The ESG Report

SUMMER 2007

# How to Communicate With Your Structural Engineer - Part 2

This edition of the ESG Report is the second part of an article series that addresses how to communicate with your structural engineer – or 'Engineer-Speak 101'.

In our previous article, we described some of the basic concepts and terms you should understand in order to better communicate with your engineer and the general concepts of what you can anticipate in discussions with your engineer. The better you understand your engineer's needs, the better you can prepare for those first few conversations. You should expect a lot of questions about your project's geographical location, its applicable codes (and specifications), and especially about your expectations of the final deliverables. As we continue to expand on our discussion, let's start with expectations.

Managing expectations seems to be a popular term in the corporate vernacular. Clearly conveying your expectations is often a challenge, particularly with a fast-tracked project. The quality of information you provide is directly related to the quality of the engineer's deliverable.

## THE DELIVERABLE

The entertainment industry is known for the creative make-it-up-as-you-go mentality – and there is little difference on the technical side. However, from an engineering perspective, this philosophy is not conducive to producing the most efficient deliverable. As we described in our last article, engineers are bound by professional ethics, codes, and by-laws to exercise due diligence in their work. The product of this work will contain their professional engineering seal. Generally speaking, this involves a repetitive process that checks every element of a design for compliance and safety. The engineer prefers information from the client that is as complete as possible, essentially permitting a linear process – start at the beginning, finish at the end with little detour in between. Every detour is extra time, and time is money to the client. When the client provides a creative concept, that concept almost always requires translation into the nuts and bolts; and therefore, into the loads and reactions required by the engineer to perform a review.

This isn't to say that engineers are not or cannot be creative. Previously, we generalized basic differences between analysis and design. The analysis process can be creative if the engineer is exploring new ways to justify current construction technology. In our own experience we've discovered creative ways to address concerns like seismic design in T-bar walls, as they pertain to the scope of a larger system analysis. We haven't necessarily designed new ways to build T-bar walls as much as we've simply explored new ways of justifying the existing designs in the analysis process.

However, the design process is really where creativity plays an important role for the engineer. Remember – design almost always occurs as a separate and demarcated part of the work scope; design is time and time is money. In the most efficient scenario, the client provides technically correct drawings and calls out estimated loads, connections, and components pertinent to the system. The engineer then reviews this information for compliance with applicable codes. Note that we haven't mentioned "design" anywhere in this hypothetical best case. If the original system isn't properly designed, properly drawn, or doesn't accurately illustrate complete intent, then the engineer must either go back and ask more questions, or must divert from a review process to begin a design process – repetitive and tedious.

Using proven methodologies almost always helps your engineer be as efficient as possible, but what happens when you're asked to provide something non-standard? In that case, instead of using template analysis processes, the engineer must build a new analysis process from scratch. If you will require an engineer seal on multiple but similar projects, you can expect that

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Entertainment Structures Group (ESG) will be celebrating their 5th anniversary in style — with a booth at this year's LDI show (November 12-18 in Orlando, Florida).

Come join us at booth #1486 and meet the team. Stay for interactive presentations and question-answer sessions. Learn how ESG can help you with your next show.

Sign up for the LDI ESTA Tech Track session, *Pipe Dreams: Evaluating the Feasibility of Adding Grids to Existing Structures* (Nov. 18th 11:00 am—12:30 pm) to learn about the loads imposed on a building by dead-hung pipe grids or other specialized supporting substructures. See you there!

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the initial analysis costs will be higher, as the process template is built. This doesn't mean that you're paying for the engineer to learn about your system – you are paying for the engineer to become more efficient on subsequent projects. Repetition leads to economy of scale. There's no substitute for completeness and accuracy of information – often, if this is done correctly the first time it facilitates efficiency on subsequent projects provided they have similar equipment, layouts, loads, and systems.

**DUE DILIGENCE**

If you're following this short series of articles, you may have noticed another recurring term: *due diligence: the degree of care that a prudent person would exercise*, which is also characterized as *a legally relevant standard for establishing liability*. In our last article we mentioned that we would visit this topic again, and this is the perfect opportunity to do so. The concepts of work scope and analysis process help illustrate what generally constitutes due diligence – but more importantly, what does not constitute due diligence.

To reiterate: the engineer has a professional, ethical and legal obligation to exercise due diligence in their work. Probably the most important reason for this is because the engineer's work scope almost always includes a final act of placing an engineering seal on a document. This attests compliance with all applicable legal and safety requirements of the systems described in the documents. Generally, there are a few basic steps to achieving this:

- The engineer must be specifically trained in the branch of engineering pertaining to the scope of work – in other words, a mechanical engineer can't seal work of a civil or structural nature. Although in many states, there is no distinction between a civil and a structural engineer (Steven Schaefer Associates is licensed as professional engineers in all fifty states).
- The engineer must be experienced in the scope of work being performed (Steven Schaefer Associates has at least eleven engineers in the ESG Division with specific experience in entertainment-related systems).
- The engineer must have sufficient knowledge of the work to make design decisions or answer questions about the design process. In many cases this also means having sufficient knowledge to assume complete responsibility for the work product – and here's where we hone in on an aspect of due diligence that most people aren't familiar with: sealing requirements for documents.

**SEALING REQUIREMENTS FOR DOCUMENTS**

Did you know that many states don't allow the professional engineer to seal work that has been produced by others (i.e. a client's drawing)? Being licensed in all fifty states, we are obligated to know and understand each state's legal and professional requirements. Each state imposes their own specific set of engineering codes of ethics and engineering laws. By our interpretation, twenty-six states generally prohibit the engineer from sealing work produced by others. Of those twenty-six, nineteen have explicit language to that effect.

What does that mean to you? It means that if your company has produced a set of drawings for a project in, for example Pennsylvania, then we can't seal those drawings because we didn't produce them. In that case, we can provide a letter of review, which essentially states that we have "…reviewed the documents in question and have found them to be incompliance with applicable codes, even though we did not produce them…"

In contrast, other states allow us to seal your drawings provided that we retain the right to modify them as necessary to achieve compliance. Such a right conveys a sufficient element of responsibility to us, allowing us to maintain direct control over the work product. In fact, our fee proposals and contracts frequently contain the language "we will direct you in the production of CAD drawings for our review and seal, and we retain the right to change the work at our sole discretion".

This is becoming a major factor because many states are concerned about a concept of "plan stamping." Basically plan stamping is considered an act in which a client is paying for the engineering seal, rather than for the underlying analysis and design. If we were to parse it down to semantics, we'd say that you aren't paying us for a seal, you're paying us for the experience, the analysis, and the assurance that goes along with it. To provide that to you, we are obligated to exercise due diligence, follow all engineering rules and regulations, and provide factually correct approvals, verified through a thorough review and quality assurance process.

Come by and visit us at our LDI booth #1486 this year in Orlando. We'll have a wealth of information to help you understand what we need to provide you with the best possible engineering service.



## News and INFORMATION:

ESG is working on a new web site to provide you with better information about our services — along with project examples, white papers and past issues of the ESG Report.

Get to know ESG better when we launch this site in late September! Want to know when it's live? Send an email to elizabeth.baron@entertainmentstructures.com to be added to our growing email list!

## Project SPOTLIGHT:

**KENNY CHESNEY TOUR 2007**

ESG is working with their client to provide construction submittal documents for the Kenny Chesney Tour 2007. The tour uses the new Gen2 roof system, consisting of (8) posts and steel roof trusses. The system is typically set-up in a 160' wide x 80' deep configuration, with an erection height of approximately 60'. The system is capable of supporting significant loads and can be erected in approximately eight hours.