Worcester, MA

Expanding Markets and Revitalizing Communities

A Construction and Demolition (C&D) Material Reduction Success Story

Abandoned industrial complex prior to cleanup and demolition activities.

Sustainable reuse of brownfield properties involves an emphasis on reducing the environmental impacts of building renovation. One of the most effective ways of reducing these impacts is the recycling of construction and demolition (C&D) material. Recycling of C&D material can prevent loss of useful property, wasted materials and embodied energy. It conserves raw materials through the use of existing materials, conserves energy and water, and reduces the production of greenhouse gas emissions and other pollutants. Furthermore, by providing materials to local vendors and processors, C&D recycling can create employment opportunities and economic activities that sustain local economies.

Project Highlights

In June 2003, EPA awarded Main South Community Development Corporation (CDC) in Worcester, Massachusetts a $200,000 Brownfields Cleanup grant to address contamination discovered on 7.8 acres of the Gardner-Kilby-Hammond Neighborhood Revitalization Project—an ambitious $32 million dollar, 30-acre inner city neighborhood redevelopment project. Cleanup of contamination present in the soil and the abandoned industrial buildings was completed in March 2006. To help keep cleanup costs within Main South CDC's budget, McConnell Enterprises recovered multiple construction and demolition (C&D) materials from the abandoned industrial buildings, including: 15,000 tons of concrete and brick, 1000 tons of steel, 200,000 broad feet of hard yellow pine, and 2000 tons of granite. Salvaged materials were sold through local and global markets, reused onsite for new construction, or recycled, strengthening the local market for C&D materials. Main South CDC realized a savings of approximately $200,000 as a result of its C&D material reduction strategies. Early planning and a phased approach to the cleanup and development of the property also allowed for a major phase of the Gardner-Kilby-Hammond Neighborhood Revitalization Project to move forward: the construction of a Boys and Girls Club and affordable housing for first-time homebuyers.

Construction and Demolition Material

Construction and demolition (C&D) material is produced during new construction, renovation and demolition of buildings and structures.

C&D material includes bricks, concrete, masonry, soil, rocks, lumber, paving materials, shingles, glass, plastics, aluminum (including siding), steel, drywall, insulation, asphalt, roofing materials, electrical materials, plumbing fixtures, vinyl siding, corrugated cardboard, and tree stumps.

C&D materials can be recovered through reuse and recycling. In order for materials to be reusable, contractors generally must remove them intact (e.g., windows and frames, plumbing fixtures, floor, and ceiling tiles) or in large pieces (e.g., drywall and lumber). In order to be recyclable, materials must be separated from contaminants (e.g., trash, nails, and broken glass).

Background

The Main South CDC, a non-profit organization, was incorporated in 1986 to address the social, environmental and economic decline of the Main South Community in Worcester. The CDC's mission is to improve and sustain the quality of life for neighborhood residents by working together on projects and issues that will create and sustain safe affordable housing, support economic opportunities for businesses and residents of Main South, enhance

the physical image of the area, and instill a strong sense of place. To put its mission into action, Main South CDC, working closely with Clarke University and the City of Worcester, launched the Gardner-Kilby-Hammond Neighborhood Revitalization Project. The 30-acre inner city neighborhood redevelopment project plan called for the construction of the Worcester Boys and Girls Club, a new athletic field, and over 80 affordable "green" homeownership units for sale to first-time low-to-moderate income homebuyers.

A critical barrier to the Neighborhood Revitalization Project was the assessment and cleanup of a 7.8-acre abandoned and contaminated industrial complex built in the early 1800s in Main South. A preliminary environmental assessment of the property indicated soil and buildings contamination from prior uses including a former foundry, metal fabrication shop, a paper mill, a wood patterning shop and auto detailing and repair shops. A Phase II environmental assessment was the necessary next step. An environmental Phase II assessment completed in 2001—with EPA Brownfields Assessment grant funding awarded in 1999—revealed soil and buildings contaminated with metallic residues, paint, solvents and petroleum requiring cleanup. To assist with cleanup costs, EPA awarded Main South CDC a $200,000 EPA Brownfields Cleanup grant in 2003.

Main South CDC would like to thank all of its public and private partners:

We recognize that without shared vision, plans may remain ink on paper. Shared vision puts plans into action, in this case restoring hope and creating opportunity for current and future generations.

Process

To adhere to Massachusetts' material reduction goals and manage project costs, Main South CDC incorporated C&D material reduction activities directly into their Request for Proposal (RFP). The RFP required contractors bidding on the cleanup project to access the scrap and recycling value of the project and include the value in the project pricing. Subsequently, Main South CDC hired GZA Environmental Inc., to cleanup the environmental contamination present in the soil and the abandoned buildings, while Ryan Construction was retained to perform the demolition and construction phase of the project.

Project Funding

EPA Assessment grant funding to City of Worcester	$161,500
EPA Cleanup grant funding to Main South CDC	$200,000
In-kind funding from Main South CDC used forcleanup	$40,000
Leveraged for redevelopment from private sources	$12,950,000

Cleanup of the soil and abandoned building was completed on March 20, 2006. Next, demolition of the old industrial buildings began. In stark contrast to conventional demolition, McConnell Enterprises salvaged market-value materials such as steel, brick, granite, and lumber from the abandoned industrial building. Prior to the recovery of C&D materials, GZA Environmental, Inc. determined that a portion of brick was painted with lead. Testing revealed it was an insignificant amount of lead, and as a result, the Massachusetts Department of Environmental Protection approved a beneficial use determination to allow building debris to be reused as back fill after the removal of contaminants. Crew members from McConnell Enterprises deconstructed the clean bricks and stored them on the property for reuse during the new construction. The excess brick salvaged was sold in Boston to other construction companies to restore historically zoned homes and buildings. The salvaged pine heart lumber was sent to lumber mills in Mountain Pine, North Carolina and exported to parts of Spain for restoration projects. The recycled steel was exported to other countries, such as China. In addition, the lumber which was not recyclable was ground and burned at a power plant with natural gas in Maine to produce a mulch-like material, which has a variety of uses.

Recycling demolition material from the former industrial complex.

Recycled Materials from the Former Industrial Complex

- 15,000 tons of concrete and brick
- 1000 tons of steel
- 200,000 broad feet of hard yellow pine
- 2000 tons of granite
- Four three-decker duplex buildings

Results

As a direct result of the construction and demolition material reduction strategies, Main South CDC and its partners realized significant reductions in cleanup costs which kept the project competitive. Stephen Teasdale, the director of Main South CDC commented that the "actual cost of site acquisition, demolition and cleanup was greater than the market-value of the site. To keep the project cost competitive, materials were salvaged, reused or recycled resulting in huge savings; thus the 'value' created outweighed the costs." Some of the value created includes the revitalization of 7.8 acres of industrial brownfields. In its place stands a state-of-the-art Boys and Girls Club facility and a clean site awaiting a new track and all-weather athletic field owned by Clark University; this will be made available for use by the Boys and Girls Club. In addition to the C&D material recycling of the abandoned industrial buildings, Stutman Contracting moved, relocated, and revitalized four three-decker duplex buildings from Kilby Street to Hollis Street. As a result, approximately $100,000 in additional project savings realized due to avoided demolition and disposal costs. In addition, 35 new affordable and "green" housing units (using energy efficient boilers, low flow toilets, R-4 rated windows, bamboo flooring, and avoided vinyl products) were constructed and sold to first-time low and moderate income buyers, providing the community with needed affordable and sustainable housing. The final phase of the housing project is underway and includes the construction of 10 new duplex housing units with solar panels on the roofs.

The Neighborhood Revitalization Project is helping to create a new perception of the Main South area. Revitalization projects completed to date are helping increase property values for adjacent property owners; decrease crime rates; inspire new developers and renew developer interest in the area; motivate residents to maintain their neighborhood; and create a stronger sense of community.

The new Worcester Boys and Girls Club.

More information on Construction and Demolition Debris and brownfields can be obtained at www.epa.gov/brownfields/tools/tti_assess_cleanup.htm or by contacting the EPA Office of Brownfields Land and Revitalization (OBLR) at (202) 566-2777.

The EPA Brownfields Program provides grants to fund environmental assessment, cleanup, and job training activities. The Program is designed to empower states, communities, and other stakeholders in economic redevelopment to work together in a timely manner to prevent, assess, safely clean up, and sustainably reuse brownfields.