



Emeryville, California

A Former California Brownfield Recycled

A Construction and Demolition Waste Reduction Success Story



The GreenCity Lofts in Emeryville, CA.

Sustainable reuse of brownfields properties increasingly involves an emphasis on reducing the environmental impact of building renovation. One of the most effective ways of reducing these impacts is the recycling of construction and demolition (C&D) waste. Recycling of C&D waste can prevent loss of useful property, wasted materials, and embodied energy. It also helps to conserve 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 and economic activity that helps sustain local economies.

Project Highlights

In July 2003, the City of Emeryville provided \$1,175,000 in Environmental Protection Agency (EPA) Brownfields Revolving Loan Funds to GreenCity LLC to assist with cleanup costs associated with the GreenCity Lofts property, a former paint factory. The GreenCity Lofts project team completed cleanup of the 0.9-acre property in December 2004 and 62 condominiums were constructed in 2005. Demolition of the former paint factory and warehouse buildings was necessary before construction of the lofts could begin. The project team employed C&D waste recycling practices including deconstructing (hand-

dismantling) the buildings on the former industrial property as an alternative to traditional demolition. As a result, 94.6 percent of the demolition waste was recycled, exceeding the nearby City of Oakland's legal requirement by 45 percent. In addition, 21,569 tons of excavated soil were diverted from disposal and used as Beneficial Cover at a local Class II Landfill reducing project cost by an estimated \$496,708 in eliminated tipping fees.

Background

The GreenCity Lofts property is on the border of Emeryville and Oakland, in the San Francisco Bay Area. The property was used for paint manufacturing from 1923 through 1991 and then as a warehouse from 1991 through 2000. The soil was contaminated with petroleum hydrocarbons due to its former use as a paint factory. The property's ground water was also contaminated with petroleum hydrocarbons due to a neighboring paint factory.

The Bay Area city of Emeryville, like many other urban centers, is experiencing a major population growth. As a result, demand for housing is exerting tremendous pressure to develop remaining open space which contributes to urban sprawl. The increasing housing demand and lack of available



The 80-year-old abandoned paint factory building and warehouse.

land are driving the redevelopment of abandoned industrial land. In 2000, former Oakland Mayor Jerry Brown challenged developers to build projects that would revitalize city neighborhoods and set a new sustainable standard. Responding to the Mayor's challenge, GreenCity Development Group envisioned reclaiming the abandoned 80-year old paint factory property for construction of "green" high-density housing. However, environmental cleanup costs presented a substantial barrier to reclaiming the abandoned industrial land.

Process

To offset the costs associated with the environmental cleanup, the City of Emeryville provided \$1,175,000 in EPA Brownfields Revolving Loan Funds (RLF) to GreenCity LLC in July 2003. Cleanup of the GreenCity Lofts property was subsequently completed in December 2004. As part of the building permit process, GreenCity LLC submitted a Waste Reduction & Recycling Plan (WRRP) to the City of Oakland. The WRRP documents show how the developer will meet the city's goal of reducing the quantity of construction C&D debris disposed of at landfills by 50 percent or greater.

Consistent with the approved WRRP, project contractors implemented onsite source separation of demolition materials and segregated recycling for the deconstruction and new construction phases of the project. Onsite co-mingling of C&D waste with an off-site waste segregation method was used for the final (traditional) phase of demolition. According to an Emeryville city official, C&D debris recycling strategies can increase project cost due to the need for skilled labor. Fortunately, the terms (i.e., two-year interest free grace period, 3.5-years to pay thereafter, and two percent interest rate) of the EPA Brownfields RLF loan helped to reduce the developer's C&D recycling costs.

Construction and Demolition Debris

Construction and demolition (C&D) debris is produced during new construction, renovation, and demolition of buildings and structures. C&D debris 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, lumber). In order to be recyclable, materials must be separated from contaminants (e.g., trash, nails, and broken glass).

Results

The GreenCity Lofts project recycled a record 94.6 percent of its demolition wastes; exceeding Oakland's legal requirement of 50 percent by 45 percent. The high rate of C&D recycling was achieved in large part due to the deconstruction demolition process implemented. Deconstruction versus traditional demolition allowed large quantities of market-valued materials (i.e., plumbing and electrical fixtures, lumber, windows, and steel) to be salvaged and recycled. During construction of the lofts, 21,569 tons of excavated soil were diverted from disposal and used as Beneficial Cover at a local Class II Landfill. This reduced project cost by an estimated \$496,708 in eliminated tipping fees.

Emeryville's RLF grant leveraged the cleanup and reuse of an 80-year old abandoned industrial property for much needed housing. The project was proclaimed "the greenest multifamily development" by former Oakland Mayor Jerry Brown. From the inception to the finished product, sustainable practices were implemented throughout the life cycle of the project:



A construction crew collecting demolition debris for recycling.

Key Benefits

- Diverted 94.6 percent of demolition wastes from disposal thus, conserving space in existing landfills.
- Reduced overall building project expenses by avoiding C&D debris disposal costs (estimated \$496,708 in tipping fees).
- Allowed for the maximum recovery of waste material such as plumbing and electrical fixtures, salvageable lumber, and various metals.
- Reduced the financial and environmental impact associated with extracting, processing, and transporting raw materials.
- Generated revenue from the sale of market-value materials recovered as a result of innovative demolition.
- Qualified for a significant tax rebate offered by the City of Oakland Public Works Agency.
- Strengthened the local economy by supporting local markets for recyclables and the local work force.

- Deconstruction of the buildings resulted in demolition waste being diverted conserving landfill space, and easing the environmental impacts and costs of processing, shipping, and extracting raw materials.
- Lofts were built following U.S. Green Building Leadership in Energy and Environmental Design (LEED) principles using recycled building materials and local/regional materials.
- Project maximized the use of energy/water efficient technologies, such as collecting water runoff for use in landscape irrigation and providing wiring in the parking garage to accommodate electric motor vehicles.
- Housing project complied with Emeryville's affordable housing goal by providing six affordable housing units.

By implementing C&D materials recycling along with other sustainable reuse practices during the redevelopment of former brownfields, key EPA Brownfields Program goals were met and creation of a potential future brownfields was avoided.

More information on Construction and Demolition Debris and brownfields can be obtained at http://www.epa.gov/brownfields/tools/tti_assess_cleanup.htm#construction or by contacting the EPA Office of Brownfields Cleanup and Redevelopment (OBCR) 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.