

CLEANING UP after parties is not an exciting (or lucrative) project for most people, especially after events like the 2004 Democratic National Convention (DNC), which drew 35,000 guests to Boston. But for greenGoat (www.greengoat.org) — a Somerville, Massachusetts nonprofit that works with developers, contractors, and building material manufacturers to divert construction and demolition (C&D) debris — the convention was a welcome opportunity to demonstrate the benefits of deconstruction and recycling. "Conventions are a perfect showcase for the economics of reuse," says greenGoat founder Amy Bauman, noting that major events like the DNC involve light use and very quick turnover of large quantities of materials.

Working with the onsite contractor, Shawmut Design and Construction, and the Democratic National Convention Committee (DNCC), greenGoat provided advice on designing convention facilities at Boston's Fleet Center with deconstruction in mind, identified end markets for salvaged materials, and helped coordinate demolition activities. The convention stage and the media pavilion shell were rented, but Shawmut was responsible for constructing workspace for 15,000 media representatives in the media pavilion, the center's luxury boxes, and a fleet of outdoor trailers. Tasks included shielding the interiors of the luxury boxes to protect them, building platforms for film crews, and installing 90,000 square feet of nylon carpet, 50 tons of supplemental cooling and 4,000 miles of cable.

The seeds for greenGoat's involvement were planted in 2003 when Bauman agreed to cochair the Coalition for Environmentally Responsible Conventions (CERC), an alliance of Boston organizations that was formed to promote ecofriendly policies at both 2004 national conventions. Green construction and recycling were high on CERC's agenda, and Bauman took the lead in advocating for reuse at the Fleet Center when the construction contract was awarded to Shawmut in early 2004. Like Bauman, Tom Perry, Shawmut's project manager, was already LEED accredited (the U.S. Green Building Council's Leadership in Energy & Environmental Design), and was re-

MORE BENEFITS FROM DECONSTRUCTION

FINDING MARKETS FOR C&D (NON) DEBRIS

Massachusetts company fills in the missing pieces by identifying end markets for salvaged materials, coordinating deconstruction schedules, and working with regulatory agencies.

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Table 1. Savings from recycling at the Democratic National Convention Fleet Center, Boston, Massachusetts, July 2004

Material	Traditional Disposal (a)		Recycling (b)		Savings (a - b)	Salvage Benefit
	Tip Fees	Transport	Fees	Transport		
Drywall	\$4,505	\$52	\$512	\$1293	\$2,752	
Plywood	\$574	\$93	\$0	\$10	\$667	\$2,000
Masonite	\$231	\$37	\$0	\$10	\$268	\$850
Light Iron	(\$444)	\$242	(\$444)	\$242		
Carpet	\$167	\$19	\$210	\$88	(\$43)	
Homasote	\$981	\$56	\$0	\$0	\$1,038	\$5,100
Telecom. Cables	\$221	\$19	\$221	\$19		
Site trash	\$740	\$19	\$740	\$19		
	\$6,985	\$537	\$1,239	\$1,681	\$4,682	\$7,950

ceptive to the goals of salvage and recycling. The DNCC (the official client) also was supportive, integrating environmental goals at the Fleet Center and other convention venues into its media plan.

Shawmut used greenGoat's bid specification language for inclusion of deconstruction and recycling measures. For example, masonite used for floor covering was taped down rather than nailed to keep sheets as intact as possible for reuse, and wallboard was left unpainted because a local manufacturer agreed to recycle unpainted sheets.

The DNCC requested that reusable materials should go mainly to nonprofit organizations working with disadvantaged communities; at two local reuse centers, Bauman identified users for salvaged plywood, masonite, and homasote, including Women in the Building Trades, Artists for Humanity, and the Jamaica Plain Neighborhood Development Corporation. The project yielded over 100 tons of diverted wastes (88 percent of the total) and thousands of dollars in total savings, as summarized in Table 1.

FILLING AN INFORMATION GAP

Bauman was a development analyst for Fidelity Investments in Boston when the state of Massachusetts proposed banning unprocessed C&D waste from landfills under its *Beyond 2000 Solid Waste Master Plan*. She recognized that the construction industry would need help in identifying new options for C&D waste, particularly wood products, and founded greenGoat in 2001 to fill that niche. The organization operates as a consulting firm on resource management for all phases of land development. Bauman's experience with cost-benefit analysis undergirds her conviction that deconstruction is sound business practice. "Salvage and recycling help companies take advantage of unseen value in certain types of material," she says, while observing that these practices also deliver environmental and community relations benefits.

The organization's central tool is a broad

RECYCLING INITIATIVES AT CONVENTIONS

IN ADDITION to salvage and recycling at the Fleet Center, the Coalition for Environmentally Responsible Conventions (CERC) helped propose and implement several other recycling initiatives:

Recycled Paperboard Posters: To demonstrate the efficiency of Massachusetts' recycling infrastructure and the importance of completing the recycling loop, CERC worked with waste management consultant Scanlon Associates to turn convention waste paper into 30,000 souvenir posters printed on recycled paperboard. The project picked up wastepaper from the Fleet Center, processed it into paperboard, printed the posters, and delivered them back to the Fleet Center within 24 hours. Participants included Waste Management, Inc. (transport), Haverhill Paperboard Mill of Haverhill, MA (processing), and Journeyman Press of Newburyport, MA (printing).

Food Composting at Convention Hotels: CERC received a \$15,000 grant from the Massachusetts Department of Environmental Protection (DEP) to promote organics recycling at convention venues.

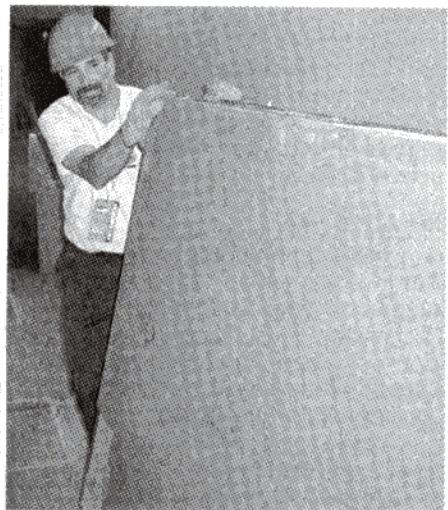
Major hotels and the Boston Convention Centers were receptive, but were deterred from implementing food composting or organic source separation during the DNC (beyond one Convention Center event) by the perceived difficulty of adopting new waste management practices during the convention, and by the lack of readily available and economic hauler options. However, longer-term discussions continue between interested hotels and food service associations, DEP, industry experts, and environmental groups. Consultant John Connolly of J.F. Connolly & Associates, who led the CERC outreach effort, notes that the supermarket sector in Massachusetts is conducting a high level of organics composting, and asserts that many pieces are in place to expand organics recycling to the hospitality industry. "The Massachusetts DEP vision and efforts surrounding organics recycling continue long-term," says Connolly. "Source separation and composting of hotel and convention center food waste can contribute to the success of that vision."

road construction, but Massachusetts bars the practice out of concern that the road asphalt will be contaminated with asbestos. Under a grant from the Home Depot Foundation, greenGoat is analyzing ways to ensure that asphalt shingles are free from contamination as they go into the grinding process, thus allowing more shingles to be recycled and reducing disposal costs.

Collaborating with local regulatory agencies helps keep greenGoat abreast of developments that may impact markets for C&D materials. Bauman serves on a subcommittee convened by the Massachusetts Department of Environmental Protection (DEP) that worked from 2002-2004 to recommend language for the proposed C&D waste ban, and greenGoat received a DEP grant in 2002 to develop a series of case studies identifying potential markets for C&D materials and quantifying disposal cost savings from deconstruction. In addition to calculating cost savings and tons of materials diverted, these studies highlighted the roles of advance planning and appropriate equipment in successful deconstruction projects.

In one case, during redevelopment of the Eagle Square shopping center in Providence, Rhode Island, contractor Costello Dismantling used a long-reach boom attachment on its Komatsu PC-450 excavator to extract valuable old-growth yellow pine timbers from 1911-vintage factory building frames for resale. Renovation of a historic fire station in Milford, Massachusetts in 2002 was facilitated when Consigli Construction rented a Quikrete concrete silo on wheels which could be moved around the construction site and was filled with pre-mix, saving time, money, and packaging. In addition, by coordinating with neighbors to shift dumpsters around the tight workspace during demolition, the company obtained access to valuable space and extra containers for source separation.

This kind of efficiency and collaboration help to guarantee that deconstruction will yield clean and consistent products for reuse. Accordingly, greenGoat advises clients on project planning, trains crews and subcontractors on material recovery, coordinates onsite logistics such as dumpster placement and pick up schedules, and maintains close communication between project managers, work crews, and end markets. Bauman emphasizes the importance of spelling out salvage and recycling requirements up front to ensure that materials are handled properly: "People do what they're paid to do, so get it in the spec. The biggest money saver in the long run is the first round of decisions." For example, at the Democratic convention, the gypsum recycler could only accept one load daily, so some gypsum dumpsters were shifted to other materials. Deconstruction had to be completed within 10 days after the convention ended, so work proceeded around the clock, and distribution of salvaged materials to nonprofit recipients was scheduled after all materials had been removed.



Masonite sheets are collected for recycling after convention activities.

database of markets for C&D materials, developed through intensive ongoing research and face-to-face conversations with contractors, architects, yards, and certified recyclers and manufacturers. GreenGoat directs materials to local, national, and international users ranging from retail building supply outlets to large companies such as Georgia Pacific and DuPont (which recycle gypsum wallboard and carpeting respectively). Outlets for building materials develop continually and reflect factors such as commodity price fluctuations, emerging applications for specific materials, and shifting transportation and labor costs. An individual client's goals, such as the DNCC's request to direct salvaged convention materials to small nonprofits, may bring new users to light. Bauman jokingly calls the organization a dating service for material holders and potential users, and emphasizes that goals vary from project to project: "Some clients want the money from scrap value, and others just want to find placement in strategic markets. It basically comes down to customer service."

In some instances, greenGoat may be able to make a match by overcoming obstacles to a specific use. For example, Maine permits recycling of used asphalt roof shingles for

GREEN PASTURES

Massachusetts is currently reviewing public comments on revised wording of its proposed C&D waste ban, and the DEP expects to promulgate the final regulations as soon as late 2004, although the department may add a transition period before the ban takes effect. While some players in the construction industry are already anticipating the ban, the need for new markets — especially for wood — will only increase as the measure moves toward enactment. A 2003 study for the DEP by the Boston-based Tellus Institute estimated that if the ban were implemented, C&D recycling in Massachusetts would increase from about 3.5 million tons in 2000 to more than 5 million tons in 2010. (This figure assumed that the ban would enter into force by the end of 2003, so the actual figure will likely be somewhat lower). The study recommended developing targeted education and training programs for C&D contractors and processing and disposal facilities, modeled after similar programs in North Carolina, Washington state, and Vancouver, British Columbia.

Massachusetts DEP maintains a number of online resources on recycling C&D debris, including a directory of service providers, greenGoat's case studies, and specifications and calculators adapted from the King County, Washington construction recycling program (<http://www.mass.gov/dep/recycle/cdhome.htm>). The Department plans to develop more case studies on markets for C&D materials, based on the work done by greenGoat. The approach greenGoat used for the DEP project was "very useful. It really helped us develop a template," says Jim McQuade, Regional Planner with the Department's Bureau of Waste Prevention.

The issue is equally pressing throughout the Northeast: tipping fees are high (averaging \$80-\$100 per ton in the Boston area) and landfill space is in short supply in many areas. Additionally, states are looking for ways to reduce greenhouse gas emissions from all major sectors, including waste management. High oil prices increase the transportation cost of moving raw materials, offering manufacturers an incentive to consider recycling where possible (greenGoat lowered C&D disposal costs during the DNC to \$31.37 per ton on average). In sum, a strong market exists for greenGoat's services.

In Bauman's view, more contractors will adopt deconstruction methodologies as quickly as greenGoat can develop or help develop applications for C&D materials. "We are limited only by our imaginations. Once people see how much money they can save, and how much sense it makes to recognize the value of the resources we sometimes call 'waste', they are happy to have someone come in and offer a new way to do things — one that respects their bottom line and doesn't paint conservation as serving only the environment. It's a good time to be here." ■

Jennifer Weeks is a Massachusetts-based writer specializing in energy and environmental issues.



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