

INSIGHTS

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Relationships and Results on Design-Assist Projects

By Scott Van Deren

Scott Van Deren is active in business development at Drake Williams Steel, an AISC certified fabricator, in Denver, CO, and was previously President & CEO at Mountain Steel & Supply Co in Denver. Scott currently serves as Chairman of Associated General Contractors of Colorado and sits on the market development committee for the American Institute of Steel Construction in Chicago, IL. He can be reached at svanderen@dwsteel.com.



The concept of “design-assist,” and what makes it a success, is often a mystery in the construction industry. Some already have a strong opinion about this project delivery system based on prior experience; others may have no experience at all. With that understanding, this article offers insight into the characteristics and keys to a successful design-assist project from the singular perspective of a steel fabricator with design-assist experience.

To begin, do not get hung up on the formal “contractual method” being utilized. While there is a wide range of contractual options, the following information is directed toward the process and spirit of the design-assist concept. In the scenario visualized below, the steel fabricator has been on-board at the Schematic Design (SD) or Design Development (DD) levels with the general contractor requesting participation in design completion and trade coordination.

The ultimate goal of a design-assist approach is to encourage collaboration between the design team, multiple trade partners, and the general contractor to achieve benefits not available in a traditional design-bid-build process. The benefits of the design-assist process include improved constructability at the job site, faster construction schedules, and budget savings for the client.

Shared Mutual Interests

We often live and work in isolated silos. While the Structural Engineer of Record (EOR) may be contracted with the architect, the steel fabricator is usually contracted with the general contractor. The architect and general contractor typically establish the communication channels. However, despite the imposed distance and indirect communications, the EOR and fabricator share mutual interests based on common priorities for the project.

The structural design is the critical path as the EOR is making the architect's vision into a reality. Once at the job-site, erection of the fabricated steel frame is the critical path and the key to the overall schedule, allowing other trades to begin their work.

With limited time for the initial design and accommodating owner changes, the engineer is continually chasing deadlines and coordinating with the architect to issue a complete structural package. Likewise, during the completion of design, the fabricator is chasing structural design changes and unexpected additions to scope from the owner.

Driven by deadlines and often working with incomplete information, the EOR and fabricator



share a sense of urgency to deliver the structural backbone for the project. This mutual interest presents an opportunity to exit isolated silos and work as a collaborative team. A successful approach to design-assist entails scheduling joint meetings between the steel fabricator and the EOR early in the process. The technical expertise of the EOR and the practical experience of the fabricator can be best utilized when communicating directly.

Better Understanding

On each project, it seems that communication increases, the email traffic is intense, addendums are being issued, and Request for Information (RFIs) are flying. The sheer volume of communication, however, is not always effective. While three dimensional modeling software and electronic communication provide tremendous capability, they do not always lead to a concise understanding between construction team members.

An example is the steel tonnage on a project being miscommunicated by different parties. The total tons is often calculated by the EOR from the Revit design model and used as a benchmark by the contractor's preconstruction team. With insufficient time to complete a comprehensive preliminary design, the EOR may utilize the model to determine initial shaft sizes and may be unaware that the contractor will distribute the package for pricing to subcontractors. Simultaneously, the steel fabricator may be preparing updated budget pricing based on this Revit model and other “fill in the gaps” assumptions. For example, an astute fabricator will include base plates, connection material, stiffeners, kickers, and other miscellaneous structural material in the preliminary pricing proposal.

While both parties are calculating accurate “total” tons, they are considering different factors and will reach a different conclusion. A contractor may report this difference to an owner or conclude during a design meeting that the fabricator's tons are heavy. In a recent in-person design-assist work session based on schematic design drawings, this “miscommunication” was quickly discovered and resolved. With a new understanding and mutual respect in place, additional discussions of material

availability, preferred connection designs, and cost-effective edge condition details ensued. The EOR, steel fabricator, and ultimately the contractor reached a better understanding of the tonnage required for a complete steel scope. This meeting eliminated confusion and provided a streamlined communication process.

An effective meeting for a complicated project that includes the architect, engineer, contractor, fabricator, erector, and possibly other major trades may not be possible. Regardless of the communication method, how can there be more direct communication and better understanding between engineer and fabricator? In-person meetings, sharing the design model, Skype meetings, and conference calls offer the opportunity to collaborate early to avoid bottlenecks and misunderstanding. Not more communication, but *meaningful* communication is the key.

Pro-Active Leadership

To some extent, construction team members are reliant upon the general contractor to establish a communication structure. Leadership is not a title, however, and any pro-active member of the project team can

assert influence on collaborative processes and direct communication.

A recent progress meeting for an office building produced a surprising result. Cost of the roof structure increased despite the engineer's effort to reduce member sizes. In this case, the fabricator created a summary to clearly show the decrease in overall weight and the increased number of beams, which drove the cost higher. The summary was pro-active, as there had been no request for an analysis of weight or number of fabricated beams. This helped shape the direction of the design early in the process, eliminating expensive re-design later.

Seeking similar ways to provide leadership at different points in the process can have a positive impact on project outcomes. An engineer may alert the fabricator of potential changes, perhaps a complex roof structure that has not been fully developed or a floor that has not yet considered loads from mechanical systems. Similarly, an engineer could reach out with questions for a fabricator related to material availability or details regarding bolted or welded field connections. This pro-active approach may result in the EOR and fabricator forming a relationship, creating a trusted ally to address project issues.

Conclusion

The design-assist process is not a panacea for all industry challenges. Genuine collaboration means working through difficult issues and potential disagreement about solutions.

The impact and payoff of a design-assist approach, however, can be significant for the project team as well as the project. For example, efficient connection details developed with consideration for labor savings, at the job-site or fabrication shop, reduces project costs. Likewise, developing these details early in the process allows greater profitability for the EOR by eliminating costly re-design. Improved constructability and shortened construction schedule benefit the owner and contractor alike.

An integrated design-assist team can create tangible results by recognizing shared mutual interests. Willingness to initiate direct and effective communication builds trust among team members. Pro-active leadership may be provided by the EOR or any team member willing to share a unique solution or lead by example.

The challenge is to create better understanding through relationships and define the results that are possible for the next design-assist project opportunity. ■

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