



## Five Tips for Engineering Managers

By Stan R. Caldwell, P.E., SECB

**A**fter forty-five years of experience as a structural engineering manager, including much trial and error, I have learned what works well and what does not. Based on what I have learned, I would like to offer this advice on five important topics.

### Swim Upstream

More than one hundred years ago, master builders like Eiffel and Roebling dominated the structural engineering profession. Since then, structural engineers have gradually moved down the “food chain.” Whether self-imposed to reduce liability exposure, or shoved aside by more ambitious professionals, many structural engineers now find themselves in unfortunate circumstances. MEP engineers typically receive higher fees than structural engineers, while providing less effort and taking less risk. Architects and civil engineers are almost always the prime professionals on building and bridge projects, respectively; and they frequently select structural engineers based almost exclusively on price, often neglect to include them in the critical conceptual phases of their projects, and pass along as much of the liability exposure as possible.

The most effective remedy for this situation is to proactively steer your firm upstream. Structural engineers are not prohibited from acting as the prime professional on any project, and some firms are seizing that opportunity. Strive to work directly for project owners whenever possible, and to earn a seat at the “big table” where the earliest and most important project decisions are made. Always remember: other parties can only maintain your inferiority with your consent.

### Stay in Your Lane

Most jurisdictions offer only generic P.E. licensure, which allows an engineer to practice in any area where they feel they are competent. This practice has resulted in structures designed by civil, mechanical, and electrical engineers. Some structural engineers also stray out-of-bounds. When an engineer practices outside

their area of competence, the results are often disastrous. I witnessed a particularly egregious example involving a mid-rise luxury condominium tower overlooking a prestigious golf course. The structural engineer on this project, the leader of a small structural design firm, also decided to act as the civil, mechanical, electrical, and plumbing engineer. He engaged a sole-practitioner architect, provided office space for him, and overruled much of the architectural design. Then he started a construction company specifically to build the project and a testing laboratory to inspect it. In addition to all of this, he served as the managing partner of the developer. As you might imagine, the project encountered multiple problems. The litigation that followed has been ongoing for six years, and the engineer, the contractor, and the developer have all declared bankruptcy.

I encourage you to be entrepreneurial, but only if you stay within your areas of competence or add new competencies through education and experience, or by acquisition.

### Embrace Construction

Only accept assignments that include full construction administration services. It is during construction that your risk is highest and more disputes arise there than after completion. If the construction is deficient, you will be a party to any subsequent litigation whether or not you or your staff visited the job site. Insist on being paid for site visits and regularly visit every job site to ensure that your design intent is achieved.

Structural engineers are often asked to certify the construction of their projects, and they often get themselves into trouble by doing so. You should never certify any construction unless a member of your firm provided observation of that construction. My advice is to certify only what you or your staff have personally observed and know to be fact.

### Cherish Your People

Few firms enjoy truly unique technology, facilities, and other resources. The only

long-term competitive edge that any firm has is its people. So hire only the best and the brightest. Place them in a professional environment with clear office policies, effective collaboration, first-rate technology, meaningful mentoring, real opportunities for training, and exposure to the profession beyond the workplace. Then challenge them with diverse projects and a bit more responsibility than you think they can handle. Correct their errors and shortcomings, but also reward their accomplishments with timely bonuses and recognition. Promote based on merit alone, and let the cream rise to the top regardless of seniority. Most important of all, listen intently to the thoughts and concerns of every person and act on what you hear.

With the right people in the right environment, your firm is sure to prosper.

### Make a Profit

There are many firms that never decline a project. Others gladly accept whatever fee is offered. Still others are content to work on handshake agreements without any written documentation. In doing so, they set the bar too low and damage the profession as a whole. Although engineering managers might be reluctant to admit it, their firms exist to make a profit. You are running a business, not a practice. Accordingly, without compromising your integrity or professionalism, you should strive to make a profit on every project. Insist on written agreements that adequately define your scope, schedule, and fee. Fulfill your commitments and never hesitate to demand additional fees whenever your scope grows or additional services are requested.

Profitable firms are healthy firms, but they are maintained only through a sharp focus. ■

*Stan R. Caldwell ([StanCaldwellPE.com](http://StanCaldwellPE.com)) is a consulting structural engineer in Plano, Texas. He currently serves on the SECB Board of Directors, the SELC Steering Committee, and the SEI Task Committee on Digital Presence.*

*Structural Forum is intended to stimulate thoughtful dialogue and debate among structural engineers and other participants in the design and construction process. Any opinions expressed in Structural Forum are those of the author(s) and do not necessarily reflect the views of NCSEA, CASE, SEI, C<sup>3</sup> Ink, or the STRUCTURE® magazine Editorial Board.*