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and the scrap metal that goes into "their" steel must come from the project's immediate area or region.

In almost every case, such requirements actually result in a signi cantly increased environmental impact for the project. Why? Because the existing steel supply chain is highly tuned and ef cient, and attempting to change it without careful consideration of the consequences will create more problems than solutions.

Scrap metal tends to be bulky and dif cult to handle until it can be shredded or compressed. This means that metal recyclers tend to draw from their local area in order to minimize the shipping of unprocessed materials. A signi cant portion (60% to 70%) of scrap metal for structural steels comes from junked cars, which require processing before they can be shredded; mercury switches have to be removed, oils and other uids drained for separate

Service Centers

Since mills are highly motivated to run continuously for greatest efficiency, and construction markets are highly variable, there needs to be a "shock absorber" in the system. This is one of the roles played by service centers. They buy large quantities of steel from the mills on an ongoing basis, and then store it for sale to fabricators as needed. Service centers can also enable more efficient use of steel by cutting it to required lengths.

Here's an example: Let's assume a standard 40-ft beam. If one fabricator needs a 25-ft piece and another needs a 15-ft piece, the service center can simply cut one beam into both pieces without either fabricator having to coordinate with one another. The alternative would be for each fabricator to buy a 40-ft section, cut the piece to the length they need, and keep the remainder on hand in case they need that particular length someday (potentially wasting it).

Service centers enable fabricators to buy only what they need, as they need it. So rather than purchasing all of the steel for a given project at the same time and storing it at their own facility, the fabricator can take delivery as the project progresses, making their own storage space available for staged delivery of finished material to the site, rather than simple stockpiles.

A further "hidden" benefit of service centers is geometric; large, single-storage yards are more efficient in terms of area vs. perimeter than many smaller storage areas, so one service center can store more material than many fabricators, using less space to do so. This also means fewer cranes, fewer forklifts, more efficient handling, and subsequently lower fuel consumption.

Fabrication

A major benefit of fabricators is that they do their work off-site, under controlled conditions. This means that only the materials necessary for the structure are actually shipped to the site; beams don't need to be trimmed on-site, holes needn't be drilled on-site, extra items aren't sent "just in case," and so on. Thus, nobody has to pay to truck materials that won't be used (trimmed ends and spare beams may not seem like much at first, but they add up quickly), and the gas needed to move them won't be burned.

Compare this to typical residential wood framing, where basically all pieces are custom-built on-site; scraps of wood cannot be reclaimed efficiently, and thus the overall level of construction waste is considerably higher.

Myth Making

Some projects, in an effort to meet arbitrary goals for "local materials," will attempt to require that the steel in their building come from scrap metal from their area. Simply put, this well-intended approach would create staggering waste at every level of the production chain.

Think about it for a moment: You'd be shipping a junked car from City A to City B to be processed. That entire trip is a waste, because there was already perfectly usable scrap metal in City B. Then the scrap from City A would have to be kept separate from

out will result in wasteful connections that are stronger than they really need to be. Don't specify slip-critical connections unless they're actually needed. Don't say "weld all around" or specify complete joint penetration groove welds unless they're genuinely called for. Arbitrary catch-all requirements waste time, money, and reduce sustainability by demanding the use of materials that aren't truly required.

In the end, the most effective improvement that can be made is to help ensure that an ef cient system can continue to run ef ciently. MSC

For a related article on achieving savings via smart detailing and design, see "Save More Money" in the March 2008 issue.