

The Responsibilities of a Structural Engineer

By John G. Tawressey, S.E.

Reviewed by the CASE Risk Management Program

In the previous article dealing with Risk Management (*Structure*® magazine, December 2006), Risk Management was defined as one part of managing our work to reduce the risk of an unfavorable project. This definition recognizes that rigid adherence to traditional Risk Management recommendations, such as the importance of having an executed written contract for every project, is not enough; it is not sufficient for long-term Risk Management success. Preventing claims requires more than following prescriptive procedures. It requires that we practice the profession correctly.

To further this dialogue, this second article will discuss the responsibilities of the structural engineer.

According to state professional licensing regulation, our primary responsibility is “to protect and safeguard the health, safety, welfare and property of the public”. The ASCE code of ethics states “...engineers shall hold paramount the safety, health and welfare of the public...”. Thus, we are responsible to the public. We are also responsible to our clients. (This can put us in an awkward situation if the public interest is different from our clients). We are also responsible to the users of our designs including contractors, sub-contractors, lenders, insurers, tenants, customers of tenants and the occasional wanderer through the project (third parties). It appears we are responsible to everyone – and we are.

What does it mean for structural engineers to be liable? If we are liable, this means that we are responsible for damages suffered by another party. A structural engineer who is liable for damages has, by definition, practiced the profession in a negligent fashion. The emphasis here is on the word negligent. To avoid negligence, we must exercise the degree of care and skill that society reasonably expects of a prudent and careful structural engineer working under similar circumstances. If we do less than this, we fall below the “Standard of Care” and are considered to be negligent in the performance of our services.

Four conditions are necessary for an adversary (plaintiff) to prove professional negligence and liability: 1) There must be a duty for the structural engineer (defendant) to perform; 2) There must be a violation of that duty; 3) It must be shown that the violation of the duty was the proximate cause of the problem; 4) There must be measurable damages.



Photo courtesy of www.sxc.hu

Our professional duties are defined by the Standard of Care (how others would have performed given similar circumstances). Knowing what the prudent and careful structural engineer would do in a given situation is sometimes difficult to determine. But it is helpful, in the day-to-day practice of our profession, to frequently ask the question, “What would a prudent and careful structural engi-

neer do?” Ask yourself. Ask another engineer in the office or ask at various professional association gatherings. Collaboration among and between our structural engineering peers is one of the most effective ways to practice Risk Management.

The second condition, a violation of our duty to perform, is normally assumed to exist if something goes wrong. When things go

wrong, someone must have violated a duty to perform and the process begins to identify the culprit. The structural engineer is usually in the mix. Take for example the duty to conform to the Building Code. Conformance with the code is an expected Standard of Care. When there is a problem, it is not hard to find an expert to interpret the overly complex codes in a way unfavorable to the defense. But, even if all agree that we are in conformance with the code, it does not necessarily mean that we practiced at or above the Standard of Care. If expectations are not met, but we are in conformance with the code, we may still be held responsible for an unfavorable outcome.

The third condition, proximate cause, often becomes a major issue in assessing responsibility. Structural engineering expert opinions are usually at odds. Attorneys have difficulty in assimilating and understanding the complex technical issues associated with connecting the loss occurrence to the necessary prerequisites. There is no end to the creative and often defective logic that typically links our professional practice to the plaintiff's loss. For this reason, the best Risk Management tool is to practice the profession so as to minimize the chance of making mistakes (more on this subject in later articles).

Finally, there must be measurable damages. Damages grow, sometimes very quickly. It is generally in the structural engineer's interest to resolve mistakes as early as possible, regardless of whose mistake it might be. Most professional liability insurance carriers have early action programs (pre-claim programs) so issues can be addressed before they get worse. When stuff happens, even if you are sure that you have not practiced below the Standard of Care and you are in conformance with your contract, but someone thinks you caused a problem, the issue should be addressed and professional assistance obtained. Good Risk Management requires communication of potential or real problems to a principal, lawyer and/or insurance carrier. In the early stages, perceptions are reality, and open communication and collaboration with other experienced professionals is essential.

In summary, we are not responsible for every mistake that we may make. As professionals, society allows us to make mistakes. This premise not only allows for more cost-effective custom design, but also provides for opportunities to advance the technology. We can make a mistake, but it can't be a mistake that the average engineer would have avoided under similar circumstances and conditions.

That is the theory. From experience, our responsibilities are somewhat broader. In reality, what are we responsible for? We are responsible to foresee and prevent unfavorable outcomes. It is the "You Should Have Known Rule" that will ultimately decide what you are responsible for. If in hindsight, you could have foreseen and prevented the unfavorable outcome, then you will likely be held responsible.

An example is a project consisting of a conventionally reinforced concrete flat slab building, constructed during the winter with floor forms removed and re-shores installed after only two days of cure. The following summer, after completion, the brick veneer over steel studs cracked in an unusual pattern. A claim against the structural engineer resulted. The owner's experts asserted that the design of the primary structure was too flexible to adequately support the veneer. The structural engineer's expert claimed the formwork was removed too early. Depositions, mediations and extensive analysis failed to resolve the claim (the engineer who sealed the plans was sued personally as well as the firm). At a last ditch attempt to settle before trial, one of the attorneys placed a photograph on the table. It was a photograph of the brick veneer being laid


from the scaffolding. It clearly showed that the re-shores (for all floors) were still in place. Unfortunately, it was the structural engineer who took the picture during a site observation visit. He failed to foresee the consequence of the re-shores being in place while the brick was being laid, and consequently failed to prevent the resulting cracking. He paid (look for more information in this continuing series).■

Risk Management Recommendation:

Ask yourself the question, what would a prudent and careful structural engineer do? Meet the expectations of others as best you can. Don't make mistakes. When stuff happens, tell someone and be smart to avoid project problems.

Read the next four articles.

John G. Tawressey S.E. is a Vice President of KPFF Consulting Engineers, Seattle Washington.



kpff
www.kpff.com

Seattle, WA
Tacoma, WA
Portland, OR
Sacramento, CA
San Francisco, CA
Los Angeles, CA
Irvine, CA
San Diego, CA
Phoenix, AZ
Denver, CO
St. Louis, MO
New York, NY

W Hotel
Seattle, Washington