

STRUCTURAL ENGINEERS as primes

Richard G. Weingardt, P.E.

Often, structural engineering discussions explore whether structural engineers should be prime designers—those who lead the design and/or design/build teams. These debates eventually come around to two questions:

Are structural engineers appropriately educated and trained to head up and manage design/construction groups? And do they have the right stuff?

For those answering “yes” to these questions, the follow-up question is always: on what types of projects should structurals be the prime? Regularly, at the top of that list are parking structures, warehouses, industrial facilities, bridges, towers and projects modifying complex structures. Yet rarely are structural engineers the design-team leaders, even for these types of projects. Why?

Some would suggest that doing leading-edge structural design requires one to focus on keeping abreast of all the structural industry’s latest, greatest analytical tools and techniques. And there is little time for structurals to broaden their knowledge of other disciplines or refine their management and people skills needed to be a prime designer. Fortunately, not all structural engineers agree with this conclusion.

With the increasing use of design/build systems, highly specialized and narrowly focused experts, like

structural engineers, are being pushed further down the food chain away from leadership. This seriously weakens control of this industry’s destiny as a respected profession.

Loring Wylie, head of Degenkolb Engineers (well-known seismic experts from San Francisco), said, “Structural engineers should be the team leader on jobs that are predominately structural in nature. When they are, the owner gets a better job, and usually for a better price.” However, the vast majority of projects his firm handles are people-use buildings needing heavy architectural and planning expertise. “Architects are traditionally the design leaders for such projects,” added Wylie.

One of the drawbacks for many engineers managing a design team, according to Wylie, is that “engineers want to stay in cubicles. And, the reputation of the profession is that its members don’t have good people skills. Project management, even for structurally heavy jobs, requires that the team leader had a general understanding of electrical, mechanical, architectural and water-proofing systems.” Many structurals don’t, and this limits their ability to hold leadership roles.

Like many consulting structural companies, Degenkolb does a certain amount of prime design work. For them, it amounts to 25% of their firm’s total fees and is mostly for buildings requiring seismic strengthening. In the

past, Degenkolb had also served as a prime on parking structures. “This type of work [however] has decreased for us lately,” reported Wylie. “Many garage projects are now being done by specialty firms [like Walker and International Parking] who concentrate on parking garage design. Plus, the parking structures we now engineer are wrapped by commercial spaces. Because of the amount of architectural detailing involved, an architect is the team leader.”

“Structural engineers should be the team leader on jobs that are predominately structural in nature.”

The Degenkolb model is common for most traditional structural engineering companies involved in building design. Businesses only get beyond the 25% prime-design mark when they diversify their staff, adding architects or other widely trained and educated professionals. Single discipline firms, like structurals, are mostly “interpro”-consultants hired by architects, A/Es and multi-discipline engineering companies. Because of this, purely structural firms tend to be small. Among those who are members of the American Consulting Engineering Council (ACEC), the average size is eight people.

Not only do structural consultants often do work for other designers (who are the prime), they are sometimes positioned in a subservient role—and often selected by lowest price alone. Hardly ever does a structural engineer hold the highest position of authority for a major construction project or within a large public or private agency. Here are a few examples. Jack Lemley, in charge of the construction of the \$18 billion Chunnel project, was an architect. Bill Smith, who directed the design and construction of the \$5 billion Denver International Airport until his death, was a civil engineer. His replacement was another civil engineer, Ginger Evans.

If current trends continue, narrowly focused structural engineers will be pushed into the background more and more.

Though structurals are the heads of structural or bridge divisions for state departments of transportation, rarely, if ever, are they the top person – the Director of Transportation. In fact, when structural engineers are hired to design bridges or other highway structures, it is often as an interpro working for a civil, transportation or highway engineering firm.

Those structurals who have broken the 25% threshold for prime design work have found a niche market that allows them to work directly with owners, bankers, developers, insurance companies, manufacturers, etc. Or they have become E/A firms, in which structural engineers still control and run the company, but have on staff architects and/or engineers comfortable with management responsibilities.

If current trends continue, narrowly focused structural engineers will be pushed into the background more and more. They'll be treated as highly specialized technicians. And fewer of them will head design/build teams.

For the structural engineering profession to have more of its members in

leadership positions on construction projects, in multi-discipline departments or as prime designers in the future, what is needed? Its emerging leaders dedicated to broadening the scope of their talents.

To lead rather than be led demands that young structural engineers, especially those who want to expand their horizons, be more broadly trained and aware of all the other engineering and architectural systems that make up the total building package—and encouraged to hone their leadership, communications and people skills to the highest level possible.

You can help bring about the educational and industry changes necessary to accomplish this. You only need to step forward and take the lead today for the profession's well-being tomorrow.

Richard G. Weingardt, P.E., is CEO and chairman of Richard Weingardt Consults, Inc. He may be reached at 303/671-7033 or via email at enrgs@weingardt.com.

