

# Construction Recycling Toolkit



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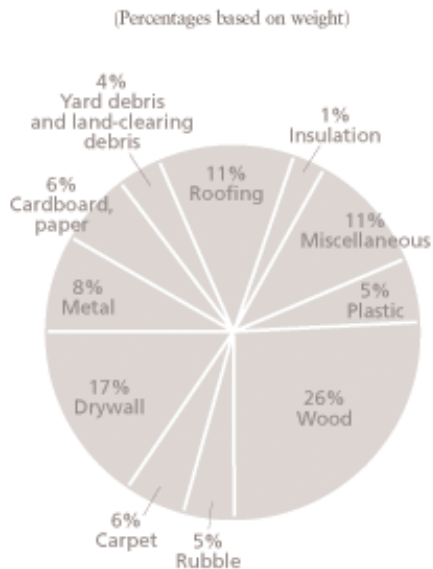
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**W**elcome to the Construction Recycling Toolkit for **Whatcom County!** This guide attempts to gather in one handy location all of the essential information that a construction and demolition contractor working in Whatcom County will need to greatly minimize the amount of materials leaving their jobsite as waste, rather than as a resource. We hope this will give you the tools you need to get started.

**Purpose of this Publication:**

This is the second installment of the Sustainable Connections Construction Waste Recycling Toolkit. Input for this document was created with the help of Whatcom County and King County Solid Waste Divisions and local service providers. Building materials represent the biggest opportunity and the biggest challenge in taking them from disposal as garbage into salvage and reuse programs. The U.S. Green Building Council has done a good job of providing incentives to deconstruct as well as build with used materials, but builders and architects have found that attaining the LEED points for these practices can be difficult, even for experienced builders. For this reason, this publication is structured around the use of LEED programs and explicitly describes how local project teams can make salvage and reuse easier, maximize their LEED points related to reuse and salvage and minimize project cost.

**Typical waste from construction\***



**How can you recycle construction materials?**

After all the options to prevent waste and salvage and reuse materials have been incorporated into the project, the next step is to recycle as much of the remaining debris as possible. Here's why:

- Recycling construction materials saves money by cutting disposal costs
- It reduces waste going to the landfill
- Facilitates a cleaner and safer construction site
- Improves community relations



**There are three types of facilities where waste and debris are processed:**

- 1. Landfills** - The least desirable method of waste disposal is at a landfill, where waste is deposited and buried. Landfills usually are designed to permanently contain the waste and prevent the release of harmful pollutants to the environment. There are usually no recycling or reuse options available by the time waste gets to a landfill.
- 2. Transfer stations** - A transfer station is a facility where waste is moved from collection vehicles to larger trucks or rail cars for longer distance transport. Waste usually is dumped onto a concrete floor; some large, easy-to-separate recyclable materials are sorted out of the load. The remaining waste is loaded onto a larger truck for shipment to a landfill. Waste destined for the Roosevelt Regional Landfill in Klickitat County moves via railcar out of Whatcom County. Transfer stations also accept some types of source-separated debris for recycling, such as wood, metal and cardboard.
- 3. Material recovery facilities (MRFs)** - "Material recovery facility" (MRF) is the general term used to describe a waste-sorting facility where a variety of commingled, "dry materials" are accepted. The term "dry materials" means that household garbage, food, liquid and hazardous wastes are not accepted. Using a MRF is the easiest way to recycle waste from a construction site because it allows contractors to put select recyclables such as wood, cardboard, and metals into one container. At a MRF, a combination of mechanical and hand-separation procedures are used to sort the recyclable items from other waste. The average recycling/recovery rate of a MRF is around 40 percent of all material brought in for processing.



## How Do I Get the Best Recycling Rate At My Jobsite?

If you want to obtain recycling rates worthy of green building points/credits for LEED you will have to:

- Learn the recycling rates for the different Construction and Demolition (C&D) processing facilities
- Specify to your hauler or drivers exactly where C&D materials from the project will be going
- Insist on receiving tip receipts (or equivalent) for anything and everything that leaves the job site
- Be aware that the most efficient balance between commingling all materials and source separating everything is a 3 container system where 1 container is for garbage, 1 container is for mixed C&D recyclables and 1 container is for the single material (or group of materials) which are being generated during any given phase of construction and that can be taken directly to individual C&D recycling facilities
- Make a C&D materials diversion plan at the beginning of the project and stick to it. This plan, and a report at the end of the project, are being required more often in construction contracts

## Players and their roles

- ★ **Property owner, property manager and developer** Establish requirements for waste reduction, set goals, and monitor and support program.
- ★ **Architect, designer, specification writer** Identify opportunities for waste reduction to the owner and developer, write specification for waste reduction, and monitor the program.
- ★ **Construction project manager** Plan and implement the waste reduction program, communicate the program to crew and subcontractors, monitor and report on program results.
- ★ **General Contractor** Interpret the specs to develop a bid package that meets the deconstruction and reuse requirement. Create a work plan for getting deconstruction done, selling and storing materials, and using salvaged materials in the new project. If the owner has a LEED target, create a tracking system to document the amounts of materials diverted from the landfill and reused in the new building.
- ★ **Subcontractors** Understand and implement the plan for deconstruction, storing materials and reusing salvaged material. Understand and implement the tracking system.

## Why deconstruction and reuse?

Why deconstruct a building? Perhaps the most obvious benefit is that deconstruction cuts waste and associated disposal costs. However, project owners who have deconstructed buildings cite a variety of other benefits.

- **Generating revenue.** Because deconstruction preserves the value of building materials, project teams can sell them. Alternatively, project teams can reuse salvaged materials, thus avoiding the expense of buying new products. In contrast, demolition practices generate expenses in the form of high disposal fees for waste.
- **Sustainability.** Modern demolition practices typically use heavy machinery to demolish buildings. This method can have significant air quality implications, and heavy machinery can damage sensitive areas such as shorelines, stream banks and tree roots. Deconstruction reduces these effects. As a result, the permitting process for deconstruction can be simpler than for demolition.
- **Safety.** Compared to traditional demolition, which uses heavy equipment, deconstruction poses less serious risk of worker injury.
- **Being responsive to the larger community.** Unlike demolition, deconstruction diverts materials from disposal, creates a local source of building supplies and reduces the demand for virgin materials.
- **Deconstructing** an existing building will not automatically reduce costs, but it might if planned carefully. If the project team can reuse or sell many of the materials that are salvaged from the old building, then the cost savings and revenue generated may equal or exceed the higher labor costs of deconstruction. Depending on the project and the salvage value in a particular building, deconstruction may cost less than mechanical demolition.
- Firms that establish a reputation for successfully executing deconstruction and reuse projects can market themselves as specialists in a field of generalists. This experience may translate into greater selection of future work.
- Deconstruction and reusing salvaged materials can help project teams achieve Materials and Resources credits in LEED. It can also help a building project qualify for local or state tax incentives.



## Why build green?

McGraw-Hill Construction's 2009 Green Outlook reports that the value of green building construction starts was up five-fold from 2005 to 2008 (from \$10 billion to \$36-\$49 billion), and could triple by 2013, reaching \$96-\$140 billion. Since 2005, the perceived benefits of green building have increased and differentiated as people become more knowledgeable about green building. The decrease in operating costs is the most often cited benefit (13.6%, up from 8-9% in 2005), followed by the increase in building values (10.9%, up from 7.5% in 2005).

Currently, one of the best ways for owners and project teams to demonstrate their commitment to the environment is to achieve LEED certification. The building industry, government agencies and the general public all have accepted LEED as a standard that indicates a building's environmental performance. Deconstruction and reusing salvaged materials can help owners and project teams qualify for LEED credits.

**Developers who build green expect to reap a premium of around 7.5 percent compared to standard construction.**

### What is LEED?

LEED, or Leadership in Energy and Environmental Design, is a green building rating system that sets a voluntary standard for high performance, sustainable buildings. The U.S. Green Building Council (USGBC) developed this standard and

continues to refine it. According to the USGBC web site, the council created LEED for the following purposes:

- Define "green building" by establishing a common standard of measurement
- Promote integrated, whole-building design practices
- Recognize environmental leadership in the building industry
- Stimulate green competition
- Raise consumer awareness of green building benefits
- Transform the building market

So far, it seems to be working: demand is growing for LEED-certified buildings. In fact, Whatcom County alone has over 24 projects currently registered for LEED certification. Elsewhere in the Pacific Northwest, the city of Seattle recently changed its building codes to allow developers to add extra stories to downtown buildings, but only if the buildings meet the LEED-silver standard.

The city of Portland currently has the most LEED-certified buildings per capita in the nation! The state of Washington, the City of Bellingham and Whatcom County require all of its new buildings and major renovation projects above 5,000 square feet to be built to LEED standards.

The USGBC has developed different rating systems for different types of building projects: new construction and major renovations, core and shell, commercial interiors, and neighborhoods, to name a few. All of them work on a point system. A project's LEED certification level depends upon the number of points it achieves. There are four levels to LEED v3: Certified (40-49 points), Silver (50-59 points), Gold (60-79 points), Platinum (80+ points). The points are divided among six categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation in Design.

Most of the LEED credits related to deconstruction and materials reuse are in the Materials and Resources section. There may, however, be opportunities to use deconstruction and materials reuse to obtain credit in the Innovation in Design section.

Comparison of materials and resources credits related to deconstruction and reuse

<b>LEED-NC v3</b>	New! Nine credits relate to deconstruction and reuse, and up to four credits available for innovation in design.
<b>LEED-EB v3</b>	Existing buildings. Four credits relate to deconstruction and reuse.
<b>LEED-CI v3</b>	Commercial interiors. Seven credits relate to deconstruction and reuse.
<b>LEED-CS v3</b>	Pending Core and shell. Eight credits relate to deconstruction and reuse.





## LEED 2009 for New Construction and Major Renovations Project Checklist

Project Name:

Project Address:

Y ? N	Materials and Resources	14 Points
<input checked="" type="checkbox"/>	<b>Storage and Collection of Recyclables</b>	Required
<input type="checkbox"/>	<b>Building Reuse</b> —Maintain Existing Walls, Floors and Roof	1-3
<input type="checkbox"/>	<b>Building Reuse</b> —Maintain Existing Interior Nonstructural Elements	1
<input type="checkbox"/>	<b>Construction Waste Management</b>	1-2
<input type="checkbox"/>	<b>Materials Reuse</b>	1-2
<input type="checkbox"/>	<b>Recycled Content</b>	1-2
<input type="checkbox"/>	<b>Regional Materials</b>	1-2
<input type="checkbox"/>	<b>Rapidly Renewable Materials</b>	1
<input type="checkbox"/>	<b>Certified Wood</b>	1

### Why documentation is the key to LEED

The LEED rating system relies on a third-party certification process. This process has distinguished LEED from other commercial building rating systems, and made LEED one of the most recognized and respected green building standards in the industry.

To maintain its rigor, the USGBC requires that project teams document all phases of a project - from pre-design through demolition to construction and commissioning. The documentation requirements are significant. Although the documentation process does take time, the result is worth it. LEED certification has high credibility among government agencies, the building industry, and perhaps most importantly, the market.



### PROJECT PROFILE



WECU HOME LOAN CENTER  
BELLINGHAM, WASHINGTON

96% construction waste recycled

45% more efficient than code

50% water reduction

#### LEED® Facts

WECU Home Loan Center  
Bellingham, WA

LEED for New Construction  
Certification awarded 2007

<b>Gold</b>	<b>41*</b>
Sustainable Sites	9/14
Water Efficiency	4/5
Energy & Atmosphere	6/17
Materials & Resources	5/13
Indoor Environmental Quality	12/15
Innovation & Design	5/5
* Out of a possible 69 points	



Opened in February 2007, the 9,000 square foot building is the first privately funded LEED™ project in Bellingham. WECU saw the design and construction of the Business & Home Loan Center as an opportunity to progress the region's green building movement by demonstrating LEED strategies and results to their members and the community. Over 90% of the construction waste created onsite was diverted from the landfill through composting, recycling and reuse. The project team supported the regional economy by purchasing over 45% of materials from local manufacturers and 20% of the materials were extracted regionally. Further success was reached with by purchasing building products with recycled content that totaled over 10% of the total materials used on the project.





## Waste Management Progress Report

MATERIAL CATEGORY	DISPOSED IN MUNICIPAL SOLID WASTE LANDFILL	DIVERTED FROM LANDFILL BY RECYCLING, SALVAGE OR REUSE		
		Recycled	Salvaged	Reused
1. Asphalt (cu yds)				
2. Concrete (cu yds)				
3. Porcelain Plumbing Fixtures (lbs)				
4. Ferrous Metals (lbs)				
5. Non-Ferrous Metals (lbs)				
6. Wood (lbs)				
7. Glass (lbs)				
8. Clay Brick (lbs)				
9. Bond Paper (lbs)				
10. Newsprint (lbs)				
11. Cardboard (lbs)				
12. Plastic (lbs)				
13. Gypsum (lbs)				
14. Paint (gal)				
15. Insulation (lbs)				
16. Other (insert description)				
17. Other (insert description)				
<b>Total (In Weight)</b>				
(TOTAL OF ALL ABOVE VALUES - IN WEIGHT)				
<b>Percentage of Waste Diverted</b>				
(TOTAL WASTE DIVIDED BY TOTAL DIVERTED)				

## Reuse & Salvage Facilities

### RE Store 360-647-5921

Non-profit with licensed salvage and demolition crew. Accepts a wide range of used building materials for resale to the public. Donated material is tax-deductible. Pick up and removal available.

### Robinson Recycled Building Materials 360-676-8890

Demolition contractor salvages and accepts selected reusable materials from demolition sites.

## QUESTIONS?

### Call the Recycling Hotline 360-676-5723

**The Whatcom County Health Department** offers free consulting and technical assistance regarding reuse, recycling, or disposal of construction and demolition debris. For assistance call 360-676-6724.

### Whatcom County Public Works

#### Solid Waste Division

360-676-7695

322 N. Commercial Street, #220  
Bellingham, WA 98225

#### Disposal of Toxics

360-380-4640

3505 Airport Drive, Bellingham  
(one block west of the airport entrance)  
Open Monday - Friday 9 am - 4 pm  
First Saturday of every month 9 am - 4 pm

#### Sources:

Whatcom County Public Works: [www.co.whatcom.us/publicworks/solidwaste](http://www.co.whatcom.us/publicworks/solidwaste)  
Metro's web site: [www.metro-region.org](http://www.metro-region.org)  
King County Solid Waste Division:  
<http://www.metrokc.gov/dnrp/swd/greenbuilding/>

The USGBC now allows project teams to fill out all the forms online, which can make things simpler and faster. Check out [www.usgbc.org/leed](http://www.usgbc.org/leed).

### Additional Resources

 Sustainable  
Connections  
[SustainableConnections.org](http://SustainableConnections.org)



## Q&A

### Q: Can it be cost effective and in compliance with state and local regulations to recycle asphalt and/or concrete on-site?

A: Yes, asphalt and concrete can be used in both structural and non-structural applications as long as it is processed (usually crushed) to meet the required specifications for the application. Certain additional requirements do apply to the use of the material (e.g. must be above placed above the level of the water table) but the practice of processing and using these materials on-site is often more cost effective than having the “waste” material hauled off and having new material brought onto the site. More information is available at <http://your.kingcounty.gov/solidwaste/greenbuilding/>

### Q: Can painted, pressure treated and creosoted wood be recycled?

A: No, though some commercial boilers may be permitted by Ecology to incinerate some of these contaminated wood materials as boiler fuel. Care should be taken to insure the incinerator the incinerated material will be going to is permitted to incinerate the exact materials that will be going there. If someone accepts this material from you for recycling you may wish to request a paper trail to verify that the material is processed in accordance with state regulation. Links to additional information and guidance documents can be found on-line at <http://your.kingcounty.gov/solidwaste/greenbuilding/>

### Q: Can cedar shakes be recycled?

A: Yes and No. If they have been treated they should be handled like any other treated wood (see treated wood Q&A). If they have not been treated then they can be reused or recycled through composting. Though technically not recycling they can also be incinerated as boiler fuel.

### Q: Can new gypsum drywall scraps be used as a soil amendment?

A: Maybe, though the practice is not currently recommended in our region. Adding drywall definitely changes the mineral content of the soil it is applied to and this can be a bad thing or a good thing depending on the condition of the pre-existing soil. Wet gypsum drywall is known to release hydrogen sulfide which smells like rotten eggs and there are also concerns that hazardous heavy metals may be present in some drywall products currently on the market which could accumulate and potentially become a problem in soils amended with gypsum drywall material.

## C&D Definitions:

### ADC (Alternative Daily Cover):

Cover material other than earthen material which is placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter and scavenging.

### Appropriate for Processing:

Loads of C&D materials entering a facility of which most of the material (90%), as determined by the processor, can be sent on by the facility for recycling. Usually charged a lower rate.

### Beneficial Use:

The use of CDL waste as an ingredient in a manufacturing process, or as an effective substitute for natural or commercial products in a manner that does not constitute recycling and in a manner consistent with all applicable laws. Beneficial Use includes but is not limited to use as hog fuel and alternate daily cover.

### (CDL) Construction, Demolition and Landclearing Debris:

CDL debris results from construction, remodeling, repair or demolition of buildings, roads or other structures. It includes (but is not limited to) wood, concrete, drywall, masonry, roofing, siding, structural metal, wire, insulation, asphalt, packaging materials related to construction or demolition and natural vegetation resulting from clearing land for development.

### Commingled C&D:

Pure loads of Recyclable C&D Waste that contain mixed types of recyclable materials stored in one on-site container, which is taken to a sorting facility where materials are separated for recycling. Non-recyclable material may not be placed in a commingled container.

**In Washington, 1.4 million tons of construction and demolition waste are land-filled annually.\* It is estimated that three quarters of this waste (approximately 74%\*\* ) is divertible. Recycling and reusing construction materials is an essential part of reducing the amount of resources that end up in landfills. The listings in this brochure provide contact information for most construction recycling services in the Whatcom County area. It is recommended to call first to verify pricing, material, and quantity information. REMEMBER: It is illegal to burn, bury, or dump construction demolition waste. In Washington State, burying or dumping can pollute ground water and surface water (WCC 8.28). Only clean, dry vegetation may be burned (WAC 173-425).**

\*Department of Ecology Annual Disposal by County Report. \*\*California Integrated Waste Management Board. Targeted Statewide Waste Characterization Study: Detailed Characterization of Construction and Demolition Waste-publication #341- 06-007, June 2006, by Cascadia Consulting Group.



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### **Hog Fuel:**

A specific grade of ground up wood and bark. It varies in size but is generally between 1/2" and 6" screen size. In the Pacific Northwest, hog fuel from CDL recycling facilities is generally used to fuel boilers for the wood and paper processing or other industries.

### **Inappropriate for Processing:**

Loads of C&D materials entering a facility of which less than 90%, as determined by the processor, can be sent on by the facility for recycling. Usually charged a higher rate.

### **Mixed C&D Waste:**

C&D materials containing both recyclable and non-recyclable. C&D materials that have not been source separated. C&D waste is considered to be mixed C&D waste if it contains more than 10 percent, but less than 90 percent recyclable C&D waste by volume.

### **Source-separated C&D Waste:**

A single kind of recyclable C&D waste material that has been separated from other C&D waste materials at the site of remodeling, repair, construction, demolition, or land clearing before it is transported to a receiving facility.

