

ANNEX B
WASTE REDUCTION & RECYCLING GUIDELINES

WASTE REDUCTION & RECYCLING GUIDELINES

This section represents the supporting documentation for general Requirements Section 2 Point D. Site Construction & Demolition Waste Management

WASTE MANAGEMENT

1.1 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Commingling: Mixing recyclable C/D material in one waste container. Materials Recovery Facilities (MRF) exists to sort and recycle commingled materials off-site.
- C. Construction and Demolition Waste: Includes all non-hazardous solid wastes resulting from construction, renovations, alterations, repair, and demolition.
- D. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitability, corrosiveness, toxicity or reactivity.
- E. Material Recovery Facility (MRF): A processing facility designed to sort and separate recyclables based on market needs and material components.
- F. Non-hazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitability, corrosiveness, toxicity, or reactivity.
- G. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- H. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- I. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste. Can be conducted on-site (as in the grinding of concrete and reuse on-site).
- J. Return: To give back reusable items or unused products to vendors for credit.
- K. Reuse: To reuse a construction waste material without altering its form on the project site or elsewhere.
- L. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- M. Sediment: Soil and other debris that has been eroded and transported by storm or well production runoff water.
- N. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste in order to reuse or recycle them.
- O. Toxic: Poisonous to humans either immediately or after a period of exposure.
- P. Trash: Any product or material unable to be reused returned, recycled, or salvaged.
- Q. Volatile Organic Compounds (VOCs): Chemical compounds common in and emitted by many building products over time through off gassing: solvents in paints and other coatings; wood preservatives; strippers and household cleaners; adhesives in particleboard, fiberboard, and some plywood; and foam insulation. When released, VOCs can contribute to the formation of

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smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.

- R. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.
- S. Waste Management Plan: A project-related plan for the collection, transportation, and disposal of the waste generated at the construction site. The purpose of the plan is to ultimately prolong the useable life of waste materials and reduce the amount of material being landfilled.
- T. Waste Management Report: A monthly report completed by the contractor describing actual waste disposal of materials, including methods, types of waste, destination and quantities. All weight tickets must be attached to waste management report.

1.2 RESOURCE EFFICIENCY

- A. The Contractor shall use resources as efficiently as possible, in completion of the project. Namely Owner shall require the Contractor to:
 - 1. Use techniques that minimize waste generation
 - 2. Reuse and renovation of existing structures in lieu of demolition
 - 3. Salvage of existing materials and items for reuse/resale
 - 4. Reuse materials on site where possible
 - 5. Recycling of waste generated during the demolition and construction process

1.3 ADDITIONAL INFORMATION/RESOURCES

- A. Build America Beautiful Program
National Association of Home Builders
1201 15th Street, NW, Washington DC 20005, (800) 368-5242
- B. Designing With Vision: Public Building Guidelines for the 21st Century
Chris Stafford, AIA, Stafford-Harris, Inc., 1992
1916 Pike Pl., Seattle WA 98101, (206) 682-4042
- C. Environmental Building News
A bimonthly newsletter on environmentally sustainable design and construction.
Yearly subscription
RR 1, Box 161, Brattleboro, Vermont 05301, (802) 257-7300
- D. The Environmental Resource Guide
A collection of detailed material assessments, articles, and case studies connecting environmental awareness with building construction
Quarterly: \$200/year
- E. The American Institute of Architects
1735 New York Ave, NW, Washington DC 20006
(202) 626-7331 (800) 365-ARCH
- F. "Green Building" Performance Standard Guide
American Society for Testing Materials (ASTM), 1992
- G. The Healthy House
An in-depth look at the construction of a "healthy house" especially with respect to chemical sensitivity. Chapters are broken down into stages of building (i.e., planning, location, etc.) and building components (i.e., foundation systems, steel framing, windows and doors, etc.) Good lists of organizations and suppliers.
John Bower
Carol Communications 1989.

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- H. Sustainable Construction: Proceedings of the First International Conference of the International Council for Building Research Studies and Documentation Task Group 16
Covers a wide range of topics. Over 800 pages.
University of Florida College of Architecture,
Center for Construction and Environment, 1994, (904)392-7502
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E-1 APPENDIX E - GREEN BUILDING RESOURCES
TRIANGLE J COUNCIL OF GOVERNMENTS **Waste Spec**
APPENDIX E - GREEN BUILDING RESOURCES E-2
- I. Sustainable Building Guidebook for the New State Office Building: A Preliminary Overview
Center for Maximum Potential Building Systems, Inc
February 1993
- J. Architectural/Engineering Guidelines
Comprehensive specifications covering energy efficiency and other life cycle and sustainable provisions
About 110 pages
State of Texas General Services Commission, Office of Facility Planning, 1993 Austin, Texas
- K. Demolition for Salvage and Reuse: Prototypical Demolition Specifications
A summary of background and specifications used on a demolition project in Portland
About 25 pages
Metro Solid Waste Department, 1993
600 NE Grand Avenue, Portland, Oregon, (503) 797-1650
- L. Waste Reduction Specifications 1993
A collection of examples of waste reduction specifications
About 50 pages
Metro Solid Waste Department
600 NE Grand Avenue, Portland, Oregon, (503) 797-1650
- M. URBAN PLANNING/LAND USE/COMMUNITIES
A Pattern Language: Towns-Buildings-Construction
A design classic, illustrating patterns that work on all scales, from the reading nook to the whole city
Christopher Alexander, Sara Ishikawa, and Murray Silverstein
Oxford University Press
Design with Nature
Ian L. McHarg
John Wiley & Sons, Inc., 1991
605 3rd Avenue, New York NY 10158 (212) 850-6000 or from the AIA Bookstore (800) 365-2724
- N. Land Use Strategies for More Livable Places: A Guidebook for Local **Governments**
Clear and concise guidelines for land use planning to reduce automobile use.
California emphasis, but nationwide applicability
Have sample drafts of a resolution and other documents for use by local governments or community groups
Steve Weissman and Judy Corbett, Local Government Commission, 1992
909 12th Street, Suite 205, Sacramento CA 95814, (916)448-1198
(916) 448-8246 (fax).
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- O. Sustainable Communities: A New Design Synthesis for Cities, Suburbs, and Towns
Essays by these two leading planners and several others provide a good overview to the theory of ecologically appropriate land use.
Sim Van der Ryn and Peter Calthorpe

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Sierra Books, 1986
 2034 Fillmore Street, San Francisco CA 94115, (415) 291-1600 or from the AIA
 Bookstore (800) 365-2724

1.4 INDUSTRY EXAMPLES SUCCESS STORIES

Record-Setting Program	Project Type	Project Highlights	Recovery Strategy	% Debris recovered (by weight)
Bagley Downs Apartments Eugene, OR	Demolition and construction	This project created 30 affordable housing units, saved the University of Oregon demolition costs, and preserved a community landmark.	Entire buildings saved by moving them to a new location.	73%
Erickson's Diversified	New construction	Erickson's planned to incorporate materials recovery efforts during the construction of	Source separation of materials during	69%
Corporate Headquarters Hudson, WI	Its new corporate headquarters even though it expected to pay more than if it disposed all materials generated. In fact, the company diverted 69% of the project debris and saved money.	Construction by all subcontractors.		
Four Times Square New York, NY	Demolition and construction	Materials recovery was included in plans from the beginning. The contract included requirements that subcontractors reduce disposal and, as an incentive, they were allowed to retain savings earned through avoided disposal costs and materials revenues	Pre-demolition salvage, construction materials sorted off-site because of space limitations.	58%
Marion County Senator Block Salem, OR	Demolition	Marion County and Salem Area Transit saved over \$160,000 by diverting demolition materials from disposal while using the project as a tool to educate the public on recycling. The county placed ads on TV and radio and placed banners illustrating the project recycling rate around the project site.	Salvage of usable items before demolition. Hand and mechanical sorting of materials after demolition to recover metals, concrete, and asphalt.	82%
Ridgehaven Green Office Building San Diego, CA	Renovation	The city of San Diego wanted to reduce, recycle, and reuse renovation materials from this project in order to comply with California's 50%	Many existing materials refurbished and reused. Materials sorted into labeled dumpsters for recycling	51%

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		recycling goal and reduce materials going to the city-owned landfill. In addition to recycling, diverting 51% of the renovation materials from disposal, the city also saved \$92,000.		
Stowe Village Hartford, CT	Deconstruction	This demonstration project not only recovered 50% of the materials from six public housing units, it also trained nine public housing residents in deconstruction techniques.	Buildings hand-dismantled to recover maximum usable materials	50%
Whole Foods Market Corporate Headquarters Austin, TX	Renovation	Recovery of renovation materials saved Whole Foods over \$32,000. Reuse of materials, such as ceiling tiles, light fixtures, and doors, helped the company avoid the purchase of nearly \$25,000 worth of supplies. The company was also able to take an \$8,000 tax deduction for donating salvaged goods to non-profit organizations	Contracts required recycling and reuse. Materials stockpiled and moved about site for storage due to limited space.	42%

1.5 REQUIRED RECYCLING INCLUDES: (NOT AN EXHAUSTIVE LIST)

- A. Used beverage containers—banned from all North Carolina landfills (NC SB111. p. 1345)
- B. Cardboard—banned from Mecklenburg County Landfills
- C. Clean wood wastes
- D. Scrap metal
- E. Asphalt
- F. Gypsum
- G. Ballasts
- H. Fluorescent bulbs containing mercury— banned from North Carolina landfills
- I. White goods—banned from North Carolina landfills (major household appliances such as stoves and refrigerators that are typically finished in white enamel)
- J. Yard waste – Banned from North Carolina Landfills
- K. In addition to required recyclables/recycling, encourage:
- L. Log and sell timber from land-clearing operations any ground timber will be used on campus as mulch
- M. Excess clean earth may be used/needed by UNC Charlotte
- N. Inert materials such as stumps, brick, concrete, block and rock cannot be disposed of in sanitary landfills and must go to a permitted Construction/Demolition landfill.

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- O. Bricks and blocks
 - P. Doors and windows
 - Q. Plumbing fixtures and pipes (provided they don't contain lead)
 - R. Electrical fixtures and wiring
 - S. Metals
 - T. Cardboard
 - U. Aluminum
 - V. Concrete
- 1.6 SAMPLE WASTE MANAGEMENT PLAN (DRAFT & FINAL)
- 1.7 SAMPLE MONTHLY WASTE MANAGEMENT REPORT
- 1.8 STIPULATIONS
- A. The Contractor shall remove all generated trash, recycling, and debris (including, for example, old carpeting) at his or her expense. **The Contractor may not place this trash and debris in University dumpsters.** The Owner, acting through the Designer, shall retain the right to direct the disposal of salvageable equipment (such as metals, cardboard, plastics, paper, glass, and blueprints).
 - B. For all demolition or renovation work which removes serviceable, repairable, or otherwise recoverable equipment or materials (such as metals, cardboard, plastics, paper, glass, and blueprints), the Contractor shall certify that he or she has exercised every practical means of recovery or salvage. (Note: this would be in addition to the required recyclables).