Case Study: Construction and Demolition Waste Reduction

This case study is one in a series developed by the Massachusetts Department of Environmental Protection (DEP) to highlight techniques for saving money and protecting the environment through reuse and recycling of construction and demolition debris.

Project Description: Clarke Distribution Corporation, Milford, Massachusetts

Clarke, a wholesale distributor for several lines of luxury kitchen appliances, renovated and expanded its distribution center in 2004. The Center is located in a rural area in central Massachusetts. Consigli Construction Inc. was the lead contractor for the project. The Institutional Recycling Network (IRN), a commercial recycling cooperative, provided waste reduction planning assistance and managed recycling logistics.

Spotlight: Ceiling Tiles and Doors

The project recycled six tons of ceiling tiles through the Armstrong Ceiling Recycling Program. Armstrong recovers the mineral fibers from discarded ceiling tiles to use in making new tiles. Armstrong’s program is available to demolition projects and to building owners who choose Armstrong ceiling systems in their renovation projects. Consigli removed the ceiling tiles, stacked them and IRN provided the transportation. Armstrong provides a “Recycling cost comparison worksheet” on its web site that allows users to compare the cost of recycling versus disposal.

Clarke also donated 20 wood doors and 20 metal doors to a non-profit organization, the Building Materials Resource Center (BMRC), a reused building materials retailer. Clarke received a tax credit for the donation, Consigli saved disposal costs and BMRC sold these products at a reduced cost to low-income homeowners for use in their homes.

Cost Savings

Following is a breakdown of the cost savings due to source separation and recycling:

<table>
<thead>
<tr>
<th>Material</th>
<th>Tons</th>
<th>Recycling Cost</th>
<th>Avoided Disposal Cost*</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Tiles</td>
<td>6</td>
<td>$625</td>
<td>$708</td>
<td>$83</td>
</tr>
<tr>
<td>Asphalt</td>
<td>970</td>
<td>$2,367</td>
<td>$114,460</td>
<td>$112,093</td>
</tr>
<tr>
<td>Concrete</td>
<td>1,267</td>
<td>$4,092</td>
<td>$149,506</td>
<td>$145,414</td>
</tr>
<tr>
<td>Metal</td>
<td>19</td>
<td>$785</td>
<td>$2,242</td>
<td>$1,457</td>
</tr>
<tr>
<td>Cardboard</td>
<td>0.86</td>
<td>$105</td>
<td>$101</td>
<td>($4)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2,263</td>
<td>$7,974</td>
<td>$267,017</td>
<td>$259,043</td>
</tr>
</tbody>
</table>

*Cost that would have been paid if material were disposed, asphalt & concrete are typically recycled.

Cost savings does not include reuse of 7,225 tons of ledge.

Disposal costs based on local rates.
Keys to Success: Team Approach to Waste Reduction Planning

Before construction started, staff from Clarke, Consigli and the Institutional Recycling Network walked through the facility to identify potential waste reduction opportunities. They developed a waste reduction plan that guided the entire waste reduction process from planning to development and construction. The plan identified several recycling opportunities, including:

- Clarke’s CEO used his business contacts to identify a new home for a 9,000 square foot refrigeration unit that would have otherwise been disposed.
- Rather than purchasing new loading dock leveling units, weighing two tons each, Clarke authorized Consigli to reuse 6 out of 10 of the existing units.

Project Team

- **Building Owner**
  Clarke Distribution Corporation, 397 Fortune Boulevard, Milford, MA 01757
  CEO: Tom Clarke  (508) 435-6226

- **Contractor**
  Consigli Construction Inc., 197 Main Street, Milford, MA 01757, Telephone: (508) 473-2580
  Contacts: Tom Burns, Project Manager, and John Laperle, Superintendent

- **Recycling Services**
  Institutional Recycling Network, 7 South State Street, Suite 2, Concord NH, 03301
  Telephone: (603) 229-1962

- **Building Material Reuse**
  Building Materials Reuse Center, 100 Terrace Street, Boston, MA 02120,
  Telephone: 617-442-8917

- **Armstrong Ceiling Tiles Recycling Program:**

Additional Resources:

- Massachusetts Department of Environmental Protection (DEP) Web site on Construction and Demolition Materials: Reuse and recycling resources for building and demolition contractors includes case studies, model specifications, recycling companies and information on best practices.
  [http://www.state.ma.us/dep/recycle/recycle.htm](http://www.state.ma.us/dep/recycle/recycle.htm)