



Is C&D on the Right Track?

Resources For Diversion

March 21, 2007



The State of C&D

2005 C&D Disposal Estimates

Tons Disposed Via C&D Facilities	Tons Disposed via Intermodal	Tons Disposed at Transfer Stations	Total C&D Disposed
199325.9	45,593	162,000	406,918.9

C&D Diversion/Recycling Rates at Mixed C&D Facilities

Incorporates monthly reporting data from WM, Allied, and Recovery 1 Facilities.

- Diversion rate: 12.28%
- Recycling rate: 4.71%





Program Goal

Goal of This Program

Divert the greatest amount of materials possible

- Without negatively impacting project schedule
- Without negatively impacting project budget
- Without increasing project liability



A large stack of weathered wooden planks, likely from a construction or demolition site. The planks are arranged in a neat stack, showing various shades of brown and grey, indicating age and exposure. The text "Strategies for Diverting C&D" is overlaid in the center in a white, serif font with a black outline.

Strategies for Diverting C&D

Strategies Overview

- Waste reduction (handout)
- Reuse
 - Salvage
 - Deconstruction
- Recycling



Salvage

Removing non-structural items of value from a building.



Deconstruction

The process of taking down a building in such a way as to maintain the highest value practical of its components.



Beams



- Average beam yield per building = 150 lineal feet
- 150 lineal feet of 6x8 = 600 board feet
- 600 board feet x \$0.70-0.95/board foot = \$420-570/building depending on condition/quality
- \$420-570/building x 100 buildings with 6x8 foundations = \$42,000.00 - 57,000.00

Recycling Pays

- Clean Wood: $-\$30 + \$80 = \$50$
- Concrete: $-\$40 + \$80 = \$40$
- Cardboard & Plastic Wrap: $\$0 + \$80 = \$80$
- Metal: Pays! Pays! Pays!



Recycling Saves Money

Alternative	Total C&D Debris Costs	Total Trucking Costs	Total Cost of Disposal
0% Recycling Rate	\$59,294.03	\$8,535.60	\$67,829.63
50% Recycling Rate (1 LEED Point)	\$49,633.76	\$4,836.84	\$54,470.60
60% Recycling Rate (Const. Works Min.)	\$47,701.71	\$4,097.09	\$51,798.80
75% Recycling Rate (2 LEED Points)	\$44,803.63	\$2,987.46	\$47,791.09
84% Recycling Rate (Projected Project Max.)	\$43,064.78	\$2,321.68	\$45,386.47

A large stack of weathered wooden planks, likely railroad ties, is shown. The planks are arranged in a neat stack, with some showing signs of wear and discoloration. The text "Tools To Increase Diversion" is overlaid in the center of the image in a white, serif font with a black outline.

Tools To Increase Diversion

The Toolbox


- Specifications
- Requiring submittals
- C&D facility recycling rate web pages
- Scheduling (salvage/deconstruction)
- Hauling distance
- LEED
- ReStore salvage contract
- Technical assistance for project manager
- Project assistance for contractor

Specifications

- Section 01505 - Construction Waste Management (PDF, 39 K) - also used as Section 1524
- Section 01736 - Building Deconstruction (and Salvage) (PDF, 26 K) - also used as Section 02050 or Section 024293 under 2004 CSI
- More to come.....

Submittals

Waste Management Report:

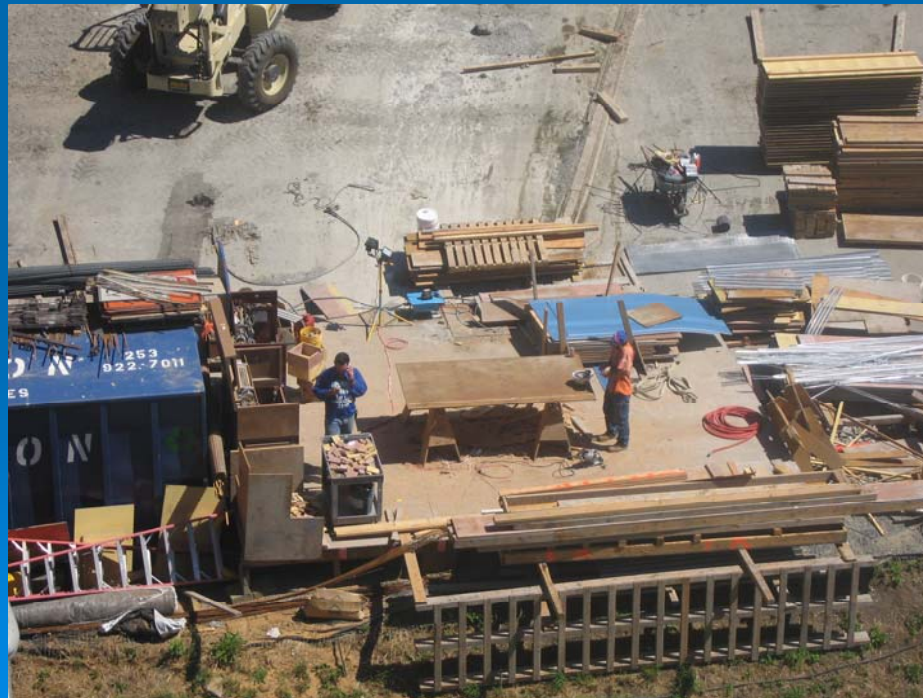
1. A record of the type and quantity, by weight, of each material salvaged, reused, recycled or disposed.
 2. Total quantity of waste recycled as a percentage of total waste.
 3. Disposal Receipts
 4. Recycling Receipts
 5. Salvaged Materials Documentation
- 

Regional CDL Recycling Facilities & their Current Diversion/Recycling Rates – as Reported to King County

Facility Name	Facility Recycling Rate ¹	Appropriate for Processing Recycling Rate ²	Percentage of Diverted Materials Recycled ³	Percentages of Diverted Materials to Beneficial Use ³	
				<u>Hog Fuel</u>	<u>ADC</u>
<u>Waste Management - Cascade Recycling Center</u>	25.40%	49.50%	64.20%	17.70%	18.10%
<u>Waste Management - Eastmont Recycling Center</u>	23.60%	73.70%	84.00%	16.00%	0%
<u>Waste Management - Recycling Northwest</u>	0.74%	49.50%	25.70%	73.30%	0%
<u>Rabanco - Black River</u>	0%	0%	0%	0%	0%
<u>Rabanco - 3rd & Lander</u>	1.40%	3.90%	100%	0%	0%
<u>Recovery 1</u>	93.81%	91.91%	20.56%	60.46%	18.98%

Scheduling

- Salvage may occur prior to Notice to Proceed
- Allow ~1 extra week for full deconstruction
- Advance notice goes a long way!



Avoided Hauling Costs

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LEED

- Materials and Resources Credit 2.1 – 50%
- Materials and Resources Credit 2.1 – 75%
- Innovation Credit – 90%



ReStore Contract

- Covers light salvage to minor deconstruction
- Free service to the county
- Can conduct site assessment and provide itemized list of salvageable items
- Prefer 2 weeks notice
- Contracted to respond within 72 hours of notification
- Have not delayed any schedules to date

Assistance

- Technical assistance for project manager
- Project assistance for contractor

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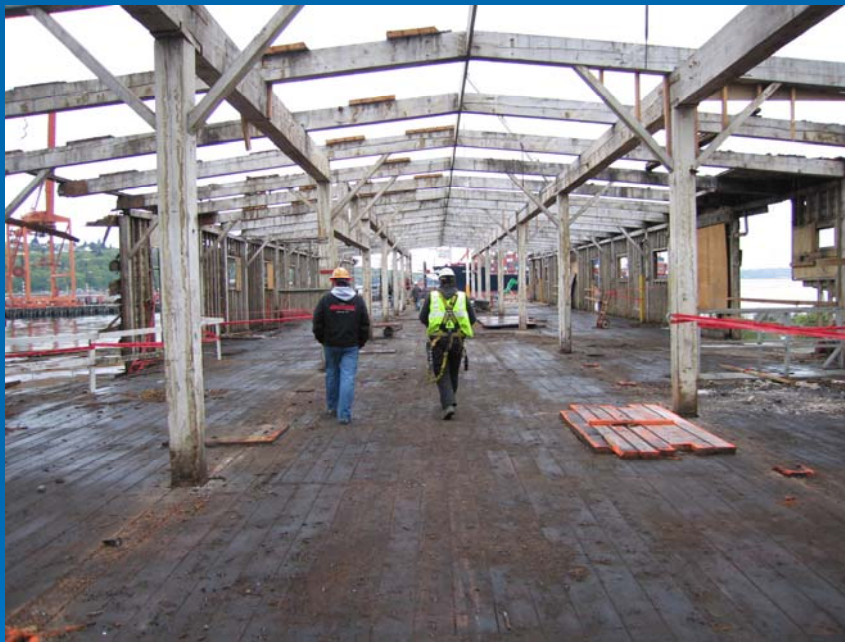
King County Case Studies

North Recovery Facility

- ReStore salvaged 10 tons at no cost to county
- Contractor salvaged 28 tons of beams
- Combined resale value of salvaged materials ~\$22,500
- Avoided \$2000 - \$3000 in disposal costs
- Could have saved \$26,000 - \$41,000 in disposal costs
- Strategies: Salvage and deconstruction



Harbor Island Fisher Mill



- Bid as a deconstruction project requiring 75% diversion
- Recovered 78% of non-concrete materials
- Recovered 93% of all materials
- Over 178 tons of wood were salvaged for reuse
- Avoided disposal fees totaled \$40,000-\$60,000
- Strategies: Deconstruction and recycling

Pan Abode



- Diverted 5 tons of material from landfill
- Materials diverted: walls, floors, ceilings, cabinets and a bathtub
- \$ saved: The cost of demolition
- Diversion: Salvage and deconstruction



Program Impact

Project	Tons Diverted	CO2 Equivalents Diverted
NRF	38	
Harbor Island	180	
Brightwater	75	
PanAbode	5	
King County Subtotal	298	208 MTCE (Metric Ton Carbon Equivalent)*
Greenbridge	25	
DoubleTree Hotel at Southcenter	66	
Total	389 tons	272 MTCE (Metric Ton Carbon Equivalent)*

* Calculated using EPA's WARM software (<http://yosemite.epa.gov/oar/globalwarming.nsf/WARM?openform>) assuming that all diverted materials were dimensional lumber which was recycled.



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