

A&E PERSPECTIVES



5 TOOLS NEEDED TO RUN SUCCESSFUL MEETINGS

It is important to come prepared for possible situations and lead the group through the meeting before it becomes a waste of time.

Have you ever tried to run a meeting that started out strong, only to watch it fall apart as participants and topics unraveled? As the facilitator of a meeting, it is important you come prepared for the situations and lead your group through the process before it becomes an unproductive use of time.



BY ERICA LOYND
DLR GROUP

Karen Johnston of Johnston Training Group recently shared with DLR Group her secrets to holding a positive and productive meeting.

Common problems encountered in meetings include not having the decision-makers together and present, dominant personalities overtaking the meeting's direction, or participants not staying on track to accomplish the goals or timelines of the meeting.

At many meetings, such as

a team meeting, the dynamic of the group can be predicted. You have either engaged with the attendees before or have held similar meetings. For instance, a site construction meeting has certain set agendas to review on-site concerns, and it is repeated weekly or monthly as the work progresses. The same attendees tend to be present at each meeting and come anticipating the meeting's intentions.

But some other meetings, such as community presentations, cannot be as easily anticipated because they are open to the public.

A public meeting might be the hottest discussion topic in the jurisdiction, making everyone in the community want to attend and share his or her opinion. Another public meeting might be calm and inviting, with a few people present who just want to hear your progress.

Having a prepared toolbox and the confidence that you are ready for whatever is coming will make you the leader of the show.

Your meetings toolbox should include these strategies:

1 Create and share your agenda.

Your agenda is the most important tool you can prepare for your meeting. It prepares the group for what goals you intend to accomplish through the meeting. Setting times to the topics on the agenda ensures the group knows how long you intend the discussion will last.

If discussion of a topic grows longer or more detailed than anticipated, an agenda allows you to stop conversations and defer them to another meeting or discussion offline. You can say, "This is an important conversation that should be addressed. Let's table this for a meeting outside of this group to make sure we can discuss all the items on today's agenda."

Additionally, many meetings do not require the attendance of the whole group for the entire meeting. Setting times and keeping to them allows the key decision-makers to know exactly when they are required to be in the meeting room and when they can

return to work.

Submit your agenda to the group a couple days prior to the meeting, and ask attendees for feedback before they arrive. This gets the participants to start thinking about the meeting before the day of the event. They'll feel engaged and will come prepared with questions or comments.

Also, confirm the agenda with the group to make sure there are no hot items that need more time dedicated to them. By sending the agenda before the meeting day, attendees can respond to you and leave time for you to adjust the agenda on the day of the meeting.

2 Set guidelines suitable for the dynamic of the group.

When you set the guidelines at the outset of the meeting, everyone buys into the expectations of each other before someone can disrupt the group. Guidelines can include cell phone use, computer use or talking out of turn.

Present your guidelines in a responsive way, asking the group, "What is your preference on cell phone use? Can we agree that we want to put them away during the meeting?" This encourages the participants to agree on the priorities or needs of the group to keep the meeting progressing. If they feel that they helped set the guidelines, they will also help to enforce them.

3 Send out meeting notes promptly.

Issuing meeting notes promptly allows information to be fresh in everyone's mind. They can provide feedback and comments on items that are not clear. The meeting notes are also commonly used as a record of key decisions made on the project and referenced for the duration.

4 Set the stage for the meeting.

Move the furniture to create the collaborative group setting you need for the meeting. Encourage people to sit in certain spots that you see will facilitate their interaction. Make sure all participants can see the presentation material clearly so they remain engaged.

5 Work to gain the trust of the participants.

When you implement these goals and strategies, the participants will turn to you to direct the conversations and keep them on track. By creating the agenda and sticking to it, you'll ensure attendees that their time is productive.

Make sure you book the time for the adequate length and start promptly.

Erica Loynd is an architect and senior associate with DLR Group in Seattle. She manages integrated design teams, government agencies and owners through the design and construction of large, complex justice and civic projects.



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ON THE COVER

The Seattle office of Callison designed the recently finished 65-story Lotte Center Hanoi in Vietnam. The architectural giant was bought earlier this year by Arcadis. Turn to page 16 to find out how Callison and other firms are doing in the post-recession economy.

IMAGE FROM CALLISON

A&E PERSPECTIVES 2014 TEAM

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WHY TOMORROW'S ENGINEER NEEDS A DIFFERENT EDUCATION

The main reason college students go into other fields is they view engineering education as a soulless sorting process.



BY DAVID E. GOLDBERG & MARK SOMERVILLE
SPECIAL TO THE JOURNAL

In 2008, the oddest couple since Oscar and Felix met and collaborated on how to change the shape of engineering education forever.

In that year faculty at a small, private upstart college, the Franklin W. Olin College of Engineering, and faculty at a big, established public research university, the University of Illinois at Urbana-Champaign, got together to come up with a different way of looking at education reform — a way that may have implications beyond engineering for architecture, business school, and all forms of professional education.

This journey is chronicled in a new book entitled “A Whole New Engineer: The Coming Revolution in Engineering Education.”

The book makes the following key points:

1 Stop taking the crisis in engineering education for granted.

Start working diligently until engineering is attractive to our best and brightest. We live on a planet with 7 billion people. Without technology, 6.9 billion of us or so would have to die or be culled. Yet, in advanced cultures the best students want to be anything but engineers. For the planet's survival and quality of life, creating inspirational engineering education is a globally urgent imperative.

2 Stop basing the education system on an operating system of fear.

Start building a new operating system that works through joy, connection and openness. The main reason students go to other fields is they view engineering education as a soulless sorting process, a survival of the fittest, where they must pass a harsh fraternity hazing before they are allowed to practice the chocolate of engineering design. Giving students a taste of the chocolate early makes the process a joyful one, thereby attracting and retaining students.

3 Stop boring our students into dull obedience.

Start trusting them until they

have the courage to be creative and unleashed. Our education system is based on memorizing and regurgitating facts that are now widely available to anyone with a laptop. This worked in the 1950s when we wanted technical drones to do the bidding of large hierarchies.

Now we want innovative and creative engineers (the next Steve Jobs), but we educate the creativity out of them by sticking to the mind-numbing old ways. Instead, we need to give them real-world challenges and trust them until they find the courage to fail and then succeed. In a word, we need to unleash them.

4 Stop educating engineers as technical brains on a stick.

Start educating engineers with six minds: analytical mind, design mind, linguistic mind, people mind, body mind and mindful mind. Math and science are important to engineers, but educating math robots instead of more reflective engineers misunderstands how engineering is really practiced and discourages and drives out the capable.

5 Stop throwing Ph.D.s into classrooms as experts.

Start training a new generation of skilled educators with both technical knowledge and an ability to coach young people. Modern companies spend \$500 an hour to provide executive coaches to the C-Suite with sharp skills (stop calling them soft skills).

About 80 percent to 90 percent of our educational difficulty comes from Ph.D.s trained as narrow specialists with a lack of sharp skills in noticing, listening and questioning, and speech acts. Replacing fear with joy, boredom with unleashing, and narrow technical skills with the whole new engineer requires educators with the sharp skills of a coach.

6 Stop assuming that educational transformation can be performed by a system designed in the 11th century, a system designed to maintain the status quo.

Start to use new methods of change management to bring about the needed change. Deans, department heads and faculty assume that changes can be made through existing channels in the system. Olin was a blank slate. The initiative at Illinois was an incubator of educational change.

Change and leadership expert John Kotter says we need a dual operating system for effective change. Let's use learning from the corporate world and educa-

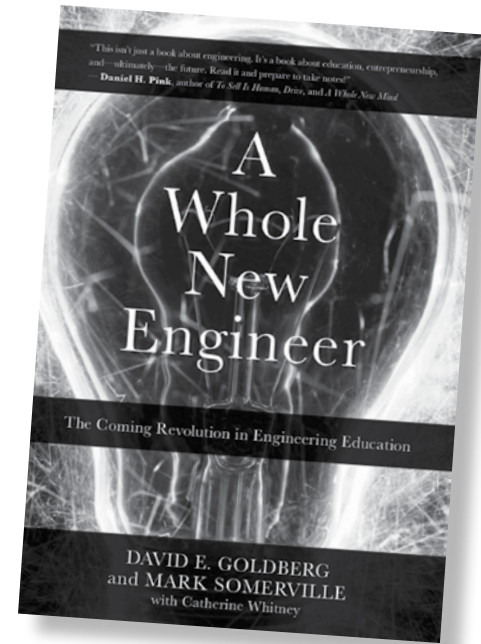
tional initiatives as best practices in making academic change.

One of the surprising conclusions of this work has been the way in which the usual rational approaches to education reform — content, curriculum and pedagogy — have been replaced by a concern for decidedly emotional and cultural variables.

Coming to this conclusion was especially difficult for a pair of traditionally trained engineering educators, but over and over again, we saw students unleashed to a life full of engaged and pervasive learning where they were trusted, took courage from that trust, and took initiative that resulted in authentic learning. And once students were unleashed to authentic learning like this, they are able to apply it in other domains and throughout their lives.

In short, once we got to the emotional floor of the educational enterprise, we knew there was no going back, and once others can bring themselves to speak of education in this way, they are better able to help bring about the needed changes.

David E. Goldberg is president



Two professors uncover different ways to educate engineering students in this new book.
PHOTO FROM DAVID GOLDBERG

of the nonprofit Big Beacon, and a computer scientist, civil engineer and professor emeritus at the University of Illinois at Urbana-Champaign. Mark Somerville is a professor of electrical engineering and physics

at Olin College, where he also serves as associate dean for faculty affairs and development. They authored, with Catherine Whitney, “A Whole New Engineer: The Coming Revolution in Engineering Education.”

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D/B COMPETITIONS: A HIGH-STAKES POKER GAME YOU CAN'T WIN

If the design/build competition process becomes predominant, it will financially cripple many architectural and engineering firms.

Design/build competitions are becoming popular in the public sector.

On the face of it, these competitions seem to have the advantage of a package deal with a happy team of contractors and designers, and a complete design with a final price. But behind the scenes, D/B competitions fuel many incentives contrary to owners' best interests — mostly driven by the financial brinkmanship that the competitors must survive.



BY STEVE MCNUTT
NAC ARCHITECTURE

One caveat before going further: Other versions of design/build, with selection based largely on qualifications, avoid the problems of D/B competitions and are not the subject of this article.

Others wouldn't touch this

A D/B competition is like shopping among several accountants, doctors or lawyers and saying: "I'm shopping for the best professional service in your field and contacting several professionals. Here are the facts of my situation and the needs I foresee. Now meet with me a few times to clarify those needs. And then give me your best analysis of my

situation, what my future needs will be, and a firm fixed cost for taking my situation to conclusion.

"I'll pay you some of your costs for this test-drive, even though it only represents a fraction of the cost it will require for you to be successful. And by the way, I know I am a big potential customer of yours, and I'm planning on doing all my professional business this way from here on out. So impress me."

Most accountants, doctors and lawyers would tell these potential customers "no thanks." But, in lean economies with few opportunities for big design commissions, hungry architects and engineers allow themselves to be drawn in.

The cost of participation is astronomical and the potential for success minimal. If the D/B competition process expands to become predominant in the marketplace, it will financially cripple many architectural and engineering firms and eventually dilute and degrade the quality of service in the design profession.

Heavy-handed leverage

To illustrate the dilemma and leverage a D/B competition exerts on a typical design team, think of it in these personal terms: you apply for a good job; you know that you are well-qualified; you are eager for the position because you know your present employment may end due to

your current employer's declining workload.

This potential new job is very important. But the new employer can't decide among three good candidates. So the new employer says it will give all finalists a trial run on the job for a few weeks, and pay all finalists for their time during the trial run — but only a fraction of the real time value.

The finalists will all perform separately (and have homework) so that the new employer can compare and evaluate them based on criteria given in advance. In addition, the new employer may reserve the right to "negotiate" with the finalists about their salary to assess performance versus cost.

Do you abandon the process and set yourself adrift without a job? Or do you compete to win — and go all out with effort well beyond the partial compensation to prove your worth?

On one hand, you are certain the other finalists will do the same. On the other hand, you worry about asking for too much salary. But you sense that you have to try because this is a growing trend and many other potential employers will use this selection process.

You conclude that you must compete or die, but the reality is you might compete AND die.

Your chances of winning are one in three. You find yourself asking: Does this happen three times before you finally win a job? Or will you lose three times and find yourself in the unemployment line?

A process with many pitfalls

These D/B competition pressures result in a laundry list of overt and hidden disadvantages:

- **The wrong financial motivators.** Financially, the winning D/B team will barely survive the competition. The D/B competition costs are typically about 5 to 10 times the cost of "normal" project pursuits based on qualifications. All the downstream incentives are to constrain services.

- **Honorariums are a mixed bag.** Stipends or honorariums are frequently offered to short-listed D/B finalists. The honorarium helps — but also has a downside. Generally it sets the competition bar higher and acts as a springboard to burn up the honorarium cost and go overboard even more.

- **Isn't it the D/B team's own fault for going overboard?** Not really. D/B competitions inher-

ently require the design to be sufficient for contractors to bid something tangible (versus something vague with non-competitive bids padded for unknowns).

This requires about 30 percent complete design effort. Once the design team invests 30 percent design on the technical side, it simply has to go overboard and "sell" it. This effort is required regardless of lesser artificial completion targets set by the owner. If design teams don't overspend, they will not be competitive.

- **De facto fee bidding.** The pressure is on to reduce design fees to less than what would be paid in a "normal" setting. The D/B competition is judged on how much quality per dollar is offered in the D/B end product. This forces the D/B team to ramp up quality to the maximum — and not dilute quality with high-profit fees (or even "normal" fees).

It's a classic double whammy: incur extraordinary costs to compete, and give up compensation downstream to be competitive. An underpaid design team will be an underperforming design team.

- **Stifled innovation and creativity.** D/B competitions encourage the designers to narrowly solve owner problems within competition parameters. They limit exploration of "what if" possibilities that might benefit the owner because doing so may be a competitive disadvantage. And, if the competition is won, the motivation is to survive not excel.

- **Conditions ripe for change orders.** Within a D/B competition the designers meet with the owner two or three times to dialogue about the implications of the owner's never-perfect program. These few interchanges represent maybe 10 percent of the discussion necessary to refine a multi-million-dollar building design. Even so, at the end of this incomplete process there is a 100 percent guaranteed maximum price.

The project scope and price are now frozen. If the owner wants or needs to change something, it's a change order.

- **Complexity breeds risk.** Simple D/B projects make sense (a cookie-cutter warehouse, for example). But as project complexity ramps up, so does the risk. An exhaustive 2012 FTA-sponsored study of seven huge transit projects illustrates this point: three didn't finish on time, five were over budget, and two

ended with multi-million-dollar claims.

- **Impossible cost targets.** Sometimes, either naively or intentionally, the owner sets an unachievable construction cost target. It can take tens of thousands of uncompensated dollars spent by multiple D/B teams to discover this fatal flaw. This is at least unfair, if not exploitive.

- **Lack of transparency.** D/B competitions don't encourage transparency. If a D/B team discovers hidden risk, there is an incentive to keep it concealed. It's a competitive disadvantage to address risk that other D/B teams may not see. And there is little incentive to reveal the risk to the owner when solving the problem can be more profitable as a downstream change order.

- **Imperfect team marriages.** A happily partnered contractor and design team is not guaranteed. These marriages are the result of mad-scramble match-making. A first-tier contractor can end up with a second-tier design team, or vice versa. In these circumstances, the quality of the process is dragged down to the level of the team's poorest performer.

The post-competition financial pressures and unknown problems of birthing a multi-million-dollar building are just the kinds of problems that often ruin a marriage — and cause a lot of collateral damage.

- **A squeeze on second-tier players (resulting in low quality and less competition).** The best engineer or subcontractor will often get squeezed out. The best-qualified mechanical engineer can only compete effectively on one team (or die financially doing multiple designs).

Similarly, a good electrical subcontractor might have the competitive edge of having worked for the owner in the past and being mobilized nearby ready to go. But this advantage can only reside in one D/B team (it is impossible to bid multiple designs). If that team loses for other reasons, then the D/B competition didn't land on the best buy for electrical work.

- **Financial brinkmanship.** The difference between design/build and "normal" selection by qualifications is like the difference between low-stakes and high-stakes poker. Designers can afford to play penny ante poker and compete for lots of projects based on qualifications. With D/B competitions they're play-

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ELECTRONIC DATA LOSS CAN BECOME A SHOCKING SURPRISE

Companies can get into trouble if they don't properly preserve and collect electronic documents.

Your company is finishing up a large project on a site that used dozens of subcontractors and you start closing out the project as you have done dozens of times in the past. As part of the closeout process, you wipe the hard drives from workstations and laptops from the site and archive all the servers to backup tapes. This seems like a pretty standard workflow that companies go through, but what happens when two years later your company is sued for breach of contract and accused of deleting relevant electronic data?



BY JASON VELASCO
LIGHTHOUSE
EDISCOVERY

This is a common occurrence in the world of electronic discovery or eDiscovery. eDiscovery is the use of electronic information related to a litigation matter, internal investigation, or government request. After a lawsuit is filed there is usually a discovery request for

relevant documents pertinent to the case that includes both paper and electronic documents. Those who are inexperienced at handling these types of matters can inadvertently put your company in jeopardy by taking the incorrect course of action.

Where should you start to make sure you're not hurting your company?

Luckily, there is an industry-standard workflow to help you understand the things you need to do for the eDiscovery process. As eDiscovery became more of a common occurrence, thought leaders from corporations, law firms and vendors came together to form the Electronic Discovery Reference Model (www.edrm.net) and outlined the process for dealing with eDiscovery.

This is a great place to start, but make sure you're talking to your attorneys about eDiscovery so that everyone is on the same page. As part of the litigation process, the parties are required to "meet and confer" about topics relevant to the discovery process, which includes eDiscovery. At this important meeting, the attorneys on both sides should discuss who, what, when and

how the data will be preserved, collected and produced in the case.

The biggest challenge inexperienced companies face is the proper preservation and collection of electronic data or, as it's sometimes called, electronically stored information. There are many different types of data to collect, including email and Microsoft Office documents (Word, Excel, PowerPoint). In some cases, data on mobile phones or social media sites such as Facebook and LinkedIn may be relevant to a particular case as well.

When dealing with construction and architecture companies, among the most important data types are design and CAD files. These are difficult to print out and require extra attention when it comes to eDiscovery.

It's important to discuss all of these types of data at your "meet and confer" or else you run the risk of not preserving information, which can get you into trouble with the courts or government in the event of an investigation.

There are several different approaches to collecting data

and both your attorneys and IT organization should be involved in the discussion. You may want to consult with an eDiscovery specialist as well since they have the most experience dealing with eDiscovery challenges.

The first method is self-collection, where the individual or the IT organization collects the data from the enterprise systems. This method is common but must be done with care, as it runs the risk of altering critical meta-data, which may have an adverse impact on the case.

In eDiscovery, the meta-data (data about data) can be a critical component of the state of mind of a user when creating the document. Simply copying and pasting data from one folder to another will alter the meta-data about when the file was created from a file level perspective. Most file types now have internal meta-data that can be reviewed and extracted, but that requires specialized eDiscovery and forensic tools.

There are ways to copy the data in a manner that doesn't change the data, but it requires some special knowledge of how to copy data in that manner.

The second method is the forensic approach. Computer forensics is a well-established process where specialists can gather data in a manner where nothing is altered from the system by creating a forensic image of the media. This is a virtual representation of the media — such as a hard drive, USB drive, or mobile device — that can be authenticated by other forensic experts. This allows the forensic experts to testify to the veracity of the data and provide their opinion about what happened with the files on the system.

Computer forensics is necessary when there is a concern about whether data may have been intentionally deleted to hide the facts from the requesting parties.

The forensic approach is tried and true, but it can be expensive.

So which approach is the best? It will depend on the case and the type of data involved.

In employment cases or government investigations, it might be worth the expense of using computer forensics because the cases commonly hinge on the

DATA LOSS — PAGE 11

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COMMISSIONING IS KEY TO A SMOOTH RUNNING CENTRAL UTILITY PLANT

With central utility plants, the devil is in the details. These great systems can be felled by a subtle misstep somewhere in the plant, in the distribution system, or in any one of the myriad systems it supports.

A central utility plant is an intricate array of equipment bringing power, water, heating and cooling to a campus through a coordinated distribution system.



IMAGE FROM WOOD HARBINGER



BY BRUCE A. PITTS



& BRUCE J. HIGGS

WOOD HARBINGER

A successfully completed project, with all building systems working at optimum efficiency; that's the end result for which the whole project team strives from day one.

Commissioning is a widely recognized quality-assurance process that can ensure this goal becomes reality. If you have the right commissioning team for the job, that is,

There are stark differenc-

es between commissioning a stand-alone building, such as an office tower or even a research facility, and commissioning a central utility plant.

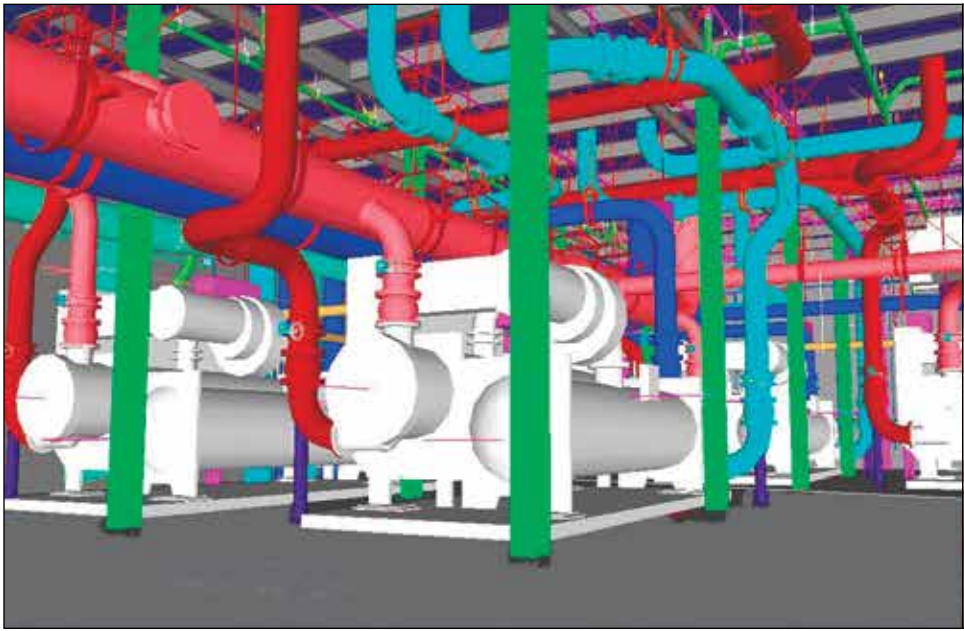
Generally used in university or medical campuses and large-scale production facilities, central utility plants are a collection of finely calibrated, critical systems, with highly customized and sophisticated operating criteria, connected to rest of the campus by an intricately coordinated distribution system. The commissioning exercise — and the choice of who will take on that challenge — become exponentially more critical due to the complex nature of the central utility plant.

Bringing a highly skilled commissioning team with extensive central utility plant experience into the project early on is an owner's best bet for successful project completion and

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Plans laid out in BIM, left, are transformed into the actual product. Engaging the commissioning team during the design phase can optimize system performance.

LEFT IMAGE FROM JHKELLY; RIGHT FROM WOOD HARBINGER

ongoing operation and maintenance benefit.

How do they work?

The central utility plant is the heart, lungs and brain of a multi-building entity; the origin of main source heating, cooling, power and other systems serving the primary needs of the campus. The distribution system, then, is the arteries, veins and nerves, branching out and connecting to every system, in every space, of every building.

The sheer scale and intricacy

of the combined operation, coupled with the crucial nature of the spaces and systems often served, sets a central utility plant apart from any other application of MEP systems.

The challenge for the commissioning team lies in considering the entire perspective. It requires strong knowledge of the related distribution system, a deep understanding and experience with how the entire system integrates and operates together, and a honed ability to recognize the nuanced problems that will come up.

Expertise comes with experience, and since very few projects of such size and complexity as a central utility plant are built in the first place, there are limited chances for commissioning authorities, as well as designers, to gain experience. An engineering background and keen awareness of industry best practices, through high-level certifications like the Building Commissioning Association's Certified Commissioning Professional credential, provide a solid foundation on which acute experience will build.

Leveraging the expertise of an experienced commissioning authority is a lucrative opportunity to help ensure ultimate project success.

Big picture and the details

With central utility plants, the devil is in the details. These great systems can be felled by a subtle misstep somewhere in the plant, in the distribution system, or in any one of the myriad systems it supports. A commissioning authority truly capable of placing the "big picture" in mind, while

also possessing the precision required to focus on the details, can spot connections that aren't always apparent or intuitive. This insight might be the difference between an expensive "fix" and a real solution. That distinction is invaluable to an owner.

During a recent startup of a 1.3 million-square-foot manufacturing facility, the commissioning team encountered recurring faults with the variable-speed drives for five parallel chilled water distribution pumps in the

COMMISSIONING — PAGE 11

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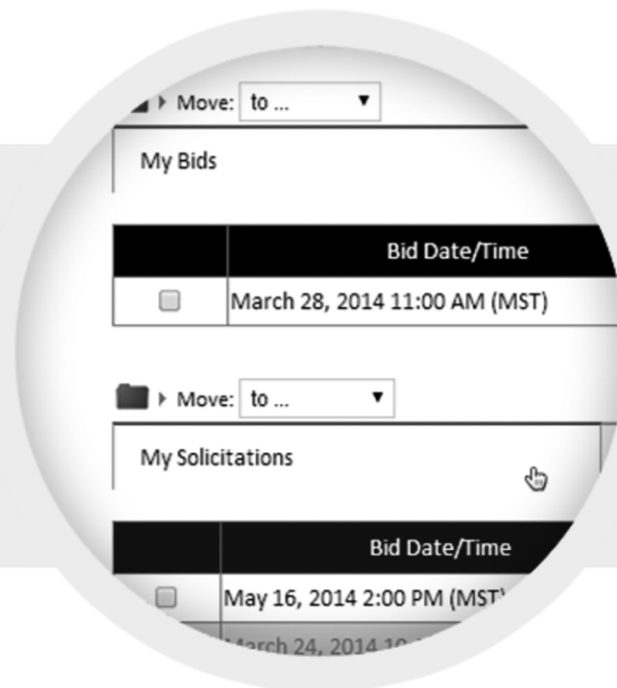
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LEAN DESIGN SHINES IN TRICKY HEALTHCARE PROJECTS

The VA is developing a new model clinic that borrows designs from Group Health Cooperative's Puyallup Medical Center and refines them with the help of clinic staff and users.

If lean process improvement has become a mainstay in the healthcare industry, lean design follows as a close second.

Organizations are increasingly expecting design professionals to better understand their business processes. They are also including "lean design experience" in their selection criteria.



BY DOUG GROVE
COLLINSWOERMAN

When and how does a design firm initiate the lean design process? The logical answer would seem to be immediately upon award of contract, to employ lean workshops and tools to create the expected value-added spaces.

But what if the project is in an existing space? Or, what if the design is inhibited by a "standard" layout? Can lean design be successful when deployed under less-than-ideal conditions?

The VA and lean design

When CollinsWoerman was asked to run three lean workshops for the Veterans Administration in Palo Alto, California, we jumped at the chance to help the agency develop a new clinic design.

The VA Palo Alto Health Care System has been recognized as a national leader in improving veterans' healthcare. We were already familiar with the VA's new Patient-Aligned Care Team approach to veterans' health as part of the team that authored the PACT design guidelines.

The PACT model is being implemented across the nation in all VA medical centers and clinics, and new clinics are being designed around it.

PACT is a care team assigned to each veteran and his or her family. Each primary care team consists of a physician, nurse care manager, clinical staff assistant and administrative staff member. Other specialties, such as behavioral health, dermatology or cardiology are brought in when required.

PACT is the VA's version of the medical home care model, where the patient "pulls" the services needed to diagnose and treat his/her condition. If a patient has multiple conditions, they will be seen by their providers on that day. Stated another way, services are brought to the patient.

Adopting Group Health's model

A notable example of a medi-

cal home clinic design is Group Health Cooperative's Puyallup Medical Center.

CollinsWoerman partnered with GHC to use their "integrated care and facilities design" process for the Puyallup Clinic. This lean method combines operational improvement with building design. The result is an on/off-stage design that separates the flow of patients and providers. GHC tested the design in full-scale mock-ups and lean workshops.

Now in its second year of operation, GHC validated the success of this approach by eliminating patient waiting and increasing doctor "face time" and the total number of patients seen. It's no wonder that when VA leadership first visited the new GHC clinic they concluded that the design would be a perfect fit for their new PACT operating model.

VA Palo Alto leadership's vision was to incorporate Group Health's operating improvements and facilities design features into the planning of the VA's Monterey and San Jose clinics. The resulting clinic designs used many of the key design concepts developed for GHC. However, one element of the planning process was missing: the lean design workshops attended by front-line clinic staff and patient advocates.

Without the process improvements achieved in the lean workshops, how would doctors and nurses know how to "operate" in their new clinic? Would they move into their new spaces and practice the way they always have?

Stop the line!

We took a step back and considered the options. Our challenge: How do we employ lean design under these conditions? Solution: Redesign the lean workshops to "test" the proposed designs.

We conducted "3P" style workshops for both clinics. The 3P (production-preparation-process) workshop motivates teams to identify waste and document current-state processes. It also inspires teams to develop new, innovative future-state processes.

Normally teams would then create layouts to support their new processes. However, with the clinic floor plans already developed, the teams focused their energy on testing the plans using simulation tools.

2-D simulation involved testing the "flows of medicine," which include patients, their families, providers, information, medication, supplies and equipment. The teams simulated a patient



Group Health's integrated care and facilities design process used full-scale mock-ups.

IMAGE FROM COLLINSWOERMAN

DESIGN APPROACHES GO HEAD-TO-HEAD

Conventional design:

- The design team is selected based on its recent experience with the proposed building type
- The designers work with an executive team to develop design schemes
- A functional space program is developed based on current business practice
- The design firm deploys its in-house healthcare experts in the proposed building type
- A footprint is developed to maximize the number of functional units, such as exam or operating rooms
- Multiple service lines, which may be adjacent, are often designed in isolation from each other
- Aesthetics and design are primarily applied, and not integrated into the patient experience
- Care teams adapt spaces to their needs when they move in: the remodel begins
- The design focus is on staff operations

Integrated care and facility design:

- The design team is selected based on its lean design leadership qualities, and experience with the building type
- The design team includes caregivers, leaders and lean advocates
- Flow and functional programs are designed in 3P events
- The organization's content experts and process owners are key members of the design team
- The footprint is created to support the "flows of medicine" and bring services to the patient
- Service lines are designed concurrently, and are based primarily on flow
- Interiors support flow, provide visual cues, control and intuitive way-finding
- Lean process improvement permits care teams to practice new processes in their existing spaces, before new space is completed
- The design focus is on the patient

visit by tracing each flow on their table-top plans. The teams also used an appointment waterfall chart along with the plans to understand clinic capacity and throughput.

After simulating patient arrival, check-in, rooming, the provider's visit and check-out, the teams identified flow bottlenecks and proposed both process and plan refinements.

Building the mock-up

We didn't stop there. The workshop teams tested their PACT skills in a full-scale mock-up

constructed in a warehouse near the NASA Ames Research Center in Mountain View. The mock-up included "on-stage" patient corridors and exam rooms and "off-stage" team work areas.

We designed role-playing simulations for several types of patient visits. With each reenactment, team members were better able to connect PACT operations with the proposed clinic design. Each team member was encouraged to provide design feedback on Post-it notes anywhere in the mock-up space. In one week over 500 comments were posted.

Since the initial workshops were completed, the mock-up has been visited by staff from existing VA clinics within the Palo Alto Health Care System, and by VA representatives from across the United States.

Architect Doug Grove is a Certified Kaizen Leader at CollinsWoerman Architects in Seattle. He has over 20 years of experience in healthcare facilities planning and development. Using the lean 3P process, he developed a unique lean design methodology that integrates process improvement with facilities planning.

IS SEATTLE'S HOUSING MARKET EMULATING THE 'SAN FRANCISCO DEATH SPIRAL'?

The Seattle City Council wants to tax new housing in an effort to lower housing prices, but that will just lead to rampant housing inflation.

When you see a "For Lease" sign on an apartment building, you might ask yourself, "where did that rent price come from?"

Many people, whether looking for housing or not, ask themselves that question. The price reflects the cost to build, maintain and operate the building (including things like taxes and utilities) divided among the units or leasable square footage.



BY ROGER VALDEZ
SMART GROWTH
SEATTLE

The price is also based on how many people want that particular unit and how many units there are like it. Fewer of those kinds of units, and the price will be higher.

When rents increase people wonder if someone is making a windfall, but rising rents are a measure of falling inventory, more people shopping for places to live, and rising operating costs. And with 120,000 people moving here in the next 20 years, we will need lots more housing supply to keep up with demand.

But the Seattle City Council is considering putting a tax on new housing in hopes, ironically, of lowering housing prices. The logic is that new jobs create a demand for housing, and housing causes an impact on the city by

creating a need for more housing. That's right, new housing creates a demand for housing. If we tax it, then we'll be able to use the money we generate to pay for, you guessed it, more housing.

In a recent Forbes article I wrote about how Seattle is beginning to emulate our neighbor to the south, San Francisco:

"When have adding fees and costs to something that is increasingly scarce suddenly caused its price to drop? Linkage fees are part of a chain reaction effect of complaints about high rents, followed by the declaration of an emergency, policies imposed that will act to raise prices, followed by another round of yelling about rising prices, with more policy that raises prices. This is what I call the San Francisco Death Spiral, a city with rampant housing inflation and where the supply of housing is 100,000 units behind demand and even billions of dollars in subsidies won't help."

Taxing housing to lower its price will just add costs to housing and act as a disincentive to build. We tax things we want less of. If there were a shortage of baby formula would we impose a tax on efforts to increase production of it?

Here are some costs already associated with new housing in Seattle.

1. Current affordable housing surcharge fees. The city already charges an affordable housing

fee on development for many downtown projects. These fees are in the range of \$2.5 million and up for a 400-foot-tall residential tower in downtown Seattle.

2. Sales tax. Unlike cities such as Portland that actually provide tax incentives for housing development as a means for encouraging density, developers in Seattle pay sales tax that approaches 10 percent.

3. Entitlement costs. The "Seattle Process" is alive and well in the complexity, time and expense that it takes to get projects entitled and permitted: often over a year, sometimes more.

4. Land costs. The cost of developable land in Seattle is at an all-time high, and in many cases pushing financial limits. While land costs fall into the category of "the basis" or soft cost financial underpinnings of a deal, extraordinarily high land prices are now challenging many projects. And no, land prices won't just drop dollar-for-dollar to match the fee imposed.

5. Cost escalation. The City Council's proposal comes at a time when construction costs for both labor and materials are on the rise, with many projects already on the verge of "not penciling," meaning that they are on the border of financial feasibility.

It's important to note that costs cited in 2-5 above also impact

nonprofit affordable housing projects. That means that subsidies used to build affordable housing get chewed up by these costs too.

Mike O'Brien as Robin Hood?

Seattle City Councilman Mike O'Brien would impose a tax from \$5 per square foot at the low end, to an astronomical \$22 per foot at the high end. For example, a 100,000-square-foot, five-story wood-frame low-income housing project in what the council is calling a "low-cost neighborhood development" would have to pay a tax of \$500,000. The idea is to grab developer profit on new development to pay for subsidized rents; taking from the rich to help the poor.

However, there is no way to cover the tax without borrowing more money, incurring interest costs on it, and paying for that with increased rents. And if the rents get too high, the project won't work. Imagine you are trying to close on a new house and someone hands you a bill that increases your costs by 5 percent; you either wouldn't get the loan or you'd have to find a part-time job.

Similarly, almost every housing project is financed and must generate a return; when costs go

up, money must be found to cover those costs, and that means higher rents. Lowering the percentage of return to the bank or an investor is not an option. There is no "profit" line in a pro-forma that can be trimmed. O'Brien's proposal doesn't take from the rich to give to the poor; it takes from one hard-working renter to subsidize another.

The best thing we can do to positively impact housing prices is build more housing, something that can be done by incentivizing innovation and production, not penalizing it. And we already have a great housing levy that fairly taxes everyone for affordable housing, and the Multifamily Tax Exemption program that lowers taxes and passes the savings on to renters.

Adding more costs will simply tip us toward the San Francisco Death Spiral: high prices, with politicians adding more taxes to subsidize housing, which raises housing prices, and repeat. This is not a sustainable way to prepare for hundreds of thousands of new jobs and people coming to Seattle in the next two decades.

Roger Valdez is director of Smart Growth Seattle, an organization that supports growth, more jobs, and more housing choices in Seattle.

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COMMISSIONING

CONTINUED FROM PAGE 7

central utility plant.

Taking into account the distribution system's routing of miles of piping beyond the plant, and conducting an investigation of the isolation and bypass valves throughout the system, they determined that the configuration of the distribution piping and the control software was forcing the pumps to operate beyond their range.

Think of a car trying to do 60 mph in first gear; it's a recipe for disaster.

The commissioning authority worked with the designer to make simple changes to the pump staging and safety control software, which allowed the pumps to properly respond to any configuration of the distribution piping network. Having discovered the root cause of the problem rather than addressing just the apparent symptoms, this solution saved the owner from unnecessarily spending thousands of dollars replacing the five huge pumps, motors and drives.

The key to this success was familiarity with the size of the systems found in central utility plants and awareness of the entire, interconnected plant and distribution system; a familiarity that commissioning teams without direct central plant experience would lack.

Whether during design or during functional testing, there's an art to discerning when an element will impede the plant's functionality, or when it won't, and when a seemingly innocuous element may be a silently ticking time bomb. Ultimately, the important things to look at are those that affect the overall functionality of the comprehensive central plant and associated distribution system.

Commissioning boosts design

Scenarios like this underscore why a proficient commissioning authority with acute central plant knowledge is vital to a project team that is designing and building a central plant. But it begs the question: Why can't these issues be avoided in the first place?

The truth of the matter is that they can be avoided before any damage is done. Hiring the commissioning authority at the onset of a project to help guide the initial process and provide design-phase review is a forward-thinking method of mitigating late-stage problems, but also

in enhancing the central utility plant's capabilities. By incorporating systems coordination and effective interfacing with the distribution system right from the start, the end result will be more efficient to operate and maintain.

The team concept

Any project achieves success only through a team effort, and commissioning authorities walk the tightrope between the technical and tangible aspects of a project. They must talk the talk of the owners and operators, digging deep to discover their needs, challenges and frustrations to best inform the design process to meet these needs and relieve these burdens. But they must also walk the walk of the design and construction team, with keen awareness of the team's dynamic, design intent and construction plans.

The commissioning team also needs to work closely with the central utility plant facilities and maintenance crews, who will be inheriting the new and improved, but also complex and unfamiliar, systems and controls. A skilled commissioning team will serve as an approachable knowledge source during the project, and leave behind operations and maintenance information that is accessible and helpful, setting up the end users for ongoing success.

Ultimately, the owner's, end users' and the maintenance staff's experience with the central utility plant governs the perception of success; it is in everyone's best interest that the project team as a whole meets their goals, and that the goals align with the owner's needs from the get-go.

The right central plant commissioning authority can make the difference between a project that results in systems that don't work, or work inefficiently, and systems that work exactly as desired — or better.

Bruce Pitts, CPMP, CSBA, LEED AP BD+C, is principal of commissioning at Wood Harbinger. Pitts leads the Building Commissioning Services group, and has nearly 40 years of industry experience. Bruce Higgs is senior technical associate for the Industrial Systems group. Higgs has more than 33 years of experience in mechanical engineering design, as well as practical knowledge of real systems.

DATA LOSS

CONTINUED FROM PAGE 5

authenticity of the data. Generally, I recommend a hybrid approach that uses computer forensics to preserve the data for the key individuals in a matter and then a self-collection (with the appropriate guidelines). Again all of this should be discussed in the "meet and confer."

eDiscovery can be challenging, but manageable, if you have the right people involved in the process. This includes your IT organization, outside counsel, and possibly an eDis-

covery specialist. Getting good advice will help save your company money and heartache in the long-term.

Some companies have developed eDiscovery playbooks that outline the manner of how they handle eDiscovery issues. Having a playbook will ensure you have a reasonable approach for preserving, collecting and producing electronically stored information that can be defended by your attorneys.

Having an eDiscovery playbook in place allows companies

to focus on the merits of the case rather than focusing all the attention and billable time on how they are going to execute discovery.

Jason Velasco, director of consulting at Seattle-basedighthouse eDiscovery, has more than 15 years of experience in electronic discovery issues and forensic investigations. He has conducted more than 350 computer forensic examinations and more than 700 classes on the subject.

D/B COMPETITIONS

CONTINUED FROM PAGE 4

ing a high-stakes game — and you can go broke if you lose too many times. Unfortunately "the house" is setting up the games, and sometimes it's the only game in town.

No panaceas

There is no perfect process for selecting a building designer or contractor. Fortunately for some owners who take the D/B competition route, many of the stresses of D/B competitions remain simmering below the surface. But if these tensions boil over, the

results can be as bad as or worse than any other process.

Instead of an optimal process for realizing a new building, D/B competitions are plagued with their own special flaws that can diminish quality, reduce competition, stifle creativity, exert significant adverse financial impacts on design teams, generate their own set of unique risks, and result in a solution that is less responsive to the real needs of the project.

D/B competitions are a high-risk proposition from many vantage points.

Reform is needed. Many

within the Design-Build Institute of America agree. There is a groundswell of contractors, architects and engineers eager to find a better pathway to project delivery — by working with the Capital Projects Advisory Review Board, the DBIA and other stakeholders.

Meaningful reform will serve the best interests of D/B competitors, owners — and ultimately the taxpayers.

Steven J. McNutt, AIA, LEED AP, is a principal at NAC Architecture's Spokane office.

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ENERGY-EFFICIENT DESIGN GOES TO SCHOOL

A number of new K-12 schools in Western Washington have impressive energy performance, yet they don't sacrifice factors such as ventilation and daylight.

The energy efficiency of new buildings has garnered increasing attention over the last several years. This focus has been particularly strong on public building projects, including schools in our area.



BY PHILIP RIEDEL
NAC ARCHITECTURE

The result is a recent body of K-12 school buildings in Western Washington with impressive energy performance, which do not sacrifice important indoor environmental factors such as ventilation and daylight. Let's examine what local design professionals have learned and successfully applied.

For a benchmark, I will use a metric called "site energy use intensity," or site EUI. This is the annual energy used on site, divided by the gross building area. As reported by the EPA last month, the median site EUI for K-12 schools nationally is 58.2. Locally, Hargis Engineers' Energy Services Group has compiled 2011-12 energy use data for 345 existing K-12 schools across 15 school districts throughout the Puget Sound area and found the following median EUIs:

- 45.8 for elementary schools
- 54.5 for middle schools
- 56.8 for high schools

Recently constructed schools in our region are achieving much better energy efficiency than these benchmarks. Some school buildings designed by our firm for the Bellingham, Snohomish and Bellevue school districts are operating with documented site EUI numbers in the 20s and below.

One outstanding example is the 83,400-gross-square-foot Cherry Crest Elementary School in Bellevue, which has operated for the past 12 months with an EUI of 17.2. When we count the reduction from energy provided by the solar panels, the net energy use was an actual EUI of 13.9.

What goes into the design to achieve this level of energy efficiency? Schools with EUIs in the 20s or lower will need to exceed minimum requirements of the Washington State Energy Code and the Washington Sustainable Schools Protocol. This article will outline several strategies and identify the best practices for each.

Integrated design

To achieve high performance without blowing the budget, a project needs clear energy effi-

ciency goals from the start. Clear goals will enable the architect and engineers to make key early decisions that become embedded in the project design.

An early integrated design workshop sets goals at the start of the design process, and then recurring meetings and open communication among the design team are needed to accommodate performance features without costly changes. Cost modeling helps evaluate combinations of strategies to facilitate decision-making.

Insulation

In the past few years, the airtightness and insulation of the building envelope has become a critical focus. Exterior wall assemblies are now required to have continuous insulation and air barriers, eliminating thermal bridges that conduct heat from inside to outside.

Today's "super-insulated" walls have true insulation values between R-25 and R-30; roofs often have R-45. These values are a significant improvement over common building practices 10 years ago. The best practice at framed walls is to include spray-foam insulation between the studs and continuous insulation outside the wall cavity. Spray foam provides both a high insulation value and a good seal to prevent air infiltration.

Window and curtain wall improvements have addressed the most significant areas of heat transfer through the envelope. We have used triple-pane glazing in some recent schools to improve thermal performance while providing ample daylight to classrooms. Triple-glazed gasketed curtainwall systems can exceed R-5 insulation value while maintaining clear views.

Heating

The climate of Western Washington makes heating far more important than cooling in our buildings. The choice of a heating system is one of the most critical pieces of the energy efficiency puzzle. There are a variety of factors to consider in choosing a heating system, but all of our best-performing schools use ground-source heat exchange. This system takes advantage of the difference in temperature between the air and underground to feed very efficient heat pumps.

Another best practice is heat recovery, which transfers heat from air being exhausted out of the building to fresh air being brought into the building. There are a number of available heat recovery system types, but the best performing are reverse-flow

Triple-pane glazing can enable large window walls for great daylight and views in special spaces without sacrificing energy efficiency at Riverview Elementary School.



PHOTOS BY BENJAMIN BENSCHNEIDER

heat recovery systems, which can achieve 90 percent effectiveness. Reverse-flow units are larger and heavier than other heat recovery types, so the choice of system needs to be made per project.

Ventilation

The most significant factor requiring energy use for heat is the amount of fresh air used for ventilation. Codes have increased the required ventilation in recent decades. Also, adequate ventilation is needed for school buildings, because fresh air benefits attention and learning. While heat recovery can mitigate much of the heating impact of good ventilation, there are other system choices to be made.

I was part of the NAC/Hargis team which pioneered the use of displacement ventilation for school buildings in Washington 10 years ago, and I still consider it to be best practice.

The principle behind displacement ventilation is to introduce air low in the room and let it stratify and move by natural convective forces upward to be exhausted at the ceiling. Because the air is not being forced by overhead diffusers to mix in the room, the maximum benefit is gained from the ventilation air, resulting in a significant improvement in indoor air quality. Combined with the inherent quietness of a displacement ventilation system, it has a lot of advantages for classroom applications.

Daylight harvesting

Good use of natural daylight

is an important part of a well-designed educational environment. The basic principles of good daylighting include bringing ample daylight in from multiple sides of a room while avoiding harsh direct sunlight, reducing contrast and glare by using reflective surfaces to balance daylight across a room, and providing user control over daylight sources.

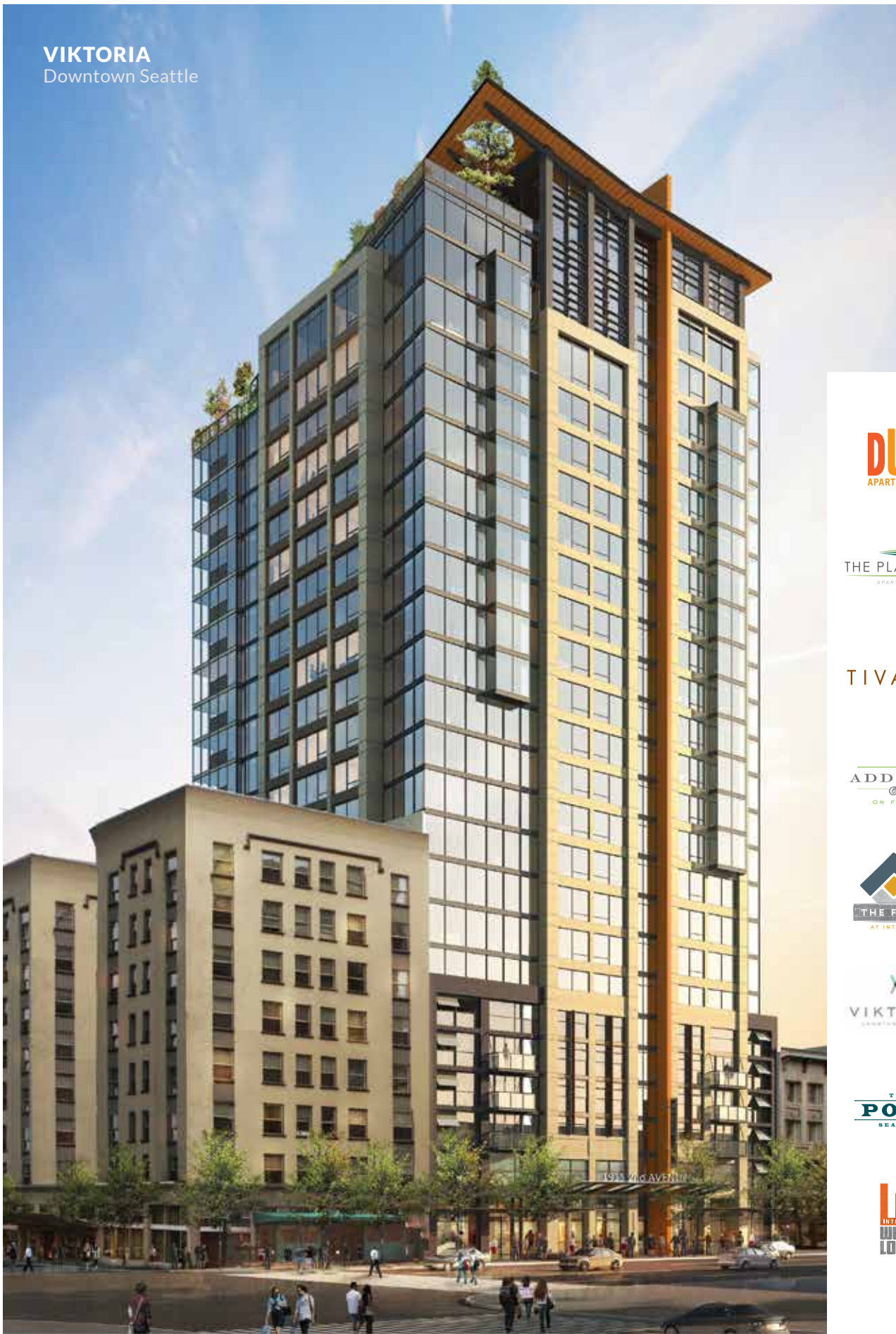
Computer modeling known as ray tracing is very helpful in predicting successful daylighting during design.

In a well-designed classroom, significant energy savings can be achieved with automatic-dimming electric light fixtures controlled by photocells, a strategy

ENERGY-EFFICIENT — PAGE 15

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SURVEYS

COLLINSWOERMAN

Specialty: Commercial, mixed-use, healthcare, multifamily/residential, and science and technology design; interior design; urban planning and design

Management: Arlan Collins, principal; Mark Woerman, principal; Phil Giuntoli, healthcare principal; Steve Moddemeyer, sustainability and urban planning principal

Founded: 1988

Headquarters: Seattle

2014 revenues: N/A

Projected 2015 revenues: 20 percent increase over 2014

Projects: 47+7 Apartments in Seattle, a six-story modular building; Urban Union, a 12-story office building in Seattle's South Lake Union neighborhood; MultiCare Covington Hospital 58-bed surgical specialty hospital addition

Principal Mark Woerman answered questions about the apartment boom and rising costs.

Q: Seattle has had an apartment boom. What is the next hot sector?

A: Increased national and international investment in the region means that all sectors (commercial, residential, retail) are gaining traction.

We are already seeing increased demand for office space for the technology sector. Larger firms like Amazon and Google are creating new experiential campuses in the urban cores of Seattle and Bellevue, but smaller start-ups are also looking for spaces that promote creativity and collaboration.

To date, a lack of financing and onerous state laws regarding the construction of condominiums has limited the supply of new vertical for-sale product that has created a pent-up demand for that type of housing. This will drive the market's response for several years and condominiums being converted from apartments

will likely be the first wave in the market. Beyond the rush to be first to market, conversions also can mitigate the liability typically associated with the development of new condominium product.

Also, the proliferation of online shopping is redefining the retail market. Destination or experience-driven retail environments are the wave of the future. As retailers integrate entertainment and interactive experiences into their retail environments, developers are converting existing properties or building new amenities to better accommodate new features.

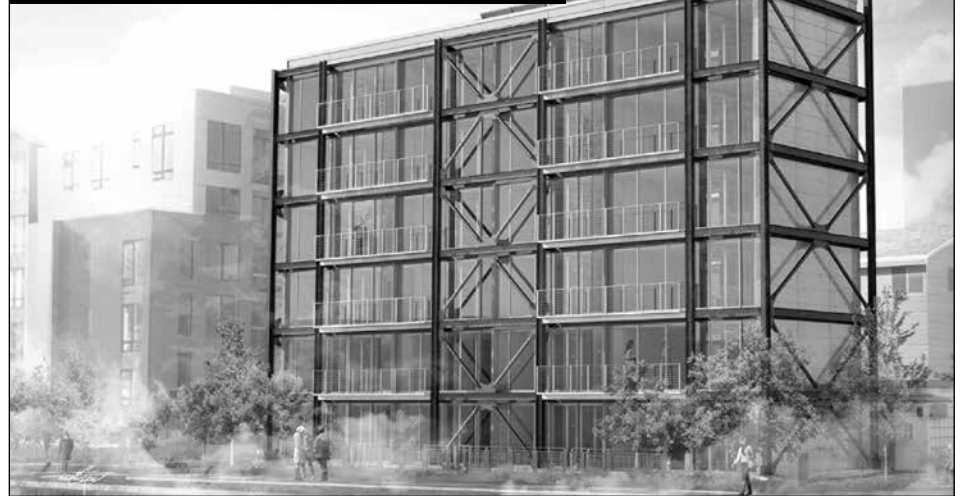
Q: How will rising land and construction costs affect downtown developments?

A: As construction and land development costs increase, they are passed along to the consumer at every level in the form of increased rents, operating costs and expenses that ultimately either drives up wages or forces workers farther from the urban centers. In addition to rising land and construction costs are the ever-increasing costs imposed by city, county and state governments for basic services, infrastructure, affordable housing, and transportation in the form of fees, charges, etc. All of these combine to broaden the gap between those who can afford to live and work close-in and those who cannot.

Q: What are clients/customers asking for now versus five or 10 years ago?

A: The market is already responding to a critical need for market-rate housing for employees in the technology and professional services sectors. However, in general there is an increased demand for properties with integrated technology; convenient access to entertainment and transportation options; sustainability initiatives and materials; and access to social interfaces and opportunities.

47+7 is a pilot housing project in Seattle's U District that uses modular construction that reportedly reduces construction time and cost.



RENDERING BY MATT GRUNERT/COLLINSWOERMAN

Q: What is Sustainable Living Innovations and how are sales going?

A: Sustainable Living Innovations LLC is a building technology developed by CollinsWoerman that developers can use to build multifamily housing projects more quickly and more sustainably than typical residential construction. CollinsWoerman exclusively licenses its patented SLI technology to North American developers and deploys SLI internationally via its Innovative Building Technologies LLC joint venture with Intellectual Ventures.

SLI has a number of projects in advanced negotiations ranging from eight to 30 stories in Seattle, San Francisco, Anchorage and Williston, North Dakota, totaling 1,500 units. We are also actively pursuing projects in New York, Los Angeles, San Diego and Las Vegas.

The SLI technology blends the flexibility of "kit-of-parts" components with modular construction. The building systems — pre-wired and pre-plumbed wall and floor panels, cabinets and roof panels — can be assembled locally and connected at the construction site to the structural frame with bolts. The electrical and plumbing

contains "quick connects" between panels for ease of assembly. Due to its simplified technology, interior finish packages are installed on the lower levels as the shell of the building is being completed on the upper levels.

In Seattle's University District, SLI has a pilot 24-unit apartment project called 47+7 under construction. Each floor of the six-story building is estimated to take a week to complete. The project is slated to be done in December.

Q: Tell us about your joint venture with Intellectual Ventures. Is the technology being used now?

A: Our joint venture — called Innovative Building Technologies LLC (IBT) — was announced in September. IBT's purpose is to commercialize new inventions for the design and construction of mid- and high-rise housing from a kit of prefabricated component parts. Sustainable Living Innovations LLC has the exclusive license to deploy the technology in the North American market. The first project using the IBT technology is the 24-unit apartment building mentioned above.

ENERGY-EFFICIENT

CONTINUED FROM PAGE 13

known as daylight harvesting. This reduces the amount of energy used when there is enough natural light in a classroom. New LED light fixtures make this easier to achieve than with previous dimming fluorescent fixtures.

Solar power

Generating electricity with solar panels should not be a substitute for the design strategies described above, but it is a valid final step in reducing utility-provided power after these conservation steps have been taken. Solar thermal panels (for hot water) do not often work as well with school water use patterns as they do in residential applications, but photovoltaic panels are effective.

Even in cloudy Western Washington, photovoltaic arrays can generate a significant portion

of the power needed to run a school. Several of our best-performing schools have 100-kilowatt arrays, which help in lowering their EUI.

Energy dashboard

A great way to inspire school staff and students to reduce energy use at their school is to give them real-time feedback. This can be done with an "energy dashboard," typically an interactive touchscreen near the school entry. When building users can see how much energy is being used, they can become part of the energy reduction solution.

This has been just a short survey of strategies to design new schools for energy efficiency; there is much more information and many contributing factors to consider in each of these categories.



Solar panels generate electricity and provide shade to south-facing windows at Carl Sandburg Elementary.

These strategies will also work on other building types, but integrated design requires specific factors to be considered for each project.

Philip Riedel, AIA, CEFP, LEED BD+C, is associate principal at the Seattle office of NAC Architecture, chair of the firm's Sustainability Commu-

nity of Practice and former president of the Washington Chapter of the Council of Educational Facilities Planners International.

SURVEYS

CALLISON

Specialty: Retail and mixed-use as well as corporate, hospitality, healthcare, multifamily residential, mission critical and high-rise markets worldwide

Management: John Jastrem, chairman and CEO

Founded: 1975, acquired by Arcadis 2014

Headquarters: 11 offices on three continents; Beijing, Dallas, Dubai, Guangzhou, London, Los Angeles, Mexico City, New York, Scottsdale, Seattle, Shanghai

2014 revenues: N/A

Projected 2015 revenues: N/A

Projects: Lotte Center Hanoi; Sea World, Shenzhen, China; JW Marriott Mexico City; Watches of Switzerland, London; Westlake Center, Seattle; University Village, Seattle

Callison opened the doors for many potential future projects when it agreed to be acquired by Amsterdam-based Arcadis earlier this year. Already one of the biggest architecture firms in the country, with regular clients that include Nordstrom, AT&T, Cole Haan and Zara, Callison will now be able to work in a lot of places it couldn't before.

John Jastrem, Callison's chairman and CEO, sat down to talk about the future of the company following its acquisition and trends in retail.

Q: How does the acquisition by Arcadis affect the company?

A: It increases opportunities for us at

all levels. Being part of Arcadis greatly expands our geographic reach globally, which is a huge benefit for the type of work we do. In the past, we managed our projects throughout the world by utilizing our 11 offices. Now with Arcadis, we are part of a company that has over 300 offices. This will have a big impact.

We have also gone from a company with 1,000 employees to over 28,000; all service-based firms working at some level as a consultancy. The culture encourages employee and client collaboration to build the best future outcomes for both. I think our current clients will see opportunities that come from expanded talent, reach, service and stability. It's a very exciting time for us.

Q: What challenges are you seeing in the field?

A: The industry continues to recover since the financial crisis. The top real estate owners, most of whom are our clients, continue to redefine and improve their environments. They understand that their properties need to be the destination for entertainment and shopping to attract the best brands and the best customers. In addition, they are maximizing the use of their land and are looking at ways to successfully implement sustainability, making their properties more profitable to operate.

The refresh cycles in retail are shortening a bit. What once was a six- to eight-year window, before refresh/remodel

Callison designed the 65-story Lotte Center Hanoi, one of the tallest buildings in Vietnam. The office and residential tower was finished last month.



IMAGE FROM CALLISON

work was required, is now closer to four or five years. This requires substantial additional capital, thus the adoption of more temporary structures, as a way of gaining confidence in design decisions before a larger investment is made.

We are experiencing more and more developers looking for a one-stop architecture design firm. As a result, it's likely that more architecture firms will need to merge to compete with the range of services, quality, innovation and geographic reach Callison now enjoys.

Q: What are the biggest trends in retail design right now?

A: Trends that are driving our top clients today are: a focus on making the

customer shopping experience unique, entertaining and joyful; integration of the online/offline experience to support the transaction, no matter how and when the customer chooses to buy; temporary structures that can be changed quickly to test new trends and ideas in a more dynamic environment; and right-sizing and business model reinvention of the retail center.

Q: Which of your services are seeing the most demand and why?

A: Our commercial architecture and design practices have seen an increase in high-profile opportunities in the past four months. Many of these projects are programs our partners have had on hold.

WALKER MACY

Specialty: Landscape architecture, urban design and planning services

Management: Principals Douglas Macy, Michael Zilis and Chelsea McCann

Founded: 1976

Headquarters: Portland

2014 revenues: N/A

Projected 2015 revenues: N/A

Projects: Horton Plaza, San Diego; Bothell City Hall; Willamette Falls Legacy Project, Oregon City

Like many designers, Doug Macy wants to make a difference with his work.

Since the mid-1970s, Macy, a principal with the Portland firm Walker Macy, has strived to push himself and his colleagues to take on greater challenges while growing the firm.

"Part of our success has been that we're not afraid to take chances," Macy said. "Our whole philosophy has been to work on projects that really make a difference in communities."

Public work

Macy said a majority of his firm's work in recent years has been in the public sector — a

trend brought on by the recession that began in 2008. The work that was common during the housing boom of the mid-2000s, such as high-end multi-housing projects, has been slow to return, Macy said. That is especially true in the Portland market.

"There's a lot more things being built in the private sector in Seattle than in Portland," he said. "That wasn't the case in 2008."

But the drop-off in private work has been offset by the increase in public work. "A lot of public agencies are coming out of the woodworks," Macy said, referring to state and city agencies that are calling for landscape architecture firms, both in Portland and the Seattle area.

The firm has completed landscape and master plan design projects at the University of Washington, Portland State University and Lewis & Clark College in Portland. But it has also expanded out of the Northwest to do campus planning for University of California Riverside and UC Santa Cruz.

Out of state

Macy, who worked on the design team for Portland's Pio-

Walker Macy is working on the Willamette Falls Legacy Project, which envisions a downtown hub of shopping, business, housing and tourism in Oregon City.



IMAGE FROM WALKER MACY

neer Courthouse Square, also known as the city's "living room," said his firm has gone after high-profile, out-of-state civic projects by parlaying its experience on well-known Portland projects. "Our experience makes it possible for us to beat other national firms," he said.

Walker Macy designed Horton Plaza in downtown San Diego, taking a former vacant commercial site and turning it into the city's new "civic heart," he said.

New Seattle office

The firm this summer opened a Seattle branch, with two designers. Macy said the branch will give the firm "a lot of technical depth to take on multi-million-dollar projects" in the Seattle area. Even before opening its Seattle office, Walker Macy had completed work on the University of Washington's Bothell campus master plan and several UW main campus projects, such as

landscape design for Discovery Hall and the Molecular Engineering Building.

"It's nice to be in Seattle," he said, referring to the firm's new office. "It's such a vibrant city."

Having co-founded Walker Macy in 1976, Macy said the drives to "work hard" and "make cities better" have been behind the firm's growth. "It's been a long and interesting road," he said. "We're very pleased with what we've accomplished over the years."

SURVEYS

NOTKIN MECHANICAL ENGINEERS

Specialty: Mechanical and electrical engineering

Management: Principals Sandy Bonderman, Larry Brown, Tom Ferlan, Stacy Knight, Darren Schwend and Larry Swartz

Founded: 1951

Headquarters: Seattle

2014 revenues: N/A

Projected 2015 revenues: N/A

Projects: UW Medical Center expansion phases one and two; Perry Center for Fisheries & Aquaculture Sciences at Bellingham Technical College; Aviation Battalion Complex dining facility at JBLM

Principal Sandy Bonderman answered questions about the industry and how business is going for Notkin.

Q: In the last year, have you seen a rebound in construction?

A: Yes, construction is rebounding in healthcare and higher education, especially for clients who use design-build construction. Though funding is decreasing in the defense sector, Notkin's work is increasing due to new relationships. Integrated project delivery continues to be popular. Some clients are also using multiple construction delivery methods, such as combining design-assist with GC/CM delivery. Design-bid-build construction is declining.

Q: In what areas is Notkin growing?

A: Notkin is experiencing an increase in design-build construction and prime consultant work. Previous success in leading prime contracts for federal clients has led to successful award of a prime contract healthcare client for infrastructure work. As clients seek ways to revitalize their facilities within their current footprint, they engage engineering consultants earlier in the design or funding process to support programmatic changes.

Q: What technical advances in mechanical engineering have affected you?

A: Three-dimensional modeling and building information modeling are the norm, and clients want to see the entire project in 3-D, not just areas that require extra attention because of equipment and component density. Clients also have a heightened awareness of the potential energy simulation and life-cycle-cost analyses have on their construction and operational costs.

And while not a technical advance, traditional lines of responsibility between a project's design and construction members continue to blur. For example, when Notkin teams with



PHOTO BY C9 PHOTOGRAPHY

a contractor to perform on-site assessments, the contractor's perspective on constructability and reliability allows the project budget and schedule to be further defined. Also, for Notkin's Department of Defense design-build work, extensive modeling is required by contract to support overall energy reductions of 30 percent over a comparable project.

With early contractor engagement, Notkin can capitalize on the contractor's specific skills and creativity to develop specific solutions with lower financial and performance risk — a win-win arrangement for everyone.

Q: Have you focused more attention on the public or private sectors in the last year?

A: Notkin would like to obtain more private work because of the decline in public work, but our focus remains on clients within specific market sectors, regardless of whether they're public or private.

Q: Which of your private-sector clients has become a significant source of work?

A: One of our private healthcare clients has increased the number of projects awarded, and more of these projects are funded for construction. This is an important difference from activity during the economic downturn when clients were awarding assessment-type work only.

Q: Has Notkin made sustainable design a regular factor in its projects?

A: Yes, even before sustainable was quantified by organizations such as the U.S. Green Building

Council or Green Globes. A significant component of sustainability is energy conservation; the more energy-efficient the HVAC systems or the higher the water savings in plumbing sys-

tems, the lower the impact on our environment.

Notkin works with clients to develop sustainable options that make sense for their budget, the program for the facility, and

effect on facility users. Years ago we bored people talking about our mechanical systems. Now, mechanical systems are often one of the marketing features of a building.

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SURVEYS

GRAPHITE DESIGN GROUP

Specialty: Commercial office, residential, mixed-use, retail and financial

Management: Martin Hill, Peter Krech, Michael Medina, Mike Scott, Patrick DiStefano

Founded: 2012

Headquarters: Seattle

2014 revenues: N/A

Projected 2015 revenues: N/A

Projects: Vulcan Block 52 East, a 315,000-square-foot office building in the South Lake Union neighborhood; 2202 8th Avenue, a 450-unit oval-shaped apartment tower in the Denny Triangle neighborhood; Akard Place, 425,000 square feet of office space, 300 housing units, 100,000 square feet of retail and an urban plaza in Dallas

Managers at Graphite Design Group answered questions from the DJC about local development and industry trends.

Q: Seattle has had an apartment boom. What is the next hot sector?

A: Although a step or two behind the apartment boom, the commercial office sector is seeing tremendous growth in the speculative and build-to-suit arenas. As these new projects come online and large employers such as Amazon.com occupy new space and current leases expire, the commercial leasing market will see a notable reshuffling. This will drive property owners to focus on repositioning and updating existing properties, as well as an expansion of amenity offerings to attract and retain tenants.

Increasing density of the office environment will also have a ripple effect on

the retail and service sectors, as neighborhoods such as South Lake Union, which do not have an established retail infrastructure, capitalize on an influx of potential customers.

In the residential market, a trend towards larger two- and three-bedroom multifamily units may emerge as couples with growing children look for options to stay in the city center.

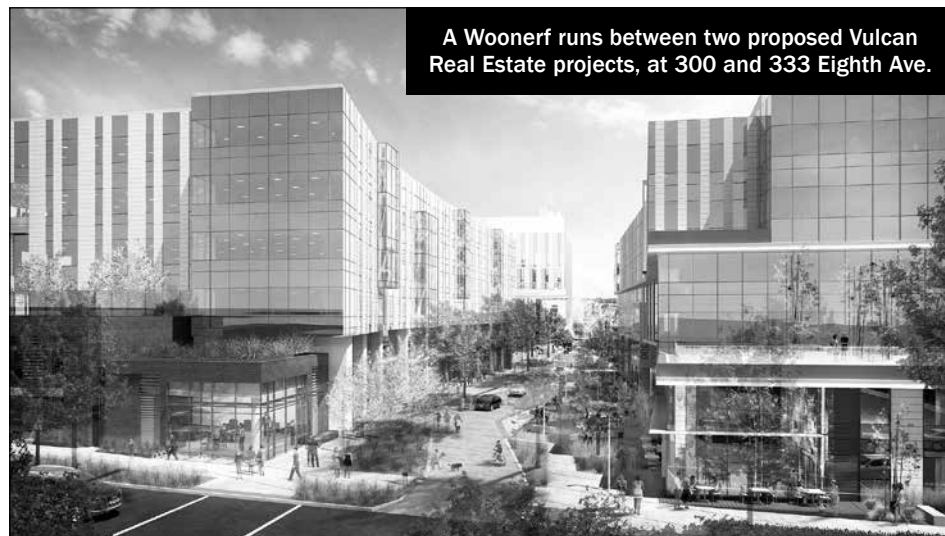
Q: How will rising land and construction costs affect downtown development?

A: While land and construction costs may slow development over the near term and discourage some investors (particularly those new to these markets), it should have a negligible effect on long-term growth. Location is still paramount, and Seattle and Bellevue will continue to be desirable for a young, educated workforce and, in turn, employers.

We may see increased efforts to assemble property to develop larger, more ambitious projects that require more upfront capital, but spread development costs over a larger product base and consolidate entitlements. The downside to this trend may be an aversion to explore more complex project types such as mixed-use or public-private partnerships, as the risk threshold may be too high.

Q: What sustainable elements have you introduced into your projects?

A: In Seattle, we are all seeing the effects of the recently increased energy code requirements, especially as they affect building envelope performance. In response, we have been working with



A Woonerf runs between two proposed Vulcan Real Estate projects, at 300 and 333 Eighth Ave.

IMAGE BY STUDIO 216 FOR GRAPHITE DESIGN GROUP

our clients to prioritize higher performing cladding systems that often have a direct impact on the building aesthetic.

In the Denny Triangle, our 27-person firm is involved in a number of projects that will take advantage of the developing district energy system, where waste heat produced by high-intensity users such as mission-critical facilities is directed toward and used by nearby projects to offset their energy requirements.

Q: What are clients/customers asking for now versus five or 10 years ago?

A: The trend toward desiring a more "authentic" urban experiences continues. Tenants are willing to sacrifice square footage for proximity to the urban center and the retail, transit and cultural offerings these locations provide.

Where multi-building users once wanted a campus, now they want a neighborhood. They value diversity, eclecticism

and choice. Rather than, and often in addition to, investing in on-site offerings such as cafeterias, health clubs, daycare centers — often only available to tenants — building owners are asking that more space and design attention be committed to high-quality retail venues and letting the marketplace provide these amenities to their employees.

Companies such as Amazon.com realize that their employees value the diversity and connectivity that an urban location affords and want to build this into buildings on day one.

Q: What can architects and developers do to make cities such as Seattle and Bellevue more livable?

A: Ultimately, the livability of our cities depends on the quality of the urban environment and those transitional spaces that residents and visitors experience as they move between where they live, work and play.

PCS STRUCTURAL SOLUTIONS

Specialty: Structural engineering firm focused on Northwest commercial building markets; expertise in education and healthcare

Management: Brian Phair, CEO; Craig Stauffer, president; Jim Collins, executive vice president; Don Scott, vice president and director of engineering

Founded: 1965

Offices: Seattle and Tacoma

2014 revenues: \$8 million

Projected 2015 revenues: \$8.6 million

Projects: Discovery Hall, University of Washington Bothell; Raisbeck Aviation High School, Tukwila; Swedish Medical Center First Hill transformation, Seattle

Craig Stauffer, president of PCS Structural Solutions, shared his thoughts about advanced delivery methods and what's next for local construction markets.

Q: Residential high-rise construction has been nonstop in Seattle. Are you tempted to join in?

A: Seattle is booming beyond just residential — developers are showing increased interest in office buildings also. We've had many strategic meetings regarding how much time we want to spend in the high-rise market. Numerous general contractors have pushed for our involvement on pursuits over the last year; however, we're realistic on the amount of expertise and competition.

We have two residential towers in conceptual design, and we are working on a very significant Northwest office building with Wright Runstad. Long-term relationships with clients are our focus — a few taller projects fall out of that every year.

Q: Which sectors do you expect to see expand or shrink?

Aviation High opened in 2013. PCS was the structural engineer.



PHOTO COURTESY OF PCS STRUCTURAL SOLUTIONS

A: K-12 and higher-education markets were slow during the economic downturn, however the necessity of modernizing their aging facilities and accommodating the expanding population

remained unchanged. We expect to see work increase in both of these markets.

Many medical campuses were being "affiliated" over the last few years, and this market is moving

back to historic averages of yearly capital improvements.

The large-scale apartment market is at an unbelievable

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SURVEYS

MAGNUSSON KLEMENCIC ASSOCIATES

Specialty: Structural and civil consulting engineering services

Management: Ron Klemencic, chairman and CEO; Derek Beaman, president; Andy Fry, COO; Bill Christopher, CFO; senior principals Greg Briggs, Shelley Clark, Don Davies, Brian Dickson, Dave Eckmann, Drew Gangnes, John Hooper and Jay Taylor

Founded: 1920

Headquarters: Seattle

2014 revenues: \$46 million

Projected 2015 revenues: \$48 million

Projects: Amazon Rufus 2.0 Blocks 14, 19 and 20; Elliott Bay Central Seawall; 888 Second Avenue; Second and Pike Tower; Overlook Walk; University of Washington New Burke Museum; Rainier Square; Salesforce Tower in San Francisco

Magnusson Klemencic Associates is doing engineering work for some of the most important projects in Seattle and San Francisco, including Amazon.com's three towers in the Denny Triangle, and Salesforce's new headquarters in downtown San Francisco. It has also done work on parks and stadiums around the country. The DJC sat down with Chairman and CEO Ron Klemencic to talk about the company's current projects and some industry trends.

Q: What sustainable elements have you introduced to your projects?

A: Our current and recent work focuses more on an overall approach to incorporating sustainability rather than any one specific element. Two areas of specific emphasis are carbon accounting and water resource management.

Our structural engineering practice is incorporating the assessment of embedded carbon content in the concrete, rebar, steel and heavy timber we specify, attempting to reduce overall carbon consumption through smart design, specification and procurement choices. We have been able to achieve an embedded carbon reduction of 30 to 40 percent with little, if any, cost premium.

Our civil practice is focusing on strategic water resource management, targeting significant reductions in overall water consumption of our building projects through rainwater capture and graywater and blackwater treatment and reuse.

Both of these strategies appear to be taking hold with our clients, as many of our recent projects are incorporating these strategies.

Q: What are some challenges

in the industry right now?

A: Across the country, construction seems to be booming. With the attrition in the industry as a result of the great recession, there is a shortage of skilled and experienced architects, engineers and construction workers. Unfortunately, because of this, we are witnessing a general decline in the overall quality of the work that is being completed as firms are spread thin.

At MKA, we are committed to maintaining the quality of our services and work products, leading us to be more selective about the projects we are taking on in the face of extraordinary demand. While it is tempting to want to try to do it all, we are steadfast in our resolve to properly attend to our current and loyal clients.

Q: Which of your services are seeing the most demand and why?

A: MKA is a structural and civil engineering practice focused primarily on building projects and site design. We work in a variety of market sectors, such as aviation, healthcare, sports, convention centers, retail, office, residential, hospitality and large public parks. Each of these sectors is very active across the United States.

Much of the demand appears to be coming from the tremendous growth of Internet-related companies such as Amazon, Google, Salesforce, Twitter and Facebook, to name a few of the more obvious. With the growth of these companies, and many others, has come significant demand for new office buildings, hotels, retail and housing.

In addition, there is strong demand for our services from Asia, in particular China and Southeast Asia. While it is true that the Chinese economy is slowing, overseas investment opportunities are being sought for the wealth accumulated over the last two decades, driving the economies of many smaller, emerging nations.

Q: You've worked on several prominent stadiums recently, how have design, engineering and construction needs for stadiums changed over the years?

A: The entire stadium and arena delivery process has changed from what used to be a public design/bid/build process to more of a "team build" approach.

Most recent sports projects have been delivered with both public and private funding with partnerships between the public, team owners and private

developers. This model of delivery has only increased the speed at which the projects are now expected to be brought on line.

Many of these large stadium and arena projects go beyond traditional "fast track" deliveries and are on "super-accelerated" schedules. As a result, there is a greater specialization needed by the contractors and design teams that execute these projects.

MKA has taken an approach similar to some of the national sports architects in that we have developed a Sports Specialist Group with a focus on, and extensive experience in, the unique design aspects of stadium and arenas.

Q: How does Seattle stack up to the other markets you are working in?

A: The Seattle market is strong and quite active. Of course, there is significant activity fueled by the growth of Amazon in South Lake Union, which a great number of us are supporting. Numerous commercial developers are proceeding forward with significant projects, including office, hotels and housing. The Washington State Convention Center is planning a significant expansion, which will also fuel additional commercial development.

Overall, we are quite optimistic about the Seattle market for the next several years.

Comparatively, San Francisco is an even stronger market. The amount of construction under-



Magnusson Klemencic Associates is providing engineering for the central waterfront seawall project.

PHOTO BY BENJAMIN MINNICK

way and in planning is extraordinary. Most of this demand is fueled by the growth of Internet companies headquartered in the Bay Area (mostly Silicon Valley) and their significant migration into the downtown area seeking to satisfy a workforce that is demanding a more urban lifestyle.

Access to public transporta-

tion, restaurants, retail, sports and cultural events is causing many traditionally suburban-based businesses to move into the city in order to recruit and retain employees. This trend seems to be growing across the country and is certainly evident with Amazon and the transformation of the South Lake Union neighborhood.

PCS

CONTINUED FROM PAGE 18

level, however we don't see it sustaining that pace. Clients of ours such as Olson Kundig Architects are having continued growth in high-end residential around the globe — we expect that to continue.

Q: Technological and project delivery advances are supposed to make the design and construction process more efficient. How has that affected you?

A: We've had success with advanced delivery methods such as integrated project delivery (IPD), have completed over 300 projects utilizing building-information modeling (BIM), and recently worked on the Northwest's first true IPD project for Seattle Children's Hospital.

When embraced by the entire team the processes are more efficient, produce a better product, and are a lot of fun. However, our design and construction effort is actually increasing on

intense BIM/IPD/lean projects due to numerous bid packages and pre-fabrication. We're staffing projects with more individuals to separate these tasks.

Educated owners understand the value in compensating collaborative teams as construction dollar savings greatly overshadow these upfront tasks.

Q: Has there been a recent project that has given the firm a chance to stretch its capabilities?

A: Building-information modeling has allowed delivery methods to improve significantly, such as design-build now being used on select public projects.

We worked with the University of Washington on one of their first design-build projects, as well as their first full IPD(ish) project. Both proved that collaborative, creative teams can embrace great architecture and provide schedule and cost savings to

the public through alternative delivery methods.

Q: What structural design trends are you seeing? Any major advancements?

A: The industry continues to develop new sustainable structural components. Cross-laminated timber looks like a promising system, however manufacturing capabilities must improve and building codes need to adjust for it to be widely implemented.

As far as industry advancements, we're using performance-based design on many more building types. Historically, this high-end analysis procedure was used primarily on high-rise structures. Medical clients and other long-term building owners, even owners' insurance agencies, are seeing the benefit of reducing risk and increasing reliability. We have employees on national code panels relating to these discussions, as we see this trend continuing.

SURVEYS

DRIFTMIER ARCHITECTS

Specialty: Full-service architecture firm with a focus on owner-occupied facilities, including offices, financial institutions, retail and government buildings

Management: Rick Driftmier, president/principal architect, Lee Driftmier, vice president/associate principal

Founded: 1980

Headquarters: Redmond

2014 revenues: N/A

Projected 2015 revenues: N/A

Projects: Houghton Center remodel and expansion, Kirkland; North City Water District administration and public meeting building, Shoreline; 1st Security Bank, Poulsbo

Rick Driftmier, president of his namesake architecture firm, responded to questions that ran the gamut from bank robberies to when to call it quits.

Q: What sort of projects have been keeping you busy?

A: Prior to 2009 we generally had 12 to 14 bank or credit union projects going. While that dropped off significantly for a few years, we now have five credit union and two bank projects in



Driftmier Architects designed a renovation and expansion for the North City Water District Administration Building, which opened last year in Shoreline.

PHOTO COURTESY OF DRIFTMIER ARCHITECTS

design or under construction.

We are also working with two larger utilities to design remodels or expansions of their headquar-

ters facilities and helping one Washington county determine its facility needs over the next 20 years.

Q: Is there a type of work you'd like to do more of?

A: We have worked with a couple wineries and completed a few smaller shopping centers. Expanding those markets would be wonderful.

Q: As a mid-sized firm how do you attract clients and talented personnel?

A: Being a mid-sized firm actually is often a competitive advantage in both attracting clients and attracting employees.

We offer potential clients a wide range of experience that comes with a more personalized and responsive design process. To prospective employees we can offer the opportunity to work on a broad range of project types and experience in large array of responsibilities.

Q: Online banking makes it easy for customers to avoid setting foot in their local branch. How are banks and credit unions adapting?

A: It is true that many of us manage our accounts online and get our cash at the supermarket, but most of us prefer to get financial advice, finalize loans and accomplish similar items in person.

Branches are getting smaller, branch staffs are getting smaller and better trained, and the focus is moving from checking balances and processing transactions to providing better service on a wider variety of financial products.

Watch for banks to find more ways to get the customers in the door. This could lead to in-branch wine tastings, book clubs, and

branches that share their lobby with a coffee shop or other retail establishment.

Q: When a robber successfully robs a bank is that partially a design fault?

A: Bank robberies occur for reasons totally separate from the bank or credit union itself. Generally, desperate and often irrational people look to banks for "easy money." But there are lots of things an architect can do to help deter robberies.

Design elements that increase the time needed for the robbery, expose the robber to direct view and to cameras, and that impede the escape all contribute to deterring robberies. If a robbery does occur, the design needs to provide a high level of safety for customers and employees.

Design can also help catch the bad guy by collecting evidence through use of a creative branch layout, interior materials selection, camera placement and other design elements.

Q: You've been in business since 1980. Have you ever thought about calling it quits or merging with another firm?

A: Quitting has never been considered. But over the years we have had several opportunities to acquire, be acquired or merge with other firms. While this interest has been flattering, we have chosen to maintain our firm size and focus on excellent design solutions and exceptional customer service. This has led to a situation where more than 80 percent of our work over the last 20 years has been for repeat clients.



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A special thanks to the hundreds of creative partnerships and the thousands of individuals in the Northwest who challenge PCS everyday and make our work rewarding and fun along the way!

PCS has provided unique and innovative structural solutions to our region for nearly 50 years. We can't wait to celebrate this watershed moment with you!

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