



Scott L. Melnick

**M**y middle child, Joshua, is fascinated by nature and is forever stopping to pick up rocks, plants and bugs. When I was growing up, children could buy a "bug bottle," essentially a small bottle about an inch in diameter with a magnifying lens on top. Well, times have progressed, and Josh's grandmother gave him the modern version for his birthday: the bug pail. A jumbo version of the bug bottle, it's about eight inches in diameter and the entire top is a magnifying lens. It even has a shoulder strap for easy conveyance.

Over time, most things change and evolve. Even such hidebound bureaucracies as toll-road authorities adapt to modern technology to reduce costs. Where I live, you can now purchase a transponder for your car, and instead of stopping at tollbooths, you just slow down and 50 cents is deducted from your account. In the near future, a coalition of states from the east coast westward to Illinois will create a joint system. An even better system exists in Ontario, where Highway 407 has no tollbooths at all: cameras detect your license plate and if you don't have an account (qualifying you for reduced rates), a bill is sent to your house.

Surprisingly, a large number of construction industry professionals resist adapting to changing times—even when these advancements can substantially reduce costs. In fact, the adoption of just a few simple steps can more than offset the recent rise in raw material costs.

**1 Involve a fabricator early to ensure an economical structure.** While engineers can often employ rules-of-thumb to reduce the cost of a structural steel building, the most efficient way to ensure that you're receiving the best value is to consult with a specialty steel contractor early in the design process. A study from the Construction Industry Institute, conducted in conjunction with Penn State, investigated 351 construction projects built between 1990 and 1995 and demonstrated that the most successful projects were those where specialty contractors were brought on board before any of the design was completed.

**2 Don't assume that least weight is always least cost.** Many contractors evaluate project costs based solely on the weight of the framing members. While common, in the long run it ends up costing an owner big bucks. Even with the recent price increases in structural steel, the cost of fabrication and erection is still a greater percentage of the cost of the steel package than is the cost of the raw material. Therefore, reducing the weight of the steel while increasing fabrication or erection costs will often end up costing the owner money. For example, you can usually increase column weight by as much 100 lb per linear foot and still save money if it eliminates the need for stiffeners.

**3 Encourage the use of Electronic Data Interchange (EDI).** A growing number of engineers and fabricators are working together to exchange design drawings electronically and work within a total 3D project model. A common objection is that engineers need to spend slightly more time developing their design drawings up front. However, this results in a big time savings during the shop drawing review process, eliminating much of the revising and resubmitting. Studies by AISC show the use of EDI can usually save more than 10% of the steel package and reduce the total project time by between four and 12 weeks. As an example, on the Lansing Community College Health and Human Services Career and Administration Building in Lansing, MI, Douglas Steel Fabricating helped to create an alternate to the original design that lopped \$315,000 off the original \$2.9 million steel package. This alternative design was generated 2½ weeks prior to the hard bid due date. The client approved the alternative and selected Douglas Steel for fabrication and erection. The design was finalized and Douglas Steel was able to place the mill order four days after being given the nod. Integration of design, detailing and fabrication software helped to quickly generate a more economical design and facilitated incorporation of those changes ahead of schedule.

**4 Make sure you're not paying for unnecessary paint and fire coatings.** In most cases, there is no need to paint or prime steel unless it is being left exposed. On a 100,000 sq. ft. building, unnecessarily painting the steel can easily add \$30,000 (though the savings would be slightly less for not painting a bar joist system). Likewise, current building codes allow designers to utilize active fire protection systems (sprinklers) instead of passive systems (spray-on coatings). Too often, designers are unaware of the specific code requirements and end up specifying both. And at a rough cost of \$0.40 per square foot for spray-on coatings, the unnecessary costs quickly add up.

The Steel Solutions Center offers a free service to help reduce costs. From typical framing studies to total structural systems (including project costs and schedules), the Steel Solutions Center provides owners, designers, and contractors with up-to-date information with a focus on office buildings, parking structures, multi-story residential, healthcare, and institutional construction. In addition, the Steel Solutions Center answers technical inquiries and offers a number of electronic tools to help reduce project costs. The Steel Solutions Center can be reached by calling toll-free 866.ASK.AISC or e-mailing [solutions@aisc.org](mailto:solutions@aisc.org).

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