Scott Foley practices green building, although not quite in the same sense as we’re hearing that term used nowadays. Sure, when he builds using post-frame, SIPs, and stick-building techniques, he values energy efficiency, and his jobsite waste management practices are certainly environmentally friendly. But to Foley, the “green” in green building signifies something any builder can relate to.

Cash.

Foley’s company, Ultimate Construction of Cottage Grove (Wis.), employs an exemplary jobsite waste management program that pays off in a number of different ways. Keeping and re-sizing lumber reduces waste and future material costs. Hauling and storing other wood products gives Foley fuel for a cost-effective wood-burning furnace that heats his shop and a farmhouse. Recycling excess steel generates extra cash.

Intangibly, paying such close attention to responsible waste management gives Foley a nice marketing boost in the environmentally-conscious Madison area — he’s a green builder in the commonly-accepted sense of the term.

Ultimate Construction recycles its waste steel products, and uses waste wood to power a furnace.
Taste for waste

According to a report from research architect Tom Napier of the U.S. Army Corps of Engineers, in 1998 the EPA estimated that 136 million tons of building-related waste is generated in the U.S. annually, which is 25 to 40 percent of the national solid waste stream. A 2003 update shows an increase to 164 million tons annually, of which 9 percent is construction waste, 38 percent is renovation waste, and 53 percent is demolition debris. The number of construction waste or demolition debris landfills is declining, which means fewer disposal options, greater hauling distances, and increased fuel consumption and vehicle emissions. EPA estimates that only 20 percent of this waste is being recycled.

Rural builders work on a variety of jobsites, and waste materials and costs can vary widely. But builders across all disciplines can learn from one example of why responsible waste management makes sense. Take residential construction.

NAHB’s estimates on typical waste for construction of a 2,000-square foot home are staggering: 2,000 pounds of drywall, 1,600 pounds of solid sawn wood, 1,400 pounds of engineered wood, 1,000 pounds of masonry, and 600 pounds of cardboard. That’s a lot of materials that are paid for and never used. Peter Yost of NAHB’s Research Center breaks waste management for home building into four categories.

Cost: An NAHB survey reported that a typical builder pays $511 per house for construction waste disposal. Costs rise as old landfills close and new ones become more difficult to site and more costly to design and operate.

Efficiency: If materials are wasted on your jobsite, you pay twice — once at purchase, and again when the usable material is hauled off for disposal.

Liability: As a generator of potentially hazardous materials — solvents, adhesives, caulks — you must protect yourself from potential liability resulting from the unauthorized or illegal disposal of hazardous wastes.

“"We always include a dumpster with each building. The crew has time allotted in the estimate to keep the site clean and pick up waste, usually at day’s end. At our location we recycle aluminum scraps and put the money toward our summer family picnic. All other waste goes in the dumpster.”

— Mike Gerrits, Morton Buildings

Website poll

In a recent survey conducted on Rural Builder’s website, www.ruralbuilder.com, builders weighed in on their waste tactics.

Question: Which phrase best describes your company’s waste management policy?

The results:
Pay a responsible third party to separate and dispose of it, taking into account recycling......................35%
Dispose of it ourselves............30%
Hang onto waste and find productive uses for it.................................22%
Chuck it in the dumpster and forget about it..................................13%

Visit www.ruralbuilder.com to take part in more quick polls on items of interest to our industry.
Proper waste management planning

Steps to setting up a construction waste reuse and recycling program

1. Plan
   a. Commit to reuse and recycle.
   b. Put recycling into specifications and into all contracts.
   c. Establish who will control the debris.
   d. Include waste reduction, reuse, and recycling from the start.
   e. Select a coordinator.

2. Identify target materials
   Identify target materials at the jobsite that can be recovered from the waste stream — during construction/demolition and during site preparation. Items include: asphalt, bricks, cans and bottles, cardboard, carpet and pad, concrete, drywall, metal, paper, and wood products.

3. Request for hauling
   a. Develop vendor list for your area.
   b. Write request for proposal.
   c. Allow haulers to bid on specific materials.
   d. Select haulers and make arrangements for dumpster sizes and collection.

4. Develop recycling plan.
   Include:
   a. Description of the project and identification of the waste management plan manager.
   b. Goal for the percentage of waste to reuse and recycle.
   c. Analysis of the projected types of jobsite waste to be generated, including types and quantities.
   d. Targeted materials for recycling.
   e. Responsible parties for recycling operations.
   f. Trash and recycling service providers.
   g. End markets for all targeted materials for recycling.
   h. Educational and motivation plan.
   i. Waste auditing procedures.
   j. Documentation procedures.

5. Make decisions on site logistics.
   a. Determine where to place dumpsters, how many and what type are needed, and when.
   b. Determine how to move recyclables and trash around the site.

6. Monitor
7. Educate and train
8. Document
9. Make adjustments


Marketing: As you begin managing your construction waste, take credit for being a good corporate neighbor and protecting resources. Let the buying public know that as you build, you are striving to protect the natural environment.

An epiphany
   Putting dumpsters on a jobsite and paying a service to take waste away at the end of a job didn’t add up to Foley. “I buy the product, then pay to get rid of it?” he says. “It didn’t make sense. That’s where the true profit is, in the waste. With costs rising, everybody’s looking for every penny, and that waste is money.”

The true costs of waste really hit Foley when confronted with rising costs everywhere else on his balance sheet. “I was sitting down with my CPA, trying to hit a percentage, and trying to figure out where to find it,” he says. “So we looked at the next big wasted dollar — waste.”

Previously, Foley would have a dumpster or two onsite. For average projects, the cost would
“I’m going to have grandkids one day. We can’t just keep creating landfills.”

—Scott Foley

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be around $1,000, or $1,500 for three dumpsters. By altering his procedures, Foley is down to $35 a ton, most of which is recycled or reused. “I have to pay labor to truck it and move it, but I don’t have a dumpster onsite,” he says. “It keeps jobsites clean.”

Instead of dumpsters, Foley made two steel crates that measure 6 feet high, 10 feet long, and 4 feet wide. The crates can be transported on a trailer or Foley’s dump truck. One crate holds plywood, the other rough lumber. That lumber is brought back to the Ultimate Construction shop, where Foley and an employee go through the pile and cut them into common sizes for use in future projects.

The other way wood waste is used productively is as fuel for a wood-burning furnace. The system, which Foley says cost $12,000, warms Ultimate’s shop floor with radiant heating, and heats a nearby farmhouse. In addition to using leftover construction materials, Foley’s crew feeds the furnace with debris created by site clearing and demolition work, like old wood barn panels or tree stumps.

The HeatMaster furnace, which Foley bought from Packerland Heating, can accommodate wood pieces up to 5 feet long and 20 inches in diameter, but Foley tries to keep pieces to about 3 feet. He uses a custom-made splitter that fits on his Bobcat. The furnace is filled twice a day, and at the end of the year a 55-gallon drum of ash is full.

“Considering I’m heating 12,000 square feet of buildings, my payback is going to be four to five years, which I think is a heck of a return,” Foley says.

“We are always shopping dumpster costs because our locations change and trucking costs add to dumping costs. We always ask the customer if they want burnables left for bonfires.”
—Steve Nikkel, Orchard Construction
Demolition opportunities

The waste diversion potential in a demolition scenario is considerable. The building’s construction type and project schedule are the two primary factors in determining what and how salvage, reuse, and/or recycling can be accomplished. Consider the following:

- Develop the project schedule to accommodate salvage, reuse, or recycling. The quality and quantity of materials salvaged is a direct function to the time available for salvage.
- Prior to demolition, salvage as much usable material and components as the schedule will allow. Windows and doors, wood flooring, cabinetry, architectural millwork, electrical fixtures, plumbing fixtures, mechanical equipment — anything that can be detached and removed can usually be salvaged and reused. When developing the C&D Waste Management Plan, identify the most accessible and valuable materials, thereby optimizing the application of resources to this task.
- Concrete and masonry materials can be recycled to produce aggregate. This may be accomplished on-site with mobile equipment, or rubble can be hauled to a permanent recycling facility. Preferences vary among demolition contractors and recyclers about whether the building should be gutted prior to demolition, leaving only concrete and reinforcing to be crushed, or demolished intact, and the debris sorted as part of the concrete crushing process. Consider how the recycled concrete aggregate (RCA) will be used, what RCA products are most usable, and how the rubble should be processed to produce these products. If aggregate materials are required for the project, on-site recycling can provide these materials at a reduced net cost.
- Landscape materials and wood that is not painted with lead-based paint, treated with an arsenic-based preservative, or otherwise contaminated with a hazardous or toxic material can be shredded into mulch, composted, or chipped for boiler fuel. This can be accomplished on-site or off-site. If mulch or compost is required for the project, shredding on-site can provide these materials at a reduced net cost.
- Structural steel and metals are almost universally recycled. This should be standard practice with any demolition contractor.
- Old growth timber is a valuable material and will usually justify the time required for a more delicate removal process. Timbers are generally sold through timber brokers to be cleaned and resold for timber framing, or as feedstock for high quality architectural millwork.
- Some species of dimensional lumber can also be quite valuable. Wood framed buildings can be partially or totally deconstructed. While this is often a more labor intensive approach, cost avoidance and the value of the materials can offset initial cost. The Building Materials Reuse Association (BMRA) can provide information on deconstruction contractors and used building materials retail businesses.
- If none of the alternative salvage, reuse, or recycling options are possible, mixed demolition debris can be hauled to a C&D debris recycling facility, as described above.

Taken from Whole Building Design Guide, “Construction Waste Management,” by Tom Napier, research architect, U.S. Army Corps of Engineers (www.wbdg.org/design/cwm.php?print=1)
Beyond wood, Ultimate also recycles the steel used on its jobsite, from building panels to steel banding.

Team effort

A primary reason this waste exists at all is inefficiencies between builders and their suppliers. Many guides to jobsite waste management stress the need for accurate estimating and extensive work with manufacturers to provide building products that are a precise fit. “It’s great to say that, but it’s difficult when you’re stick building,” says Foley, who says his post-frame projects also generate considerable waste. “If you use (structural insulated) panels on everything, the manufacturer precuts everything, so the waste factor is minute.”

Obviously, it is important for Foley’s subs to buy into his waste management practices. Consistency in this area helps things run smoothly. “I don’t flip around on subs,” he says. “I use the same heating guy, he’s bringing me back his tin cutoff. My roofers, electricians, plumbers, they’re the same way.”

It hasn’t always been easy bringing these guys around, Foley says. “The mentality of people nowadays is not like it used to be,” he says. “The way society’s gone, the attitude is, ‘Hurry up, get it done.’ Nobody gives anybody any time any more.”

“It depends on the project and customer. Quite frequently on ag buildings, the customer will provide a dumping place for us. There are always several pieces of decent lumber that are too small for us to ship back to the yard, but are excellent around the farm — steel for a doghouse, 2x10s for a lawn mower ramp, etc. The ideal situation is not to generate a great deal of waste on the job. We try to do as much work in the factory beforehand as possible, both to speed up the erection process, as well as eliminate the mess in the field.”

—Nick Hoerr, FBi Buildings

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“As a general rule we furnish a dumpster on the jobsite for all waste, or we allow the customer to dispose of his own waste if he wants to, and we back out the dumpster. Most of the lumber will get reused by the customer in some fashion, with the exception of small pieces, and those most of the time either get thrown in the dumpster or burnt by the customer at the site or used as firewood. If the customer takes care of the trash, then in general they take the scrap steel to a recycling facility and get money back for it. On larger jobs, my brother and I have taken the waste — cut framing lumber and cut steel — and built a post-frame doghouse with it. I don’t know if that constitutes recycling or not, but you can build a pretty sweet doghouse with scraps from a post-frame jobsite!”

—Sam Odom, FBI Buildings

Ultimate’s customers seem to appreciate the progressive handling of jobsite waste, a side bonus being a tidy work area. Some have even taken note of Foley’s wood-burning furnace and inquired about adding one to their properties. “But you can’t do this in the city, it’s got to be a country thing,” he says. “Some areas are starting to crack down on outside stoves and the smoke they produce.”

Other customers will no doubt latch onto the technology, just as other builders will surely find ways to minimize jobsite waste and make the unavoidable waste work for them. Intelligent jobsite waste management may put more green in builders’ pockets while they are in business, but will also help keep the world green for future generations.

“I’m going to have grandkids one day,” says Foley. “We can’t just keep creating landfills.”