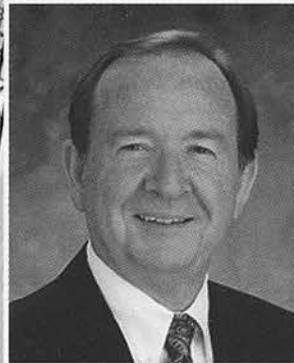


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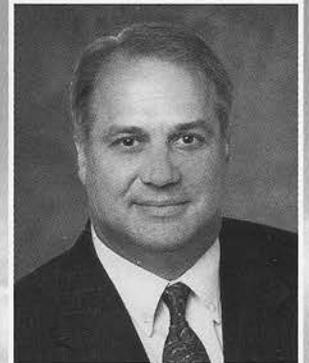
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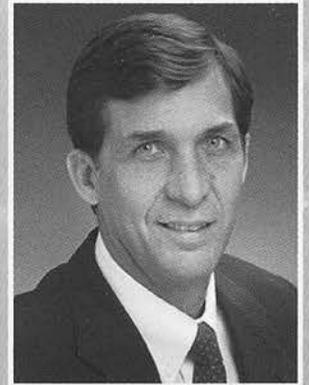
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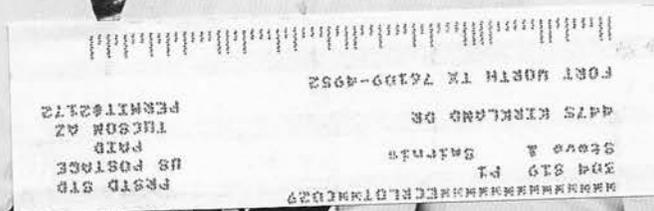


Dave Baer, Vice President
San Antonio



Doug Worrell, Vice President
Estimating

At Knox Park (from left to right): Wes Duke,
David Pinson, David Clowers, and Gary Morgan



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Bridging the Gap

By John Spencer, International Construction Data, Inc.

The computer age has changed many aspects of virtually every industry. Ours is no exception. Arguably, some are for the better, some are not. If we could look ahead to the future, say 200 hundred years from now, it would be very interesting indeed to see how the computer has either enhanced or detracted from the quality of human life. For me it would be especially fascinating to see how a set of plans is made ready for use in the field.

If we could jump into our time machine and work with the builder of the future for one day, it would give us back here in the 21st century the proper frame of reference to understand that our methods are still evolving and will change. The fact that we still use paper in this digital age will no doubt seem laughable to our future builder, but would seem perfectly logical to the builder of 2,000 or even 5,000 years ago.

The importance of a set of plans, no matter what the medium or what time period in human history, cannot be overstated. It is quite literally the "bridge" between concept and concrete, imagination to reality. There is no other single item that contributes as much to the successful completion of a project. Even the best con-

tractors can be overwhelmed (and in some cases overcome) by a truly bad or incomplete set of instructions. At best the delays and extra cost involved can be enormous—at worst, everyone loses. The owner may not get what he wanted or paid for and the builder can't recoup what he has had to spend to try and correct the problems. If he does, it will ultimately cost the owner.

There are many factors that can contribute to a less-than-adequate set of plans, not the least of which is money. While money itself cannot guarantee a perfect set of plans, the lack of money or insufficient budget can "hamstring" a design team and cause problems before the first machine starts moving dirt. Changes made to a design, if not carried from concept (owner/architect), to engineers (structural/civil), and finally to builder—if that protocol is not followed exactly (it evolved that way for a reason)—then strange things can happen.

In my 30 years of working between designers and builders, I have for the most part been very fortunate in working with some very great plan sets. Like anything else in this life, experience makes a difference. I have also been involved with some **PLANS FROM HELL.**

The objective of this article is not to lay blame on any one group or entity; rather, it is more important to examine or contrast a truly great set of plans with what we shall call a "not-so-great set of plans." In dealing with the affairs of we humans, it is important to keep in mind that none of us are perfect and mistakes and oversights are going to happen. With the great design teams and plan sets I spoke of, how these mistakes and oversights are handled are but one of the defining areas of the integrity and experience required to reach the plateau of excellence that these companies enjoy.

In an earlier Bridging The Gap, I made a comment that architects are required to think in concepts. It is important that their minds not be bound by the same restrictions that all of the other disciplines, structural, civil, contractor, etc., are forced to live with. If this were not the case, architecture would be quite boring and never change.

It is a powerful thing indeed when a architect and owner sit down and discuss something that only exists in the imagination and begin the process of turning a dream into reality. It is the most important (at least the most visible) aspect of our existence, one that sets us apart from the rest of God's creatures. The architect's position is not casual.

As the progression from imagination to

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concrete takes place, it is also imperative for the architect to understand that no one else in line has the luxury of imagination. Every step now has to be detailed and it is this attention to detail that will make the difference in the DNA, if you will, of our project.

Every organic, carbon-based organism, from amoebas to zebras, comes with a set of instructions—their DNA. Leave out a specific strand of DNA (a page of instructions) or let a cosmic particle alter the strand from actually hitting it, and you will get something different than what you expected. The same is true for our project.

This attention to detail requires someone to know all of the parts of the puzzle and how they all fit together. A daunting task, but someone has to know. That responsibility rests with the architect. (In the DNA analogy, it rests with the ultimate Architect.)

When the concept is clear in his mind, the structural engineer decides how the structure is to work. This includes EXACT dimensions to concrete (literally) corners and EXACT elevations to each part. The plans that work best during actual construction have these details in exact lines to exact points so that when a construction worker wants to know how far it is from one corner to another or one event to another, he can get the dimension from his structural plans. The same holds true for all the other disciplines. The more detail, the better the chance of all parties having a trouble-free, successfully completed project. (The experience I spoke of earlier is the knowledge required to know which details are critical and which are not.)

In my business of “prebuilding” projects to ready them for the contractor, I have worked with many sets of flawless plans—all the dimensions required to build the structure are on the page, checked and working as planned. The

outside dimensions and angles add up correctly and the building “closes”—it is square. As basic as this sounds, it is not always the case. Sometimes the plans leave out critical measurements and sometimes they simply don’t add up correctly. Many times there is simply a miscommunication between the architect and engineer. Something is not clear. The details are left to the builder to discover—one way or the other.

The advent of computer-aided drafting (CAD) has at least the potential of eliminating many of the gray areas between concept and reality. Today’s architect is able to draw his concepts out in the electronic format and transfer this information to his engineers. In a perfect world, the architect draws his concept to exact scale, all of the disciplines take this drawing and use it as their base and everything fits as planned on the first try. The problem, of course, is that this is not a perfect world. The original design rarely becomes the final design and changes occur constantly.

Many factors including but not limited to budget constraints, planning and zoning, esthetics, and whims contribute to the chaos that can follow major and minor changes to a design. But at some point, the design has to be pronounced finished and the process and progress to the final plans is set in motion.

It has become standard operating procedure at ICD to have two draftspersons independently draw (electronically) the foundation plans to scale and overlay them. In this manner we can find our own mistakes. This process locates all of the piers, building corners and radii and any other significant events in the building just as the construction team would attempt to do it in the field. If the engineer tells us that he has drawn his building to scale, then we will compare his drawing to ours making one more check (impos-

sible to make too many checks).

Many times the engineer will explain that changes have occurred after he has completed his drawing and there is not enough time or money to redraw the changed areas to see if the new dimensions will work as planned.

As I have stated earlier, it has been my good fortune to work with some truly great plan sets. I have also experienced some that left much to be desired. Large prefabricated metal buildings built with a very different footprint than the foundation, critical dimensions wrong or totally left out (some intentionally), incorrect angles with no closing distances, and on and on ad infinitum...almost all of which could be caught and corrected with the aid of CAD. The relatively small amount of time to draw or redraw something to scale is far more desirable than finding out the problem is serious after it turns into concrete and steel. Electronics are always cheaper than concrete and steel.

In closing, I will simply restate my firm conviction. The most important piece in the complicated puzzle that will become a finished project is the plan set. The amount of detail and attention given this Holy Grail will pay big dividends for all involved—owner, designer, and builder. Every minute spent checking and completing the instructions will translate to hours/days/even weeks of time and money saved in the construction phase. To do any less than the best is to see that advantage evaporate.

It is the objective of all parties involved to swiftly construct a project with as few problems as possible. Granted, there are some things simply out of human control, but good plans are not on this list. Will the digital age be part of the solution or part of the problem? Are we really getting more work done because of the technology, or are we becoming a slave to the increasing demands created by it? I think if we could sit down with our counterpart in that time machine of the future, he might very well tell us of a problem we are just becoming aware of—that the *quality* of our work and even our lives may be affected by this exponential growth in technology.

“Don’t be seduced,” he might begin, “by believing that more is always better. The real danger is replacing quality with quantity.”

I’m sure he would stroke his gray beard, pause and finish, “It all depends on where you place your priorities.”

Of course, he would have the advantage of history.

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