



Do's and Don'ts During Construction

By G. Daniel Bradshaw, CPCU, MBA

While working with design professionals for the past 29 years as a Professional Liability Agent, the author has learned a great deal about the construction observation process. The most important lesson – how structural engineers can improve their construction observation processes to reduce risk and reduce the chance of being involved in litigation. This article examines common issues structural engineers frequently encounter during construction and offers suggestions for improvement.

Pre-Site Visit Issues

Substitutions

Contractors love to make substitutions. Because substitutions during construction may pose a risk to the project and the design team, structural engineers need to have formal procedures in place to control the number of substitutions and define a method for evaluating them. The formal procedure must clearly define the process that a contractor must follow to request and obtain approval for a substitution. The approved procedure should require a formal submittal which includes the manufacturer's literature, complete product specifications, test data, and approvals for each proposed substitution. It should also include a statement containing reasons and justifications for requesting the substitution.

Value Engineering

Often projects receive some form of value engineering. The author's clients describe the best time for value engineering as early in the design process; however, it is surprising to learn that projects usually get some form of "value engineering" before or during construction. In most cases, the value engineering is done out of desperation by an owner or contractor to save costs. In many cases, when value engineering is done during construction, the cost-saving substitutions become the subject of costly claims later on. Unfortunately, too often, an owner spends a lot of money and time to fix a problem after construction begins by hiring experts, lawyers, and so on. However, they are not willing to spend money or time for a proper solution during design. Structural engineers need to continually educate owners, contractors, and architects that real value can be obtained if value engineering is conducted during design and not as a cost reduction during construction. Structural engineers

also need to call the activity value engineering at the end of the design process and during construction "cheapen engineering," as that is often what it actually is.

Communications

XL Catlin, a professional insurance provider, gathers information each time a professional liability claim is presented. This information forms the basis of a very large database of claims that provides insights into the causes of claims. For each claim, they strive to determine which "non-technical" areas fit the claim. "Non-technical" issues are typically the things an engineer does in his or her practice that were not taught in school. A large "non-technical" issue identified in over 35% of claims is poor communication. Structural engineers should strive to improve communications on projects by implementing a weekly status report. This report can be sent to the appropriate people inside and outside the firm, and clients and owners. It highlights the status of the project, items of concern, and rationale for all decisions that were made to-date.

Issues That Arise While on a Site Visit

Do Not Be Forced to Make Quick Decisions

One of the author's first lessons as a young agent working with a seasoned Architect was to never make a decision quickly when pressed by a contractor or a client over the phone, during meetings, or during a site visit. This architect pointed out that he had learned that, every time he was pressed to make a change, he later had to change his mind and tell the contractor or others that the proposed change would not work. Too often something that looks attractive while under pressure to make a decision can quickly become a problem later. Better answers, he said, are found after hours of contemplating solutions to the problem and considering their impacts on the overall design. He recommends telling the contractor and client that he would take the issue under advisement and a decision will be made in approximately 24 hours, if the change is feasible. This gives time to review the change and consider what impacts it might have on other aspects of the design.

Always Walk the Site with the Contractor

When conducting a site visit, check in at the site trailer and with the project superintendent.

If possible, conduct the visit with a person who has the authority over the project or site. Doing so ensures that any issues that are discovered are also observed by an authority figure responsible for the construction.

Photographs Should Focus on the Problem

Photographs are valuable tools and provide reminders from a site visit. Photographs can increase an engineer's exposure to risk if used incorrectly. Do not take pictures of the overall site which may include problems that were not noticed. Photographs should focus only on the problem areas identified at the time and that need to be emphasized. Sometimes, an overview picture of surroundings or assemblies are needed to provide context, but always zoom in and focus only on the specific issue that is of concern.

Write the Construction Observation Report as Soon as Possible

Take notes during the site visit, and then commit the site visit report to paper or a computer file as soon as possible so that any observed issues are fresh and easy to recall. A template can help record routine items such as the date, the weather, trades on the site during the visit, and other general items. Steer away from generalizations such as "everything looks great," and use detailed descriptions about the items to describe any issues observed and how they should be corrected. When writing the site visit report, always be specific and clear.

Go Through Proper Channels to Stop Work

When construction specifications and details do not appear to have been followed, do not be quick to issue a stop work order. Typically, the engineer's contract is silent on authority to stop work. Contractually and practically, it is better to have the right to "advise the client" to stop the work when it appears construction does not meet the design specifications. Seek other ways to keep other parts of the project on schedule. Stopping the work outright can have huge financial consequences for the owner, contractor, and structural engineer.

Special Inspections

Special inspections may be required by the project specifications. However, promptly receiving the special inspection reports can be a challenge. A time frame for receiving special inspection

reports should be addressed in the construction documents and during a pre-construction meeting. As a tool for improving communications on a project, a Time Frame Chart and a Communication Hierarchy chart can be more useful than just a written document specifying the procedure and time frame to be followed.

Safety Issues

During a site visit, safety issues may be observed. How they are dealt with is a critical procedure. Most structural engineers have very good practical knowledge and no experience or background in OSHA or other safety training. If there is a construction related injury, everyone with anything to do with the project could find themselves at risk to the injured worker. It is likely that the contract the structural engineer is working under contains no responsibility for job site safety or contractor means and methods. This is the reason why the method in which an engineer deals with an apparent safety issue on the site is so important. If safety issues are noticed, the structural engineer should report them to the on-site project superintendent, using language that clearly states that the observation was made by a professional who is not an expert in safety or means and methods. The site visit report must also include some detail about what was observed that appeared unsafe, what, if anything, the structural engineer did, and who was alerted about the issue. The report should be sent to the structural engineer's client as soon as possible, so they are aware and can make appropriate notifications to the contractor. However, beware that the act of reporting does not change the structural engineer's contractual role and reclassify that role as an inadvertent on-site "safety expert." Safety on the site is a contractor responsibility, so it is important that an engineer not assume that role. This area of job site safety should be addressed at the firm level and procedures established within the firm so that each person visiting a site acts in the same manner to perceived safety issues.

Recognize Problems Early

A significant challenge for many structural engineers is recognizing symptoms of problems during construction that have the potential to blow up into bigger problems, or worse, a professional liability claim. The following are good reference points that signal if project issues are spinning out of control:

- Finger pointing; various trades or sub-consultants blaming others for problems.

- Construction costs over budget.
- Project construction behind schedule.
- The client or their representatives exhibit a curt attitude toward the structural engineer.
- An abnormal amount of RFI requests from the contractor.
- Payment issues, such as the owner not making timely payments to the design team or contractor, or the architect not paying sub-consultants in a timely fashion.
- Turnover of project superintendents.
- Turnover of project managers within the design team.
- The client hires another engineer to look at issues on the project.

What to Do if You Spot Trouble

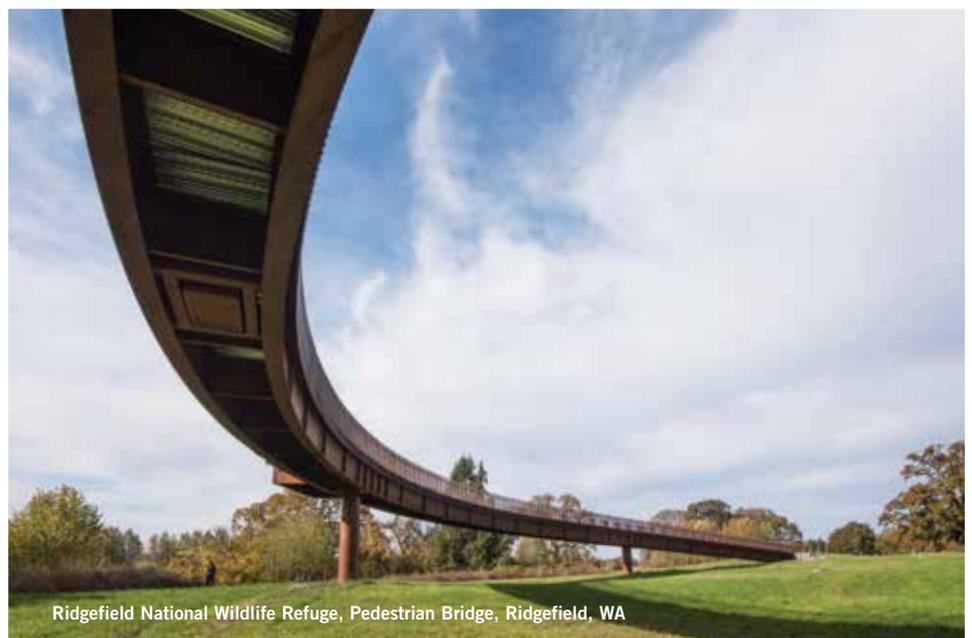
Often, Professional Liability Carriers can provide behind-the-scenes assistance to diffuse many types of problems. Tools, like an informal mediation session with the parties early on, can diffuse an issue that could become the subject of a costly Professional Liability Claim. Hiring another expert to review the structural engineer's work is a good option when intense finger pointing

about a design issue arises. Having an attorney review a particular stance that was taken on an issue can provide an engineer with confidence to stand up for what they believe is the right course of action.

Keep in mind, as symptoms of problems are recognized, if the client is demanding money or services to "fix a problem," this request might also meet the definition of a Professional Liability claim. It may trigger a duty to put the structural engineer's insurance carrier on notice. When in doubt, contact a Professional Liability Agent or Broker, tell them what has been recognized, and seek their advice on what to do next.

Using some of the ideas in this article and ideas from other professionals, an engineer can develop a standardized approach to site visits, site reports, and how to spot trouble areas. This standardization helps avoid problems and can lead to more effective site visits and procedural consistency. ■

G. Daniel Bradshaw, is a professional liability specialist in Bountiful, Utah. He has served on the board and is a Past President of the Professional Liability Agents Network (PLAN), an association of agencies and brokerages serving design firms in the U.S and Canada.



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