The Good and the Bad with Delegated Design

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Structural engineers of record (SER) are always under some external pressure on projects. Is there enough fee? Is there enough time to complete the work? Is the project becoming more difficult and complex because of bad decisions made without SER input? Are the Owner's expectations unrealistic? Is there scope creep because other team members are passing the buck?

Delegated design – deferring the structural design of certain components or systems on a project to a specialty structural engineer (SSE) hired by the contractor – fills a role in today's complex projects that have tight schedules and aggressive budgets. There are plenty of good reasons why it might make sense to delegate the design but, regardless of the motivation, it is important to be aware that delegated design is not a panacea.

Before deciding to delegate a design, consider the pros and cons, the good and the bad.

The Good

There are structural engineers who are expert in specialized aspects of the profession, so why not tap that resource? For example, consider the office known for expertise in the design of timber frame structures using traditional joinery with wood pegs. Bringing a true expert onto the team can improve the whole project.

If the structural system to be used is commonly something the contractor will want to design, why not let him? Why waste precious time and resources on a design that is just a starting point for someone else? Sometimes it does make sense to lay down ground rules (design criteria and boundary conditions) and then get out of the way.

It probably also does not make much sense for the SER to engineer the design for a proprietary product when the manufacturer provides a design anyway, even when the SER does not ask for one.

Structural components or systems for which the design is commonly delegated to an SSE include:

- Metal-plate connected wood trusses
- Light gage metal framing and trusses
- Precast/prestressed concrete elements
- Joist girders
- Steel connections
- Heavy timber connections
- Modular retaining wall systems

The Bad

Most contractors are good people with reputable business practices. But they typically work for a fixed price and are motivated to shop around for sub-contractors to get the best pricing. If the lowest price subcontractor uses an ethically-challenged engineer who is willing to "stamp" anything, the SER may wind up with a worthless submittal that does not work or has not been thoroughly developed. Then the design becomes the SER's problem.

Some SERs will delegate the design of a system because they do not understand it, or have never designed it before. But what if this delegated portion of the project is most of the project? The SER ought to ask himself if he is the right structural engineer for that project. Sometimes it is best just to step aside.

If delegating a design is a business practice undertaken with the thought of increasing profit and minimizing risk, do not kid yourself. The ultimate responsibility for the safety and adequacy of the design of a structure rests with the SER. Coordination of the delegated design with the overall project remains the SER's responsibility. Adding a specialty structural engineer or two to the project may not reduce risk, it may increase it. As for cost, how much time will it take to review, coordinate, and possibly correct the delegated design? If the SER can design it, the SER probably should.

Gray Areas

What is the right amount of information to show on a set of structural drawings for a design which will be delegated to an SSE? Not all structural engineers provide the same amount of information for the SSE to work from. Best practice will include design criteria and loads, primary structural system design, and relevant notes, specifications, or design standards to be used in the design of the delegated item so that the SSE can figure out the work required. Also, the SER needs to prepare or edit the relevant specification sections carefully. Do not leave that to the architect.

Sometimes there is no structural engineer of record on the project. That may seem like an uncommon occurrence, but it happens. For example, pre-engineered metal buildings are typically designed by the manufacturer's engineer, who is probably located out of state and may not have professional liability insurance. Or, perhaps it is a design-build project with no SER and a hodge-podge of isolated SSEs. Who is providing the structural design criteria and ensuring the overall stability of the

building? Probably no one. If asked to be an SSE for only a piece of the project, while the rest of the project has no SER, think twice. Even if the SSE's work is perfect, but the rest of the project goes awry, the SSE may be left with the lion's share of liability for a mouse's share of the fees.

Is the SER really asking for a delegated design? It is not unusual for an SSE to receive a set of structural drawings for a project with every single piece, nut, and bolt sized and drawn by the SER. Nothing left to design, so no SSE is needed, right? Not so fast. Often the specifications or drawing notes, or the construction manager's bid instructions, will still require a delegated design by an SSE. Sometimes it is a simple oversight, as when default text in a standard document did not get deleted. Other times it is a conscious decision by the SER to use the SSE as a second set of eyes, or again under the misguided pretense of shedding liability. What should an SSE do in this case? The SSE's first reaction ought to be to tell the client (usually a subcontractor) that a delegated design is not needed and ask for clarification. If the answer comes back that a delegated design is indeed required, other questions may arise. What does the SSE do if the SER's design does not work? Is the contractor entitled to a change order if something gets bigger, heavier, or more laborious? Has the Owner now just paid twice for the same design work?

Communication, communication, communication. Protocols should go out the window here, and the SER and SSE need to communicate directly. Picking up the phone to straighten out an issue can save weeks of back and forth. Keep the team apprised of developments.▪

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Five Takeaways for the SER:

- Delegating design does not necessarily reduce liability and risk.
- Only delegate design work when it makes sense to do so.
- Think like the SSE and provide the required project information.
- Do not let other team members delegate aspects of the structural design.
- Communicate directly with the SSE during the course of the work.

Five Takeaways for the SSE:

- Learn enough about the project to understand the risk. Charge accordingly.
- Get a signed contract in advance, and a retainer if appropriate.
- Be prepared to deliver on deliverables (sealed calculations, connection details, etc.)
- Speak up about unreasonable requests.
- Communicate directly with the SER during the course of the work.

For Further Reading

CASE Document 962B – *National Practice Guidelines for Specialty Structural Engineers*