

\$42,787 Resource Benefit Seen During Historic Renovation

The Spruce Street Fire Station, a landmark in the town center of Milford, MA, was due for renovation and expansion in early 2002. Specializing in historic restoration, Consigli Construction wanted to restore the original facade while conserving material resources. GreenGoat helped Consigli divert 89% of materials coming out of the renovation from local landfills, saving themselves time and money in disposal costs.

Project Summary

- **Timeframe:** 3/02 – 8/03
- **Renovation:** 4,300 s.f.
- **New Construction:** 9,500 s.f.

Material	Recycled	Disposal	Total
Asphalt	328.95		328.95
Concrete	184.33		34.97
Wood	19.98	15.00	34.98
Metal	4.00		4.0
Slate	18.00		18.0
Debris		54.68	54.68
Totals	555.26	69.68	624.94
Tip Fee Base		\$83/ton	
Cost / Benefit			
Additional Hauling		(\$2,023)	
Avoided Disposal		\$41,840	
Labor Costs*		\$ 770	
Materials Salvaged		\$ 2,200	
<i>*Quikrete silo saved labor, but additional savings were realized and not quantified.</i>			

demolish in the first place, and the contractor saved the client a lot of money by pointing out that the roof substrate did not *really* need to be replaced. This discovery saved an additional 1600 square feet (or 4.32 tons) from disposal.

Overall, diversion of materials included asphalt, concrete, metal, wood, masonry, brick, and slate. Markets for all materials except asphalt shingles were researched and used by the project manager.



Project Description

The Milford Fire Department Spruce Street Station totals 14,000 square feet on a small lot in the center of town. A local architect designed the building in the 1800s. Since then, Milford has grown substantially, and the lots have shrunk to 1/5th of what they once were, leaving little room for separation of materials as the project progressed.

But the contractor was undaunted, having made a commitment to the town to maximize material recovery to the extent possible. This commitment led to an 89% recovery of overall construction and demolition debris.

Working on a very small lot, the crew worked in concert with neighboring establishments to shift dumpsters around during the demolition phase. The coordination paid off, with abutters loaning the project valuable space and access for extra dumpsters for source separation.

In all, the project generated 625 tons of C&D waste. Of this, 555 tons were recycled. Of course the easiest way to recycle is not to

Spotlight on Quikrete™

For any project involving masonry and concrete, the project manager typically stores sand and palettes of lime and cement bags on the jobsite to mix as needed.

The storage of materials results in air quality impact to the surrounding community. In this case, the contractor had a silo filled with 'pre-mix', allowing workers to get smaller quantities of concrete, always in the right proportions, without having to open bags, measure, and mix.

The saved labor in this case does not include the additional air and water quality engineering that would have been needed without the approach. Nor does it include the health benefits for the surrounding community, who breathed a bit easier.

This approach saved time, money, product, and packaging. The company renting out the silo takes a deposit for the palettes and the large, reusable bags for the pre-mix, ensuring their reuse. One significant benefit of pre-mix product itself is that there is no chance of mixing ingredients in the wrong proportions, avoiding wasted batches. The silo is on wheels, so in this project, where space was tight, the silo was moved more easily than stockpiled ingredients. This meant that sand storage wasn't needed, and the air quality on site was greatly improved.

Costs and Benefits

The way disposal is done saves as much as source separation itself. In this case, the contractor used a Lull (like a forklift) to their advantage. Rather than having the crew take debris to the dumpsters, the lull would be driven into the building to wait for a load. In a tight space, workers may have trouble getting to the dumpsters, so this approach saved them 'travel time' and made the work site safer.

Value engineering played a big part on site as well. One of the engineers found an existing 6" sewer line from a diner that used to be next door. Reusing this line eliminated the cost of adding an extra sewer line from the budget. Labor costs were a large part of the savings, as the Town did not want traffic to be disrupted at all.

The contractor also saved a roof substrate that the client thought needed replacing, saving labor and replacement costs for 1600 square feet of 1" wood. That relates to a little over 4 tons of waste avoided, as well as material and labor savings. (Please note - those savings are *not* included in the figures to the left).

In terms of costs, the contractor felt that source separation did not add labor cost to the project. Work was scheduled so as to isolate materials (as an example, 'drywall day' was coordinated for all gypsum board removal), so source separation naturally flowed into the project. Although having more dumpsters added hauling costs, the actual labor costs were unaffected.

How to Replicate

There are some general tips that can be used at any site to maximize savings:

- If space is tight, find a source for smaller dumpsters. The hauling contract in this case was given to a vendor who was more responsive (picking up loads more often).
- Owning equipment is a huge long-term savings, as well as having a place off site to

store smaller quantities of debris in order to make a single, larger haul to a recycler.

- The engineer found an existing sewer line that helped the project. Setting aside time for planning is essential here, as is a good relationship with municipal planners, engineers and building departments.

**'You can just as easily
toss debris in a specific
bin as a mixed bin.
There really was no
extra work.'**

- Although the client was willing to pay for a roof, the contractor knew that the changes weren't necessary. Value engineering helped the budget and the team relationship with the Town.

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greenGoat diverts *post-industrial* (i.e. construction debris) and *post-consumer* (i.e. demolition debris) building materials out of landfills and back into other structures ... even other industries.

We would like to thank Massachusetts Department of Environmental Protection and their grant for us to show the financial viability of recycling demolition debris. Frequent updates on the project were given at the C&D Subcommittee, which made recommendations for future C&D Debris Diversion to the state legislators. The ban of asphalt paving, brick, concrete, wood, and metal has a proposed effective date of January 2005.