics to benchmark the quality of your project teams within your organization and against competitors?
3. How are you going to develop “managing relationships” as a key competency focus?
4. How are you going to utilize benchmarking to develop contracting strategies in the future?
5. How are you going to achieve “contracting performance,” which may conflict with traditional evaluation and decision-making processes?
6. How are you going to reward contractors who develop their competencies and create value?

FMI Quarterly: These questions revolve around changes in contracting strategies. What do you see changing relative to these contracting strategies in the Middle East construction market?

Eccleston: The contracting industry is no stranger to change ... but is it ready to address tomorrow’s challenges? We believe that it is. The largest engineering and construction firms currently operating in the Middle East include Chiyoda, Technip, JGC, Fluor Corp., and Foster Wheeler. The earnings generated by these firms in the Middle East are improving. Yet, they are not adequate for the risk undertaken, particularly in the use of EPC delivery models. (See Exhibit 1.)



Chohan: In addition, the contracting strategies have shifted to reflect the recent change in the balance of power between service providers and owners. Between 1980 to early 2000 much of the power resided with

owners that were able to push risk and responsibility to the service providers. Today’s demand levels and the difficulty in getting access to qualified labor, engineering talent, and project management talent are resulting in a shift of power back toward the service providers. (See Exhibit 2.)

FMI Quarterly: Given all the disruption and change, what are the solutions for successful construction in the Middle East?

Eccleston: The solutions that we see in this market are all built upon a base of transparency of the relationship between owner and contractors. Historically in the Middle East, the perception of trust between contractors and owners is very low, and a lack of trust is built into the process. This lack of trust is, in part, due to a lack of transparency in the process, and the fact that owners have tended to keep poorly qualified contractors involved in the process, forcing

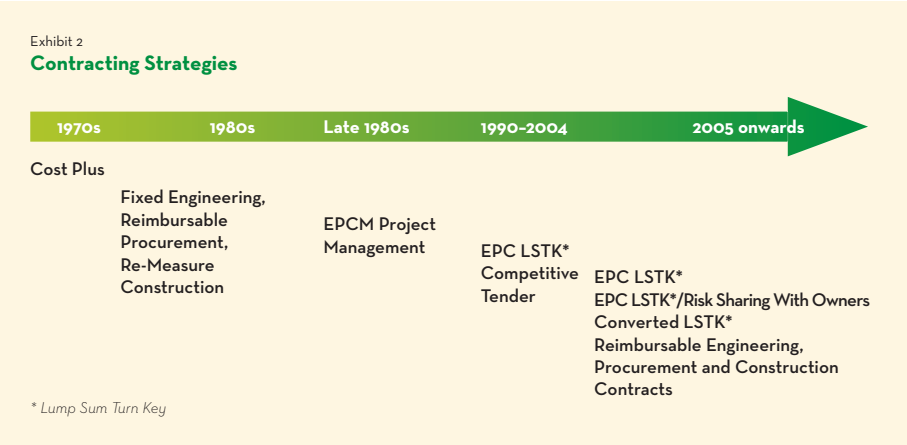


Exhibit 3

Assessment Matrix for Contractor/Owner Fit

The Future Competency Picture for Contractors			The Future Competency Picture for Owners		
Performance Orientation	People Development	Strategic Orientation	Strategic Orientation	People Development	Performance Orientation
Managing Relationships	Change Orientation	Community Orientation	Managing Relationships	Change Orientation	Community Orientation
Innovation	Service Orientation	Complexity	Innovation	Service Orientation	Complexity

class A contractors to compete against class C contractors. Transparency can only be built between two firms with matching competencies and who change behavior, build skills, and grow knowledge together. Today, both owners and contractors must understand themselves and their partners. Contax designed the matrix in Exhibit 3 as a way to assess the degree of fit between a particular contractor and a particular owner. In the example, the contractor and owner are well-matched; their particular competencies mirror each another. This mirroring raises the likelihood that both will win. Mismatched firms do not mirror one another in their competencies; as a result, their relationship is competitive, making it difficult for them to succeed together. (See Exhibit 3.)

In the past, firms have had to experiment with one another on high risk, high complexity, and one-off projects in order to determine the degree of competency fit. Today, Contax provides a set of services to support growth building that result in an acceleration of this process. We want to help firms that want to succeed in this market to do so. ■

FMI Quarterly thanks Tony Bury, Paul Eccleston, and Shaheen Chohan for sharing their insights on the Middle East construction market.

Large Project Partnering: T-REX Project's Success a Model for the Industry

The T-REX project is a model for how the partnering process should be implemented on large complex projects of any nature.

By Bill Spragins



On Nov. 16 and 17, 2006, public and transportation officials from all levels of government gathered in Denver to celebrate with project team members the successful completion of the \$1.7 billion design-build multi-modal Transportation Expansion Project (T-REX). A number of factors contributed to the success of this project, including unprecedented agreements between local, state, and federal agencies, an innovative procurement approach, and well thought-out staffing plans for all organizations involved.

Yet, a key supporting element was the implementation of the most extensive and committed partnering effort ever undertaken for a project of this size and complexity. The process was carried out from the executive level through all task force discipline teams and helped the project team deal with the continual flow of issues they encountered during the five-year project duration. This article reviews key elements of the process and the results achieved.

KEY PROJECT STAKEHOLDERS

- T-REX — a partnership between the Colorado Department of Transportations (CDOT) and the Regional Transportation District (RTD)
- Southeast Corridor Constructors (SECC) — Kiewit Construction Group and Parsons Transportation
- Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA)

THE PROJECT

This massive multi-modal transportation project involved the reconstruction of I-25 and I-225 for 17 miles and the addition of 19 miles of a new double-track, light-rail transit line including 13 new stations (see project map in Exhibit 1). The area involved included the two major business districts between downtown Denver and the Denver Tech Center. The scope of this project also included:

- Adding one through-lane on each side of the highway for a total of four lanes in each direction
- Adding two through-lanes on each side of the highway for a total of five lanes in each direction
- Constructing seven interchanges, including I-25/I-225
- Reconstructing or widening 60 bridges
- Improving drainage, including 29 miles of pipe
- Maintaining three lanes of traffic during daylight hours in each direction.

PROJECT SUCCESSSES

The project achieved success in a number of key goal areas, including:

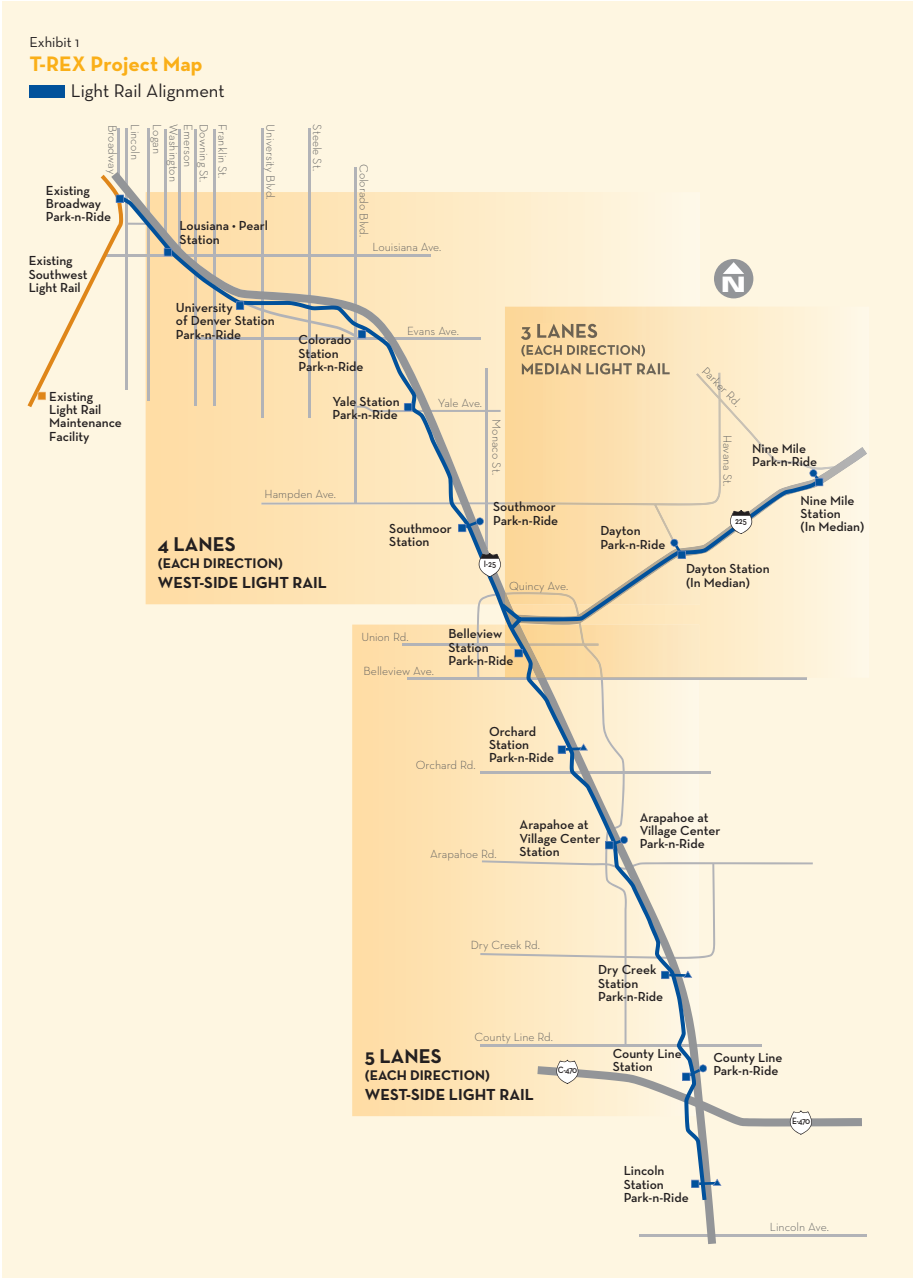
Community: A primary focus of the project was to achieve minimal impact to the traveling public by keeping six lanes of traffic open during construction. Accomplishing this in a major urban area affecting multiple municipalities and under the public microscope was a remarkable achievement. Through a robust public information program and superior traffic management techniques, the project team achieved above an 80% approval rating among residents and a 93% approval rating among commuters.

Safety: The project's safety record was six times lower than OSHA's incident rate for heavy-highway construction.

Cost: The project was completed under the established base-budget of \$1.67 billion. More than \$74 million in third-party enhancements were added to the scope without impact to the schedule.

Quality: The project's quality control and assurance program achieved ISO 9001:2000 certification. The team

The T-REX project was selected by the Associated General Contractors of America as a winner of the Marvin M. Black Excellence in Partnering Awards for 2007. This award identifies excellence in partnering, celebrating the success of stakeholders in teambuilding, improving communication, and delivering superior project quality. FMI is pleased to have been a partnering consultant on this project. Bill Spragins led the FMI team.



developed a paperless documentation system, enabling all field inspection and test results to be entered into hand-held computers on-site.

Schedule: The project was completed 22 months ahead of the original seven-year time table. The light rail segment was completed a month ahead of SECC’s proposed schedule, opening to revenue service in November 2006.

PARTNERING PROCESS

With assistance from Charles Cowan & Associates and FMI Corporation, the T-REX project partnering process was perhaps the most committed and extensive partnering effort completed on a major public works project since the industry began

Exhibit 2
T-REX Partnering Process



using partnering in the late 1980s. Partnering was developed based on the principles of collaboration, accountability, and consistency (see Exhibit 2). Collaboration among team members is critical in a design-build environment where the number of issues requiring decisions and the speed of decision making increases dramatically from the typical design-bid-build project delivery method. Individual accountability is also crucial, especially within a large organization like T-REX that developed quickly and continually evolved as the various phases of the project initiated and completed. Finally, consistent communication is essential within an organization comprised of more than 20 task-force teams. The T-REX partnering process embraced all of these principles, and its implementation was embraced at the executive level throughout the task-force teams.

EXECUTIVE-LEVEL PARTNERING

“We took a top-down approach to partnering, and I don’t think partnering would have been nearly as successful if the top officials from every organization hadn’t sent a strong message to emphasize their commitment to the process,” said Larry Warner, former T-REX Project Director.¹ On T-REX, executives from CDOT, RTD, FHWA, FTA, and their counterparts from SECC began meeting in July 2001 in bi-monthly board of directors partnering sessions and then quarterly for the final three years of the project. According to Tom Howell, SECC Project Director, “Both teams worked hard early on to put together their individual teams so they would accept the partnering process as an opportunity to work together at bringing the project in on budget and within schedule.” A total of 24 executive-level sessions were

held during the project's five-year duration. At the initial session, a project charter of mutual goals was developed, a team evaluation process established, and issue-escalation principles agreed upon. The group reviewed team goals, listened to the project-management team's status report, discussed key issues, and established action plans at continuing partnering sessions.

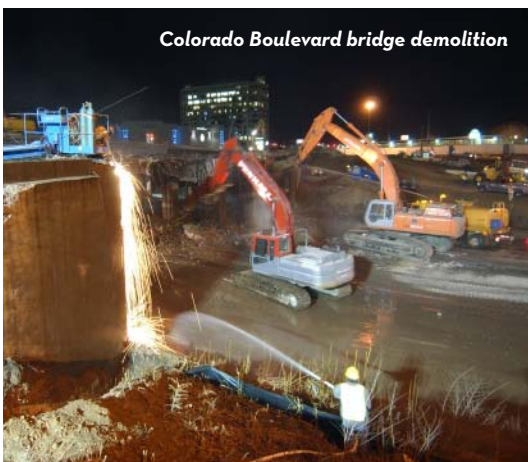
PROJECT-LEVEL PARTNERING

To promote communication and a sense of partnering, the entire project team, including T-REX staff, SECC, and the City and County of Denver, set up offices in the same office buildings.

"Everyone had almost daily contact with their counterparts from other organizations," said Warner.² "This facilitated timely decision making." The comprehensive formal approach to partnering included the following activities:

- Approximately 40 kick-off and follow-up partnering sessions at the task-force team-level and with third-party stakeholders
- Approximately 40 separate 90-minute meetings with the project management steering committee to review partnering results and determine future partnering strategy
- Four, formally facilitated issue-escalation meetings where position papers were presented by each organization to the next level of management and plans forward were established to resolve the issue(s).

"This process allowed for issue resolution at the lowest practical level," said Bill Murphy, former project director for SECC. "Formal partnering provided an excellent working environment in which team members developed personal relationships that helped minimize disputes on the job."³



The face-to-face interaction that the partnering process provided also helped to establish trust among the project's team members.

The face-to-face interaction that the partnering process provided also helped to establish trust among the project's team members. "Once we went through the process of meeting people, then the critical question became 'will we work together or handle things as separate entities?'" said Deputy Project Director Del Walker. "Being



able to look straight into the eyes of your counterparts from SECC and know you could trust them was key.”

The activities of the project-level partnering process and the subsequent sub-categories are summarized as follows:

INITIAL AND FOLLOW-UP PARTNERING SESSIONS

Each task-force team held their own initial partnering session to develop team goals and an issue escalation ladder specific to their discipline needs. The first teams to hold separate sessions were the public information team and the design teams. As the project progressed, kick-off sessions were held for all newly mobilized teams. The last team to

hold a kick-off session was the landscape team, nearly three years into the project.

Follow-up sessions were held periodically throughout the project. Co-leads of the task-force teams were empowered to call their own follow-up sessions as needed. At other times, the project management steering committee directed a team to hold a session given the phase of the project or the results of a particular team evaluation/report (see “Ongoing Team Evaluations and Co-Lead Reporting” on page 31).

THIRD-PARTY STAKEHOLDER PARTNERING SESSIONS

Although the City and County of Denver were not contractual project parties, they did control the right-of-way on the peripheral and frontage roads immediately adjacent to the mainline highway for almost 50% of the project. Another impetus for the third-party stakeholder partnering sessions was the fact that numerous businesses and homeowners within city jurisdiction would potentially be impacted by project activities — unless communication was carefully coordinated. In order to ensure expectations were clearly established between the city, the T-REX team, and SECC, a series of partnering sessions were held exclusively with the city team. The first session was held before the final design was started, and then two other sessions were held during the first year of the project. At these sessions, issue escalation protocol was established and continually reviewed, including how technical and commercial issues would be addressed.

Four representatives from the city moved with the project team to the main project offices housing the T-REX staff and SECC team, further enhancing communication on the project. The city representatives attended construction task force follow-up partnering sessions, which were held periodically during the project. This was particularly helpful in aligning expectations during reconstruction of the

two largest intersections of the project (Hampden Boulevard and Colorado Boulevard), the two most heavily traveled intersections along the corridor.

The Transit Oriented Development (TOD) task-force team held a “lessons learned” session close to project completion. T-REX, SECC staff, representatives from the major jurisdictions along the corridor, and developers participated in the session. A preliminary survey solicited input on pluses (successes) and deltas (opportunities for improvement) during each phase of the project. The session focused on key conclusions reached by phase and produced a white paper that will be available to other rail programs around the nation. The immediate beneficiary should be RTD’s FasTracks program, a \$4.7 billion multi-corridor build-out across the Denver metro area to take place during the next decade.

ONGOING TEAM EVALUATIONS AND CO-LEAD REPORTING

The co-leads of each task-force team submitted a report (monthly for the first 18 months and then bi-monthly) that summarized deal-breakers (issues on which task force members had disagreed, reached an impasse, and required escalation), rocks (issues being worked on but not needing escalation), and goal progress. Additionally, a team evaluation was conducted for each task force that surveyed the status of team relationships (see Exhibit 3). All of this was then rolled up into a master report of all task-force teams that was reviewed by the project management steering committee

Exhibit 3

Partnering Team Evaluation

Task Force/Team _____

Evals. Sent _____

Date _____

Returned _____

1. Communication between partners _____

Average: _____

Comments: _____

• _____

2. Timely resolution to issues and conflicts _____

Average: _____

Comments: _____

• _____

3. Cooperation between partners _____

Average: _____

Comments: _____

• _____

4. Morale/enjoy working on project _____

Average: _____

Comments: _____

• _____

5. Trust among partners _____

Average: _____

Comments: _____

• _____

Observations: _____

• _____

Ideas for Improvement: _____

• _____



Colorado Boulevard bridge demolition and the audience

in a 90-minute meeting. To further drive accountability for the process, co-leads from select task-force teams were rotated into this meeting to provide an in-depth explanation of their team results. Over the course of the project, 15 different task-force teams reported at these meetings, and at least five reported more than once. The steering committee used the results of these ongoing evaluations and reports to determine strategy for the next reporting period. In most cases, project leaders followed up on the various issues raised. But numerous follow-up partnering sessions were initiated from these meetings as well, and the information generated from these reports was consolidated and presented to the executive board of directors.

Most teams follow a development pattern of forming, storming, norming, and performing, and this certainly played out on the T-REX project. The results of the team evaluations are depicted in Exhibit 4 starting in January 2002. After an initial high score of around 4.00 (“meeting expectations”) near the team’s formation, scores then dropped on subsequent evaluations to a 3.70 level in a storming phase as the

Most teams follow a development pattern of forming, storming, norming, and performing, and this certainly played out on the T-REX project.

team dealt with numerous design issues. Once the design phase moved toward completion and construction fully ramped up, scores rebounded and the team moved into a “performing” mode. The drop in scores during the December 2002 to April 2003 period can be attributed to uncertainties revolving around the Hampden and Colorado Boulevard change negotiations. In the April to June 2004 period, new task-force teams were initiated that were focused on project completion activities. Once these teams jelled, scores once again rebounded for the remainder of the project.

“One of the teams that came late

into the process, was put in a crunch, and the result was a poor set of initial numbers,” said Deputy Project Director Del Walker. “However, with follow-up partnering efforts things improved, and in the end, the scores also improved significantly.” Overall, the evaluation trend was a healthy one that ended on a high note, achieving “above expectations” for the majority of the project’s final year, finishing at 4.27. The final evaluation summary of all task-force team scores is detailed in Exhibit 5.

ISSUE ESCALATION MEETINGS

During the last month of the project, team members discussed the partnering process. Specifically, the issue-resolution process was commonly cited as being a key contributor to the project’s success. Members noted that this process kept parties meeting and talking while working through difficult issues. It also required task-force

Exhibit 4
Partnering Evaluation Summary:
T-REX Project – December 2001–July 2006

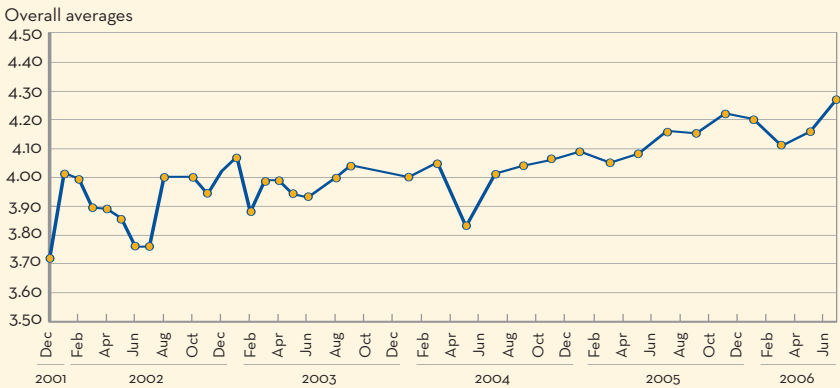


Exhibit 5
Partnering Evaluation Summary – June–July 2006
Scale: 1–5 (4 = “Meeting Expectations”)

Teams	Communication Between Partners	Timely Resolution of Issues and Conflicts	Cooperation Between Partners	Morale/Enjoy Working on the Project	Trust Among Partners	Average
Construction Combined	4.00	3.80	4.20	4.00	4.00	4.00
Contracts	4.70	4.00	5.00	5.00	4.70	4.68
Document Control	5.00	5.00	5.00	4.00	5.00	4.80
EEO/Civil Rights	No submittal	No submittal	No submittal	No submittal	No submittal	No submittal
DBE	No submittal	No submittal	No submittal	No submittal	No submittal	No submittal
Environmental	4.00	4.50	4.50	4.50	4.50	4.40
ITS	4.14	3.14	3.43	4.00	3.43	3.63
Landscape	4.00	3.91	3.91	3.91	3.91	3.93
LRT Combined	4.05	3.85	4.30	4.25	4.10	4.11
Stations	4.10	4.00	4.50	4.40	4.30	4.26
Systems	4.00	3.70	4.10	4.10	3.90	3.96
Track Work	Project Complete	Project Complete	Project Complete	Project Complete	Project Complete	Project Complete
MHT	4.29	4.00	4.43	4.29	3.86	4.17
PCIP/Safety	4.63	4.63	4.63	4.63	4.63	4.63
Project Controls	4.25	4.00	4.50	4.75	4.50	4.40
Public Information	4.00	4.00	4.60	4.60	4.00	4.24
Quality Management	4.79	4.43	4.57	4.71	4.36	4.57
Right of Way (ROW)	4.25	4.00	4.25	4.25	4.25	4.20
Systems Safety	4.00	4.00	4.00	4.00	4.00	4.00
Utilities	4.00	3.80	4.40	4.60	4.40	4.24
AVERAGE	4.27	4.06	4.37	4.36	4.23	4.27

Exhibit 6

Issue Resolution/Escalation Process

Issue Escalation Ladder		Issue Escalation Process
Level 1	Task Force Teams T-REX SECC	If a specific issue cannot be resolved by the TREX and SECC representatives at a given level, resulting in a disagreement or an impasse at problem resolution, then the issue must be escalated to the next level of management with the following information prepared: <ul style="list-style-type: none">• Project goal(s) impacted and contract provisions affected• Facts to the issue• Actions taken to date• Proposed resolutions• Timeline needed to resolve the issue
Level 2	Task Force Co-Leads T-REX SECC	
Level 3	Discipline Managers T-REX SECC	
Level 4	Primary Management Teams Larry Warner, T-REX Rick Clarke, T-REX Bill Murphy, SECC	
Level 5	Executive Team Tom Norton, CDOT Cal Marsella, RTD Al Kirkwood/Steve Hansen, SECC	If an issue cannot be resolved following the issue escalation process, the issue is presented to a Dispute Review Board (DRB). The DRB is comprised of three members with the chair reserved for a lawyer or retired judge. The contractor may appeal the final DRB decision in accordance with C.R.S. 24-4-106.
Dispute Review Board	Robert Smith, Chair Bill Peckham Ray Dodson	

members or co-leads to escalate an issue to the next level of management when they reached an impasse on it (see Exhibit 6). The issue was then either resolved or escalated further through the levels of management. If all levels of management were exhausted, then the issue was taken to a neutral dispute review board, which existed to assist the team in resolving the issue.

“Setting up counterparts in the beginning was crucial,” Project Director Rick Clarke said. “Then, it was having the discipline to keep the follow-up going. Additionally, the team took a ‘let’s do what’s best for the project’ approach. So we got the best technical solution first and then resolved the contractual aspects later. It was clear nobody was going to hold the other side hostage.”

Key issues resolved using this process included:

- HDPE pipe substitution
- I-25/I-225 interchange reconfiguration
- Public information team identity
- Municipality permitting fees
- Compensation for private utilities
- Dry Creek station design
- LRT ADA curve ramps
- Right-of-way Studebaker property
- Arapahoe station design.

Of the thousands of issues the team dealt with throughout the project, only 35 entered into the formal issue escalation process. Of those 35, all were resolved within the team at the following levels of management:

- Twenty-one issues were resolved within the project co-lead or task-force levels.
- Nine issues were resolved at project management level.

- Five issues were resolved at the executive level.
- Zero issues went before the Dispute Review Board.

The T-REX project is a model for how the partnering process should be implemented on large complex projects of any nature. The process enabled the team to achieve major accomplishments in a relatively short time period.

The following key conclusions on partnering should be considered for other large transportation projects and programs:

- Absolute commitment to the partnering process is required from both executive and project management levels, shown more through action and follow-through rather than through words.
- Constant follow-up and reinforcement of the process is required to instill and maintain proper behaviors, particularly in regard to issue resolution.
- Continually measure the process, and make adjustments to it as necessary.
- The owner and design-build construction teams should appear and function seamlessly to each other, regardless of how many separate organizations are involved.
- Task-force and discipline teams need to function as integrated teams.
- The issues will always be there — focus on consistent processes that will help in the resolution of those issues. ■

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¹ Colorado Construction, November 2006

² Colorado Construction, November 2006

³ Colorado Construction, November 2006

Creativity in the Workplace

By increasing the creative ability of workers, the workplace can be transformed into an environment of increased productivity, superior performance, and better work in place.

*By Tim Tokarczyk, Jake Appelman,
and Vanessa Winzenburg*

Creativity plays a vital role in all aspects of organizations, yet its importance is often misunderstood or brushed aside as insignificant. Creativity involves the ability to transcend traditional ideas or processes and create meaningful, novel ideas and applications. By better understanding creative thought and by increasing the creative ability of your workers, the workplace can be transformed into an environment of increased productivity, superior performance, and better work in place.

THINKING: PRODUCTIVE OR REPRODUCTIVE

True creative thought comes from a shift in your basic mental paradigm. As you grow up, you face problems and develop solutions to those problems. When you face similar problems, you refer to your past solutions to shape your response. Humans are uniquely suited to learning from experience and rapidly responding in a conventional manner. For example, if you were asked, “What is one-half of eleven?” you would probably answer five and one-half. This answer came to you instantly, requiring virtually no mental effort.

This type of thought is reproductive, meaning you look back on similar problems and generate a response. Reproductive thought is vital because it saves the time

“Creativity has been heralded as the procedure for transforming problem into opportunity, for energizing the development of novel ideas and fresh approaches. Innovation has been called a mechanism for dealing with uncertainty, for asserting control over volatile events. Creativity is the input to innovation, the raw material of revolution. The issue before us, therefore, becomes one of leveraging creativity, of maximizing its appearance and applications.”

—Robert Lawrence Kuhn¹

otherwise required to mentally process the answer. If you posed the same question to six-year-olds, they would struggle to answer the question at all. The speed and familiarity with which we solve common problems often limits our ability to generate novel, creative ideas. For example, a worker is assigned a problem to solve that he has faced many times throughout his career. Most likely, the worker will use reproductive thought, recalling how he solved the problem in the past, and follow the same steps to reach the solution. However,

this limits the worker in his problem solving since by relying on previously used methods, he eliminates the possibility of finding new, better ways to reach a solution. While the worker may reach the conclusion desired using reproductive thought, he may overlook a much more effective and efficient way to reach an even better solution. Furthermore, in a constantly changing business environment, the solutions used in the past will not necessarily work in the future. Using only reproductive thought greatly limits a workforce’s ability to reach the best solution to an issue.

One key to creative thought is shifting from reproductive thought to *productive* thought. Instead of referencing your mental library for examples of successful solutions, productive thought requires you to look at problems differently and develop an entirely new set of possibilities. For example, consider the question above that asks: “What is one-half of eleven?” Reproductive thought would lead to the obvious answer: five and one-half. Productive thought might come up with one of the following:

—11— 11 eleven —XI—

When you convince yourself there is only one answer to a problem, you limit the potential of opening up new worlds. In many cases, creativity comes from exploring all the possibilities when a proven solution is already on the table. In an increasingly competitive world, organizations need to consistently challenge themselves to reassess their current activities, looking for not only a solution to a problem, but the best solution. The best organizations — and the ones achieving the most success in the 21st century and beyond — will be the ones that are never satisfied with their current operations, and are constantly pushing themselves to dig deeper, to think in new ways and to relentlessly pursue improvement. Albert Einstein was once asked what characteristics separated his mind from the average person. He responded that when the average person is asked to find a needle in a haystack, they stop once they find a needle. When he searches a haystack and finds a needle, he continues to tear it apart looking for more needles. When we find an answer or solution, most of us stop searching. However, simply because we have one possible answer does not mean that we have found the only answer or solution, or even the

best one. Being inquisitive after arriving at one possible solution will most likely lead to even better results. What would people in your organization do?

Reproductive thought is fine as long as your organization continues to face the same types of problems you have always faced. However, the modern challenge of a flattening world makes this more and more unlikely. The strategies and techniques you employed in the past will work less and less well. With the advent of new technologies, the world has become an increasingly smaller and flatter place. Countries and people from around the world share a connection in ways unlike any before in human history. While this has created great opportunities for people all across the globe, it has also made the world a much more competitive place. Twenty years ago, organizations could succeed with a focus on the past. Now, in a rapidly changing and oftentimes chaotic marketplace, organizations must have a vision of the future, and actively innovate and adapt themselves to the changing world if they hope to be successful. The flattening of the world has created vast opportunities, yet it challenges companies to innovate persistently and constantly assess past actions in order to facilitate constant improvement. The answer to this challenge is the flexibility and adaptability that comes from creativity.

Reproductive thought is fine as long as your organization continues to face the same types of problems you have always faced.

CREATIVITY MYTHS

Multiple myths about creativity work to discourage leaders from creating a truly creative environment in their workplace. These myths range from the type of people who can be creative, to the role creativity should play in the workplace. Only by examining these myths and pursuing the truth about creativity can we gather a real understanding of the value creativity brings to organizations.

Myth 1: Creativity is for dreamers.

An often-cited fallacy about creativity is that it is only for the unrealistic dreamers and artists among us. Those of you in the general contracting world are probably picturing architects you work with as you read this. However, creativity as a strategic advantage plays out at all levels and across all job functions, from the administrative assistant who devises a more efficient method of processing paperwork to the chemist who invents a new admix for concrete. The most successful companies

are the ones that utilize the creative potential of all their workers, not just “the creative ones.” Anyone can learn to be creative, and to contribute that creativity towards enhancing the bottom line. For example, *The Wall Street Journal* reported that following a two-year internal creativity course at General Electric, a 60% increase in patentable ideas occurred throughout the organization. At Sylvania, thousands of employees took a 40-hour course in using creativity to solve problems in the workplace. The return on investment for the creativity course was \$20 for every \$1 spent. Pittsburgh Plate Glass offered their employees a creativity-training program, which resulted in a 300% increase in practical ideas among attendees compared with those who declined to enroll in the program. Each of these examples shows an organization that committed itself to improving workplace creativity, and witnessed fast, measurable results as a result. In addition, the *Journal of Engineering Construction and Architectural Management* has stated that the implementation of creative construction procurement processes can drive productivity up by as much as 28% to 30%.

Myth 2: Creativity is for geniuses.

You may also find it surprising to know creativity is not linked to intelligence. The physicist Richard Feynman is widely regarded as the last great American mind despite having a merely above-average IQ of 122. However, his ability to think differently led to paradigm-shifting work including expanding the theory of quantum electrodynamics, exploring the physics of the superfluidity of super-cooled liquid helium and developing particle theory. You can probably come up with examples from your own experiences of people who were brilliant but lacked a shred of creativity, and people with average intelligence who were bursting with creative ideas. Creativity is not tied to genius. Under the right circumstances, any employee is capable of generating true creative thought.

Myth 3: Creativity does NOT belong on the front lines.

You may be thinking, “Fine, creativity is great, but the majority of employees in my organization are out in the field. I don’t want them getting creative; I want them to get the job done!” One of the most limiting approaches a leader can take is to assume creativity belongs only in the executive suite or marketing department. Some of the most creative approaches come from front-line people, who have the opportunity to problem-solve on a day-to-day basis. While they obviously have other tasks and need to complete their jobs on time, it is essential for field employees to play a role in developing creative solutions for the organization. These employees are the ones who put work in place for the organization. They possess valuable insight into the company’s strengths and weaknesses, effectiveness of systems and processes, and customer reactions to services and work performed.

BUILDING A CREATIVE WORKFORCE TO ENHANCE PRODUCTIVITY

One of the difficulties with enhancing creativity in organizations stems from involving field people as agents of creative change. To capitalize on this worker perspective, leaders must create an environment in which these workers are encouraged to develop creative ideas and solutions that will better the whole organization. Sadly, most American companies fail to capitalize on valuable innovations created by employees. In his book, *Corporate Creativity: How Innovation and Improvement Actually Happens*, author Alan Robinson reports, “American companies adopt about 38% of all creative ideas presented to them, as compared to Japanese companies that adopt about 90%.” By taking steps to ensure your workplace is conducive to creativity, your organizations can benefit from the creative innovations your employees are capable of developing.

To improve creativity in the workplace, leaders need to focus on creating a more open and supportive environment. They can accomplish this by providing better support for their employees, recognizing them for good performance and giving them positive feedback. Leaders need to insist on having an open culture, where employees feel comfortable expressing their thoughts, opinions, and ideas. Leaders also need to actively listen to their employees and act on their needs. On the other side, there are specific behaviors that leaders should avoid since they quell creative thought. These include giving either too little or too much guidance on assignments; micromanaging and constantly checking on assigned work; and solving problems their employees should solve.

There are a number of structured systems and processes that managers can employ to ensure their organization is actively searching for and utilizing the creative ideas of the workforce. These include formal After Action Reviews (AARs), suggestion systems, individual meetings or lunches, and employee surveys. AARs are professional discussions that allow groups or teams to assess a project or major activity and determine specifically what outcome occurred and why. AARs are much like a post-project review or post-mortem, but generally of a narrower scope. Through AARs, employees learn from both the successes and stumbling blocks encountered during a project or activity, and use that knowledge to broaden their perspectives.

Instead of simply having a suggestion box, organizations should move toward suggestion systems, a formalized process for listening to employee thoughts and ideas, and then aggressively acting on them. Managers can also schedule meetings or lunches with key employees to discuss their ideas and thoughts.

When leaders react positively and openly toward new ideas, they help create an

Leaders need to insist on having an open culture, where employees feel comfortable expressing their thoughts, opinions, and ideas. Leaders also need to actively listen to their employees and act on their needs.

open and supportive environment, in which employees not only feel free to express ideas, but feel encouraged to do so. Employee surveys can be used to elicit suggestions and ideas from the workforce while conveying the message that employee input is valued and expected. Similarly, all ideas should at least receive consideration and those that potentially add the most value should be acted upon quickly. Every employee has the capacity to create innovative solutions or ideas for your business, and following these guidelines will help your organization capitalize on the creative potential of your workforce.

Leaders can also take steps to encourage their employees to think differently. There are multiple ways to achieve this. A popular tactic is to have one worker responsible each month for explaining an innovation in the industry, or a new business idea that they have read about and researched, to the team. By presenting an idea or innovation and then discussing how it could be integrated into their own organization, the employee will start thinking about their own work in new ways. The employee will also begin focusing on creative solutions to improve the way they perform. Leaders can also focus more on asking the right questions, rather than always supplying an answer. This will work to stimulate employees' creativity and

Understanding the major barriers to this process can help leaders avoid stalling in their attempts to increase creativity in the workforce.

allow them to think through complex issues. In addition, seeking out formal creativity training for the workforce can vastly improve the amount of productive thought. As a manager or leader, what activities similar to this exercise could you use to get your workers to think creatively about their work processes and products?

MAJOR BARRIERS TO CREATIVITY

Leaders face several challenges in developing a creative environment for their workers. Understanding the major barriers to this process can help leaders avoid stalling in their attempts to increase creativity in the workforce. Many organizations do not focus energy on increasing creativity because of a

lack of time; a lack of understanding of the role that creativity plays; biases as to the types of people capable of truly creative thought; and a lack of a sense of urgency for innovation. These challenges can be overcome by addressing each and developing solutions that fit your individual organization. To address the barrier of a lack of time, a suggestion system can be implemented that creates a process for gathering and implementing ideas from the field. To address a lack of understanding regarding the fundamental issues of creativity, management can quickly educate themselves on the nature of workplace creativity and gain a better understanding of where and how creative thought arises. To instill a sense of urgency, one only needs to reference the flattening world, paying attention to the increasing speed, competition, and changes occurring in the marketplace. Companies that do not urgently innovate and adapt will

face big challenges in the coming decades. Leaders must spend some time examining their organization, asking themselves why creativity doesn't happen more often, what barriers to a creative environment currently exist and the best means of breaking through those barriers.

Research shows that the quickest way to suppress workplace creativity is through managers who too closely monitor their workers. Employees need to feel that they have some degree of independence in their work. The resulting increase in the employees' sense of personal responsibility will create an environment where they feel free to come up with new, useful ideas to improve multiple aspects of the workplace. To foster a creative culture, employees must be motivated primarily by the work itself, not the organization's system of rewards. Meaningful, challenging work coupled with an environment in which employees are free to express their opinions, share ideas, and stimulate thought will bring forth the most creative ideas from the workforce.

BENEFITS OF DEVELOPING A CREATIVE WORKFORCE

With this knowledge about the creative thought process and the realization that everyone possesses the ability to think creatively, management can increase the effectiveness of their organization. Managers can actively seek to increase the overall creativity of their workplace culture. By encouraging workers to come up with innovative solutions, you will not only empower and motivate them, but you can foster some truly great ideas. By developing a culture of creative thought, managers and supervisors will benefit from employees who are working at peak performance and are openly contributing to creating a better organization.

Injecting creative thought into organizations results in multiple benefits. These include increases in quality, productivity, and efficiency. Dr. Ellen Domb, president of the PQR Group and editor of the TRIZ Journal, conducted research on the relationship between creativity and quality, and concluded: "Creativity improvement enhances quality improvement. Quality analysis tells us what our customers want, what our processes need, and what our employees need, but creativity is needed to find ways to make these new products, services, systems, and processes happen." Creativity allows organizations to work more intelligently.

Finally, employees who are allowed to tap into their creative sides are generally more highly engaged in their positions and experience higher morale. This causes these employees to have a higher sense of commitment to their jobs and their companies, which results in higher productivity by minimizing the amount of turnover. In addition to a more productive workforce, increasing employee creativity may result in performance or process improvements that allow you to better serve your customers and gain competitive advantage. ■

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¹ Robert Lawrence Kuhn is an international investment banker, corporate strategist, scholar, and scientist.

Leveraging the Trained Worker

The ever-changing workforce and the importance of productivity in the field make a trained, productive employee the single-most profitable venue for business today.

By Kelley Chisholm and Randy Nemchin

Productivity is an important part of our industry's profits and is impacted by many variables such as unskilled workers, new employees, weather, vendors, equipment, and materials. Improved productivity can not only enhance the bottom line, but also help workers feel as though they contribute directly to the success of any project.

This article specifically examines the costs of employee turnover with respect to productivity in construction companies. We show how retaining trained employees impacts productivity and therefore, net profits. We also include an interview with Pete Pace, vice president and CEO of the Florida division of Clancy & Theys Construction Company, who describes the benefits of retaining trained employees in his organization.

THE COSTS OF REPLACING EMPLOYEES

What does it really cost to replace a departing employee? Numerous studies have been conducted on how much it costs to replace an employee, and the figures can range from the employee's yearly salary to upwards of 2.5 times that amount. For example, consider an employee making \$40,000 who leaves the organization after only 10 months. If you use the formula of 1.5 times the annual salary, this employee's departure can cost the organization in excess of \$60,000. A company incurs several

expenses each time a new employee is hired to take the place of an employee who has left. Some of these expenses are obvious, such as those associated with recruiting and interviewing. Others may not be so obvious, such as a loss of productivity or institutional memory. These costs may be broken down into separation costs, recruitment costs, new-hire costs, training costs, and intangible costs, as listed below.

Separation costs are those costs associated with the actual exit of employees, and may include:

- Exit interviews
- Administrative costs
- Separation/severance pay
- Increases in unemployment compensation
- Temporary employees to fill vacancy
- Overtime pay for existing employees
- Diminished productivity of the work group from which the employee departed
- Loss of organizational memory
- Loss of organizational relationships

Recruitment costs are incurred when the company begins the search for new employees, and include:

- Advertising expenses
- Recruiter costs
- Time spent reviewing resumes
- Travel expenses of recruiter or prospect
- Time spent in interviews
- Assessments/pre-employment tests
- Background checks (educational, criminal, references)
- Physicals
- Drug screening
- Employee referral fees

New hire costs are those expenditures necessary to bring new people into the company and may include:

- Sign-on bonuses
- Moving/relocation expenses
- On-boarding expenses, such as ID cards, business cards, equipment costs such as cell phones, pagers etc.

Training costs begin once new employees are hired, and cover:

- Orientation
- New software training
- New communications training

- New equipment training
- New process training
- Training materials
- Training facilities
- Travel costs
- Instructor costs
- Time spent in training

Intangible costs are often very hard, if not impossible, for most companies to measure, but should be examined and estimated. They include:

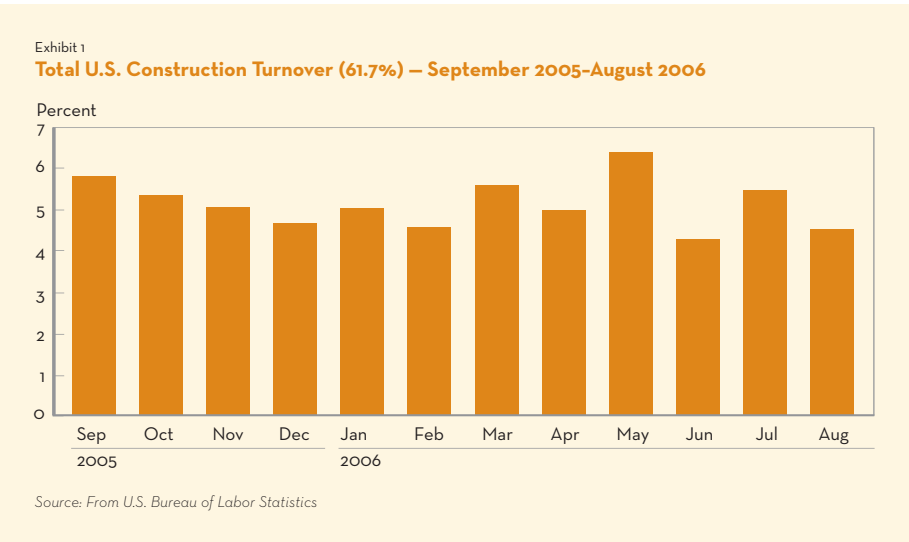
- Uncompensated and increased workloads other workers assume due to vacancies
- Stress and tension that the turnover causes
- Declining employee morale
- Loss of intellectual capital
- Decreased productivity due to diminished resources
- Decreased productivity costs due to employee learning curves
- Unhappy customers and/or vendors due to quality issues, lack of attention, delays etc.
- Loss of customer referrals

All of these costs must be considered when calculating the amount it takes to replace an employee.

EMPLOYEE TURNOVER RATES

The U.S. Department of Labor compiles turnover statistics for all major industries. (See Exhibit 1.) For the period of September 2005 to August 2006, total U.S. construction turnover was a whopping 61%. Couple this figure with how much it costs to replace an employee, and it becomes very apparent how turnover has a huge impact on a company’s bottom line.

To minimize turnover and its associated costs, many construction companies are



doing everything they can to retain their employees, realizing that a good base salary and benefits are not enough. Builders are recognizing the value of employee satisfaction and are implementing innovative training initiatives aimed at recognition, career growth, and quality relationships.

TRAINING = INCREASED PRODUCTIVITY

It is not realistic to expect that any new employee will have all of the necessary knowledge and skills to be able to immediately perform all required tasks to company standards. One of the reasons so many organizations use pre-employment tests as part of their interviewing process is to determine a new employee’s skill level so they can begin planning for the new employee’s initial training phase. As part of the recruiting process, companies need to evaluate prospective employees to ensure they not only have the qualifications but the capacity to learn the position quickly and the growth potential desired for long-term retention.

An employee’s learning curve has a direct impact on overall productivity. All organizations face the challenge of acclimating their new employees to the company’s systems and procedures so they become productive quickly. Some of the learning curves new staff must go through may include getting to know co-workers and customers, various tools and equipment, standard operating procedures, and other job-related issues. While this is hard to quantify, companies should try to estimate the average time it takes for new staff to acclimate after they are hired.

One way to estimate this is to determine if the employee has a quick, average, or slow learning curve for a particular task. For a task that the new employee can easily

perform, the learning curve is considered quick. A quick learning curve predicts that the new employee will gain 25% productivity each month so that by the end of the fourth month, the new employee is fully productive. With an average learning curve, it will take an employee twice as long to become fully productive. For very complicated tasks, gains in productivity are slower,

and it may take up to a year or longer to achieve full productivity. Exhibit 2 shows a breakdown of productivity for each learning curve category for a period of 12 months or less. Keep in mind this is just a guide, and each company must calculate their own estimates based on previous experience and performance.

Exhibit 2

Learning Curve Productivity

Number of months	Learning Curve		
	Fast	Average	Slow
1	25%	25%	25%
2	50%	25%	25%
3	75%	25%	25%
4	100%	50%	25%
5		50%	50%
6		75%	50%
7		75%	50%
8		100%	50%
9			75%
10			75%
11			75%
12			100%

LEVERAGING THE TRAINED WORKER: AN INTERVIEW

We interviewed Pete Pace, vice president and CEO of the Florida division of Clancy & Theys Construction Company. Clancy & Theys is a general contractor and

construction manager. The company builds commercial, industrial, and institutional buildings and specializes in team approaches to design and construction including construction management-at-risk, team-build, and partnering. The following is an excerpt of the interview.

You can't be successful without having people trained in the skill sets that they need.

FMI Quarterly: What impact do trained workers have on your company?

Pace: For field employees, it's huge.

Without proper training, you just cannot be successful. There's no way you can take a crew or several people who don't have the right skill sets and put them in situations where there's concrete, carpentry, steel, and have them be successful. We see this more in the industry today because the need for people has risen so greatly. This has allowed people who aren't trained to come into the business. Looking at some of our subcontractors, you can see the crews that have people without the right skills. The quality suffers, the schedule suffers, and they just don't understand the process. You can't be successful without having people trained in the skill sets that they need.

FMI Quarterly: What about your management staff?

Pace: It's the same thing there. We have an extensive program for all of our project managers. We have a staff development program, and we plan each year. Everyone is required to participate in it, from our new hires fresh out of school, up to myself.

FMI Quarterly: What type of training is included?

Pace: We're doing safety training, planning, and scheduling — both short-term and long-term — project manager training, including basic skills for PMs, as well as leadership training.

FMI Quarterly: What skills sets and competencies are you looking for in your new hires?

Pace: In the field, we are looking for skills in the specific trade, as well as an aptitude for the work. For project managers, we're looking at the experience they gained in school and the success they showed in school (i.e., their GPA and test scores). We're also looking to see if they have the capacity to learn and improve, from an intellectual and motivational standpoint.

FMI Quarterly: How long does it normally take to bring a new hire up to speed?

Pace: In the field, usually about six months. In the office, it takes six months to a year for independent functioning, depending on the position. New hires with more experience catch on quickly, and it usually takes them about six months to learn our operations and procedures. Then, they know the people and the framework and feel comfortable operating independently. For our new hires right out of school, it normally takes about a year.

FMI Quarterly: What are your biggest challenges?

Pace: It's finding people with the skill sets we need. That's not happening right now so we're looking at the next wave of people — who have the basic, overall skill sets to be successful in our industry. We'll train them. One of the areas we've started to target is military personnel since they already have leadership qualities, and they are used to doing things in an organized fashion and being scheduled. We are developing a program to attract individuals coming out of the service in order to give them an opportunity to join our company and become successful.

FMI Quarterly: In terms of training, what benefits you the most?

Pace: Right now, it's leadership training. Most of our project managers have the basic skill sets they need to complete their tasks. Leadership and problem solving are the two things they don't have that are built by experience and training. We find that developing problem solving capabilities and leadership skills in people makes the biggest difference in their success.

FMI Quarterly: On the average, how much does it cost to replace an employee in your company?

Pace: It's probably at least a year and a half times the position's salary, depending on the level of the person being replaced. The higher up in the organization the person is, the more it costs to replace them.

FMI Quarterly: Do you have any statistics on your turnover rates?

Pace: It is obviously higher for our field staff. We hire folks who tell us they have certain skill sets, and then we find out quickly that they don't. We then decide if they can learn the needed skills. If so, we provide training. If not, we replace them. In the office, turnover is much lower; we do a good job of pre-screening people before they come to work for us.

FMI Quarterly: Besides pre-screening, what else benefits your hiring process?

Pace: I think we're doing a good job at looking at people's backgrounds and trying to communicate our culture and what we're about. We want them to understand this so they can decide if they fit. I think a person's success in an organization depends a great deal on their fit with the culture and values of the company. If they don't fit the culture and share the values, no matter how skilled they are, they won't be successful.

FMI Quarterly: What is your training budget?

Pace: Our training budget for 2007 is over \$100,000, for 20 to 24 employees. This includes technical training, such as Primavera, desktop publishing, leadership training, and advanced interpersonal skills training, such as conflict management and negotiation skills.

FMI Quarterly: What are you doing to retain your workforce?

Pace: Training is a big part of it because people want to be able to improve themselves and have an opportunity to move up. We have a competitive compensation and bonus program where people are rewarded for their efforts and successes. But the biggest thing is communication. This means spending time with employees and

finding out what's going on with them professionally and to some degree personally, so we can provide them with what they're looking for. This is especially true for our young employees who have a different view of work than I do or my father did. They may not want to work for us for the rest of their lives. The idea is that both parties can be successful. We'll give you the opportunity to grow, and you contribute to the success of our company. If that's for three years, five years, or seven years, we can both benefit, especially if you want to move up to the next level.

We'll give you the opportunity to grow, and you contribute to the success of our company.

FMI Quarterly: Do you have a specific person who's in charge of training?

Pace: I lead the training efforts within the company because I think it is so important. I work with two senior project managers and our administrative team director. I put the budget together and work with them to determine and schedule the training. At year-end, we conduct feedback/review sessions with

our employees. Some of the things we ask are: What do you want to do to improve next year? What strengths do you want to improve? What deltas do you want to work on? We combine this input with the areas we see for improvement and put together a plan. We schedule training early in the year so everyone knows what classes they will be taking and when. This way, no one can use the excuse that they are too busy.

FMI Quarterly: Are the personal development plans tied to compensation?

Pace: There's not a numerical multiplier, but to advance in our company, the type of training and how you have improved matters.

FMI Quarterly: How does training increase productivity?

Pace: If you compare someone who has not received any specific training — someone who has learned by bumping their head — to someone who has had formal training, you will see at least a 20% to 30% faster learning curve in the person who received training. This may even be as high as 50% for some people. We try to make learning (as opposed to training) part of our culture. It comes from the top, and we value it.

The ever-changing workforce and the importance of productivity in the field make a trained, productive employee the single-most profitable venue for business today. Overhead can be minimized, supplier and vendor costs can be managed, and productivity gains can be maximized if we leverage the trained worker. ■

Why Contractors Fail: A Causal Analysis of Large Contractor Bankruptcies

FMI's in-depth study and analysis of the causes of large-contractor bankruptcies reveals a deeper understanding of these contractor collapses.

By Hugh Rice and Arthur Heimbach, Ph.D.

Too big to fail. This phrase has been used to describe large banks whose failure would cause a chain reaction among other banks and financial institutions in their network.

The theory is that it is in the best interests of the national economy for the Federal Reserve to provide liquidity to assure that these banks don't fail. Some analysts have said that GM falls into the too-big-to-fail category. However, most in the United States agree that government bailouts should be rarely, if ever, applied in a free market system.

So can a corporation be too big to fail? Recent history has shown that construction firms are not too big to fail even though they may have annual revenues ranging from hundreds of millions to several billions of dollars. During the past few decades, there have been dozens of large contractors who, after many years of growth and apparent prosperity, experienced notable financial disasters, resulting in bankruptcy or a reincarnation of the business in a much different form. The following is a partial listing of recent casualties.

- The Austin Company
- Dillingham Construction

- Encompass Services Group
- Fishbach & Moore
- Guy F. Atkinson
- IT Group
- J.A. Jones
- JWP Group
- Modern Continental
- Morrison Knudsen
- Morse Diesel
- Railworks Corporation
- Raymond International
- Stone & Webster

There are bonding safeguards to protect project owners and others when a contractor fails; however, there are no such safeguards for the contractors themselves. Such an event affects not only the employees and shareholders of the firm but the industry as a whole.

WHAT CAUSES LARGE AND HISTORICALLY SUCCESSFUL CONTRACTORS TO SELF-DESTRUCT?

The industry has regularly witnessed smart leaders making what appear to be the same fatal mistakes others have made before them. While lists of the major reasons for contractor failure have been circulated in the past, many industry leaders said something was missing in those lists. FMI Corporation (FMI), spurred on by particular interest from the Construction Industry Round Table (CIRT), chose to search for a deeper understanding of why seemingly successful contractors, many of whom had been in business for several decades, experienced financial distress.

Our mission was to provide a richer understanding of large contractor failure by identifying the root causes behind the “surface level” causes that are so frequently blamed (e.g., ventures into new geographic markets, choosing to offer types of

construction in which the firm has no experience, taking on excessively large projects etc.). It is our hope and expectation that this effort will improve the endurance and longevity of the high-quality contractors serving the needs of our society.

The industry has regularly witnessed smart leaders making what appear to be the same fatal mistakes others have made before them.

RESEARCH SCOPE

When contractors fail, a rather standard set of reasons is given for the failure. Our review of trade publications and other printed materials on the subject of contractor failure provided an initial list of the most-often cited causes for why large contractors fail. (Some causes frequently cited in other

lists are more relevant to smaller contractors.) To help understand the general sources of each “cause,” we grouped the items in the list into three major categories: strategic, organizational, and uncontrollable.

MOST-OFTEN CITED CAUSES OF CONTRACTOR FAILURE

Strategic

- Unrealistic growth/over expansion/unfamiliar new markets and/or entry into new types of construction
- Volume obsession
- Unrealistic promises/bad contracts/poor project selection

Organizational

- Insufficient capital/profits
- Lack of business knowledge/poor financial management/poor sales skills/inadequate marketing
- Poor leadership/poor leadership transfer
- Project losses/poor field performance
- Owner court battles/owner bankruptcy

Uncontrollable

- Industry/economic weakness
- Banking and surety changes

While helpful, the list provides insufficient clarity regarding the causal roots of failure. A review of the list, in addition to our industry experience, told us that in order for firms to have stronger preventive guidance, we needed to identify the causes behind the causes. Why do contractors grow unrealistically? Why are they obsessed with volume? Why do they have insufficient capital? Why do they go from good performance to poor? With that goal in mind, FMI's Research Services Group consulted a wide variety of sources, including:

- Written case studies of more than 80 large contractors who suffered a major financial crisis, many of which resulted in bankruptcy
- In-depth book studies of the issues that generally led successful companies into tenuous situations
- Leading management consultant reports, such as the *McKinsey Quarterly*
- Academic articles focusing on company failures in the construction industry
- Cross-industry comparative analysis of financial data
- Cross-industry analysis of Myers-Briggs profiles
- U.S. Census data on failures in the construction industry
- Surety-based historical data on past failures

- Reviews of financially-based predictive models for failure
- A nationwide survey of senior executives and middle managers from contracting companies with annual revenues over \$250 million
- In-depth case studies of more than 25 failed contractors, representing a wide range of industry segments
- In-depth personal interviews with 35 top executives of contracting companies and surety firms

A MODEL OF THE PATHS TO FINANCIAL CRISIS

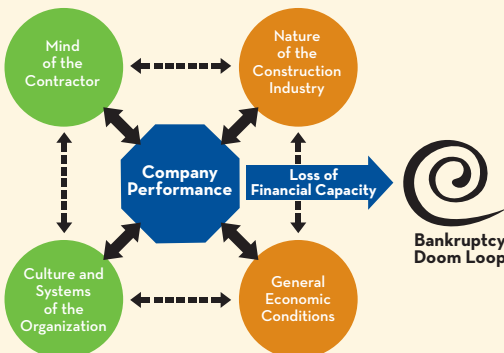
Overall, our research isolated about 200 potential factors that can lead to contractor failure. In digging behind these factors, we realized that no single factor would usually signal the impending doom of a construction firm. More than one issue is most always involved. We found that failing companies usually exhibited a combination of factors that interacted, causing company performance to spiral toward inevitable bankruptcy. Construction is a dynamic and risky business, and as such, it appears that the causes of contractor failure are similarly dynamic and involve a number of difficult-to-manage risk factors.

Failure Chain Reaction Model

To illustrate the causes of contractor failure and how they relate to one another, we created a preliminary model called the Failure Chain Reaction Model. This model categorizes the causes of contractor failure into four major groups, ranging from macro to micro conditions. “General Economic Conditions” and the “Nature of the

Exhibit 1

Failure Chain Reaction Model



Construction is a dynamic and risky business, and as such, it appears that the causes of contractor failure are similarly dynamic and involve a number of difficult-to-manage risk factors.

Construction Industry” represent the macro conditions in the model. The micro conditions are represented by the “Culture and Systems of the Organization” and the “Mind of the Contractor.” (See Exhibit 1.)

“Company Performance” results from the combination of these four categories. Ultimately, poor company performance leads to a

“Loss of Financial Capacity,” which is the final step toward a downward spiral we call the “Bankruptcy Doom Loop.”

Each component of the model is explained further in the following sections.



General Economic Conditions

Specific economic forces affect contractors through many paths, including bonding issues, demographics, government policy, tax law, consumer confidence, and even material shortages. (See Exhibit 2.)

The items in Exhibit 2 are often blamed, in whole or in part, as causes for contractor failure. For example, contractors may blame their financial disaster on a lack of available work due to a suppression of construction plans

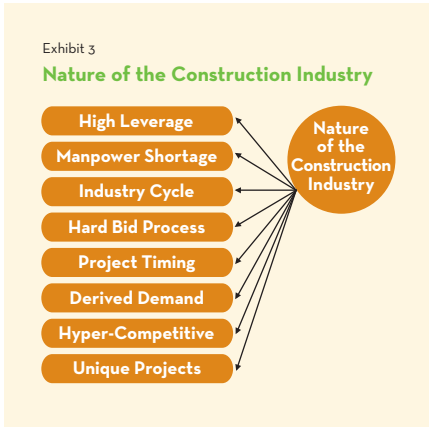
that is caused by an increase in interest rates. However, we question the validity of blaming external economic conditions as the primary cause of a firm’s financial collapse. The fact that not all contractors fail during difficult economic times indicates that there are other causes that are more relevant.

The Nature of the Construction Industry

Many of the characteristics that are unique to the construction industry are also key contributors to contractors’ financial difficulties. Exhibit 3 lists several such items, which are explained in more detail below.

High leverage for contractors does not usually mean a lot of debt, though that can be the case, too. More typically for the construction industry, this refers to the amount of revenue pushed through the pipeline compared to the underlying equity base or level of working capital. Contractors, especially in the building market, can do a large amount of business with a little bit of equity. In the late 1990s, some building contractors turned their working capital 40 or 50 times. Leveraging working capital or leveraging equity is what we mean by “leverage” in the construction industry.

Workforce issues represent an industry-wide problem that is becoming more and more critical to the success of a construction industry firm. The construction industry is a people business, and without the right people in the right places, contractors are bound to get into trouble. Where are these people going to come from, and where will a construction firm find technically qualified people to do the work in the pipeline now and in the future?



The cyclical nature of the industry signifies that construction activity rises and falls faster than the overall economy. Such fluctuations lead to being over-committed or scrambling for work to keep people busy. Both can lead to problems.

The hard-bid process is unique to the construction business. The way work is procured in a large part of the construction industry is different from the way most businesses work. The owner wants a building and wants to know exactly how much it is going to cost before the project is built. Increasing complexity of projects, fluctuating materials costs, and labor concerns all conspire to make this a dangerous get-work practice for contractors. While the predominance of this method is changing with new delivery methods, it is easy to see how contractors still get into trouble here.

Project timing is dictated by owners' schedules, leaving contractors with little control over project start dates. Sometimes project opportunities become available at the same time, leading to over-commitment of company resources. In other cases, project start dates slip, creating staffing and financing challenges for the contractor. Backlogs can fluctuate widely. A related issue is the long project durations, which can result in project impacts due to material, labor, weather, and related issues.

Derived demand is an interesting concept when applied to a contractor. Most businesses think they have the ability to affect the demand for their service or product. If a company wants more business, then it conducts more marketing to create the demand for its product or service. On the other hand, contractors are always responding to opportunities (unless they are able to create a new project and provide the financing as in some design-build, public-private-partnership type

The cyclical nature of the industry signifies that construction activity rises and falls faster than the overall economy. Such fluctuations lead to being over-committed or scrambling for work to keep people busy.

projects). Still, 99% of the work done in the construction industry comes from contractors responding to available work. So contractors are at the mercy of the work that comes their way. This easily leads to the project timing issues noted previously.

The construction industry is hyper-competitive, especially in the United States, with tight, low-margin business. Why is the industry so competitive? Construction is an easy business to get

into; low barriers-to-entry and price-driven competition lead to a very competitive industry. In addition, when every project is unique, contractors don't get to practice. The learning curve can be expensive and not all learning is portable to the next project.

Culture and Systems of the Organization

In our research, we found that the "Culture and Systems of the Organization" played an important role in a construction firm's downfall.

Under this general category are several issues and management areas. Several of these are listed in Exhibit 4.

Lack of financial discipline generally means the business is not being managed like a real business. Some contractors are not good business people. They are good builders, but they don't give the financial side of the business the attention it deserves. For example, at some firms the financial people aren't involved in decision-making; instead, they are relegated to bookkeeper status with the thinking that the only real work of a construction business is construction.

Succession planning is often missing or mismanaged in the construction industry. This makes it a particularly precarious time when, for example, the long-time leader or founder is ready to leave the business, or when unforeseen circumstances cause sudden leadership changes. Similar concerns occur in transitions that involve subsequent generations, as well. Ensuring that a strong leader is replaced with another strong leader when the time is right assures the continuity of the business and future growth. This does not happen often enough in the construction industry.

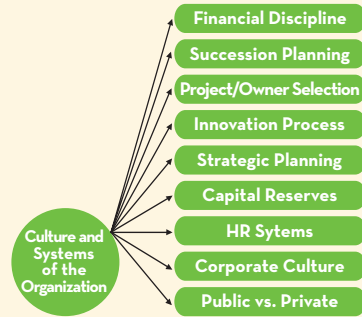
A poor project/owner (or customer) selection process ties back to the project timing and hard-bid process macro causes for contractor failure outlined above. Many contractors do not have a well-defined process for making go/no-go decisions when deciding whether to take on a project. In a highly competitive business, one bad project can mean an unprofitable year, or worse.

Failure of the innovation process usually indicates that there is no innovation process. There is often a sense that construction is a business that never changes. If that was ever true, it isn't any more. Innovation is required to win the work and to build it profitably.

Strategic planning that is not strategic is another way to enter the Failure Chain Reaction Model. We have found that many construction

Exhibit 4

Culture and Systems of the Organization



Ensuring that a strong leader is replaced with another strong leader when the time is right assures the continuity of the business and future growth.

companies do strategic planning but don't have very good strategies. They tend to be so caught up in the process that they forget that their task is really to determine what kind of company they are and where the company should be headed. Instead, their "strategic" planning becomes an operational fix-it list.

Companies that do not maintain adequate capital reserves are running on the razor's edge. One misstep can cause them to fall into the cycle of failure. This management aspect is a critical area that affects the long-term sustainability of a contractor. It is often sabotaged by other corporate and personal demands, leading to the company's demise.

Since the construction industry is a people business, all aspects of human resource management are important. Finding and retaining the talent needed to do the job is critically important for construction firms.

Corporate culture issues have gained recognition in recent years as being more important than historically thought. This area is especially notable when clashes in corporate culture are cited as leading to a company's end. Ethical and moral issues are some of the more serious areas of corporate culture failures, but a company's culture also affects decisions about the company's strategy and hiring needs. The strength of the company's culture dictates not only its ability to hold firm on the practices needed to maintain a financially disciplined organization but also its capacity to change and meet the never-ending evolution of the market and the competition. Our research on failed organizations indicates that cultural issues often contributed to company failures.

The Mind of the Contractor

One of the most surprising and perhaps most interesting results of our research is a greater understanding of the role played by what we call "The Mind of the Contractor." After reviewing our research, we wondered if we could identify

certain mentalities that also increase a company's probability for running into trouble. We found that some of the characteristics that contributed to the success of an individual leader, also contributed to the company's collapse. Exhibit 5 lists some of the characteristics potentially leading to construction company failure.

Since all the items on the list are psychological factors, a broad range of interpretations can be drawn. Our research included our own consultants' experiences working with contractors as



well as interviews and comparative results from accepted personality tests such as the Myers-Briggs Type Indicator. Generally, if you are a contractor or know those who lead and own construction firms, most characteristics on this list will ring familiar.

Most contractors are by nature driven to grow their business. They want to build the biggest job or perform the most volume. They readily buy into the "if you're not growing, you're dying" mentality. If the firm is a public firm, the market expects it to

Construction is a high-risk business, so it is not surprising that those who venture into this business are numb to its inherent risks.

grow. Part of that expectation is the belief that profits will grow along with revenues. In construction, this result is often not the case.

Contractors are also by nature action-oriented, rapid decision makers who sometimes act too quickly when a more deliberate approach is needed. Most leaders in the construction industry came from the operations side of the business. Most were former project managers or superintendents. While this is a critical background for a construction executive, the CEO's job is to run the business, not the projects. Some leaders never make this transition.

A project focus to the business can lead to a feast or famine mentality. Getting the next project and building the backlog seems to overshadow all other considerations — frequently leading to taking the wrong job for the wrong reasons.

Construction is a high-risk business, so it is not surprising that those who venture into this business are numb to its inherent risks. Or, after decades of facing these risks and succeeding, the contractor often develops calluses to these risks. Many people outside the industry consider the risk contractors assume compared to the low margins gained, crazy. Yet, the people running construction companies don't see it that way. Instead, they sign personally for bank loans and bond guarantees thinking it is "no big deal." They believe they can control the risks. They have strong egos and a can-do attitude. This supreme confidence can be a great characteristic for a contractor, but it can similarly lead to the downfall of the business.

Being afraid of layoffs is linked to the concern contractors have for finding and keeping the right people as well as the drive to grow the business and the cyclicity of the industry. Construction firms that have built up a good workforce in good times naturally want to keep people busy until the next big job comes along. But this can lead to inflated overhead, fattened job costs, and poor project selection.

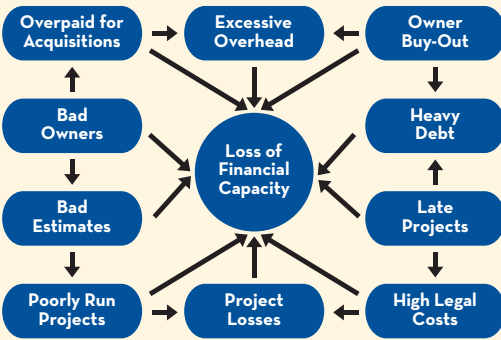
Loss of Financial Capacity

When the contractor's mindset, company culture, general economic conditions, and the nature of the industry combine to create Poor Company Performance (the red octagon in the middle of the Failure Chain Reaction

Being afraid of layoffs is linked to the concern contractors have for finding and keeping the right people as well as the drive to grow the business and the cyclicity of the industry.

Exhibit 6

Loss of Financial Capacity



the potential of a firm’s failure employ some of these financial measures. Unfortunately, by the time these lagging metrics indicate a problem, it is usually too late. The company will typically have already lost its Financial Capacity and will be scrambling to pay its bills and employees.

End Stages of the Model

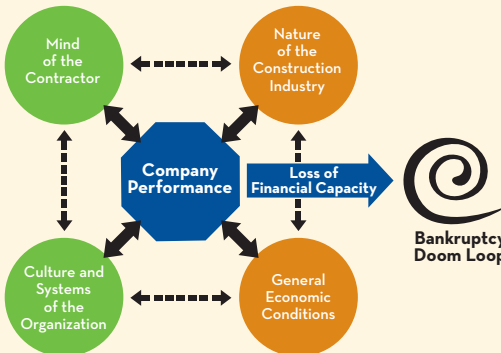
The End Stages of the Model in Exhibit 7 shows the interactivity of causes that can lead to a Loss of Financial Capacity, which in turn can lead ultimately to what we call the “Bankruptcy Doom Loop.” If these terms sound ominous and scary, they should. Once a firm has lost its financial capacity, failure is almost inevitable. Loss of Financial Capacity is the ultimate trigger of the downward spiral that includes a decline in surety bonding, the calling of bank loans, and the inability to make payroll and pay suppliers.

THE FAILURE CHAIN REACTION MODEL IN ACTION

One of the most important aspects of our preliminary model is the interaction of factors leading to contractor failure. As an example of this interactivity, the Failure Chain Reaction diagram shown in Exhibit 8 illustrates how two micro factors (Ego

Exhibit 7

Failure Chain Reaction Model

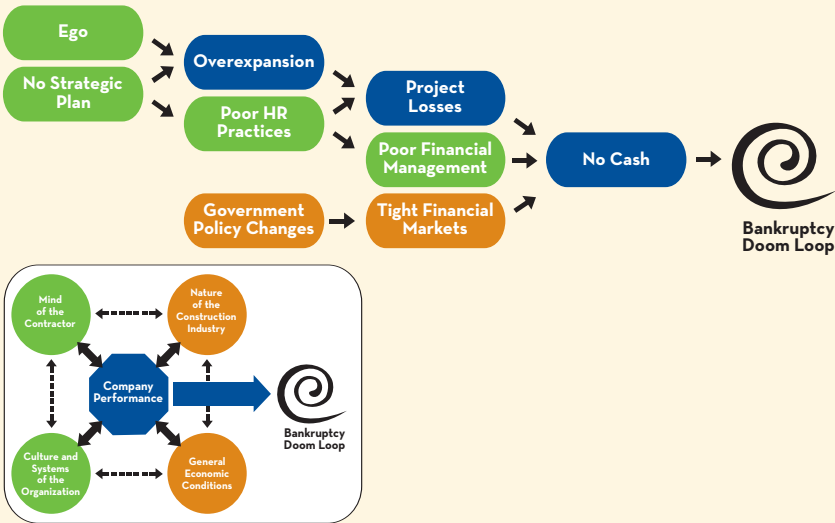


Model illustrated in Exhibit 1), the result is oftentimes the Loss of Financial Capacity. See Exhibit 6 for example causes behind this loss. Before a firm loses financial capacity, however, symptoms of this impending loss can be detected through measures of Company Performance. In fact, most models that predict

and No Strategic Plan) can begin the chain reaction. The ego of the leader, a factor from the “Mind of the Contractor” category, causes him or her to drive rapid growth for the company. However, this growth is being driven without a strategic plan, a factor in the “Culture and Systems of the Organization.” Combine these initial causes with poor human

Exhibit 8

Failure Chain Reaction Model in Action



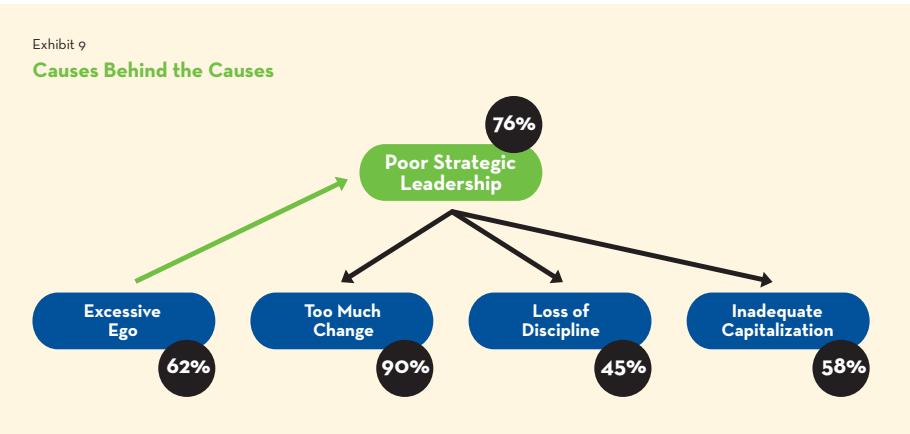
resource planning during a period of over-expansion, and project losses are inevitable. At the same time, the organization may make poor financial decisions.

It is not hard to imagine how these initial factors would come together if everyone is focused on rapid growth, and the organization doesn't have the discipline to create a strategic plan. It may be possible to recover at this point in the chain reaction if someone inside or outside the organization says, "Wait a minute, I think this company is in deep trouble." However, this is not likely to happen when the leader has an oversized ego. Although we noted above that general economic conditions were rarely the root cause of failure, a declining market can provide the tipping point or last straw to this impending disaster. At this point, being over-extended due to rapid expansion, late projects, poor cash flow, and a host of other poor performance factors, can lead to financial failure.

The above scenario is just one of many possibilities using our Failure Chain Reaction Model. After clarifying the items involved in the model and their general interrelationships, we then focused on identifying which elements and relationships are the most common and/or most powerful in the process that led to the failure of large contractors over the past two decades.

THE CAUSES BEHIND THE CAUSES MODEL

Our preliminary model clarified that a systems approach was the best method for understanding the process of going bankrupt. We used that model's framework to organize



the information we obtained from our in-depth interviews with a wide array of senior executives involved with many of the recent and large failures in the construction industry. We then identified five dominant root causes — Excessive Ego, Poor Strategic Leadership, Too Much Change, Loss of Discipline, and Inadequate Capitalization. Exhibit 9 illustrates a new model that illustrates our perspective on the relationship of these root causes.

Excessive Ego

The interviews we conducted indicated that in 62% of the company-failure cases, ego-related issues were a crucial element in the actions that led up to the disaster. According to one industry executive:

Ego-driven people scare me the most. In this business, pride and ignorance go together, and experience and humility go together. If you have been around construction long enough, you have failed and been humbled. If you are prideful and arrogant in construction, you simply have not been hit yet.

The concept of excessive ego embodies a constellation of attitudes and beliefs that in many ways point to a leader’s ability to succeed. However, those same attitudes can often be identified as the root causes leading the company to failure. The concept of a two-edged sword could not be more applicable here. Pride, arrogance, over-

**In this business,
pride and ignorance
go together, and
experience and
humility go together.**

optimism, and blindness to realities (to name just a few of the traits) are often characteristics of a leader who fails to develop a team, or seek candid feedback. Such leaders may also develop a sense of invincibility. There are many ways in which an excessive ego can distort reality, leading to misperceptions concerning the market, the company’s capabilities, and the leader’s personal needs, any of which can put the firm at much greater risk of failure.

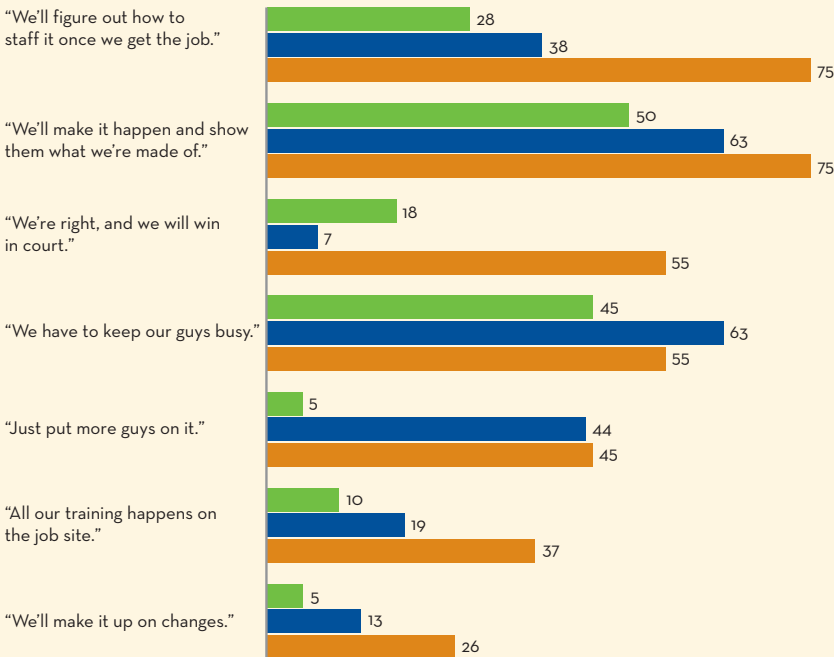
When we asked managers and executives of construction firms across

Exhibit 10

Evidence of a Relationship Between Excessive Ego and a Financial Crisis

Percentage of survey respondents answering “yes” to statements concerning their company’s attitudes and culture. (Sorted by the company’s risk of financial crisis)

- Least risk of financial crisis
- Low risk of financial crisis
- Had a financial crisis



Notes to chart key:

Least Risk of Financial Crisis = responses from people employed with a contractor that they believe to be well below average in terms of its risk level for having a financial crisis within the next five to 10 years.

Low Risk of Financial Crisis = responses from people employed with a contractor that they believe to be about average, or near average, in terms of the risk level of having a financial crisis within the next five to 10 years.

Had a Financial Crisis = responses from people who have been employed with a contractor that had a financial crisis.

the nation to select the statements that best describe their culture, the responses from companies that are experiencing financial crisis displayed high-ego attitudes more frequently than firms with lower risk. (See Exhibit 10.)

Most of the statements on our list are familiar to those who have worked in the industry for any length of time, and it isn't hard to see how such attitudes can get a contractor into trouble. For instance, a project manager's policy of, "We'll figure out how to staff it once we get the job," often results in a poorly or incorrectly staffed job. As mentioned relative to Exhibit 6, leaders who are trying to grow the company too fast may lack a good strategic plan and/or good human resource planning. While this approach sometimes works as the company scrambles to put people on the job, it also frequently leads to lower margins and late projects. When this approach does work, it builds the leader's ego to the point that a sense of invincibility is reinforced, which can lead to taking greater risks until disaster strikes. As illustrated in Exhibit 10,

even companies that we considered low risk for failure said some of these statements described the attitudes in their company. When too many of these ego-centric attributes come together with other factors, the risk for failure in these companies appears to increase.

If the perils of excessive ego appear to be obvious, why do companies or leaders let these attitudes get them into trouble? One reason, as mentioned above, is that

Often, there is a short distance between the self-confidence needed to assume the risks typical to an entrepreneur and the over-confidence that precipitates the fall of the unsuccessful contractor.

sometimes these attitudes work; however, more often, in our daily culture, we do what feels right to succeed and stay blind to the dark side of many of our thoughts, beliefs, and actions. Often, there is a short distance between the self-confidence needed to assume the risks typical to an entrepreneur and the over-confidence that precipitates the fall of the unsuccessful contractor.

Poor Strategic Leadership

In 76% of the company failures studied, poor strategic leadership was cited as a leading factor in the business failure. For instance, one executive of a public company that ran into serious financial difficulty said:

“Everything comes back to leadership; all the decisions were made by me and a few other people in upper management. We are relatively democratic, considering a broad range of options; we ultimately make the decisions, so

problems are our fault. Once we made poor leadership management decisions, there were certain operational failures where lower-level people made erroneous decisions, causing systems and business processes not to work as intended. The problems all stemmed from bad choices made at the top.”

A leader's excessive ego often leads directly to “Poor Strategic Leadership,” which is typically the root of a contractor's financial difficulties. Another leadership weakness leading to corporate collapse is not having any (or enough) “skin in the game.” This results in a renter's attitude rather than that of an owner. The lack of a personal presence, i.e., absentee leadership, results in insufficient awareness and control of the organization. As we examined cases of contractor failure, we noted that many leaders, due to their excellent building and technical skills, ended up running large companies that far exceeded their business management capabilities. Strategic mistakes resulted. Just as over-confidence can produce wrong decisions bringing down companies, indecision can lead to problems not getting resolved, which can equally topple companies.

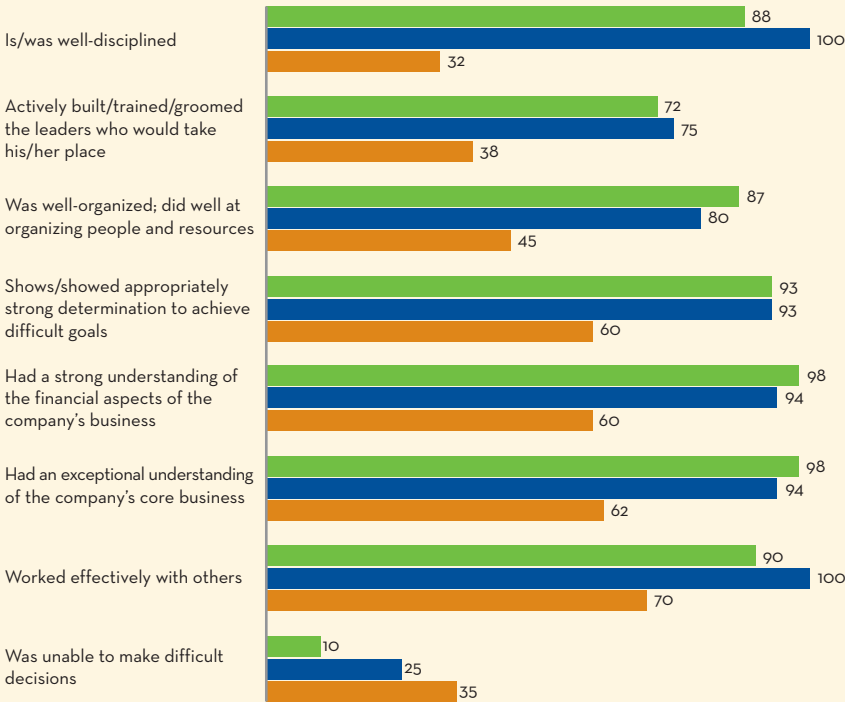
We asked executives and managers of construction firms to choose from a list of

Exhibit 11

Evidence of a Relationship Between Leadership Quality and a Financial Crisis

Percentage of survey respondents answering “yes” or “generally yes” to statements concerning the behavior and skills of their company leader.

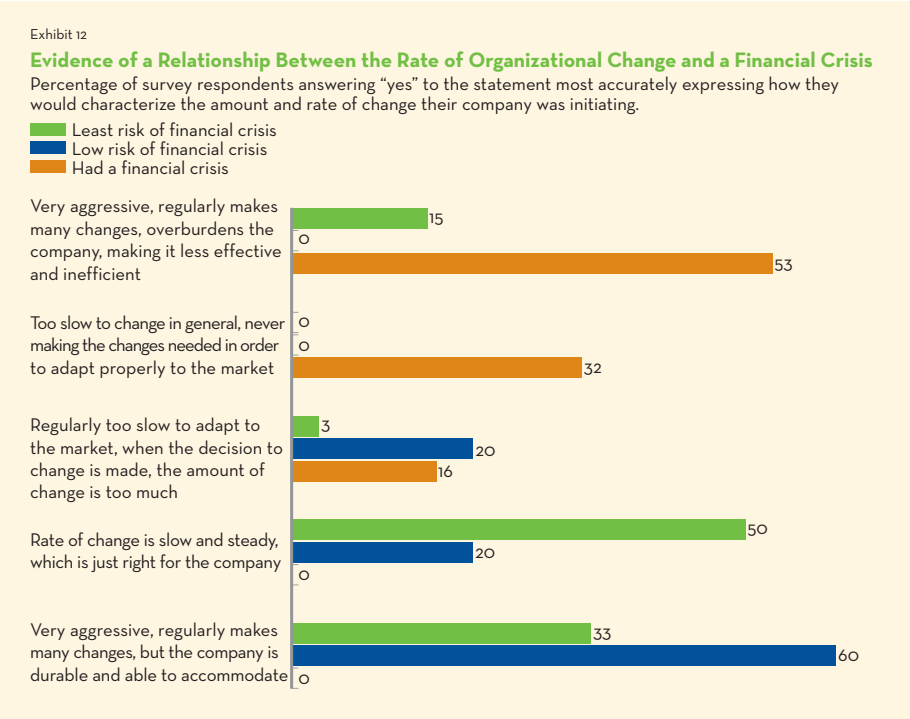
- Least risk of financial crisis
- Low risk of financial crisis
- Had a financial crisis



statements related to the skills and behaviors of strong strategic leaders. Only 32% of executives who had worked with companies that had experienced a financial crisis replied that leadership was well-disciplined. (See Exhibit 11.) Not grooming new leaders and successors; showing little understanding of the finances and core aspects of the business; not having an ability to make difficult decisions; and other factors from our responses indicate poor strategic leadership. Sometimes the wrong person gets the top job.

Too Much Change

For the large-contractor failures that we studied, a startling 90% of the organizations had initiated a considerable amount of change preceding their crisis. In fact, excessive change appears to be the root cause behind many of the more surface-level causes that are often identified. Examples of these surface-level causes include a sudden increase in the volume of work, entry into new geographic markets, working with new owners, and choosing to offer new services. In addition, hiring new senior leaders, changing ownership, hiring new project managers, and even installing a new accounting system can all be changes that set events in motion toward the failure of the organization. With each increment of change, there is an exponential increase in the risk of losing the systems of procedure and control that are so fundamentally critical to bringing projects in on time and on budget, and maintaining satisfied



owners and employees. Changing too much, too fast leads to problems.

The results of our survey support the concept that a constant, yet moderate, pace of change is the best route for a company. (See Exhibit 12.) Whereas about half of the respondents from companies rated as “least at-risk” believed their company made changes at a slow and steady pace, none of the executives and managers from companies that had experienced a financial crisis believed this to be true for their companies. Rather, these managers and executives reported their companies to be far more likely to approach change with a very aggressive and overburdening style.

Pushing the Speed Limits of Change

“Fire fighting” and “spinning out of control” are phrases that executives often use in their descriptions of companies that took on too much change on their way to financial meltdown. With the obvious importance of managing the rate of change for the survival of a contractor, we felt a need to more clearly understand how the pace of change leads to added difficulties. To illustrate the problem, we created a graph along the lines of the supply/demand graphs used

“We blew-up because we had too many moving parts. We couldn’t keep our focus and fight the fires at the same time.”

— Ex-executive of a failed firm

in economic theory. (See Exhibit 13.) The X-axis along the bottom of the diagram represents the total amount of change within the organization occurring at one time. The vertical Y-axis represents amounts of resources, which can be machines and internal systems (computers, construction equipment, accounting systems etc.), but primarily is used to represent human resources (the mental capacity for change as well as simply the number of employees in the firm). The upwardly sloping green

line represents the resources required to accommodate change, and the downwardly sloping blue line represents the resources available or remaining to accommodate the changes being made in the company. As the amount of change increases, the amount of resources used to accommodate the change increases and the amount of resources available to accommodate additional change decreases.

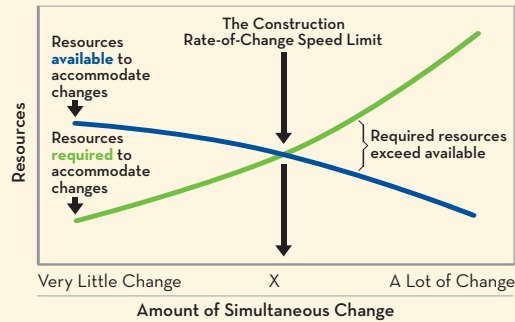
The Rate-of-Change Speed Limit is the point at which the upwardly sloping line intersects the downwardly sloping line. It is at this point that the company is operating at its speed limit, or maximum level of change, using all of its resources to accommodate the changes being made. If the company exceeds its speed limit, the ability for it to maintain its discipline and quality of work is severely compromised, and there is an increasing risk of instability leading to failure.

Loss of Discipline

Whether it occurs because of too much change or is a gradual decay, the Loss of Discipline is one of the most caustic root causes of contractor failure. About 45% of the large contractors we studied reportedly experienced this erosion of discipline. The importance of maintaining discipline in the management and operations of the

The importance of maintaining discipline in the management and operations of the company is no different from the importance of discipline in the processes employed in constructing a building.

Exhibit 13
**Contractor Resource
Equilibrium vs. Rate of Change**



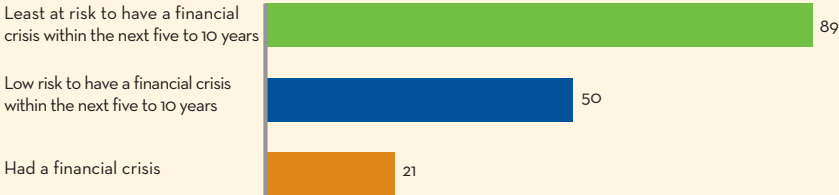
company is no different from the importance of discipline in the processes employed in constructing a building. If the measurements are off or attention to detail is neglected, cost overruns and on-the-job accidents become the focus of attention. The analogies for management include, but are not limited to, staying true to appropriate project selection and pricing policies, taking efforts to maintain an entrepreneurial spirit, avoiding bloated overhead and complex organizational structures, and not succumbing to the impulse of needing to “feed the beast,” or take the seldom-actualized “break-even” project just to keep people busy.

The results from our nationwide survey of construction executives and managers show that how well a company

Exhibit 14

Evidence of a Relationship Between Maintaining Organizational Discipline and a Financial Crisis

Percentage of survey respondents who answered “yes” or “generally yes” to a statement concerning their company’s consistency in maintaining organizational discipline.



is believed to be “keeping its eye on the ball” is directly related to its risk of financial crisis. (See Exhibit 14.) We defined “keeping the company’s eye on the ball” as not changing from proven practices regarding solid hiring, training, employee retention, accepted project risk level, or proper job estimating and/or cost controls.

Executives and managers in companies that had experienced a financial crisis more frequently reported their company took on strategies that didn’t fit core competencies, and seldom had a culture that supported learning from mistakes. (See Exhibit 15.) In contrast, executives and managers from companies believed to have a low likelihood for a financial crisis reported their company’s behavior as being more disciplined.

One individual we interviewed illustrated this by saying: “We have about eight offices. I say that could be about seven too many.” Companies that lack a good growth strategy or are inattentive in deploying their strategy can end up with more infrastructure than the company can support. The result is a lack of focus, a drain on resources, and, in order to keep people busy, the urge to chase projects that don’t fit the

business. Lack of discipline is often seen in the lack of a “way” that the company does things. There is no standardization of processes or systems. There are many ways that a loss of discipline can get a company into trouble, and it is a strong sign that a company may be heading toward failure.

Companies that lack a good growth strategy or are inattentive in deploying their strategy can end up with more infrastructure than the company can support.

Inadequate Capital

The last major root cause for contractor failure is having “Inadequate Capital.” This was the case in 58% of the crises we studied. This refers to companies that maintain a level of capital that is inadequate for ensuring a sufficient buffer for sudden, unexpected needs (despite what the

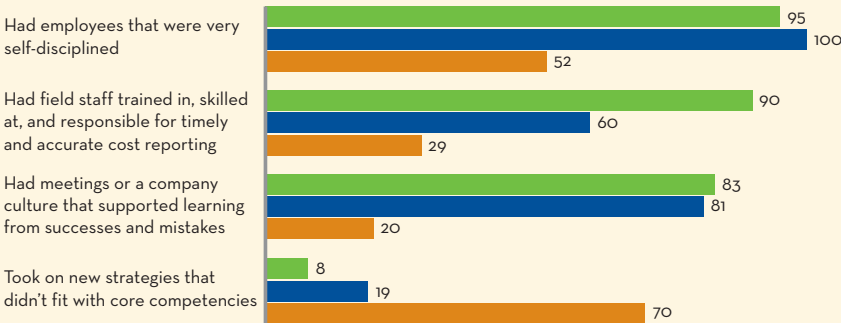
company leader may think). The economics of the construction industry are rather unique, and many leaders fail to grasp the severity of risk that the company is exposed to by maintaining an inadequate amount of capital. There are many forces tugging, even yanking, on the leader to take funds from reserves in order to fund

Exhibit 15

Additional Evidence of a Relationship Between Maintaining Organizational Discipline and a Financial Crisis

Percentage of survey respondents who answered “yes” to statements revealing company practices characteristic of maintaining organizational discipline.

■ Least risk of financial crisis
■ Low risk of financial crisis
■ Had a financial crisis



other, seemingly more pressing, needs. The list of issues related to an inadequate amount of capital is long. The following is a partial list:

- A financial policy that is too liberal and that consistently targets a level of contingency/reserves that is inadequate.
- Being forced to litigate disputes since the capital base is inadequate to allow compromise.
- Large, long duration projects causing significant equity, cash, and working capital to be tied up in uncompleted work (or claims).
- Pressure to show profits prematurely. Equity reflected in percent of completion estimates does not reflect real profits.
- Ownership-related capital depletion. For instance, stockholder buyouts lower the capital base of the company.
- Diversification into illiquid assets. Assets tied up in real estate do not provide cash available to solve problems that may arise.
- Surety availability. Lower equity means reduced bonding capability.
- Managing cash vs. managing the business. As cash runs short, too much time is spent managing cash, taking focus away from the business.
- Over-leveraging — too much debt, too little “real” equity.
- Over-payment for acquisitions.
- Leadership’s unspoken assumption that the firm will incur no bad luck.
- Leadership’s reliance on “phantom” capital, which is the equity reflected on a balance sheet that is made up largely of estimated profits on uncompleted work.

Prudent management dictates that the firm’s equity and working capital levels be maintained at a level to survive unforeseen problems.

THE NATURE OF THE CONSTRUCTION INDUSTRY AND
GENERAL ECONOMIC CONDITIONS

Many people from failed companies point to issues outside the control of their company as the causes of its demise. Yet, in any market, at any time, you can find examples of companies that succeeded despite the same external force being

present when another company suffered a catastrophic financial event. In fact in our study, many seasoned industry executives emphatically rejected the notion that luck or other extraneous forces are responsible for a company's decline.

Nonetheless, we do see a need for identifying the role that external economic conditions can play. Our study indicates that these externalities are not root causes but actually accelerants that quicken the pace of demise for those companies that already suffer from one or more of the root causes noted. It is a rather thin

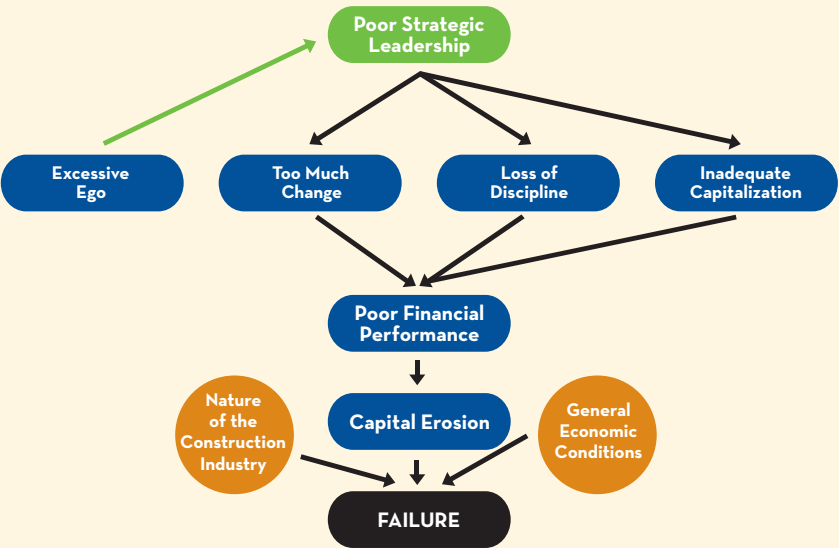
It is a rather thin edge
on which successful
contractors live.
A significant misstep
can end the life of
the company.

edge on which successful contractors live. A significant misstep can end the life of the company. The depth and complexity of the troubles that take large contractors down is evident; we see more liquidations than reorganizations.

Using parts of our original Failure Chain Reaction Model and focusing on the critical root causes results in the simplified model below. (See Exhibit 16.) This model illustrates the interplay of the critical root causes that lead to poor financial

Exhibit 16

Failure Chain Reaction Model: Critical Root Causes



performance, which aggravates the issue of maintaining adequate capital (creating “Capital Erosion”). Finally, additional input from external forces may accelerate the firm’s pace to failure.

FMI is working on the development of diagnostic tools that are based on this model and that will provide new ways to assess a contractor’s level of risk for incurring a financial crisis. Whereas the majority of our work has always been to help our clients improve their corporate strength and value, it is now clear that the activities required for a contractor to grow and prosper are not exactly the same as those necessary for it to have sustainable success. The tools resulting from this research, and the continuing knowledge-building in this area will be valuable aids in building a better construction industry. ■

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- ⁹ Surety historical data on past failures.
- ¹⁰ Reviews of financially based predictive models for failure.
- ¹¹ Nationwide FMI survey of a sample of senior executives and middle managers from contracting companies with annual revenues over \$250 million.
- ¹² In-depth case studies of more than 25 failed contractors, representing a wide range of industry segments. List of companies available upon request.
- ¹³ In-depth personal interviews (anonymous) with 35 top executives of contracting companies and surety firms.

Fit Your Education to Your Life

As construction projects increase in complexity so will the demand for knowledgeable construction managers. Online degrees offer a flexible way to earn these credentials.

By Kelley Chisholm

Considering a career in construction management? If not, you may want to. The *Occupational Outlook Handbook*¹ reports that construction managers can expect excellent employment opportunities through 2014 since the number of available positions will exceed the number of qualified individuals seeking to enter the occupation.

In addition, the increasing complexity of many construction projects will require more managers to oversee them. Although the average construction manager often works more than 40 hours a week and has to deal with delays, bad weather, and emergencies, salaries and benefits are usually good. Salary Wizard® at Salary.com™ reports that the median expected salary for a typical experienced Construction Manager I in the U.S. is \$86,799 and rises to \$107,321 for a Construction Manager II, keeping in mind salaries can be affected by compensable factors such as employer size, industry, employee credentials, years of experience, and others. Salaries can also vary widely by geographic location, where compensation generally moves with costs of living.

Individuals interested in becoming construction managers must hold certain qualifications to be considered for these positions. According to the Bureau of Labor Statistics, employers prefer to hire people who combine actual industry work experience with an undergraduate degree in construction science, construction management, or

civil engineering. Hands-on experience is key and may be acquired by work in one of the construction trades, another industry job, through internships, or through co-op programs. In addition to industry experience, employers are also placing a growing importance on post-secondary education. This stems from increasingly complex construction processes that are due, in part, to rapid technological changes. Besides understanding contracts, plans, and specifications, and knowing about construction methods, materials, and regulations, construction managers also need to have some experience with computer software for job costing, online collaboration, scheduling, and estimating. Further, understanding of the business side of construction is expected by more and more employers, as is skill in interpersonal relations.

Many universities and colleges in the United States have undergraduate and/or graduate degree programs in construction management or construction science. Graduates from four-year degree programs are usually hired as assistant project

managers, field engineers, schedulers, or cost estimators. Master's degree recipients, especially those with previous construction work experience, generally become construction managers in large construction firms or construction management companies. Doctoral degree recipients usually become college professors or conduct research.

Individuals pursuing an undergraduate or advanced degree can choose between traditional or online classes. *U.S. News & World Report* recently reported that more than three million students are currently pursuing online degrees from higher learning institutes across America.² This is almost double the number of students who were taking online classes just four years ago. Distance learning has

Distance learning has exploded for a variety of reasons, including not having to sit in a classroom, flexible scheduling, and access to global resources and experts.

exploded for a variety of reasons, including not having to sit in a classroom, flexible scheduling, and access to global resources and experts. However, online learning is not for everyone. Some people may be reluctant to take online courses if they feel the need for a more interactive environment and face-to-face contact with professors

and other students, or if they are uncomfortable with the technology in general or lack the time management skills needed to succeed. Nonetheless, a growing number of people realize education is one of the best investments for their future, and an online environment makes it easier to obtain a degree while maintaining their busy lives.

Some of the advantages of online learning include:

- Geographical barriers are eliminated, allowing for greater educational options
- Self-paced learning allows students to learn at the rate they prefer
- Online learning is designed around the students, and supports multiple learning styles
- 24/7 accessibility makes scheduling easy
- Overall tuition and other costs are frequently less
- Students develop knowledge of the Internet that will help them later in their careers
- Travel time and costs are reduced or eliminated
- Students can easily revisit content for reinforcement
- Greater interaction among students and instructors is achieved through the use of e-mail, message boards, chat rooms etc.

FMI Quarterly recently spoke with Dr. Bradford Sims, construction management department head and developer of the online master of construction management degree program at Western Carolina University (WCU) in Cullowhee, N.C., to gain more insight into the online world of construction management.

FMI Quarterly: What were the driving forces behind making WCU's master of construction management program online?

Sims: Our business college at WCU has a master's degree in project management, which is completely online. It is one of only two PMI-certified online master's programs in the United States. I conferred with WCU during development because I wanted to build a program for project managers and others who want to move to the next level. I also wanted the program to have more of an MBA flavor to it. We worked out details with the College of Business, and we agreed that the first year of their business program was relevant for our construction management students. But for the second year of our construction-management program, we would offer

WESTERN CAROLINA UNIVERSITY

*Master of Construction Management
Degree Program*

WCU's program is completely online and can be completed in two years. Courses include the following:

Prerequisites

- Tools for Financial Management
- Statistics and Economics
- Legal and Ethical Issues

Core Courses

- Project Management Systems
- Project Plan Development
- Project Plan Analysis and Approval
- Research in Construction
- Construction Informatics
- Construction Marketing and Development
- Advanced Topics in Construction

Additional information about WCU's program may be found at www.wcu-cm.org.

classes more specific to the construction industry. Since their program was already online, it was easy to get ours approved by the University for online offering. I wanted it online since the construction industry is so transient; when I was building refineries for a living, there was no guarantee I could stay in one location long enough to get a degree. But if the program is online, it doesn't matter. Students in the program start and go through every class sequentially together. The program is tailored to working individuals in that we only accept people who are currently working.

FMI Quarterly: How long did it take to develop the online curriculum?

Sims: Putting the content into an online package for each class took a few months. Other WCU faculty members contributed to the class designs. For example, one faculty member had a strong interest in construction informatics and helped design that course as well as the construction marketing class. Another person designed the advanced topics class, and I designed the construction research class.

FMI Quarterly: What software did you use?

Sims: We used a standard educational software package called WebCT. WebCT recently merged with Blackboard so we'll be using their new system. The master of project management online program also used WebCT so that's why we decided to use it. It is very robust, and you can use all or some of the features, which include live voice communication, whiteboards, and the ability to post assignments. It's a great package; everything can be placed in one location and archived. Students are required to login on a regular basis to participate in online discussions with their group members, to post their assignments, and to get new ones.

FMI Quarterly: How are your students embracing the online format?

Sims: In the series of classes, there was an attrition rate for the first two classes. For some students, it was too much of a change from the traditional classroom, and they didn't feel comfortable with it so we lost a percentage of them. Students who completed the program said the use of online collaboration tools gave them additional success at work and made them better employees.

FMI Quarterly: How many students are currently enrolled?

Sims: This fall will be our second year, and we have approximately 30 students enrolled.

FMI Quarterly: What is the average age of your students?

Students who completed the program said the use of online collaboration tools gave them additional success at work and made them better employees.

Sims: So far, we're seeing many students in their mid-to-late 20s who are working at construction companies with an unrelated degree and want to get a construction management degree.

FMI Quarterly: How many faculty members do you have? Are they virtual or campus-based?

Sims: This fall we will have seven construction management faculty members, and they will all be here at WCU. The first-year classes are taught by business faculty, and second-year classes are taught by construction management faculty. In any case, the university requires that all faculty teaching distance learning, unless they are adjunct, have to maintain an office on campus.

FMI Quarterly: Is there any face-to-face interaction during the program, such as at orientation or the program end?

Sims: No, the students are not required to ever set foot on campus, although some do come for graduation. The whole concept was to make this program truly online. There are some plusses and minuses, and I can't say it's perfect, but based on our industry and how folks move around, we didn't want to make face-to-face interaction a requirement.

FMI Quarterly: What are some of the advantages and disadvantages of the online platform compared to the traditional classroom?

Sims: For students, one of the advantages is the transparency of the professor's lesson. Professors have to be much more prepared and organized to teach an online class, and the students benefit from this. Another big plus for the students is the variety of backgrounds, work experiences, and age groups in each cohort. The students are forced to collaborate with each other on group assignments, and through this process, they have the opportunity to learn from one another. Learning to use the online tools is another advantage, for the students and the companies they represent.

A drawback to online courses is that students don't have an immediate support group. It is easy to wait until the last minute to do the coursework or not do it at all. It is also much easier to dropout in an online environment when you get busy with your job or family life.

FMI Quarterly: What recommendations do you have for other universities that are interested in taking their programs online?

Sims: They should survey their potential clients first and see what they need in a program. In today's market, the traditional master's degree is not always the best way to go. For example, in our program we don't require a thesis — it's all classwork. We

exist for the working individual; that's our focus. Universities need to understand their client base and how to market to that base. The other important point is to ensure quality in the program. Without quality, you are going to lose students. Working individuals want high-quality. Plus, if a program is poor quality it gives all online programs a bad image, and I think this has been a big challenge for universities over the past five years. We need to look at what we can do to fill the need for online education because there is a huge market out there. At the same time, we need to look at the quality of what we're providing.

FMI Quarterly also spoke with Andrew Sapienza who is enrolled in WCU's master of construction management degree program, to gain a student's perspective on the online experience.

FMI Quarterly: What made you decide to enroll in WCU's master's program?

Sapienza: I was probably biased since I work at WCU as the network coordinator for the Kimmel School of Construction Management, Engineering, and Technology.

FMI Quarterly: Why did you opt to take an online master's curriculum over a traditional classroom-based curriculum?

Sapienza: The flexibility of the program is the main reason. Between home life and work, it is much better to be able to do the program online.

FMI Quarterly: Have you met any of the professors in the program face-to-face?

Sapienza: I do see the CM professors every day because of my work as the network coordinator. However, I have not met any of the project management professors face-to-face.

FMI Quarterly: What about your classmates — have you met any of them?

Sapienza: No, not in person. The way it works is that the students are placed into teams. On my current team, there is one person who lives in Asheville, N.C.; one in Toronto, Canada, who works for the Canadian Royal Air Force; and one who is a lieutenant in the Navy and based in Connecticut. We bring to our team diverse backgrounds and different perspectives, which is nice because we all learn from each other.

FMI Quarterly: Have you had any previous online learning before this program?

Sapienza: The majority of my undergraduate classes were face-to-face, but I did have one online class 10 years ago, when online classes were just starting to catch on.

FMI Quarterly: How did that class compare to your classes now?

Sapienza: There was much more interaction with the professor then. Today's classes are much less personal, and you are working more with your teammates instead of the professor.

FMI Quarterly: Have you encountered any problems with WebCT?

Sapienza: Our IT services are very good and usually resolve any issues within a day. We post web pages about ourselves and our contact information, and it's recommended that each student have at least all team members' phone numbers as backup.

FMI Quarterly: What are some advantages you've had with the online experience?

Sapienza: The flexible schedule and convenience of being at home. Many people in the program travel a lot, and as long as they have an Internet connection, they can take the work with them. So it doesn't matter where they are, whether it's a hotel room or their office, they can participate in an online chat session or do postings.

FMI Quarterly: What about the disadvantages?

Sapienza: You really can't develop relationships with your classmates or your professors. You definitely need to be disciplined and set aside a certain amount of time each night to do the work. The coldness of the online environment is another thing. We actually talked about this in my first course. Also, not being able to read body language or to see someone's facial expressions is a disadvantage.

FMI Quarterly: Do you feel that the online curriculum is as rigorous and challenging as the traditional classroom?

Sapienza: It is very rigorous. Students in the first class are weeded out quickly because they don't realize the amount of work that's required.

FMI Quarterly: Do you have any suggestions on improving online learning?

Sapienza: I think it would be beneficial to at least meet with the instructor at the beginning of the course, such as in a web chat session. Right now in the project management part of the program, we mainly communicate through postings or e-mail. Once we move into the construction management side of the program, the individual instructors are considering holding weekly conference calls for everyone.

Many people in the program travel a lot, and as long as they have an Internet connection, they can take the work with them.

FMI Quarterly: Would you recommend an online master's program over a traditional program to others?

Sapienza: If you're a working professional, yes, because of the flexibility it offers. If you travel a lot, it's very convenient. Many of the people in the program are project managers who travel so it works very well for them.

FMI Quarterly: What are your plans after graduation?

Sapienza: I'm considering the construction management Ph.D. program at ECU or at Indiana State, and then going into teaching.

If a degree is important to further your career, then the online option should be considered as an alternative and flexible way to earn these credentials.

There are a few things to bear in mind when choosing an online program:

- **Is the program legitimate?** Many employers disregard degrees that are not accredited. Another thing to consider is how long the institution has offered online courses.
- **What computer skills are necessary?** Generally, good keyboarding/typing skills, experience with e-mail, familiarity with Windows, and the ability to use online discussion boards and chat rooms are basic competencies for online success.
- **What hardware, software, and Internet speed requirements are needed?** Consider all technical requirements, which are usually listed on the institution's web site, before signing up for any online course.

As construction projects increase in complexity so will the demand for knowledgeable construction managers. While employers prefer candidates who possess previous construction work experience and a strong background in building technology, they are also placing a growing importance on post-secondary education. If a degree is important to further your career, then the online option should be considered as an alternative and flexible way to earn these credentials. ■

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Managing Risk: The Paradoxical Farce of Change Order Policy

Developing a proactive change order management strategy will not only minimize the firm's risk but also provide a mechanism to better manage customer expectations and relationships.

By Gregg Schoppman

“**N**o work shall commence without a signed change order.”

The mantra of almost every contractor in the United States, these stern words embody the average construction firm's policy regarding additional work resulting from any number of factors — including, but not limited to, unforeseen conditions, designer error or omission, uncoordinated scope etc.

With such a strict policy that appears universal in its application, why do so many firms struggle with the liability of unapproved, uncollected, or even litigious change orders? What are the drivers of this management dilemma, and how have these nine words become a paradoxical farce in the construction community?

Most industry experts would agree that change orders no longer represent untapped margin potential. With few exceptions, change orders are productivity killers and often become the focal point for schedule disruptions and project controversy. Customers believe contractors seek out change orders when, in fact, most contractors would relish a project with few or no changes. Many studies have shown that as the frequency of change orders increases, labor productivity decreases. Coupled with other uncontrollable project issues (i.e. climate, spatial constraints etc.), project margins begin to suffer. The deleterious effect of change orders becomes compounded on projects with multiple trade contractors and suppliers. General contractors and trade contractors alike suffer from the effects of poor change

Even on hard-bid, lump-sum projects where maintaining strong customer ties for the next project is less important, there is no discounting the project harmony that is lost with a heated and controversial change order battle.

management. With the exception of collaborative delivery systems such as design-build, many contractors would agree that construction documents are declining in quality and presenting greater ambiguity in their interpretation. All signs are indicating that problems related to construction changes will continue to worsen before they improve.

So what are project managers to do? Project managers walk a tenuous line when charged with managing not only the project, but also preserving and maintaining the customer relationship. Even on hard-bid, lump-sum projects where maintaining strong customer ties for the next project is less important, there is no discounting the project harmony that is lost with a heated and controversial change order battle.

Here in lies the conundrum. Proceed

with the work and maintain the schedule and relationship, or stop, haggle, and argue — disrupting the wheels of progress and shaking the project's momentum. However, proceeding blindly without authorization is never without risk. While maintaining the project's progression and continuity is desirable, negotiating values at the end of the project increases change order exposure. These change orders are rarely collected at full value; project write-downs occur, disrupting the anticipated margins and even the overall financial health of the organization. In addition to the sacrificed direct costs, the project team also often fails to capture some of the hidden or indirect costs. The impact of increased or expended general conditions and additional overhead exacerbates the damage.

Developing a proactive change order management strategy will not only minimize the firm's risk but also provide a mechanism to better manage customer expectations and relationships.

MANAGING CHANGE EARLY

Why do change orders exist?

Controversial changes usually result from breakdowns in communication. To be sure, some change orders are simply the result of a customer making a harmless business decision to better the finished product, in their opinion. To add an office, add an outlet, or change a color may be simple and non-controversial discussions. Yet, the vast majority of change orders arise from

mismanagement of expectations. Flaws in the design and constructability driven by errors and omissions in contract documents, unforeseen site conditions, and misaligned interpretations of scope, comprise the foundation of many change orders. Many contractors believe architects and engineers are single-handedly responsible for all change orders. In the contentious world of hard-bid plan and specification contracting, it is easy to take the perspective of the victimized contractor and ask: How can contractors maintain control when they are merely operational pawns reacting to their customer's poor planning and coordination?

Whether talking about hard-bid or design-build projects, many contractors subscribe to a victim mentality rather than seeking early and firm resolutions to change orders. Proactive management begins with handling change before there is one. During the preconstruction meeting with the customer, whether it is an end-user or general contractor, the change order process must be discussed. In addition to discussing generic project specifications, the process should include the following items:

- **Lines of Authority** — Who can approve what and for how much? If a customer hesitates to sign a change order for fear of retribution within their organization, they probably do not have the necessary authority. Find the decision maker. This may change as change costs increase.
- **Deadlines** — What time frames are established for resolving change order issues? Avoid the never-ending change order cycle and have mechanisms in place to resolve contentious items early.
- **Escalation** — If change orders cannot be resolved at the job site, at what level are issues escalated? Within the time frames allotted, when should issues be escalated to the next level? What is the process for escalation?








Many contractors view this method of addressing potential change orders early in the project relationship as adversarial and worry that customers will view this manner of questioning as primer for the change-order floodgate. Yet the opposite is true. When the change order process is discussed proactively within the context of standard operating procedures such as invoicing, quality control, and schedule management, it becomes less controversial and more about finding

solutions. Educating customers on the process outlines the potential hazards to them and helps to uncover the hidden and nebulous contract terms, often only discovered after the project climate has become hostile. It also mitigates the risk associated with ignorance about how to handle change. Historically, contracts become the “go-to”

Educating customers on the process outlines the potential hazards to them and helps to uncover the hidden and nebulous contract terms, often only discovered after the project climate has become hostile.

Exhibit 1

Trade Contractor Scope Coordination:
Division 15 – HVAC Coordination Matrix

	Domestic and Sanitary	Roof Top Unit Connection	Condensate Lines	Roof Drains	Connection to Central Plant
EZ Plumbing Inc.					
ICE Cold HVAC Company					

Duplication of Scope?

Scope Hole?

device in times of crisis rather than tools to manage unforeseen conditions, schedule delays, schedule acceleration, and damages.

The next step in the process is to begin to identify change. Most likely, crews identify changes as they toil in the field. Changes either receive early, orderly approval; result in work taking place on unapproved changes with hazards of future collection; or work stoppages that halt progress and negatively affect productivity. Careful scrutiny of the plans and specifications during the pre-job planning phase is one mechanism to remedy these events, but beware that this effort does not turn into an Easter egg hunt for potential change orders. More importantly, the project manager and superintendent should examine the plans, specifications, subcontracts, purchase orders, permits, and site carefully, using a check list of potential “job progress hazards.” Here is an example.

- **Trade Coordination** — Review the scope of each trade contractor and/or supplier to identify scope holes or scope duplication. Exhibit 1 illustrates the use of matrices to coordinate scopes.
- **Detail Review** — Each member of the team should scrutinize connection details, grade changes, cross sections, panel summaries, room details etc. This is where small details are usually missed or omitted. These small details can compound and complicate already arduous schedules.
- **Staging** — Job sites continue to shrink, and site utilization during construction resembles claim-staking from the Gold Rush. Developing site and logistic plans will help manage expectations for storage, deliveries, and exit strategies. Simply laminate a site plan and use scale models to represent material bundles, access roads, critical utility ties-ins, trailers, crane swing radii etc. Map out utilization on paper before it costs money to relocate materials and labor. This best practice not only protects against presumptive change orders related to logistics and handling, but it also guides the project team in strategic management of the site. Exhibit 2 depicts how this process works.
- **Schedule Review** — Review all assumptions regarding schedule milestones, and ensure both production and procurement schedules support the overarching project goals. A matrix similar to the one in Exhibit 3 can be used to develop master schedules and to expose disconnects or interpretation differences early on.

Each piece of this pre-job planning exercise must be carefully mapped and developed to match the firm’s core business. For example, the level of detail will vary greatly between a mechanical contractor engaged in gas-piping installation at a hospital and a painting and coatings contractor responsible for tilt-up warehouse finishes. Consistency, standardization, and a customized application of historical lessons learned will help improve any firm’s process and root out potential scope conflicts. Early identification of errors, conflicts, and omissions will not only mitigate the risk of uncollected change orders, but it will help manage the overall project scope by reducing production killers and simple reactionary tactics.

**CHANGE ORDER
PROCESS AND STRATEGY**

Changes are inevitable, even with the greatest preparation and planning. Of the work-in-process changes, the majority are started with an RFI. Many problems stem from the request’s

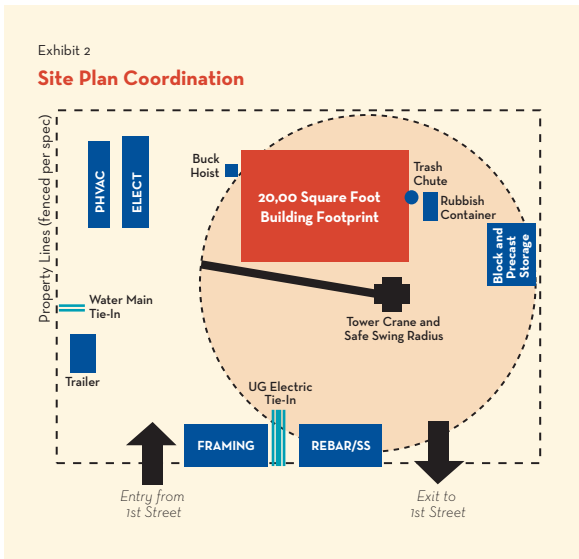


Exhibit 3
Master Schedule Development Matrix

Task	Trade/Supplier	Anticipated Duration	Actual Duration (Input From Contractor or Supplier)	(Disconnect)	Resolution
Foundations	Grey Concrete Inc.	10 Days	10 Days	0	
Slab on Grade	Grey Concrete Inc.	7 Days	7 Days	0	
Door-Frame Installation	Internal (SUPPLIER ABC Frames Inc.)	3 Weeks	6 Weeks	3 Weeks	Quick Ship (10% price increase)
Elevators	U.S. Hydraulics Inc.	5-week Install, 15-week Procure	7-week Install, 20-week Procure	7 Weeks TOTAL	Meet with USH on Tuesday to coordinate production and review bid documents
Carpet Installation	Fuzzy Side Up Inc.	4 Days	3 Days	-1	Allow for special staging – Use day to load individual floors

verbiage. Quite often, the contractor knows the right answer, yet poses the question in some convoluted and tortuous fashion. So RFIs become an instrument to prove designer incompetence and offer one-upmanship for contractors with an axe to grind. Pre-job planning helps to avoid this by identifying changes, errors, and omissions, which leads to asking the question in a professional and goal-oriented manner. Any well-crafted RFI should facilitate an expeditious and well-crafted response by including the following:

- **Location** — Where on the site does this occur? Where on the plans does this occur? Including a sketch, cut sheet, and photographs makes it easier to visualize the problem and potential solution.
- **Potential Solutions** — What options are available? This does not mean contractors are assuming the risk, but by posing options, precious time spent on investigating solutions can be saved.
- **Magnitude** — Does this change have an impact? How is the cost quantified? Receiving clarification on wall colors has minimal impact. Resolving plenum conflicts with trade contractors may have some impact on schedule and project cost. Finding a satisfactory answer requires knowing all of the factors.

This same strategy is employed in drafting change orders. Timely approval of change orders can often be traced to its presentation. Consider the two examples in Exhibit 4.

There are many items to consider when developing strategic change orders. First, consider the audience. While a field director may authorize a change order and understand its background, decision-makers higher up in the organization may not be privy to important supporting details. Assume the audience is ignorant of the change-order particulars. This ensures project managers develop each change order as

if they were educating their customer for the first time.

“Sticker shock” is another important consideration of delays in change-order approvals. Customer confidence in a product or system can often be shaken or dissuaded after seeing the price tag. With only one option presented, the automatic reaction is to ask for other options. Carefully selected options or shopping lists eliminate a costly and unproductive step in change-order resolution.

Customer confidence in a product or system can often be shaken or dissuaded after seeing the price tag.

Exhibit 4
Change Order Comparison

**CHANGE ORDER PROPOSAL
EXAMPLE No. 1**

MECHANICAL – Change Units

TOTAL COST = \$16,500

VS.

**CHANGE ORDER PROPOSAL
EXAMPLE No. 2**

MECHANICAL
Provide two additional HVAC units (20 tons) to meet the City of Anywhereville mechanical codes. (See Exhibit A and letter provided by Arthur Dumore in Exhibit B, Engineer of Record.) The roof plan is attached to show the location of the units. Below are three options to aid in the decision process:

ExpenseAire Units (10-Year Warranty)
(Per Specifications)
MATERIAL COST = \$15,000
PROFIT = \$1,500
TOTAL = \$16,500

Middleburg Cooling Units (Five-Year Warranty)
MATERIAL COST = \$10,000
PROFIT = \$1,000
TOTAL = \$11,000

CheapieAire Units (Six-Month Warranty)
MATERIAL COST = \$5,000
PROFIT = \$500
TOTAL = \$5,500

NOTE - Keep in mind the specified product will result in extending the schedule by three weeks due to production.

The final price and its constituent components become another contentious issue. Contractors guard against sharing their margins, believing it to be proprietary corporate information. Gone are the days of assigning change-order margins of 40% to 50% and having customers not question the exorbitant costs. General contracts and subcontracts now often stipulate change-order terms and quantify allowable margins and overhead. Provide the breakdown early! A schedule of values or line-item accounting becomes the next step in this tedious process. The customer begins to wonder what the contractor is hiding when a breakdown is conveniently absent.

While change orders may lack the enormous profit potential of yesteryear, contractors should have a measure to capture all of the hidden, but real, costs of change orders. As a change order is estimated and priced, project managers should review their firm's checklist of potential costs including, but not limited to, the items below:

- Additional supervision
- Additional project management (if direct-costed)
- Clean-up

- Additional storage and trailer rentals
- Transportation costs
- Misc. tool and equipment rental
- Bonds
- Builder's risk policies
- Safety management and supplies.

Many of these items are easily justified and imperative for completing additional work. Historically, high margins simply covered these various costs. Now contractors need to provide the appropriate justification. Once again, preparing the change and providing sufficient explanation makes this more palatable for the customer, thus increasing the rate of approval.

Change order discussions would be remiss without discussing schedule. One of the greatest frustrations in change order management comes after the costs are agreed upon. "Well, glad we got that approved," says the project manager. "By the way, the materials you chose will take an extra three weeks to produce. Sorry." Schedule can rival cost when evaluating alternatives and making final decisions. Blinded by dollars, contractors fail to provide critical schedule information.

The failure to quantify the impact of procurement is not the only misgiving of schedules and change orders. With the addition or modification of scope, resources must be adjusted and reallocated. The options to handle change include adding labor and equipment to accomplish new tasks or extending the schedule. Many contracts have clauses precluding the addition of time to schedules. Hard and fast deadlines mean the adjustments are addressed during the pricing. Proposing change

orders at standard rates when clearly additional time is necessary becomes a recipe for margin fade.

Schedule can rival cost when evaluating alternatives and making final decisions. Blinded by dollars, contractors fail to provide critical schedule information.

Utilization of time and materials tracking is another traditional mechanism used in change order value disputes. Customers often feel this method ensures the contractor's honesty and avoids the padding of final prices with excess contingencies. This is true until the issuance of the final invoice. Weeks of work tickets, time cards, and receipts are dismissed because "there was no way it could have taken that much time or that much money to do that work." Who is at fault — the customer who declined the option of taking the lump sum change order value or the contractor

who perceivably duped the system and used this time and material change order as a vehicle for capturing lost margin? In this instance, better communication during the process prevents the buyer's remorse customers feel when presented with the bill. Providing time and material changes is one communication tool that helps prevent

sticker shock by arming customers with breakdowns of change order costs and time during the work in process. Frequency is dependent on the project specifics. Some change orders will require only weekly maintenance, while others may require daily updates. The complexity of the work and potential costs are the most likely determinants. The customer can continually compare the progress to their baseline or

expectations. Ultimately, the contractor has a running tabulation of the project’s progress and a narrative establishing precedence to the customer. Exhibit 5 illustrates a running time and material change order log.

In addition to showing various costs and their chronological history, the log allows customers to quickly review reasons for projected cost overruns. In many cases, this log resembles an abbreviated work-in-progress report for the customer. For the entire project team, it serves as a central mechanism for communicating the work. However, the log is based on a critical assumption — that field

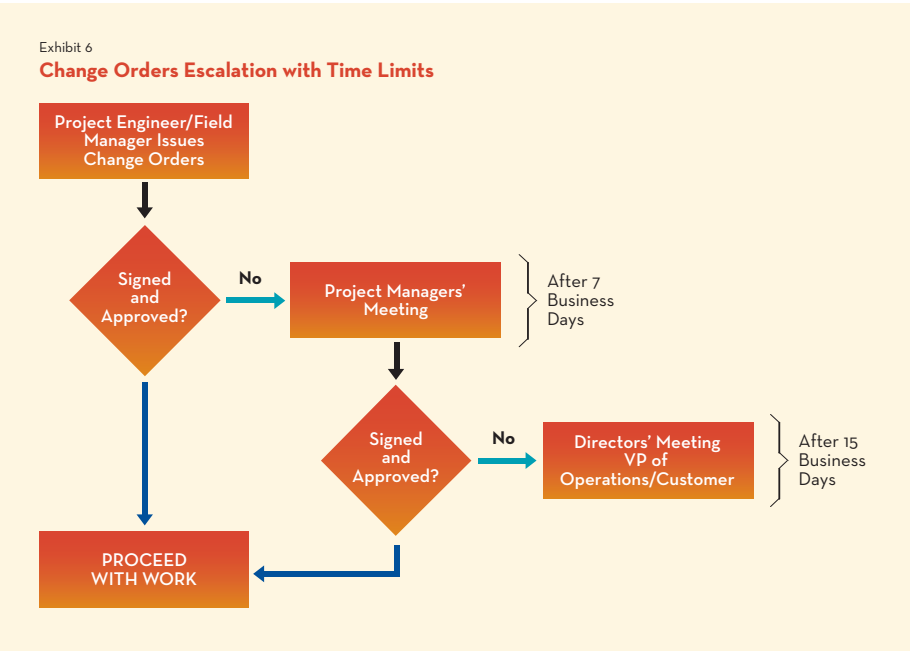
managers are receiving the appropriate daily approvals and gaining consensus on quantities and work tickets. Discounting and abandoning this first step in the field implodes the entire process.

The resolution of many change orders occurs at the project end. Project managers delay the awkward conversations as if settling a bar tab. As a result, facts surrounding the changes are fleeting memories, and the project staff barely resembles the one that began the project. In the spirit of expedient closure, settlements occur at fractions of the original change-order value. Yet, these same change orders were bullet points in every project progress meeting for the prior six months, with the project team dancing around these “five-hundred pound gorillas” during general discussions. Higher powers muddle through these sticky and complicated issues at

The resolution of many change orders occurs at the project end. Project managers delay the awkward conversations as if settling a bar tab.

Exhibit 5
Running Time and Materials Change Order Logs

Update	Current Labor Spent to Date	Current Equipment Spent to Date	Total Costs to Date	Anticipated Cost at Completion	Project Overrun	Discussion
12/5	\$2,500	\$2,000	\$4,500	\$25,000	0	
12/12	\$5,000	\$5,000	\$10,000	\$27,000	\$2,000	Lot 14 included per John Smith direction
12/19	\$12,000	\$7,000	\$19,000	\$30,000	\$5,000	Rock formation at Station 100+10



the end of projects with little or no documentation of fact on which to base a sound decision. To avoid this never-ending combative change order discussion that plagues so many projects, establish escalation steps. If an issue remains open for seven days, what is the next step toward resolution? How and when should it be routed to a higher level that can render judgment? Exhibit 6 illustrates typical escalation steps.

PROACTIVE MEASUREMENT

Accurate record-keeping provides accountability and measures a firm’s risk related to change orders. Numerous project management software packages contain tools to capture not only change orders and RFIs but also important metrics about a project or individual’s performance. The first step is to develop and maintain a project specific change order log (see Exhibit 7).

In addition to capturing the fundamentals such as number and title, the change-order log contains a series of metrics, which provide feedback on project performance. One metric, the change order closure rate, provides a benchmark for monitoring the status of unapproved change orders. In the scenario above, change orders typically close within 7.5 days. The unapproved change orders are averaging a rate of almost 11 days outstanding. Are these change orders disputed, or is it simply an administrative hiccup? Ticklers or metrics such as these serve as reminders for the management team. Exhibit 8 is

Exhibit 7

Change Order Log and Summary

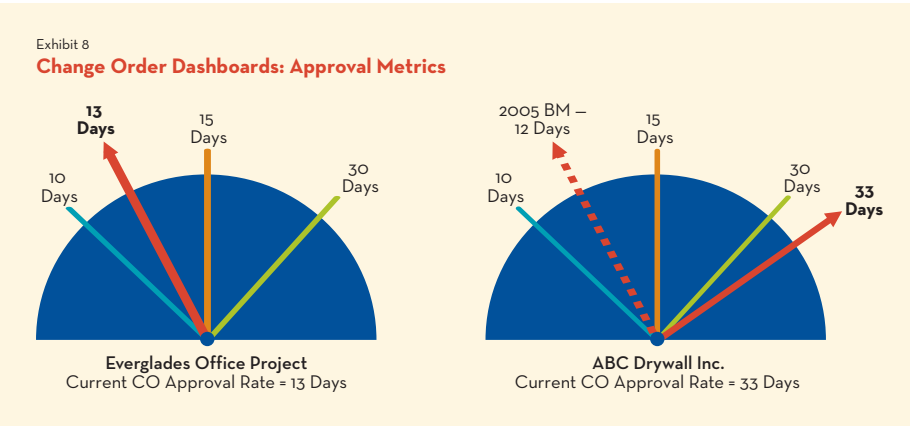
Change Order Log: Summary Sheet								
Project	ABC Hospital, P-1234.	Total number of change orders to date		5				
Customer	ABC Health	Current change order outstanding duration		10.67				
Architect	XYZ Designers	Average change order closure rate		7.5				
Engineer	123 Engineering Inc.	Average dollars attributable to change orders		\$7,550				
Drawing Version	2	Current potential exposure of change orders related to unresolved change orders		\$37,750				
Report Run Date	12/20/06							

Change Order Critical Information								
Change Order Number	Change Order Title	Origination Date	Date Finalized	Closed?	Days Outstanding	Finalization Date	Tied to RFI? (#)	Cost/ (Credit)
1	Error in duct size	12/1/06	12/7/06	Yes	Closed	5	#2	\$2,000
2	Conflict with joist	12/2/06	12/15/06	Yes	Closed	10	N/A	—
3	New equipment — Carrier vs. Trane	12/1/06		Pending	14	N/A	#10	\$50,000
4	Cut refrigerant lines	12/6/06		Pending	11	N/A	#11	\$750
5	Deletion of West Wing HVAC	12/6/06		Pending	7	N/A	#13	-\$15,000

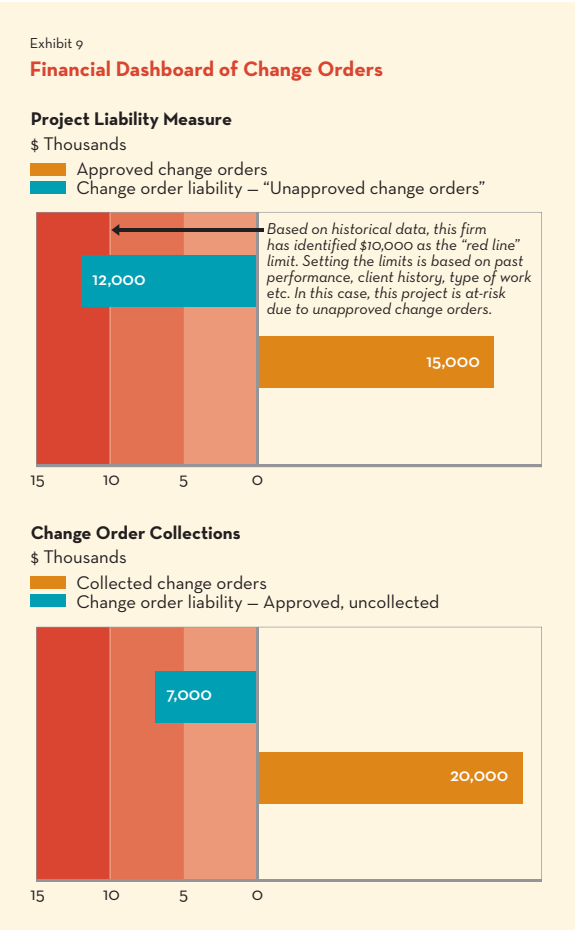
another example of comparing the closure rate from a project and firm perspective.

Dashboards such as these provide a visual depiction of performance better than many tabular representations or spreadsheets. Managers, superintendents, executives, foremen, and technicians alike can quickly process and assimilate the information presented in these pictorials. Firms are also able to capture benchmark data and use this comparative information to measure historical performance. Exhibit 8 shows that ABC Drywall Inc. is experiencing a 33-day closure rate, which is poor compared to their 2005 rate of 12 days. The information gathered from this process provides fodder for introspective questions such as: What are the drivers of this increase? How have customers’ behaviors changed during this time? What are project managers doing (or not doing) to gain the necessary approvals?

Closure and approval rates are one measure to mitigate the risk from change orders. Financial exposure is another key metric that quantifies exposure and risk. PMs should review approved changes as well as those whose dollars have yet to be collected. Even with a fully executed change order, the risk remains of customers



failing to pay. Exhibit 9 illustrates two perspectives on examining change orders. Managers have to understand how change orders are affecting the business in order to make effective decisions. An inter-company, change-order dashboard enables executives to make a quick scan while remaining above the minutia of project details. Identification of high-risk areas focuses the effort. Also, change orders can be evaluated within the context of their project size. Operations managers, vice presidents, and controllers alike can use this dashboard information when evaluating new projects



to be estimated, existing customer risk, and individual associate performance. No conclusions can be drawn from this single metric, but with a comprehensive investigation or audit, managers and executives can make better business decisions. Exhibit 10 compares individual projects with their actual measure of change order liability.

SABOTAGING CHANGE ORDER MANAGEMENT

Monthly job cost review meetings often become the bane of any project manager’s monthly schedule. This monthly torture for some project managers often resembles the Spanish Inquisition. Project managers squirm

and routinely rationalize poor project performance. Ultimately, there are always the change orders “that are in the mail” and will be signed in a week’s time. The week passes with no signature and compounding project costs. However, strong project leaders abound in firms whose commitment to change order policies is exemplary. Unfortunately, the risk lies not in the project manager’s behavior but with the senior executive’s flimsy adherence to policy. Change order sabotage is another frequent cause of change order mismanagement.

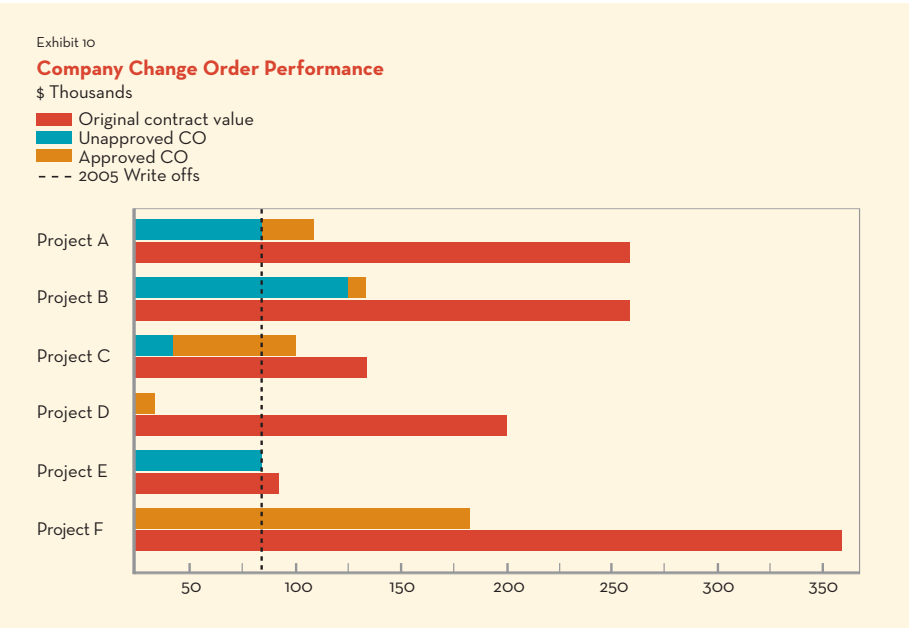
The ruthless change order saboteur thwarts even the greatest project managers in their efforts to effectively manage this delicate process. For example, consider a project manager who has informed a customer that no work will be completed without a signed change order in a professional and non-confrontational manner. Upon hearing this perceived insubordination, the customer dials the project manager’s superior instantaneously with the fury of an active volcano. The construction executive only has to hear a customer

complain once to completely abandon the firm’s change order policy and countermand the project manager. “No problem, Mr./Ms. Customer,” says the construction executive. “I’ll tell my project manager to get to work immediately. Sorry for the confusion.” Exceptions are made for this “one customer” in the effort of expedited schedules and satisfied customers. Many business decisions are made in the spirit of maintaining customer relations. In many cases, this scenario becomes the rule rather than the exception. What message has this sent to the project manager? In order to keep the customer satisfied, do work without signed change orders. At the first sign of resistance, abandon the process and rationalize away good judgment. The correct behaviors are abandoned when the

project manager is chastised for demonstrating them. Senior management should use this opportunity to reflect on the reasons for the customer’s reaction. Was it because they did not have all of the information? Was it due to a potential breakdown in the firm’s process? Alternatively, did the customer not intend to pay in the first place and so used this strong-arm tactic to gain the upper hand?

When developing a change order strategy, tie it to the firm’s strategy. A hard and aggressive change order process will not suit a contractor that prides itself on being “customer-centric.” This does not mean signatures become optional. Rather, developers of change-order process should be conscious of their business drivers. Focus on the upstream processes to minimize change orders needed and the potential impacts. Determine the root causes of these changes. Does the customer routinely use poorly defined scopes and weak designers to develop the projects plans and

When developing a change order strategy, tie it to the firm’s strategy. A hard and aggressive change order process will not suit a contractor that prides itself on being “customer-centric.”



specifications? Do the schedules continually compress or elongate? Is this customer “high maintenance?” The customer-centric contractor’s process revolves less around change orders and more on educating the customer early in the construction process.

Process, procedure, proactive management, and measurement will mitigate many of the risks surrounding change orders. A good process and consistent communication will yield timely, collected change orders for most contractors and customers. But for a small group of dastardly individuals, a proactive strategy will not help. These individuals are the lowest common denominator on the ethical scale and will never pay no matter how well they are managed. The process does, however, provide detailed records in the case of litigious situations. Careful customer selection provides the greatest safeguard against unethical customers. In the middle of these extremes are the many customers, contractors, and end-users that become branded as unethical and obstinate simply because they lack the knowledge to help themselves. Educating customers early in the process is the greatest preventative medicine to ensure good customers do not go sour. Adherence to policy and procedure will educate the majority of customers on the correct way of handling change. Understanding how to prevent change, communicate change, and manage change will not only serve to deliver a higher quality finished product but create more knowledgeable project teams in this business of construction. ■

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The U.S. Economy: Geographic Winners and Losers

While the U.S. economy remains strong, an analysis along regional lines illustrates clear geographic winners and losers.

By Heather Jones

The U.S. economy, while slowing, remains strong. A good jobs situation, unyielding consumer spending, and business and government spending are contributing to this strength and are offsetting the slowing housing market. To understand how the economy affects individual businesses, we will take a closer look at regional activity.

U.S. regions can be defined in many ways. The U.S. Census Bureau breaks the country into four regions and nine districts (see Exhibit 1). Many other analysts refer to popular definitions such as the Sun Belt and the Rust Belt. Still other analysts use Virginia Tech's Metropolitan Institute's Megapolitans (see Exhibit 2). Any way that you analyze it, there are clear winners and losers.

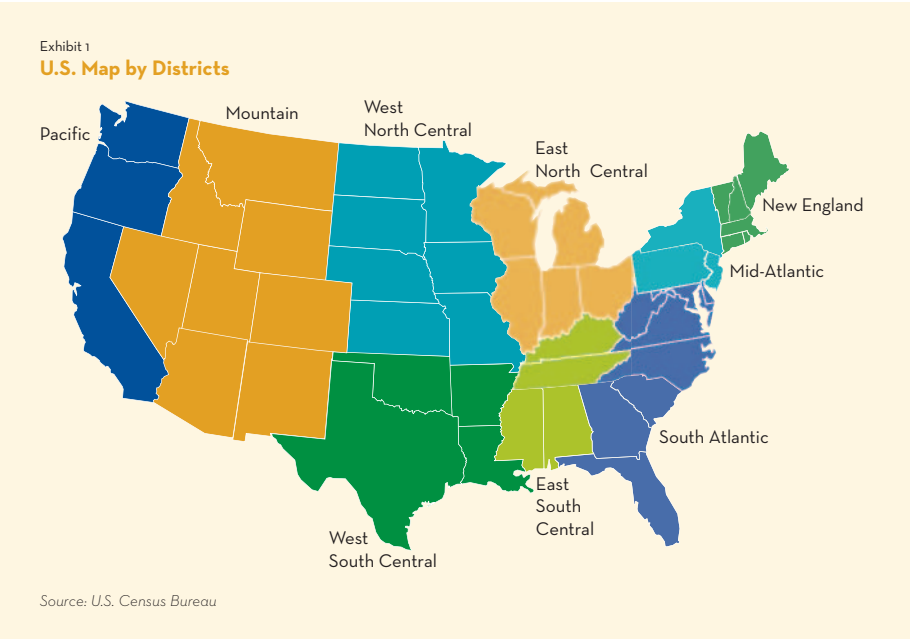
THE BIG WINNERS: THE SOUTH AND THE SOUTHWEST (OR THE SUN BELT)

It may seem intuitive that these areas of the country are the fastest growing, but there are concrete factors behind this growth.

Historically, the Northeast and the upper Midwest were the strongest of the regions. However, in 1970 the South and Southwest regions began to see rapid population growth. These regions were termed the "New South," a precursor to the term the "Sun Belt." The Sun Belt is roughly defined as the states south of the 37th parallel and includes between 15 and 17 states, depending on the source. Though, it

generally includes Virginia and the states south to Florida as well as the states west of Virginia to include Southern California. Colorado and Utah are sometimes included as well. For this article, we will use the broadest definition and include all 17 states, which is much broader than the map shown in Exhibit 3.

The South is by far the hottest region in the country. It recovered from the 2001 and 2002 downturn faster than any other region, mostly due to well diversified economies without a heavy reliance on the tech sector. The South also enjoys mostly affordable home prices and lower cost labor, which is attractive to both workers and companies. The Southwest continues along its same path. California remains a



strong state despite many residents cashing out their fat real-estate gains and moving to more affordable Southwestern states. This action has proven to be beneficial to both California and the other Southwestern states. In particular, Arizona and Nevada have

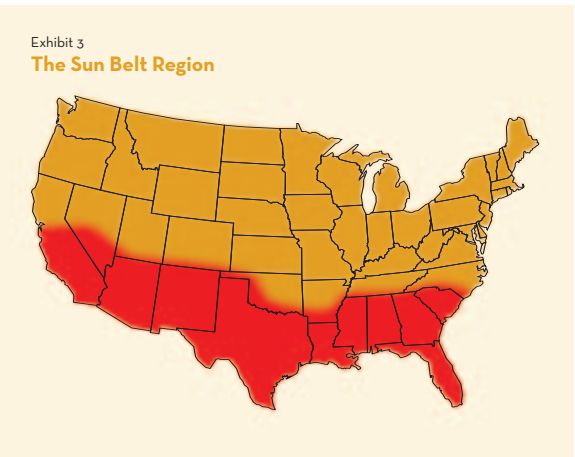
both been beneficiaries of these actions.

Regions become *hot* for several reasons. Population growth is the most obvious and intuitive. It is a very important factor. However, there are several other, less obvious and intuitive factors that are important as well. The type of industry, presence of college degrees or graduate degrees, per

capita income growth, job creation, and the presence of exurbias are all factors that contribute to the region's economic activity. These factors can influence the level of *heat*, but all *hot* areas have the following factors in common: steady growth, a strong economy, affordable costs of living, first-rate educational systems, and good infrastructure (highway system or mass transit). Examples of these factors in several *hot* Sun Belt metropolitan statistical areas (MSAs) and states are discussed below.

POPULATION GROWTH

Seven out of the top 10 states for population growth rate from 2005 to 2030 are from the Sun Belt region. (See Exhibit 4.) The other three are in the West region. Eight of the top 10 states for population growth are from the Sun Belt. (See Exhibit 5.) For the remaining two states, one is from the West region and the other is from just above the Sun Belt region. Arizona is projected to have the highest growth rate at 83% and is ranked No. 4 in terms of volume. The state is expected to add over 4.8 million people from 2005 to 2030. Nevada comes in a close second with 82% growth and ranks ninth in volume, expecting to add over 1.9 million people. Florida comes in third with a population growth rate of 64%. It comes in first place based on volume, with an expected increase of over 11.1 million people. Texas has the next highest growth rate at 46%, and is ranked second in terms of volume and is expected to add over 10.5 million people. Utah comes in fifth, with a growth rate of 44%. While the state is



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not in the top 10 in terms of volume (it is ranked 15), it will add just over one million people. North Carolina, Idaho, Washington, Georgia, and Oregon round out the top 10 in growth rates, with rates ranging from 41% to 34%. Utah, Idaho, and Oregon are the only three states that are ranked in the top 10 for growth rate that are not ranked in the top 10 for volume. Conversely, California, Virginia, and Maryland are ranked in the top 10 for volume but not for growth rate.

Exhibit 4
**Top 10 States for
Population Growth Rate**
Percentage of change: 2005–2030

Rank	State	Percent
1	Arizona	83
2	Nevada	82
3	Florida	64
4	Texas	46
5	Utah	44
6	North Carolina	41
7	Idaho	40
8	Washington	39
9	Georgia	35
10	Oregon	34

estate, food service, tourism, and relocation business sectors have been growing along with population growth. California’s government has focused on improving the business climate in the state to attract new business types. While many initiatives are in the planning stages, cuts in workers’ compensation rates have materialized. The focus on these initiatives appears to be working: the state’s revenue was running \$7 billion over forecast in June 2006. Gross state product can also be an indicator of a well diversified economy. From 2000 to 2005, the average gross state product growth was 12.2%. Tennessee and Virginia (which are included in our definition) greatly outpaced the national average with output of 35.3% and 24.9% respectively. Arkansas and Alabama also outpaced the nation with output of 21.7% and 17.9% respectively. Texas is one of the strongest states in the Sun Belt. Oil prices would have once been able to cause boom and bust conditions, but that is no longer the case. Texas’s economy is now well diversified with strong new industries such as technology, financial services, international exports, and wholesale and retail trade. Add to this the current higher oil prices, and Texas is firing on all economic cylinders. Memphis, Tenn., has a focus on diversifying its economy. It already has an increasingly booming tourism industry and is also a national distribution hub that boasts headquarters for AutoZone, FedEx, ServiceMaster, and the newly arrived

TYPE OF INDUSTRY

Huntsville, Ala., or “Rocket City” is a surprisingly *hot* MSA. It has a high concentration of military and aerospace contractors, biotechnology firms, and telecommunication companies. Many of the MSA’s professional or management positions are in the engineering field. San Diego also has a booming high-tech industry, but it is well diversified within the industry as well. The large influx of people into Arizona has helped to diversify its job sectors. The real

Exhibit 5
Top 10 States for Population Growth
Number added: 2005–2030

Rank	State	Volume
1	Florida	11,175,942
2	Texas	10,542,700
3	California	10,406,002
4	Arizona	4,844,393
5	North Carolina	3,525,329
6	Georgia	3,092,042
7	Washington	2,420,169
8	Virginia	2,272,438
9	Nevada	1,930,016
10	Maryland	1,421,688

The presence of college or graduate degrees is a good indicator of heat in a market since these types of degrees are an indicator of a market's ability to innovate, create, and compete.

technology centers, university towns, and affluent suburbs. According to the Census, a worker with a graduate degree earns 45% more than a colleague with a college degree and 160% more than those who never progressed beyond high school. Both the Raleigh, N.C., and Durham, N.C., MSAs have an extremely high concentration of adults who hold college degrees at 38% and 39% respectively. Over 31% of Huntsville, Ala.'s, adults hold college degrees. Washington D.C. (which is sometimes included as an addition to Virginia and therefore included in the Sun Belt) boasts a 21% concentration of adults who have graduate or professional degrees. The national average is 8.9%. Arlington, Va., and Austin, Texas, also boast extremely high rates of college degrees at 60% and more than 40% respectively. The national average for college degrees is 24.4%.

PER CAPITA INCOME

The average growth rate for per capita income in 2005 was 4.2%. It was 15.6% from 2000 to 2005. All of the top 10 states for per capita income growth outpaced the nation. (See Exhibit 6.) North Dakota had the highest growth rate at 7.6% but has a low dollar value at \$31,230. It was followed by Washington D.C., Wyoming, and Texas, which all had growth rates above 6%. The Northeast typically has the highest dollar value of income per capita. However, it also typically has the lowest affordability.

The average growth rate for per capita income from 2000 to 2005 was an

International Paper. It is actively courting new, smaller businesses. Shelby County, where Memphis is located, recently approved a program that offers cash-short businesses legal and accounting help at county expense. Specifically, the program helps companies complete the required paperwork to qualify for government contracts.

PRESENCE OF COLLEGE OR GRADUATE DEGREES

The presence of college or graduate degrees is a good indicator of *heat* in a market since these types of degrees are an indicator of a market's ability to innovate, create, and compete. Markets with a high presence of these degrees tend to be based in

Exhibit 6
Top 10 States for
Income per Capita Growth
Percentage of change: 2005

Rank	State	Percent
1	North Dakota	7.6
2	District of Columbia	6.6
3	Wyoming	6.4
4	Texas	6.0
5	Hawaii	5.6
6	Alabama	5.6
7	Maryland	5.5
8	Oklahoma	5.4
9	Arizona	5.3
10	Kansas	5.2

Exhibit 7
Top 10 States for Job Creation
Percentage of change: 1Q2006

Rank	State	Percent
1	Nevada	6.2
2	Arizona	6
3	Idaho	5
4	Utah	5
5	Wyoming	5
6	New Mexico	4
7	Texas	4
8	Florida	3.7
9	Oklahoma	3.5
10	Montana	3.3

astounding 16% for the Sun Belt. Huntsville topped this growth with a rate of 20% for the same time period. Naples, Fla., has one of the highest per capita income levels in the nation at \$44,458.

JOB CREATION

The national average for increase in employment for the first quarter of 2006 was 2.2%. Seven of the top 10 states were from the Sun Belt. (See Exhibit 7.) Nevada and Arizona were the leaders at 6.2% and 6.0% respectively.

They were followed by Idaho, Utah,

and Wyoming at 5.0% each. The rest of the top 10 ranged between 4.0% and 3.3%.

Sarasota-Bradenton has one of the highest levels of job creation in the country. Its employment base has increased by 21.5% from 2000 to 2005. It added almost 900 news jobs every month from 2000 to 2005 and continues to add jobs at the same pace.

PRESENCE OF EXURBIAS

Exurbs are “not yet full-fledged suburbs, but no longer wholly rural,” and are undergoing rapid changes in population, land use, and economic function according to the Brookings Institution. Exurbs are further defined as communities located on the urban fringe with at least 20% of their workers commuting to jobs in an urbanized area, exhibiting low housing density, and having relatively high population growth. This high population growth is of particular interest in a regional study. This growth drives the economy, which in turn drives construction activity. FMI believes that today’s exurbs will be tomorrow’s suburbs. Some highlights from the Brookings Institution study using public demographic and economic data from 1990 to 2005 follow.

Six percent, or 10.8 million people, lived in exurbs of large MSAs as of 2000. These exurbs grew more than twice as fast as their respective MSAs, by 31% in the 1990s alone. The South has the most exurbs, with 47% of the total exurb population, representing more than five million people. South Carolina, Oklahoma, Tennessee, and Maryland have the largest proportion of residents living in exurbs while Texas, California, and Ohio have the largest volume of residents. Sun Belt MSAs have the highest number of exurban counties within their MSAs. The

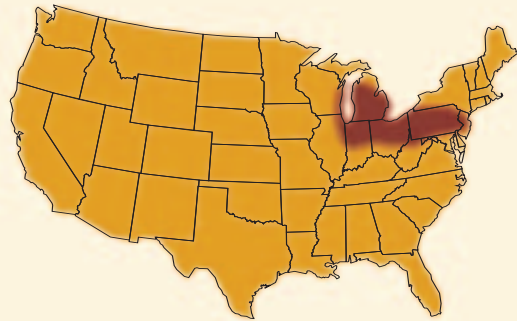
Louisville, Ky., MSA has the highest number of exurban counties at 13. This is followed by Atlanta, Ga., Richmond, Va., and Washington D.C., which each had 11 exurban counties.

THE LOSERS: THE MIDWEST AND NORTHEAST (INCLUDING THE RUST BELT)

While it takes several factors to make a region hot, it can take only a few to make one bleak. Heavy reliance on a failing industry (no diversification), lack of land availability, and low affordability can be a severe drain on a region. Examples of these are discussed below.

The Rust Belt region looks pretty dismal. It is even less clearly defined than the ambiguous Sun Belt. The Rust Belt is generally defined as the area beginning with the Boston-Washington corridor (but not including Boston or Washington, D.C.) and running west to eastern Wisconsin, south to the beginnings of the coal mining areas of Appalachia, and north to the Great Lakes. (See Exhibit 8.) The Brookings Institute performed a study on manufacturing job losses in the Great Lakes region, which we have included in the Rust Belt. Some highlights from this study follow.

Exhibit 8
The Rust Belt Region



More than one-third of the nation's three million manufacturing job losses were in seven states. These states include Michigan with the largest loss (almost 218,000), followed by Ohio, Illinois, Pennsylvania, Indiana, New York, and Wisconsin. Manufacturing job losses were a major reason for slowing overall job growth or even decreasing into overall job losses. Most increases in higher paying service jobs were not enough to offset these manufacturing job losses.

The Midwest has very few bright spots. The declining auto and manufacturing industries have prevented this region from reaching its previous, higher pre-recession level. According to the Regional Economics Applications Laboratory (REAL) at the University of Illinois at Urbana-Champaign, the Midwestern states are not doing enough to encourage trade within the region. An example that REAL gave of this is that while the states have signed free-trade agreements with Canada and Mexico, trucks still

**More than one-third
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need a license plate for each state that they drive through, and each state has its own weight limits and regulations on interstate shipping. Around 40% of these states' exports are within this region and could benefit from some reform. REAL also states that while productivity has improved somewhat, employers are still slow to add new workers. It suggests that Illinois (largely due to Chicago) may reach its pre-recession level in 2007 but that the rest of the states probably have another

three years before reaching their previous levels. Michigan, and especially Detroit, are a huge drag on the region's economy. Ford's and General Motors' financial problems are hurting the economy from a business and consumer standpoint.

The Northeast is straining to regain its pre-recession ground but is hindered by slow population growth, lack of available land, and low affordability. The move of manufacturing to the South and offshore is also hindering its ability to regain ground. According to the Boston Federal Reserve, New England's employment rate is down 2% from its pre-recession level, while the national average is 2% above its pre-recession level. Low population

growth is also a problem. In fact, Massachusetts actually saw a decline in population in both 2004 and 2005. New York City also lost population, losing 20,000 residents in 2005. It should be noted that New York City is still by far the most populous city with over 8.1 million residents, more than double the second place city of Los Angeles, which has 3.8 million residents. Boston's population decreased by 1.5%,

Detroit's by 1%, and Lansing, Mich.'s, by 1.2% in 2005. The Northeast will continue to struggle until its population growth begins to pick up. Affordability is a problem that may take years to overcome, if it all. Its lack of land is insurmountable.

The construction outlook for the overall U.S. economy is quite healthy. Yet, despite this overall strength, the U.S. economy has clear geographic winners and losers. The South and Southwest regions are truly hot markets while the Midwest and Northeast regions look dismal. Watch these areas to determine future opportunities. ■

**The construction outlook
for the overall U.S.
economy is quite healthy.**

Build a Winning Team

Building a team environment, letting people know their roles, and putting them in a position to win goes a long way toward being successful.

By Jeff Schulz



Maximizing productivity. Minimizing costs. Retaining key employees. Reducing waste. Controlling scope creep.

These are some of the major problems affecting nearly every company within the construction industry. Tremendous amounts of time and money are wasted on these issues. Yet, one possible, all-encompassing solution exists within your company: teamwork.

Teams win championships. Having superstars is a tremendous advantage, but the everyday guys who perform their roles and buy into the team-first strategy are the real keys to victory. The Chicago Bulls and Michael Jordan provide a good example. Do you think Jordan won those six titles by himself? Jordan was definitely the best player, but he did not do it by himself. In fact, until he became a team player, he did not win an NBA Championship. Remember the Detroit Pistons and their “Jordan Rules” tactic? Under this strategy, the Pistons fouled Jordan every chance they got. They did this because they knew the Bulls were not a team. If Jordan couldn’t beat them, they weren’t going to lose. But, Jordan finally brought home the trophies when he had a team around him. By themselves, Jordan’s teammates were not superstars, but they did have individual strengths that could be parlayed into team success. When Jordan was double-teamed, Scott Kerr and John Paxson were there to hit the open threes. When a shot was missed, Horace Grant and Dennis Rodman were there to grab the rebounds. And Scottie Pippin was there to back-up Jordan

and even be Jordan when the “big guy” needed a break. That team had its star, and the others were willing to be role-players in order to win and be named champions.

CONSTRUCTION TEAMS

“It’s the team, the team, the team.” One of the most successful and respected coaches in the history of college football professed this mantra. The late coach of the Michigan Wolverines football team, Bo Schembechler, knew that if he could get his star players to play as a team, he would win ... and he did win. He was the winningest college football coach of the 1970s; he won or tied for 13 Big Ten Championships and never once had a losing record in his 27 seasons as a head football coach. As the athletic director, he emphasized this to all his teams: ice hockey, softball, swimming, you name it. The players bought into his team philosophy and were rewarded by being winning teams and earning the glory for successful tasks, including the 1989 men’s basketball NCAA title.

Construction is arguably the industry that most closely resembles the sporting world. Teams are requirements. It is impossible for nearly any project to be completed successfully by one person acting alone. A typical project has several sub-teams working within a big team. The foremen, supervisors, and laborers work internally for the self-performing GC. Then the HVAC, plumbing, steel erector, roofers, and other subcontractors work on the same team as the GC. Don’t forget about the office crew or the architect, scheduler, estimator, sales force, admin., PE, and on and on. Tying this all together is the coach of the project, the project manager.

A football team is a strong analogy for a construction project. In football, you have the head coach, the assistant coaches, and the players who specialize in different positions. The head coach sets the vision for the team. He then tweaks this vision based on input from his assistant coaches. At this point, the coach leaves his assistants so they can go to their individual players whether it is the offensive line or the defensive backfield, and implement a plan based on the overall goal. Goals

are set for the long-term and the short-term. Every player knows what his role is every day. Then, after the individual units have their assignments, they put it all together and practice, practice, practice. The saying goes: Amateurs practice until they get it right, but professionals practice until they can’t get it wrong.

This mirrors a construction project, or at least how a winning company runs a project. The project manager acts as the coach of his or her team. He has the plan and sets the vision. He then assembles his supervisors and foremen and gets their input and buy-in. If anyone in this group sees something that could be improved or a danger that was previously overlooked, they work together to solve the problem. Then, those leader-supervisors take the ideas back

to their groups, and the process repeats itself with each individual calling upon his experience and background to add to the process.

Getting employee input helps employees feel that they provided value and were important to the project. It also encourages employees to put in the extra effort sometimes needed to keep the project on schedule and within budget. These newly educated employees can make informed decisions, reducing waste caused by uncertainty. Uncertainty forces a delay so a situation may be discussed with a supervisor or, worse — it leads to doing something incorrectly and creating expensive re-work.

Subcontractors are the free agents who have the expertise we cannot find within our organization. These agents also need to feel like a part of the team. As free agents, they have their own way of doing things so they need to know how the team operates and what the goals are. Otherwise, they will act individually and prevent the project team from reaching its potential.

Another part of the construction team is the back office. These are the people who facilitate projects and make them run smoothly and efficiently. For example, the administrative staff answers phones and handles paperwork. Taking these tasks off project managers' plates frees up their time to ensure the actual construction work stays on plan. Administrative staff perform many tasks effectively and at a significantly lower cost. Other team members perform necessary roles for a successful project, even though they are not physically out on the playing field. The estimators, human resources coordinator, business developers, and workers in the supply shed, for example, are the scouts, the grounds crew, and the equipment managers of our construction team. If these people do not share the same vision as the rest of the team, they can seriously impair or cripple a job.

Perhaps the most important team member, yet often the most overlooked member, is the client. On too many projects, the client is perceived as the enemy, the opponent on the field. Nothing could be further from the truth. The most successful firms make sure they share a common vision with the client. They work hand-in-hand as a team. This leads to many benefits. If a client trusts you, they are more willing to listen to your suggestions and act on your expert opinion. If a project hits a bump, teammates don't hide the problem; they turn to the client and seek client input or maybe even assistance, in order to overcome this obstacle. It also accelerates other processes and minimizes change orders. Team behavior can reduce payment periods. Teamwork leads to long-term relationships. Consider a contractor whose sense of teamwork with a client is so well established that the contractor does not bid a job unless there is a potential long-term relationship with the client.

Perhaps the most important team member, yet the most overlooked member, is the client. On too many projects, the client is perceived as the enemy, the opponent on the field.

PREPARATION

Teamwork is all about the development of your team and your people. It is not about building buildings.

So why don't all construction crews put an emphasis on developing their people? In the *2005–2006 U.S. Construction Industry Training Report*, FMI's survey respondents listed their top five training challenges as:

1. Finding time to train people
2. Obtaining measurable results
3. Training people at multiple or remote sites
4. Delivering comprehensive training
5. Using training to drive organizational change.

While these are all valid issues, there are several ways to overcome them, with some effort. For example, finding time to train means that the individual being trained is not at that moment helping to produce a building. People perceive an employee in training as a cost. Yet, this is very short-sighted. Individuals in training are learning valuable ways to increase productivity, and gains of 10% in margin can be created by something as small as a 1% gain in productivity. Oftentimes, even greater gains can be realized. Beyond productivity improvement, workers are also learning how to improve safety and prevent costly accidents, reducing waste. Furthermore, the training investment made in the employee by the organization builds loyalty. The Craft Labor Supply Outlook states that while there probably will not be a shortage in actual bodies for the construction workforce, the problem will be the quality and the lack of necessary skills and talent. Recruiting will be important, but retention will be essential. Companies will be forced to do whatever they can to keep good team members. Keeping your team for the long run will mean realizing a large return on investment.

The majority of training for baseball takes place during spring training. The team manager sets the season strategy and selects the team that will best help the team achieve its goals. This does not necessarily mean selecting the best players. Even in perceived individual sports such as cycling, the winners are usually those with the best team. Lance Armstrong won seven straight Tours de France, but he readily admits that it was his team who made this possible. It could be argued that his team, Team United States Postal Service and later Team Discovery, was not the best team. That honor belonged to Team Telekom. However, Telekom had no leader since its three best riders were out for themselves and would not sacrifice potential individual glory for the team. Why would Lance's teammates subjugate themselves to support roles?

Two major reasons exist: to be associated with winning as opposed to simply being an above-average individual and perhaps to be the future leader of the successful, winning team. Individuals become team members, train appropriately, and focus on team success. They develop skills that strengthen the team more than themselves, and their reward is the team's success.

In player development, the company aligns its efforts to build the team's long-term success, not just an

In order for the stakeholders in your project to be a winning team, they have to know what qualifies as winning.

individual's win or a short-term project success. Find time or make time. The outcome of increased employee loyalty, reduced costs, and increased efficiency will nearly always more than offset the short-term costs of developing the skills of team members and the teamwork of those members.

KNOW THE SCORE

In order for the stakeholders in your project to be a winning team, they have to know what qualifies as winning.

In baseball, it is easy to know. You look up at the scoreboard and everything is there: runs, innings, pitch count, and the runners on base. You even know the history of the batter. All of this information is up-to-the-moment. Baseball players know exactly where they stand. They know the score, and they know if they are winning or losing.

But, how do you tell what the score is on a job site? And does your team know the score? The project score can be based on many things, but it is usually some combination of client satisfaction, meeting the specs, safety, and, of course, completion on time and within budget. These scores should be reinforced every day on the job. Daily huddles are excellent times to provide the team with updated information, remind everyone of the plays for the day, and inform them of the score and how they can help the team win.

It is easy enough to state, "We are going to be under-budget and on time." That is a fair selection as it is easily quantifiable and normalized. The most successful companies tend to have team development and human measurement involved as well from both the client and the project team.

FORWARD

There are many needs that must be met to assure a team success. Maximizing productivity. Employee retention. Keeping costs to a minimum. Reducing waste. A highly effective way to achieve all of these is through the building of a strong team. Allow team members to feel that they have the power to contribute to and affect the success of the job. Provide them the opportunity to voice their opinions. Employees, once encouraged, are usually excited to come together and express their views, talking candidly about ways to improve.

Industry analysts have stated that labor is going to be the biggest issue, including how the industry is able to manage that demand in more creative ways, for the construction industry for the next three to five years. Building a team environment, letting people know their roles, and putting them in a position to win goes a long way toward being successful. You already have some of the players, now make them a team. Develop more team members. When you do, you will improve your profits and beat your competitors. ■

Derailment: Are You Sending Your Top Talent Off the Tracks?

Organizations create the conditions under which careers flourish or fade. To prevent and reverse derailment, organizations need to take concrete and conscious steps.

*By Tim Tokarczyk, Willie Hepworth,
and Vanessa Winzenburg*

Employee derailment occurs in organizations in every industry. Most employees can recall an individual who seemed destined for the highest levels of leadership, yet took a drastic turn and flopped.

Jim is such a leader, one who advanced quickly in his industry, but experienced derailment as he tried to transition into a new position.

Jim is a 15-year construction veteran with a background in finance and a great deal of field experience. Jim experienced many successes throughout his career, and as a result, the executive team considered him to have high potential for leadership success. Two years into his current role, Jim seemed poised to make the next leap in his career. Instead, he hit a wall. His performance began to suffer noticeably, causing Jim to grow more and more frustrated and increasingly alienated from his coworkers. Senior leaders could not explain the change they witnessed in Jim. He was on the fast track to becoming CFO, and inexplicably, his behavior changed. He became rigid and stubborn, and stopped listening to those around him. Senior leaders concluded that their earlier assessment was erroneous, and Jim was not executive leadership material.

CAREER DERAILMENT

Unfortunately, stories like Jim's are all too familiar throughout the construction industry. Many employees set at full-steam ahead are coming off the tracks, their careers derailed. According to research conducted by the Center for Creative

Leadership, between 30% and 50% of all high-potential employees derail. This trend exacerbates one of the most serious challenges currently facing the construction industry — recruiting and retaining top talent. The construction industry's annual turnover rate recently leapt from 23.2% to 25.4%. And, FMI research supports that the No. 1 industry challenge is a lack of skilled management. Baby boomers are retiring, and there are too few replacements in the pipeline. Firms with significant growth projections face an even greater challenge. With these trends, firms cannot afford to lose even a single high-performing employee, let alone 30% to 50% of its star talent.

In addition to the challenges of finding and keeping star talent, a number of costs are associated with a derailed employee. These costs include the exit and re-hire process, as well as lowered morale and productivity in employees witnessing the derailment. Conservative estimates of the direct costs of employee turnover hover between \$10,000 to \$30,000 per field-level employee, with much higher costs within the leadership ranks. Indirect costs, such as lowered morale and productivity of remaining staff can become self-perpetuating, as stress and reduced commitment and

energy spread throughout the ranks.

Furthermore, it can take an average of \$20,000 in training and 13 months for new employees to operate on the same level of efficiency as more experienced workers. In companies with high levels of employee turnover, these costs can be enormous.

Derailment is a process. It doesn't happen overnight, and it can be prevented, interrupted, or reversed in many cases.

WHY DERAILMENT OCCURS

Employee derailment can occur for many reasons. Some employees plateau for personal reasons that are beyond the control of the firm, like a birth in the family or the need to care for a sick parent. The stresses of these life events shift the employee's focus and energy

away from their work. Others, however, derail due to factors well within the control of the organization, like organizational culture or inadequate leader development.

Derailment is a process. It doesn't happen overnight, and it can be prevented, interrupted, or reversed in many cases. It is helpful to understand the steps in the derailment process:

1. Individual performance levels off or declines, and the organization cannot figure out how to "fix" the individual. This results in a decrease in worker productivity.
2. The organization loses patience and tolerance, and the individual becomes frustrated.
3. The individual resigns, is terminated, or is bypassed.

SKILL-BASED CAUSES OF DERAILMENT

Research by the Center for Creative Leadership suggests that most executives who derail were once on the career fast track, running up an early string of successes.

However, as leaders advance in the organization, job demands change. With the advent of new responsibilities and measures for success, leaders often struggle to transition from reliance on the skills used to succeed early in their career to the skills necessary to succeed in their new position. The four primary skill-based causes of derailment are:

- Problems with Interpersonal Relationships
- Failure to Meet Business Objectives
- Failure to Build or Lead a Team
- Inability to Change or Adapt.

Often, derailing employees are struggling with more than one of these challenges simultaneously since the causes for derailment are closely related. For example, it might be obvious that the employee is failing to meet business objectives. But this failure might have resulted from poor interpersonal relationships, which prevent a leader from building a team that can deliver results. In this way, the causes of derailment build on each other, exacerbating performance problems for the individual. The difference between an individual contributor and a leader is focus. Whereas individual contributors focus on getting work done by himself or herself, leaders focus on getting work done through others. This shift requires strong interpersonal competencies. Derailed employees often display the following behaviors, as opposed to those displayed by actively engaged employees:

Derailed Employees	Engaged Employees
Ego-Driven	Self-Confident
Reckless	Purposeful
Rigid	Open-Minded
Controlling	Guiding
Mistrustful	Trust Guardedly
Aloof	Involved
Seeking Validation	Seeking Feedback

Employee derailment is often evident by the employee’s failure to meet required business objectives. However, the failure to meet business objectives can also be the cause of derailment. Specifically, employees who derail often find themselves in situations where they are unable to follow-through on promises. Sometimes this results from being too ambitious with goals or failing to prioritize appropriately. These productivity issues have far-reaching consequences — from a loss of trust in the leader to lost business for the organization.

Organizations often promote employees into leadership positions because of their individual contributions. However, this does not mean these employees know how to lead. Many leaders today lack the knowledge and skill to create a vision or motivate others. They are unable to build trust within teams, ensure collaboration,

and align team members toward achievement of a common goal. Most have not received sufficient developmental opportunities to build these essential leadership skills. The result, however, can be devastating to the organization as employees work toward meeting personal goals rather than shared organizational goals, resulting in infighting. The infighting causes silos to develop and/or project teams to fall apart.

The most common challenge faced by leaders who derail is the inability to adapt to new situations and roles. Research shows that two-thirds of derailed American leaders displayed an inability to change. These leaders sometimes display an overt resistance to change, rigidity, or inflexibility. More frequently, leaders derail during times of transition. They have difficulty understanding their new roles and adapting their behaviors appropriately. Few organizations in the construction industry provide adequate assistance during these turbulent and confusing times. For the most senior leaders, adaptation-related derailments occur as leaders focus too heavily on the history of their own organization rather than the future state of the environment in which they work. In other words, they fail to anticipate and prepare for necessary changes. The ability to see the bigger picture is essential to good leadership, and derailed leaders often lack this crucial skill.

PERSONAL CAUSES OF DERAILMENT

Harvard psychologist Steven Berglas identified four negative behaviors that result when individuals reach great success without the necessary character to support them. The Four As of such behavior are arrogance, aloneness, adventure seeking that is destructive, and adultery. Derailed individuals often experience several of these behaviors. Typically when leaders reach a certain level of success, their new position conditions their behavior and how others view them. Their newfound power can cause them to behave arrogantly, while also isolating them in their position and causing a feeling of aloneness. Leaders who have achieved so much often become desperate for new challenges or new experiences, and these can materialize as destructive

adventures, and occasionally as adultery. Leaders that begin to show signs of these destructive behaviors can reverse the process and stop the pending derailment, but they must find a way to reconnect with those around them.

In addition to the skills and personal attributes that can cause a leader to derail, FMI's experience suggests that a subset of workers is prone to derailment due to their current life stage. As people move through various eras of their life, their thoughts about themselves and consequent actions can radically change their career. Literary

The most common challenge faced by leaders who derail is the inability to adapt to new situations and roles.

journalist and lecturer Gail Sheehy created the term "middlescence" in 1995 to describe the rebellious middle age of the baby boomer generation. Like adolescence, middlescence is a period in employees' lives (generally between the ages of 35 and 55) characterized by confusion, frustration, and newfound self-awareness. Due to the

fundamental changes occurring during this turbulent period, these are the workers most likely to derail. During this period, workers often reevaluate their life and career goals, and oftentimes lose satisfaction with their current job and their career trajectory.

Workers may also experience a mid-life crisis, which occurs when people realize their lives are almost half over, and reevaluate their goals, dreams, and their place in the world as a result. This reevaluation process often causes afflicted people to make visible and occasionally drastic changes in their lives. Similar to middlecence, middle-aged workers experiencing a mid-life crisis may undergo a series of changes that temporarily prevent them from aligning with the organization's goals or their position requirements. For this reason, as well as those previously discussed, these employees may plateau or completely derail.

When Jim, our 15-year construction veteran, plateaued after a series of successes, senior leaders did not have an explanation for his sudden change in behavior. They could not explain how such a promising employee could become so unproductive and problematic. Likewise, Jim felt frustration in his new position, unable to explain his lack of productivity and his difficulty dealing with other people. Until this point in his career, he wholeheartedly tackled every new challenge he faced. In this case, both parties missed the underlying causes of Jim's derailment. Rising in the organization through the financial sector, Jim relied heavily on his financial knowledge and his ability to solve problems. As he took on a leadership position, his primary duties shifted from solving problems himself to leading and managing people. Jim received no formal leadership development opportunities and felt overwhelmed in the new role. He was expected to function as a leader while given little opportunity to gain the requisite skills needed for the position. The derailment Jim faced is a phenomenon that occurs daily in most organizations, especially in the construction industry.

Emotionally committed employees will derive pride, inspiration, and enjoyment from their job and organization. When an organizational culture fails to gain the emotional commitment of its employees, derailment will greatly increase.

ORGANIZATIONAL CAUSES OF DERAILMENT

Emotional commitment is required for productive, content workers. An employee's emotional commitment includes a belief in the organization's vision and goals; a belief in the work as challenging, meaningful, valued, and appreciated; and a belief in his or her manager and team members. Emotionally committed employees will derive pride, inspiration, and enjoyment from their job and organization. When an organizational culture fails to gain the emotional commitment of its employees, derailment will greatly increase.

What makes construction a particular minefield for potential derailment? Organizational cultures play a significant part in the derailment process. Many companies in the construction industry deliberately create cultures that foster and

Many companies in the construction industry deliberately create cultures that foster and reward an achievement-at-all-costs mentality.

reward an achievement-at-all-costs mentality. They select and promote high achievers, let nature take its course, and look the other way as long as the numbers are good. Without the benefit of appropriate leadership development opportunities, high achievers with inadequate or dysfunctional leadership qualities can derail not only themselves, but also may send your up-and-coming talent off the tracks or directly to your competitors.

The construction business is a people business. Frequently it is a “person” business because of the importance of a single strong leader.

In this way, the success or failure of a contractor usually rides on the person leading the charge. The stronger the personality of the CEO, the more his or her way of behaving is reflected in the culture of the firm. This is especially true in highly centralized firms where decisions, responsibility, and authority come from the top.

A highly centralized organization is rarely successful at retaining star talent since the most effective and ambitious employees seek responsibility and decision-making authority regardless of their level in an organization. Three dysfunctional cultures can result from the impact of leader personality on organizational culture, including suspicious cultures, dramatic cultures, and detached cultures. Suspicious cultures result from suspicious leadership, or mistrust of others, secretiveness, and envy. Suspicious cultures often work to derail individuals since the lack of trust and open communication create performance challenges for even the most effective leaders.

Dramatic leadership is characterized by a need to impress and get attention from others. Dramatic leaders are driven by an unusually strong need for excitement and stimulation. Dennis Kozlowski, the former CEO of Tyco International who was convicted of misappropriating \$400 million of the company's funds, was a very dramatic leader. Dramatic leaders create dramatic cultures where risk-taking and thrill-seeking are rewarded rather than rewarding planned, thoughtful, and perhaps even ethical behavior. This can create a false sense of invincibility, which often precedes a disastrous misstep.

Detached leadership involves a pattern of non-involvement and is characterized by a withdrawn leader. Detached behavior can show up in otherwise healthy executives who have become bored with their daily work routine. These leaders delegate the management of their firm to second-tier managers, who tend to be unclear about authority and responsibilities. The culture of an organization with detached leadership lacks connection with the leader and his or her vision. In these cultures, employees are unwilling to buy into the leader's vision and remain unmotivated and uninspired.

Leaders in this environment are so detached from the rest of their organization that they have little or no influence on results.

In cultures where leaders are left to develop on their own, these leaders may rely on less desirable means of accomplishing tasks such as “winning through intimidation” or “command and control” and not only derail themselves, but derail others in the organization. The organization and its key leaders should be held accountable when the culture, or the behavior of leaders, contributes to the derailment process.

PREVENTING DERAILMENT

Simply because a leader derails in one organization does not mean that his or her career is over. This is where derailment and retention issues are highly related. An employee who derails in one organization may seek employment elsewhere, and may achieve great levels of success in an organization with a more open culture and strong focus on developing leaders. In the war for talent, an employee who feels he or she has reached a plateau in an organization will often look at competitors for opportunities they do not see at their current firm. This creates an even greater retention challenge.

Imagine what would happen if you or one of your senior managers derailed. The potential losses in productivity and potential contribution would be great. Moreover, such derailment would have a devastating impact on the organization's culture and the morale of other employees. As a leader, it is critical to examine:

- What do you see happening in your organization that could contribute to your own or others' derailment?
- Is there anything you are doing as a leader that could be sending you or other top talent off the tracks?
- What can you do to prevent the derailment of others?

The good news is that derailment is often preventable and reversible. There are numerous strategies for leaders and organizations to get disengaged employees back on track, prevent future derailments, and shape the type of organizational culture that fosters engagement and commitment. Some strategies to consider include:

Expand leadership development. A recent trend in the construction industry indicates a severe shortage in leaders to fill management positions and leadership succession pipelines. Many mid-career employees are eager to move up the ladder and fill senior management slots. This situation is sadly ironic — mid-career managers are frustrated by the lack of promotion opportunities, and corporate executives are concerned with a lack of candidates with the right experience. The solution is to widen access to leadership development programs to both rejuvenate mid-career managers and refill the leadership pipeline. The first step in this

process is to assess the organization's culture to determine how well employees are trained to lead teams, how much focus is given to a person's interpersonal skill development, how well people are supported in times of change, and how much support is given when a person fails. These are early indicators of how well an organization manages its potential derailment problem.

Focus attention and resources on periods of transition. The firms most adept at managing employees to prevent derailment have identified periods of transition as the most prevalent phase for derailment to occur. Organizations can ensure rising employees make a smooth transition into their new roles through the use of training, mentorship, and orientation for new leadership positions. By focusing more attention during these tumultuous times, organizations can ensure their newly appointed leaders have all the tools necessary to succeed in their new position.

Find the keepers. Consider the use of performance management systems to identify specific development needs, identify and reward high-performing employees, and target the right career development opportunities to employees at all levels within the organization.

Remove the barriers to occupational mobility. Is your company unwilling or unconsciously disinclined to invest in extensive training for employees over a certain age? Training today is disproportionately aimed at the young or high potentials. Many older workers are in real danger of reaching a career plateau. Senior leaders also need continuous learning opportunities and room for development and can

often be overlooked by an organizational focus on training and developing younger employees.

Mentor colleagues. Put experienced employees into mentoring, teaching, and other knowledge-sharing roles. This has the dual benefit of reengaging the mid-career worker and boosting the expertise and organizational knowledge of less experienced employees. This partnership between older and younger employees results in tangible benefits for both. It works to prevent derailment in older workers because it allows

them to feel more valuable and create lasting connections and bonds with coworkers. Younger workers are given a mentor to help them manage the transitions and new experiences of the job and to have a role model whose positive behavior they can duplicate.

REVERSING DERAILMENT

The key to reversing the derailment process is early identification. This means recognizing that a leader is derailing before he or she is ready to leave the organization. Reversing derailment is a collaborative process. The employee and his or her leaders must work together to identify the reasons for the derailment (lack of skills, personal factors, organizational factors) and potential solutions. The employee who is derailing must become aware of his or her failure to meet business objectives and must have

Organizations create the conditions under which careers flourish or fade.

hope that the situation is reversible. Self-awareness is a major step on the road to overturning derailment.

Possible solutions include the use of 360-degree feedback and personality, cognitive, and natural-ability assessments to enhance self-awareness. Specifically, these assessments can pinpoint ineffective behaviors or personal attributes that may be contributing to

the leader's inability to perform in a new role or position. Self-awareness can also help to improve team-building skills and decrease ego problems. In addition, an executive coach can help with self-awareness; executive coaches help leaders develop skills and tactics to improve their leadership as well as strategies for adapting to their new environment. Often, providing additional assistance will revive derailed leaders' passion for their work and provide them with a clear purpose or personal mission, helping them get back on track.

The same senior executives that deemed our construction executive, Jim, unfit to be CFO later scrutinized why they had such a large retention problem among their high-potential employees. In their analysis, they realized that Jim's career stalled because he lacked interesting and exciting work. Thrown into his current position, Jim felt unprepared and faced daily challenges without the necessary skills to overcome. He focused his energy on task-based, rather than relationship-oriented leadership. After further consideration by senior management and participation in leadership development opportunities, Jim became procurement director. In this role, his innate skills and enthusiasm as a negotiator, financial analyst, and risk-taker paid off. In his first year, he saved the company \$7 million while doing work he loves. While not every derailment story ends on such a positive note, Jim's eventual success serves as a vital reminder that derailed employees can get back on track and add real value to their organizations.

Organizations create the conditions under which careers flourish or fade. Firms with derailment issues can expect to see a decrease in worker productivity, morale, and motivation and an increase in relocation expenses and the costs associated with finding a replacement employee. To prevent and reverse derailment, organizations need to take concrete and conscious steps. Participation in leader development programs is a form of recognition of an employee's value and potential, and workers emerge with a renewed commitment to the organization.

If your firm wants to control its fate when the boomer retirement wave and associated brain drain hit with full force, start today to systematically reengage and retain people with the skills and abilities needed for the long run. It is just good business. ■

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FAS 123(R) and Equity-Based Compensation

First published in the CFMA's *Building Profits*, this article explains how construction companies will be affected by new accounting rules under FAS 123(R).

**By David N. Allison and
Timothy R. Sznawajs**

Does your company provide stock bonuses of corporate shares to its employees to motivate them and provide them with a sense of ownership? Does it have a buy-sell agreement for its stock that uses a pre-defined formula, such as book value or a multiple of earnings, to determine the trading value of its shares?

If your company engages in these practices, or makes use of equity as part of its compensation package in other ways, then recently adopted accounting rules will probably have a substantial impact on the recorded financial performance of your company's business.

FASB Statement of Financial Accounting Standards No.123, Share-Based Payment [FAS 123(R)] went into effect in 2006 for private companies, and creates new standards for determining the fair market value of share-based payments to employees. (This ruling, issued in December 2004, is effective for private companies as of the beginning of the first annual reporting period after December 15, 2005.)

These new rules can lead to lower recorded net income, decreasing the amount attributable to retained earnings and limiting bonding capacity. They may also limit your company's ability to fund buyout provisions related to the ownership transfer process. Finally, these rules may require the opinion of an outside financial advisor to justify certain tax and accounting treatments for employee share-based compensation.

In short, all CFMs need to be aware of FAS 123(R). Why? Because this ruling has the potential to dramatically alter the accounting for share-based compensation

This ruling has the potential to dramatically alter the accounting for share-based compensation due to its stringent requirements to accurately represent the market value of a company's shares related to employee compensation.

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While FAS 123(R) is directed at both public and private companies, this article focuses on private companies — specifically those in construction and construction-related businesses. It provides an overview of FAS 123(R), including what it is, the practices it mandates for privately held businesses, and the implications for your company. Finally, this article describes three questions that privately held contractors should discuss with their financial advisors.

FAS 123(R) OVERVIEW

For quite some time, a debate has existed within accounting and financial circles about the most appropriate way for U.S. accounting standards to represent the transactions surrounding

employer-issued equity compensation. In 2003 to 2004, multiple events coincided to compel FASB to act definitively to ensure uniformity in this area, including:

- The voluntary adoption of so-called “fair-value-based” methods of accounting by approximately 750 public companies, which led to a two-tiered system of disclosure among public companies;
- The continued clamoring of various financial statement users, mainly institutional and individual investors, for greater accuracy and disclosure in this area;
- The issuance of a comparable standard by the International Accounting Standards Board (IASB); and
- The various (and not necessarily related) abuses of employee-issued equity compensation by notable public companies that engendered public mistrust in the ability of accounting professionals and financial markets to accurately gauge the true economic performance of large, formerly well-regarded companies.

Upon its issuance, FAS 123(R) superseded APB Opinion No. 25, Accounting for Stock Issued to Employees and its interpretations.

Under Opinion No. 25, issuance of share-based compensation could be accounted for using the “intrinsic value” method, a more loosely defined standard that typically resulted in no expense to employers for issuing stock options to employees. FAS 123(R) requires the use of the “fair-value-based” method of accounting for equity issuances, a more stringent accounting standard.

So what is share-based compensation? Setting aside the exact accounting definition, FASB’s language can be interpreted to define this as any share-based payment to an employee for services rendered, including both options and stock. Stock issuances include:

- Employee Stock Purchase Plans (ESPPs)
- Stock Appreciation Rights (SARs)
- Performance shares
- Restricted stock
- Phantom shares
- Other types of equity compensation

Shares associated with Employee Stock Ownership Plans (ESOPs) and equity payments to non-employees are specifically excluded from the requirements of FAS 123(R). Of course, if this ruling’s effect was to only require a relatively straightforward accounting change for these payments, that would not be so bad. However, the more cumbersome aspect of FAS 123(R) is not in its desired outcomes, which we believe are positive on the whole. Rather, the implementation of FAS 123(R) requires substantial judgment and expertise to determine the fair value of the share-based payment in question. The next section examines this fair value requirement.

DETERMINING THE FAIR VALUE OF A PRIVATELY HELD COMPANY UNDER FAS 123(R)

Contractors must be careful when reviewing the accounting literature for defining fair value. Recently, FASB established a fair-value hierarchy under FAS 157, which gives the highest priority in determining fair value to quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). Unfortunately, FAS 157 does not apply to stock-based payment transactions.

FAS 123(R) has its own requirements for determining fair value. When there is not an observable market price for an award (as is the case with most employee stock options), companies must use a valuation method that market participants would use to value the award.

FAS 123(R) expresses no preference for either a lattice model (e.g., binomial model) or a closed-form model (e.g., a Black-Scholes-Merton model). The appropriate selection of a model will be affected by the requisite vesting period and satisfaction of market conditions in the award. However, the transferability and other restrictions in an award should affect its fair value only if they are in effect after the award vests. Unfortunately for privately held construction companies, these models rely on inputs (such as price, volatility etc.) that can only be obtained from publicly traded comparables.

While there are undoubtedly great challenges and risks inherent in owning and managing a private construction business, no impartial observer could reasonably assert that an \$80 million general contractor with two owners and 40 employees is comparable to the behemoth publicly traded construction companies on the New York Stock Exchange.

GUIDANCE

In these instances where the Black-Scholes-Merton and Lattice-Binomial methods are not applicable, FAS 123(R) provides very little guidance for those charged with implementing its findings. The small amount of available guidance centers around a little known 2004 AICPA Practice Aid, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*.

This Practice Aid, while not representing an authoritative accounting pronouncement, has been cited by the SEC staff in evaluating companies filing for IPOs. As such, many major accounting firms strongly recommend the valuation guidance as a best practice for privately held companies.

While it is highly unlikely that most privately held construction companies will even contemplate an IPO, given the lack of formal guidance that exists on this topic, the findings of this Practice Aid are one of the definitive standards for private company practices in the area of share-based payment.

Specifically, the Practice Aid states that because observable market prices are not available for the equity securities of privately held companies, a market approach (such as market multiple analysis) or income approach (such as a discounted cash flow analysis) should be employed.

Further, the Practice Aid recommends that privately held companies obtain these market or income valuations from “independent valuation specialists” to determine the fair value of securities issued as compensation.

Undoubtedly, the implications of FAS 123(R) may be quite onerous for private construction companies that engage in share-based payment.

In other words, according to this interpretation of FAS 123(R), the vast majority of privately held construction businesses in the United States (most of which clearly qualify only for the Level 3 category of information) need to strongly consider obtaining certified valuations from independent valuation specialists to determine the fair value of any share-based payments issued to employees for accounting purposes.

IMPLICATIONS

Undoubtedly, the implications of FAS 123(R) may be quite onerous for private construction companies that

engage in share-based payment. Given that the majority of FAS 123(R) was intended to address public company behavior, and that FAS 123(R) was not fully implemented for private companies until the end of 2006, there is a possibility that FASB may offer more

explicit guidance around this issue as 2007 unfolds.

This guidance for privately held businesses that only qualify for a Level 3 category of information could entail explicit instructions for fair market value determinations, provide for an extended phase-in period, or possibly suspend the requirements. However, based on the information available to the public at press time, contractors and providers of accounting services to privately held construction companies that issue share-based payment will likely incur some time and expense meeting these new FAS 123(R) requirements.

CFM ALERT — MODIFICATIONS OF EQUITY AWARDS

FAS 123(R) does not just apply to new awards but is also retroactive for existing awards that are modified after the adoption of FAS 123(R). Nonpublic companies that have unmodified, unvested awards (liability or equity) that existed prior to adoption of FAS 123(R) can continue to account for these awards under FAS 123, APB No. 25, FIN 28, or other prior accounting rules.

QUESTIONS FOR PRIVATELY HELD CONTRACTORS

In light of the significant changes that FAS 123(R) is likely to have on many privately held companies, contractors and their CFMs should work with their financial advisors to fully understand the appropriate response to FAS 123(R).

Specifically, they should ask:

Does the company issue any share-based compensation that falls under the new FAS 123(R) guidelines?

- Does the company offer performance shares, restricted stock grants, stock appreciation rights, or phantom stock to employees?
- Does the company have a stock bonus program that involves shares of stock as a portion of compensation?
- Are there plans for, or employee expectations of, share-based payments as part of the compensation program?
- Does the company conduct sales of shares at book value or other set formula price?

If so, how will the company value these shares to meet the requirements of FAS 123(R)?

- What is an acceptable level of risk regarding the interpretation and practice surrounding the fair value requirements of FAS 123(R)?
- Should your CPA seek an outside valuation expert to provide a professional and independent opinion of the fair value of these share-based payments?
- What controlling document for setting share price (such as a buy-sell agreement) needs to be adjusted to recognize the requirements of FAS 123(R)?

How can the company adjust future compensation plan design to minimize future exposure to FAS 123(R)?

- What are the goals of the company's share-based compensation practices? Loyalty and retention? Wealth creation? Ownership transfer?
- Are there alternative methods of compensation that may accomplish these goals that do not involve share-based payments?
- If your company alters current compensation practices in light of FAS 123(R), what impact will this have on its compensation program's goals?

FAS 123(R) ushers in a new level of scrutiny of share-based compensation practices. Meeting the fair value requirements of FAS 123(R) requires a thorough review of all share-based compensation practices, a determination about the efforts taken to meet the fair value requirements, and possible adjustments to existing compensation practices to reduce exposure to this new standard for share-based compensation. ■

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