

It doesn't have to

be that way!

Part 3 of 3

Andy Johnson

In this three-part series, Andy Johnson, AISC's vice president of marketing, examines traditional project delivery methods in light of the many unknown variables that can enter into the project delivery process. He offers suggestions for how project team members can work together more effectively—especially by bringing fabricators on board in the early phases of project design.

Part 1 (January 2003) takes a close look at the different roles and responsibilities of individual project team members. Each player faces different tasks and obstacles, but it is only when team members understand each other's challenges that the group can communicate and work together effectively.

Part 2 (February 2003) examines fabricator design-assist prior to bidding in design-bid-build projects. If you're working on a design-bid-build project, get fabricators involved early in the game to assist in the design process—and avoid costly delays and change orders.

Part 3 (March 2003) looks at how to implement the design-build project delivery method. Design-build is a time- and money-saving way to design and manage a project. Bring fabricators on board at the earliest project stages to make them an integral part of the design and planning process.

The greatest savings in cost and schedule can be achieved through the design-build project delivery system. The fabricator is selected at the earliest stage of a project and then made an integral part of a design-build team. Worries about competitive bidding are unnecessary, since fast-track projects that are fluid, with design holes and anticipated changes, give the owner little guarantee that the final project cost will be near the original bid anyway. Working with the right fabricator at the front end can lead to savings in cost and time, and the initial determination of a more realistic budget.

The first step is to get the right fabricator on board through a rigorous

evaluation process. Here are some factors to consider:

- **Size and capacity**—Does the fabricator have sufficient shop capacity to handle the project in a timely manner?
- **In-house engineering**—Does the fabricator have the engineering staff to work with the architect and engineer of record regarding cost-effective designs and connections, working around design holes, and ways of accommodating changes during the course of the project?
- **Project management**—Is there a project management staff to stay on top of the details, changes and logistics? What are the qualifications of the individual project managers? Is the fabricator prepared to put a

manager on site to resolve on-the-job problems?

- **Shop drawing production**—How does the fabricator handle the coordination of shop drawings? Many shop drawings now are prepared offshore, which can be a time and cost saver when facilitated by e-mail. Has the fabricator established uniform drawing standards and a management method to get quality drawings in a timely manner?
- **Shop certification**—Is the fabricator AISC certified and at a level appropriate for the project?
- **Steel erection**—Does the fabricator have its own steel erection crews or does it subcontract this trade? If it subcontracts, how close is the coordination with the steel erector? The

erector should be involved in some key early decisions such as construction sequencing, temporary bracing, working around changes, items to be field fabricated instead of shop fabricated, etc.

- **Erector certification**—Is the steel erector AISC certified and at the appropriate level for the project?
- **Price**—Price should be considered only in the greater context of all the previous qualifications. Some fabricators provide unit costs for items of work executed at various stages of a project. They break projects down into units of work, and make allowances for changes in scope at different stages of the project. This requires close coordination with the designers and general contractor for given job conditions. For example, to develop representative costs, the fabricator and engineer might need to agree on connection types and member selection. Further, the cost to detail and fabricate a given size column will vary depending upon whether it is already detailed, whether it is already in the shop and needs to be reworked, or if it's already in the field. The design for some parts of the project might be readily fixable, in which case the fabricator can give a fixed price for this portion of the work.
- What is the **prior working relationship** with the fabricator and the level of trust in that relationship? Being able to trust the fabricator to do the work honorably and fairly is important.

Once the qualified fabricator is selected, the process continues in an organized and logical set of steps. The choice is to either over-design certain areas and avoid the wait for final design information, or identify the design holes and work around them. Here are the steps:

1 ■ Have a pre-kickoff meeting with all stakeholders, including the steel erector, to discuss items that can

impact heavily on the project cost and schedule.

2 ■ Identify the owner constraints – certain late decisions, changing tenant requirements, etc.

3 ■ Determine the sequencing of the job from both a decision-making and framework erection standpoint.

4 ■ Isolate the design holes and their causes. Provide allowances for them and get agreement from all the stakeholders.

5 ■ When consulting with the designers, develop a plan for working around design holes to control costs and keep the job moving. This can be the biggest determinate of ultimate cost and schedule. This is how each party reaches an understanding of the implications of the timing of design decisions. To create a plan:

- Establish a hierarchy of changes and information flow. For example:
 - Which issues or changes must be decided most quickly?
 - Which issues or changes can wait until the last minute?
 - Which work can be postponed as long as possible?
- Over-design certain areas to accommodate changes in location or weight of mechanical systems. This usually affects a limited number of areas or bays and only adds material. Detailing, fabrication and erection costs are not impacted. The same remains true for accommodating increased floor loads. The cost of extra material at this point is negligible compared to the cost of time lost waiting for final design decisions or costs of reprocessing if the material is already being detailed or fabricated.
- Use CS Series or constant-shear steel joists in areas that will be required to support supplemental loads. Also upsize angles for curb supports. Doing so allows for much greater flexibility in locating those loads.

■ Allow flexibility in floor openings by increasing allowable slab projections into the floor opening itself.

■ In the field, locate and cut beam-web penetrations that accommodate mechanical systems. This work can be based on predetermined unit prices.

■ In the field, locate and weld up frame locations for roof openings. This work is also based on predetermined unit prices.

■ The steel erector, based on predetermined estimates for different systems, can handle connections for precast panels and other types of cladding.

A major benefit of this procedure is that the fabricator can place an early mill order for as much of the project as is nailed down. Shop drawings can begin for certain portions. Detailing around holes is more productive than working upwards from the foundation and stopping at every hole.

We have described a construction project environment that is high dollar, high risk, fast track, complex and subject to numerous changes during its life. Such projects are ripe for cost overruns, schedule delays and unfortunately, litigation—all results that are typical of many projects.

We refuse to accept the status quo because there are ways around the problems. Early project involvement by a carefully selected structural steel fabricator creates greater understanding between the project stakeholders.

The solution is to recognize that the steel fabricator should no longer be the missing piece of the project team. Continuing to work in the same old way but with more meetings, louder voices, tighter contracts, more finger pointing and more lawyers does not yield efficient project delivery. **It doesn't have to be that way! ★**

Andy Johnson is vice president of AISC Marketing, LLC, in Chicago, IL.