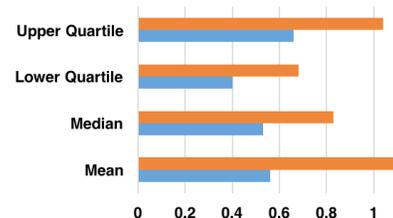


TRENDLINES

Firm value/net service revenue



Look at how much a firm's value (expressed as a multiple of net service revenue, or NSR) fluctuates based on the reason for the valuation. Valuations obtained for **internal ownership transfers** top out at 0.66x NSR – the upper quartile number. Compare that to valuations obtained for **external sales or mergers** (i.e. M&A deals). That same multiple (0.66x NSR) is less than the lower quartile value of external sales or mergers (0.68x NSR)! Huge difference, according to the 2016 Valuation Survey of AEP & Environmental Consulting Firms. — Jamie Claire Kiser, director of M&A

Proper attire required

“It drives me crazy when I see people wearing suits with tears around the pockets, sweaters with holes in the elbows, or one I see in many men today – T-shirts that are frayed around the collar.”



Mark Zweig

EDITORIAL

I got a text the other day from an old client and reader who said it had been a while since I addressed the topic of how to dress around clients. Apparently he is still suffering through the frustrations of dealing with his people who don't seem to get it.

He said, “I've got grown men asking what the appropriate dress is for client meetings ... REALLY ... as you said in an article regarding manners, they just haven't had anyone tell/show them what's appropriate ... that's my positive rose-colored glasses perspective.”

So maybe it is time to talk about how to dress once again. I'm a man so most of my comments will apply to men. Doesn't mean I think we shouldn't have women in our firms or shouldn't have women in the workplace. I strongly support the idea of both! But here are my thoughts:

- 1) Not all clients are the same and appropriate dress varies widely.** You don't want to wear polyester sans-a-belt slacks to go see a successful developer. Conversely, you don't want to wear a \$2,000 Armani suit (or whatever is considered high-style these days), to go see your local city engineer, either. Different clients have different expectations about what is appropriate.
- 2) Never is it acceptable to wear clothing that is ripped, torn, frayed, or worn out.** It drives me crazy when I see people wearing suits with tears around the pockets, sweaters with holes in the elbows, or one I see in many men today – T-shirts that are frayed around the collar. Or how about shoes with round heels or holes in the soles? Bad, bad, bad! Whatever you wear, it cannot be worn out. You'll look like a bum.

See MARK ZWEIG, page 2

MORE COLUMNS

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BUSINESS NEWS

ISG ASSISTS IOWA CITIES IN PROTECTING PUBLIC HEALTH THROUGH WATER/WASTEWATER SERVICES

While water conservation practices are much more prevalent than in past years, many Iowans do not have direct visibility into the constant efforts needed to maintain clean water.

According to the Iowa Department of Natural Resources, "Qualified and well-trained drinking water and wastewater operators play a vital role in drinking water quality."

With four ISG professionals, in Iowa alone, who hold DNR Certified Operator status in drinking water treatment, drinking water distribution, and wastewater treatment, ISG's Des Moines, Storm Lake, and Algona offices are directly dialed into the water quality of surrounding communities.

ISG certified water/wastewater specialist Jason Butler was awarded the 2015 Operator of the Year award from the Iowa Rural Water Association during its annual conference in February. Jason was nominated for this award by 9 local communities and industry representatives, and was the sole recipient of this annual statewide award.

"The best part about being an operator is helping towns identify issues and being a part of the solution. It's different every day, and each

town that I serve has faith and trust I will do the right thing, and that support, and drive to make the best decision for the community, is what makes my role so fulfilling," stated Jason.

ISG civil engineering designer Kelly Evans recently joined the list of professionals who are able to serve Iowa communities with operations of their water and wastewater facilities passing certifications for Grade 2 Water Distribution, Grade 2 Water Treatment, and Grade 2 Wastewater Treatment. As part of the operator certification process, Kelly was tasked with gaining the needed knowledge and experience to properly operate the systems and in turn, protect public health and safety, and the environment while being better equipped to design water/wastewater treatment systems.

Accumulating more than 3,600 hours of service annually, ISG's water/wastewater professionals, which include Evans and Butler, provide sludge judging, valve exercising, and routine operations for 32 municipal and industrial clients across the state. Among the four ISG Iowa professionals, they provide more than 55 years of experience in the field and hold a combined eight Grade 2, three Grade 3, and one Grade 4 certifications.

MARK ZWEIG, from page 1

3) Whatever you wear, make sure it fits! I see so many guys – have been one myself – with suit coats or jackets that are too small. We get older – we live the "good" life and our gut expands – and clothes don't always fit. I see it with women, too. Sometimes it's embarrassing for you (and them). Make sure whatever you wear you get something that fits properly – not too big or too small.

4) Fabric – natural is better than poly or synthetic – at least for men. That means wool and cotton and silk, and maybe bamboo. Slick fabrics are bad. Stretchy fabrics – not for men. My suits and sport coats are 100 percent wool or wool/silk blends. And shirts – send them out to the cleaner. For \$1.50 to \$3.00, depending on where you live, you'll look so much better. A nice, starched cotton shirt, properly pressed – to me, it's comfortable and looks like you care about yourself. I also like to wear jeans for work sometimes. I send mine out to the cleaner along with my shirts. Cotton rules. You'll never see James Bond wearing polyester!

5) Belts and other accessories. Don't have a worn out belt! They get old and tired and look bad as your waistline goes up and down. Buy some new ones every once in a while! Ditto for your ties. Old ties look dated. **IF** you wear a tie get some new ones every so often from a good store (not Wal-Mart). And obviously, today there are a lot of people who don't wear ties. If you are one of them, buy new T-shirts, please! We don't want to see your worn, stretched, frayed, and nasty T-shirts. New ones cost about \$10 each. You can afford it! And get a new wallet. You don't want to be pulling yours out to pay your and your client's lunch bill and have one that looks like you first got it 20 years ago. They wear out – like everything else!

6) Laptop bags and luggage. Get quality ones. I like leather. It looks classier. Nylon is OK but don't get a color that looks like it could be used by a college student. I'm not fond of backpacks because I'm an old man. A lot of younger, hipper folks are using them these days. I don't wheel a bag, either. My leather duffel will stuff in any bin or under any seat and I never have that last minute, "Where'd my bag go?" drama that some of these wheeled bag users seem to generate.

Other thoughts? Send them to me at mzweig@zweiggroup.com. We may help make you famous and print them in a future issue! ▀

MARK ZWEIG is Zweig Group's founder and CEO. Contact him at mzweig@zweiggroup.com.

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THE ZWEIG LETTER

1200 North College Ave.
Fayetteville, AR 72703

Mark Zweig | Publisher
mzweig@zweiggroup.com

Richard Massey | Managing Editor
rmassey@zweiggroup.com

Christina Zweig | Contributing Editor
christinaz@zweiggroup.com

Sara Parkman | Editor and Designer
sparkman@zweiggroup.com

Megan Halbert | Design Assistant
mhalbert@zweiggroup.com

Liisa Andreassen | Correspondent
landreassen@zweiggroup.com

Tel: 800-466-6275
Fax: 800-842-1560
Email: info@zweiggroup.com
Online: www.thezweigletter.com
Twitter: twitter.com/zweigletter
Blog: blog.zweiggroup.com

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Competition and the Theory of Relativity

You have to keep your firm moving if you hope to stay ahead of the competition, and if you want your firm to age gracefully.



**Bill
Murphey**

**CONTINUING
ED**

If you've ever spent any time at the beach, you may have noticed two distinct characters. One is the tanned, 50-year-old blonde basking in the sun on her lounge chair. Her leather-like skin makes her look 20 years older than she really is. Contrast that with the 50-year-old surfer, effortlessly maneuvering his longboard on the rolling waves. He's nearly indistinguishable from the other surfers 20 years his junior.

Albert Einstein thought about this. Well, not about this beach scene. But he did discuss the relationship between fast- and slow-moving objects in his Special Theory of Relativity.

So what does this have to do with the AEC industry, you ask? I'm one of those people who is always searching for a way to connect the dots, and I found that Einstein's Special Theory of Relativity provides another way of explaining the difference between fast-growth entrepreneurial firms and slow-growth small businesses.

In a previous *TZL* article, I recommended reading obscure books as a way to broaden your river of knowledge in leadership and business concepts. The current book on my nightstand is Stephen Hawking's *A Brief History of Time*. Released in 1988, Hawking's book does a great job of explaining the space-time concept of Einstein's theory that we can use to understand how some firms out-compete other firms in our industry.

In very simplistic terms, Einstein's theory suggests that objects in motion, and traveling at very high speeds relative to slow-moving observers, will age more slowly than the static observers.

Imagine two successful engineers, Andrew and Ben. They begin working at the same design firm straight out of college and at age 40 each decides to leave the company to establish his own firm.

Andrew begins building his business by reaching out to his past clients and grows at the industry average of 5 percent per year. Ben decides to take another path and competes for projects beyond his firm's current capacity. His strategy pays off and he's able to grow at the rate of 20 percent each year.

By the time Andrew and Ben turn 50, Ben has increased his firm's revenue four-fold relative to Andrew's firm. Both have likely worked a similar

See BILL MURPHEY, page 4



ON THE MOVE

CHRIS MASTERS, P.E., JOINS LAN AS VICE PRESIDENT AND TRANSIT LEADER Chris Masters, P.E., joins planning, engineering, and program management firm **Lockwood, Andrews & Newnam Inc.** as vice president and a transit leader in its Transportation Business Group. In this role, Masters will be responsible for expanding the firm's transit practice.

Masters, who worked for LAN early in his career leading construction management for light rail programs, has 20 years of experience managing engineering, construction, and complex capital improvement programs. Previously, he served **Parsons Transportation Group** as a vice president responsible for the pursuit, development, and delivery of rail and transit projects throughout North America. Prior to that role, Masters served as an assistant vice president for the **Dallas Area**

Rapid Transit responsible for delivering the agency's rail expansion programs.

Masters has managed some of the most high-profile transit projects in the Dallas Fort Worth area, including DART's first design-build light rail expansion program (Orange and Blue Lines), which added 20 miles to the light rail system at a value of \$1.53 billion. He also provided project controls, disputes mitigation and technical services for DART's \$1.8 billion, 27-mile Green Line light rail expansion program. Most recently, Masters led the final design for the Fort Worth Transportation Authority's TEX Rail Corridor, a 27-mile commuter rail system connecting downtown Fort Worth to DFW Airport's Terminal B.

"North Texas is one of the fastest growing regions in the country and is investing heavily in its infrastructure to deal with this growth,"

said Dennis Petersen, P.E., LAN's president. "Chris has significant experience leading transit projects in both the public and private sectors, and has proven skills in managing people and resources. With his addition, we are looking forward to further improving our service to our clients and aggressively growing our transit practice."

Masters graduated from the U.S. Military Academy, West Point, where he earned a bachelor's degree in civil engineering and his commission as an engineer officer. He served in the U.S. Army in various roles such as facilities construction management engineer, special projects engineer, and vertical construction platoon leader. Masters was also listed as one of the Top 20 Under 40 leaders by *Engineering News-Record* in 2014. He is a licensed professional engineer in Texas.

BILL MURPHEY, from page 3

number of hours each week, but it's also likely that Ben's work hours were more productive with a flurry of activity. Not the 186,000 miles per second speed of light kind of flurry, but it sure felt that way to Ben. I'm sure Andrew was busy, as well, as he enthusiastically prepared project proposals with the uninspiring lead in: "We provide innovative solutions to give you a competitive advantage." It's no wonder Andrew's is a slow-growth firm.

Einstein's Special Theory of Relativity states that when two bodies later converge, the slower-moving body will have aged considerably relative to the fast-moving body. Indeed, when Andrew and Ben meet again at Zweig Group's Hot Firm and AEC Industry Awards Conference 10 years later, there's a distinct difference between the two firm owners.

"Slowing down to bask in the glow of last year's successes accelerates the aging process by forcing you to work harder to catch up with the fast-growth competition."

Both are now age 60, but look at the work years remaining. Andrew has only a few years left to increase the value of his firm before he reaches normal retirement age. At this 20-year point, the revenue at Andrew's firm is the same as Ben's firm at the 5-year point. In other words, Andrew's slow-growth firm will have aged 20 years to Ben's fast-growth firm's 5 years. To me, that sounds exactly as Einstein predicted when he published his theory over one hundred years ago!

With a much higher firm valuation, Ben is in the driver's seat and can command a better price for his firm when he decides to sell. That would afford him the opportunity to move to a place where it's always sunny and warm and he can hit the surf every morning. Andrew, on the other hand, will have to decide between working late into life or retiring and selling his firm at a much reduced price relative to Ben's firm.

"Reading exercises the synapses in your brain and, according to one study, can rewire your brain and transform you into a continuous learner. Create a 'Recommended Reading List' for your firm."

What can you do to slow your firm's aging process?

- **Move!** Keep your firm in motion, and as car aficionado Mark Zweig says: "Don't let up on the gas!" Slowing down to bask in the glow of last year's successes accelerates the aging process by forcing you to work harder to catch up with the fast-growth competition.
- **Develop a growth plan and stick to it.** Don't get too comfortable with the status quo. Push yourself and your firm beyond the "business as usual" mentality. View every decision your firm makes from the lens of, "Will this contribute to the growth of our firm?" If it doesn't contribute to your growth, it could be slowing you down and causing you to age faster.
- **Stay engaged.** Continue to improve the skills of your principals, project managers, and team members by ensuring they're educated and trained in the latest concepts and techniques. Attending conferences to stay abreast of the current issues in the industry will keep your eyes fresh.
- **Read.** Constantly read to keep your mind active. It doesn't matter whether you're reading a newspaper or a physics book. Reading exercises the synapses in your brain and, according to one study, can rewire your brain and transform you into a continuous learner. Create a "Recommended Reading List" for your firm.

Which path is your firm on? Are the decisions you're making today designed to keep your firm young, vibrant, and competitive, or is your firm simply lying on the beach growing old? ▀

BILL MURPHEY is Zweig Group's director of education. Contact him at bmurphey@zweiggroup.com.



Subconsultants and risk

Since firms are liable for the work performed by their subs, it's imperative that a comprehensive plan be in place before selection and work begins.



Dan
Knise

GUEST
SPEAKER

Well-run design firms focus significant attention on managing risk. Besides issues involving an architect's or engineer's interaction with the owner, active risk management also calls for addressing exposures associated with any subconsultants or subcontractors (e.g., a driller taking soil borings), utilized on a project. In effect, design firms are legally responsible for services provided by their subs.

WHAT CAN GO WRONG? Consider a recent claim involving a parking garage project. An architect retained an MEP engineer to design a retainage structure and pumping system for storm-water control. The MEP specified pumps to empty a holding tank which separates sediment from storm water before it enters the municipal storm water drainage system. The MEP decided to install two 2-1/2 inch pumps for this task, even though there were four 8-inch drain pipes funneling run-off water into the holding tank.

During the first big thunderstorm, the tank overflowed, flooding the garage. The "fix" required replacing the pumps and piping with larger capacity models and cutting new holes in the concrete decks and cost more than \$90,000.

Although the MEP clearly was responsible for the

error, the project owner also sought to hold the architect accountable; noting that the architect's responsibilities included choosing qualified subconsultants, overseeing their work, and ensuring its correct completion. This "vicarious liability" can create substantial financial risk for firms retaining subconsultants and needs to be carefully managed.

ESTABLISHING SOUND SUBCONSULTANT PRACTICES. Design firms need a thorough process for selecting and retaining subconsultants/subcontractors. The objective: Ensure client satisfaction while insulating your firm (and your insurance program) from losses caused by the subconsultant. Key aspects of a subconsultant risk management plan include:

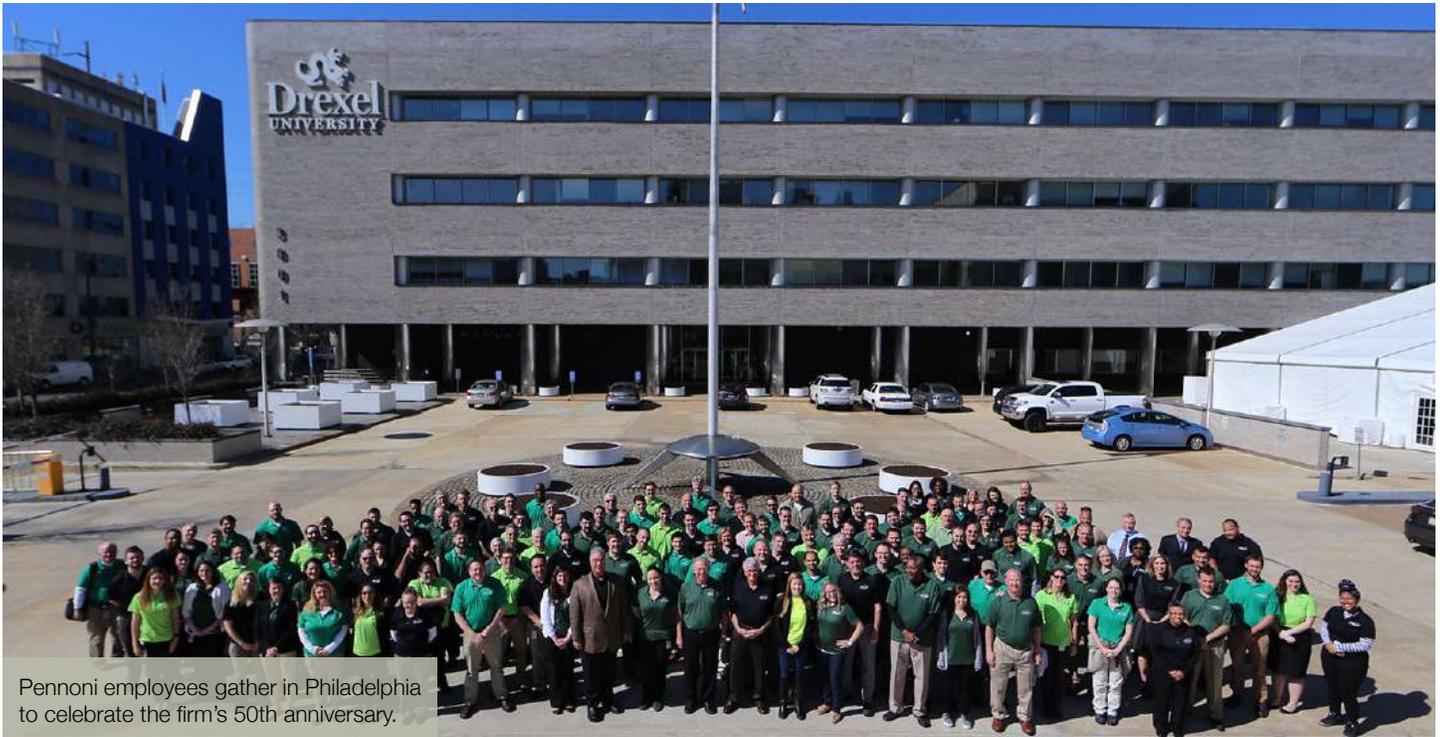
- **Choose qualified firms.** This is a vital first step in controlling subconsultant risk. Check each firm's

See DAN KNISE, page 8



SPOTLIGHT ON: **Anni**

PROFILE



Pennoni employees gather in Philadelphia to celebrate the firm's 50th anniversary.

Golden anniversary

Venerable Philadelphia firm Pennoni heads into its 50th year with plenty to celebrate – stability, rebranding, growth, projects, and awards.

By LIISA ANDREASSEN
Correspondent



Joe Viscuso,
Senior VP
& Director
of Strategic
Growth,
Pennoni

Philadelphia-based **Pennoni** (#47 Best Firm Multidiscipline and #88 Hot Firm for 2015), an engineering and consulting firm with more than 1,100 employees, is off to a roaring start for 2016. The firm is celebrating its 50-year anniversary, the 10th year of its community-oriented Ellipse Award, and an assortment of projects, acquisitions, and accolades.

CELEBRATING 50 YEARS OF SUCCESS. On March 1, it celebrated its 50th anniversary with a virtual company-wide celebration. All 30 offices participated in a web-based conference meeting, where each location shared personal remarks and stories about working at the firm. Offices submitted photos with employees wearing anniversary shirts. At the same time, Pennoni introduced a refreshed corporate brand, including a revamped website (pennoni.com), and an updated logo.

Joe Viscuso, Pennoni's senior vice president and director of strategic growth, says the 50th anniversary presented the perfect opportunity to rebrand.

"While we wanted to pay tribute to the past and to what got us to 50 years, we also wanted to demonstrate our commitment to the future – 50 years and beyond," he says. "We worked with an advertising agency that conducted an initial survey to see what was being said about Pennoni. They interviewed Pennoni executives and employees, as well as a few of our clients. As much as we knew about our brand, we learned even more from this process – good and bad. We took all of that information and used it to refresh our brand."

So, what does Pennoni hope to achieve with this rebranding? It's three-pronged:

- 1) **Create a comprehensive look and feel for the firm.** They want their look to be as recognizable as their name and logo, to reflect their work ethic, and



versary

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to be creative, innovative and professional.

2) Have a better understanding of how they are perceived in the industry. The candid and honest feedback they received from employees and clients was invaluable. In evaluating their brand, it was important that they remained on the same page as their employees and clients and that the message and the quality of work remain the same across the board.

3) Celebrate their anniversary. Anniversaries are a great time to take a look at where you've been and where you're going. This was their opportunity to look at all the things that have led to their successful 50 years in business and use that to shape the next 50 years of success.

"Honesty, integrity, and service – these are the values that C.R. 'Chuck' Pennoni instilled into the company when he founded it 50 years ago," Viscuso says. "Our employees demonstrate these values with every client on every project."

"While we wanted to pay tribute to the past and to what got us to 50 years, we also wanted to demonstrate our commitment to the future – 50 years and beyond."

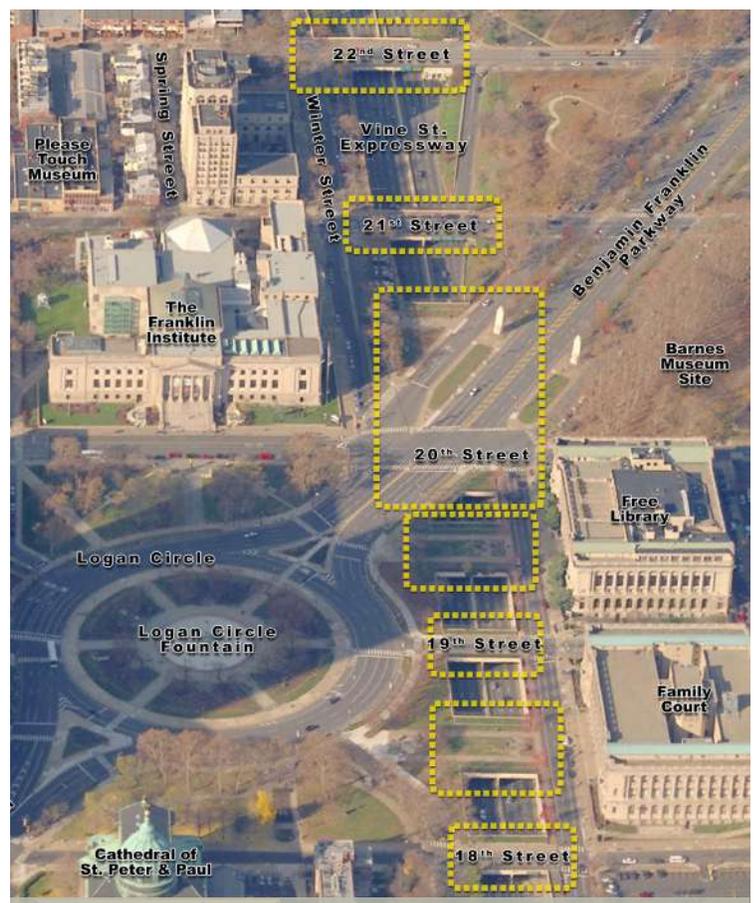
CELEBRATING 10 YEARS OF ELLIPSE AWARDS. Pennoni is also proud to reveal that this year marks the 10th anniversary of its Ellipse Award, presented annually to a member of the community who has improved the quality of life through an investment in infrastructure. Each year, Pennoni's board of directors and executive team, in addition to previous award recipients, recommend possible nominees. The group then votes on a final recipient.

This year they selected the American Society of Civil Engineers in honor of its quadrennial Report Card on America's Infrastructure.

"Pennoni felt that the ASCE should be recognized for the spotlight they have placed on our nation's failing infrastructure" Viscuso says.

Once every four years, America's civil engineers provide a comprehensive assessment of the nation's major infrastructure categories in ASCE's Report Card for America's Infrastructure. Using a simple A to F report card format, the review provides a comprehensive assessment of current infrastructure conditions and needs, both assigning grades and making recommendations for how to raise the grades. According to the report card, the nation's infrastructure is currently rated at D-plus, and needs an investment of \$3.6 trillion.

CELEBRATING PROJECTS. In addition to these milestones, See PENNONI, page 8



Pennoni was selected by the Pennsylvania Department of Transportation to complete the development of conceptual plans, contract bid documents, and services during construction for the superstructure replacement of seven non-composite bridges, which include 22nd Street, 21st Street, 20th Street, Free Library of Philadelphia Pedestrian Bridge, 19th Street, Family Court Pedestrian Bridge, and 18th Street, spanning over the Vine Street Expressway.

- More reasons for Pennoni to celebrate:**
- They just acquired two more firms: **RWD Consultants** in Camden, NJ, and **McCarthy Associates** in Clearwater and Delray Beach, FL.
 - They were named a 2016 Top Workplace in the Philadelphia region by Philly.com, and Workplace Dynamics.
 - They were ranked number three in the *Philadelphia Business Journal's* list of Engineering Firms.
 - The structural division manager in the Philadelphia office, Matthew Stuart, was recognized in ASCE's first Innovation Contest, which identified creative and innovative ideas for reshaping infrastructure. His theory was recognized as "Most Efficient" in the "Resilience" category for "Improving the Resilience of Sheathed, Unbonded Mono-Strand Post-Tensioned Construction."

DAN KNISE, from page 5

credentials and seek references if you've not worked with them. Find out if the firm has been involved with troubled projects and examine its financial health. Firms in financial difficulty might over-reach to get work or cut corners to improve profitability.

- **Clarify the scope of work.** Claims often arise from a lack of clarity about who is responsible for what on a project. Have a clearly defined scope of work and require subconsultants to follow through, fill their intended role, and complete all assigned tasks.
- **Have a signed contract.** The first line of defense when problems or claims arise is the contract between the subconsultant and the prime engineer or architect. Design firms should have a standard subconsultant agreement that has been reviewed by legal counsel. It should address scope of work, standard of care, indemnification, ownership of documents, etc. Equally important is the fair allocation of risk and clearly defined insurance requirements (see below).
- **Require subconsultant insurance.** Your subconsultant agreement should detail the minimum insurances for your subconsultants to carry. The goal is to have their insurance respond first to pay any loss, with your firm's insurance responding only if their insurance policy limits are insufficient to satisfy the full amount of the loss. Insurance coverages typically required include:
 - Commercial General Liability
 - Business Auto (or hired and non-owned auto as part of the CGL)
 - Worker's Compensation and Employer's Liability
 - Umbrella/Excess Liability (if appropriate to provide increased limits)
 - Architect/Engineers Professional Liability (including pollution liability)

Depending on the project, it may be appropriate to require additional coverages (e.g., builder's risk, if the design firm is responsible for construction as well), or to modify the minimum limit requirements to account for project size and complexity.

You should also establish minimum limits of insurance by policy type. While such limits should account for the project scope, complexity, and risk profile of the sub's work, here are some recommended minimums:

- Commercial General Liability: \$1 million per occurrence/aggregate

PENNONI, from page 7

Pennoni has completed several projects it's particularly proud of. Here is a small sampling:

- **Vine Street Expressway/I-676 Bridge Improvements.** The project site is located in the middle of Philadelphia's art and historic districts. A major benefit of this project is improving how commuters access a number of Philadelphia's landmarks. In doing so, the firm is reshaping the aesthetics and the experience of visiting Philadelphia. An added challenge came in September 2015, when they had to coordinate the project in the midst of a visit from Pope Francis.

- Business Automobile Liability: \$1 million per occurrence/aggregate
- Employer's Liability: \$500,000 per disease/injury
- Professional Liability: \$1 million per claim/aggregate

Larger or more complex undertakings should also require umbrella/excess liability with a minimum limit of \$3 million to \$5 million.

INSURANCE POLICY ENDORSEMENTS ENHANCE PROTECTION. Include details in your subcontract insurance specifications on coverage extensions that can further protect your firm. For example, your firm should be listed as an "additional insured" on the subcontractor or subconsultant's commercial general liability, business auto liability and, if applicable, contractors' pollution liability policies. This coverage should be denoted as "primary and non-contributory." Also, confirm the presence of a "waiver of subrogation" (by endorsement, if need be), in each policy, including commercial general liability, workers' compensation, business auto liability and, if applicable, contractors' pollution liability. The waiver prevents the sub's insurer from seeking indemnification from you (and your own insurer), for losses it pays.

HAVE SUBS "FLOW DOWN" YOUR REQUIREMENTS. Be sure your subconsultant agreement stipulates that provisions (including all insurance requirements), in your agreement with the owner or manager must "flow down" to subconsultants and subcontractors of the sub you hire. We've seen losses arise from uninsured or underinsured subs of an A/E's subconsultants or subcontractors.

While there may be valid reasons to use subs that do not meet your minimum insurance requirements, you should have a formal approval process for any exceptions. Determine who within your firm can approve an exception and under what circumstances.

Risk management requires formal processes and continual attention. Along with having the appropriate framework and tools up front, it's important to maintain an open dialogue and good communications with your subconsultants. Finding out about problems early allows you to take action to correct any errors or mitigate any risk to the project or your firm. ▀

DAN KNISE is president and CEO at **Ames & Gough**. Contact him at dknise@amesgough.com.

- **Energy OPTICS.** Pennoni recently launched a proprietary web-based active energy management platform that enables end-users of all sizes to better manage their energy budget and optimize their energy use. In using the program, end-users get an enhanced view of each component of their energy spend, which helps to identify future opportunities for cost reductions and savings.
- **Proctor & Gamble (Fluor Corporation).** Pennoni is working with global engineering and construction company Fluor Corporation on a new Procter & Gamble manufacturing facility – projected to be the largest manufacturing facility in the world. ▀



Believe it: Quality counts

If a firm wants to succeed at a high level, it must keep a keen eye on the documents, and have an ear for what the client needs.



Ed
Friedrichs

FROM THE
CHAIRMAN

It's my experience that too many firms give lip service to quality assurance and quality control. Quality assurance is the process or set of processes used to measure and assure the quality of a product, while quality control is the process of ensuring products and services meet consumer expectations.

Do you have an active and thorough QA/QC program in your firm? If not, why? If you asked your clients, "How important is it that we have a QA/QC program?" how do you think they would respond? Probably with something like, "WHAT? How could we trust you if you didn't?"

While most organizations I talk to claim they have QA/QC processes, when I look deeply into the firm's practices, the reality of any rigorous QA/QC program is virtually non-existent. I've pressed the firms I've worked with to query their insurance carrier about what the impact of a well-documented QA/QC, metrics-driven program could have on their insurance rates. Their jaws have dropped.

Yes, QA/QC can pay for itself many times over – not just with reduced rates, but with reduced claims for errors and omissions and fewer claims

from contractors for time extensions, which usually find their way to your doorstep if an error in your drawing is the cause.

In our business, quality assurance relates to the accuracy and completeness of the documents from which a project will be built. There are a few excellent methods to catch problems before your drawings get into the contractor's hands.

In 1976 when I opened an office for **Gensler** in Los Angeles, one of the young, aspiring architects I hired came to me one morning and said, "We need some grey hair around here," meaning someone who had seen every flaw in a set of drawings that could be made and who would review and mark up the drawings for correction. Subsequently, we got a three-for-one package when we hired the senior architect the young architect recommended.

See ED FRIEDRICHS, page 12



CALENDAR: MAY 2016



5.5 **BECOMING A BETTER SELLER**

Could every person in your firm describe your services in a succinct and persuasive way that demonstrates what sets you apart from the competition? Everyone is not a born seller, but everyone can learn how to be more effective at capitalizing on opportunities, creating business, marketing, and promotion.

Becoming a Better Seller is a one-day seminar that was specifically developed to help design and technical professionals in architecture, engineering, planning, and environmental firms become more comfortable dealing with clients and promoting the firm and your services.

cost: first attendee: \$975; additional attendees: \$825

location: Miami

more info: zweiggroup.com/seminars/better_seller/

5.16-18 **STRUCTURAL DESIGN TOPICS IN WOOD CONSTRUCTION**

Virginia Tech is presenting a short course covering topics often faced by wood building design professionals for which background information and references are not readily accessible.

The primary audiences for this course are registered design professionals, structural engineers, wood truss engineers, wood truss designers, truss manufacturers, post-frame designers, EWP designers, and inspectors.

cost: \$895

location: Roanoke, VA

more info: cpe.vt.edu/sdtwc/index.html#sthash.QPuiZsKK.dpuf

5.16-18 **MUNICIPAL WET WEATHER STORMWATER CONFERENCE**

Sponsored by EPA Region 4 and the Southeast Chapter of the International Erosion Control Association, presentations will inform MS4 operators, consultants, contractors and others practicing in the discipline of stormwater quality, and erosion and sediment control.

cost: \$445 for all days; \$120 for one day

location: Nashville, TN

more info: ieca.org/conference/regionals/nashvillems4.asp



5.18-19 **THE PRINCIPALS ACADEMY 2.0**

The Principals Academy 2.0 is an updated version of Zweig Group's crash course in all aspects of managing a professional service firm. The program is presented by a team of speakers – including Zweig Group founder and CEO Mark Zweig – who have extensive experience working with and for A/E firms.

The two-day agenda covers six critical areas of business management from the unique perspective of architecture, engineering, and environmental consulting firms, and is presented in tutorial and case study workshop sessions.

cost: first attendee: \$1,575; additional attendees: \$1,475

location: Washington, D.C.

more info: zweiggroup.com/seminars/tpa/



5.18-20 **INTERNATIONAL CONFERENCE ON SUSTAINABLE DESIGN, ENGINEERING & CONSTRUCTION**

Co-sponsored by ASCE and Arizona State University, the conference features three tracks: Sustainability/Resilience; Construction; and Intelligent Systems/Big Data.

cost: \$400 for two days; \$200 for one day

location: Tempe, AZ

more info: icsdec.org

5.22-26 **WORLD ENVIRONMENTAL & WATER RESOURCES CONGRESS 2016**

Created in 1999, the Environmental & Water Resources Institute is the recognized leader within ASCE for the integration of technical expertise and public policy in the planning, design, construction, and operation of environmentally sound and sustainable infrastructure impacting air, land, and water resources.

cost: member full: \$820; non-members full: \$920; member daily: \$395; non-member daily: \$425

location: West Palm Beach, FL

more info: ewricongress.org

5.23-24 **20TH ANNUAL WATER REUSE RESEARCH CONFERENCE**

The latest research focused on helping communities develop resilient water supplies will be presented at the 20th Annual WaterReuse Research Conference in Denver, CO on May 22-24, 2016. The Research Conference provides a unique opportunity for water professionals and researchers to interact, network, and discuss current research and future trends. This solutions focused event will provide water professionals and industry with tools to address water scarcity and sustainability challenges.

cost: members: \$475; non-members: \$600; daily: \$350

location: Denver

more info: wateruse.org/news-events/conferences/annual-research-conference/



5.25 **FINANCIAL MANAGEMENT FOR NON-FINANCIAL MANAGERS**

This is a one-day seminar that was specifically developed to help design and technical professionals become more comfortable dealing with financial management and accounting. This course helps attendees become better stewards of the company's resources and to better understand how to leverage resources and maximize profit.

cost: first attendee: \$975; additional attendees: \$825

location: Los Angeles

more info: zweiggroup.com/seminars/better_fm/index.php

PROFILE



An Earthship designed by Mike Reynolds, founder of Earthship Biotecture. The structure is designed to be fully functional even though it's not plugged into a public utility.

The Earthship has landed

Architect Mike Reynolds, founder and owner of an unconventional design-build company, uses recycled materials to construct a sustainable enterprise.

By RICHARD MASSEY
Managing Editor



Mike Reynolds,
Founder,
Earthship
Biotecture

Mike Reynolds, founder of **Earthship Biotecture**, rose from obscurity outside of Taos, New Mexico, to become the internationally known designer and builder of sustainable, “off-the-grid” housing made out of used tires, bottles, concrete, and aluminum cans.

While he started out in the early 1970s by himself, he now has more than 40 employees, and if needed, says he can muster as many as 1,000 people for a specific build event. Featured in the *New York Times* as far back as 1974, Reynolds is revered for challenging the status quo in the name of his Earthships.

Even with a global following, Reynolds is not without controversy and detractors. Some people say his Earthships, for a variety of reasons, really don't work that well, and that they are too expensive to build. To this day, Reynolds does not hold an architecture license in his home state of New Mexico, although he is registered in Colorado and Arizona.

He drives a 1973 Mercedes Benz that runs on recycled grease, wears his hair in a tangle, and is

unabashed in his commitment to save the world, one Earthship at a time. To say the least, he's an unconventional architect. But it appears to work for Reynolds. His backlog is healthy enough that he has to turn down work, and he can't realistically employ all the people who want to join his team.

Reynolds recently returned from a month-long stay in Uruguay, where he oversaw a design-build for an elementary school. *The Zweig Letter* caught up with him by phone for an interview at his home base in northern New Mexico.

A CONVERSATION WITH REYNOLDS.

TZL: How has social media played into your journey from “outlaw” architect to sustainability guru?

MR: I started doing what worked for me. And then my friends and neighbors, people from around town, the country, and the world, started doing it. (Earthship has over 189,000 likes on Facebook, over 8,400 followers on Twitter, over 500 connections on LinkedIn, and a raft of videos on YouTube, in addition to over three decade's worth of

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ED FRIEDRICHS, from page 9

John Perkins had an eagle eye for errors, inconsistencies, missing information, and inappropriate or impossible-to-build details. He was also a great coach and a wonderful specification writer. He had the ability to teach a group of young practitioners how to put together a complete and consistent set of drawings, but also how to completely connect the drawings with the specifications. The latter is one of the greatest flaws that lead to claims in the field or, worse, in the courtroom. We made it a practice never to let a set of drawings out of the office without John's scrutiny and feedback. No one ever resented it, and all of us became stronger practitioners.

We kept metrics on how we were doing:

- Number of plan-check corrections
- Number of Requests for Information from the contractor
- Number of Change Orders & Claims

When John finally retired for good, and we grew, it was too much for one person. We had several senior production people who took on John's role. At various milestones in a project (schematic design, design development, then at 50 percent completion of construction documents, and finally at 100 percent), someone reviewed each project, looking for buildability, completeness and accuracy. The overseer shared the responsibility to guide and instruct the person or team that had done the job.

Not just anyone is well suited for this quality assurance role. It's essential to assign someone who has a keen eye, a clear understanding of how drawings and specifications support one another, and a personal coaching style that is supportive of learning.

Beyond making sure drawings are completed and accurate,

EARTHSHIPS, from page 11

mentions in traditional media.)

TZL: At some point your enterprise had to start making a profit for it to survive. How does Earthship deal with real revenue?

MR: The money goes back into building. We're solid in terms of revenue so that we have jobs. But we're not weighed down by the need for profit. If we're not trying to make a billion dollars then the profit goes back into the technology. The entity is growing, becoming more powerful, and has more equity. (Earthship has an assortment of products for sale on its website – books, DVDs, construction drawings, and clothing. The company administers a popular building academy, and even sells its own app for the Simple Survival Earthship, in addition to other product lines.)

TZL: You have a powerful brand. How has branding benefited your business?

MR: We came up with the word Earthship because it's not a house, it's a vessel. People were using our brand to teach and they didn't know what they were doing. [If they are working without our direct input] we demand that they say, "earthship-inspired." If you are going to do a [real] Earthship, then we have to be involved. It's working pretty good.

quality control ensures the work is a consistent and creative solution to what the client is trying to accomplish. Think about it: The building has been completed on time/on budget, with no errors or omissions, no disputes, and a happy relationship between owner, architect, and contractor – but it's the wrong building! It doesn't accomplish its purpose very well. It's a church where the parishioners don't feel spiritual and don't put much in the offering plate. It's a hospital where rates of infection go up and post-operative patient stays increase.

We always started every project by asking key questions about the metrics our clients wanted to track to be sure the building was affecting business performance indicators in a positive manner. We asked the client why they had hired us, what they saw in us that they felt would make their business perform successfully. We needed to know what was important to them.

We displayed these client notes, often in the form of a large storyboard, at each design meeting, so we could check in with the client to see if these were still the priorities, or if something needed to be added. We presented each design element, describing how it would affect behavior in such a way that it enhanced business performance. Post completion, we gathered statistical evidence from the client to be certain our design had accomplished what we and the client set out to do. This process kept us focused on the project goals, and gave us a body of data about our work. It also helped set a cultural attitude about what we were doing on each succeeding project.

Give these ideas a try. Let me know if your work improves, your insurance rates go down, your staff has a better time, or your clients tell potential clients how terrific you are. ▀

EDWARD FRIEDRICHS is a consultant with Zweig Group and the former CEO and president of Gensler. Contact him at efriedrichs@zweiggroup.com.

TZL: How do you recruit and retain the best people for your company?

MR: We're turning people away. A lot of people come through the academy and want to stay. We pick the best ones – law, graphics, internet, tech – there's no shortage of talented people.

TZL: You wrote the rulebook on Earthships. How important is it to be an expert?

MR: I'm always thinking of biology, physics, structure, economics, and psychology. People ask me if I think [my knowledge] can be stolen from me. It's too involved. You can steal my horse, but you can't ride it.

TZL: How have you managed growth over the years?

MR: It's not easy. A lot of people help. I've been absorbed by this, but it's not a sacrifice. It's fun. It's hard work and there's battles and stress, but I got lucky on this.

TZL: How important has marketing been in your journey from misunderstood architect to renowned designer?

MR: We've never done formal advertising. It's out there, and if it's appropriate for people, they'll take it. A virus spreads on its own, and this is a good virus. ▀