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Small Project Practitioners

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Journal 36

Top Issues Affecting Small Project Practitioners

- Litigation and affordable professional liability insurance
- Contracts, documents, and support materials targeted for the small project practitioner
- The need to educate clients and the larger community of the benefits of using an architect
- Design-build as an alternative
- Office management models and profitability
- Successful project delivery models
- Work flow scheduling
- The need for advice and comments in a small practice (there is a need for professional feedback on a daily basis)
- The need for a metric to qualify potential hires and the skills they possess

Getting It Built

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DEPARTMENTS

LETTER FROM THE CHAIR

Look at What We Are Doing Now

This year has been a challenging yet rewarding year for the Small Project Practitioners (SPP) Knowledge Community—and that name was indeed the first challenge. To better reach out to all practitioners who work on and deliver small projects, we changed our name from the former Small Project Forum. We understood the implications and potential confusion, but these problems are no greater or less now than before, except for one major consideration: Our constituents *are* small project practitioners, whether in small or large practices. No longer does our name create the impression that our sole purpose is to serve small firms or small-firm practice when we, in fact, serve a much wider sector of membership that delivers *small projects*.

Hand-in-hand with the name change, we refocused our purpose as did all national committees. No longer were there only PIAs (Professional Interest Areas) that addressed a general level of support to members; the PIAs have become knowledge communities assigned with the tasks of knowledge research, acquisition, assembly, and sharing to meet the fundamental need of sharing useful knowledge among the members within each community. This, in turn, required a much higher level of strategic planning by the Advisory Group (AG): defining purpose, issues, knowledge base, Institute and membership framework, resources, budget, and key metrics to evaluate success. This redirection was indeed painful while in process but has now given the AG much-needed focus and purpose.

This year also brought about our first Small Project Practitioners Awards. Serving what we believe to be an underserved group in this arena, the awards recognized excellence in small project design and began a campaign to bring awareness of quality architecture to all projects no matter their size. The program was well received by our membership, and the results were recognized throughout the knowledge communities and the Institute.

We have worked hard this year to develop our membership (now well over 6,000 individuals, making it the 11th largest knowledge community out of 25) and to set the groundwork to create and support local SPPs at components throughout the country. These efforts are now being recognized and used throughout the knowledge communities as the standard methodology for local component knowledge-group growth and the vehicle for knowledge sharing. We also engaged the AIA in developing a member survey that in part focused directly on our membership. This effort will help lead us in the future to make sure we are listening to our membership and their needs.

Our programs at the AIA 2005 National Convention in Las Vegas showed us that the membership is supporting our direction and purpose. Attendance at each program grew from the year before. The awards banquet brought together many of the winners who shared their experiences and insights into their projects and practice. The Sole Practitioners Breakfast was filled to capacity, and the sharing of ideas and relevant discussion to small project practice could have gone on for hours. This, too, was the outcome of the Media Marketing Exchange. A room full of small project practitioners shared outstanding ideas on creative marketing efforts.

The backbone of the SPP has been and will continue to be our journal. In 2005 we expanded our delivery of journals from three to four per year. With the sponsorship of Victor O. Schinnerer & Co., we have again been able to put in our members' hands a printed journal, which had been the mainstay of the early Small Project Forum. With this journal, we have published 36 printed or electronic journals sharing insights, techniques, tips, and tricks from our membership.

The SPP Advisory Group, from left to right, are: Kevin Harris, AIA; Deborah A. Pierce, AIA; David C. Hughes, AIA (2005 AG chair); Lisa Stacholy, AIA (2005 AG vice chair); and Louis B. Smith Jr., AIA.

As exciting as these efforts have been for us on the AG this year, the future for the SPP Knowledge Community looks to be even more so. The strategic planning process that we struggled through last year is beginning to reap great benefits for us. Our planning is now looking out to 2008 with new initiatives to bring more and better programs and knowledge-sharing opportunities to each member.

The 2006 SPP Awards Program will again culminate with the awards presentation next June at the AIA 2006 National Convention in Los Angeles. Our traditional convention programs will continue, with greater emphasis on member interaction, sharing, and discussions. Three new convention seminar programs have been approved: Residential Renovations, AIA Documents, and a four-hour workshop on creating architectural concepts.

Next year also will see the beginning of our first research initiative: *Small Firm*

Operations. This is an exciting program that will delve into the inner workings of small firms and the delivery of small projects. We will begin looking at regional conferences in partnership with the AIA Design-Build Knowledge Community. Local-component SPP Roundtable development will continue to be a key initiative to serve our membership in their own communities, and the development of the SPP Roundtable Toolkit will foster that program as well as similar programs with other knowledge communities.

Other initiatives in planning include participation in the AIA150 celebration; an SPP *Firm Handbook;* new regional technology conferences; continued interactive SPP Web-page development; a peer-reviewed journal on small project delivery; and the publication of a book highlighting the winners of the Small Project Practitioners Awards Program. And of course, our quarterly journals will continue to reach your desks.

So please continue to look at what we are doing now. And more importantly, get involved in what we are doing. There are numerous opportunities: assist one of many committees where we can use your insights; help start a local component SPP; contribute articles and/or tips to journals. And let us hear from you. Let us know what you think about the content of our programs, what you need for your practice, and how we are doing. Feel free to give any one of us a call. The 2005 and 2006 Advisory Groups look forward to continuing to serve you.

Thank you for being a part of this outstanding AIA Knowledge Community.

David C. Hughes, AIA
2005 Chair
Small Project Practitioners Knowledge Community

Playing the End Game Well

By David P. McGill, AIA

Planning and design have proceeded according to schedule. What happens when the client turns that first shovel of dirt? Does your well-orchestrated game plan become the luck of the draw?

As the scheduled completion date approaches but actual completion of construction does not, the entire development team—including the architect—is held responsible regardless of what went wrong. When it becomes obvious that a project nearing completion will not finish on time, tension and anxiety grow among the owner, the contractor, and the architect, with pressure escalating as each extra month slips by.

What can the architect do to ensure that the project will be completed on time? In the last months of a project, the end game is out of the architect's control—there's no "get out of jail free" card to help you now—so how can an architect play the end game well and deliver *what* was promised *when* it was promised?

THE PROJECT THAT ENDS WELL IS THE PROJECT THAT BEGINS WELL

The successful architect looks at the construction phase more like a game of chess than a game of chance—with a strategy that looks far ahead at each step. While an architect cannot "fix" a late project, the architect *can* make strategic, proactive moves from the beginning that dramatically improve the odds of finishing strong in the end.

The project schedule and the construction schedule are different, and everyone must understand what each schedule represents. The development team sets the project schedule, covering every phase from planning through occupancy. The contractor is but one of the team players who must perform according to that schedule. The project schedule drives the construction schedule, not vice versa, so the architect must be prepared to stay vigilant and in the driver's seat.

Not incidentally, the architect must meet his or her own responsibilities to the schedule to keep the project moving well. Stay on top of—and prepared to review and approve—all

Taking a project from design to timely completion requires a strategy of looking far ahead and making strategic, proactive moves from the beginning.

submissions for shop drawings, color selections, and the like in a timely manner.

CONTRACTOR SELECTION: THE FIRST KEY DECISION AFFECTING TIMELY COMPLETION

WHEN SELECTING A CONTRACTOR, ASK THESE QUESTIONS:

- What is the contractor's record on similar projects? Does the contractor have a history of completing projects on time, and what strategies has the contractor used to ensure successful project completion?
- Does the contractor have the manpower to perform essential trades? Managing subcontractors can eat up valuable project time, especially if a nonperformer on a critical path has to be replaced. Investigate the contractor's depth of personnel.
- If the schedule is aggressive, does the contractor have enough overall manpower to meet it?

STAY ON TOP OF CONSTRUCTION-PHASE ISSUES

When the construction period is set, be realistic and get total buy-in from the selected contractor. With that agreement in place, liquidated damages should be a part of the contract to compensate the owner for any delay. Still, it's important to be fair, allowing a grace period just like a project contingency.

To stay on schedule from the beginning, evaluate the construction process early and often, and be prepared to act from the very first month. Document progress—or the lack of it—and be prepared to aggressively push the contractor to stay on schedule. When the contractor submits for payment, the architect's construction administrator must verify *each month* that what was billed has actually been completed and that the contractor is still on schedule—the team's project schedule.

Generally, three issues cause delays: a materials shortage, a delivery delay, or a manpower shortage. Materials shortages are relatively easy to foresee; however, even ordering materials for an earlier delivery can't speed up the project if sufficient manpower is not available.

By taking control of the schedule and watching for warning signs, the architect can deliver what was promised when it was promised.

The labor issue—manpower or lack of it—is the strategic variable that must be managed in the game of finishing strong. *If construction begins to lag, the contractor must be prepared to add personnel or to add shifts. The architect has the responsibility to spot delays in the critical path of the project and compel the contractor to catch up—as early in the game as possible.*

FIVE CRITICAL EVALUATION POINTS

When looking for warning signs of a project slowdown, focus on five especially critical evaluation points. Each point represents an opportunity to increase manpower to catch up and get back on schedule. Failing that, the chance of finishing on schedule diminishes to the point of near impossibility as each critical point passes. The contractor's maintenance of an updated critical path schedule is essential in facilitating this process.

1. Site mobilization and start of construction—on schedule?

The first critical evaluation begins the first month. A construction trailer moved quickly on site is not an adequate sign that the project has begun on schedule. Instead, answer the following:

- Has the contractor mobilized and begun work in earnest?
- Have any unexpected issues developed in clearing and grading the site, such as rock or unsuitable soils?
- Check that the footings, foundations, and utilities are in progress and on schedule.

2. Building closed in—on schedule?

Once the building is closed in, chance is eliminated; weather doesn't affect progress as seriously from this point.

- Is the building topped off—roof and roofing in place?
- Is the building dried in—windows and doors installed on schedule?

If the project has fallen behind schedule, arrival at this milestone offers a tremendous opportunity to load the construction schedule and intensify the manpower both inside and out.

3. Rough-ins of major systems completed—on schedule?

Are the rough-ins for mechanical, electri-

cal, plumbing, fireproofing, and low-voltage systems completed on schedule?

The building is now ready for finishes.

4. "End of project" review (when 60 percent of construction is completed)—still on schedule?
The timing is critical for this review, which looks toward the end of the project but takes place well ahead of time, at a point where quick and decisive action can still speed up progress. Ramping up labor at this point may still lead to successful completion of the project or at least minimize the delay if insufficient manpower is available to make up for lost time. If this review indicates that deadlines will be extended, the owner gets more advance notice to prioritize needs, make new plans for occupancy, and cover the financial consequences of delay. Your client won't be happy, but neither of you will feel the full sting of a big, untimely surprise.

5. Punch lists—on schedule?
Finally, every job involves punch lists, and it is essential that sufficient time remains. The contractor must understand the expectation that the contractor's punch list must occur sufficiently before project completion to allow time for work on the architect's and owner's punch lists.

When a project is late, there's panic, anxiety, unnecessary expense—and the architect is certainly one of the scapegoats. Take control of the schedule, look for the warning signs, and win the end game—for you, your team, and your client.

David P. McGill, AIA, is vice president of SFCS Inc. of Roanoke, Va. He has more than 25 years of experience in project design and management—from both the construction and architect's sides—for projects across the country.

Five Rules of Construction Administration

By Bud Dietrich, AIA

I work exclusively on single-family residential projects, mostly renovations and additions. Many of these are larger projects where a significant portion, if not all, of the owners' houses are being reconstructed. When doing these projects we—the homeowners and I—must decide whether the homeowner remains in the house during construction. More often than not, the client remains in the house due to budget constraints and logistical issues.

So what we have is a recipe for disaster! We have a builder who is about to rip apart and rebuild the homeowner's most valuable possession, blended with someone who has never been through a home renovation. All that's left is to add a sprinkling of "unforeseen" and dash of "Are you sure that's what you want?" topped off with a "That's nice on paper but it doesn't fit."

I heartily advise all architects that it is in their best interests to avoid the effects of this impending disaster. But how *do* we avoid this? For my own purposes, I follow these Five Rules of Construction Administration.

RULE NO. 1: SHOW UP

It's a business rule that the fellow not in the room is the one who messed everything up and so deserves all the blame! So make sure you show up during construction. If you don't, you'll be taking it on the chin simply because you're not there! Sure, that's easier said than done, so to make sure that I'm engaged for construction administration services, I appeal to my client's fears and greed.

First, I tell my client about all the things that can happen during construction and that some of these aren't good and that they'd be best served with an advocate nearby. I explain that just like they wouldn't go into court without a lawyer, they shouldn't spend tens of thousands (or hundreds of thousands) of dollars without an advocate.

Second, I tell the client that the few dollars that I'll cost during the construction phase could, and most likely will, save them much more in avoidance of potential mistakes, change-order management, and creative problem solving when the inevitable "unforeseen" is uncovered.

RULE NO. 2: KNOW THE PROJECT

Sure, I know the project better than anybody. I've lived through all the design, prepared the construction documents, and guided the client in making the decisions that they've had to make to get to the construction stage. No one, neither the client nor the builder, comes close to having as much knowledge about the project as I do. So I visit the job site with this knowledge and a set of drawings in hand. When the client wants to make a change, I help to explain the "ripple effect" of the change on all of the client's previous decisions and the overall project. Or when the builder comes across a difficulty and explains to the client why it would be easier or better to adjust certain things, I'm there to explain to all why we've designed and placed items as we have and how we want to make any changes consistent with the design intent.

RULE NO. 3: HELP SELECT THE BUILDER

Be intimately involved with the builder selection. I guide my client to select a builder who will do a good job, can be empathetic, is personable, and knows and respects my work. Notice that the builder doesn't need to have the best price. In fact, I tell clients that getting the right builder (someone whom the client will have faith and trust in as well as someone the client can live with during the construction) is something that warrants a premium.

Guiding the client to select a builder whom I know will do a good job and will develop a rapport with the client will pay dividends as the client inevitably tires of, and becomes frustrated with, the construction.

RULE NO. 4: BE THERE THROUGH THE GOOD AND THE BAD

"When the going gets rough, . . ." You know the rest. It's a natural inclination for most of us to shy away from unpleasant activities. Having a client constantly calling us to complain and generally making us as miserable as they may be is certainly something to avoid. In the end, though, this is the time we need to be closest to our client. Anybody can be their friend when the going is easy—but they'll appreciate you more if you're their friend during the rough times.

RULE NO. 5: ADD VALUE

Last but certainly not least, I make sure that I add value to the construction phase, and I let my clients know that I'm adding that value. Sometimes the value is measured in dollars—certainly the easiest way to measure—but all too often the best way to provide value is to make the construction-phase experience less than a living hell. It's the small things that really count. Bring the client a latte when you go to the job site, which also happens to be their home. Give them tickets to a new movie or a weekend room at a local hotel. Take them to lunch and dinner. Celebrate milestones, like when the rough inspection is complete and when the cabinets are installed.

But most of all, keep them focused on the end result. Keep reassuring them that, unlike spending an eternity in Hell, the construction will end and their "new" home will be something they'll treasure for many years to come.

Bud Dietrich, AIA, is the owner of HFD Architects LLC in Deerfield, Ill. Though he has worked on projects across the United States and in Europe and Asia, the last few years have been the most rewarding and exciting, with his focus solely on single-family residential projects.

TIPS

Develop a Good Bedside Manner

By Louis B. Smith Jr., AIA, Ann Arbor, Mich.

Bedside manner is one of the most important aspects of the doctor-patient relationship. Poor bedside manner is also known to be a predictor of who will get sued for malpractice. Take it as essential, then, to establish good relationships with the owner, the contractor, and, if necessary, the subcontractors. The extra cost of a cup of coffee and a few minutes of sincere interest may mean the difference between an amicable settlement of some unforeseen issue and the start of a legal action.

Raised Floor Design and Construction at Hensley Field

by Michael A. Kawecki, Assoc. AIA

This is the first of an open-ended series of articles detailing the design and construction of the Hensley Field Operations Center, which is currently seeking LEED certification.

No doubt by now you've heard of raised floor systems. These systems were initially popularized in the United States to serve computer rooms because of their cable and power distribution capabilities. Today, we are seeing these systems being used more and more, and no longer just in computer areas. With technology changing daily, upgrading infrastructure can be a major expense for companies. By using this type of system in administrative areas, reconfigurations are now much more cost-effective; data, power, and ventilation can now be redistributed at will and at a fraction of typical cost. Combine these factors with lower energy costs (by discharging air at higher temperatures) and a healthier work environment (by having more efficient air changes) and this system truly becomes competitive.

Those factors aside, what's so different about our installation? We decided to stain the floor and use it as an exposed system. Sure, now that I've said it, it seems obvious. But you should have seen the faces of the design team when I announced that this is what we were going to do.

Concrete staining is not new. Normally on a raised floor you would install carpet tile. As is inevitable with any carpet tile, reconfiguration of the floor will require replacing previously cut carpet tile with

full pieces. In the big scheme of things, this is not a large issue; it just means you have to keep attic stock. We had a new idea: If you eliminate the carpet tile, you eliminate the need for attic stock. Fewer materials to maintain equals less cost, both initial and long term.

Let me outline our design scenario. As with any renovation, we needed to address several factors. We were converting a former shop space into administrative office space. None of the previous electrical distribution could be reused; it had been fed from the ceiling and along the walls—walls that were to be removed. The new office space needed a suitable electrical distribution system that could feed nonpowered modular-furniture wall systems while also being able to accommodate future reconfigurations. Dropping out of the ceiling into power poles, while functional, was not the answer.

Further complicating this was the construction of the slab. This being a former military facility, it was designed to last forever. Our initial coring determined that the slab was a minimum of eight inches thick. On top of that, several of the walls that were scheduled for removal sat upon bond beams, with the adjacent slabs spanning in between. Removal of the walls left us a wide open space with a large variation in finished floor heights.

Economically, it was infeasible to saw cut the slab and install a new electrical distribution. Equally infeasible was floating out the slab to correct the varied finish floor heights. Using a raised floor system could correct both these issues.

I had previously used this type of floor system on several projects (visit *www.usgbc.org/chapters/northtexas/chrf.asp* to read more about what makes up these systems and what they can do).

We needed to meet one more design criterion, however. This type of facility probably will have higher than normal levels of dirt. Specifically, we did not want carpet in the administration areas because it is significantly more difficult to clean grease and tar from carpet than from concrete.

I consulted Paul Kinsella with Allied Interiors, the distributor I had used several times in the past. We explained what we wanted to do, and we were hoping that this had been done before; after all, there is no need to reinvent the wheel. We quickly found out that this was not an entirely new concept. There are raised floor systems that don't use carpet—unfortunately, the vinyl-tile computer look was not the aesthetic we were trying to achieve. They did offer a clear sealer that really brings out the nature of the concrete, but this system was also going to serve as a design element, and we needed color.

Because of the way that the panels are manufactured and sorted, I knew that there was no way to ensure consistency of stain. So, this aspect was designed into the system. If we did all the panels the same color, the color would be close but not an exact match. When placed side by side, you would be able to distinguish a change in color across the floor. Factoring this into

the equation led us to use several different colors. My original intention was to install the panels in a random mosaic pattern. While this sounded good in theory, we needed to keep the color selection to a minimum. My contractor suggested installing the panels in a diagonal pattern—this was definitely the correct solution!

We used our painters to stain the panels on site. The biggest challenge with this was allowing for the low VOC content of the stain because this was a LEED building. The first stain that we used was within the VOC limits but had no other favorable qualities. The panels looked so hideous that we didn't even take them out of the truck. Once the painters realized that I wasn't going to give in, they gave a concerted effort and found an appropriate stain. Once the initial colors were approved, we had the panels delivered to the site and spread out in one of the bays. Here you can see the staining in process.

Installation was pretty standard. We waited to seal the floor until it was installed. This would cut down on touch-ups and ensure a consistent depth of sealer. The panels soak up the stain like a sponge. It's not until the sealer is applied that the true color comes out.

We did have to do one additional step before sealing the floor. I had the contractor back out all the screws about a quarter of an inch before applying the sealer. This was so that in the future, when reconfiguring the space, we would not have to worry about chipping when unscrewing the panels. The last step was to fully remove the screws and replace them, due to the amount of sealer in the heads. We also used a gasket system at the perimeter to account for an airtight seal between the panels and the exterior wall.

What other items must you consider when using an exposed stained raised floor system? It is best to do a layout similar to a reflected ceiling plan. Minimize your cuts, and establish a starting point for full panels. In this case, we poured our stairs, ramps, and landing out of concrete for a finished look.

We've now covered the aesthetics of the system, and you've sold the architect and owner on the idea. But what about your mechanical and electrical engineers? In a future article we will discuss the components that we used for electrical and mechanical distribution, along with the benefits and limitations.

Michael Kawecki, Assoc. AIA, has been a project manager for the City of Dallas since 1999 and has been involved in sustainable building since 2002.

Waterless Urinals and LEED

By Michael A. Kawecki, Assoc. AIA

Passage of the Energy Policy Act in 1992 established water-conservation standards for fixtures—mainly water closets, shower heads, and faucets. This was done to save an estimated 6.5 billion gallons of water in the United States per day. Locally, the City of Dallas supplies water to more than 25 nearby cities, a population of more than 2 million individuals. Dallas's drinking water comes from five lakes: Grapevine, Lewisville, Ray Roberts, Ray Hubbard, and Tawakoni. Two other lakes, Fork and Palestine, are in reserve for future supply. However, with an ever-increasing population, we need to be reducing our usage now.

While the Energy Policy Act of 1992 provided a great starting point, it can be taken further. LEED Water Efficiency credit 3 (WEcr3) deals with water reduction of fixtures above and beyond EPA requirements. One point can be achieved with a 20 percent reduction; increasing that reduction to 30 percent can garner you another point.

If you've worked on a LEED project, there is a good chance that the subject of waterless urinals has been brought to the table. For new construction, urinals using flush valves of one gallon per flush are used. However, in existing buildings, it is not unusual to see flush valves that use anywhere from two to three gallons per flush. On average, a flush-type urinal can use 45,000 gallons of water annually. Waterless urinals that use no water can significantly reduce a building's water usage.

How do waterless urinals work? A removable cartridge is inserted into the drain. This cartridge has a built-in trap that contains a layer of sealant that floats on top of both water and urine. Urine, which is heavier than the sealant, passes through the sealant and then out through the trap. The construction of the cartridge allows urine, which is heavier than the sealant, to pass through the sealant. The sediment settles out and is contained in the cartridge, while the remaining urine passes into the drain and into the sewer system. The sealant also forms a seal that prevents sewer gas from leaking out.

I am a big supporter of waterless urinals. Overall, waterless urinals require less time on annual maintenance than flush urinals. There are no moving mechanical parts to replace, and there is less risk or damage associated with breakage, stopped up drains, or vandalism. And then, of course, waterless urinals save water. However, as with any new technology, some critical items need to be addressed before an owner decides to install waterless urinals.

During construction, it is imperative that the drain line be installed per the manufacturer's recommendation (normally ¼ inch per foot). With flush-type urinals, a gallon of water (minimum) is flushed through the drain line. This quantity and force often overcomes a no-slope or negative-slope condition. This is not the case with a waterless urinal. Drainage is directly related to the quantity of urine in the trap and occurs much more slowly. A no-slope or negative condition can lead to urine remaining in the drain line and eventually causing issues. At the same time, too much slope can also cause issues. A large slope can cause a vacuum to occur, which will suck out (that's a technical term by the way) all the fluid in the trap, including the sealant.

As bad as this sounds, this is a relatively easy condition to fix. Many different types of flanges or supports can be attached to an existing drain line. These flanges are affixed to the wall surface and keep the drain line at a proper elevation. These flanges are also convenient to use in a retrofit or renovation situation.

The other item to be aware of is the different type of maintenance required. With flush-type urinals, maintenance is normally required by a plumber. In a waterless urinal, this responsibility is shifted to the custodial staff. Daily maintenance is simple. The urinal needs to be cleaned with a damp sponge and a disinfectant. It is recommended not to use harsh or abrasive chemicals, along with large quantities of liquid, because they will cause the sealant to break down faster or be flushed from the trap.

The traps also must be replaced periodically—depending on usage, typically three to four times a year. Sediment and contaminants remain in the trap instead of entering the drain. This sediment eventually builds up and requires maintenance. We have found it more cost-effective to replace the entire trap (for approximately $35 each) than to clean the trap. When replacing the trap, it is important to flush the system with a couple of gallons of warm soapy water. This removes the calcium carbonate (urine salts) buildup from the drain lines. Falcon, one of the largest manufacturers of waterless urinals, puts out an easy-to-follow, step-by-step guide for maintenance (see *www.usgbc.org/chapters/northtexas/docs/pdf/FalconRecomendedCleaning.pdf)*.

To reiterate, I support the use of waterless urinals. However, as with any new technology, improper installation and improper training of staff can lead to serious issues. Below I describe an extreme situation that occurred because of improper slopes and no maintenance over a period of 18 to 24 months (the stars also had to be in proper alignment). You will probably (I hope, never) run into these issues, but they can happen.

Calcium carbonate (urine salt) is caused by a reaction between urine and water. Flush-type urinals actually cause a larger reaction because of the quantity of water used. At the same time, that quantity of water flushes these contaminants directly into the drain lines. With waterless urinals, you have a much slower reaction because of the absence of water. However, there is nothing to flush the calcium out of the drain lines. This is the reasoning behind flushing the system when replacing the traps. At the same time, you can have sediment buildup. Older-style cartridges could allow the sediment to build up enough in the trap and extend into the drain line. The newer cartridges have a smaller neck, which clogs up with sediment and stops working before being passed into the drain lines. However, when these two items collide, you can end up with the condition below. You can still clean the line out, but it may require the removal of the urinal from the wall.

No-slope or negative slope can also cause issues. Without proper maintenance of the traps, urea (the caustic portion of urine) can build up and overflow into the drain line. Couple this with other sediment and calcium buildup that can trap the urea in the low spot of the drain line, and it will eventually eat through the copper line. This also occurs with flush-type urinals but takes significantly longer (years and years).

In a couple of years, use of waterless urinals will be so common that these installation and maintenance issues will become the norm and go away. Until that time, though, keep the above in mind, and enjoy the water savings!

Michael A. Kawecki, Assoc. AIA, has been a project manager for the City of Dallas since 1999 and has been involved in sustainable building since 2002. For additional information regarding this article, please contact the author at mkawecki@usgbcnorthtexas.org. *All comments are the sole responsibility of the author. This article and more by the author can be found at* www.usgbcnorthtexas.org.

TIPS

Helping the Client Helps You

By Louis B. Smith Jr., AIA, Ann Arbor, Mich.

The span of time between the completion of your drawings and the start of construction may be the most challenging for homeowners and small-business people unfamiliar with the construction process. You might consider making it a regular practice to call such people weekly and counsel them on what they should be doing. You may need to advise them on which bank to go to and what to ask of the banker. You may need to help them negotiate with or identify a contractor. You might even consider offering this handholding as a separate service at a nominal fee. The sooner the project gets built, the sooner you can move on to the next one.

Professional Practice Transformations

By Andrew Charles Yanoviak, AIA

More than two centuries ago, Benjamin Franklin said it best: "An ounce of prevention is worth a pound of cure." How true this fundamental "pearl of wisdom" is, even on small projects, when a construction project dispute is not resolved without resorting to mediation, arbitration, or litigation. This can be an emotionally painful and expensive business proposition, which might have been avoided earlier if A/E firms had instituted more prudent professional-practice modes of operation. Lessons learned through reflective hindsight can provide constructive insights that empower architects with the necessary foresights to provide "A stitch in time (that) saves nine."

Construction litigation can be frustrating, even for legal counsel and professional liability insurance carrier claims agents, because the courts and their appointed judges, arbitrators, and mediators may not understand the complexities of organizational communications on even a small construction project. They tend to avoid the complicated issues arising from counterclaims and rebuttals and are anxious to resolve the matter generally on behalf of the owner-consumer.

Andrew Charles Yanoviak, AIA, is an architect-planner in Honolulu. His firm, Environmental Systems Planning and Design Consultants, has specialized in alternative dispute resolution methodologies, principally in areas of land use and construction litigation, for more than 25 years.

Constructing Relationships

By Louis B. Smith Jr., AIA

Architecture connects people to each other—before, during, and after the construction of a project. That is the most difficult aspect of architecture. The architect who brings a purely intellectual solution that is carefully synthesized and mathematically correct but fails to connect people is of limited value. The architect, through his or her ability to bring people together and to inspire, must create a project team with the owner and contractor and even suppliers from around the world to make the design a reality.

It is during construction that these relationships come into sharpest focus. The architect must advocate for the owner while maintaining a positive relationship with the contractor. In this role the architect can be neither too trusting nor too distrustful, neither antagonizing nor passively standing by as though helpless. Architects must continually bring together the owner and contractor—educating, managing the expectations of each, and resolving differences. They must find that third way that goes beyond "right" and "wrong" and reaches "effective," where the experiences of the owner and the contractor become assets and not liabilities. The team must constantly strive for better clarity and communications. Through these efforts successful projects are built.

What can be done to promote this communication? Start with a communication plan. It should include a description of those project communications you think are needed on a regular basis. It might also include the reasons why you might deem a message unnecessary. "They ought to know already" is not an adequate reason. The plan should address information distribution: Who needs to know what and when? The plan should also have an informal aspect. It won't hurt you to become personally familiar with the other players' values and motivations. In fact, that knowledge could become of immeasurable value when you try to craft a compromise over some critical issue that arises. Don't be disingenuous. The honesty of your interest is the most powerful tool for getting even more information.

Probably the most underconsidered aspect of communications is listening. Listen to everyone on the site and the project. Judge what is working or not working by balancing the reports and perspectives of each member of the team. What a sub complains about could yield quality improvements on this or your next project. This is not to say that you should blow in the wind—only that listening is a powerful communications tool.

Louis B. Smith Jr., AIA, is an at-large member of the Small Project Practitioners Advisory Group. Until recently, he maintained a small practice in Ann Arbor, Mich.

Building the Banque in Beirut

By Aram K. Yeretzian, Intl. Assoc. AIA

Owner: Banque du Liban et d'Outre Mer

Architect: Prime Design

Electro-mechanical: Pierre Dammous and Partners

Interior design: Dada and Partners

Project: Bank branch in Beirut, Lebanon

CONTEXT

The project is situated on a busy street in a suburb of Beirut. The program consists of 600 square meters of office space and two basement levels, each of 1,000 square meters, consisting of car parks and storage space.

DESIGN PROCESS

Functional and environmental parameters dictated the shape and form of the building. The introduction of the first vehicular ATM in Lebanon and the provision of adequate daylighting to the office spaces are main features of the design. Our office prepared all design drawings as well as the construction documents. Because it was a small project, the contract documents we prepared were brief and custom-made for this particular project. As we later found out, they were not as elaborate as they should have been.

CONSTRUCTION PROCESS

The owner analyzed the bids and awarded the contract to the contractor with the lowest bid without our advice and involvement. The owner's choice was based mainly on financial concerns, without taking execution capabilities into account. This issue was the cause of our problems during construction supervision because the project had fair-faced concrete components, which was not a strong asset of the contractor's experience.

Because Beirut still has no bylaws governing the procedures to be followed in a construction process as such, it is left to the owner's discretion to devise and adopt a construction strategy that tends to reduce the financial burden.

During construction, the contractor found loopholes in the general conditions that we had prepared. This would have been avoided had we used the general conditions of FIDIC (Fédération Internationale des Ingénieurs Conseil).

The contractor would short-circuit the contract's requirement that samples be presented for approval before execution. Although our office would issue site instructions requesting such samples, the owner would accept to continue with the work due to time constraints. This created a precedent for the contractor by encouraging him to sacrifice other issues relating to quality and workmanship.

View of the building from the main street

Disputes between the architect and the contractor caused significant delays in the construction schedule. Because of the owner's commitment to a completion deadline imposed by pertinent authorities and the consequent need to speed up progress, certain undesirable compromises were made, unfortunately at the expense of workmanship quality.

CONCLUSION

The transformation from concept to object is the combined responsibility of the owner, the architect, and the contractor in charge of construction. The synergy of the three parties creates a platform for either success or failure of a project's execution, and we learned the following lessons from this project:

1. The contract documents should be comprehensive.
2. The competence and qualifications of a contractor should be compatible with the vision of the architect's design team.
3. The skills of workmanship should correspond to the quality of the specified materials.
4. The owner and architect should establish and maintain constant coordination and communication or else a contractor may take advantage of any deficiency in this regard, to the detriment of the project.

The building as a final product is a satisfactory addition to the context, although it almost took twice the construction time estimated initially.

Aram K. Yeretzian, Intl. Assoc. AIA, is a partner in Prime Design, an architecture firm practicing in Lebanon and the Middle East. The firm advocates the integration of climatic and environmental parameters in architectural design.

Working *with* Contractors Pays Off

By Thomas J. Carleton, AIA

In the last few years, our small firm (five employees) has produced construction drawings for about 20 private commercial and residential projects each year. The only time I have had trouble during construction is with a contractor who initiated changes in our drawings without notification.

I explain to my clients that choosing a general contractor is as important as choosing an architect. I recommend that both be selected in a similar manner: interview those with a good reputation, inspect past work, and check references. There are many ways to deliver a project, but I strongly advise against competitive bidding among general contractors (although it can be managed between subcontractors or suppliers). Instead I recommend the "negotiated bid" method. I ask my clients to select one construction firm and negotiate a price with them.

In this approach, the owner, contractor, and architect are working as a team during the estimating and construction phases of work. The negotiation between parties to find an acceptable bottom line may involve changes in exterior product selections, such as roofing and window manufacturers. It may involve interior choices, such as flooring, countertops, and appliances. Sometimes the drawings may be altered to change a detail or reduce square footage. The costs are openly discussed and decisions are made to deliver the project that the client can afford at a predictable level of quality.

In my experience, competitive bidding often does not deliver on its promise to reduce costs. When the bids come in, clients end up comparing apples to kumquats. All too often, the low bidder may look for errors and omissions in construction drawings to add change orders and raise the price later. This sets up a combative relationship between the architect and builder during construction that I prefer to avoid.

When the owner and I have worked through an estimate with a contractor in the "negotiated bid" method, I have an advantage when construction problems arise in the field because we are working toward the same goal. When I get a call from a builder, I respond that same day. When it requires a quick trip to the site, the contractor often has figured out a solution to the problem to discuss with me

BOOK REVIEW

Pendulum: Léon Foucault and the Triumph of Science

Author: Amir D. Aczel

By Louis B. Smith Jr., AIA

If you have ever felt like you just could not get recognition in the inner circles of architecture and society, you might find this historical biography an inspiring piece. While I have never been a math genius, I have always prided myself on my ability to think through a problem. This was why I came into architecture. This book reinforces my belief that a clear concept and a powerful idea can still be the measure of social success. It shows how the little guy can win.

The book examines the work and life of French physicist Léon Foucault. Foucault is best known for creating a pendulum experiment that even now is on display at science museums around the world. The experiment proves that the earth is, in fact, rotating. These displays are usually marked to show how much the earth rotates over a given period of hours at a given latitude. Foucault associated with many French scientists and mathematicians whose names are familiar to most of us, including Fournier (mathematics), Descartes (mathematics), Daguerre (photography), and many others.

Foucault spent the greater part of his life trying to enter the French Academy of Science, the elite of French intellectual society in the mid-19th century. Despite notable work and numerous inventions in the areas of microscopy, photography, and physical science, he was continually rejected. The pendulum experiment eventually helped him achieve his goal—not because it amounted to such a difficult or long mathematical treatise but because it was a clear idea executed in an uncompromising fashion. That clarity assisted greatly in establishing not only Foucault's proof but also his talent. It is the same sort of clarity that drove Einstein's miracle year. Now, I am no Einstein. Still, I found the book an inspiration in that a clear and simple solution to design problems might be the powerful force that defines my success as an architect. The work I create need not be complicated, large, or overwhelming to be distinct and powerful. If you want to take a little time to be inspired, I recommend this book.

Louis B. Smith Jr., AIA, is an at-large member of the Small Project Practitioners Advisory Group. Until recently, he maintained a small practice in Ann Arbor, Mich.

and the owner. If you work with contractors as colleagues, you have the opportunity to learn from their experience—and you may get job referrals from them in the future. While the negotiated bid method is not foolproof, it makes work a lot more enjoyable.

Thomas J. Carleton, AIA, is the principal of Thomas J. Carleton Architecture in Salinas, Calif. Established in 1992, the award-winning design firm specializes in private commercial and residential projects in Northern California. Current projects include a new auto dealership, office building, retail renovations, apartments, residential additions, and new custom homes. Web site: www.tjcaia.com.

The Worst-Case Scenario: Property Owners as Novice General Contractors

By Joseph J. Minuta, AIA

As a small-business architect, I have found that some property owners are choosing to be their own general contractors (GCs). Three recent clients—all well-educated, excellent doctors—decided to be their own GCs on projects they invested in for extra income and/or future retirement benefits. Accomplished in their own areas of professional expertise, they thought they were also qualified to be GCs and thus save money by managing their own projects despite their lack of education or experience in architecture or construction. Ultimately, all have well exceeded their intended budgets and surpassed completion deadlines through field coordination errors and poor coordination with the trades and subcontractors. In addition, they tried to save more money by cutting out bidding and negotiation (B&N) and construction administration (CA) services by the architect. The three projects below illustrate some of the problems experienced by these ill-prepared property owners.

CASE NO. 1: THE PROFESSIONAL BUILDING

An owner who contacted me about designing his professional building received a proposal for services, but I didn't hear from him again until some 12 months later. The owner then needed my assistance because the local building department had rejected the plans provided by a modular-home company for his commercial project. After reviewing the plans and state laws, I informed the client that those design plans required the state approval process, not simply approval by the local inspector or town engineer. Because the modular-home company did not want to go through the state approval process for this one-time-use project, it withdrew and refunded the owner's money. Twelve months into the process, therefore, the owner had to start from scratch.

The owner then received authorization from the modular-home company to use the design so he could save money by not having to redesign. The owner's stipulation to the architect was that documents be completed for a building permit application within 30 days because he had already lost so much time and had only a short extension on his bank loan. I then provided an agreement and started work, met the deadline, and obtained a building permit. The owner then hired as his GC a maintenance person he knew from a medical facility. After the trades were lined up, the owner removed the GC to save money but kept the man on the job as the framer. The owner then became a novice GC and ran into the following field errors:

- Lack of understanding what he was observing: The excavator dug the footings too deep and was then paid again to fill with gravel and compact, which required a letter from a geotechnical engineer to pour the footings.

- Poor coordination with the plumber, who stubbed up the plumbing in the wrong location because he was given only the schematic plumbing plan and not the entire drawing set—later having to cut out the concrete to relocate the plumbing.

- Extra cost for the change order for additional concrete.

- No coordination for applications of two layers of rated gypsum board on the ceiling before the electric and mechanical systems were installed. One layer of gypsum board had to be removed to apply the required furring channels between layers of 5/8-inch gypsum board to meet a two-hour UL assembly rating on a 3,000-square-foot ceiling.

CASE NO. 2: THE SHOPPING MALL

In this case, the owner purchased a run-down shopping mall to reinvent it. He hired my firm but sought a contract for only the building permit, not construction services. Although we produced several new concept drawings for him, the owner never provided a budget for the project, even though we asked. He made material selections based on the aesthetic fabric of the local community. The design required structural reinforcement of the existing structure for an already partially failed roof system. So, plans were prepared and the building permit approved. The owner, acting as GC, let us know that he would handle the B&N and CA.

The cost of steel reinforcement alone put the owner in shock. Drawings were sent to

five steel fabricator/erectors, and a final selection was made. To save money, the owner decided to use his maintenance crew, and construction commenced—until the town inspectors showed up to issue a stop-work order for serious violations. The inspectors informed my firm that no one on the project spoke English, a cohesive set of plans were not on site, and items from sprinkler heads to open electrical panels were cited. The owner stated that the steel fabricators spoke English (in fact, they did but the GC's foreman did not).

To the owner's credit, these items were promptly corrected and, fortunately, no one was injured. However, understanding OSHA compliance, site safety, and coordination of trades and their responsibilities are items learned with formal education and/or experience. These are not areas of work to jump into without prior understanding. This case also illustrates the checks and balances that are in place for the good of the public. Had this project gone uninspected, the outcome could have been disastrous.

CASE NO. 3: THE DENTIST'S OFFICE

The owner put complete faith in his "interior designer" (actually a specialty furniture, furnishings, and equipment, FF&E, supplier and not a duly licensed interior designer) because he was going to save him money by reducing some of the architect's services. My contract, therefore, was for basic services—a set of documents for a building permit and construction.

At our initial meeting, the designer stated that the new X-ray equipment did not require lead shielding of the X-ray room, and the dentist asked the architect to specify the equipment. Upon investigation, X-ray shielding of the room *was* required, and a physicist was required to calculate the shielding requirements—additional services of the architect's specialty consultant and an additional fee to the owner. A pre-bid conference was held by the FF&E supplier and the owner (without informing the architect), and drawings were presented to the contractors. I then received a phone call from the irate contractor: "This is all you provided—three drawings? How can we bid from this set? My architect could have done this for less money and provided all the required work! Thank you for wasting my time!" Only later did I learn that the FF&E supplier presented only three drawings of a 10-drawing set to the contractors. Due to the mishap, only one of the five contractors decided to come back to rebid the project, and he was not bondable. After the contractor and the owner signed the contract, I was contacted numerous times for information that was clearly on the drawings. I billed the owner for extra services. He refused to pay, resulting in a less than amicable relationship between us.

LESSONS LEARNED—THE HARD WAY

These experiences have taught me that a client's intent is not always immediately revealed—even through the best of initial meetings. My advice to others, therefore, is to beware of owners acting as their own general contractors, especially on commercial projects. Make sure your contracts are ironclad, the scope of work is well defined, and consult with an attorney and your insurance company on your modified standard form of agreement. Work in the best interest of the project but be prepared to go to court, if necessary, to obtain your just fees, and don't expect to get paid for everything that is not in your contract—public health, safety, and welfare are most important.

Finally, protect yourself by remembering the three "feasances": malfeasance, misfeasance, and nonfeasance. Look them up; if substantiated, any of these can result in a court judgment, and avoiding them is a barometer for best practice.

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Developing Thick Skin by Way of Scar Tissue

By Karen L.W. Harris, AIA

Having worked through a project with the Worst Contractor Ever (WCE), I now believe I can face any challenge to "*Getting It Built*." Although I would wish the WCE experience on no one, there has been no construction-phase issue since then that can begin to compare with that fateful project.

The project that truly tested my resolve was a technically complex, low-bid, public project that was 250 miles away in an area of the state with only a small pool of local contractors and subs who can or will bid such work. Unfortunately, the one we got does almost exclusively low-bid work because few would hire him given any other choice. Added to the brew was a contentious project just completed by WCE at the same institution and timid owner representation.

Word for word, the first request for information (RFI) that we received read,

"The CMU is hollow!" We were so confused by that statement of the obvious that we missed what, in hindsight, was our first glaring red flag. The RFI actually should have said, "We ignored the notes on the drawing that delineated how to install a new steel lintel prior to cutting a large hole in the existing CMU wall, and as a result, the wall has cracked and is in danger of collapse. The reason this is your fault and not ours is that you did not indicate on your drawings that the existing CMU was hollow. What should we do now?"

In addition to contentious meetings, phone calls, and faxes, we ended up doing a fair amount of the general contractor's work. We laid out walls for the contractor because "our dimensions were wrong." When our drawing dimensions worked out perfectly, we were told that the reason was because "we measured from north to south rather than south to north." We also spent a great deal of time locating specified building materials for WCE that he claimed did not exist because he had never heard of them. These unfathomable, cutting-edge products included such things as solid six-inch concrete block, MDF, and gypsum board reveals. We even were asked for a color selection that had never been submitted but was suddenly critical to their schedule. That request and color chart was faxed to us posthaste. The all gray-tone color chart was on our bulletin board for quite a while. It was worth a smile each time we walked by.

Problems were not always the architect's fault. The contractor blamed the storefront sub for a problem with the rough openings. This is because the sub had told WCE he would build the storefront to fit the rough openings, but instead "he actually built it plum and square." Needless to say, we had a similar problem with the casework.

After months of heartache and harassment—through meetings when items were actually thrown at me—and after a second 10-page punch list, WCE said he was not going to rehang an egress door because it was my fault it did not open. First, he stated that nowhere did my drawings say the doors had to be operable. He was absolutely correct on that count, and to this day I do not include such a note on my drawings. (Too bad the spec actually stated the fact quite nicely.) Second, the door was poorly designed because I put it on the sunny side of the building. "When the sun did not heat up the metal door and frame, it opened just fine." Again, the lesson WCE tried to teach me went unheeded. I continue to put doors on all sides of buildings.

WERE ANY LESSONS LEARNED?

I am now convinced that the toll this experience took on me was not worth the thick skin that it developed.

Early in the project, I tried to have a professional, private troubleshooting discussion with WCE. I also tried to enlist additional owner support, but having just finished another difficult project together, both parties were more interested in just getting it done than in getting it done right. I sought counsel from the Best Contractor Ever (BCE) about how to create a more cooperative and professional atmosphere. They had some great advice, but it would have taken a buy-in by all of the parties to make it work. We lacked that buy-in.

From the beginning, it was obvious that there was a personality conflict in addition to a problem with me being a woman. At the time, I had a very young staff, and none of them could handle construction administration (CA) duties. They also would have been destroyed by WCE. We were at the end of our fees, and the extensive additional CA required to deal with WCE only increased the loss we were going to take on this project. As a result, I felt I needed to stick it out, take the abuse, and see the project through. In a small firm it is difficult to change personnel to meet various personality demands. In hindsight, I should have read the personalities better, outsourced the CA on this project, and taken the financial loss.

Karen L.W. Harris, AIA, is principal of Architecture Matters Inc. in Denver and immediate past chair of the Small Project Practitioners Advisory Group.

TIPS

Manage Project Closeout

By Louis B. Smith Jr., AIA, Ann Arbor, Mich.

Project closeout is one of the hardest parts of the job. Take the time to manage owners' expectations regarding the closeout process. You may want to let them know what they must do themselves to get the project in magazine-ready condition. You may also want to clarify for them the limits of the contractor's responsibilities for equipment installation and other end-of-contract work. You might go so far as to have a reference available for handyman services to help them get the place into the condition they want beyond the contract requirements.

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