FULL POTENTIAL

BY MARK D. WEBSTER, SECB, LEED AP

The steel industry has plenty of opportunities to be the most it can be from a sustainability standpoint.

AS THE TREND TOWARDS SUSTAINABILITY AND EVER-GREENER BUILDINGS CONTINUES TO GAIN STEAM BOTH HERE AND ABROAD, it looks like a good time for the steel industry to consider how it can do more to address this issue. With global temperatures and energy prices on the rise, there is little doubt that the push towards a less ecologically destructive economy will do anything but accelerate. I offer here a few ideas for how the steel industry can actively engage this process.

Love it or hate it, LEED is the de facto green building standard in the U.S. today. So working to make changes in LEED that reward innovative approaches to reducing buildings' environmental impact, and at the same time help the steel industry advance its green credentials, would appear to be a sure-fire way to positively impact both the environment and the industry.

What sorts of changes? Two effective green building strategies that are not currently recognized in LEED's Materials and Resources category are material efficiency and design for deconstruction.

A credit for material efficiency would reward designs that make the most with the least. One way to measure achievement might be to compare a project's per-square-foot weight of structural steel, concrete, or other structural system to industry averages. If the structural engineer can figure out how to support the required loads with, say, 25% less material, that achievement should be recognized. And it need not be limited to the structural system. Eliminating finishes and exposing the structure can further reduce material consumption and allow building users to appreciate the exemplary work of the structural engineer and the builder.

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One source of tension, of course, is economy of materials vs. economy of dollars. We've all seen the articles in this magazine giving tips on "economical" steel design. For instance, one tip is that it is better to increase the column size than to add continuity plates at the beam-to-column connections. But this design strategy comes at a cost—not to the pocketbook, but to the environment, since it increases the overall structural steel weight, sometimes significantly. Extra labor that reduces weight may add expense but reduce ecological cost. Perhaps incentives in LEED and other green building rating systems for material efficiency could start to turn this logic around, or at the very least bring into focus, for the designer, the occasional trade-offs between designing for the environment and designing for the pocketbook.

Designing for deconstruction (DFD) is a green building strategy where steel structures could really shine. The goal of DFD is to construct a building that can be easily disassembled at the end of its life, permitting reuse of its materials. Steel, with its standard shapes and its potential to use bolted connections, is well suited for DFD. At end of life, steel shapes could be unbolted like pieces of an Erector Set—catalogued and stored to find life again in a new project, without ever having to return to the mill.

In addition to tackling LEED, there's another initiative the steel industry could take. Let's face it: Climate change is the defining environmental challenge of our generation, and all industries need to step up with effective plans to reduce their carbon emissions. The U.S. steel industry should look to its counterpart in the United Kingdom for inspiration. In the U.K., industry-wide average emissions per unit of steel production are being determined. Further, steel fabricators are calculating the life-cycle carbon efficiency of their own product, and work is underway to make these findings available to others. If this plan reaches fruition, a specifier could require that the steel used on a project be sourced from a lower-carbon producer. Nothing like a little competition to effect a change in practice! In the international market, the U.S. structural steel industry should be well positioned for this type of competition, with its reliance on relatively efficient electric arc furnaces and scrap steel for production.

So there you have it: several suggestions for ways the steel industry could step up its green building leadership. The steel and other building material industries need to be active drivers of effective change in building practice, and not allow themselves to merely be reactive players while others develop standards and policies based on incomplete understanding of each industry's environmental potential. Steel has a lot to offer in green building design, and I'd like to see its potential fully realized. MSC

Have an opinion you'd like to share in "Topping Out"? Send your feedback to Geoff Weisenberger, senior editor, at weisenberger@modernsteel.com.