

POLLUTION PREVENTION

Waste Reduction Opportunities in Construction, Renovation and Demolition Operations



Provided by:

Pinellas County Department of Environmental Management

Pollution Prevention and Resource Recovery Program

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Pinellas County Department
of
Environmental Management's

V I S I O N

The Department of Environmental Management is dedicated to providing responsible leadership necessary to manage our natural and urban environment to meet the needs of our present and future Pinellas County citizens.



About This Manual

Waste streams from construction and demolition (C&D) sites may appear to be non-polluting and have little impact on the environment. However, C&D waste streams could potentially contain hazardous or toxic chemicals, some of which may not have been generated by construction and demolition activities. They may be in such small quantities that detection is impossible through waste screening. In an unlined disposal facility, groundwater contamination is a real concern. These materials could potentially leach out and impact ground water.



This manual is designed to assist construction and demolition contractors with waste reduction in on-site activities. Excessive waste is an indicator of the inefficient use of raw materials and resources. Through the use of Best Management Practices (BMPs) and implementation of a waste reduction program, C&D contractors can minimize the amount of liquid, solid, and gaseous waste in Pinellas County, while improving their economic viability. The information in this manual provides guidance for waste stream identification, material reuse/recycling opportunities, and applicable market resources.

Manuals are developed by the Pollution Prevention and Resource Recovery Section of the Pinellas County Department of Environmental Management, a non-regulatory program that provides waste reduction technical assistance. Program staff provides information on new technologies, process modifications, substitute products, and current industry-specific BMPs. Staff can assist businesses in their efforts to become more efficient, profitable, and competitive, while complying with regulatory requirements. As a Pinellas County business, no fees are charged for using the Pollution Prevention Program's services. On-site waste reduction assistance is available by contacting program staff at (727) 464-4761.

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Introduction

The U.S. Environmental Protection Agency (EPA) estimates that C&D debris accounts for approximately 24 percent of the waste in our country's landfills. According to a recent EPA report, the C&D debris waste stream is primarily composed of materials from building demolition (48%), renovation (44%) and construction (8%). In addition to requiring a vast amount of space for disposal, landfilling these wastes is both economically and environmentally costly.

While renovating an existing building for new use may reuse the greatest amount of building materials, this approach is not always feasible. While demolition may sometimes be the only option, C&D debris should be looked at as a commodity, rather than a waste. Dismantling, salvaging and separating re-usable materials has become a cost effective and competitive method for building construction and demolition contractors. Many older structures may contain irreplaceable materials such as wide oak boards and pine flooring, in addition to common reusable construction materials. Removing carpet, flooring or other construction materials may uncover these valuable treasures.

Best Management Practices (BMPs) and new technologies are available that offer contractors an opportunity to improve efficiency. Waste reduction practices can:

- ★ Reduce the use of raw materials
- ★ Minimize the expense of waste disposal
- ★ Reduce the exposure of workers and the general public to hazardous and toxic materials
- ★ Reduce the threat of product liability
- ★ Maximize compliance with environmental regulations

By practicing waste minimization you can improve your bottom line while increasing your business's competitive ability.

What is pollution prevention?

It is the reduction or elimination of pollutants or wastes at the source. The idea behind pollution prevention is to avoid producing the waste in the first place, then you do not have to worry about storage or disposal problems. Having less waste means a better environment for all of us.

Why Should You Consider Waste Minimization and Pollution Prevention?

Wastes result from construction, renovation and demolition activities. Some of these wastes may be classified as hazardous by federal or state regulations and others, while not necessarily hazardous, could damage the environment if not handled properly. Whatever characteristic of the waste, all waste represents loss of resources and loss of money.

Waste reduction techniques include:

- ★ Improved operation and maintenance
- ★ Use of new technologies
- ★ Use of substitute chemicals
- ★ Inventory management
- ★ Water and chemical conservation
- ★ Production process modification
- ★ On-site recovery, recycling and reuse

What can you do?

Many pollution prevention practices are low-cost and low-risk alternatives to help minimize waste and the resulting disposal costs. Most of the approaches are based on common sense and do not require sophisticated technology. This manual contains ideas to get you started. Your business may already be using pollution prevention practices without realizing it!

Often things are done a certain way simply because, “It’s always been done that way.” Remember, there is always room for improvement and, “An ounce of [pollution] prevention is better than a pound of cure.”

What are C&D wastes?

The regulatory definition of C&D waste is based on the source of the waste materials and the waste characteristics. Simply stated, C&D wastes are generated from construction, renovation, or demolition of structures. This includes wastes from development operations and land clearing. Florida Administrative Code (F.A.C.), Ch.62-701 defines components that are typically found in C&D wastes and characterizes these wastes as insoluble in water and non-hazardous in nature. For the purpose of this manual, renovations will be inclusive when the term C&D is used.



Regulations Governing C&D Waste Disposal

The Solid Waste Management Act of 1988 requires the segregation of C&D wastes from non-commercial solid waste. Additional F.A.C. regulations that address disposal of waste materials commonly found in C&D debris include the following:

Asbestos Removal	Chapter 62-257
Refrigerant Recovery	Chapter 62-281
Used Oil/Filter Management	Chapter 62-710
Hazardous Wastes	Chapter 62-730
Mercury-Containing Devices	Chapter 62-737

Prohibited Materials at C&D Disposal Facilities

C&D debris may contain various materials unacceptable for disposal in an unlined landfill. Florida Administrative Code prohibits disposal of the following materials at C&D disposal facilities: hazardous wastes, PCBs, biohazardous waste, lead-acid batteries, used oil/filters, yard trash, white goods (appliances, air conditioners, heaters, etc.), whole tires (some exceptions in Ch. 62-711, F.A.C.), free liquids, household wastes, food wastes, asbestos, mercury-containing lamps and devices, and cadmium-containing batteries. Several of these materials are discussed in the following sections of this manual.

Hazardous Wastes

A hazardous waste is any solid, liquid or contained gaseous by-product with certain properties, that may pose dangers to human health, property or the environment if not managed properly.

Hazardous wastes are currently regulated by federal, state and local public health and environmental protection agencies. A waste may be considered hazardous if it exhibits any of the following characteristics: ignitable, corrosive, reactive, or toxic



Ignitable wastes are easily combustible or flammable. They have a flashpoint of less than 140°F or an alcohol content of 24% or more. (The flashpoint is the lowest temperature at which the vapor of a combustible liquid can be made to ignite in air.)

Ignitable (D001)



Corrosive wastes are liquids that dissolve metals and other materials, or burn the skin. They have a pH of 2 or lower, or 12.5 or higher.

Corrosive (D002)



Reactive wastes are unstable and react rapidly or violently to shock, heat, or pressure, or when mixed with water or other materials.

Reactive (D003)



Toxic wastes generally have adverse health effects. They need only contain a small amount of a certain material such as heavy metals or toxic organics.

Toxic (D004)

A site waste assessment can identify waste contaminants and their characteristics. Some hazardous waste can be identified by reading product labels. Others may be hidden underground (e.g. lead pipes). It is important to remember that demolition contractors can be held liable for hazardous materials that are spilled, ignited, ingested, improperly disposed of, or released. Contact the P2R2 Program when drums or containers of unknown substances or materials are encountered on a site.

PCBs

Polychlorinated biphenyls or PCBs were once used as insulators in electrical equipment, but their manufacture and use has been banned since 1976. However, other parts of the world still manufacture PCBs. In construction, renovation, and demolition activities, PCBs may still be found in fluorescent light ballasts or starting capacitors in pre-1976 electric motors. It is difficult to determine if an old electrical device contains PCBs. Such devices may not have labels that identify PCBs. A safe rule of thumb is to consider electrical equipment containing insulating oil as potentially containing PCBs. Wastes containing PCBs are regulated wastes.

Used Oil/Filters

There are several waste disposal locations in Pinellas County for used oil. Contact the P2R2 Program for a list of participating facilities and drop-off sites. Hydraulic oils from structural equipment such as automatic doors should be recovered during C&D activities.

White Goods

“White Goods” is a term for household appliances (water heaters, refrigerators, etc.). White goods are typically part of residential renovation and demolition projects. However, commercial sites may have white goods in employee break rooms. C&D landfills are concerned with white goods containing PCBs or freon. Recycling is a viable option in this case. Used appliance stores and non-profit organizations can provide a market for these items. In project activities where white goods are recovered, store all freon-containing devices upright to prevent compressor oil from leaking into the freon. If freon is contaminated with oil, the recycling potential of the freon is reduced. Remember, only a certified technician can remove freon from a stationary source according to Section 608 of the Clean Air Act of 1990.

Free Liquids

Free liquids (paints, oils, etc.) should not be disposed of in a C&D landfill. Contact the P2R2 Program for disposal options.

Asbestos

Asbestos is one of the most common hazardous materials encountered in C&D projects, but recognizing asbestos-containing materials (ACM) can be difficult. Asbestos insulating and fire retardant properties make it suitable for use in insulation materials, condensate barriers and acoustical applications. However, due to the hazardous risks of airborne fibers, asbestos requires special handling and disposal. Potential inhalation of fibers poses a health risk.

The following is a list of applications where asbestos is likely to be present:

- ★ Ceilings (popcorn, ceiling tiles, acoustical, troweled, sprayed, textured, skim coats)
- ★ Flooring (vinyl sheets, floor tiles, adhesives, glue)
- ★ Roofing materials (flashing, tab shingles, asphaltic shingles, cement shingles, felts)
- ★ Exterior cement siding
- ★ Textured paints, plasters, brown coats, skim coats
- ★ Cement pipe (boiler and pipe insulation)

- ★ Pipe coverings (insulation or mudded joints)
- ★ Millboard, drywall, tapes, joint compound
- ★ Window caulking
- ★ Corrugated cement panels
- ★ Boiler room walls and ceilings
- ★ Boiler and tank insulation
- ★ Duct insulation, wet tape, and vibration dampers
- ★ Expansion joints
- ★ Fireproofing on beams and walls
- ★ Radiant heat systems, boilers, chillers, radiators



Prior to demolition or renovation activities, a thorough inspection performed by a licensed asbestos consultant is required to determine if asbestos is present. A materials content can only be determined through analytical analysis. If asbestos is determined to be present on a renovation or demolition project, the asbestos-containing materials must be handled by a Licensed Asbestos Removal Contractor.

The following rules are applicable to asbestos:

- ★ Pinellas County Code and The National Emission Standard for Hazardous Air Pollutants (NESHAP) regulation (40 CFR 61 Subpart M) requires a thorough asbestos inspection, notification and very specific work practices for renovation and demolition activities.
- ★ Occupational Safety and Health Administration (OSHA) requires a hazard communication to workers on all asbestos projects and protects workers from the health hazards associated with asbestos through proper training and personal protective clothing requirements.
- ★ The Department of Business and Professional Regulation (DBPR)

requires specific training and/or licensure for the removal of ACM, based on the specific type of material. They also required licensure for Asbestos Consultants.

Failure to comply with any of these asbestos rules can result in costly penalties and fines. Contact Pinellas County's Air Quality Division at (727) 464-4422 to determine if a project may be subject to any asbestos regulations.

Mercury-Containing Lamps and Devices

Mercury-containing devices typically present in both residential and commercial building structures include:

- ★ Mercury lamps and ballasts
- ★ Mercury Vapor HID lamps (used in outside applications, e.g. security, parking lots)
- ★ Metal halide lamps (used in outside applications, e.g. security, parking lots)
- ★ High pressure sodium lamps (used in outside applications, e.g. floodlights, roadways)
- ★ Thermostats, thermometers (usually contain elemental mercury in some type of glass ampoule)
- ★ Mercury switches/relays (usually contain elemental mercury in some type of glass ampoule)

The mercury waste stream may appear to be small, but one standard four foot fluorescent lamp may contain up to 41 milligrams (mg) of mercury. The mercury is present in gaseous form and in the phosphor powder coating inside the tube. If a tube is broken during disposal, the gaseous mercury enters the atmosphere and a solid waste stream concern results from the powder coating. This powder may cause adverse impact to ground water if it filters downward. Mercury and mercury-containing devices require special handling. These materials are normally considered a hazardous waste if not recycled.

Mercury-containing devices should be removed prior to demolition and renovation of structures. Rule 32-737.300 of the Florida Administrative Codes prohibits the disposal of mercury-containing devices, but does not

include lamps. A list of mercury recyclers is included in the Resources Section of this manual.

Rechargeable Batteries

Rechargeable batteries (in C&D projects, lead-acid and ni-cad batteries weighing less than 25 pounds and from non-vehicular sources) and products containing rechargeable batteries should not be placed in a mixed solid waste stream. Exit signs in buildings typically use lead-acid batteries and must be removed prior to demolition and renovation of structures.

Waste Assessments

Why do landfills screen wastes?

Landfills screen wastes to identify any prohibited materials in waste loads and to facilitate removal of such wastes for proper disposal or recycling. C&D landfill facilities prohibit certain wastes depending on their contamination potential, exposure hazards (e.g. decomposition gasses), special handling requirements, or the source of the material. Special handling costs could be incurred as a result of delivering prohibited wastes to a C&D landfill. For this reason, C&D contractors need to know the proper removal, handling, disposal, and or recycling of prohibited wastes from structures prior to demolition. Items of concern include:

- ★ Thermostats
- ★ White goods
- ★ Fluorescent light fixtures, tubes, and ballasts
- ★ Smoke detectors
- ★ Exit lights and other fixtures that contain rechargeable batteries
- ★ Furniture
- ★ Electronic equipment (televisions, radios, computers, etc.)
- ★ Paint, paint cans and buckets
- ★ Hazardous wastes/materials (lead, asbestos)
- ★ Gasoline operated devices
- ★ Heavy equipment parts
- ★ Wood



Screening wastes removes contaminants that may impact groundwater quality, particularly in unlined landfills.

Why should contractors conduct an on-site waste assessment at each project?

On-site waste assessments will not only assist the removal of hazardous wastes and wastes prohibited from C&D landfills, but they also function to identify re-usable or recyclable materials that may have been overlooked in the absence of an assessment.

Development of a Waste Assessment

Each construction and demolition project has its own combination of wastes, creating a challenge for the project manager to identify uses for the wastes. Prior to any construction or demolition activity:

- ★ Accompany salvagers on-site to identify re-usable or marketable items.
- ★ Identify potential wastes and remove salvageable items as early as possible in the project.
- ★ Remove and recycle all metal before demolition (aluminum siding, steel pipes, copper pipes).
- ★ Separate your waste streams.
- ★ Identify, remove and properly dispose of all hazardous materials according to regulatory requirements for each waste.
- ★ Identify and remove asbestos-containing materials according to regulatory requirements and guidelines.
- ★ Remove freon from refrigerators, air conditioners, and cooling units to prevent releases to the air.
- ★ Remove controls that contain PCBs such as those on refrigerators, fluorescent ballasts and dryers.

During the project:

- ★ Look for additional salvageable items during each stage (e.g. salvageable hardwood flooring covered by carpet, reusable ceiling beams, etc.)
- ★ Develop a troubleshooting plan. Periodically visit the site.

On-site, continually assess the waste generated. An easy rule to follow when demolishing a structure is to take it down in the reverse order of the construction phase to maximize material reclamation:

- ★ Electrical and plumbing fixtures
- ★ Cabinets
- ★ Inner walls
- ★ Molding, trim, carpeting, interior walls, ceilings, doors, windows
- ★ Roof (related materials and supports)
- ★ Siding
- ★ Studs and joists
- ★ Sills and main beams
- ★ Foundations

Materials Associated with C&D Projects

C&D activities can produce a variety of wastes, including:

- ★ Wood (waxed corrugated plywood, pressure-treated lumber, etc.)
- ★ Lead pipes
- ★ Concrete, brick and block
- ★ Ferrous and non-ferrous metals
- ★ Paint
- ★ Tile
- ★ Asphalt/roofing materials
- ★ Fiberglass, isocyanate and urea-formaldehyde foam insulation
- ★ Glass
- ★ Empty barrels, paint buckets, cans, caulking tubes
- ★ Plastic/laminate scrap composite/plastic interior
- ★ Petroleum-contaminated soils
- ★ Plaster from lathe and plaster walls
- ★ Vinyl siding/window frames
- ★ Drop cloths and tarps

Wastes indicate a loss of resources and money. Rather than pay for disposal, C&D wastes may be up to 80% recyclable.

“Problem Wastes”

Materials usually considered problem wastes include buckets, carpet, caulking tubes, cardboard, food wastes, and treated wood wastes. These

wastes are not considered acceptable at C&D facility landfills. However, exceptions to the policies may exist, depending on individual landfill capabilities. For example, if a C&D landfill operator accepts buckets, he/she must have a system to ensure that only empty buckets are in the disposal areas. The primary concern is determining if a bucket is empty or contains a hazardous material. Ask your C&D hauler to provide you with their landfill policy on problem wastes. Carpet and treated wood wastes are briefly discussed in this manual.

Carpet

Carpets are a concern in landfills due to what may have been applied to them during their useful life (pesticides, chemicals, adhesives, etc). In addition, new carpet fragments from construction or demolition activities may emit volatile materials into the air. Carpets are not typically removed from demolition projects, but new carpet and padding fragments may be resold or donated to charitable organizations.



Treated Wood Wastes

Treated wood wastes have the potential to release chemicals used in preservatives to the environment. Water-borne preservatives may contain heavy metals (chromium, arsenic, copper, zinc), which can be acutely toxic or carcinogenic in sufficient quantities. Oil-borne preservatives such as pentachlorophenol (PCP) or copper naphthenate also have toxic characteristics. PCP may be found on utility poles, cross arms, and large structure laminated beams.

Creosote is another preservative that is used in applications where the preserved material will not frequently come into contact with bare skin. Railroad timbers, bridges and guardrail posts, fencing posts, marine docks, seawalls, and bulkheads may contain creosote. Creosote is actually a mix of creosols, phenols, and other chemicals. Creosols and phenols are toxic to the environment.

Potential Markets for C&D Materials

The savings generated from recycling C&D debris is directly proportional to rising landfill “tipping fees” (fee charged by landfill operators), providing a powerful incentive for locating markets for C&D debris. In Florida, the average fee is \$30-40/ton with some landfills as high as \$100/ton.

<i>Material</i>	<i>Potential Use</i>
Asphalt	Road subbase fill, new road construction
Concrete	Crushed and mixed to make new asphalt cement blocks, base material, asphaltic concrete
Dirt	Landscaping, landfill cover
Metals	Scrap metal dealers
Wood	Fuel, animal bedding, landscaping, manufactured building products, and compost; donate to Habitat for Humanity (727) 321-4512
Brick	Masonry crushed for ornamental stone
Glass	Fiberglass insulation, sand blast, aggregate in asphalt reflective beads
Gypsum/drywall	Soil amendment, gypsum board, cement production, stucco additive
Plastic	ABS: plastic lumber; PCV: highway barriers; Polyethylene: traffic cones
Polystyrene	Insulation
Porcelain	Crushed for aggregate

<i>Material</i>	<i>Potential Use</i>
Corrugated cardboard	Paper mills, fuel pellets
Carpet	Landfill cover
Roofing shingles	Asphalt paving
Appliances	Donate or sell usable units; recycle unusable units with a metal recycler
Cabinets	Reuse remodeling activities
Doors	Reuse remodeling activities
Electrical scrap wire	Recycle to an electrician or metal manufacturer
Windows	Vinyl frames are not recyclable, but the glass, wood and aluminum components are recyclable
Framing	Recycle, reuse
Heating	Recycle metal ducts and trimmings
Insulation	Reuse clean scraps around windows or filling around bath tubs
Millwork	Reuse casings and moldings recycle remainder with wood
Paint	Reuse leftover paint as primer, or donate to Pinellas County Swap Shop, or program like Habitat for Humanity
Plumbing	Reuse fixtures, donate or sell usable fixtures, recycle metal
Vinyl Flooring	Flooring and adhesives may contain asbestos. Before removal call Pinellas County Air Quality's Air Toxics Section at (727) 464-4422
Wood Flooring	Reuse; damaged flooring can be recycled with wood

Although there are currently many companies across the nation recycling materials derived from C&D debris, it can sometimes be difficult to locate markets. In Florida, there are many waste stream materials that are either reused or recycled:

- ★ Concrete
- ★ Asphalt
- ★ Rock and construction aggregate
- ★ Lumber, wood waste (pallets, unpainted, and untreated wood)
- ★ Ferrous and non-ferrous metals
- ★ Corrugated cardboard

Reusing building materials from salvage operations can reduce material and disposal costs at the construction site, prove more economical than disposal, and can result in a lower bid price for the project. The following information identifies potential uses for C&D related waste.

This manual contains a listing of salvagers. Additional listings occur in the Yellow Pages under “demolition contractors”, “salvage merchandise”, or “building materials-used”. Reusing or recycling one material could divert the majority of your waste (e.g. wood, concrete). A detailed discussion of salvageable items follows.

Asphalt and Concrete

Local recyclers of asphalt and concrete may include construction material companies, sand and gravel producers, and asphalt plants.

Recycling asphalt and concrete on-site:

- ★ Reduces the cost of new material
- ★ Saves landfill space
- ★ Generates income from the sale of scrap rebar, copper piping, and used bricks
- ★ Saves in landfill tipping fees and transportation
- ★ Conserves resources

Potential markets for crushed concrete include:

- ★ Substitute for crushed stone products in road construction (pavement and road base)
- ★ Fill material (footing and foundation backfill and general fill)
- ★ Landfill roadways or landfill covers
- ★ Slabs of concrete can be used to prevent shoreline and stream erosion, or used in artificial reef development.

Asphalt pavement can be recycled on-site by either surface recycling or road base recycling. Surface recycling breaks up the top layer of a pavement structure then recompacts the loose material. A new surface is placed on top of the recycled asphalt, and the pavement is compacted again. Road base recycling lifts, blends, and crushes the asphalt and base of the road, then deposits a well-graded mix. A new surface is placed on top of the

recycled base. If reuse on-site is not desired, recycled asphalt can be transported to an asphalt batch plant and processed.

There are several points to consider before implementing on-site recycling of asphalt and concrete materials:

- ★ Air permits or permits to operate may be necessary depending on local and state regulations
- ★ Regulatory compliance with regard to source emissions and fugitive emissions
- ★ Regulatory restrictions may apply if hazardous materials are present

Wood Wastes

Wood wastes can be diverted from landfilling and used in a number of applications:

- ★ Lumber reuse
- ★ Fibers for manufacturing
- ★ Animal bedding
- ★ Mulch
- ★ Bio-mass fuel
- ★ Composting operations (soil amendment or fertilizer)
- ★ Applied to cleared areas for dust suppression and runoff control
- ★ Reuse for hobby projects
- ★ Reuse in home heating or construction

Although many markets exist for wood wastes, it is often difficult to reuse all of the waste products. Wood wastes that cannot be reused or taken offsite by a recycler can be reduced in size by a wood tub grinder. Wood wastes that are chipped or ground will decompose more readily. Grinders can process large and odd-shaped wood wastes.

Treated wood wastes, plywood, and particle boards should not be composted. These wood materials may contain glues that are hard on machinery, difficult to compost, and contain chemicals not suited for land application.

Reusing or composting wood waste will result in a reduction of disposed waste, purchasing costs, and landfill disposal fees.

Roofing Materials

The asphalt shingle is the most common type of roofing material used in both new home construction and re-roofing. Recycling and paving technologies currently exist for roofing wastes.

Roofing wastes can be used for:

- ★ Parking lots or temporary roadways
- ★ Aggregate base course
- ★ Hot mix asphalt wear course
- ★ Pothole/road patch material
- ★ Granular base stabilization layer
- ★ Expansion joints
- ★ Moisture barrier under base course

Recycling roofing materials for roadways is limited by Department of Transportation (DOT) paving specifications for road durability based on local climactic conditions. The paving specification defines acceptable composition of paving materials, approved additives, and field applications. The composition of waste shingles varies from roof to roof creating a further challenge to recycling.

Recycling is possible once the hurdles of the recycling operations are overcome. The desire for simple, easy disposal, the costs for setting up the recycling operation, and the collection process have to be considered to develop an effective recycling program for roofing materials.

Contact your local DOT about potential local markets for shingles in paving materials.

Best Management Practices for C&D projects

Waste management can be costly, particularly when ensuring proper handling and safety. Consider the following tips to minimize waste generation in C&D projects:

- ★ Identify potential wastes prior to any construction or demolition activity
- ★ Allow time in the schedule for salvage and recycling

- ★ During land clearing activities, leave as many trees and shrubs in place as possible to minimize the solid waste stream. Also, a certain number of trees must be kept according to County Code and site characteristics (Development Review Services Department, Environmental Section, (727) 464-3888).
- ★ Plan reclaim activities in stages to coincide with demolition stages so that stockpiling will not interfere with construction or demolition activities.

On the average, most construction waste can be disposed of at a recycling facility for fees ranging from \$0 to \$45/ton. If recycling is occurring, some recyclers may pay you for the salvageable products.

Improve Operations

- ★ Practice good inventory control to prevent usable materials from becoming waste.
- ★ Select demolition methods and procedures that will promote reuse.
- ★ Separate your waste streams to increase their potential for reuse/recycling or to reduce disposal costs when there is no other option. Mixing wastes can cause non-hazardous waste to be considered hazardous if mixed with hazardous wastes, increasing disposal costs.
- ★ Ventilate workers' areas that may be contaminated with radon, particulates, or gases, and be certain that pollution problems are not transferred outside.
- ★ Hire only trained personnel or provide a training program.

Reuse & Recycle

- ★ Establish a recycling program. Involve co-workers and contractors from the start.
- ★ Develop specific salvage, reuse, or recycling guidelines for subcontractors to follow as part of a contract. Include a monitoring system to track the effectiveness of waste stream diversion.
- ★ Inventory and remove reusable and recyclable materials.
- ★ Reuse or sell for reuse: bricks and blocks, doors and windows, plumbing, electrical fixtures and wiring, etc.

- ★ Sell for recycling: glass, metals, plastic, wood, etc.
- ★ Crush old concrete that does not contain metal and use it as an aggregate or base material.
- ★ Educate subcontractors on materials to be recycled and include the recycling requirement in their contract. Inform all workers on site that regular garbage should not be placed in recycled product areas. Designate a garbage bin.
- ★ Clearly mark and locate the collection bins to encourage separation of wastes.
- ★ Find a hauler to handle the job. Check out your hauler to prevent illegal dumping. Question where the waste is going, and request a receipt from a legitimate recycler or processor.
- ★ Provide periodic reports to owner/contractor on the money saved and the amount of material salvaged, reused, or recycled.
- ★ Offer excess or salvageable materials that do not require special handling or regulated disposal for reuse.
- ★ Ask suppliers to haul salvaged drywall back to their plant and recycle it into new drywall; donate scrap drywall to community housing projects.
- ★ Use components of the demolished structure in the new project by starting with common dimensional lumber, such as 2 x 4s and 2 x 6s.
- ★ Dispose of all non-reusable/non-recyclable waste materials at a regulated facility. Call Environmental Management's Pollution Prevention and Resource Recovery (P2R2) Program for more information on handling and disposal. Construction site recycling guides, recycling markets directories and materials exchange programs can help locate networks to sell or buy surplus products and unspent materials. Several guides provide specific material descriptions and pricing.

Construction and Renovation Projects

During construction and renovation activities, consider these measures:

- ★ Instead of demolishing sound structures, retrofit and retain as long as possible.
- ★ Remove lead paint.
- ★ Replace lead water pipes with copper or steel pipes.

- ★ In plumbing that is less than five years old, replace lead solder with tin-based solder to prevent leaching of the lead. In older pipes, the lead carbonate that forms inside the pipes keeps the lead from leaching.
- ★ Purchase materials from manufacturers who practice Pollution Prevention (see C&D Industry Resources Section of Manual).

One Final Word About Pollution Prevention...

Pollution prevention is everyone's responsibility. Management commitment and employee participation are vital to a successful pollution prevention program. Management can demonstrate commitment to pollution prevention and encourage employee participation by "practicing what they preach" in addition to the following:

- ★ Training employees in pollution prevention techniques
- ★ Encouraging employee suggestions
- ★ Providing resources necessary to get the job done
- ★ Establishing a recognition program to encourage employee participation

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Envirosense. 1996. *Wood Recycling*. On the web at: http://p2library.nfesc.navy.mil/P2_opportunity_handbook/7_I_A_5.html. Discussion of several applications for recycling and reuse of wood wastes.

University of Wisconsin-Extension, Solid and Hazardous Waste Education Center & Small Business Development Center. 1997. *Small Business Waste Reduction Guide*. On the web at: <http://www.uwex.edu/ces/ag/sbdc/sections.htm>. Discussion of waste reduction opportunities in small business including C&D activities.

PRO-ACT Factsheet. 1995. *Disposal of Construction and Demolition Debris*. United States Air Force efforts to minimize landfilling of C&D debris.

Randy Woods. 1996. *C&D Recycling Blooms In the City of Roses*. Waste Age. Facility success stories of waste reduction and C&D recycling in Portland, Oregon.

Michael Krissoff. 1996. *Construction and Demolition Material Recycling*. http://p2library.nfesc.navy.mil/P2_opportunity_handbook/7_I_A_8.html. This article provides information on recycling processes for asphalt/concrete and resource lists.

Assistance Centers and Information Sources

Pinellas County

Department of Environmental Management

Pollution Prevention Resource Recovery (P2R2) Program: (727) 464-4761

Air Quality Division: (727) 464-4422

Household Electronics and Chemical Collection Center

24 hour Hotline: (727) 464-4623

Utilities/Solid Waste (727) 464-7500

State of Florida

Department of Environmental Protection

- Main Switchboard: (813) 744-6100
- Hazardous Waste Compliance Assistance Program: (800) 741-4337
- Emergency State Warning Point: (800) 320-0519
- Florida Small Business Assistance Program: (800) 722-7457
- Pollution Prevention Information Clearinghouse: (202) 260-1023
- Earth’s 911 for Community Assistance: (800) 947-3873
- Southern Waste Information Exchange (SWIX): (800) 441-7949

United States

Environmental Protection Agency

- Region IV, Atlanta: (404) 562-9900
- Small Business Assistance Ombudsman: (800) 368-5888
- Waste Reduction Resource Center: (800) 476-8686
- Education and Outreach: (800) 241-1754
- RCRA/Superfund Hotline: (800) 424-9346
- Occupational Safety and Health Administration (OSHA): (813) 626-1177
- Recycling Hotline: (800) 947-3873

Additional assistance is also available through your industrial associations and various programs:

- National Association of Demolition Contractors (NADC): (800) 541-2412
- American Institute of Constructors: (727) 578-0317
- National Association of Home Builders of the United States: (202) 822-0200

C&D Industry Resources

C&D Recyclers

Asphalt Products

Sonny Glasbrenner (727) 573-1180
 3741 126th Avenue North
 Clearwater, FL 33762

Angelo’s Recycling (727) 581-1544
 1755 20th Avenue SE
 Largo, FL 33771

Carpet Recycling

Margie Fox (813) 224-9694
3000 North Boulevard
Tampa, FL 33603
Pull up commercial carpet, clean and reuse elsewhere

Carpet Pad Recyclers

Carpet Pad Recycling. (352) 735-9008
Recycling LLC.
26128 C.R. 448A
Mt. Dora, FL 32757
Get paid 5-10 Cents/Pound For Old Carpet Padding.

Enviro-Tech, R.C. Inc. (727) 572-8448
4477 122nd Avenue North, Unit A
Clearwater, FL 33762

Recyclease, Inc (727) 841-6934
8725 Bench Drive, Suite 6
Port Richey, FL 34668

Concrete Products

Sonny Glasbrenner. (727) 573-1180
3741 126th Avenue North
Clearwater, FL 34622

Angelo’s Recycling (727) 581-1544
1755 20th Avenue SE
Largo, FL 33771

Southwest Land Developers. (941) 637-8345
Exit 28, North Jones Loop Near I-75
Punta Gorda, FL 33982

Drywall

Southwest Land Developers. (941) 637-8345
Exit 28, N Jones Loop Near I-75
Punta Gorda, FL 33982

Pallets

Southwest Land Developers. (941) 637-8345
Exit 28, North Jones Loop Near I-75
Punta Gorda, FL 33982

Pallet Recall (941) 727-1944
6755 33rd Steet
Sarasota, FL 34243

D&S Pallets Services (727) 540-0061
10315 68th Street
Pinellas Park, FL 33782

East Bay Environmental Services (813) 577-9572
5210 West Linebaugh Avenue
Tampa, FL 33624

A.C.C. Recycling Corporation. (727) 896-9600
1190 20th Steet North
St. Petersburg, FL 33713

Wood

Southwest Land Developers. (941) 637-8345
Exit 28, N Jones Loop Near I-75
Punta Gorda, FL 33982

Used Building Material Re-Sale Outlets

Giant Mart (727) 526-1494
5485 Haines Road North
St. Petersburg, FL 33714

S & M's Used Merchandise (727) 526-8888
5275 Haines Road North
St. Petersburg, FL 33714

Layman's Used Merchandise (727) 531-3801
12190 U.S. 19 North
Clearwater, FL 33764

Pinellas Habitat for Humanity (HFH) (727) 536-4755
3071 118th Avenue North
St. Petersburg, FL 33716

Sarasota Architectural Salvage (941) 358-7730
1093 Central Avenue
Sarasota, FL 34236

Used Stuff Inc. (941) 953-5100
1404 Central Avenue
Sarasota, FL 34236

Orlando Liquidators, Inc. (407) 332-6206
1016 Savage Court
Longwood, FL 32750

Demolition Companies Involved in Deconstruction and Dismantling

Insul-Coat, Inc. (407) 478-0627
2302 Mercator Drive, Suite 102
Orlando, FL 32807

L&L Demolition and Salvage (407) 295-0875
5500 Old Winter Garden Road
Orlando, FL 32811

Standard Demolition Corporation (888) 678-7898
1607 43rd Street North
Tampa, FL 33605

Beasley & Son Inc. (813) 626-0978
4922 N 56th Street
Tampa, FL 33610

Dore & Associates Contracting, Inc. (800) 344-7876
1715 E Fowler Avenue, Suite 217
Tampa, FL 33612

Florida Wrecking and Salvage (813) 741-0405
8814 Honeywell Road
Gibsonton, FL 33534

4Globe Demolition and Recycling. (407) 422-4768
2225 Hazelhurst Drive
Orlando, FL 32801

Salvage Brokers

Michael Murphy (813) 902-1480
3503 West San Juan Street
Tampa, FL 33629

Land Clearing Debris (Trees, shrubs, brush)

Peterson Organics, Inc (727) 898-7488
P.O. Box 415
St. Petersburg, FL 33771

Consolidated Resource Recovery (727) 299-9300
12101 40th Street
Clearwater, FL 33762

White Goods

Scrap-All, Inc. (727) 247-3619
2801 East 4th Avenue
Tampa, FL 33605

Additional recycler information may be available in the local phone book yellow pages or the Environmental Yellow Pages. If you would like to receive a copy of the Environmental Yellow Pages, contact the P2R2 Program at (727) 464-4761. The information is provided to you as a resource and is not intended to promote any one business.

Recyclers of Mercury-Containing Lamps/Devices

Envirolight & Disposal, Inc. * (727) 526-8870
3200 44th Avenue North
St. Petersburg, FL 33714

ONYX (Superior Special Services) ** (800) 556-5267
4972 Woodville Highway
Tallahassee, FL 32311

HID Recycling, Inc..... (800) 200-9716
32000 Aurora Road
Solon, OH 44139

* *Florida Permitted Mercury Recovery Facility*

** *Florida Permitted Mercury Recovery and Mercury Reclamation Facility*

Materials With Recycled Content

Cellulose Insulation

RPH Enterprises, Inc. (904) 387-5571
2903 Burke Street
Jacksonville, FL 32205

Southern Cellulose..... (404) 696-3590
4530 B Patton Drive
Atlanta, GA 30336

Gypsum Wallboard

BPB America, Inc..... (866) 427-2872
5301 West Cypress Street, Suite 300
Tampa, FL 33607

Polystyrene

PACTIV Building Products (800) 241-4402
2100 River Edge Parkway
Altanta, GA 30328
“Green Guard” products

Polyisocyanurate Insulation

Atlas Roofing Corporation (800) 933-1476
1775 The Exchange, Suit 160
Atlanta, GA 30339

Structural Fiberboard and Laminated Paperboard

Georgia-Pacific Corporation (404) 652-5547
P.O. Box 105605
Atlanta, GA 30348

Cement & Concrete

CDS Manufacturing, Inc. (850) 875-4651
441 South Virginia Street
Quincy, FL 32351

Titan America Company (305) 364-2230
11000 North West 121 Way
Medley, FL 33178

Ceiling Tiles

Armstrong Ceiling Recycling Program (877) 276-7876
P.O. Box 3001
Lancaster, PA 17604
Pays freight for shipping to recycle & reuse their ceiling products

Floor Tiles

Tennessee Mat Co., Inc. (615) 254-8381 or (800) 264-3030
1414 Fourth Avenue, South
Nashville, TN 37210-0186

Additional Resources

Hazardous Waste and Paint Disposal Information

Pinellas County Solid Waste (727) 464-7500

Illegal Dumping Reporting

Pinellas County Solid Waste Enforcement Division (727) 464-7500

Asbestos Abatement Information

Pinellas County Department of Environmental Management,
Air Quality Division, Air Toxics Section (727) 464-4422

Human Exposure to Lead/Lead Abatement

Pinellas County Health Dept Environmental Health (727) 824-6900
Provide survey for Homeowners

Occupational Safety & Health Administration (OSHA) . . (813) 626-1177

Underground Storage Tanks

Pinellas County Public Health, Engineering (727) 538-7277

Florida Department of Environmental
Protection (FDEP) (813) 744-6100 ext. 356

Publications/Reports

Recommended Management Practices for the Removal of Hazardous Materials from Buildings Prior to Demolition, 2nd Edition, Prepared by Department of Environmental Engineering Sciences, University of Florida Gainesville, Florida, Report #0232009-04
http://www.floridacenter.org/publications/Demo_Guide_04_FINAL.pdf

Vleck, Rudi E., *Advanced Construction and Demolition Waste Management for Florida Builders*. University of Florida, August 2001

Guidance for Controlling Asbestos-Containing Materials in Buildings, EPA 560/5-85-024. (To Order, call EPA Publications at 513-489-8190 or 800-241-1754)

Organizations/Associations

National Demolition Association (NADC) (800) 541-2412
16 North Franklin Street, Suite 203
Doylestown, Pa. 18901

National Association of Home Builders (NAHB) (800) 368-5242
1201 15th Street NW
Washington, D.C. 20005

Florida Home Builders Association (FHBA) (850) 224-4316
P.O. Box 1259
Tallahassee, FL 32302

Building Materials Reuse Association (BMRA) (800) 990-2672
545 Ridge Avenue
State College, PA 16803

Construction Materials Recycling Association (CMRA) . (630)-585-7530
P.O. Box 122
Eola, IL 60519

Tampa Bay Builders Association/Contractors
& Builders Association of Pinellas (813) 873-1000
2918 West Kennedy Boulevard, Suite 201
Tampa, FL 33609

Construction Resources Group, Inc. (727) 578-1962
469 94th Avenue North
St. Petersburg, FL 33702

The Center for Construction and Environment (352) 392-9029
University of Florida, FAC 101
P.O. Box 115703
Gainesville, FL 32611-5703

Website Resources

www.WasteXchange.org - SWIX, the Southern Waste Information eXchange, Inc. operates as a clearinghouse for information on the availability of and demand for waste streams.

www.freecycle.org – Site to advertise items you would like to give away.

www.shinglerecycling.org - The University of Florida has created ShingleRecycling.org to provide information to those interested in recycling asphalt shingles. Information on markets, technical reports, fact sheets, permitting issues, and more.

www.drywallrecycling.org - on-line resource for those interested in recycling gypsum drywall.

Funding Opportunities for Recycling

Florida Resource Guide for Recycling Businesses, 1998; pgs. 25 –31;

A publication of the Florida Recycling and

Reuse Business Assistance Center (850) 245-8707

http://www.dep.state.fl.us/waste/quick_topics/publications/shw/recycling/rbacguid.pdf

Innovative Recycling Grants Program

Shannon Reynolds, Innovative Recycling Grants Coordinator

Florida Department of Environmental Protection,

Division of Waste Management (850) 245-8716

2600 Blair Stone Road

Tallahassee, Florida 32399-2400

The P2R2 Program can provide additional resources regarding project funding, energy efficiency, product/equipment technology, and technical assistance. For information, contact our program at (727) 464-4761.

The P2R2 Section was developed to minimize the amount of liquid, solid, and gaseous pollution as well as energy and water consumption within Pinellas County.



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The **P2R2** Section's mission is to minimize the amount of liquid, solid and gaseous pollution as well as energy & water consumption within Pinellas County.



For any additional information, please contact the Pinellas County Department of Environmental Management Pollution Prevention and Resource Recovery Program at **(727) 464-4761**.

**Pinellas County Department of
Environmental Management**
512 S. Ft. Harrison Avenue
Clearwater, FL 33756



www.pinellascounty.org/environment



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Pinellas County complies with the Americans with Disabilities Act. To obtain accessible formats of the document, please contact the Department of Environmental Management at:
(727) 464-4761/TDD-Text Phone (727) 464-4062