Business Environmental Program
College of Business
University of Nevada, Reno

Providing environmental and energy information and solutions to Nevada's businesses and communities

Business Environmental Program Hazardous Waste Fact Sheet

Solid Waste Source Reduction and Recycling Opportunities for the Construction and Demolition Industry

"'WASTE' – A resource in the wrong place"

Old Chinese Proverb

This proverb perhaps has no better application than to Construction & Demolition (C&D) waste. Studies show that as much as 82% of C&D waste can be averted from landfill disposal through reuse and recycling. The salvage of demolition materials can be a significant means to reducing solid waste volume, avoiding tipping fees, and providing a revenue source from the sale of recovered materials or reducing costs by reusing existing materials. Planning is essential to reducing C&D waste. This is a bottom line issue. Dollars spent handling and disposing of waste are not adding any value to your projects and are reducing profits. Not only is C&D waste, a resource in the wrong place, but it is expensive.

The type and quantity of waste generated by any Construction and Demolition (C&D) operation will depend on the type of C&D project. For example, demolition typically produces larger percentages of waste than renovations. Road repair/paving projects regularly produce asphalt, asphaltic concrete, concrete rubble, excavated soils, and miscellaneous metals. Residential and commercial renovation projects will generate packaging materials, drywall, carpeting and padding, miscellaneous wood products, roofing materials, appliances (aka) "white goods". New home construction also produces significant quantities of waste. EPA estimates that approximately 4.41 lbs/ft^2 are produced from residential construction.

Many states have been facing landfill space shortage problems for some time now; it is in everyone's best interest to save landfill space. Waste minimization by source reduction is the key to doing business in an efficient and environmentally friendly way. A growing number of companies, such as INTERFACE and IKEA, view the generation of waste as lost profits and inefficiency. The following are a few tips to improve efficiency and reduce the amount of waste generated from C&D work which can also result in increased profits and improved environmental performance:

- Optimum Value Engineering: design the project such that materials usage is maximized to prevent waste.
- Use Green/Sustainable Building techniques to insure efficient use of materials and time.
- Purchase what is required and request delivery 'just-in-time' to minimize storage space.
- Store materials properly before use, so they don't become waste.
- Clean up salvage and debris as you go!! A clean work site is a safe work site, promotes organizational efficiency, and reduces the risk of injury.
- **DON'T** have large containers to throw things in; the Builder and sub-contractors can see the waste being produced and determine how to reduce the amount of waste generated. This also prevents drive-by contamination.
- Make sub-contractors legally responsible for the waste they generate at your site and make sure they practice waste minimization techniques such as segregation of materials.

There are four materials—concrete, metal, high-quality lumber and wood—that have the best market value. Probably the most recycled materials in the United States are concrete and asphalt. The Construction Materials Recycling Association

(CMRA) estimates that more than 100 million tons of concrete are recycled every year.

Concrete

Use the right formulation and mix properly.
Grade and prepare the base properly to prevent excess consumption.
Concrete can be crushed and sieved for use as a base aggregate on site or at nearby projects.
If excess concrete is mixed, pour into block forms and reuse it on-site or at another site.

Studies show wood debris can make-up 30% of a C&D project. Wood waste is paid for 3 times: purchase, site handling (several times), and disposal.

Wood

Design the project to accommodate standard lumber and dry wall sizes.
Use engineered lumber to maximize recycled content and efficiency of wood utilization.
Construct Site-Engineered Environmental (SEE) studs on site using scrap dimensional lumber and scrap OSB, (aka) waferboard. (www.buildingscienceconsulting.com/resources/walls/SEE_stud_specs.pdf)
Measure carefully and use a central cutting area to improve material utilization.
Use smaller lengths as spacers.
Maximize blocking and backing during framing to facilitate reuse of cutoffs.
Reuse foundation form boards for flooring, subflooring or framing.
Use prefabricated trusses and wall components.
Reuse wood in renovation.
Grind wood on site for use in landscaping and erosion control.

Drywall

Place cutoffs inside walls; this will increase thermal mass which will minimize heat loss.
Grind waste drywall for the following uses:
- To produce new drywall
- An ingredient in Portland cement
- A source of sulfur and calcium for crops in agricultural land application
- An amendment in composting systems

Metal

Scrap metal (including HVAC ductwork, framing, pipes, conduit, lighting fixtures, structural steel, doors and window frames) is easily recycled and can provide a source of revenue for the project.

Deconstruction is another option to address C&D Waste. According to the Deconstruction Institute (www.deconstructioninstitute.com) Deconstruction is a process of building disassembly in order to recover the maximum amount of materials for their highest and best re-use. Deconstruction is an alternative to demolition and landfilling. It diverts usable materials from the waste stream and into profitable and environmentally sound reuse and recycling. Deconstruction relies heavily on manual labor, therefore SAFTEY should be the paramount consideration for all activities associated with this process. Deconstruction is considered demolition and is covered by the OSHA Code of Federal Regulations (CFR) 29 Part 1926 for Labor.

Deconstruction is a cost-competitive and environmentally responsible alternative to conventional building demolition. By choosing deconstruction methods over conventional demolition, you can improve your bottom line through avoided waste disposal costs, and also by generating revenue from salvaged building materials to offset the demolition costs. In turn, high-quality used building materials are produced for use in new construction or renovation projects. For instance, the demolition of a typical 2,000 square foot home can be expected to produce 127 tons of debris; if disposal fees are $10 per ton, one can expect to pay $1270; if 80% of the material is diverted for reuse and recycling, one can save $1016 in tipping fees. Additional savings are realized in reduced labor costs associated with hauling the waste, and reduced amounts of raw materials that need to be purchased, plus any revenue from the sale of salvaged material.

As with all successful projects, careful planning is essential and must be a prerequisite to implementation in order to minimize the generation of costly waste. Recovered materials have three places to go: Reuse, Recycle or Disposal. Therefore, plan so that materials are not handled any more than three times: removal; on-site cleaning, de-nailing, staging; final transport. Contractors well versed in recovery methods and local markets may be able to recover more materials than contractors unfamiliar with reuse and recovery techniques. Facilitate good communication among the client, project facilitators, and contractors such that goals, incentives and penalties are understood and agreed upon. Lastly, allot enough time for project completion.

Summary:
A number of factors are stimulating interest in the C&D industry. These include but are not limited to: rising costs of waste disposal; increased cost of work related injuries; stringent new government regulations; tax credits awarded to those who divert materials from landfills; the availability of effective mobile crushing, screening, and recycling equipment; the excellent after-market value of many recycled materials, like steel and lumber, and a steadily growing concern for the environment by both consumers and commercial entities. State and municipal regulations are being contrived to encourage growth of the recycling businesses.

In an effort to address some of these concern, there has been a growing green building movement that has gained considerable momentum over the past few years. The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) green building certification program awards points specifically for recycling certain percentages of the debris generated by the demolition of whatever stood before the LEED building was constructed. LEED is stimulating the popularity of controlled methods of demolition—dissecting a structure with the help of excavators armed with specialized attachments, for instance, instead of implosion or knocking a building down with a wrecking ball—thus putting more emphasis on salvaging demolition materials for recycling.

LEED and other Green Building Programs also reward new construction projects that develop and implement waste management plans that promote recycling and reuse of waste materials. A schooled plan will greatly minimize waste or "the cost of doing business" that adversely affects a builders bottom line. (http://www.toolbase.org/Best-Practices/Construction-Waste/residential-construction-waste)

Local/Regional Businesses knowledgeable with C&D processes are:

Castaways Trash Hauling 1000 Avenue of the Colors Lockwood, Nevada **Steve Duque, Operations Mgr.** Phone: (775) 342-2444 Fax: (775) 342 6262 E-mail: steve@castawaytrashhauling.com	Nevada Waste Group Nevada Recycling & Salvage 1085 Telegraph Street Reno, Nevada 89502 **Dave Wieland, General Mgr** Phone: (775) 322-5788 Fax: (775) 745-1164 E-mail: dwieland@nvwastegroup.com	Asphalt Concrete Recycling Center 65 Newman Court Moundhouse, NV 89706 **Billy Dunn, GM** Phone: (775) 246-3388 Fax: (775) 246-3339 Mobile: (775) 691-9985 E-mail: bdunacrc@sbcglobal.net
Tahoe Truckee Sierra Disposal Co. 645 Westlake Blvd., Ste 5 Tahoe City, CA 96145 **Operations Manager** Phone: (530) 583-0148 Fax: (530) 583-0804	The Pallet Depot, LLC 5910 Alpha Avenue, Suite C Stead, Nevada 89506 Phone: (775) 971-1983 Fax: (775) 971-1880 www.thepalletdepot.com	Akita Enterprises, Inc. 4533 Feather River Blvd. Marysville, CA 95901 **Arthur Clegg**, President Phone: (530) 742-9114 Fax: (530) 742-9114 E-mail: artclegg@aol.com

This listing of C&D businesses is provided for informational purposes only. This list is provided as a service to Nevada businesses in order to assist them with proper C&D management. The listing of these businesses is not to be construed as an actual or implied endorsement of their services. Additionally, other businesses which provide similar services may not be listed; this omission is not to be construed as an actual or implied denouncement of these businesses.

As stated on page 1, the four materials discussed in this fact sheet offer the most economic benefit from recycling and they compose the largest volume by weight of material associated with any construction, demolition or deconstruction project. However, in addition to these materials, cardboard, plastic, appliances, shingles and numerous other items are generated during construction, demolition or deconstruction projects which also maybe reused or recycled. There is an ever growing market of businesses available to contractors that are willing to assist builders and contractors in diverting materials from disposal to the landfill. A more comprehensive list of companies providing recycling services can be reviewed at this website **http://nevadarecycles.gov/main/recyclables.htm.**

Please review the Business Environmental Program's website **WWW.UNRBEP.ORG** or call (800) 882-3233 for further information regarding this subject or any other environmental issues of concern to you

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