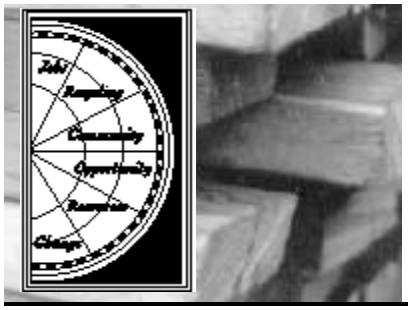

Deconstruction Works:
A Study of Programs in Action

Case Study #5: Wood Reuse

Published by the Materials for the Future Foundation September 2001
Funding Provided by the U.S. Environmental Protection Agency, Region 9

What is Deconstruction?

Deconstruction is the process of carefully dismantling a building in order to salvage components for reuse and recycling. This labor intensive, low-tech, and environmentally sound process has emerged as an alternative to traditional demolition methods. Demolition places high priority on removing structures as quickly and cheaply as possible, and in the process, minimizes employment and maximizes waste.
Deconstruction has many benefits, including: maximizing the recovery of materials, conserving finite old growth forest resources, and providing many employment and job training opportunities. By coupling deconstruction activities with traditional demolition methods, communities can create local economic activities around remanufacturing or reprocessing salvaged materials while diverting demolition debris bound for landfills and preserving resources through reuse.

Community Woodworks: Reclaimed Lumber Mill and Woodshop

Project Goals

As several organizations pursued the deconstruction of large wood-frame warehouses at closing military bases in the San Francisco Bay Area, it quickly became evident that existing markets could not absorb the quantity of salvaged lumber being produced. Thus, the Wood Reuse Working Group was formed to bring together nonprofit social service agencies performing deconstruction, for-profit deconstruction businesses, deconstruction advocates, and technical assistance providers. Members included Alameda County Supervisor Wilma Chan's office, Beyond Waste, Building Opportunities for Self-Sufficiency (BOSS) Enterprises, the East Bay Conversion and Reinvestment Commission, Materials for the Future Foundation, the National Economic Development and Law Center, Treasure Island Homeless Development Initiative, and Youth Employment Partnership.

The economic viability of deconstruction depends on generating sufficient revenue from the sale of the salvaged materials to offset the increased labor costs. While there are many potential uses for salvaged lumber, it is mostly seen as a low-value commodity. Reuse has the potential to generate significant revenue, but is a labor-intensive process. All nails and other metal contaminants must be removed by hand. Any undetected metal can damage mill equipment, resulting in costly repairs and equipment down time. Few mills dealing in new wood are willing to accept this material for processing.

The Wood Reuse Working Group commissioned a study of the markets for reused lumber that found opportunities in value-added manufacturing and targeted marketing of reclaimed wood products. The group then developed a business plan for Community Woodworks (CW), an integrated wood mill using exclusively salvaged lumber. The mill would serve as a recycled lumber retail yard and would remill dimensional lumber and manufacture products such as tables and architectural millwork. The Wood Reuse Working Group was awarded a $500,000 grant from the Department of Health and Human Services Job Opportunities for Low-Income Individuals (JOLI) program for the project. The William and Flora Hewlett Foundation also funded CW in the amount of $241,000.

CW is a unique nonprofit organization with a twofold mission: to support the expansion of the deconstruction and wood reuse industry; and, in

Printed on 100% Postconsumer Recycled Paper - Process Chlorine Free

doing so, to create training and employment opportunities for low-income and formerly homeless individuals. CW purchases "raw" salvaged lumber, remills it and markets value-added reclaimed wood products, thus making deconstruction projects and enterprises more sustainable. In addition, CW provides in-house, on-the-job training for low-income individuals with little or no previous woodworking experience.

Project Goals

The following are the systemic outcomes that CW seeks to achieve:

1. Support local deconstruction efforts, thereby creating training and employment opportunities for low- income individuals;
2. Reduce greenhouse gas emissions by diverting usable wood from the landfill into productive use;
3. Reduce demand for new wood and conserve forest resources;
4. Become a national model for environmental economic development; and
5. Create infrastructure to support mandatory deconstruction ordinances.

Grant funds were used as follows:	
Repairs and Maintenance	$2,088.94
Shop Supplies	$561.59
Utilities	$1,995.18
Accounting Fees	$1,362.50
Legal Fees	$50.00
Telephone	$1.441.79
Permits	$50.00
Total	**$7,500.00**

The Materials for the Future Foundation (MFF)/US Environmental Protection Agency (US EPA) Deconstruction Grant funds covered start-up costs and initial inventory purchases for the set up of the mill.

Project Detail

After fourteen months of predevelopment and business planning, CW hired an Executive Director and began negotiating for a site at the former Oakland Army Base. A suitable site was secured in March 2000 and the CW staff began making necessary facility improvements, purchasing and installing equipment, and hiring and training a crew.

In July 2000, approximately 200 guests attended the CW's Grand Opening, which was sponsored by the Alameda County Waste Management Authority, US Environmental Protection Agency, Region 9 and Weyerhaeuser Paper Company. The event gained significant media attention, including local television and radio coverage and a brief segment on CNN, which boosted sales.

Employment/Training

CW provides employment for low-income and homeless individuals at its mill and woodshop facility. CW employees have the opportunity to learn skills in a variety of areas related to milling and woodworking. The organization's training goal is to bring all employees through a three-year woodshop training program. In order to effectively reach this training goal, the staff developed a training plan based on the woodworking industry career ladder. Employees develop skills that promote advancement within CW and create avenues to other employment in the woodworking industry. Skills learned during the first 90 days also allow employees to gain career access to other industries, namely warehouse related businesses.

Employees begin training in the mill department and move into the woodshop as they develop increased skills. In the mill, employees receive on-the-job-training in occupational safety, machine operation and material handling, forklift operation, basic math skills, and accurate use of measuring tools. As employees gain experience, they are given further training and increased responsibility including operation and maintenance of industrial mill equipment, cutting parts to specification, assembly, and reading shop drawings. Advanced training includes wood species recognition, grain characterization, selecting material for production and wood product design and specifications.

To date, CW has hired eleven BOSS program participants and two graduates of a local youth deconstruction training program. CW plans to fill five additional employment slots during 2001 with BOSS as the first source for employee referrals.

Printed on 100% Postconsumer Recycled Paper - Process Chlorine Free

Waste Diversion

CW initially concentrated on production of flooring, siding, roof decking, and resurfaced lumber. The mill has processed approximately 85 tons of lumber, generating about $84,000 in sales between May 2000 and June 2001.

CW is currently expanding its product line to include more complex milled products such as molding, trim, windows, doors, and components for furniture designers. This expansion increases the markets available for CW products and increases the level of on-the-job training provided to employees. During this next phase, CW anticipates doubling monthly sales revenue by the end of 2001 while diverting approximately 100 tons of lumber from landfill or low-value recycling.

Greenhouse Gas Emissions

Source reduction of wood through deconstruction directly reduces greenhouse gas emissions by keeping the material out of the landfill and increasing forest carbon sequestration. By reusing 85 tons of lumber, this project reduced greenhouse gas emissions by 37 Metric Tons of Carbon Equivalent (MTCE) -- roughly the amount emitted annually by 30 cars. To estimate your greenhouse gas reduction benefits from source reduction or recycling, use EPA's online calculator - Waste Reduction Model (WARM) at http://www.epa.gov/globalwarming/actions/waste/w-online.htm, and for additional information on climate change and waste visit http://www.epa.gov/globalwarming/actions/waste/index.html.

Lessons Learned

The Executive Director left CW in August 2000 after nine months on the job. The success of the project was heavily dependent on the ability of the Director to meet the goals of the business plan. The combination of an inexperienced crew and the production and equipment issues left by the former Executive Director slowed down the mill's anticipated start-up timeline significantly.

Aside from this set-back, the CW project has reached several preliminary conclusions regarding the wood reuse industry:

1. Producing remilled dimensional lumber is not cost-effective. CW originally planned to include remilled dimensional lumber as a core product, focusing on Douglas fir, which is used extensively on the West Coast for structural applications. The mill primarily processed reclaimed dimensional lumber rather than timbers and beams, since the market for reclaimed timbers and beams is fairly mature, while the market for reclaimed dimensional lumber is weak. Sold as-is, reclaimed dimensional lumber has a very low market value, and rarely supports the cost of deconstruction, denailing, and marketing the material. Moreover, the material has often warped during drying so that it is no longer square and the original grade stamp is generally not accepted. The lumber can be resurfaced, regraded and made square again, but the increase in value is minimal compared to the cost. In addition, the waste factor is very high when remilling dimensional lumber to be resold as lumber, since the reclaimed material must be surfaced down to the next smaller standard dimension.
2. Cost-effective use of reclaimed dimensional lumber requires higher value-added production. Original business planning included several value-added products, such as tables, molding and trim, in addition to remilled dimensional lumber. These products have become the core of CW's marketing efforts. The added value offsets the relatively high cost of preparing the reclaimed material. In addition, defects can be cut away and discarded without losing the entire board, as is the case when material is being remilled into lumber.
3. A varied product line is essential to respond to variations in deconstruction feedstock. The supply of reclaimed lumber is extremely variable. While the new wood market is subject to variations in price and supply, these fluctuations are much more pronounced in the reclaimed lumber market. A varied product line gives CW the flexibility to utilize available materials.

Printed on 100% Postconsumer Recycled Paper - Process Chlorine Free

Conclusions

The CW staff continues to address production issues, identifying and repairing equipment problems, modifying the core product line and adding a woodshop component to diversify products. CW hired a Production Manager in October, 2000, who has organized the woodshop as a separate department to produce custom items. This allows the mill to focus on standard items, such as flooring and siding, reducing time-consuming changes in equipment set up. It also allows the crew to gain experience more gradually with a limited number of products. Custom and more complex items, such as doors, windows and furniture components, are produced in limited quantities in the woodshop.

Materials for the Future Foundation (MFF) is the fiscal agent and sponsor of CW. CW plans to become an independent 501(c)(3) organization.

This is the fifth in a series of five case studies on deconstruction projects produced by the Materials for the Future Foundation. Funding provided by the United States Environmental Protection Agency, Region IX, under the Source Reduction and Recycling Initiative of the US Climate Change Action Plan. Project managed by Lisa Geller. Written and designed by Simon Walker. Materials for the Future Foundation has compiled this information as a resource guide only and does not, by inclusion, endorse any of the organizations listed, nor, by omission, imply any negative opinion. Copyright 2001. The Materials for the Future Foundation. All rights reserved. Permission to use, copy, and/or distribute this document in whole or part for non-commercial purposes is hereby granted, provided that this notice and appropriate credit to MFF and US EPA are included. Commercial use requires prior written consent from MFF. If you have questions or comments about this material, please contact

Materials for the Future Foundation
P.O. Box 29091
San Francisco, CA 94129
tel: 415.561.6530 fax: 415.561.6474
email: mff@best.com
http://www.materials4future.org

Printed on 100% Postconsumer Recycled Paper - Process Chlorine Free