

**American Association of Port Authorities
2010 Environmental Enhancement Award**

Demolition Program Port of Tacoma



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April 30, 2010

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Introduction

The Port launched an 18-month demolition program on the Blair-Hylebos Peninsula in June 2008 to make way for remediation and planned terminal, road and rail development. The demolition program called for the Port and its tenants to remove 57 structures from the peninsula and the surrounding Tacoma Tideflats area.

With the support of a resolution from the Port's five publicly elected commissioners, the demolition contracts required a minimum of 65 percent, by weight, of all non-hazardous materials to be diverted from landfills.

In addition to this minimum requirement, prorated cash incentives were offered for contractors to achieve diversion rates higher than 65 percent. The incentive levels were outlined in contract specifications and factored into the project budget at the time of bid.

Contractors also were required to use ultra-low sulfur diesel (USLD) in any equipment used more than 40 hours on the project to significantly reduce diesel particulate emissions, helping maintain better air quality in and around the Port.

During the 18-month program, these collaborative, incentive-driven efforts diverted from landfills an average 87 percent—and in some instances more than 98 percent—of the demolition materials. The 7,071 tons of recycled or reused material kept about 275 dump truck loads of waste out of community landfills. In addition, the recycled and reused material replaced the need to produce or import that much in new material.

Goals and Objectives

The Port of Tacoma has made significant progress in reducing its carbon footprint through cooperative, market-driven programs that clean up existing contaminants in the environment and prevent future pollutants from entering it.

The Port's five publicly elected commissioners passed a resolution in early 2008 to reaffirm the Port's environmental stewardship objectives. The resolution commits the Port to minimize pollution and waste by reducing pollution sources, reusing materials where possible, and promoting recycling and the use of recycled materials.

The 18-month demolition program on the Blair-Hylebos Peninsula provided an opportunity to demonstrate this environmental leadership.

The demolition program called for the Port and its tenants to remove 57 structures from the peninsula and the surrounding Tideflats area. To meet the objectives of the Commission resolution, demolition contracts required a minimum of 65 percent, by weight, of all non-hazardous materials to be diverted from landfills.

Cash incentives for diverting more than the minimum requirement encouraged contractors to look for creative ways to do even better.

Discussion

Background

The Port launched a demolition program on the Blair-Hylebos Peninsula to make way for remediation and planned terminal, road and rail development. From June 2008 through December 2009, the Port and its tenants removed 57 structures from the Tacoma Tideflats area.

Many of the structures were old and abandoned, posing both environmental and human hazard. These structures varied from a single-story wood-framed residence to multiple-story concrete, masonry and steel-framed industrial buildings.

The four main demolition sites included:

- **Kite Shop:** This was an abandoned two-story wood-framed office building.
- **Steam Plant:** A former steam plant, built in the 1930s, once provided power for the City of Tacoma. The project including demolishing several structures, including the masonry, concrete and steel-framed boiler and turbine house, cooling towers, an office building, maintenance building, waste transfer building and a 250-foot-tall double-walled steel smokestack. In-water barge mooring dolphins, a cut-off wall and water intake structure also had to be removed.
- **Arkema:** A former chemical facility contained three buildings and multiple tank farms, including process lines and associated items.
- **Earley Business Center and TOTE Finger Pier:** These projects included removing five steel-railed shipways and related creosote-treated structures that once were part of the Todd Shipyards World War II shipbuilding facility. Two pier structures, multiple mooring dolphins and related gangways, and a concrete T-pier also had to be removed.

Methodology

The Port clearly defined expectations for minimum requirements to divert materials from landfills, offered cash incentives for above-and-beyond performance and provided examples of ways to meet those objectives.

The contract specifications called for at least 65 percent of the demolition materials to be diverted from landfills. Contractors that failed to meet the minimum diversion requirements would be considered in breach of contract, precluding them from bidding on future Port projects.

In addition to the minimum requirement, prorated cash incentives were offered for diversion rates higher than 65 percent. The incentive levels were outlined in contract specifications and factored into the project budget at the time of bid.

The Port also offered examples of ways to divert demolition materials:

- **Reuse:** Using equipment and materials, such as tanks or windows, for their original purpose elsewhere
- **Salvage:** Using equipment and materials, such as structural timbers, elsewhere for uses other than their original purpose
- **Recycling:** Reducing materials, such as steel and aluminum, to their basic form for future use in other products
- **Site Residual:** Crushing materials, such as concrete, asphalt and masonry, for use as structural fill for future projects
- **Universal Waste:** Sending equipment, such as fluorescent light tubes and ballasts, to recycling facilities
- **E-Waste:** Sending electronics, such as computer equipment, to appropriate recycling facilities

To assist in meeting the objectives of this demolition program, the Port contracted with ReUse Consulting to analyze each site and provide a report identifying items for reuse or recycling. This information provided contractors with valuable ideas for alternate means of disposal, including potential contacts and sources.

The Port also found the information useful in determining what items potentially could be sold as surplus before demolition began. As a result, two buildings were sold and dismantled for reuse elsewhere, tanks and equipment were salvaged for reuse by a Port tenant and usable equipment was sold rather than scrapped.

How Project Meets Award Criteria

1. The program reused or recycled an average 87 percent of demolition materials, with some projects reaching diversion rates of more than 98 percent. Those efforts kept more than 7,000 tons of material—about 275 dump truck loads—out of community landfills. Reusing materials eliminates the need to mine new native material and significantly reduces truck-related emissions from importing new material to the Port or hauling waste to distant landfills.
2. The Port voluntarily required at least 65 percent of the materials from its demolition sites to be recycled or reused to reduce further its carbon footprint and demonstrate environmental leadership in being a responsible community neighbor. By providing incentives for higher landfill diversion rates and listed resources for achieving those results, the Port garnered cooperation and participation from its contractors. Results benefited the Port, the contractors, the community and the overall environment.
3. The minimum requirements and additional cash incentives encouraged contractors to think creatively and work together to find ways to reuse and recycle materials. Some

- of the more creative solutions included reusing piling for pole barns in Eastern Washington, trading discounted transport services for reusable equipment and finding new homes for specialized treatment systems to keep further pollutants out of the environment. These creative solutions directly contributed to the high 98 percent and 99 percent reuse/recycle rates on some projects.
4. The demolition program was completed in December 2009. While the terminal, road and rail infrastructure originally planned for the area has been delayed, completing demolition allowed many of those properties to be leased for immediate productive use. Many are now generating lease revenue for the Port and jobs for the community.
 5. Recycling and reusing material saves money in hauling fees and having to purchase new material. Recycling material with one Port vendor, for example, costs about \$20 per ton; hauling that material to a landfill costs about \$27.50 per ton. Masonry, concrete and asphalt can be processed on site for \$5 to \$7 per ton, and the Port gains the beneficial reuse of the material, saving \$15 to \$20 per ton on import material.
 6. The technologies and ideas involved in this demolition program are readily transferable to other ports and projects. In fact, since the demolition program, the Port sold four retired straddle carriers at auction with the stipulation that as many pieces as possible should be reused or recycled. The buyer, Goshen Forest Products, followed through with impressive results. Contractors will reuse long steel columns as rollers for moving structures and heavy pieces of equipment; wheels and rims were reused by a tire company; engine oil was recycled; and most of the remaining pieces were salvaged for reuse or recycling.

Conclusion

Contracts with required minimums and cash incentives for above-and-beyond performance contributed to a highly successful program that achieved diversion rates averaging 87 percent—and in some instances more than 98 percent—of the demolition materials. The 7,071 tons of recycled or reused material kept about 275 dump truck loads of waste out of community landfills.

Diversion efforts also generated 19,671 tons of recycled masonry, concrete and asphalt for reuse on other Port projects. Reusing the on-site recycled material eliminated the need to mine new native material and significantly reduced truck-related emissions that would have resulted from importing new material to the Port.

Through this program, several World War II-era pier structures and supporting mooring dolphins were removed, eliminating more than 85,000 square feet of overwater coverage and clearing debris from about half a mile of shoreline.

The contract requirements and cash incentives pushed contractors to look for alternate, creative means of disposal or reuse in lieu of simply transporting waste to landfills. Two of the contractors went well beyond the Port's requirements to reach diversion rates of 99.24 percent and 98.52 percent, respectively.

Here are results from the four main demolition sites:

- **Kite Shop:** DMSL Construction of Arlington, Wash., demolished a two-story wood-framed office building, diverting 77.7 percent of the materials. These results kept 224 tons of waste, or about eight dump truck loads, out of the landfill.
- **Steam Plant:** R.W. Rhine of Tacoma, Wash., completed the demolition contract, reaching a diversion rate of 98.52 percent. This included diverting 2,027 tons of

waste from the landfill—enough to fill 78 dump trucks—and generating 14,671 tons of recycled masonry and concrete material. The Port and R.W. Rhine worked together to find a business that could reuse a specialized treatment system found on one demolition site. The treatment system, which uses chemicals to remove oil and other materials from water, was dismantled and taken to Petroleum Reclaiming Services, where it will be reinstalled to process waste oils.

- **Arkema:** DEMCO of Seneca, N.Y., demolished this former chemical facility with a diversion rate of 99.24 percent. The 2,300 tons of diverted material equaled about 88 dump truck loads. The company worked out a creative, mutually beneficial deal with Recovery One, a company that converts and separates construction debris into salvageable material. Recovery One offered discounts to transport and recycle material from the site in exchange for tanks and equipment from the demolition site that it wanted for a stormwater treatment system. This collaborative effort reduced costs, kept material from the landfill and helped protect water quality on another Tideflats site.
- **Earley Business Center and TOTE Finger Pier:** These two projects were combined under one contract with Northwest Demolition. During demolition, more than 1,500 creosote-soaked wood piling were removed from Commencement Bay waterways. The diversion requirement prompted Northwest Demolition to seek other creative ways to dispose of these items. By selling piling to farmers and growers in Eastern Washington, a significant portion were salvaged for reuse in pole barns and storage facilities.